System Management Command Reference for Cisco NCS 5500 Series Routers and Cisco NCS 540 Series Routers

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Preface

This guide describes the System Management commands. This chapter contains details on the changes made to this document.

Changes to this Document

Table 1: Changes to this Document

Date	Summary
July 2018	Initial release of this document.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business results you're looking for with the technologies that matter, visit Cisco Services.
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Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Boot Commands

This module describes the commands used to boot or reset Cisco IOS XR software.

For more information about ROM Monitor (ROMMON) and boot tasks, see or .

reload

To reload the route processor (RP), use the **reload** command in EXEC mode.

reload

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **reload** command to cause the RP to reload the Cisco IOS XR software according to the configuration register setting (for example, 0x0 to enter ROMMON mode and 0x2 to reload the RP to EXEC mode). If a standby RP is in the ready redundancy state, the **reload** command also causes the router to fail over to the standby RP. Use the **show redundancy** command in EXEC mode to display the status of the standby RP.

When the **reload** command is used and a switchover occurs, the running (active) software configuration is automatically maintained during switchover.

Caution If a standby RP is not installed or is not in the ready state, then the router experiences a loss of service while the active RP is reloading Cisco IOS XR software. To view the status of the standby RP, issue the **show redundancy** command in EXEC mode.

If you use the **reload** command and there is no available standby node, you are prompted to continue with the reload:

```
Router# reload

Standby card not present or not Ready for failover. Proceed?[confirm]y
```

Task ID

Task ID	Operations
root-lr	execute

The following example shows how to reload the active RP. If a standby RP is in the ready state, then the router fails over to the standby RP. If the standby RP is not installed or is not in the ready state, then the router enters ROMMON mode and routing operations stop.

```
Router# reload

  Updating Commit Database.  Please wait...[OK]
  Proceed with reload? [confirm] y

  PCI0 device[7]: Vendor ID 0x10ee
  PCI0 device[7]: Device ID 0x300e
  PCI1 device[7]: Device ID 0x1100
  PCI1 device[7]: Vendor ID 0x1013
  PCI1 device[8]: Device ID 0x649
  PCI1 device[8]: Vendor ID 0x1095
  PCI1 device[9]: Device ID 0x5618
  PCI1 device[9]: Vendor ID 0x14e4
  PCI1 device[10]: Device ID 0x5618
  PCI1 device[10]: Vendor ID 0x14e4
  System Bootstrap, Version 1.15(20040120:002852) ,
  Copyright (c) 1994-2004 by cisco Systems, Inc.
  Board type is 0x100000 (1048576)
  Enabling watchdog
  Broadcom 5618 #0 Found on PCI
  Broadcom 5618 #1 Found on PCI
  No. of BCM 56xx switches found 2 .
  BCM Switch #0 initialisation complete.
  BCM Switch #1 initialisation complete
  G4(7450-SMP-GT64260_A) platform with 2048 Mb of main memory

  rommon B1 >
```

reload (administration EXEC)

To reload a node or all nodes on a single chassis or multishelf system, use the **reload** command in the appropriate mode.

reload [**location** {*node-id* | **all**} | **rack** *rack-number*]

Syntax Description

location	(Optional) Specifies the node to reload.
node-id	The *node-id* argument is expressed in the *rack*/*slot*/*module* notation.
all	The **all** keyword specifies all RP nodes.
rack-number	Rack number of the line card chassis or fabric chassis.

Command Default

None

Command Modes

Administration EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Before reloading nodes on the router, we recommend using the **cfs check** command to check the sanity of the configuration file system and attempt to recover from internal inconsistencies.

To reload a specific node on the router, specify the **reload** command with the **location** *node-id* keyword and argument. The *node-id* is expressed in the *rack*/*slot* notation.

Task ID

Task ID	Operations
root-system	execute

The following example shows how to reload all nodes on the router:

```
Router(admin)# reload location all
Graceful reload of all nodes not supported
Assuming 'force'
Operation may result in file corruptions or loss of config. Proceed [Y/N]? y
```

Note To ensure the sanity of the configuration file system, enter the **cfs check** command on the router.

show epm trace boot

To display execution path monitoring traces, use the **show epm trace boot** command in administration EXEC mode.

show epm trace boot [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**unique**][**verbose**] [**wrapping**][**file** *filename* **original**] [**location** {*node-id* | **all**}]

Syntax Description

hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
verbose	(Optional) Displays additional internal debugging information.
wrapping	(Optional) Displays wrapping entries.
file *filename* **original**	(Optional) Specifies the filename of the file to display. You can specify up to four trace files.
location	(Optional) Specifies the node of the RP.
node-id	The *node-id* argument is expressed in the *rack/slot/module* notation. You can specify up to four nodes.
all	The **all** keyword specifies all RP nodes.

Command Default

None

Command Modes

Administration EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show epm trace boot** command provides a simple way of tracking and time-stamping critical events to clearly understand their temporal relationship to one another and the amount of time spent performing critical operations.

Task ID

Task ID	Operations
basic services	read

The following example shows sample output from the **show epm trace boot** command:

```
Router(admin)# show epm trace boot

Mon Jun  1 03:16:36.946 PST
22 wrapping entries (1024 possible, 0 filtered, 22 total)
Oct  8 07:54:49.610 epm/boot 0/RP0/CPU0 t1  @ 00:00:06 - [init] process-start
Oct  8 07:55:25.710 epm/boot 0/RP0/CPU0 t1  @ 00:00:42 - [insthelper] process-start
Oct  8 07:57:08.992 epm/boot 0/RP0/CPU0 t1  @ 00:02:25 - [sysmgr] process-start
Oct  8 07:57:09.785 epm/boot 0/RP0/CPU0 t7  @ 00:02:26 - [sysmgr] start-level: start
Oct  8 07:57:10.722 epm/boot 0/RP0/CPU0 t1  @ 00:02:27 - [sw_dwnld_svr] process-start
Oct  8 07:57:12.482 epm/boot 0/RP0/CPU0 t11 @ 00:02:29 - [sysmgr] start-level: admin
Oct  8 07:57:13.385 epm/boot 0/RP0/CPU0 t1  @ 00:02:30 - [instdir] process-start
Oct  8 07:57:19.638 epm/boot 0/RP0/CPU0 t1  @ 00:02:36 - [instdir_lr] process-start
Oct  8 07:58:07.045 epm/boot 0/RP0/CPU0 t9  @ 00:03:23 - [sysmgr] admin-plane-up
Oct  8 07:58:52.057 epm/boot 0/RP0/CPU0 t4  @ 00:04:08 - [cfgmgr-rp] admin-config-start
Oct  8 07:58:59.973 epm/boot 0/RP0/CPU0 t4  @ 00:04:16 - [cfgmgr-rp] admin-config-done
Oct  8 07:59:00.079 epm/boot 0/RP0/CPU0 t9  @ 00:04:16 - [sysmgr] start-level: infra
Oct  8 07:59:00.615 epm/boot 0/RP0/CPU0 t1  @ 00:04:17 - [devc-conaux] exec-available
Oct  8 07:59:02.288 epm/boot 0/RP0/CPU0 t4  @ 00:04:18 - [cfgmgr-rp] admin-plane-mount-done
Oct  8 07:59:08.157 epm/boot 0/RP0/CPU0 t6  @ 00:04:24 - [instdir] ready-for-requests
Oct  8 07:59:15.999 epm/boot 0/RP0/CPU0 t6  @ 00:04:32 - [sysmgr] start-level: active
Oct  8 07:59:32.300 epm/boot 0/RP0/CPU0 t13 @ 00:04:48 - [sysmgr] start-level: final
Oct  8 07:59:38.143 epm/boot 0/RP0/CPU0 t9  @ 00:04:54 - [sysmgr] lr-plane-up
Oct  8 07:59:38.189 epm/boot 0/RP0/CPU0 t4  @ 00:04:54 - [cfgmgr-rp] lr-config-start
Oct  8 07:59:49.898 epm/boot 0/RP0/CPU0 t4  @ 00:05:06 - [cfgmgr-rp] lr-config-done
Oct  8 07:59:50.259 epm/boot 0/RP0/CPU0 t4  @ 00:05:06 - [cfgmgr-rp]
bulk-interface-config-start
Oct  8 07:59:50.351 epm/boot 0/RP0/CPU0 t7  @ 00:05:06 - [cfgmgr-rp] node-config-done
```

In this sample output, the time stamp following the @ sign is the elapsed time in the format hh:mm:ss since the execution phase started (for example, since node start, in the case of a boot).

show mirror

To display disk mirroring information, use the **show mirror** command in EXEC or administration EXEC mode.

show mirror [**location** {*node-id* | **all**}]

Syntax Description

location	(Optional) Specifies the node of the RP for which to display the mirroring information.
node-id	The *node-id* argument is expressed in the *rack*/*slot*/*module* notation.
all	The **all** keyword specifies all RP nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
filesystem	read

The following is sample output from the **show mirror** command:

```
Router# show mirror


 Mirror Information for 0/RP0/CPU0.
 ==========================================================
  Mirroring Enabled
    Configured Primary:         disk0:
    Configured Secondary:       disk1:

  Current Mirroring State:      Syncing Files
    Current Physical Primary:   disk1:
    Current Physical Secondary: disk0:

  Mirroring Logical Device:     disk0:

  Physical Device     State       Flags
 ----------------------------------------------------------
   disk0:           Available     Enabled Formatted
   disk1:           Available     Enabled Formatted
   compactflash:    Not Present
   disk0a:          Available     Formatted
```

```
   disk1a:          Available     Formatted
   compactflasha:   Not Present

 Mirroring Rommon Variable
  BOOT_DEV_SEQ_CONF = disk0:;disk1:
  BOOT_DEV_SEQ_OPER = disk1:
  MIRROR_ENABLE = Y
```

Table 2: show mirror Field Descriptions

Field	Description
Mirroring Enabled	Indicates whether mirroring is enabled or disabled.
Configured Primary	If mirroring is enabled, the configured primary disk for mirroring.
Configured Secondary	If mirroring is enabled, the configured secondary disk for mirroring.
Current Mirroring State	Current status of mirroring. Possible values are as follows: Syncing files—Files are being synchronized between the primary and secondary disks. Not Configured—Mirroring is not configured. Mirroring Paused—In this state, no mirroring is being done to the secondary device and the disk redundancy has been removed. The values of the BOOT_DEV_SEQ_OPER and MIRROR_ENABLE variables reflect this. Redundant—The primary and secondary disks are totally in synchronization. Any read or write failure on the primary device results in disk redundancy switchover such that all operations are performed on the secondary device.
Current Physical Primary	Current primary disk.
Current Physical Secondary	Current secondary disk.
Mirroring Logical Device	Device name used by the mirroring process to intercept all application requests to that named device before passing them through to one of the mirrored physical devices.
Physical Device	Physical disk in router.
State	Status of the disk. Possible values are as follows: Available—Disk exists in router and is available. Not present—Disk does not exist in router. Partitioning of disks is available only after the disk has been formatted with the **partition** keyword.
Flags	Enabled—Disk mirroring has been enabled on this device and the device is part of the mirroring process. Repaired—During the boot, some minor inconsistencies were discovered on the disk and were repaired to make the file system consistent. Formatted—Disk was formatted before mirroring was enabled.

Field	Description
BOOT_DEV_SEQ_CONF=	ROM Monitor environmental variable for the boot disk sequence. This variable is is set when mirroring is enabled through the **mirror** configuration command. The devices in this ROMMON variable declare the primary and the secondary devices of the mirroring process. The first device is the primary device and the second device is the secondary device in the mirroring process. **Note** This variable is also shared by the disk backup feature. This variable can also be set or unset using the system boot-sequence command of the disk backup feature. But the use of system boot-sequence and system backup commands is blocked, if mirroring is enabled.
BOOT_DEV_SEQ_OPER=	ROM Monitor environmental variable that reflects the state of the disk redundancy status. When mirroring is enabled and the state is redundant, this variable is set to the primary device followed by the secondary device. When mirroring is not in the redundancy state, then this variable is updated to contain only the primary device.
MIRROR_ENABLE	ROM Monitor environmental variable whose value reflects the mirroring status. If it is set to Y, then mirroring is enabled. If it is set to P, then mirroring is paused. If empty, mirroring is not enabled.

show reboot

To display reboot information for a node, use the **show reboot** command in the appropriate mode.

show reboot {**history** | [**reverse**]} **location** *node-id*

Syntax Description

first	(Optional) Displays information about the first ungraceful reboot.
last	(Optional) Displays information about the last ungraceful reboot.
crashinfo	Displays crash information for an ungraceful reboot.
syslog	Displays the syslogs related to an ungraceful reboot.
trace	Displays trace information for an ungraceful reboot.
graceful	Displays information about the last graceful reboot.
history	Displays the reboot history of a specific node.
reverse	(Optional) Displays the reboot history information in reverse chronological order. **Note** Starting from Cisco IOS XR Release 24.3.1, the **reverse** keyword is deprecated and will not be supported in future releases.
location *node-id*	Specifies which node to reload. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 24.3.1	The **reverse** keyword is deprecated and will not be supported in future releases. Hence the **show reboot history reverse location** command is also not supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **history** keyword for the **show reboot** command displays all reboot causes stored for previous node resets.

Crash information (**crashinfo**), syslog, and kernel dumper ltrace (**trace**) can be displayed for the first or last reboot if it is an ungraceful reboot.

Task ID

Task ID	Operations
system	read

This example shows sample output from the **show reboot** command with the **history** keyword:

```
Router# show reboot first crashinfo location 0/rp0/cpu0

Crashinfo Timestamp: Thu Jul 19 20:32:57 2007

20070719 20:32:57

Crash Reason: Cause code 0x21000010 Cause: Missed deadline,
  client: sc-reddrv-main, timeout: 5 Process: wd-critical-mon
Traceback: fc1941a0 fc194290 48200738 482013cc 48201c04 fc1d4fb0 Timezone UTC0

Exception at 0xfc1944c8 signal 5 c=1 f=3

Active process(s):
pkg/bin/wd-critical-mon Thread ID 1 on cpu 0
pkg/bin/l3test Thread ID 0 on cpu 1

       REGISTER INFO
      r0        r1        r2        r3
R0   01000000  4817e8c0  4820e208  000000de
       r4        r5        r6        r7
R4   fc1b4856  7fffffff  4817e738  fc1b4856
       r8        r9       r10       r11
R8   00000000  602cf522  00000000  00000000
      r12       r13       r14       r15
R12  602cf51c  4820e1a0  00000000  00000000
      r16       r17       r18       r19
R16  00000000  00000000  00000000  00000000
      r20       r21       r22       r23
R20  00000000  00000000  48200000  48200000
      r24       r25       r26       r27
R24  48200000  48200000  48200000  48200000
      r28       r29       r30       r31
R28  00000028  00000001  21000010  6029b000
        cnt        lr       msr        pc
R32  00000000  fc194290  0002d932  fc1944c8
        cnd       xer
R36  44000094  20000006

                SUPERVISOR REGISTERS

               Memory Management Registers

               Instruction BAT Registers
                Index #               Value
               IBAT0U #             0x1ffe
               IBAT0L #               0x12
               IBAT1U #                  0
               IBAT1L #                  0
               IBAT2U #         0x30000ffe
               IBAT2L #         0xf0000032
               IBAT3U #         0xfffc0003
               IBAT3L #            0x40011

               Data BAT Registers
                Index #               Value
```

```
                    DBAT0U #             0x1ffe
                    DBAT0L #               0x12
                    DBAT1U #                  0
                    DBAT1L #         0x10000012
                    DBAT2U #         0x30000ffe
                    DBAT2L #         0xf000006a
                    DBAT3U #         0xfffc0003
                    DBAT3L #            0x40011

                    Segment Registers
                     Index #              SR-Value
                         0 #                     0
                         1 #                     0
                         2 #                     0
                         3 #                     0
                         4 #                     0
                         5 #                     0
                         6 #                     0
                         7 #                     0
                         8 #                     0
                         9 #                     0
                        10 #                     0
                        11 #                     0
                        12 #                     0
                        13 #                     0
                        14 #                     0
                        15 #                     0

                Exception Handling Registers
          Data Addr Reg #                DSISR
            0x602cf440 #         0x42000000
        SPRG0 #      SPRG1 #      SPRG2 #      SPRG3
        0x1 # 0x21000010 # 0x6029b000 #        0
      SaveNRestore SRR0 #    SaveNRestore SRR1
           0xfc1944c4 #            0x2d932

Miscellaneous Registers
    Processor Id Reg #                  0
                HID0 #         0x8410c0bc
                HID1 #         0x9001ac80

               MSSCR0 #            0x88000
               MSSSR0 #                  0

 STACK TRACE
#0 0xfc194290
#1 0x48200738
#2 0x482013cc
#3 0x48201c04
#4 0xfc1d4fb0
```

show variables boot

To display boot file setting for the in the system, use the **show variables boot** command in Administration EXEC mode.

show variables boot

Syntax Description

location	(Optional) Specifies the node to reload.
node-id	The *node-id* argument is expressed in the *rack/slot/module* notation.
all	Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

Administration EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
root-lr	read

This example shows sample output from the **show variables boot** command:

```
Router# show variables boot
Tue Nov 12 12:20:28.357 UTC
root=/dev/panini_vol_grp/xr_lv0 platform=fretta boardtype=RP vmtype=xr-vm prod=1 crashkernel=0
 bigphysarea=200M quiet clocksource=jiffies elevator=noop
RP/0/RP0/CPU0:pp-r1-pod1#
```

show variables system

To display internal system environmental variables set on the router, use the **show variables system** command in EXEC mode.

show variables system

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show variables system** command to display system environmental variables for the router.

To display the configuration register setting, use the **show variables boot** command in administration EXEC mode.

Task ID

Task ID	Operations
basic-services	read

This example illustrates sample output from the **show variables system** command. The output is meant to be interpreted by Cisco personnel.

```
Router# show variables system

  TERM=vt220
  GDB_PDEBUG=-P1
  TERM=vt100
  DIR_PREFIX=.
  LOADPATH=/pkg
  LD_LIBRARY_PATH=/pkg/lib
  PATH=/pkg/bin
  BFM_CONFIG_PATH=/pkg/bfm/config
  BGP_PATH=/pkg/bgp
  CONFIGS_PATH=/pkg/configs
  CRAFT_PATH=/pkg/cwi
  CTF_PATH=/pkg/ctf
  DM_RULES_PATH=/pkg/dm/rules
  ETC_PATH=/pkg/etc
  FPD_PATH=/pkg/fpd
  IM_RULES_PATH=/pkg/rules
  INIT_STARTUP_PATH=/pkg/init.d
  INSTHELPER_PATH=/pkg/other
  MAN_PATH=/pkg/man
  MIB_LIBRARY_PATH=/pkg/lib/mib
  MIB_PATH=/pkg/mib
```

```
NETIO_SCRIPT_PATH=/pkg/script
PARSER_PATH=/pkg/parser
PARTITIONS_PATH=/pkg/partitions
QOS_PATH=/pkg/qos
SCHEMA_PATH=/pkg/schema
STARTUP_PATH=/pkg/startup
TCL_LIBRARY=/pkg/lib/tcl
UCODE_PATH=/pkg/gsr/ucode
UCODE_ROOT_PATH=/pkg/ucode
VCM_RULES_PATH=/pkg/vcmrules
JOB_ID=0
INSTANCE_ID=1
SYSMGR_TUPLE=
SYSMGR_NODE=node0_RSP0_CPU0
EXIT_STATUS=0
SYSMGR_RESTART_REASON=0
AAA_USER=labuser
EXEC_PID=18280619
TASKID_MAP_SIZE=72
HOME=/disk0:/usr
TMPDIR=/disk0:/var/tmp
PWD=/disk0:/usr
```

Manageability Commands

This chapter describes the commands that can be used to enable HTTP servers, enable router management through Extensible Markup Language (XML) agent services, and support the Common Object Request Broker Architecture (CORBA) infrastructure.

The XML Parser Infrastructure provides parsing and generation of XML documents with Document Object Model (DOM), Simple API for XML (SAX), and Document Type Definition (DTD) validation capabilities:

- DOM allows customers to programmatically create, manipulate, and generate XML documents.
- SAX supports user-defined functions for XML tags.
- DTD allows for validation of defined document types.

For more information, see *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

iteration

To configure iteration size for large XML agent responses, use **iteration** command in xml agent configuration mode. To revert to the default iteration settings, use **no** form of this command.

iteration {**off** | **on** **size** *iteration-size*}

Syntax Description

off	Disables iteration- Entire XML response is returned, regardless of its size. **Note** This option is not recommended.
on	Enables iteration- Large XML responses are broken into chunks according to the iteration chunk size specified.
size *iteration-size*	Specifies the size of the iteration chunk, in **Kbytes**. Iteration-size can range from 1 to 100,000.

Command Default

Iteration is **enabled**; with the *iteration-size* as 48.

Command Modes

XML agent

TTY XML agent

SSL XML agent

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When a XML agent returns a large response, it splits the response into chunks and returns one chunk at a time. Externally, a **GetNext** request is sent to obtain the next chunk. This command can be used to control the size of iteration chunks.

A larger chunk value lets you receive many chunks in a shorter time, but, makes the router busy. A smaller chunk value lets you receive only a few chunks even over long time but, does not make the router busy. The iteration can be disabled by using the **off** keyword in the command..

Note It is not recommended to disable iteration because, it could result in large transient memory usage.

Example

The following example shows how to configure the iteration chunk size to 100 Kbytes.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration on size 100
```

The following example shows how to disable iteration:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# iteration off
```

The following example shows how to turn on iteration with the default iteration size:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration off
```

The following example shows how to change the iteration size to the default iteration size.

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml)# no iteration on size 100
```

The following example shows how to change the iteration size of the TTY agent to 3 Kbytes:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-tty)# iteration on size 3
```

The following example shows how to turn off the iteration of the SSL agent:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-ssl)# iteration off
```

streaming

To configure the streaming size of the response while the XML agent is retrieving data from the source, use the **streaming** command in the appropriate mode.

streaming on size *size in kbytes*

Syntax Description

size *size in kbytes*	Streaming size of the xml response. Range is 1 to 100000.

Command Default

Default is 48 KB.

Command Modes

XML agent mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Iteration must be off. The sub-response block size is a configurable value specific to each transport mechanisms on the router (the XML agent for the dedicated TCP connection and Secure Shell (SSH), Telnet, or Secure Sockets Layer (SSL) dedicated TCP connection).

Example

This example shows how to configure the streaming size to 100 KB:

```
RP/0/RP0/CPU0:router (config) # xml agent
RP/0/RP0/CPU0:router (config-xml) # streaming on size 100
```

show xml schema

To browse the XML schema and data, use **show xml schema** command in XR EXEC mode.

show xml schema

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

This example shows how to enter the XML schema browser and the available commands:

```
RP/0/RP0/CPU0:router# show xml schema
Tue Dec  5 12:52:58.857 WET
Username:lab
Password:
Enter 'help' or '?' for help
xml-schema[config]:> ?
config                    oper                    action
adminconfig               adminoper               adminaction
cd                        pwd                     classinfo
list                      ls                      datalist
walk                      walkdata                get
hierarchy                 quit                    exit
help
xml-schema[config]:>
```

throttle

To configure XML agent processing capabilities, use **throttle** command in XML agent configuration mode.

throttle {**memory** *size* | **process-rate** *tags*}

Syntax Description

memory	Specifies XML agent memory size.
size	Maximum memory usage of XML agent per session in MB. Values can range from 100 to 600. The default value is 300.
process-rate	Specifies the XML agent processing rate.
tags	Number of tags that the XML agent can process per second. Values can range from 1000 to 30000.

Command Default

The process rate is not throttled; memory size is 300 MB.

Command Modes

XML agent configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **throttle** command to control CPU time used by the XML agent when it handles large data.

Example

This example illustrates how to configure the number of tags that the XML agent can process to 1000:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# throttle process-rate 1000
```

xml agent

To enable Extensible Markup Language (XML) requests over a dedicated TCP connection and enter XML agent configuration mode, use the **xml agent** command in global configuration mode. To disable XML requests over the dedicated TCP connection, use the **no** form of this command.

Note This command enables a new, enhanced-performance XML agent. The **xml agent tty** command enables the legacy XML agent and is supported for backward compatibility.

xml agent
no xml agent

Command Default

XML requests are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend that you use the enhanced-performance agent. The legacy agent is supported for backward compatibility. Use the **xml agent** command to enable the enhanced-performance XML agent. Use the **xml agent tty** command to enable the legacy XML agent.

This example shows how to enable XML requests over a dedicated TCP connection:

```
RP/0/RP0/CPU0:router(config)# xml agent
```

xml agent ssl

To enable Extensible Markup Language (XML) requests over Secure Socket Layer (SSL) and enter SSL XML agent configuration mode, use **xml agent ssl** command in global configuration mode. To disable XML requests over SSL, use **no** form of this command.

xml agent ssl
no xml agent ssl

Command Default

SSL agent is **disabled** by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The k9sec package is required to use the SSL agent. The configuration is rejected during commit when the security software package is not active on the system. When the security software package is deactivated after configuring SSL agent, the following syslog message is displayed to report that the SSL agent is no longer available.

```
xml_dedicated_ssl_agent[420]:
%MGBL-XML_TTY-7-SSLINIT : K9sec pie is not active, XML service over
SSL is not available.
```

This example shows how to enable XML requests over SSL:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
```

xml agent tty

To enable Extensible Markup Language (XML) requests over Secure Shell (SSH) and Telnet or to enter TTY XML agent configuration mode, use **xml agent tty** command in global configuration mode. To disable XML requests over SSH and Telnet, use **no** form of this command.

Note This command enables a legacy XML agent that has been superceded by an enhanced performance XML agent and is supported only for backward compatibility. To enable the enhanced-performance XML agent, use the **xml agent** command.

xml agent tty
no xml agent tty

Command Default

XML requests over SSH and Telnet are **disabled**.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

There are two XML agents: a legacy XML agent and an enhanced-performance XML agent. We recommend you to use the enhanced-performance agent. The legacy agent is supported for backward compatibility. The **xml agent tty** command enables the legacy XML agent. Use the **xml agent** command to enable the enhanced-performance XML agent.

This example shows how to enable XML requests over Secure Shell (SSH) and Telnet:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
```

ipv4 disable

To disable IPv4 XML transport, use the **ipv4 disable** command in XML agent configuration mode. To enable IPv4 XML transport, use the **no** form of this command.

ipv4 disable
no ipv4 disable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv4 XML transport is enabled by default.

Command Modes

XML agent configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to disable IPv4 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv4 disable
```

ipv6 enable (XML)

To enable IPv6 XML transport, use the **ipv6 enable** command in XML agent configuration mode. To disable IPv6 XML transport, use the **no** form of this command.

ipv6 enable
no ipv6 enable

Syntax Description

This command has no keywords or arguments.

Command Default

IPv6 XML transport is disabled by default.

Command Modes

XML agent configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

This example illustrates how to enable IPv6 XML transport:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent) ipv6 enable
```

nvgen default-sanitize

To enable sanitizing Strings, Usernames, Passwords, Comments, or IP Addresses in the output for **show running configurations** command, use the **nvgen default-sanitize** command.

nvgen default-sanitize { **strings** | **usernames** | **passwords** | **comments** | **ipaddrs** }

Syntax Description

strings	Removes the description strings in the running configuration and replaces it with **<removed>** phrase.
usernames	Removes the usernames in the running configuration and replaces it with **<removed>** phrase.
password	Removes the passwords in the running configuration and replaces it with **<removed>** phrase.
comments	Removes the comments in the running configuration and replaces it with **<comments removed>** phrase.
ipaddrs	Removes the IP addresses in the running configuration and replaces it with **<removed>** phrase.

Command Default

The output for **show running configurations** command includes sensitive information such as Strings, Usernames, Passwords, Comments, or IP Addresses.

Command Modes

Configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

Examples

The following example shows how to sanitize show running configurations:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# nvgen default-sanitize strings
RP/0/RP0/CPU0:router(config)# nvgen default-sanitize usernames
RP/0/RP0/CPU0:router(config)# nvgen default-sanitize passwords
RP/0/RP0/CPU0:router(config)# nvgen default-sanitize comments
RP/0/RP0/CPU0:router(config)# nvgen default-sanitize ipaddrs
RP/0/RP0/CPU0:router(config)# commit
```

session timeout

To configure an idle timeout for the XML agent, use the **session timeout** command in xml agent configuration mode. To remove the session timeout, use the **no** form of this command.

session timeout *timeout*

Syntax Description

timeout	Amount of idle time in minutes that must pass before the XML agent closes the session. Values can range from 1 to 1440.

Command Default

There is no session timeout.

Command Modes

xml agent

xml agent ssl

xml agent tty

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

The following example illustrates how to configure the dedicated agent to close the session after 5 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# session timeout 5
```

The following example illustrates how to configure the XML TTY agent to close the session after 60 minutes of idle time:

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-agent-tty)# session timeout 60
```

The following example illustrates how to configure the XML TTY agent to have no timeout (the default):

```
RP/0/RP0/CPU0:router(config)# xml agent tty
RP/0/RP0/CPU0:router(config-xml-agent)# no session timeout
```

show xml sessions

To display the status of an Extensible Markup Language (XML) session, use the **show xml sessions** command in EXEC mode.

show xml sessions [**default** | **ssl** | **tty**] [**detail**]

Syntax Description

default	Displays the status of the default XML agent.
ssl	Displays the status of the XML agents over secure socket layer (SSL).
tty	Displays the status of XML agents over telnet.
detail	Displays details regarding the XML sessions.

Command Default

None

Command Modes

XR EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read

Example

This example illustrates sample output of the **show xml sessions** command with no optional keywords specified:

```
RP/0/RP0/CPU0:router# show xml sessions

Session  Client                  Agent    User  Date                     State
00000001 192.168.10.85 (default) tty      cisco Fri Jun 19 22:42:29 2009 idle
10000001 10.12.24.15 (VRF1)      default  lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **tty** keyword:

```
RP/0/RP0/CPU0:router# show xml sessions tty

Session  Client                  Agent User  Date                     State
00000001 192.168.10.85 (default) tty   cisco Fri Jun 19 22:42:29 2009 idle
00000002 10.12.24.15 (VRF1)      tty   lab   Fri Jun 19 22:32:12 2009 busy
```

This example illustrates sample output of the **show xml sessions** command with the **detail** keyword:

```
RP/0/RP0/CPU0:router#
show xml sessions detail


Session: 00000001
  Client:                 192.168.10.85 (default)
  Agent type:             tty
  User:                   cisco
  State:                  idle
  Config session:         -
  Alarm notification:     Registered
  Start Date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:00:27
  Last State Changed:     00:00:27
Session: 10000001
  Client:                 10.12.24.15 (VRF1)
  Agent type:             default
  User:                   lab
  State:                  busy
  Config session:         00000010-0005b105-00000000
  Alarm notification:     Not registered
  Start date:             Tue Aug 24 18:21:29 2010
  Elapsed Time:           00:01:10
  Last State Changed:     00:01:10
```

shutdown (VRF)

To configure the dedicated XML agent to not receive or send messages via the default VRF, use the **shutdown** command in xml agent vrf configuration mode. To enable the dedicated XML agent to receive or send messages via the default VRF, use the **no** form of this command.

shutdown
no shutdown

This command has no keywords or arguments.

Command Default

The default VRF instance is enabled by default.

Command Modes

xml agent vrf configuration

xml agent ssl vrf configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
config-services	read, write

Example

The following example illustrates how to configure the XML dedicated agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# shutdown
```

The following example illustrates how to configure the XML SSL agent to send and receive messages via VRF1 only:

```
RP/0/RP0/CPU0:router(config)# xml agent ssl
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent-ssl)# vrf default
RP/0/RP0/CPU0:router(config-xml-agent-ssl-vrf)# shutdown
```

The following example illustrates how to enable the default VRF after it has been disabled:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf default
```

```
RP/0/RP0/CPU0:router(config-xml-agent-vrf)# no shutdown
```

vrf (XML)

To configure a dedicated agent to receive and send messages via the specified VPN routing and forwarding (VRF) instance, use the vrf command in one of the xml agent configuration mode. To disable the receiving and sending of messages via a specific VRF instance, use the **no** form of this command.

vrf {**default***vrf-name*}

Syntax Description

default	Configures the default VRF instance.
vrf-name	Configures the specified VRF instance.

Command Default

The default VRF is enabled by default.

Command Modes

XML agent configuration

XML agent SSL configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default VRF is enabled by default. To disable the default VRF, use the **shutdown** command.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to configure the dedicated XML agent to receive and send messages via VRF1, VRF2 and the default VRF:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF1
RP/0/RP0/CPU0:router(config-xml-agent)# vrf VRF2
```

This example shows how to remove access to VRF2 from the dedicated agent:

```
RP/0/RP0/CPU0:router(config)# xml agent
RP/0/RP0/CPU0:router(config-xml-agent)# no vrf VRF2
```

Terminal Services Commands

This chapter describes the Cisco IOS XR commands used for setting up physical and virtual terminal connections, managing terminals, and configuring virtual terminal line (vty) pools. It also includes commands for the managing the Craft Panel Interface.

absolute-timeout

To set the absolute timeout for line disconnection, use the **absolute-timeout** command in line template configuration mode. To remove the **absolute-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

absolute-timeout *minutes*

Syntax Description

minutes	Absolute timeout interval, in minutes. Range is from 0 to 10000.

Command Default

minutes: 1440

Command Modes

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **absolute-timeout** command to terminate the connection after the specified time has elapsed, regardless of whether the connection is being used at the time of termination. You can specify an absolute-timeout value for each port. The user is notified 20 seconds before the session is terminated.

The following example shows how to set the session timeout value to 2880 minutes (2 days) for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# absolute-timeout 2880
```

access-class

To restrict incoming and outgoing connections using an IPv4 or IPv6 access list, use the **access-class** command in line template configuration mode. To remove the restriction, use the **no** form of this command.

access-class *list-name* {**in** | **out**}

Syntax Description

list-name	IPv4 or IPv6 access list name.
in	Filters incoming connections.
out	Filters outgoing connections.

Command Default

No access class is set.

Command Modes

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **access-class** command to restrict incoming or outgoing connections to addresses defined in an access list. Use the **ipv4 access-list** or **ipv6 access-list** command to define an access list by name.

Note To restrict access of incoming or outgoing connections over IPv4 and IPv6, the IPv4 access list and IPv6 access list must share the same name.

The following example shows how to specify an access class assigned to outgoing connections for the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# access-class vtyacl out
```

The following sample output from the **show ipv4 access-lists** command displays the IPv4 access list named vtyacl:

```
RP/0/RP0/CPU0:router# show ipv4 access-lists vtyacl

ipv4 access-list vtyacl
 10 permit ip host 10.32.162.48 any
 20 permit ip host 10.20.49.170 any
 30 permit ip host 10.60.3.5 any
```

The following sample output from the **show ipv6 access-lists** command displays the IPv6 access list name vtyacl:

```
RP/0/RP0/CPU0:router# show ipv6 access-lists vtyacl

ipv6 access-list vtyacl
 10 permit ipv6 host 2001:db8:2222:: any
 20 permit ipv6 host 2001:db8:0:4::2 any
```

autocommand

To automatically run one or more commands after a user logs in to a vty terminal session, use the **autocommand** command in line default or line template configuration mode. To remove the **autocommand** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

autocommand *command*

Syntax Description

command	Command or command alias to be executed on user login to a vty session.

Command Default

No default behavior or values

Command Modes

Line template configuration

Line default configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **autocommand** command to automatically run a command or command alias when a user logs in to a vty session. To run multiple commands, use a command alias for the *command* argument. When the user logs in, the commands included in the alias are run sequentially.

Note The **autocommand** command is supported on vty connections only; it is not supported on console or aux line connections. Use this command to automatically run a command after user login.

The following example shows how to use the **autocommand** command to automatically run the **show ip interface brief** command when a user logs in to a default vty session:

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

  <Your 'TELNET' connection has terminated>
```

The following example shows how to disable the feature using the **no** form of the **autocommand** command. In this example, the autocommand for the **show ip interface brief** command is disabled. When the user logs out, and logs back in, the **autocommand** command does not run.

```
RP/0/RP0/CPU0:router# configure terminal
RP/0/RP0/CPU0:router(config)# line default
```

```
RP/0/RP0/CPU0:router(config-line)# no autocommand ?

  LINE  Appropriate EXEC command

RP/0/RP0/CPU0:router(config-line)# no autocommand show ip interface brief
RP/0/RP0/CPU0:router(config-line)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes

RP/0/RP0/CPU0:router# exit

<Your 'TELNET' connection has terminated>

User Access Verification

Username: lab
Password:
RP/0/RP0/CPU0:router#
```

banner exec

To create a message that is displayed when an EXEC process is created (an EXEC banner), use the **banner exec** command in global configuration mode or XR config mode. To delete the EXEC banner, use the **no** form of this command.

banner exec *delimiter message delimiter*

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. Text may include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in *banner exec tokens*.

Command Default

No EXEC banner is displayed.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **banner exec** command to specify a message that is displayed when an EXEC process is created (a line is activated or an incoming connection is made to a vty). Follow this command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the delimiting character (c).

When a user connects to a router, the message-of-the-day (MOTD) banner appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Use tokens in the form $(*token*) in the message text to customize the banner. Tokens display current configuration variables, such as the router hostname and IP address.

The tokens are described in this table.

Table 3: banner exec Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

The following example shows how to set an EXEC banner that uses tokens:

```
RP/0/RP0/CPU0:router(config)# banner exec c

  Enter TEXT message.  End with the character 'c'.

THIS IS AN EXEC BANNER
c
```

banner incoming

To create a banner that is displayed when there is an incoming connection to a terminal line from a host on the network, use the **banner incoming** command in global configuration mode or XR config mode. To delete the incoming connection banner, use the **no** form of this command.

banner incoming *delimiter message delimiter*

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in *banner incoming tokens*.

Command Default

No incoming banner is displayed.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Follow the **banner incoming** command with one or more blank spaces and the delimiting character (c). After entering one or more lines of text, terminate the message with the second occurrence of the delimiting character (c).

An *incoming connection* is one initiated from the network side of the router. Incoming connections are also called reverse Telnet sessions. These sessions can display message-of-the-day (MOTD) banners and incoming banners, but they do not display EXEC banners.

When a user connects to a router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

Incoming banners cannot be suppressed. If you do not want the incoming banner to appear, you must delete it with the **no banner incoming** command.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current variables, such as the router hostname and IP address.

This table describes the tokens.

Table 4: banner incoming Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.

Token	Information Displayed in the Banner
$(line)	Displays the vty or tty (asynchronous) line number.

The following example shows how to create an incoming connection banner:

```
RP/0/RP0/CPU0:router(config)# banner incoming c

  Enter TEXT message. End with the character 'c'
THIS IS AN INCOMING BANNER.
c
```

banner login

To create a customized banner that is displayed before the username and password login prompts, use the **banner login** command in global configuration mode or XR config mode. To disable the login banner, use **no** form of this command.

banner login *delimiter message delimiter*

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable. Tokens are described in *banner login tokens*.

Command Default

No login banner is displayed.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Follow the **banner login** command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

When a user connects to the router, the message-of-the-day (MOTD) banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(*token*) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in the this table.

Table 5: banner login Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

The following example shows how to set a login banner:

```
RP/0/RP0/CPU0:router(config)# banner login c
```

```
Enter TEXT message. End with the character 'c'.
THIS IS A LOGIN BANNER
c
```

banner motd

To create a message-of-the-day (MOTD) banner, use the **banner motd** command in global configuration mode or XR config mode. To delete the MOTD banner, use the **no** form of this command.

banner motd *delimiter message delimiter*

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No MOTD banner is displayed.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This MOTD banner is displayed to all terminals connected and is useful for sending messages that affect all users (such as impending system shutdowns). Use the **no banner motd** command to disable the MOTD banner on a line.

When a user connects to the router, the MOTD banner (if configured) appears first, followed by the login banner and prompts. After the user successfully logs in to the router, the EXEC banner or incoming banner is displayed, depending on the type of connection. For a reverse Telnet login, the incoming banner is displayed. For all other connections, the router displays the EXEC banner.

To customize the banner, use tokens in the form $(token) in the message text. Tokens display current configuration variables, such as the router hostname and IP address.

Tokens are described in this table.

Table 6: banner motd Tokens

Token	Information Displayed in the Banner
$(hostname)	Displays the hostname for the router.
$(domain)	Displays the domain name for the router.
$(line)	Displays the vty or tty (asynchronous) line number.

The following example shows how to configure an MOTD banner with a token:

```
RP/0/RP0/CPU0:router(config)# banner motd c

  Enter TEXT message.  End with the character 'c'.
Notice: all routers in $(domain) will be upgraded beginning April 20
c
```

banner prompt-timeout

To create a banner that is displayed when there is a login authentication timeout, use the **banner prompt-timeout** command in global configuration mode or XR config mode. To delete the prompt timeout banner, use the **no** form of this command.

banner prompt-timeout *delimiter message delimiter*

Syntax Description

delimiter	Delimiting character is (c).
message	Message text. You can include tokens in the form $(*token*) in the message text. Tokens are replaced with the corresponding configuration variable.

Command Default

No banner is displayed when there is a login authentication timeout.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

Follow this command with one or more blank spaces and the delimiting character (c). Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character (c).

This prompt-timeout banner is displayed when there is a login authentication timeout at the username and password prompt.

The following example shows how to configure a prompt-timeout banner:

```
RP/0/RP0/CPU0:router(config)# banner prompt-timeout c

Enter TEXT message.  End with the character 'c'.
THIS IS A PROMPT TIMEOUT BANNER
c
```

clear line

To clear an auxiliary or console line to an idle state, use the **clear line** command in EXEC mode.

clear line {**aux** | **console**} **location** *node-id*

Syntax Description

aux	Clears the auxiliary line.
console	Clears the console line.
location *node-id*	Specifies the location of a route processor (RP) where the auxiliary or console line to be cleared resides. The *node-id* argument is entered in the *rack / slot / module* notation.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The following example shows how to clear the console line, putting it in an idle state:

```
RP/0/RP0/CPU0:router# clear line console location 0/RP1/CPU0
```

clear line vty

To clear a virtual terminal line (vty) to an idle state, use the **clear line vty** command in EXEC mode.

clear line vty *line-number*

Syntax Description

line-number	Line number in the range from 0 to 99.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show users** command to determine the origin of the connection and which lines to clear. When a line is cleared to an idle state, the user on the other end of the connection receives notice that the connection was closed by a foreign host.

The following example shows how to reset vty 3 to the idle state:

```
RP/0/RP0/CPU0:router# clear line vty 3
```

disconnect

To disconnect a network connection, use the **disconnect** command in EXEC mode.

disconnect [*connection-numbernetwork-name*]

Syntax Description

connection-number	(Optional) Number of the line of the active network connection to be disconnected. Range is from 1 to 20.
network-name	(Optional) Name of the active network connection to be disconnected.

Command Modes

EXEC

Command Default

Disconnects the existing network connection if no arguments are provided.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Do not disconnect a line to end a session. Instead, log off the host before ending the session to clear the connection. If you cannot log out of an active session, disconnect the line.

The following example shows how to disconnect from a device (in this example “User1”) to return to the router:

```
User1% disconnect
 Connection closed by remote host

RP/0/RP0/CPU0:router#
```

disconnect-character

To define a character to disconnect a session, use the **disconnect-character** command in line template configuration mode. To remove the **disconnect-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

disconnect-character [*numbercharacter*]

Syntax Description

number	(Optional) ASCII decimal equivalent of the disconnect character. Range is from 0 through 255.
character	(Optional) Disconnect character.

Command Default

No disconnect character is defined.

Command Modes

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The break character is represented by 0; null cannot be represented.

The following example shows how to set the disconnect character for the default line template to the Esc character, which is the ASCII decimal equivalent 27:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# disconnect-character 27
```

escape-character

To define a character to escape a session, use the **escape-character** command in line template configuration mode. To remove the **escape-character** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

escape-character {**break***numbercharacter* | **default** | **none**}

Syntax Description

break	Sets the escape character to the Break key.
number	ASCII decimal equivalent of the escape character. Range is from 0 through 255.
character	Escape character.
default	Specifies the default escape character (^^X).
none	Disables the escape function.

Command Default

The default escape character is ^^X.

Command Modes

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **escape-character** command to define an escape character sequence that is different from the default. Use the escape character to exit from an existing connection and return to the EXEC prompt.

The default escape key sequence is Ctrl-Shift-6, X (^^X).The **escape-character** command with the **default** keyword sets the escape character to the Break key (the default setting for the Break key is Ctrl-C).

The following example shows how to set the escape character for the default line template to Ctrl-P, which is the ASCII decimal character 16:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# escape-character 16
```

exec-timeout

To set the interval that the EXEC command interpreter waits until user input is detected, use the **exec-timeout** command in the appropriate line configuration mode. To remove the **exec-timeout** command from the running configuration and restore the system to its default condition, use the **no** form of this command.

exec-timeout *minutes seconds*

Syntax Description

minutes	Minutes for the wait interval. Range is from 0 to 35791.
seconds	Seconds for the wait interval. Range is from 0 to 2147483.

Command Default

minutes: 10

seconds: 0

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

If no input is detected during the interval, the EXEC facility resumes the current connection. If no connections exist, the EXEC facility returns the terminal to the idle state and disconnects the incoming session. To disable the EXEC timeout function so that the EXEC session never timeouts, enter the following command:

```
exec-timeout 00
```

The following example shows how to set the timeout interval for the console line template to 60 minutes, 0 seconds:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# exec-timeout 60 0
```

flowcontrol hardware

To configure the hardware flow control setting for physical terminal connections, use the **flowcontrol hardware** command in line console configuration mode. To remove the attribute from the configuration file and restore the system to its default condition, use the **no** form of this command.

flowcontrol hardware {**in** | **out** | **none**}
no flowcontrol hardware {**in** | **out** | **none**}

Syntax Description

in	Specifies inbound flow control.
out	Specifies outbound flow control.
none	Specifies no flow control.

Command Default

None

Command Modes

Line console configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **flowcontrol hardware** command to set the flow control attribute for physical line connections. Physical line connections use either the console or auxiliary line template.

The following example shows how to restrict the hardware flow control to inbound for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# flowcontrol hardware in
```

lcd alarm-category

To set the alarm-category (will get displayed on the LCD panel), use the **lcd alarm-category** command in the appropriate mode. To delete the set category, use the **no** form of the command.

lcd alarm-category *number*
no lcd alarm-category *number*

Syntax Description

number	Number to identify the alarm category. This lists indicates the numbers for classification: • 1 for critical • 2 for critical and major • 3 for critical, major and minor • 0 for other

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd alarm-category** command:

```
RP/0/RP0/CPU0:router (config) # lcd alarm-category 2
```

lcd message

To set administrative messages (will get displayed on the LCD panel), use the **lcd message** command in the appropriate mode. To delete the set message, use the **no** form of the command.

lcd message *message*

Syntax Description

message	Administrative message for the operator. Limit is 512 alphanumeric characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd message** command:

```
RP/0/RP0/CPU0:router (config) # lcd message abcd
```

lcd name

To set the rack-name (will get displayed on the LCD panel), use the **lcd name** command in the appropriate mode. To delete the set name, use the **no** form of the command.

lcd name *rack-name location*

Syntax Description

rack-name	The rack-name. Limit is 15 alphanumeric characters.
location	The location of the rack (rack-id).

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

Example

This example show how to use the **lcd name** command:

```
RP/0/RP0/CPU0:router (config) # lcd name lc1
```

length

To set the number of lines that display at one time on the screen, use the **length** command in line template configuration mode. To remove the **length** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

length *lines*

Syntax Description

lines	Number of lines that displays on a screen. Range is from 0 through 512. 0 specifies no pausing. The default is 24.

Command Default

lines : 24

Command Modes

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **length** command to modify the default length setting for the specified line template. The length setting determines when the screen pauses during the display of multiple-screen output. Specifying a value of 0 for the lines argument prevents the router from pausing between screens of output.

The following example shows how to set the length of the default line template to 33 lines:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# length 33
```

line

To specify the console, the default, or a user-defined line template and enter line template configuration mode, use the **line** command in global configuration mode.

line {**console** | **default** | **template** *template-name*}

Syntax Description

console	Specifies the line template for the console line.
default	Specifies the default line template.
template *template-name*	Specifies a user-defined line template to be applied to a vty pool.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **line** command to specify a line template type and enter into line template configuration mode. Line templates are a collection of attributes used to configure and manage physical terminal line connections (the console and auxiliary ports) and vty connections. The following templates are available in Cisco IOS XR software:

- Default line template—The default line template that applies to a physical and virtual terminal lines.
- Console line template—The line template that applies to the console line.
- User-defined line templates—User-defined line templates that can be applied to a range of virtual terminal lines.

The following example shows how to enter line template configuration mode to allow configuration changes to be made to the default line template:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)#
```

parity

To set the parity bit for physical terminal connections, use the **parity** command in line console configuration mode. To specify no parity, use the **no** form of this command.

parity {**even** | **none** | **odd**}

Syntax Description

even	Specifies even parity.
none	Specifies no parity.
odd	Specifies odd parity.

Command Default

No parity is set.

Command Modes

Line console configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Communication protocols provided by devices such as terminals and modems often require a specific parity bit setting.

Use the **parity**command for setting the parity attribute for physical terminal connections. Physical terminal connections use either the console or auxiliary line template.

The following example shows how to set the line parity configuration to even for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# parity even
```

resume

To switch to another active Secure Shell (SSH) or Telnet session, use the **resume** command in EXEC mode.

resume [*connection*]

Syntax Description

connection	(Optional) Name or number of the active network connection; the default is the most recent connection. Number range is from 1 to 20.

Command Default

The most recent connection.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

SSH and Telnet sessions can be established to another router or server.

When the network session is being established and without disconnecting the network session, you can resume the router console session by typing a special sequence of characters as shown. After switching back to the router console, the network connection can be resumed by specifying the number of the connection or the name of the connection.

You can have several concurrent sessions open and switch back and forth between them. The number of sessions that can be open is defined using the **session-limit** command.

You can switch between sessions by escaping one session and resuming a previously opened session, as follows:

1. Escape from the current session by pressing the escape sequence (Ctrl Shift-6, x [^^X]) to return to the EXEC prompt.
2. Enter the **show sessions** command to list the open sessions. All open sessions associated with the current terminal line are displayed.
3. Enter the **resume** command and the session number to make the connection.

   You can also resume the previous session by pressing the **Return** key.

   The **^^X** and commands are available for all supported connection protocols.

The following example shows how to escape from one connection and resume another. You can omit the connection name and simply enter the connection number to resume that connection.

```
host1% ^^X
RP/0/RP0/CPU0:router# resume 1

blg_router#
```

send

To send messages to one or all terminal lines, use the **send** command in EXEC mode.

send {***line-number** | **aux 0** | **console 0** | **vty** *number*}

Syntax Description

*****	Sends a message to all tty lines.
line-number	Line number to which the message is sent. A number from 0 to 301.
aux 0	Sends a message to the auxiliary line.
console 0	Sends a message to the console line.
vty *number*	Sends a message to a virtual terminal line (vty). Range is 0 to 99.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The system prompts for the message, which can be up to 500 characters long. Enter **Ctrl-Z** to end the message. Enter **Ctrl-C** to abort this command.

The following example shows how to send a message to all lines:

```
RP/0/RP0/CPU0:router# send *

Enter message, end with CTRL/Z; abort with CTRL/C:
The system will be shut down in 10 minutes for repairs.^Z
Send message? [confirm]
RP/0/RP0/CPU0:router#

***
***
*** Message from tty to all terminals:
***
The system will be shut down in 10 minutes for repairs.
```

session-limit

To set the maximum number of outgoing terminal sessions from the current terminal, use the **session-limit** command in the appropriate line configuration mode. To remove any specified session limit, use the **no** form of this command.

session-limit *connections*
no session-limit

Syntax Description

connections	Maximum number of outgoing connections. Range is from 0 through 20.

Command Default

connections : 6

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The following example shows how to limit the number of active outgoing connections for the default line template to eight:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-limit 8
```

session-timeout

To set the timeout interval for all outgoing connections from the current terminal, use the **session-timeout** command in the appropriate line configuration mode. To remove the **session-timeout** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

session-timeout *minutes* [**output**]

Syntax Description

minutes	Timeout interval, in minutes. Range is 0 to 35791. The default is 10.
output	(Optional) Specifies that when traffic is sent to an asynchronous line from the router (within the specified interval), the connection is retained.

Command Default

minutes : 10

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **session-timeout** command to set the interval that Cisco IOS XR software waits for traffic before closing the connection to a remote device and returning the terminal to an idle state. If the **output** keyword is not specified, the session timeout interval is based solely on detected input from the user. If the keyword is specified, the interval is based on input and output traffic.

The following example shows how to set the session timeout value for the default line template to 120 minutes (2 hours):

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# session-timeout 120
```

show cli submode-exit status

To display the status of terminal submode-exit configuration, use **show cli submode-exit status** command in EXEC mode.

show cli submode-exit status

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The following block shows the output from the **show cli submode-exit status** command:

```
RP/0/RP0/CPU0:router #show cli submode-exit status
Global  submode exit feature is disabled.
Session submode exit feature is disabled.
```

show diag lcd-interface

To display details about the LCD interface (of the craft panel) , use the **show diag lcd-interface** command in the appropriate mode.

show diag lcd-interface

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Example

This example shows how to use the **show diag lcd-interface**

```
RP/0/RP0/CPU0:router # show diag location 0/CI0

Diag Information For : 0/CI0

 0/CI0-IDPROM Info
    Controller Family        : 0084
    Controller Type          : 0932
    PID                      : NCS4K-CRAFT
    Version Identifier       : V00
    UDI Description          : NCS 4000 Craft Panel
    CLEI Code                : NOCLEICODE
    ECI Number               : 11223344
    Top Assy. Part Number    : 800-41609-01
    Top Assy. Revision       : 12
    PCB Serial Number        : SAL1818RL2G
    PCA Number               : 73-14799-03
```

show line

To display the parameters of terminal lines, use the **show line** command in EXEC mode.

show line [**aux location** *node-id* | **console location** *node-id* | **vty** *number*]

Syntax Description

aux	(Optional) Displays the terminal line parameters for the auxiliary line.
location *node-id*	(Optional) Specifies the location for the route processor (RP) on which the auxiliary or console port resides. The *node-id* argument is entered in the *rack/slot* notation.
console	(Optional) Displays the terminal line parameters for the console line.
vty *number*	(Optional) Specifies a virtual terminal line (vty) number. Range is from 0 through 99.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The following example shows sample output from the **show line** command. The asterisk (*) indicates the current terminal session.

```
RP/0/RP0/CPU0:router# show line

    Tty             Speed     Modem  Uses   Noise Overruns           Acc I/O
    aux0_0_0         9600       -     -       -      0/0              -/-
  * con0_0_0         9600       -     -       -      0/0              -/-
    vty0             0/0        -     -       -      0/0              -/-
    vty1             0/0        -     -       -      0/0              -/-
    vty2             0/0        -     -       -      0/0              -/-
    vty3             0/0        -     -       -      0/0              -/-
    vty4             0/0        -     -       -      0/0              -/-
    vty100           0/0        -     -       -      0/0              -/-
    vty101           0/0        -     -       -      0/0              -/-
    vty102           0/0        -     -       -      0/0              -/-
    vty103           0/0        -     -       -      0/0              -/-
    vty104           0/0        -     -       -      0/0              -/-
    vty105           0/0        -     -       -      0/0              -/-
```

Table 7: show line Field Descriptions

Field	Description
Tty	Available ttys and vtys.
Speed	Baud rate that the inbound serial connection is using, in bps.
Modem	Not implemented.
Uses	Not implemented.
Noise	Not implemented.
Overruns	Hardware Universal Asynchronous Receiver/Transmitter (UART) overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.

The following example shows sample output from the **show line** command with the console line specified:

```
RP/0/RP0/CPU0:router# show line console location 0/rp0/cpu0

    Tty             Speed     Overruns             Acc I/O
    con0/RP0/CPU0    9600          0/0                 -/-

  Line con0_RP0_CPU0, Location "0/RP0/CPU0", Type "Console"
  Length: 24 lines, Width: 80 columns
  Baud rate (TX/RX) is 9600, 1 parity, 2 stopbits, 8 databits
  Template: console
  Capabilities: Timestamp Disabled
  Allowed transports are none.
```

Table 8: show line location Field Descriptions

Field	Description
Tty	Unique identifier of the tty; it contains the type of tty and, for physical ttys, it indicates the physical location of the tty.
Speed	Baud rate that the inbound serial connection is using in bps.
Overruns	Hardware UART overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
Acc I/O	Not implemented.

Field	Description
Line	Unique identifier of the TTY. This field displays the type of TTY and the physical location of physical TTYs.
Location	Location of the line.
Type	Line type.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit rate/receive rate of the line, in bps.
parity	Parity bits value used for physical terminal connections.
stopbits	Stop bits value used for physical terminal connections.
databits	Data bits value used for physical terminal connections.
Template	Line template being sourced by the particular connection.
Config	Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.
Allowed transports are	Incoming transport protocols that can be used by this tty to access the router.

show sessions

To display information about suspended Secure Shell (SSH) and Telnet connections launched from the terminal session, use the **show sessions** command in EXEC mode.

show sessions

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show sessions** command to display the hostname, remote connection service used by the router to access the host, idle time, and connection name.

The following example shows sample output from the **show sessions** command:

```
RP/0/RP0/CPU0:router# show sessions

  Conn Host                Address             Service Idle Conn Name
  *  1 10.26.25.40         10.26.25.40         telnet    15 10.26.25.40
```

The asterisk (*) indicates the current terminal session.

Table 9: show sessions Field Descriptions

Field	Description
Conn	Identifier for the connection used for resuming and disconnecting suspended sessions. An asterisk (*) indicates the current terminal session.
Host	Remote host to which the router is connected. This field displays either the IP address or hostname of the remote host. If the IP address of the remote host is mapped to the hostname (that is, if Domain Name System [DNS] services are enabled) and the session is initiated with the hostname, the output for this field displays the hostname of the host rather than the IP address of the host.
Address	IP address of the remote host.
Service	Remote connection service used.
Idle	Interval (in seconds) since data was last sent on the line.
Conn Name	Equivalent to the “Host” field in Cisco IOS XR software.

show terminal

To obtain information about the terminal configuration attribute settings for the current terminal line, use the **show terminal** command in EXEC mode.

show terminal

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

This example shows sample output from the **show terminal** command:

```
RP/0/RP0/CPU0:router# show terminal

Line vty0, Location "10.56.249.67", Type "VTY"
Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 0, 0 parity, 0 stopbits, 0 databits
Template: default
Capabilities: Timestamp Disabled
Allowed transports are telnet ssh.
```

Table 10: show terminal Field Descriptions

Field	Description
Line	Line that is currently being used.
Location	Location of the terminal accessing the router.
Type	Type of line.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit or receive rate of the line, in bps.
parity	Parity bits value used for physical terminal connections.
stopbits	Stop bits value used for physical terminal connections.
databits	Data bits value used for physical terminal connections.

Field	Description
Template	Line template being sourced by the particular connection.
Config	Configuration applied to the tty. This field indicates the allowed incoming transports that can be used to access the router from this tty.
Allowed transports are	Incoming transport protocols that can be used by this tty to access the router.

show users

To display information about the active lines on the router, use the **show users** command in EXEC mode or System Admin EXEC mode.

show users

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show users** command to display the line number, connection name, idle time, hosts, and terminal location. An asterisk (*) indicates the current terminal session.

Note To display all user groups and task IDs associated with the currently logged-in user, use the **show user** command in EXEC mode. See the *Authentication, Authorization, and Accounting Commands on Cisco IOS XR Software* module in *System Security Command Reference for Cisco NCS 5500 Series Routers and Cisco NCS 540 and NCS 560 Series Routers*.

The following example shows sample output identifying an active vty terminal session:

```
RP/0/RP0/CPU0:router# show users

    Line            User                Service  Conns   Idle        Location
    con0_RP0_CPU0   cisco               hardware     0  18:33:48
    vty0            cisco               telnet       0  00:30:36    10.33.54.132
  * vty1            cisco               telnet       0  00:00:00    10.33.54.132
```

Table 11: show users Command Output Field Descriptions

Field	Description
Line	All current connections. An asterisk (*) indicates the active connection.
User	Username of the user logged into the line.
Service	Physical or remote login service used.
Conns	Number of outgoing connections.

Field	Description
Idle	Interval (in hours:minutes:seconds) since last keystroke.
Location	IP address of remote login host. For local (physical) terminal connections, this field is blank.

stopbits

To set the stop bits used for physical terminal connections, use the **stopbits** command in line console configuration mode. To restore the default, use the **no** form of this command.

stopbits {**1** | **2**}
no stopbits

Syntax Description

1	Specifies one stop bit.
2	Specifies two stop bits. This is the default.

Command Default

Two stop bits.

Command Modes

Line console configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **stopbits** command to set the data bits attributes for physical terminal connections. Physical terminal connections use either the console or auxiliary terminal templates.

Communication protocols provided by devices such as terminals and modems often require a specific stop-bit setting.

Note The number of stop bits configured on the router and a terminal server should be same. The default number of stop bits on the router is two stop-bits.

This example shows how to change the default from two stop bits to one for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# stopbits 1
```

terminal cli submode-exit

To enable or disable submode-exit on interactive configuration sessions per VTY, use **terminal cli submode-exit** command in EXEC mode.

terminal cli submode-exit

Syntax Description

enable	Enables submode-exit on interactive configuration sessions per VTY.
disable	Disables submode-exit on interactive configuration sessions per VTY.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

You can control **submode-exit** feature behavior while parsing Cisco IOS-XR configuration selectively for every VTY session using this command because, global configuration takes precedence over the per-session configuration.

```
RP/0/RP0/CPU0:router #terminal cli submode-exit ?
  disable  Disable submode-exit behavior for this config session
  enable   Enable submode-exit behavior for this config session
```

```
RP/0/RP0/CPU0:router #terminal cli submode-exit enable
WARNING: submode-exit enable is already configured at GLOBAL level.This takes precedence
over per-session settings.
```

```
RP/0/RP0/CPU0:router #terminal cli submode-exit disable
WARNING: submode-exit enable is already configured at GLOBAL level.This takes precedence
over per-session settings.
```

terminal exec prompt

To specify prompt attributes for the current terminal session, use the **terminal exec prompt** command in the appropriate mode.

terminal exec prompt {**no-timestamp** | **timestamp**}

Syntax Description

no-timestamp	Disables the time-stamp printing before each command.
timestamp	Enables the time-stamp printing before each command.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the**terminal exec prompt** command with the **timestamp** keyword to show the time-stamp display after each command is entered. Use the **terminal exec** command with the **no-timestamp** keyword to disable the time-stamp display.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

This example shows how to enable the time-stamp prompt. When enabled, the date and time are displayed after each command. In this example, the **show version** command is entered, and the date and time is displayed.

The following example shows how to disable the time-stamp prompt:

```
RP/0/RP0/CPU0:router# terminal exec prompt no-timestamp
```

terminal exec utility pager

To configure the terminal page display options, use the **terminal exec utility pager** command in the appropriate mode.

terminal exec utility pager {**less** | **more** | **none**}

Syntax Description

less	Specifies to use unix-like "less" bidirectional paging for the terminal display.
more	Specifies to use unix-like "more" unidirectional paging for the terminal display.
none	Specifies that the display is not paginated.

Command Default

No pagination is configured by default.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **terminal exec utility pager** command with the **more** keyword to scroll forward through command display one screen at a time. "--More--" is displayed at the end of each screen. Press the Space key to advance one screen. Press the Enter key to advance one line. Press the Esc key to exit the command display.

This example shows how to limit command display to one screen at a time such that you can move forward through the display:

```
RP/0/RP0/CPU0:router#terminal exec utility pager more
```

terminal length

To set the number of lines that display at one time on the screen for the current terminal session, use the **terminal length** command in EXEC mode.

terminal length *lines*

Syntax Description

lines	Number of lines that display on a screen. Range is from 0 through 512.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **terminal length** command to set the terminal length value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal length value to the value configured with the **length** command.

Specifying a value of 0 for the *lines* argument prevents the router from pausing between screens of output.

Note The **terminal** commands are active for the current terminal session only. To apply a setting to all sessions, use the **line** commands.

This example shows how to set the length for the current terminal session to 120 lines:

```
RP/0/RP0/CPU0:router# terminal length 120
```

terminal width

To set the width of the display terminal for the current terminal session, use the **terminal width** command in EXEC mode.

terminal width *characters*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **terminal width** command to set the terminal width value for only the current terminal session and not save it to the running configuration. Exiting from the terminal session returns the terminal width value to the value configured with the **width** (display) command.

The following example shows how to set the terminal width for the current terminal session to 120 characters:

```
RP/0/RP0/CPU0:router# terminal width 120
```

timestamp disable

To disable time-stamp recording at the top of each command output, use the **timestamp disable** command in the appropriate line configuration mode. To reenable time-stamp recording if disabled, use the **no** form of this command.

timestamp disable

Syntax Description

This command has no keywords or arguments.

Command Default

Time-stamp recording at the top of each command output is enabled.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

By default, the time stamp is displayed at the top of any command output. The time stamp records the time at which the command was issued. You can use the **snmp-server view** command to disable this setting so that the time stamp does not appear at the top of the command output. This setting applies to all command outputs on any terminal line to which the current line template applies.

This example shows how to disable time-stamp recording for the console line template:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)#  timestamp disable
```

transport input

To define the transport protocols that can be used to access the router, use the **transport input** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport input {**all** | **none** | **ssh** | **telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet protocols.
none	Specifies that the router rejects incoming SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To be accepted, incoming network connections to an asynchronous port (terminal line) must use a transport protocol specified with the **transport input** command. This command can be useful in limiting the acceptable transport protocols to include or exclude those used by different types of users, or to restrict a line to secure connections (SSH connections).

This example shows how to set the transport input setting for the default line template to SSH connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport input ssh
```

transport output

To specify the transport protocols that can be used for outgoing connections from a line, use the **transport output** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport output {**all** | **none** | **ssh** | **telnet**}

Syntax Description

all	Specifies the Secure Shell (SSH) and Telnet transport protocols.
none	Specifies that the router rejects outgoing SSH and Telnet transport protocol connections.
ssh	Specifies the SSH transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

All protocols are allowed on the line.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Any settings made with the **transport output** command override settings made with the **transport preferred** command.

This example shows how to set the default line template to prevent any outgoing transport protocol connections:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport output none
```

transport preferred

To specify the default outgoing transport protocol to be used for initiating network connections, use the **transport preferred** command in the appropriate line configuration mode. To change or remove the protocol, use the **no** form of this command.

transport preferred {**none** | **ssh** | **telnet**}

Syntax Description

none	Disables the feature.
ssh	Specifies the Secure Shell (SSH) transport protocol.
telnet	Specifies the Telnet transport protocol.

Command Default

No transport protocol is set as the default outgoing protocol.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **transport preferred** command to provide a default transport protocol to use when initiating outgoing connections. The preferred outgoing transport protocol specified with the **transport preferred** command enables you to initiate an outgoing connection without explicitly specifying the transport protocol.

Cisco IOS XR software assumes that any unrecognized command is a hostname and the software attempts a connection. When the protocol is set to **none**, the system ignores unrecognized commands entered at the EXEC prompt, and does not attempt a connection.

The default setting, the same as using the **transport preferred** command with the **none** keyword, prevents errant connection attempts.

The following example shows how to set the preferred transport setting for the default line template to SSH:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# transport preferred ssh
```

vty-pool

To create or modify a virtual terminal line (vty) pool, use the **vty-pool** command in global configuration mode or XR config mode. To delete a vty pool, use the **no** form of this command.

vty-pool {**default** | **eem***pool-name*} *first-vty last-vty* [**line-template** {**default***template-name*}]

Syntax Description

default	Specifies the default vty pool.
eem	Specifies the embedded event manager vty pool.
pool-name	User-defined vty pool.
first-vty	First vty line in the pool. • For the default vty pool, you must specify 0 for the first vty line. • For a user-defined vty pool, the range is 5 to 99. • For the embedded event manager vty pool, you must specify 100 for the first vty line.
last-vty	Last vty line in the pool. • The default vty pool must contain at least five vtys. Range is 4 to 99. • For a user-defined vty pool, the range is 5 to 99. • The embedded event manager vty pool must contain at least six vtys. Range is 105 to 199.
line-template	(Optional) Specifies the terminal template to be used in the configuration of virtual terminals in the vty pool.
default	Specifies that the vty pool should reference the default template.
template-name	User-defined template to be applied to the vtys in the vty pool.

Command Default

default *vty-pool* : 5 vtys (vty 0 through 4) referencing the default line template.

eem *vty pool* : 6 vtys (vty 100 through 105) referencing the default line template.

Command Modes

Global Configuration mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When creating or modifying vty pools, follow these usage guidelines:

- Before creating or modifying the vty pools, enable the Telnet server using the **telnet server** command in global configuration mode.

- The vty range for the default vty pool must start at vty 0 and must contain a minimum of five vtys.
- The vty range from 0 through 99 can reference the default vty pool.
- The vty range from 5 through 99 can reference a user-defined vty pool.
- The vty range from 100 is reserved for the embedded event manager vty pool.
- The vty range for embedded event manager vty pools must start at vty 100 and must contain a minimum of six vtys.
- A vty can be a member of only one vty pool. A vty pool configuration fails if the vty pool includes a vty that is already in another pool.

If you attempt to remove an active vty from the active vty pool when configuring a vty pool, the configuration for that vty pool fails.

This example shows how to configure a user-defined vty pool (test1) that contains vtys 10 through14 and references the user-defined line template test2:

```
RP/0/RP0/CPU0:router(config)# vty-pool test1 10 14 line-template test2
```

width (display)

To set the width of the display terminal, use the **width** command in the appropriate line configuration mode. To remove the **width** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

width *characters*

Syntax Description

characters	Number of characters to display on a screen. Range is from 0 to 512.

Command Default

characters : 80

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **width** command to modify the default width setting for the specified line template.

This example shows how to set the terminal width for the default line template to 99 characters:

```
RP/0/RP0/CPU0:router(config)# line default
RP/0/RP0/CPU0:router(config-line)# width 99
```

cli whitespace completion

To enable completion of a command when you type the space key, use the **cli whitespace completion** command in the appropriate line configuration mode. To disable whitespace completion, use the **no** form of this command.

cli whitespace completion
no cli whitespace completion

Syntax Description

This command has no keywords or arguments.

Command Default

Whitespace completion is disabled.

Command Modes

Line console configuration

Line default configuration

Line template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **cli whitespace completion** command to complete the next word of the command syntax if you type the space key before completing the word. If more than one option is valid, all options are displayed for you to choose one.

Task ID

Task ID	Operations
tty-access	read, write

The following example shows how to enable whitespace completion:

```
RP/0/RP0/CPU0:router(config)# line console
RP/0/RP0/CPU0:router(config-line)# cli whitespace completion
```

Related Commands

Command	Description
cli interactive syntax check	Enables interactive syntax checking.

Cisco Discovery Protocol (CDP) Commands

This module describes the Cisco IOS XR software commands for monitoring the networking device and network using Cisco Discovery Protocol (CDP).

For detailed information about CDP concepts, configuration tasks, and examples, see the *Implementing CDP on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

cdp

To enable Cisco Discovery Protocol (CDP) globally or on an interface, use **cdp** command in the global or interface configuration mode. To disable CDP globally or on an interface, use the **no** form of this command.

cdp

no cdp

Syntax Description

This command has no keywords or arguments.

Command Default

CDP is disabled.

Command Modes

Interface configuration mode.

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, CDP is disabled globally. You must first enable CDP globally and then enable CDP for each interface.

To enable CDP globally, use the **cdp** command in global configuration mode. To disable CDP globally, use the **no** form of this command in global configuration mode.

To enable CDP on a specific interface, use the **cdp** command in interface configuration mode. To disable CDP on a specific interface, use the **no** form of this command in interface configuration mode.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to globally enable CDP:

```
Router# configure
Router(config)# cdp
```

The following example shows how to enable CDP on an interface:

```
Router# configure
Router(config)# interface gigabitethernet 0/8
Router(config-if)# cdp
```

cdp advertise v1

To change the version of Cisco Discovery Protocol (CDP) that is used to communicate with neighboring devices to version 1 (CDPv1), use the **cdpadvertise v1** command in the appropriate configuration mode. To remove the **cdp advertise v1** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp advertise v1

no cdp advertise

Syntax Description

This command has no keywords or arguments.

Command Default

Version 2 is enabled.

Command Modes

Global Configuration mode

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

By default, CDPv2 packets are sent. CDP also sends and receives CDPv1 packets if the device with which CDP is interacting does not process CDPv2 packets.

CDPv2 adds device information over CDPv1. The additional information that is contained in the CDPv2 messages relates to Native VLAN, VLAN Trunking Protocol (VTP) Management Domain, Ethernet Duplex, and other features.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to set a networking device to send and receive only CDPv1 advertisements:

```
Router# configure
Router(config)# cdp advertise v1
```

The following example shows how to restore the default condition (sending and receiving CDPv2 advertisements):

```
Router# configure
Router(config)# no cdp advertise
```

cdp holdtime

To specify the time for which the receiving device should hold a Cisco Discovery Protocol (CDP) packet from your networking device before discarding it, use the **cdp holdtime** command in the appropriate configuration mode. To remove the **cdp holdtime** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp holdtime *seconds*
`no cdp holdtime`

Syntax Description

seconds	Indicates the holdtime value to be sent in the CDP update packets, in seconds. Range for this variable must be between 10 and 255.

Command Default

180 seconds.

Command Modes

Global configuration

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

CDP packets are sent with a time-to-live value or holdtime, that is nonzero after an interface is enabled.

The CDP holdtime must be set to a higher number of seconds than the time between CDP transmissions. which is set using the **cdp timer** command.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to specify that the CDP packets sent from the networking device are held by the receiving device for 60 seconds before being discarded. You might want to set the holdtime lower than the default setting of 180 seconds if information about your networking device changes often and you want the receiving devices to purge this information more quickly.

```
Router# configure
Router(config)# cdp holdtime 60
```

The following example shows how to restore the default holdtime.

```
Router# configure
Router(config)# no cdp holdtime
```

cdp timer

To specify how often the software sends Cisco Discovery Protocol (CDP) updates, use the **cdp timer** command in the global configuration mode. To remove the **cdp timer** configuration command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

cdp timer *seconds*
no cdp timer

Syntax Description

seconds	Indicates the frequency in which Cisco IOS XR software sends CDP updates, in seconds. The range must be in between 5 and 254.

Command Default

60 seconds.

Command Modes

Global Configuration mode

Command History

Usage Guidelines

CDP updates will be sent more frequently if **cdp timer** is configured with a lower value in the range.

Task ID

Task ID	Operations
cdp	read, write

The following running-configuration shows CDP timer configured to 80 seconds. This means that the CDP updates will be sent less frequently than with the default setting of 60 seconds:

```
Router# configure
Router(config)# cdp timer 80
```

cdp log adjacency changes

To log changes to the CDP adjacency table, use **cdp log adjacency changes** command in appropriate mode. To disable the logging, use the **no** form of this command.

cdp log adjacency changes
no cdp log adjacency changes

Syntax Description

This command has no keywords or arguments.

Command Default

CDP adjacency table logging is disabled.

Command Modes

Global Configuration mode

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When CDP adjacency table logging is enabled, a syslog is generated each time a CDP neighbor is added or removed.

Task ID

Task ID	Operations
cdp	read, write

The following example enables CDP adjacency table logging:

```
Router# configure
Router(config)# cdp log adjacency changes
```

When CDP adjacency table logging is enabled, a syslog is generated each time a CDP neighbor is added or removed. The following is an example of the log entry:

```
LC/0/5/CPU0:Jun 5 10:51:18.081 : cdp[109]: %L2-CDP-6-DELETED_NEIGHBOR :
CDP Neighbour TBA04110127 on interface GigabitEthernet0/5/0/0
  has been deleted, remote interface 3/2

LC/0/5/CPU0:Jun  5 10:51:33.120 : cdp[109]: %L2-CDP-6-NEW_NEIGHBOR :
New CDP neighbor TBA04110127 detected on interface GigabitEthernet0/5/0/0,
  remote interface 3/2
```

show cdp

To display global Cisco Discovery Protocol (CDP) information, including CDP version, timer, and holdtime information, use the **show cdp** command in EXEC mode.

show cdp

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show cdp** command to display CDP version, timer, and holdtime information relative to CDP operations.

Task ID

Task ID	Operations
cdp	read

he following example shows how to use the **show cdp** command to verify the CDP global settings:

```
Router# show cdp
Global CDP information:
        Sending CDP packets every 20 seconds
        Sending a holdtime value of 30 seconds
        Sending CDPv2 advertisements is not enabled
```

Table 12: show cdp Field Descriptions

Field	Definition
Sending CDP packets every 20 seconds	Interval between transmissions of CDP advertisements. This field is controlled by the **cdp timer** command.
Sending a holdtime value of 30 seconds	Time for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the **cdp holdtime** command.
Sending CDPv2 advertisements is not enabled	State of being enabled or disabled for the transmission of CDP version 2-type advertisements. This field is controlled by the **cdp advertise v1** command.

show cdp entry

To display information about a given neighboring device or all neighboring devices discovered using Cisco Discovery Protocol (CDP), use **show cdp entry** command in EXEC mode.

show cdp entry {*****| *entry-name*} [**protocol** | | **version**]

Syntax Description

*****	Displays details about all CDP neighbors.
entry-name	Displays details only about the specified neighbor.
protocol	(Optional) Displays protocol information associated with CDP neighbor entries.
version	(Optional) Displays version information associated with CDP neighbor entries.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
cdp	read, write

The following example shows sample output from the **show cdp entry** command. Information about device ID, address, platform, interface, holdtime, and version is displayed.

```
Router# show cdp entry TBA04341195*
-------------------------
Device ID: TBA04341195(sys-235)
SysName : sys-235
Entry address(es):
  IP address: 172.16.23.9
Platform: WS-C6006,  Capabilities: Trans-Bridge Switch
Interface: MgmtEth0/RP1/CPU0/0
Port ID (outgoing port): 4/18
Holdtime : 157 sec

Version :
WS-C6006 Software, Version McpSW: 7.2(2) NmpSW: 7.2(2)
Copyright (c) 1995-2002 by Cisco Systems

advertisement version: 2
VTP Management Domain: 'sys'
Native VLAN: 125
Duplex: full
```

Table 13: show cdp entry Field Descriptions

Field	Description
Device ID	ID code assigned during installation of the router.
Entry address(es)	Addresses of the platform, selected interface, and port ID.
Platform	Platform name.
Capabilities	Special functions that the platform can perform (in this case the platform is a trans-bridge switch).
Interface	Interface location expressed in *rack / slot / module / port* notation.
Port ID (outgoing port)	Location of the port in use by the interface.
Holdtime	Time (in seconds) for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the **cdp holdtime** command.
Version	Software version.
advertisement version	Version 2 of the advertising protocol.
VTP Management Domain	VLAN Trunking Protocol (VTP) domain name of neighbor device.
Native VLAN	VLAN ID.
Duplex	Duplex setting: half or full.

show cdp neighbors

To display detailed information about neighboring devices discovered using CDP, use **show cpd neighbors** command in EXEC mode.

show cpd neighbors [*type* *interface-path-id* | | **location** *node-id*] [**detail**]

Syntax Description

type	(Optional) Interface type. For more information, use question mark (**?**), help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use **show interfaces** command to see a list of all interfaces currently configured on the router. For more information, use question mark (**?**), help function.
location *node-id*	(Optional) Displays detailed CDP information for the designated node. The *node-id* argument is entered in the *rack / slot* notation.
detail	(Optional) Displays detailed information about a neighbor or neighbors, including network address, enabled protocols, holdtime, and software version. The output includes information about both IPv4 and IPv6 addresses.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show cpd neighbors** command to display information about any CDP neighbors. When a location is specified in the command syntax, information about the neighbor is displayed for the specified node. Not specifying the location displays information about the neighbor for all interfaces.

Use the command with the **detail** keyword to display additional information, including IPv6 neighbors.

Task ID

Task ID	Operations
cdp	read

The following example shows sample output from the **show cpd neighbors** command:

```
Router# show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID        Local Intrfce   Holdtme  Capability  Platform  Port ID

TBA04110127      Gi0/7/0/0       173      T S         WS-C6506  3/9
```

```
cisco_1          Gi0/7/0/2       171      R
     Gi0/4/0/2
```

Table 14: show cdp neighbors Field Descriptions

Field	Description
Capability Codes	Type of device that can be discovered.
Device ID	Name of the neighbor device.
Local Intrfce	Protocol being used by the connectivity media and the interface number.
Holdtme	Remaining time, in seconds, for which the current device holds the CDP advertisement from a sending router before discarding it.
Capability	Type of the device listed in the CDP Neighbors table. Values are as follows: R—Router T—Transparent bridge B—Source-routing bridge S—Switch H—Host I—Internet Group Management Protocol (IGMP) device r—Repeater
Platform	Product number of the device.
Port ID	Protocol and port number of the device.

```
Router# show cdp neighbor detail

-------------------------
Device ID: uut-user
SysName : uut-user
Entry address(es):
IPv4 address: 10.0.0.1
IPv6 address: 1::1
IPv6 address: 2::2
Platform: cisco 12008/GRP, Capabilities: Router
Interface: Gi0/4/0/3
Port ID (outgoing port): Gi0/2/0/3
Holdtime : 177 sec

Version :
Cisco IOS XR Software, Version 0.0.0[Default]
Copyright (c) 2005 by cisco Systems, Inc.

advertisement version: 2
```

Table 15: show cdp neighbors detail Field Descriptions

Field	Definition
Device ID	Name of the neighbor device.
Entry address(es)	List of network addresses of neighbor devices. The address can be in IP or in Connectionless Network Service (CLNS) protocol conventions.
Platform	Product name and number of the neighbor device.
Capabilities	Device type of the neighbor. This device can be a router, a bridge, a transparent bridge, a source-routing bridge, a switch, a host, an IGMP device, or a repeater.
Interface	Interface being used by the connectivity medium.
Port ID	Port number of the port on the current device.
Holdtime	Remaining time (in seconds) for which the current device holds the CDP advertisement from a sending router before discarding it.
Version	Software version of the neighbor device.
advertisement version	Version number of the advertising protocol.

show cdp traffic

To display information about the traffic gathered between devices using CDP, use **show cdp traffic** command in EXEC mode.

show cdp traffic [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays CDP information for the CDP packets sent and received on the designated node only. The *node-id* argument is entered in the *rack / slot* notation.

Command Default

Displays CDP traffic information aggregated across all nodes.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
root-lr	read

The following example illustrates sample output from the **show cdp traffic** command:

```
Router# show cdp traffic
CDP counters :
          Packets output: 50662, Input: 40414
          Hdr syntax: 0, Chksum error: 0, Encaps failed: 0
        No memory: 0, Invalid packet: 0, Truncated: 0
        CDP version 1 advertisements output: 0, Input: 0
        CDP version 2 advertisements output: 50662, Input: 40414
          Unrecognize Hdr version: 0, File open failed: 0
```

Table 16: show cdp traffic Field Descriptions

Field	Definition
Packets output	Number of CDP advertisements sent by the local device. Note that this value is the sum of the CDP version 1 advertisements output field and the CDP version 2 advertisements output field.
Input	Number of CDP advertisements received by the local device. Note that this value is the sum of the CDP version 1 advertisements input field and the CDP version 2 advertisements input field.
Hdr syntax	Number of CDP advertisements having bad headers that have been received by the local device.

Field	Definition
Chksum error	Number of times the checksum (verifying) operation failed on incoming CDP advertisements.
Encaps failed	Number of times CDP failed to send advertisements on an interface because of a failure caused by the bridge port of the local device.
No memory	Number of times that the local device did not have enough memory to store the CDP advertisements in the advertisement cache table when the device was attempting to assemble advertisement packets for transmission and parse them when receiving them.
Invalid packet	Number of invalid CDP advertisements received and sent by the local device.
Truncated	Number of times truncated CDP advertisements were sent because there was not enough space in the CDP packet to hold all CDP type-length-values (TLVs).
CDP version 1 advertisements output	Number of CDP version 1 advertisements sent by the local device.
Input	Number of CDP version 1 advertisements received by the local device.
CDP version 2 advertisements output	Number of CDP version 2 advertisements sent by the local device.
Input	Number of CDP version 2 advertisements received by the local device.
Unrecognize Hdr version	Number of packets received from a CDP version that was outside the current configuration.
File open failed	Number of times that CDP failed to connect to one of the underlying services it uses.

clear cdp counters

To reset Cisco Discovery Protocol (CDP) traffic counters to zero (0), use the **clear cdp counters** command in EXEC mode.

clear cdp counters location *node-id*

Syntax Description

location *node-id*	Clears CDP traffic counters for the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

The counters are set to zero.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to clear CDP counters. The **show cdp traffic** output shows that all traffic counters have been reset to zero (0).

```
Router# clear cdp counters
Router# show cdp traffic

  CDP counters:
          Packets output: 0, Input: 0
          Hdr syntax: 0, Chksum error: 0, Encaps failed: 0
          No memory: 0, Invalid packet: 0, Truncated: 0
          CDP version 1 advertisements output: 0, Input: 0
          CDP version 2 advertisements output: 0, Input: 0
          Unrecognize Hdr version: 0, File open failed: 0
```

clear cdp table

To clear and automatically resize the table that contains Cisco Discovery Protocol (CDP) information about neighbors, use the **clear cdp table** command in EXEC mode.

clear cdp table location *node-id*

Syntax Description

location *node-id*	Clears and resizes the CDP table for the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear cdp table** command to clear and resize the CDP table that contains the neighbor entries. The new table size is calculated according to the recommended hash table size, as seen in the **show cdp** command output.

Task ID

Task ID	Operations
cdp	read, write

The following example shows how to clear and resize the CDP table. The output of the **show cdp neighbors** command before and after use of the **clear cdp table** command shows that all information has been deleted from the table:

```
RP/0/RP0/CPU0:router# show cdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID        Local Intrfce     Holdtme    Capability  Platform  Port ID
TBA04341195(151a Mg0/RP1/CPU0/0    171        T S         WS-C2924  0/1

RP/0/RP0/CPU0:router# clear cdp table
RP/0/RP0/CPU0:router# show cdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater
Device ID        Local Intrfce     Holdtme    Capability  Platform  Port ID
```

The **show cdp** command shows that the table has been resized:

```
RP/0/RP0/CPU0:router# show cdp

Global CDP information:
        Sending CDP packets every 60 seconds
        Sending a holdtime value of 180 seconds
        Sending CDPv2 advertisements is enabled
```

show cdp interface

To display information about the interfaces on which Cisco Discovery Protocol (CDP) is enabled, use the **show cdp interface** command in EXEC mode.

show cdp interface [*type interface-path-id* | **location** *node-id*]

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
location *node-id*	(Optional) Displays detailed CDP information for the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

This command displays information about the interfaces on which CDP has been enabled.

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show cdp interface** command to display information about any CDP interfaces. When an interface is specified in the command syntax, information is displayed about the specific interface. Not specifying the interface displays information about all interfaces.

Task ID

Task ID	Operations
cdp	read, write

The following example shows sample output from the **show cdp interface** command. Information about the status, CDP timer, and holdtime settings is displayed for all interfaces on which CDP is enabled.

```
Router# show cdp interface

POS0/2/0/0 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
POS0/2/0/1 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
```

```
    Holdtime is 240 seconds
POS0/2/0/2 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
POS0/2/0/3 is Up
    Encapsulation HDLC
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
MgmtEth0/RP1/CPU0/0 is Up
    Encapsulation ARPA
    Sending CDP packets every 120 seconds
    Holdtime is 240 seconds
```

The following example shows sample output from the **show cdp interface** command with an interface specified. Information about the status, CDP timer, and holdtime settings is displayed for Packet-over-SONET/SDH (POS) interface 0/2/0/1 only.

```
Router# show cdp interface pos 0/2/0/1

POS0/2/0/1 is Up
    Encapsulation HDLC
    Sending CDP packets every 60 seconds
    Holdtime is 180 seconds
```

Table 17: show cdp interface Field Descriptions

Field	Description
POS0/2/0/1 is Up	Current condition of POS interface 0/0/2/1.
Encapsulation HDLC	Interface is encoding packets using the Cisco HDLC Layer 2 encapsulation.
Sending CDP packets every 60 seconds	Interval between transmissions of CDP advertisements. This field is controlled by the **cdp timer** command.
Holdtime is 180 seconds	Time for which the device directs the neighbor to hold a CDP advertisement before discarding it. This field is controlled by the **cdp holdtime** command.

Clock Commands

This module describes the commands used to set and display the internal clock settings in Cisco IOS XR software.

For more information about manually setting the router clock, see .

For more information about configuring the router to synchronize to Network Time Protocol (NTP), see the *Implementing NTP on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

clock read-calendar

To manually copy the hardware clock (calendar) settings into the software clock, use the **clock read-calendar** command in the appropriate mode.

clock read-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

Read calendar is disabled.

Command Modes

EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The *calendar clock* is a hardware system clock that runs continuously, even if the router is powered off or rebooted. The hardware system clock is separate from the software clock settings, which are erased when the router is power cycled or rebooted.

Use the **clock read-calendar** command to manually copy the hardware clock setting into the software clock.

In the following example, the hardware clock settings are copied to the software clock with the **clock read-calendar** command. The **show clock** command is then entered to display the new software clock settings.

```
sysadmin-vm:0_RP0# clock read-calendar
sysadmin-vm:0_RP0# show clock
  Thu Jul  18 14:56:51.888 UTC
Thu Jul 18 14:56:52 UTC 2013
```

clock set

To change the software clock settings, use the **clock set** command in EXEC or System Admin EXEC mode.

clock set *hh*:*mm*:*ss* {*day month* | *month day*} *year*

Syntax Description

hh : *mm* : *ss*	Current time in hours (24-hour format), minutes, and seconds. Colons are required between values.
day	Current day (by date) in the month.
month	Current month (by name).
year	Current year (no abbreviation). Enter a valid four-digit year.

Command Default

Clock is not set.

Command Modes

EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Generally, if the system is synchronized by a valid outside timing mechanism, such as a Network Time Protocol (NTP) clock source, or if you have a networking device with calendar capability, you need not set the software clock. Use the **clock set** command if no other time sources are available. The time specified in this command is relative to the configured time zone.

Setting the Software Clock

This example shows how to set the software clock using the **clock set** command with the *day month* arguments first.

```
RP/0/RP0/CPU0:router# clock set 14:12:00 10 feb 2005

14:12:00.114 JST Fri Feb 10 2009
```

This example shows how to set the software clock using the **clock set** command with the *month day* arguments first.

```
RP/0/RP0/CPU0:router# clock set 14:38:00 feb 10 2005

14:38:00.069 PST Tue Feb 10 2009
```

Displaying the Clock Settings

This example shows how to display the settings of the software clock:

```
RP/0/RP0/CPU0:router# show clock

14:38:11.292 PST Tue Feb 10 2009
```

This example shows how to use th **clock set** command:

clock timezone

To set the time zone for display, use the **clock timezone** command in System Admin Config mode or XR Config mode. To remove the time zone setting, use the **no** form of this command.

clock timezone *zone region*

Syntax Description

zone	Name of the time zone to be displayed when standard time is in effect.
region	Sets the offset according to the region specified.

Command Default

UTC

Command Modes

System Admin Config mode

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This table lists common time zone acronyms used for the *zone* argument.

Table 18: Common Time Zone Acronyms

Acronym	Time Zone Name and UTC Offset
Europe	
GMT	Greenwich Mean Time, as UTC.
BST	British Summer Time, as UTC plus 1 hour.
IST	Irish Summer Time, as UTC plus 1 hour.
WET	Western Europe Time, as UTC.
WEST	Western Europe Summer Time, as UTC plus 1 hour.
CET	Central Europe Time, as UTC plus 1 hour.
CEST	Central Europe Summer Time, as UTC plus 2 hours.
EET	Eastern Europe Time, as UTC plus 2 hours.
EEST	Eastern Europe Summer Time, as UTC plus 3 hours.
MSK	Moscow Time, as UTC plus 3 hours.

Acronym	Time Zone Name and UTC Offset
MSD	Moscow Summer Time, as UTC plus 4 hours.
United States and Canada	
AST	Atlantic Standard Time, as UTC minus 4 hours.
ADT	Atlantic Daylight Time, as UTC minus 3 hours.
ET	Eastern Time, either as EST or EDT, depending on place and time of year.
EST	Eastern Standard Time, as UTC minus 5 hours.
EDT	Eastern Daylight Saving Time, as UTC minus 4 hours.
CT	Central Time, either as CST or CDT, depending on place and time of year.
CST	Central Standard Time, as UTC minus 6 hours.
CDT	Central Daylight Saving Time, as UTC minus 5 hours.
MT	Mountain Time, either as MST or MDT, depending on place and time of year.
MST	Mountain Standard Time, as UTC minus 7 hours.
MDT	Mountain Daylight Saving Time, as UTC minus 6 hours.
PT	Pacific Time, either as PST or PDT, depending on place and time of year.
PST	Pacific Standard Time, as UTC minus 8 hours.
PDT	Pacific Daylight Saving Time, as UTC minus 7 hours.
AKST	Alaska Standard Time, as UTC minus 9 hours.
AKDT	Alaska Standard Daylight Saving Time, as UTC minus 8 hours.
HST	Hawaiian Standard Time, as UTC minus 10 hours.
Australia	
WST	Western Standard Time, as UTC plus 8 hours.
CST	Central Standard Time, as UTC plus 9.5 hours.
EST	Eastern Standard/Summer Time, as UTC plus 10 hours (plus 11 hours during summer time).

This table lists an alternative method for referring to time zones, in which single letters are used to refer to the time zone difference from UTC. Using this method, the letter Z is used to indicate the zero meridian,

equivalent to UTC, and the letter J (Juliet) is used to refer to the local time zone. Using this method, the International Date Line is between time zones M and Y.

Table 19: Single-Letter Time Zone Designators

Letter Designator	Word Designator	Difference from UTC
Y	Yankee	UTC minus 12 hours.
X	Xray	UTC minus 11 hours.
W	Whiskey	UTC minus 10 hours.
V	Victor	UTC minus 9 hours.
U	Uniform	UTC minus 8 hours.
T	Tango	UTC minus 7 hours.
S	Sierra	UTC minus 6 hours.
R	Romeo	UTC minus 5 hours.
Q	Quebec	UTC minus 4 hours.
P	Papa	UTC minus 3 hours.
O	Oscar	UTC minus 2 hours.
N	November	UTC minus 1 hour.
Z	Zulu	Same as UTC.
A	Alpha	UTC plus 1 hour.
B	Bravo	UTC plus 2 hours.
C	Charlie	UTC plus 3 hours.
D	Delta	UTC plus 4 hours.
E	Echo	UTC plus 5 hours.
F	Foxtrot	UTC plus 6 hours.
G	Golf	UTC plus 7 hours.
H	Hotel	UTC plus 8 hours.
I	India	UTC plus 9 hours.
K	Kilo	UTC plus 10 hours.
L	Lima	UTC plus 11 hours.
M	Mike	UTC plus 12 hours.

This example shows how to set the time zone to IST Asia/Calcutta:

```
sysadmin-vm:0_RP0# config
sysadmin-vm:0_RP0(config)# clock timezone IST Asia/Calcutta
```

locale country

To set the default country of use, use the **locale country** command in XR Config mode. To remove the country setting, use the **no** form of this command.

locale country *country*

Syntax Description

country	Country, where *country* is a two-character country code. Case is not important.

Command Default

No default behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To display a complete listing of the available country codes, use the online help (**?**) function:

```
RP/0/RP0/CPU0:router(config)# locale country ?

   AD    Andorra
   AE    United Arab Emirates
   AF    Afghanistan
   AG    Antigua and Barbuda
   AI    Anguilla
   AL    Albania
   AM    Armenia
   AN    Netherlands Antilles
   AO    Angola
   AQ    Antarctica
   AR    Argentina
   AS    American Samoa
   AT    Austria
   AU    Australia
   AW    Aruba
   AZ    Azerbaijan
   BA    Bosnia and Herzegovina
   BB    Barbados
   BD    Bangladesh
   BE    Belgium
  --More--
```

The following example shows how to set the country of use to Australia:

```
RP/0/RP0/CPU0:router(config)# locale country au
```

locale language

To set the default language of use, use the **locale language** command in XR Config mode. To remove the language setting, use the **no** form of this command.

locale language *language*

Syntax Description

language	Two-character code that specifies the language. Case is not important.

Command Default

No default behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To display a complete listing of the available language codes, use the online help (?) function:

```
RP/0/RP0/CPU0:router(config)# locale language ?

aa    Afar
ab    Abkhazian
af    Afrikaans
am    Amharic
ar    Arabic
as    Assamese
ay    Aymara
  --More--
```

The following example shows how to set the language of use to English:

```
RP/0/RP0/CPU0:router(config)# locale language en
```

show clock

To display the system clock, use the **show clock** command in EXEC or XR EXEC mode.

show clock [**detail**]

Syntax Description

detail	(Optional) Indicates the time zone, time source, and current summer time setting (if any).

Command Default

No default behavior or values.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The system clock keeps an "authoritative" flag that indicates whether the time is authoritative (believed to be accurate). If the system clock has been set by a timing source, such as system calendar or Network Time Protocol (NTP), the flag is set. If the time is not authoritative, it is used only for display. Until the clock is authoritative and the "authoritative" flag is set, the flag prevents peers from synchronizing to the clock when the peers have invalid times.

The leading symbols that precede the **show clock** command display are shown in this table

Table 20: show clock Display Leading Symbol Descriptions

Symbol	Description
*	Time is not authoritative.
(blank)	Time is authoritative.
.	Time is authoritative, but NTP is not synchronized.

The following sample output shows the current clock settings:

```
RP/0/RP0/CPU0:router# show clock

16:18:28.927 PST Tue Feb 10 2009
```

The following sample output shows the current clock detail, including the time zone and time source:

```
RP/0/RP0/CPU0:router# show clock detail

16:18:07.164 PST Tue Feb 10 2009
Timezone: PST8PST Timesource: User configured
```

clock update-calendar

To copy the software clock settings to the hardware clock (calendar), use the **clock update-calendar** command in EXEC mode or Admin EXEC mode.

clock update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The hardware clock (calendar) runs continuously, even if the router is powered off or rebooted. If the software clock and calendar are not synchronized and the software clock is more accurate, use this command to update the hardware calendar clock to the correct date and time.

Task ID

Task ID	Operations
host-services	execute

The following example shows how to copy the current time from the software clock to the hardware clock:

```
RP/0/RP0/CPU0:router# clock update-calendar
```

confdConfig cli timezone local

To specify the timezone that must be used when displaying the time in the CLI, use the **confdConfig cli timezone local** command in System Admin Config mode.

confdConfig cli timezone local

Syntax Description

timezone	Specifies the timezone that must be used when displaying the time in the CLI. If **local** is specified then the timezone that is configured on the device is used.

Command Default

The default value is **local**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the timezone:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli timezone local
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli utcOffset

To specify the UTC offset measured in minutes, use the **confdConfig cli utcOffset** command in System Admin Config mode.

confdConfig cli utcOffset *integer*

Syntax Description

integer	Specifies the UTC offset measured in minutes.

Command Default

The default value is **0**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the UTC offset:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli utcOffset 0
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli idleTimeout

To specify the maximum idle time before terminating a CLI session, use the **confdConfig cli idleTimeout** command in System Admin Config mode.

confdConfig cli idleTimeout *time*

Syntax Description

time	Specifies the idle timeout value. It must be in this format: (nYnMnDnHnMnS).

Command Default

The default value is **PT10M**, which is 10 minutes. **PT0M** means no timeout.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to configure the idle timeout of 25 minutes:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli idleTimeout 25m
Thu May  23  23:19:47.567 UTC+00:00
```

confdConfig cli timestamp

To enable or disable the display of timestamps, use the **confdConfig cli timestamp** command in System Admin Config mode.

confdConfig cli timestamp {*enabled* | *disabled*}

Syntax Description

enabled	Enables the display of timestamps.
disabled	Disables the display of timestamps.

Command Default

The default value is **enabled**.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	By default, the sysadmin **confdConfig** configuration is visible in the sysadmin running configuration.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

This example shows you how to enable the display of timestamp:

```
sysadmin-vm:0_RP0# config
Thu May  23 23:19:47.567 UTC+00:00
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# confdconfig cli timestamp enabled
Thu May  23  23:19:47.567 UTC+00:00
sysadmin-vm:0_RP0(config)# confdConfig cli timestamp
clock24 clock24 is either 'true' or 'false'.
disabled enabled is either 'true' or 'false'.
enabled enabled is either 'true' or 'false'.
```

Secure Domain Router Commands

For detailed information about secure domain router concepts, configuration tasks, and examples, see the *Configuring Secure Domain Routers on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

console attach-sdr location

To create console access to the named-SDRs, use **console attach-sdr location** command in System Admin Config mode.

console attach-sdr location *node-id* **tty name** *tty-name* **sdr-name** *sdr-name*

Syntax Description

console attach-sdr location *node-id*	Specifies the location of the RP. **Note** XR VMs RP can be either RP0 or RP1 based on the RP on which XR VM is active gets created first, similar to default-SDR.
tty name *tty-name*	Specifies the name of tty. It can either be console1 or console2.
sdr-name *sdr-name*	Specifies the named-SDR that can be accessed through console. **Note** The consoles are per node base. They can be assigned to RP or standby RP. With console port assigned to standby RP, the standby console cannot be used for command input, similar to default-SDR.

Command Default

None

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

- With named-SDRs, you can either use console1 or console2 of RP to access XR VM. You can connect up to two named-SDRs at any given time.
- Console attach CLI needs to be configured for both Active and Standby RPs.
- On redundancy switchover, access is seamlessly transferred to the new RP. You need to connect to the new RPs console (similar to default-SDR).
- When all the VMs are created, you need to issue console attach-sdr CLI to get console access to the XR console.

Example

The following example shows how to configure console access to named-SDR.

```
sysadmin-vm:0_RP0# configure
sysadmin-vm:0_RP0(config)# console attach-sdr location 0/RP0 tty-name console1 sdr-name
sdr2
sysadmin-vm:0_RP0(config)# console attach-sdr location 0/RP1 tty-name console1 sdr-name
```

```
sdr2
sysadmin-vm:0_RP0(config)# commit
```

placement reoptimize

To reoptimize the placement of processes to provide high availability, use the **placement reoptimize** command in the System Admin EXEC mode.

placement reoptimze

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to initiate a placement reoptimization of processes:

```
sysadmin-vm:0_RP0# placement reoptimize
 Mon Jun 26 21:50:26.030 UTC
--------------------------------------------------------------------------------
Group-Name          Current-Placement             Reoptimized-Placement
--------------------------------------------------------------------------------
central-services    0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v4-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
netmgmt             1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
mcast-routing       0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v6-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
Group_0_1           0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
Group_0_0           1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
--------------------------------------------------------------------------------
Do you want to proceed with the reoptimization[y/n]y
Triggering reoptimize
Migration running in the background
Please don't trigger one more migration
```

sdr

To create a secure domain router (SDR) and to enter SDR configuration mode, use the **sdr** command in System Admin Config mode. To remove a secure domain router from the configuration, use the **no** form of this command.

sdr *sdr-name*

Syntax Description

sdr-name	Name of the SDR to be created or modified.

Command Default

The system comes configured as a single secure domain router known as the *default-SDR*.

Command Modes

System Admin Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **sdr** command to create an SDR or modify an existing SDR.

Note The *sdr-name* argument creates an SDR if the SDR specified for the *sdr-name* argument does not exist.

By default, a router running Cisco IOS XR software contains one SDR, the default-SDR. You can create multiple SDRs by deleting the default-SDR.

Use the **no** form of the command to remove a the SDR configuration. When an SDR is removed from the router configuration, all nodes included in the SDR configuration are returned to the default SDR inventory.

Maximum Number of SDR Configurations

A maximum of three named-SDRs can be configured.

The following example shows how to delete the default-SDR.

```
sysadmin-vm:0_RP0# configure
Thu Jun  25 09:36:03.496 UTC
Entering configuration mode terminal
sysadmin-vm:0_RP0(config)# no sdr default-sdr
sysadmin-vm:0_RP0(config)# commit
```

The following example shows how enter SDR configuration mode to configure an SDR.

```
sysadmin-vm:0_RP0# configure
sysadmin-vm:0_RP0(config)# sdr sdr1
sysadmin-vm:0_RP0(config-sdr-sdr1)#
```

sdr location

To reload, start, or shutdown a secure domain router (SDR), use the **sdr location** command in the System Admin EXEC mode.

sdr *sdr-name* **location** {*node-id* | **all**} {**reload** [**coredump** | **force**] | **shut** | **start**}

Syntax Description

sdr-name	Name of the SDR, **default-sdr** or **named-SDR** .
node-id	Selects the target location. The *node-id* is expressed in the rack/slot notation.
all	Selects all the nodes.
reload	Reloads the XR VM on the node.
coredump	Performs the VM core dump and then reloads the SDR.
force	Forces shutdown and does not wait for an orderly system shutdown.
shut	Shuts down the XR VM on the node.
start	Starts the XR VM on the node.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to reload the SDR:

```
sysadmin-vm:0_RP0#sdr default-sdr location 0/1 reload
```

sdr resources

To allocate resources for a secure domain router (SDR), use the **sdr resources** command in System Admin Config mode. To remove the allocated resources, use the **no** form of this command.

sdr {*sdr-name* | **default-sdr**} **resources** {**card-type** {**lc** | **RP**} [**vm-cpu** *num-of-cpus* | **vm-memory** *memory-size*] | **disk-space-size** *disk-space-size* | **fgid** *fgid* | **mgmt_ext_vlan** *ext-vlan-id*}

Syntax Description

sdr-name	Specifies the name of the SDR. Permitted values are 1 to 30 characters (0-9,a-z,A-Z,-,_).
default-sdr	Specifies the default SDR.
card-type	Specifies the type of the card, that is RP or LC.
vm-cpu *num-of-cpus*	Specifies the number of VM CPUs.
vm-memory *memory-size*	Speicifies the VM memory size in gigabytes.
disk-space-size *disk-space-size*	Specifies the size of the SDR disk space, as an unsigned integer.
fgid *fgid*	Specifies the fragment ID of the SDR, as an unsigned integer ranging from 25000 to 524288.
mgmt_ext_vlan *ext-vlan-id*	Specifies the management external VLAN for the SDR.

Command Default

None

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command must be used to fine tune the physical memory resources of each Cisco ASR 9000 High Density 100GE Ethernet line card in order to achieve full scale with Cisco IOS XR 64-bit BNG.

This command enforces to reboot the LC XR-VMs to adjust the requested resources like VM memory.

This example shows how to fine tune the memory for LC XR-VM by configuring resources for secure domain router:

```
RP/0/RP0/CPU0:router#admin
sysadmin-vm:0_RSP1# config
sysadmin-vm:0_RSP1(config)# sdr default-sdr resources card-type lc vm-memory 21
```

sdr default-sdr re_pair

To initiate re-pairing of RPs in the currently defined secure domain routers (SDRs), use the **sdr default-sdr re_pair** command in the System Admin EXEC mode.

`sdr` **default-sdrre_pair**

Syntax Description

default-sdr	Shows the details of the default SDR.
re_pair	Activates the re-pairing of RPs in the defined SDR.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to display the pairing of the default SDR:

```
sysadmin-vm:0_RP0#sdr default-sdr re_pair
 Fri May 19 21:22:36.625 UTC
Current Configuration
    0/RP0 1/RP1
    1/RP0 2/RP1
    2/RP0 0/RP1
Re_Paired Configuration
    0/RP0 1/RP1
    1/RP0 0/RP1
Would you like to proceed ? [yes/no]:  yes
Proceeding with action
```

sdr default-sdr pairing-mode inter-rack

To enable pairing RPs between racks in a diasy chain algorithm defined secure domain routers (SDRs), use the **sdr default-sdr pairing-mode inter-rack** command in the System Admin EXEC mode. The inter-rack mode of pairing provides high availability against rack failures.

sdr`default-sdr` **pairing-modeinter-rack**

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing-mode	Specifies the pairing mode of RPs.
inter-rack	Enables the pairing of RPs between racks in a configuration.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to enable inter-rack pairing:

```
sysadmin-vm:0_RP0#sdr default-sdr pairing-mode inter-rack
```

sdr default-sdr pairing-mode intra-rack

To enable pairing of RPs within a rack, use the **sdr default-sdr pairing-mode intra-rack** command in the System Admin EXEC mode. The intra-rack mode of pairing is the defaut pairing mechanism as defined in the SDR.

sdr default-sdrpairing-modeintra-rack

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing-mode	Specifies the pairing mode of RPs.
intra-rack	Enables the pairing of RPs within a rack in a configuration.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to enable inter-rack pairing:

```
sysadmin-vm:0_RP0#sdr default-sdr pairing-mode intra-rack
```

sh placement reoptimize

To show the predictions from reoptimizing the placement of processes to provide high availability, use **sh placement reoptimize** command in the System Admin EXEC mode.

shplacement reoptimze

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to see the predictions for a placement reoptimization of processes:

```
sysadmin-vm:0_RP0#sh placement reoptimize
Mon Jun 26 21:49:24.504 UTC
------------------------------------------------------------------------------
Group-Name          Current-Placement             Reoptimized-Placement
------------------------------------------------------------------------------
central-services    0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v4-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
netmgmt             1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
mcast-routing       0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
v6-routing          1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
Group_0_1           0/RP0/CPU1(0/RP1/CPU1)        0/RP0/CPU1(0/RP1/CPU1)
Group_0_0           1/RP0/CPU1(NONE)              0/RP0/CPU1(0/RP1/CPU1)
```

show sdr

To display information about the currently defined secure domain routers (SDRs), pairing details, and reboot history, use the **show sdr location** command in the System Admin EXEC mode.

show sdr [**sdr-name** `detail` [**location** [*node-id*] | **pairing** | **reboot-history location** [*node-id*]]]

Syntax Description

sdr-name	Name of the SDR, **default-sdr** or **named-SDR**.
detail	Display detailed information for the local SDR.
location *node-id*	Selects the target location. The *node-id* is expressed in the *rack/slot* notation.
pairing	Displays the SDR pairing information.
reboot-history	Displays the reboot history of the SDR.

Command Default

Displays all SDRs in the system.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

This example shows how to display the detailed information of the SDR:

```
sysadmin-vm:0_RP0# show sdr Internet-SDR detail
Sat Aug  27 06:05:36.757 UTC
------SDR Detail at location 0/RP0/VM1------
 SDR Id                          2
 IP Address of VM                192.0.0.4
 MAC address of VM               64:F6:9D:78:FD:36
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/pci_disk1/xr_data_lv0
 Big Disk Partition              /dev/pci_disk1/ssd_disk1_xr_2
 VM Id                           1
 VM CPUs                         4
 VM Memory[in MB]                11264
 Card Type                       RP_Card
 Card Serial                     SAL19058TGE
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.4
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:33:12"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
              08/11/2016 00:33:12 FIRST_BOOT
------SDR Detail at location 0/RP1/VM1------
```

```
 SDR Id                          2
 IP Address of VM                192.0.4.4
 MAC address of VM               4C:4E:35:B6:94:BC
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/pci_disk1/xr_data_lv0
 Big Disk Partition              /dev/pci_disk1/ssd_disk1_xr_2
 VM Id                           1
 VM CPUs                         4
 VM Memory[in MB]                11264
 Card Type                       RP_Card
 Card Serial                     SAL1830XFD5
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.4
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:33:01"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
               08/11/2016 00:33:01 FIRST_BOOT
------SDR Detail at location 0/6/VM1------
 SDR Id                          2
 IP Address of VM                192.0.88.3
 MAC address of VM               E2:3B:46:4F:8D:05
 Boot Partition                  /dev/panini_vol_grp/xr_lv0
 Data Partition                  /dev/panini_vol_grp/xr_data_lv0
 Big Disk Partition              (null)
 VM Id                           1
 VM CPUs                         3
 VM Memory[in MB]                6383
 Card Type                       LC_Card
 Card Serial                     SAD161300T5
 Rack Type                       Line_Card_Controller
 Chassis Serial                  FLM184073K4
 Hardware Version                0.2
 Management External VLAN        12
 VM State                        RUNNING
 Start Time                      "08/11/2016 00:32:48"
 Reboot Count(Since VM Carving)  1
 Reboot Count(Since Card Reload) 1
               08/11/2016 00:32:48 FIRST_BOOT
```

This example shows how to display the SDR pairing information:

```
sysadmin-vm:0_RP0# show sdr Internet-SDR pairing
Sat Aug  27 06:01:08.174 UTC
 Pairing Mode  AUTOMATIC
 SDR Lead
   Node 0 0/RP0
   Node 1 0/RP1
 Pairs
   Pair Name Pair0
    Node 0   0/RP0
    Node 1   0/RP1
```

This example shows the output of the **show sdr** command:

```
This example shows the output of the show sdr <sdr-name> reboot-history

sysadmin-vm:0_RP0# show sdr Internet-SDR reboot-history
Sat Aug  27 06:06:42.315 UTC

             Reboots
             Since
```

```
Location     Created   Reason
------------------------------------------------------------------------
0/RP0/VM1    1
                       08/11/2016 00:33:12 FIRST_BOOT
0/RP1/VM1    1
                       08/11/2016 00:33:01 FIRST_BOOT
0/6/VM1      1
                       08/11/2016 00:32:48 FIRST_BOOT

sysadmin-vm:0_RP0#show sdr
Fri Aug  23 10:22:21.540 UTC
sdr default-sdr
 location 0/RP0
  sdr-id             2
  IP Address of VM   192.0.0.4
  MAC address of VM  E0:50:07:FA:99:06
  VM State           RUNNING
  start-time         2013-08-23T10:17:34.33455+00:00
  Last Reload Reason CARD_SHUTDOWN
  Reboot Count       1
 location 0/RP1
  sdr-id             2
  IP Address of VM   192.0.4.4
  MAC address of VM  E2:3A:D7:21:9E:06
  VM State           RUNNING
  start-time         2013-08-23T10:17:33.387279+00:00
  Last Reload Reason CARD_SHUTDOWN
  Reboot Count       1
 location 0/0
  sdr-id             2
  IP Address of VM   192.0.64.3
  MAC address of VM  E0:50:91:A2:D7:05
  VM State           RUNNING
  start-time         2011-01-01T00:04:20.921688+00:00
  Last Reload Reason CARD_SHUTDOWN
  Reboot Count       1
 location 0/1
  sdr-id             2
  IP Address of VM   192.0.68.3
  MAC address of VM  E2:3B:41:C3:83:05
  VM State           RUNNING
  start-time         2011-01-01T00:07:09.249358+00:00
  Last Reload Reason CARD_SHUTDOWN
  Reboot Count       1
```

show sdr default-sdr pairing

To display information about the pairing details of the currently defined secure domain routers (SDRs), use the **show sdr default-sdr pairing** command in the System Admin EXEC mode.

showsdr **default-sdrpairing**

Syntax Description

default-sdr	Shows the details of the default SDR.
pairing	Displays the pairing of RPS in the SDR.

Command Default

A single SDR named **default-sdr** is configured on the router and started. In case of SOST mode, a single SDR named default-sdr is configured on the router and started. In case of SOMT mode, one or more Named-SDRs is/are configured on the router and started.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

This example shows how to display the pairing of the default SDR:

```
sysadmin-vm:0_RP0#show sdr default-sdr pairing
 Fri May 19 21:23:039.938 UTC
 Pairing Mode  INTER-RACK
 SDR Lead
   Node 0 0/RP0
   Node 1 1/RP1
 Pairs
   Pair Name Pair0
    Node 0   0/RP0
    Node 1   1/RP1
 Pairs
   Pair Name Pair1
    Node 0   1/RP0
    Node 1   0/RP1
```

show sdr-manager trace

To display SDR manager trace details, use the **show sdr-manager trace** command in the System Admin EXEC mode.

show sdr-manager trace {**all** *trace-name*} **location** *node-id* [**all** *trace-attribute*]

Syntax Description

trace-name	Trace buffer name.
location *node-id*	Specifies the target location. The *node-id* argument is expressed in the *rack/slot* notation.
trace-attributes	Trace attribute.
all	Displays all the details.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command displays the SDR manager debug traces that are meant only for diagnostics.

This example shows how to display the SDR manager trace details:

```
sysadmin-vm:0_RP0#show sdr-manager trace all location 0/0 timestamp

Fri Aug  9  07:02:28.644 UTC
06.55.47.185784448:1376031347185784662:sdr_mgr SDR MGR started
06.55.47.187332096:1376031347187332362:  @msc_entity id="0/19581" display_name="sdr_mgr"
06.55.47.187343744:1376031347187344066:@msc_event entity_id="0/19581/19581"
time="1376031347187344066" label="requesting connection to syslog (CAPI hdl=0x1bcad60, CIPC
 hdl = 0x1bcb0a0)" type="Connection" completed="false"
06.55.47.187395968:1376031347187396272:DS handle 0x1bcad60 instantiated for syslog client
handle
06.55.47.187745024:1376031347187745236:  @msc_entity id="0/19581" display_name="sdr_mgr"
06.55.47.188629504:1376031347188629812:@msc_event entity_id="0/19581/19581"
time="1376031347188629812"
label="requesting connection to calvados_ds (CAPI hdl=0x1bee4a0, CIPC hdl = 0x1bee8d0)"
type="Connection" completed="false"
06.55.47.188833024:1376031347188833246:@msc_event entity_id="0/19581/19581"
time="1376031347188833246" label="connecting to calvados_ds with endpoint (0x7f000001, 7400)

hdl=0x0x1bee4a0)" type="Connection" completed="false"
@msc_source pairing_id="0/19581/con_0x1bee4a0" type="Lane"
06.55.47.189353600:1376031347189353766:CIPC:CONN (hdl=0x1bee8d0):cipc_connect():
invoked on endpoint (127.0.0.1, 7400)
06.55.47.189588736:1376031347189588924:CIPC:INFO (hdl=0x1bee8d0):socket_connect():
async socket connection in progress
```

```
06.55.47.190383488:1376031347190383718:SMIL: set 0x1afa8d0 created
06.55.47.190388352:1376031347190388492:DEBUG: sdr_main_fsa_init
```

Bulk Content Downloader (BCDL) Commands

This module describes the **show** commands that you can use to see the status of the Bulk Content Downloader (BCDL) process. The BCDL provides the Cisco IOS XR software with high-performance downloading capabilities. This capability is used by the following internal applications:

- IPv4 and IPv6 unicast routing protocols—To provide the ability to download forwarding information from the router Global Routing Information Base (GRIB) to the line cards.
- IPv4 and IPv6 multicast routing protocols—To download the Multicast Routing Information Base (MRIB) entries to consumers managing the Multicast Forwarding Information Base (MFIB) on the various line cards.
- MPLS—To download the Label Forwarding Information Base (LFIB) entries to the line card.
- Fabric Management—To update memberships for individual fabric group IDs (FGIDs) to selected portions of the fabric hardware.
- CDS—Context Distribution Service.

There is no configuration necessary for the BCDL.

show bcdl

To display Bulk Content Downloader (BCDL) information, use **show bcdl** command in EXEC mode.

show bcdl [*group-name*]

Syntax Description

group-name	(Optional) Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output from the **show bcdl** command:

```
Router#show bcdl ipv4_rib
Sun May 31 06:56:12.093 PST
grp ipv4_rib, gid 2040, sg cnt 1, agent jid 124, node 0/RSP0/CPU0, pulse 105,
new mbr 0
sg  lwg fd csmr hdlr-act dnld-act susp wait-lck seq pulse-tot pulse-out
 0 2043 11    4       no       no   no        0 113       103         0
```

Table 21: show bcdl Field Descriptions

Field	Description
group	Type of download and the Group Services Protocol (GSP) group name.
gid	Heavyweight group (HWG) in the GSP. This is the group that a consumer initially joins. It is used by the BCDL agent to send control updates.
sg count	Number of subgroups for this particular download type.
agent jid	Job identifier of the BCDL agent. The JID is numerical identifier for a particular process and remains the same across process restarts.
node	Node, expressed in the *rack/slot* notation, in which the agent is running.
pulse	Pulse code used by the producer to pulse the BCDL agent.
new mbr	Number of new consumers that have not yet been assigned a subgroup.

Field	Description
sg	Subgroups number.
lwg	Lightweight group in GSP. This is a type of child group of the HWG. The BCDL agent tells the consumers to join this group to receive data.
fd	The connection handle between the producer and the BCDL agent.
csmr	Number of consumers.
hdlr-act	Specifies if there is a download in progress.
dnld-act	Indicates whether the convergence flag has been sent or not.
susp	Indicates whether the download is suspended due to the queue filling up.
wait-lck	If nonzero, some thread is waiting for other thread to take control of this subgroup.
seq	Sequence number of the last message sent on this subgroup.
pulse-tot	Total number of pulses sent by the producer to the BCDL agent.
pulse-out	Total number of outstanding pulses that have not yet been processed by the BCDL agent.

show bcdl consumers

To display Bulk Content Downloader (BCDL) consumer information, use **show bcdl consumers** command in EXEC mode.

show bcdl consumers [*group_name*] [*detail*]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.
detail	(Optional) Display detailed summary for BCDL consumer.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl consumers** command:

```
Router# show bcdl consumers ipv4_ribSun May 31 06:17:38.209 PST
group ipv4_rib, gsp gid 2040, 4 consumers, agent jid 124, node 0/RSP0/CPU0
(expected 4 consumers to reply, received 4 replies)
      pid       node asg csg  lwg sus  messages       bytes  errs name
   323727 0/RSP0/CPU0   0   0 2043   N       113       54196     0 fib_mgr
   110686   0/6/CPU0   0   0 2043   N       111       54140     0 fib_mgr
   110686   0/4/CPU0   0   0 2043   N       112       54168     0 fib_mgr
   110686   0/1/CPU0   0   0 2043   N       111       54140     0 fib_mgr
```

Table 22: show bcdl consumers Field Descriptions

Field	Description
PID	Process identifier.
node	Consumer node, expressed in the *rack/slot* notation.
asg	Subgroup to which the BCDL agent thinks this consumer belongs.
csg	Subgroup to which the consumer thinks it belongs.
messages	Number of messages processed by this particular consumer.
bytes	Bytes processed by this particular consumer.

Field	Description
errors	Errors encountered by the consumer. This field indicates the number of times the connection was reset.
name	Name of the consumer process.

show bcdl queues

To display Bulk Content Downloader (BCDL) queue information, use **show bcdl queues** command in EXEC mode.

show bcdl queues [*group_name*]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output from the **show bcdl queues** command:

```
Router # show bcdl queues ipv4_ribSun May 31 07:13:28.665 PST
group ipv4_rib, gsp gid 2040, 4 consumers, agent jid 124, node 0/RSP0/CPU0
(expected 4 consumers to reply, received 4 replies)
      pid       node asg csg  lwg sus msgs_in_q  bytes_in_q  errs name
   323727 0/RSP0/CPU0   0   0 2043   N         0           0     0 fib_mgr
   110686   0/6/CPU0   0   0 2043   N         0           0     0 fib_mgr
   110686   0/1/CPU0   0   0 2043   N         0           0     0 fib_mgr
   110686   0/4/CPU0   0   0 2043   N         0           0     0 fib_mgr
```

show bcdl tables

To display Bulk Content Downloader (BCDL) table information, use **show bcdl tables** command in EXEC mode.

show bcdl tables [*group_name*]

Syntax Description

group_name	Displays information for a specific BCDL group.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl tables** command:

```
Router# show bcdl tables ipv4_rib
Sun May 31 07:19:29.878 PST
grp ipv4_rib, gid 2040, sg cnt 1, agent jid 124, node 0/RSP0/CPU0, pulse 105, ne
w mbr 0
  sg  lwg fd csmr hdlr-act dnld-act susp wait-lck   seq pulse-tot pulse-out
   0 2043 11    4       no       no   no        0   113       103         0
sgs: 1, table_cnt: 1, table_mid_cnt: 4, buf size: 100
Showing table info for 1 subgroups
 sg 0: has 1 tables (messages: 0, bytes: 0)
  table 0xe0000000: 4 members, dnld act: 0, messages: 113, bytes: 54196
   cnsmr 0: pid 323727 on node 0/RSP0/CPU0
   cnsmr 1: pid 110686 on node 0/6/CPU0
   cnsmr 2: pid 110686 on node 0/1/CPU0
   cnsmr 3: pid 110686 on node 0/4/CPU0
```

Table 23: show bcdl tables Field Descriptions

Field	Description
sgs	Number of subgroups.
table_cnt	Number of tables in this subgroup.
sg	Specific subgroup for which information is provided.
has 1 tables	Number of tables in this subgroup.

Field	Description
messages	Messages sent that are not associated with a particular table ID.
bytes	Bytes sent that are not associated with a particular table ID.
table	Specific table ID for which information is provided.
members	Number of consumers associated with this table.
dnld act	Indicates whether or not the convergence flag has been sent.
messages	Number of messages sent for a particular table.
bytes	Number of bytes sent for a particular table.
cnsmr 0: pid 419725 on node 0/RP0/CPU0	Process ID and node information for each consumer in the specified table.

show bcdl trace

To display Bulk Content Downloader (BCDL) trace information, use **show bcdl trace** command in EXEC mode.

show bcdl trace [*group_name*] [**event**] [**timing**] [**grpsnd**] [**wrapping** | **unique**] [**hexdump**] [**last** *n*] [**reverse**] [**stats**] [**tailf**] [**verbose**] [**file** *filename* **original location** *node-id* | **location** {*node-id* | **all**}]

Syntax Description

group_name	(Optional) Displays information for a specific BCDL group.
event	(Optional) Displays event trace entries.
timing	(Optional) Displays timing trace entries.
grpsnd	(Optional) Displays group send trace entries.
wrapping	(Optional) Displays wrapping entries.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
verbose	(Optional) Displays additional internal debugging information.
file *filename* **original location** *node-id*	(Optional) Specifies a filename and original location of the file to display.
location {*node-id* | **all**}	Specifies the RP node for which to display the execution path monitoring information. The *node-id* argument is expressed in the *rack / slot*notation. The **all** keyword specifies all RP nodes.

Command Default

No default behavior or values.

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output using the **show bcdl trace** command:

```
Router# show bcdl trace ipv4_rib location 0/1/cpu0
Sun May 31 08:21:07.933 PST
143 wrapping entries (4096 possible, 0 filtered, 143 total)
May 21 15:14:55.790 bcdl/c/ipv4_rib 0/1/CPU0 t4  LE
  bcdl_join_internal: timer_create ret 0, id is 9
May 21 15:14:56.890 bcdl/c/ipv4_rib 0/1/CPU0 t7  LE
  bcdl_join_internal: group_lookup bcdl_ipv4_rib
  returned gid 2040
May 21 15:14:56.966 bcdl/c/ipv4_rib 0/1/CPU0 t7  LE
  join hwg 2040 returns 0
May 21 15:14:56.978 bcdl/c/ipv4_rib 0/1/CPU0 t7  LE
  bcdl_join_internal: joined group bcdl_ipv4_rib,
  member count 5
May 21 15:14:58.969 bcdl/c/ipv4_rib 0/1/CPU0 t7  LE
  rcv gsp mtype 3: connection init sg 1 cur_seq 0
  lwg_gid 2056 table tag 0x00000000 resend state yes
May 21 15:14:58.969 bcdl/c/ipv4_rib 0/1/CPU0 t7  LE
  pc ring high water 0 -> 1, 0 bytes
May 21 15:14:58.969 bcdl/c/ipv4_rib 0/1/CPU0 t4  LE
  c_h deliver msg_id 7 connection init, table event
  0 table tag 0x00000000
May 21 15:14:58.969 bcdl/c/ipv4_rib 0/1/CPU0 t4  LE
  conn init, seq 64206 -> 0, sg 65534 -> 1, gid 2040,
  lwg gid -1 -> 2056
 ...
```

File System Commands

This chapter describes the Cisco IOS XR software commands used to manage file systems on your router.

Note The commands in this module should not be used to access or modify any Cisco IOS XR software or configuration files. Use only the documented commands for installing and configuring the router. Modifying, deleting, or moving configuration or software package files using the manual commands described in this module is not required and can result in router downtime, loss of service, and a corrupted database.

cd

To change the current working directory, use **cd** command in EXEC mode or XR EXEC mode.

cd *filesystem* **:**

Syntax Description

filesystem **:**	(Optional) Location of the new working directory. Include the file system alias for the *filesystem* argument, followed by a colon and optionally, the name of a directory.

Command Default

The default file directory is **disk0:/usr**.

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The current working directory is the directory used when EXEC commands that have an optional argument are entered without that argument. Use **cd** command to define the working directory. For example, when the **dir** command is entered without specifying the *filesystem* argument, the files in the current working directory are displayed.

Use **cd** command without an argument to set the working directory back to the default directory, **disk0:/usr**.

The following example shows how to change the current working directory to the root directory on the hard disk. In this example, the **pwd** command confirms that the working directory has changed to the root directory on the hard disk.

```
RP/0/RP0/CPU0:router# cd harddisk:
RP/0/RP0/CPU0:router# pwd

harddisk:
```

The following example shows how to change the current working directory to the default file directory by specifying the **cd** command without a location. In this example, the **pwd** command confirms that the working directory has changed to the default file directory.

```
RP/0/RP0/CPU0:router# cd
RP/0/RP0/CPU0:router# pwd

disk0:/usr
```

cfs check

To clear any inconsistencies between running configuration and binary startup configuration maintained on the disk use **cfs check** command in XR EXEC mode.

cfs check

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 3.5.0	This command was introduced.
Release 24.2.1	This command was modified to increase the commit count from 20 to 40.

Usage Guidelines

Use this command to clear any inconsistencies between running configuration and binary startup configuration maintained on the disk.

On executing this command the existing binary startup configuration maintained on the disk will be discarded and the entire binary startup configuration will be recreated from system's running configuration. This will clear any inconsistency between the two.

Note While this command runs, redundancy of the designated shelf controller (DSC) is disabled.

Note Executing this command will take a lock to the configuration database, which will prevent any commit operation until this operation completes.

Task ID

Task ID	Operations
root-lr	read, write

Examples

The following example shows how to perform a CFS check:

```
Router# cfs check

Creating any missing directories in Configuration File system...OK
Initializing Configuration Version Manager...OK
Syncing commit database with running configuration...OK
Re-initializing cache files...OK
```

```
Updating Commit Database.  Please wait...[OK]
```

Related Commands

Command	Description
show configuration history	Displays **cfs check** events executed successfully.
clear configuration inconsistency	Performs the same operation as **cfs check**, can be used interchangeably.

clear configuration ascii inconsistency

To perform an ASCII backup of the system's running configuration and to clear inconsistencies between running configuration and ASCII backup copy maintained on the disk, use the **clear configuration ascii inconsistency** command in XR EXEC mode.

clear configuration ascii inconsistency

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 6.5.1	This command was introduced.
Release 24.2.1	This command was modified to include resetting the ASCII backup timer.

Usage Guidelines

Use this command to perform a forced ASCIl backup and reset the periodic ASCII backup timer. Once the backup is complete, the router will automatically initiate the next periodic ASCII backup operation only after 55 minutes from the time the **clear configuration ascii inconsistency** command is executed.

On executing this command, the ASCII backup will synchronize with the latest running configuration up to the point of the last commit made before executing the command. This clears any inconsistencies between the running configuration and the ASCII backup copy stored on disk. Additionally, this command will reset the periodic ASCII backup timer.

Task ID

Task ID	Operations
config-services	execute

Examples

The following example shows how to perform an ASCII backup and reset the ASCII backup timer to zero:

```
Router# clear configuration ascii inconsistency
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! Warning: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!! It is recommended to run this command only when all nodes in router      !!!!
!!!! are in IOS-XR RUN state. To determine node state, run following command: !!!!
!!!! 'show platform'.                                                         !!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! Warning: !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Proceed with the command ?[confirm] y
 Ascii configuration backup is in progress...
Configuration ascii backup complete
```

Related Commands

Command	Description
show configuration history	Displays **clear configuration ascii inconsistency** events executed successfully.

copy

To copy a file from a source (such as a network server) to a destination (such as a flash disk), use **copy** command in EXEC or Admin EXEC mode.

copy *source* {**location** *node-id* *destination* **location** {*node-id* | **all**} | **running-config**[**atomic**]}

Syntax Description

source	Filename including the directory path or network location of the file. The possible sources are: *directory-path* —Directory path of the file from which the file is copied. **access-list** { **ipv4**	**ipv6** }—Copies an access list (EXEC mode only). **apphost:** —Copy from apphost: file system **config:** —Copy from config: file system **disk0:** —Copies from disk0: file system. **disk1:** —Copies from disk1: file system. **ftp:** —Copies from an FTP network server. The syntax is **ftp:**[[[//*username* [:*password*]@] *location*]/*directory*]/*filename.* **harddisk:** —Copies from the hard disk drive file system (if present). **http:** —Copy from http: file system **https:** —Copy from https: file system **nvram:** —Copies from the NVRAM file system. **prefix-list** {**ipv4**	**ipv6**}—Copies from a prefix list (EXEC mode only). **roofs:** — Copy from rootfs: file system **running-config** —Copies from the current system configuration. **tftp:** —Copies from a TFTP network server. The syntax is **tftp:**[[//*location*]/*directory*]/*filename* **xml-schema** —Copies the XML schema files as a tar ball file (.tar.gz) [EXEC mode only]. **sftp:** —Copies from an SFTP network server. The syntax is **sftp:**[[[//*username* [:*password*]@] *location*]/*directory*]/*filename.* **scp:** —Copies from an SCP network server. The syntax is **scp:**[[[//*username* [:*password*]@] *location*]/*directory*]/*filename.*
destination	Filename including the directory path or network location of the file.
location *node-id*	Specifies a node. The *node-id* argument is expressed in the *rack*/*slot* notation.
location all	Copies to all nodes.
running-config	Applies the source configuration file to the running configuration of the system.

atomic	(Optional) Applies the changes to the running configuration only if there are no errors

Command Default

No default behavior or values

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 7.10.1	This command was modified to support public key authentication.
Release 7.9.1	This command was modified to support SFTP and SCP options.
Release 7.0.12	This command was introduced.

Usage Guidelines

Source and destination can each be a configuration file, a text file, or a file system. Enter source and destination URL information, usernames, and passwords and issue the **copy** command. The networking device prompts for any missing information.

The exact format of the *source* and *destination* arguments vary according to the file or directory location. Enter the device or network location for the file system type.

Filenames can include the following characters:

! # $ % & ' + 0 1 2 3 4 5 6 7 8 9 ; @ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [ ] ^ _ a b c d e f g h i j k l m n o p q r s t u v w x y z { } ~

The following characters can be used with the stated limitations:

- ` needs backslash before this character
- – cannot be the first character
- . cannot be the last character
- = cannot be the filename without other characters

The following characters cannot be used in filenames:

" ( ) * , / : < > ? \ |

To copy a file from a source on the router to a destination on the router, specify a source **location** *node-id* and a destination **location** *node-id* . To copy the file to all nodes, use the **location all** keywords.

In the alias syntax for the **ftp:** , **rcp:** , **tftp:** , **sftp:** , and **scp:** keywords, the location is either an IP address or a hostname. The filename is specified relative to the directory used for file transfers.

When no alias is specified, the networking device looks for a file in the current directory. To view the current directory, enter the **pwd** command.

Note During processing of the **copy** command, you might see the “C” character. For all files being copied, “C” indicates that the copy process is taking place. The entire copying process might take several minutes and differs from protocol to protocol and from network to network.

Table 24: Network Protocols Supported by Cisco IOS XR Software

Prefix	Name	Description
tftp:	Trivial File Transfer Protocol	*TFTP* is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).
ftp:	File Transfer Protocol	*FTP* is an application protocol, part of the TCP/IP protocol stack, and is used for transferring files between network nodes. FTP requires a username and password.
rcp:	Remote Copy Protocol	The rcp protocol allows users to copy files to and from a file system residing on a remote host or server on the network. The rcp protocol uses TCP to ensure the reliable delivery of data. The rcp protocol downloads require a username.
sftp:	Secure File Transfer Protocol	*SFTP* is an application protocol is used for secure transferring files between the router and and an archieve server. SFTP requires a username and password.
scp:	Secure Copy Protocol	*SCP* is an application protocol is used for secure transferring files between the router and and an archieve server. SFTP requires a username and password.

Additional usage guidelines are in the following sections.

Invalid Combinations of Source and Destination

Some combinations of source and destination are invalid. Specifically, you cannot copy the following:

- From a running configuration to a running configuration
- From a network device to a network device (for example, **copy ftp: rcp:**)

Using TFTP

TFTP is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).

The syntax is as follows:

copy tftp://*hostname* /*ipaddress*/*directory-path pie name target-device* [**location** {*node-id* | **all**}]

Example:

```
RP/0/RP0/CPU0:router# copy tftp://1.1.1.1/images/software.pie disk1:
```

Note Some Cisco IOS XR images may be larger than 32 MB, and the TFTP services provided by some vendors may not support a file this large. If you do not have access to a TFTP server that supports files larger than 32 MB, download the software image using FTP or rcp as described in the following sections.

Using FTP

FTP servers require a username and password for each client request. Cisco IOS XR software sends the first valid username in the following list:

1. The username and password specified in the **copy** command, if a username is specified.

   The syntax is as follows:

   copy ftp:// *username* **:** *password* **@** *hostname or ipaddress*/*directory-path*/*pie-name target-device* [**location** {*node-id* | **all**}]

   Example:

   ```
   RP/0/RP0/CPU0:router# copy ftp://john:secret@10.1.1.1/images/software.pie disk1:
   ```

2. An "anonymous" username and password. The anonymous password is "root@ip address," where "ip address" is the IP address of the local networking device.
3. A password "username@iosname.domain" formed by the networking device. The variable "username" is the username associated with the current session, "iosname" is the configured hostname, and "domain" is the domain of the networking device.

The username and password must be associated with an account on the FTP server. If you are writing to the network server, the FTP server must be properly configured to accept the FTP write request from the user on the networking device.

If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

Refer to the documentation for your FTP server for more details.

Using rcp

The rcp protocol requires a username upon each request. When you copy a configuration file or image between the networking device and an rcp server, the Cisco IOS XR software sends the first valid username in the following list:

1. The remote username specified in the **copy** command, if one is specified.
2. The username set by the **rcp client username** command, if the command is configured.
3. The networking device hostname.

For the rcp copy request to process successfully, an account must be defined on the network server for the remote username. If the network administrator of the destination server did not establish an account for the remote username, this command does not run successfully. If the network server has a directory structure, the configuration file or image is written to or copied from the directory associated with the remote username on the network server. For example, if the system image resides in the home directory of a user on the network server, specify the name of that user as the remote username.

If you are writing to the network server, the rcp server must be properly configured to accept the rcp write request from the user on the networking device. For UNIX systems, add an entry to the .rhosts file for the remote user on the rcp server. Suppose the networking device contains the following configuration lines:

```
hostname Rtr1
```

```
ip rcp remote-username User0
```

If the IP address of the networking device translates to company.com, then the .rhosts file for User0 on the rcp server should contain the following line:

```
company.com Rtr1
```

See the documentation for your rcp server for more details.

If you are using a personal computer as a file server, the computer must support remote shell (rsh) protocol.

Using xml-schema

Use the **xml-schema** keyword to obtain the most up-to-date XML schemas (.xsd files) from the router. Using this keyword is useful to prevent the use of outdated schemas in the event that router software updates include schema updates. The tar ball file includes all active schema files. It does not include schemas that are activated by specific package installation envelopes (PIEs) if those PIEs are not installed and activated on the router.

Copying to the Running Configuration

When you use the **copy** command to copy a configuration file to the **running-config** destination, the configuration in the file is applied to the running configuration of the system. This is a configuration operation. By default, the copy is carried out in a best-effort manner. This means that if some configuration lines from the file cannot be applied, the remaining configuration is still integrated into the system. In this case, a partial configuration is committed. When the **atomic** keyword is used, partial configurations are not committed. This means that even if one error occurs in the parsing or committing phase, no changes are made to the system. To view any errors when applying the configuration, use the **show configuration failed** command.

Task ID

Task ID	Operations
filesystem	execute

The following example shows how to copy a file from a FTP server to disk1:

```
RP/0/RP0/CPU0:router#
```

The following example shows how to copy a file from an rcp server to disk1:

```
RP/0/RP0/CPU0:router#
```

The following example shows how to copy a file from a TFTP server to disk1:

```
RP/0/RP0/CPU0:router#
```

The following example shows how to copy a file from a SCP and SFTP server using public key authentication:

```
Router#copy running-config scp://root@192.0.4.2//var/opt/run_conf_scp.txt
Router#copy running-config sftp://root@192.0.4.2//var/opt/run_conf_sftp.txt
```

delete

To delete files, use **delete** command in the appropriate mode.

Syntax Description

filename	Filename of the file to be deleted.
config	config: file system
apphost	apphost: file system
disk0	Deletes disk0.
disk1	Deletes disk1.
harddisk	Deletes the harddisk

Command Default

A filename must be specified. If a filename is entered without a file system or directory path, the present working directory is used.

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When a file is deleted, it is removed from the system and cannot be restored (undeleted).

Use the **dir** command to display the list of files on a storage device.

The following example shows how to delete a file:

```
RP/0/RP0/CPU0:router# delete rbtest

Delete disk1:/rbtest[confirm]y
```

dir

To display a list of files on a file system or in a specific directory, use the **dir** command in the appropriate mode.

dir [/**all** | /**ena** | /**recurse**] [*filesystem***:**] [*filename*] **location** {*node-id* | **all**}

Syntax Description

/all	(Optional) Lists deleted files, undeleted files, and files with errors.
/ena	(Optional) Recognizes subdirectories.
config	config: file system
disk0	disk0: file system
harddisk	harddisk: file system
/recurse	(Optional) Recursively lists subdirectories.
filesystem **:**	(Optional) Name of the directory containing the files to be displayed. Include the file system alias for the *filesystem* argument, followed by a colon, and, optionally, the name of a directory.
filename	(Optional) Name of the files to display. The files can be of any type. You can use wildcards in the filename. A wildcard character (*) matches all patterns. Strings following a wildcard are ignored.
location {*node-id* | **all**}	(Optional) Specifies the node from which to display a list of files. The *node-id* argument is entered in the *rack*/*slot* notation. The **all** keyword specifies to display files on all nodes.

Command Default

When **dir** command is entered without keywords or arguments, the contents of the present working directory are displayed.

Command Modes

EXEC mode.

Admin EXEC mode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

If you enter the **dir** command without specifying a directory, the contents of the present working directory are displayed. The **all** keyword displays all files, including deleted files. The size associated with the directory name is the total size for all files in that directory.

The following example shows how to display the contents of a directory:

```
RP/0/RP0/CPU0:router# dir harddisk:/log

Directory of harddisk:/log
```

```
5527        drwx  4096        Thu Aug 28 11:21:48 2008  boot_28_Aug_2008_11_21_49
5533        drwx  4096        Thu Aug 28 11:38:54 2008  boot_28_Aug_2008_11_38_54
5538        drwx  4096        Fri Sep  5 13:28:54 2008  boot_05_Sep_2008_13_28_54
5543        drwx  4096        Mon Sep  8 08:55:52 2008  boot_08_Sep_2008_06_59_08
--More--
```

mkdir

To create a new directory on a file system, use the **mkdir** command in the appropriate mode.

mkdir *filesystem:*[**location** {*node-id* | **all**}]

Syntax Description

filesystem:	File system on which to create a new directory.
location{*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.
apphost	apphost: file system
config	config: file system
disk0	disk0: file system
harddisk	harddisk: file system

Command Default

No default behavior or values

Command Modes

System Admin EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

After you issue the **mkdir** command, Cisco IOS XR software prompts you to specify the name of the directory to be created. When specifying the name of the new directory, include the directory path where you want the new directory to reside. If you do not specify a directory path, the new directory is created in the /usr directory of the file system specified for the *filesystem:* argument.

The following example shows how to create a directory named newdir. The **dir** command is used to verify that the directory has been added.

```
RP/0/RP0/CPU0:router# mkdir harddisk:

Create directory filename []?newdir
Created dir harddisk:/newdir
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  11193       drwx  4096        Fri Feb 13 06:45:05 2009  newdir
  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
  -430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
```

```
-430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

39929724928 bytes total (39883231232 bytes free)
```

pwd

To display the present working directory, use the **pwd** command in EXEC mode

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **pwd** command to show what directory or file system is specified as the default by the **cd** command.

The following example shows how to display the present working directory:

```
RP/0/RP0/CPU0:router# pwd
disk0:/usr
```

rmdir

To remove an existing directory, use the **rmdir** command in the appropriate mode.

rmdir *filesystem*: **location** {*node-id* | **all**}

Syntax Description

filesystem	Name of the file system from which to delete a directory, followed by a colon.
location {*node-id* | **all**}	Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.
apphost	apphost: file system
config	config: file system
disk0	disk0: file system
harddisk	harddisk: file system

Command Default

No default behavior or values

Command Modes

XR EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **rmdir** command to remove directories (for example, to free up disk space) from a file system. After you issue the **rmdir** command, the Cisco IOS XR software prompts you to specify the name of the directory to be deleted.

When a directory contains files, you must remove the files before deleting the directory. Use the **delete** command to remove files.

The following example shows how to delete a subdirectory from the hard disk. The **dir** command is used to verify that the directory has been deleted.

```
RP/0/RP0/CPU0:router# rmdir harddisk:

Remove directory filename []?newdir
Delete harddisk:/newdir[confirm]y
RP/0/RP0/CPU0:router# dir harddisk:

  Directory of harddisk:

  37146       drwx  4096        Sun Dec 14 15:30:48 2008  malloc_dump
  43030       drwx  4096        Wed Dec 24 11:20:52 2008  tracebacks
  43035       drwx  4096        Thu Jan  8 18:59:18 2009  sau
  51026       drwx  4096        Sat Dec 27 02:52:46 2008  tempA
  51027       drwx  4096        Sat Dec 27 02:04:10 2008  dir.not.del
```

```
-430307552  -rwx  342         Fri Jan 16 10:47:38 2009  running-config
-430305504  -rwx  39790       Mon Jan 26 23:45:56 2009  cf.dat

39929724928 bytes total (39883235328 bytes free)
```

show filesystem

To display the layout and contents of file systems, use the **show filesystem** command in EXEC mode.

show filesystem [**location** { *node-id* | **all** }]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node where the file system is located. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

The file system for the active RP is displayed.

Command Modes

EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show filesystem** command to learn the alias names (prefixes) of the file systems supported by your networking device.

The following example shows sample output from the **show filesystem** command:

```
RP/0/RP0/CPU0:router# show filesystem

File Systems:

       Size(b)     Free(b)        Type  Flags  Prefixes
             -           -     network     rw  qsm/dev/fs/tftp: tftp:
             -           -     network     rw  qsm/dev/fs/rcp: rcp:
             -           -     network     rw  qsm/dev/fs/ftp: ftp:
   39929724928 39852978176    harddisk     rw  harddisk:
    1024606208   863584256  flash-disk     rw  disk0:
       2092032     2059264       nvram     rw  nvram:
      62390272    62381260       flash     rw  bootflash:
```

The following example shows sample output from the **show filesystem** command using the optional **location** *node-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show filesystem location 0/rp0/cpu0

File Systems:

       Size(b)     Free(b)        Type  Flags  Prefixes
             -           -     network     rw  qsm/dev/fs/tftp: tftp:
             -           -     network     rw  qsm/dev/fs/rcp: rcp:
             -           -     network     rw  qsm/dev/fs/ftp: ftp:
   39929724928 39883235328    harddisk     rw  harddisk:
       2092032     2019328       nvram     rw  nvram:
    1024606208   847888384  flash-disk     rw  disk0:
      62390272    62153616       flash     rw  bootflash:
```

Table 25: show filesystem Field Descriptions

Field	Description
Size(b)	Amount of memory in the file system, in bytes.
Free(b)	Amount of free memory in the file system, in bytes.
Type	Type of file system.
Flags	Permissions for file system.
Prefixes	Alias for the file system.

show media

To display the current state of the disk storage media, use the **show media** command in mode.

Command Default

The disk storage media for the active RP is displayed.

Command Modes

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show media** command to view the status of the storage media on your system.

The following example displays the output of the **show media** command:.

```
sysadmin-vm:0_RP0 #show media
Thu Nov 30 14:57:14.002 WET
Media Information for local node.
-----------------------------------------------
Partition                    Size     Used  Percent    Avail
rootfs:                      2.7G     1.5G      59%     1.1G
apphost:                     1.9G      61M       4%     1.7G
/dev/sde                     870M     401M      50%     409M
harddisk:                    2.4G     966M      43%     1.3G
log:                         459M      67M      16%     359M
config:                      159M     2.5M       2%     144M
disk0:                       1.3G     108M       9%     1.1G
-------------------------------------------------------
rootfs: = root file system (read-only)
log: = system log files (read-only)
config: = configuration storage (read-only)
```

Table 26: show media Field Descriptions

Field	Description
Partition	Partition on the disk.
Size	Size of the partition.
Used	Partition size used.
Percent	Percentage used.
Avail	Available free partition space.

Utility Commands

This module describes the utility commands for Cisco IOS XR software. Utility commands provide CLI equivalents to common UNIX commands.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

utility cut

To extract selected characters or fields from standard input or from a file, use the **utility cut** command in XR EXEC mode.

utility cut { {**list** *character-list* | **fields** *field-list* [**nodelim**] [**delimiter** *delimiter-character*]*WORD*} [**file** *input-file*] | **usage**}

Syntax Description

list *character-list*	(**-c**) Cuts out the characters that are located on each line as specified with the *character-list* argument. The *character-list* argument specifies the character positions or range of the characters to be cut. • Use a comma (,) to indicate more than one character. For example, **utility list 1,2,5** outputs the first, second, and fifth characters. • Use a dash (-) to indicate a range. For example, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line. **Note** Lines are separated by a delimiter. The default delimiter is tab.
fields *field-list*	(**-f**) Cuts out the fields (lines) as indicated with the *field-list* argument. The *field-list* argument specifies the field numbers or ranges. For example, **utility field 2,9** outputs the second and ninth fields, **utility field 1-3** outputs the first three fields, **utility field -6** outputs the first six fields. **Note** The fields indicated by the *field-list* argument are assumed to be separated in the file by a delimiter character. The default delimiter is tab. Use the **delimiter** *delimiter* option to specify a delimiter character. Lines without field delimiters are processed unless the **nodelim** keyword is specified.
nodelim	(Optional) (**-s**) Ignores lines with no delimiter. Use this optional keyword when the **fields** *field-list* keyword and argument is specified.
delimiter *delimiter-character*	(Optional) (**-d**) Specifies an alternative delimiter to indicate the end of each field. Replace the *delimiter-character* argument with the character used as the delimiter.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file *input-file*	(Optional) Storage device and directory path of the text file used instead of the standard input (keyboard input). The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.

usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, **keyboard** input (standard input) is used.

The default for delimiter is **tab**.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **utility cut** command cuts out columns, fields, or characters displayed from standard input or from a file.

Use the **fields** *field-list* keyword and argument if the fields vary in length from line to line. (The lines must be separated by a delimiter character.) By default, the field delimiter character is the Tab key. Use the **delimiter** *delimiter-character* keyword and argument to specify a different delimiter.

Use the **list** *character-list* keyword and argument only if the fields are of a fixed length. Replace the *character-list* argument with the character positions to be extracted.

For the *character-list* argument, use a comma (,) to indicate more than one character, or use a dash (-) to indicate a range. For example, **utility list 1,2,5** outputs the first, second, and fifth characters, **utility list 1-64** outputs the first 64 characters of each line, **utility list 5-** outputs the fifth character to the end of the line.

You can also use the cut utility as a filter. If no files are specified, the keyboard input (standard input) is used.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **fields** keyword can also be entered using the UNIX-equivalent (**-f**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility cut** command is entered with the **list** *character-list* keyword and argument to display the first 10 characters in each line. The output is from the results of the **show version** command, which is entered with the pipe (|) character:

```
RP/0/RP0/CPU0:router# show version | utility cut list 1-10

  Cisco IOS
  Copyright

  ROM: Syste

  router upt
  System ima

  cisco CRS-
  7457 proce

  16 Gigabit
  2 Ethernet
  20 Packet
```

```
  20 SONET/S
  2043k byte
  38079M byt
  1000592k b
  1000640k b

  Configurat
  Package ac
   --More--
```

In the following example, the **utility cut** command is used to extract fields from a file:

```
RP/0/RP0/CPU0:router# utility cut fields 1,5 delimiter : file disk0:/usr/passwd

  root:Super-User
  daemon:
  bin:
  sys:
  adm:Admin
  lp:Line Printer Admin
  uucp:uucp Admin
  nuucp:uucp Admin
  listen:Network Admin
  nobody:Nobody
```

In the following example, the **utility cut** command is used with the **delimiter** keyword to specify an alternative field delimiter:

```
RP/0/RP0/CPU0:router# utility cut fields 1,4,5 delimiter : file disk0:/usr/passwd

  root:1:Super-User
  daemon:1:
  bin:2:
  sys:3:
  adm:4:Admin
  lp:8:Line Printer Admin
  uucp:5:uucp Admin
  nuucp:9:uucp Admin
  listen:4:Network Admin
```

In the following example, a range of fields is specified:

```
RP/0/RP0/CPU0:router# utility cut fields 1-4 delimiter : file disk0:/usr/passwd

  root:x:0:1
  daemon:x:1:1
  bin:x:2:2
  sys:x:3:3
  adm:x:4:4
  lp:x:71:8
  uucp:x:5:5
  nuucp:x:9:9
  listen:x:37:4
```

In the following example, the **list** *character-list* keyword and argument are used to specify the character positions to be extracted:

```
RP/0/RP0/CPU0:router# utility cut list 1-30 file disk0:/usr/passwd
```

```
  root:x:0:1:Super-User:/:/sbin/
  daemon:x:1:1::/:
  bin:x:2:2::/usr/bin:
  sys:x:3:3::/:
  adm:x:4:4:Admin:/var/adm:
  lp:x:71:8:Line Printer Admin:/
  uucp:x:5:5:uucp Admin:/usr/lib
  nuucp:x:9:9:uucp Admin:/var/sp
  listen:x:37:4:Network Admin:/u
  nobody:x:60001:60001:Nobody:/:
  noaccess:x:60002:60002:No Acce
  nobody4:x:65534:65534:SunOS 4.

  ================================================================================
```

In the following example, the UNIX equivalent options are used directly. First, the **utility cut** command is entered with the **usage** keyword to display the possible options. Next, the **utility cut** command is entered with the options to extract the desired data.

```
RP/0/RP0/CPU0:router# utility cut usage

  cut -c list [file], cut -f list [-d delim] [-s] [file]

RP/0/RP0/CPU0:router# utility cut -f 1,4 -d : disk0:/usr/passwd

  root:1
  daemon:1
  bin:2
  sys:3
  adm:4
  lp:8
```

utility date

To display the date and time, use the **utility date** command in XR EXEC mode.

utility date {**format** *word* | **universal** | **usage***WORD*}

Syntax Description

format *word*	(Optional) (+) Specifies the format for the date display. Use the online help system to display the available format syntax for the *word* argument.
universal	(Optional) (**-u**) Displays the date in Coordinated Universal Time (UTC) instead of local time. UTC is the standard term for Greenwich Mean Time (GMT).
usage	(Optional) Displays the UNIX options supported by this command.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.

Command Default

The date is displayed in local time.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **utility date** command displays the internal time and date for the router.

Date Format

Use the **format** *word* option to specify the format and content of the displayed date and time. The format is composed of ASCII characters and field descriptors prefaced with %, in a manner similar to a C-language printf() format specifier. In the output, each field descriptor is replaced by its corresponding value; all other characters are copied to the output without change. The format is specified using the following characters:

%C

Century in 'CC' form. For example: 20

%y

Year in 'YY' form. For example: 06

%m

Month in 'MM' form. For example: 08

%d

Date in 'DD' form. For example: 28

%H

Hour in 'hh (24 hr.)' form. For example: 18

%M

Minutes in 'mm' form. For example: 55

%S

seconds in 'ss' form. For example: 24

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **universal** keyword can also be entered using the UNIX-equivalent (**-u**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

This example shows how to display the router date and time using the **utility date** command:

```
RP/0/RP0/CPU0:router# utility date

  Fri Aug 04 11:53:38 UTC 2006
```

This example shows how to display the router date and time using a variety of options with the **format** keyword:

```
RP/0/RP0/CPU0:router# utility date format "%y%m%d"

  060828

RP/0/RP0/CPU0:router# utility date format "%y-%m-%d"

  06-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d"

  2006-08-28

RP/0/RP0/CPU0:router# utility date format "%C%y-%m-%d:%H:%M:%S"

  2006-08-28:02:09:58

RP/0/RP0/CPU0:router# utility date format "DATE: %y-%m-%d %nTIME: %H:%M:%S"

  DATE: 06-09-17
  TIME: 12:42:24
```

utility date set

To set the router time, use the **utility date set** command in System Admin EXEC mode.

utility date set *hh*:*mm*:*ss*

Syntax Description

hh	Specifies the hour in 2-digit numerical format. Range is 00 to23.
mm	Specifies the minutes in 2-digit numerical format. Range is 0 to 59.
SS	Specifies the seconds in 2-digit numerical format. Range is 0 to 59.

Command Default

None

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

A colon (:) is required between the entry for hour, minutes, and seconds.

Note Generally, if the system is synchronized by a valid outside timing mechanism, such as a Network Time Protocol (NTP) clock source, or if you have a networking device with calendar capability, you need not set the software clock. Use the **date** command or the **clock set** command if no other time sources are available.

Note To manually copy the hardware clock (calendar) settings into the software clock, use the **clock read-calendar** command in EXEC mode.

By default, the system makes a "slow adjustment" if the new time is in the range of the following:

- –2.5 minutes + old time
- 5 minutes + old time

In a slow adjustment, the clock speed increases by less than 100 percent or decreases by less than 50 percent over a period of time from 1 second to 5 minutes until the clock catches up with the new time. This slow adjustment does not cause major discontinuities in the time flow. Use the **-S0** option to disable the slow adjustment.

The following example shows how to set the time using the **utility date set** command:

```
RP/0/RP0/CPU0:router(admin)# utility date set 13:07:00

  Fri Sep 15 13:07:00 UTC 2006
```

utility fgrep

To search a file for a fixed character string, use the **utility fgrep** command in XR EXEC mode.

utility fgrep {**expr** *expression* | **script** *expression-file*} [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility fgrep *expression* [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility fgrep usage

Syntax Description

expr *expression*	(**-e**) A regular expression, whose type is determined by the -e and -f options. This form is used when only one expression is specified on the command line. Any names specified after this option are treated as input files.
script *expression-file*	(**-f**) A file containing a set of regular expressions, each separated by a new line. The type of the expressions is determined by the -e and -f options. This form is used when more than one expression is specified. You can specify more than one -f option. The syntax of the *expression-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 20.
count	(Optional) (**-c**) Displays a count of selected lines.
linenum	(Optional) (**-n**) Before each output line, displays the line's line number.
matchfile	(Optional) (**-l**) (“el”) Displays only the names of files containing the selected lines.
matchline	(Optional) (**-x**) Includes only input lines selected against an entire fixed string or regular expression.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
nofile	(Optional) (**-h**) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.
reverse	(Optional) (**-v**) Selects only those lines that don't match the specified patterns.
file *search-file*	(Optional) The file used for the search. Replace the *search-file* argument with the device and directory path of the file. The syntax for the *search-file* argument is: *device* **:**[*/ directory-path*]*/ filename*
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

The keyboard input (standard input) is used if no files are specified.

If more than one input file is specified, then the filename is displayed before each line.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **utility fgrep** command searches files for a fixed character string (as opposed to grep and egrep, which search for a a pattern that matches an expression).

The results are displayed to the standard output (terminal screen).

Note The fgrep utility options are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **count** keyword can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

The following example, the **utility fgrep** command is used with the **nocase** and **linenum** keywords:

```
RP/0/RP0/CPU0:router# show version | utility fgrep expr uptime nocase linenum

  7:router uptime is 5 days, 20 hours, 10 minutes
```

utility find

To locate files within one or more directories, use the **utility find** command in XR EXEC mode.

utility find {**path** *directory-path* {*LINE* | **name** *filename-pattern* | **user** *user-id*} | **usage**}

Syntax Description

path *directory-path*	Specifies the storage device and directory for the file search. The search is performed for the specified directory and all subdirectories in that directory tree. If a directory path is not specified, then the search is performed in the current directory (a path of . [dot] is assumed).
LINE	(Optional) UNIX command-line expressions provided as a string.
name *filename-pattern*	(Optional) Searches for the name of the file. The *filename-pattern* argument is a regular expression string.
user *user-id*	(Optional) Searches for files belonging to a specific user. The *user-id* argument is the username of the file owner.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If a directory path is not specified, then the search is performed in the current directory.

If a **name** *filename-pattern* is not specified, then the search return all files in the specified directory.

If a user is not specified, then the search is performed for all users.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **utility find** command to locate files within one or more directories. You can perform the search for a specific directory (and its subdirectories). If a directory is not specified, then the search is performed for the current directory.

To search for a regular expression string, use the **name** *filename-pattern* keyword and argument. Replace the *filename-pattern* argument with the regular expression string. If this option is not used, then all files within the specified directory are displayed.

To search for files belonging to a specific user, use the *user-id* argument. If this option is not used, then files belonging to all users are displayed.

In the following example, the **utility find** command is used to locate the file named "-fwdg-3.8.0". The path is the root directory of disk0:.

In the following example, the **utility find** command is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr name *.txt

disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to locate files matching a pattern. In this example, all files ending in ".txt" are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0: -name *.txt

disk0:/-base-3.8.0/etc/vim/doc/editing.txt
disk0:/-base-3.8.0/etc/vim/doc/help.txt
disk0:/-base-3.8.0/etc/vim/doc/intro.txt
disk0:/-base-3.8.0/etc/vim/doc/uganda.txt
disk0:/usr/test2.txt
```

In the following example, the files belonging to a specific user are displayed:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr user 0

disk0:/usr
disk0:/usr/passwd
disk0:/usr/test2.txt
```

In the following example, the UNIX equivalent option is used to display files belonging to a specific user:

```
RP/0/RP0/CPU0:router# utility find path disk0:/usr -user 0

disk0:/usr
disk0:/usr/passwd
disk0:/usr/test2.txt
```

utility less

To display a file page-by-page, use the **utility less** command in XR EXEC mode.

utility less {[**exitEOF**] [*WORD*] | **nocase** | **position** *line-number* | **startat** *string*} [**file** *source-file*]

Syntax Description

exitEOF	(Optional) (**-E**) Automatically exits the utility the first time an end-of-file is encountered.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
position *line-number*	(Optional) (**-j**) Uses the line at *line-number* on the screen to position matched lines during a patter search.
startat *string*	(Optional) (**-p**) Starts at the first occurrence of the pattern specified by the *string* argument in the file.
file *source-file*	(Optional) Specifies the storage device and directory path for the text file to be displayed. The default is standard input. The syntax for the *source-file* argument is: *device* **:**[/ *directory-path*]/ *filename*

Command Default

If no text file is specified, standard input is assumed.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **utility less**command to display files page by page. You can specify regular expressions for pattern matching using the **startat** keyword. You can scroll up as well as down. When you enter the less mode, commands are similar to the “vi” editor.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

The following example, the **utility less** command is used to display the file “config_store”. Only part of the file is shown here.

```
RP/0/RP0/CPU0:router# utility less file disk0:/usr/config_store

  Last configuration change at Tue Feb 20 18:34:02 2007 by xxx
```

```
!
hostname H1
line console
 exec-timeout 600 0
 session-timeout 600
!
line default
 exec-timeout 600 0
 session-timeout 600
!
.
.
.
```

utility mv

To rename or move a file from one directory to another, use the **utility mv** command in XR EXEC mode.

utility mv {[*WORD* | **force** | **interactive**] **source** *source-file* **target** *target-file* | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
force	(Optional) (**-f**) Forces an overwrite if the target file already exists. There is no confirmation prompt.
interactive	(Optional) (**-i**) Specifies to prompt for confirmation before renaming a file.
source *source-file*	Specifies the storage device, directory, and filename for the file to be moved.
target *target-file*	Specifies the new storage device, directory, and filename for the file.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility mv** command is used to move the file "aaa" from disk0a: to disk1a:

```
RP/0/RP0/CPU0:router# utility mv source disk0a:/aaa target disk1a:/aaa
```

utility sort

To sort, merge, or sequence-check the lines in one or more files, or from the standard input, use the **utility sort** command in XR EXEC mode.

utility sort {[[*WORD*] | [[**dict**] [**fieldSep** *character*] [**ignoreblank**] [**key** *key-definition*] [**lowercase**] [**merge**] [**numeric**] [**outfile** *filename*] [**printable**] [**reverse**] [**unique**]]] [**file** *filename*] | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
dict	(Optional) (**-d**) Sorts in dictionary order. Uses only alphanumeric and blank characters in the sort operation.
fieldSep *character*	(Optional) (**-t**) Specifies a character as the field separator.
ignoreblank	(Optional) (**-b**) Ignores leading blank characters in field comparisons.
key *key-definition*	(Optional) (**-k**) Defines a key to be the sort key. The *key-definition* argument field is defined using the following syntax: *field_start* [*type_string*] [,*field_end*] [*type_string*] • *field_start* and *field_end*—Specifies the beginning and end of the key field. • *type_string*—Specifies attributes specific to the key. The *field_start* and *field_end* arguments are each specified by a pair of digits of the form m.n, where the m refers to the field starting after the mth field separator in a line. For field_start, the .n refers to the nth character of the specified field, and is taken as zero if not specified. For field_end, the .n refers to the nth character after the last character of the specified field, and is taken as zero if not specified. The *type_string* argument may be formed from the characters bdfinr, which apply their defined attributes to the determination of the key. **Note** When ordering options appear independent of key field specifications, the requested field ordering rules are applied globally to all sort keys. When attached to a specific key, the specified ordering options override all global ordering options for that key.
lowercase	(Optional) (**-f**) Folds uppercase letters into lowercase (ignores case and treats upper case characters the same as lowercase characters).
merge	(Optional) (**-m**) Merges sorted files. Assumes that the files are already sorted and so does not sort the files.
numeric	(Optional) (**-n**) Interprets the field as numeric and sorts in numeric order. Includes the sign and optional thousands separator. This keyword also ignores leading blank characters in field comparisons (implies the **ignoreblank** keyword).

outfile *filename*	(Optional) (**-o**) Writes the results to a file. The *filename* argument is the destination disk, directory, and filename. The *filename* argument can be the same as the source file.
printable	(Optional) (**-i**) Ignores all nonprintable characters.
reverse	(Optional) (**-r**) Reverses the sort order. The sort is ascending by default.
unique	(Optional) (**-u**) Suppresses all but one line in each set of lines having equal keys.
file *filename*	(Optional) Specifies a file to be sorted.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no file is specified, then the standard input (keyboard) is used.

If an **outfile** *filename* keyword and argument is not specified, then the standard output (display) is used.

The file is sorted in ascending order.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility sort** command is used to sort the contents of the file "words.txt":

```
RP/0/RP0/CPU0:router# utility sort file disk0:/usr/words.txt

   The
   few
   inquires
  A
  Code.
  Date
  Done
  This
  best-selling
  bestseller
  book
  come
  concerning
  fiction,
  have
  its
  list
```

```
muscled
of
onto
our
the
way
way
work
```

utility tail

To copy the end portion of a file or the standard input, use the **utility tail** command in XR EXEC mode.

utility tail {[[*WORD*] | [**bytes**] [**continuous**] [**count** *number*]] [**file** *input-file*] | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Copies the end of the file measured in bytes. The default is lines.
continuous	(Optional) (**-f**) Continues to copy data from the end of the file after the last line is reached. The operation pauses for 1 second, and then resumes in a continuous loop. The input file must be a regular file, not a terminal or a FIFO special file (a named pipe).
count *number*	(Optional) (**-n**) Copies the number of lines (default) or bytes specified with the *number* argument. The range is 0 to 4294967295. By default, the last 10 lines are copied. The *number* argument is a decimal integer that defines the location in the file to begin copying: • Include the plus (+) character to copy from the beginning of the file. • Include the minus (-) character to copy from the end of the file. • Do not include a character to copy from the end of the file. **Note** Select the **bytes** keyword to copy the information measured in a count of bytes.
file *input-file*	(Optional) Directory path and filename for the input file. If no file is specified, then the standard input is used. The syntax for the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility tail** command is entered without keywords or arguments, the last 10 lines of the standard input are copied.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **utility tail** command to copy data from the end of a file. By default, the last 10 lines are copied. Use the **bytes** keyword to copy the data measured in bytes. Use the **count** *number* option to define the number of lines or bytes to copy. Use the **file** *filename* option to specify an input file.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility tail** command is used with the bytes keyword to display the last 10 bytes in the output:

```
RP/0/RP0/CPU0:router# show version | utility tail count 10 bytes

  .95.3-p8

RP/0/RP0/CPU0:router#
```

utility uniq

To display or remove repeated lines in a file, use the **utility uniq** command in XR EXEC mode.

utility uniq [[[*WORD*] | [**afterChars** *number*] [**afterField** *number*] [**count**] [**nonrepeating** | **repeating**]] [**infile** *input-file* **outfile** *output-file*] | **usage**]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
afterChars *number*	(Optional) (**-s**) Ignores the first characters on each line of the input file. Use the *number* argument to specify the number of characters. The range is 0 to 4294967295.
afterField *number*	(Optional) (**-f**) Ignores the first fields on each line of the input file. Use the *number* argument to specify the number of fields. The range is 0 to 4294967295.
count	(Optional) (**-c**) Displays the number of times the line appeared in the input file at the beginning of each output line.
nonrepeating	(Optional) (**-u**) Displays only the nonrepeating lines from the input file (repeating lines are not displayed).
repeating	(Optional) (**-d**) Displays only the repeating lines from the input file (nonrepeating lines are not displayed).
infile *input-file*	(Optional) Specifies an input file for processing. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
outfile *output-file*	(Optional) Specifies an output file. The *output-file* argument specifies the device, directory, and filename of the output file. If no file is specified, then the standard output (display) is used. The syntax of the *output-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no input file is specified, then the standard input is used.

If no output file is specified, then the standard output is used.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **utility uniq** command to display only lines that are repeated in a file, or to display only lines that appear once. This utility compares only adjacent lines, so the file or standard input must be sorted.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility uniq** command is used to display the repeating lines in the output of the **show environment** command:

```
RP/0/RP0/CPU0:router# show environment | utility uniq repeating

host    5V              4500,5500       4250,5750       4000,6000
fabricq 1.25V           1125,1375       1063,1438       1000,1500
fabricq 1.25V           1125,1375       1063,1438       1000,1500
ingress 1.25V           1125,1375       1063,1438       1000,1500
spa5    1.5V            1500,0          1575,1425       0,0
host    5V              4500,5500       4250,5750       4000,6000
fabricq 1.25V           1125,1375       1063,1438       1000,1500
fabricq 1.25V           1125,1375       1063,1438       1000,1500
ingress 1.25V           1125,1375       1063,1438       1000,1500
spa5    1.5V            1500,0          1575,1425       0,0
```

utility wc

To count words, lines, or bytes in a file, use the **utility wc** command in XR EXEC mode.

utility wc [[[*WORD*] | [**bytes**] [**lines**] [**words**]] [**file** *input-file*] | **usage**]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Displays the number of bytes in each input file.
lines	(Optional) (**-l**) (-œel-?) Displays the number of lines in each input file.
words	(Optional) (**-w**) Displays the number of words in each input file.
file *input-file*	(Optional) Specifies the input file. The *input-file* argument specifies the device, directory, and filename of the input file. If no input file is specified, then the standard input (keyboard) is used. The syntax of the *input-file* argument is: *device* **:**[*/ directory-path*]*/ filename*. The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Output is displayed in the order bytes, words, and lines, even if the options are entered in a different order.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Output is displayed in the following order:

- When keywords are entered, the output appears in the order bytes, words, and lines.
- When no keyword is entered, the output appears in the order lines, words, and bytes.
- When any UNIX equivalent options are entered, the output appears in the order specified by the options. For example, if the command **utility wc -w -l -c** is entered, the output appears in the order words, lines, and bytes.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility wc**command is issued to display the number of lines, words, and bytes in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc

        221     1160    10820
```

The output displays the following:

- 221 lines
- 1160 words
- 10820 bytes

In the following example, the **utility wc** command is entered with the **words** keyword to display the number of words in the output of the **show version** command:

```
RP/0/RP0/CPU0:router# show version | utility wc words

       1160
```

utility df

To display the amount of disk space available for a directory or file, use the **utility df** command in

XR EXEC

mode.

utility df [[*WORD*] [**kbytes**] [**mountinfo**] [**vsfStats**] [**file** *input-file*] | **usage**]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
kbytes	(Optional) (**-k**) Displays the sizes in 1-K blocks (1024-byte units) instead of the default of 512 byte blocks.
mountinfo	(Optional) (**-n**) Displays the file-system mountpoints and types only.
vsfStats	(Optional) (**-g**) Displays all statvfs() information.
file *input-file*	(Optional) Specifies the storage device and directory path of the device, directory, or file. When a directory or file is specified, the df utility displays the amount of space on the file system that contains the directory or file. If no files are specified, then only the standard input (keyboard) is used. The syntax of the *input-file* argument is as follows: *device* **:**[/ *directory-path*] / *filename* The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Information is displayed for all file systems.

The results are displayed in 512-byte blocks.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the (disk free) **utility df** command to display the amount of disk space available for a device, directory, or file. Enter the command without keywords or arguments to display information for all mounted file systems.

Use the **vsfStats** keyword to invoke the statvfs() function, which provides additional details for all mounted file systems.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the (disk free) **utility df** command is entered without keywords or arguments to display information for all file systems:

```
RP/0/RP0/CPU0:router(admin)# utility df

  /dev/hd0t6              77987744     61592  77926152       1%  /harddisk:/
  /nvram:                     4086        60      4026       2%
  /dev/disk1t6             2001280    382720   1618560      20%  /disk1:/
  /dev/disk0t6             2001184    533568   1467616      27%  /disk0:/
  /dev/fs0p1                121856        68    121787       1%  /bootflash:
```

See Table 2for column descriptions.

In the following example, the **kbytes** keyword is used to display information in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks:

```
RP/0/RP0/CPU0:router(admin)# utility df kbytes

  /dev/hd0t6              38993872     30796  38963076       1%  /harddisk:/
  /nvram:                     2043        30      2013       2%
  /dev/disk1t6             1000640    191360    809280      20%  /disk1:/
  /dev/disk0t6             1000592    266784    733808      27%  /disk0:/
  /dev/fs0p1                 60928        34     60893       1%  /bootflash:
```

See Table 2 for column descriptions.

In the following example, the **mountinfo** keyword is used to display file-system mountpoints and types only:

```
RP/0/RP0/CPU0:router(admin)# utility df mountinfo

  Filesystem           Mounted on        Type
  /dev/hd0t6           /harddisk:/       dos (fat32)
  /nvram:
  /dev/disk1t6         /disk1:/          dos (fat16)
  /dev/disk0t6         /disk0:/          dos (fat16)
  /dev/fs0p1           /bootflash:       flash
```

In the following example, the **vfsStats** keyword is used to invoke the statvfs() function, which provides additional details for all mounted file systems:

```
RP/0/RP0/CPU0:router(admin)# utility df vfsStats

  /dev/hd0t6   /harddisk:/
      Blocks:  9748468 total   9740769 avail   [4096-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat32)
      Flags : 00000120 [32bit, noatime]

  /nvram:
      Blocks:     2043 total      2013 avail   [1024-byte blocks]
      Files :        0 total         0 avail
      Type  :
      Flags : 00000000 []

  /dev/disk1t6   /disk1:/
      Blocks:    62540 total     50580 avail   [16384-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat16)
      Flags : 00000120 [32bit, noatime]

  /dev/disk0t6   /disk0:/
      Blocks:    62537 total     45863 avail   [16384-byte blocks]
      Files :        0 total         0 avail
      Type  : dos (fat16)
      Flags : 00000120 [32bit, noatime]

  /dev/fs0p1   /bootflash:
      Blocks: 62390272 total  62355240 avail   [1-byte blocks]
      Files :        2 total         0 avail
      Type  : flash
      Flags : 00000000 []
```

This table describes the significant fields shown in the display.

Table 27: utility df Field Descriptions

Field	Description
Files	Number of files in the file system.
Blocks	Amount of space available on the file system in 1-K blocks.
Total	Amount of disk space used by the directory or file.
Avail	Amount of space available for use by the directory or file on the file system.
Type	Type of file system.
Flags	Displays the file system properties.

In the following example, the **file** *source* keyword and argument are used to specify a directory:

```
RP/0/RP0/CPU0:router(admin)# utility df file disk0:/usr

  /dev/disk0t6             2001184    533568   1467616      27%  /disk0:/
```

This table describes the significant fields shown in the display.

Table 28: utility df Column Descriptions (left to right)

Field	Description
Filesystem	File system for the displayed information.
1k-blocks	Amount of space available on the file system in 1-K blocks.
Used	Amount of disk space used by the directory or file.
Available	Amount of space available for use by the directory or file on the file system.
Use%	Percentage of space used on the file system.
Mounted on	Storage device where the file system is mounted.

Related Commands

Command	Description
utility du, on page 207	Displays the amount of disk space used by one or more directories or files.

utility du

To display the amount of disk space used in a device, directory, or file, use the **utility du** command in

XR EXEC

mode.

utility du [[**all** | **specified**] [**kbytes** | **bytes** | **local**] [*WORD*] [**file** *source*] | **usage**]

Syntax Description

all	(Optional) (**-a**) Displays the disk space used for each file in the directory. By default, information is displayed only for the directory. Use the **all** keyword to display the total disk space used by all files in the directory, including the directory itself.
specified	(Optional) (**-s)** Displays the total disk space used for each specified file, rather than the totals for any subdirectories.
kbytes	(Optional) (**-k**) Displays the disk space used in 1-K blocks (1024-byte units) instead of the default of 512-byte blocks.
bytes	(Optional) (**-p**) Displays the disk space used in bytes (the default is 512-byte blocks). Also generates error messages for exiting files that cannot be displayed.
local	(Optional) (**-x**) Displays information for the local device only.
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
file *source*	(Optional) Displays the disk space used for a device, directory, or file. The syntax for the *source* argument is *device* **:** / *directory-path*[/ *filename*] The *device* argument, followed by a colon, indicates the name of the device where the file is located. Use the online help (**?**) function to display the available storage devices and network protocols. Enter the **utility du** command without specifying a device, directory, or file to display information for the current directory, and subdirectories. (The command behaves as if the filename dot (.) is entered.)
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

Information for the current directory is displayed.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enter the **utility du** command without specifying a file to display information for the current directory. The command behaves as if the filename dot (.) is entered.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **kbytes** keyword can also be entered using the UNIX-equivalent (**-k**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility du** command is used to display the disk space used for the subdirectories in the MPLS package directory:

In the following example, the **utility du** command is used to display the disk space used for a subdirectories:

```
RP/0/RP0/CPU0:router# utility du file disk0:/

-mpls-3.8.0/configs37 /disk0:/-mpls-3.8.0/configs
```

In the following example, the **utility du** command is used to display the disk space used for the current working directory:

```
RP/0/RP0/CPU0:router# cd disk0:/

-mpls-3.8.0
RP/0/RP0/CPU0:router# utility du

            160 ./schema
            104 ./lib/cerrno
            625 ./lib/mib
           2545 ./lib
           9658 ./bin
             39 ./startup
            840 ./parser
             37 ./configs
             35 ./mib
             35 ./rules
             34 ./partitions
            135 ./etc/compat
            167 ./etc
             66 ./instdb_v
            181 ./lc/bin
             33 ./lc/startup
            246 ./lc
            112 ./instdb
          14006 .
```

Related Commands

Command	Description
utility df	Displays the amount of disk space available for a directory or file.

utility egrep

To search a file or the results of standard input using full regular expressions, use the **utility egrep** command in

XR EXEC

mode.

utility egrep {**expr** *expression* | **script** *expression-file*} [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility egrep *expression* [*WORD*] [**count**] [**linenum**] [**matchfile**] [**matchline**] [**nocase**] [**nofile**] [**reverse**] [**file** *search-file*]

utility egrep usage

Syntax Description

expr *expression*	(**-e**) A regular expression. This form is used when only one expression is specified on the command line. Any names specified after this option are treated as input files.
script *expression-file*	(**-f**) A file containing a set of regular expressions, each separated by a new line. The type of the expressions is determined by the -e and -f options. This form is used when more than one expression is specified. You can specify more than one -f option. The syntax of the *expression-file* argument is: [*device* **:**]*/ filename*
WORD	(Optional) UNIX command-line option string. The maximum number of characters is 20.
count	(Optional) (**-c**) Displays a count of selected lines.
linenum	(Optional) (**-n**) Before each output line, displays the line's line number.
matchfile	(Optional) (**-l**) (“el”) Displays only the names of files containing the selected lines.
matchline	(Optional) (**-x**) Includes only input lines selected against an entire fixed string or regular expression.
nocase	(Optional) (**-i**) Ignores uppercase and lowercase distinctions during comparisons.
nofile	(Optional) (**-h**) Displays results without a filename prefix attached to the matched lines. This option applies only when more than one file is searched.
reverse	(Optional) (**-v**) Selects only those lines that don't match the specified patterns.
file *search-file*	(Optional) The file used for the search. Replace the *search-file* argument with the device and directory path of the file. The syntax for the *search-file* argument is: [*device* **:**]*/ filename*.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no files are specified, the keyboard input (standard input) is used.

If more than one input file is specified, then the filename is displayed before each line.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The grep utility searches files for character patterns using regular expressions and returns all lines that contain that pattern. The **utility egrep** command uses full regular expressions (expressions using the full set of alphanumeric and special characters) to match the patterns.

The results are displayed to the standard output (terminal screen).

Note The egrep utility options are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. For example, the **count** keyword can also be entered using the UNIX-equivalent (**-c**). To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility egrep** command is used to locate the regular expression "uptime". The **linenum** keyword is also entered to display the line number before each line of output.

```
RP/0/RP0/CPU0:router# show version | utility egrep expr uptime linenum

7:router uptime is 5 days, 19 hours, 27 minutes
```

In the following example, the **utility egrep** command is used to locate a regular expression in a file. In this example, all lines with "adm" are displayed. The * character is used as a wildcard.

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nofile file disk0:/usr/passwd

adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

In the following example, the **nocase** keyword is used to ignore the character case:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* nocase file disk0:/usr/passwd
```

```
adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

In the following example, the **linenum** keyword is used to append the line number to the beginning of each output line:

```
RP/0/RP0/CPU0:router# utility egrep expr Adm* linenum file disk0:/usr/passwd

  5:adm:x:4:4:Admin:/var/adm:
  6:lp:x:71:8:Line Printer Admin:/usr/spool/lp:
  7:uucp:x:5:5:uucp Admin:/usr/lib/uucp:
  8:nuucp:x:9:9:uucp Admin:/var/spool/uucppublic:/usr/lib/uucp/uucico
  9:listen:x:37:4:Network Admin:/usr/net/nls:
 15:ssadmin:x:901218:60001:Sun StorEdge(tm) Configuration Service Agent Admin:/:/bin/false
```

utility head

To copy bytes or lines at the beginning of a file or from the standard input, use the **utility head** command in

XR EXEC

mode.

utilityhead[*WORD* | [**bytes**] [**count** *number*][**file** *source*] | **usage**]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
bytes	(Optional) (**-c**) Copies the data in bytes from the beginning of each specified file. The default setting is to copy lines of data.
count *number*	(Optional) (**-n**) Specifies the number of lines (default) or bytes to be copied. The *number* argument is an unsigned decimal integer. By default, the **utility head** command copies the first ten units (lines or bytes) of the file. Use the **count** *number* option to change the default.
file *source*	(Optional) Specifies the storage device, directory, and filename for the files. If a file is not specified, the standard input is used.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If the **utility head** command is entered without keywords or arguments, the first ten lines of the file or standard output are copied.

If no file is specified, then the standard input is used.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **utility head** command copies the beginning bytes (default) or lines of one or more files to the standard output (usually the user interface display). Use the **bytes** or **lines** keywords to copy the data based on lines or bytes. Use the **count** *number* option to specify the number of bytes or lines to copy. By default, the **utility head** command copies the first 10 lines of each file.

If more than one file is selected, an identifying header is added before the output for each file. If no file is specified, then the standard input (keyboard) is used.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

In the following example, the **utility head** command is used to display the first 15 lines from the output of the **show version** command:

In the following example, the **utility head** command is entered with the **bytes** keyword. Only the first 15 bytes of output are displayed.

```
RP/0/RP0/CPU0:router# show version | utility head count 15 bytes

Cisco IOS XR S

RP/0/RP0/CPU0:router#
```

utility which

To locate a program file, use the **utility which** command in

XR EXEC

mode.

utility which {[[*WORD*] | [**all**] [**fullname**] [**long** [*link*]]] **program** *program-name* | **usage**}

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
all	(Optional) (**-a**) Displays all occurrences of the program specified by the **program** *pathname* keyword and argument.
fullname	(Optional) (**-f**) Displays the full pathname of the program file.
long [*link*]	(Optional) (**-l**) ("el") Displays the long format for each program found, and also displays link information if the file is a symlink.
program *program-name*	Specifies the name of the program file.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the**utility which** command is entered without keywords or arguments to display the location of the perl program:

```
RP/0/RP0/CPU0:router# utility which program perl

  /pkg/bin/perl
```

In the following example, the **utility which** command is entered with the **fullname** keyword to display the full directory path of the perl program:

```
RP/0/RP0/CPU0:router# utility which fullname program perl

  /disk0:/-base-3.8.0.1I/sbin/perl
```

In the following example, the **utility which** command is entered with the **long** keyword to display additional details about the perl program file:

```
RP/0/RP0/CPU0:router# utility which long program perl

  -rwxrwxrwx  1     0         0        19245 Jul 28 14:31 /pkg/bin/perl
```

Related Commands

Command	Description
utility find, on page 189	Locates a file.

utility xargs

To run a program from one or more argument lists, use the **utility xargs** command in

XR EXEC

mode.

utility xargs [[*WORD* | **trace**] [**program** [*program-name*] [*initial-arguments*]] | **usage**]

Syntax Description

WORD	(Optional) UNIX command-line option string. The maximum number of characters is 80.
trace	(Optional) (**-t**) Prints each program on standard error before executing.
program	(Optional) Specifies the name of the program and initial arguments. If a program name is not specified, then the echo utility is used.
program-name	(Optional) Specifies the name of the program. If a program name is not specified, then the echo utility is used.
initial-arguments	(Optional) Specifies the initial arguments.
usage	(Optional) Displays the UNIX options supported by this command.

Command Default

If no program is specified, then the echo utility is used (the input lines are displayed).

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note Keywords are entered using the displayed syntax, or with UNIX-equivalent syntax. The UNIX-equivalent syntax is displayed in parentheses () in the syntax description. To display the UNIX-equivalent syntax online, enter the **usage** keyword.

Task ID

Task ID	Operations
universal	execute

In the following example, the **utility xargs** command is used to display the egress lines:

```
RP/0/RP0/CPU0:router# more disk0:/usr/files | utility xargs program grep EGRESS

  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-101
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-102
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-103
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-104
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-105
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-106
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-107
  disk0:/usr/atm.cfg:service-policy output EGRESS-GigabitEthernet0-0-0-0-108
  disk0:/usr/atm.cfg:service-policy output EGRESS-common
  disk0:/usr/atm.cfg:service-policy output EGRESS-common
  disk0:/usr/atm.cfg:service-policy output EGRESS-common
  disk0:/usr/atm.cfg:service-policy output EGRESS-common
  disk0:/usr/atm.cfg:service-policy output EGRESS-common
  .....
```

Smart Licensing Commands

This chapter describes the commands that can be used to configure smart licensing.

For more information about Smart licensing, see Smart licensing chapter in the *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

license smart flexible-consumption enable

To enable or disable Flexible Consumption model licensing for your hardware or software, use **license smart flexible-consumption enable** command in the global configuration mode.

Use the **no** form of this command to disable Flexible Consumption model licensing.

license smart flexible-consumption enable

Command Default

By default, Flexible Consumption model licensing is disabled for a system. You have to explicitly enable it before you can start using the Flexible Consumption model licenses.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Once the command is enabled, the router captures consumption information periodically after each reporting interval. The daily license usage is reported to the Smart Licensing Manager at cisco.com. For more information about the various licenses of the Flexible consumption model, see *Supported Flexible Consumption Model Licenses* in chapter *Configuring Smart Licensing* of *Interface and Hardware Component Configuration Guide for Cisco NCS 5500 Series Routers*.

Table 29: Task ID

Task ID	Operation
sysmgr	read, write

Examples

The following example shows how to configure the **license smart flexible-consumption** command:

```
Router# configure
Router(config)# license smart flexible-consumption enable
Router# commit
```

license smart enable

To enable Smart Licensing for your product, use the **license smart enable** command in the admin configuration mode or system admin configuration mode.

Use the **no** form of this command to disable Smart Licensing and return to the default traditional mode of licensing.

license smart enable

Syntax Description

This command has no keywords or arguments.

Command Default

By default, smart licensing mode is on.

Command Modes

Admin configuration mode

System Admin config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Smart Licensing components are packaged into the ncs5500 mini image. By default, smart licensing mode is on.

Task ID

Task ID	Operation
pkg-mgmt	Read, Write, Execute

Example

This example shows how to run the command to enable Smart Licensing, and the configuration with Smart Licensing enabled.

```
Router(admin)# configure
Router(admin-config)# license smart enable
Router(admin-config)# show config
```

show license status

To display the status of Smart Licensing, use the **show license status** command in the Admin EXEC mode or System admin EXEC mode.

show license status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
pkg-mgmt	Read

Example

This example displays the current status of your license using the show license status command:

```
Router(admin)#show license status
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: <Smart Account name>
  Virtual Account: Physics
  Export-Controlled Functionality: Not Allowed
  Initial Registration: SUCCEEDED on Feb 24 23:30:12 2014 PST
  Last Renewal Attempt: SUCCEEDED on Feb 24 23:30:12 2014 PST
  Next Renewal Attempt: Aug 24 23:30:12 2014 PST
  Registration Expires: Feb 24 23:30:12 2015 PST

License Authorization:
  Status: AUTHORIZED on Feb 24 23:30:12 2014 2014 PST
  Last Communication Attempt: SUCCEEDED on Feb 24 23:30:12 2014 PST
  Next Communication Attempt: Mar 24 23:30:12 2014 PST
  Communication Deadline: May 24 23:30:12 2015 PST
```

In the above example the smart license is enabled and:

- status is registered,
- authorization is successful and the status is Authorized,

- the information is exchanged to keep the databases in synchronization.

show license summary

To display the detailed information about the Smart License entitlements, use the **show license summary** command in the Admin EXEC or System Admin EXEC mode.

show license summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
pkg-mgmt	Read

Example

This example displays the current status of your license using the show license summary command:

```
Router(admin)#show license status
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Smart Account Name
  Virtual Account: Physics
  Export-Controlled Functionality: Not Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Aug 24 23:30:12 2014 PST

License Authorization:
  Status: AUTH EXPIRED
  Last Communication Attempt: FAILED
  Next Communication Attempt: Mar 25 23:30:12 2014 PST

License Usage:
  License                    Entitlement Tag          Count       Status

-----------------------------------------------------------------------------------------------

  A9K-ADV-OPTIC-LIC       (adv_optic)                1         AUTH EXPIRED
  A9K-iVRF-LIC             (ivrf_lic)                   1         AUTH EXPIRED
```

In the above example the smart license is enabled and:

- status is registered,
- authorization period is expired,
- the information about license usage of each entitlements.

show license udi

To display the Smart Licensing UDI (unique device identifier) information, use the **show license udi** command in the Admin EXEC mode or System Admin EXEC mode.

show license udi

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
pkg-mgmt	Read

Example

This example displays the current status of your license using the show license summary command:

```
Router(admin)#show license udi
```

show license usage

To display the Smart Licensing usage information, use the **show license usage** command in the Admin EXEC mode or System Admin EXEC mode.

show license usage

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC mode

System Admin EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
pkg-mgmt	Read

Example

This example displays the current usage information of your license:

```
Router(admin)#show license usage
```

show license all

To display the Smart Licensing status, usage, and UDI (unique device identifier) information, use the **show license all** command in the Admin EXEC mode or System Admin EXEC mode..

show license all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
pkg-mgmt	Read

Example

This example displays the detailed information about your license:

```
Router(admin)#show license all
```

Network Synchronization Commands

This chapter describes the Cisco IOS XR Network Synchronization Precision Time Protocol (PTP) commands that are used to distribute precision frequency and time around a network.

For detailed information about PTP concepts, configuration tasks, and examples, see the *Configuring PTP on Cisco IOS XR Software* configuration module in

announce

To configure PTP profile announcement messages, use the **announce** command in PTP profile configuration or interface PTP configuration mode. To remove setting, use the **no** form of this command.

announce { **frequency** *frequency* | **interval** *interval* | **grant-duration** *duration* | **timeout** *timeout* } **no announce**

Syntax Description

frequency *frequency*	Specifies multiple announce messages per second. 1 One per second frequency. 2 Two per second frequency. 4 Four per second frequency. 8 Eight per second frequency. 16 Sixteen per second frequency. 32 Thirty Two per second frequency. 64 Sixty Four second frequency.
interval *interval*	Specifies the time interval in seconds at which messages are sent.
grant-duration *duration*	Specifies the length of time permission to send unicast messages is granted.
timeout *timeout*	Specifies the number of announce intervals that PTP ports wait in the Listen state before transitioning to the Master state.

Command Default

Defaults: frequency none, grant-duration 600, interval 2, timeout 3. Values are in seconds.

Command Modes

PTP profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **announce** command used configure the global PTP configuration profile which then is associated with many interfaces. Similarly it is used in interface PTP configuration mode to set the announce message settings for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

The **grant-duration** keyword is used for the ITU-T telecommunication Profile.

Example

The following sets the announcement interval to 8 seconds in the PTP configuration profile:

```
Router(config)# ptp
```

```
Router(config-ptp)# profile p1
Router(config-ptp-profile)# announce interval 8
```

clock

To enter Precision Time Protocol (PTP) clock configuration mode and run PTP clock configuration command, use the **clock** command in PTP configuration mode. To remove, use the **no** form of this command.

clock
no clock

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP clock configuration commands can also be run from global PTP configuration mode by preceding the command string with the **ptp clock** keywords. From PTP clock configuration mode, various PTP clock settings can be configured.

Example

The following example shows how to enter PTP clock configuration mode from global configuration mode.

```
Router(config)# ptp
Router(config-ptp)# clock
Router(config-ptp-clock)#
```

clock operation

To configure the type of PTP clock operation, use the **clock operation** command in PTP interface or profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

clock operation {**one-step** | **two-step**}
no clock operation

Syntax Description

one-step	Specifies the timestamp for the time synchronization message sent directly within the message itself.
two-step	Specifies the timestamp for the time synchronization message that follows the message.

Command Default

The default is two step.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **clock operation** command is used configure the global PTP configuration profile which then is associated with many interfaces. Similarly it is used in the interface PTP configuration mode to set the clock operation for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets PTP clock operation to two-step:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# clock operation two-step
```

clock profile

To configure the ITU-T telecommunication profile and clock type that can be used in all local PTP sessions, use the **clock profile** command in the PTP configuration mode. To remove, use the **no** form of this command.

```
clock profile [g.8265.1 |{master | slave}][g.8275.1 |g.8275.2]{ T-BC |
T-GM | T-TSC }
```

Syntax Description

clock-type T-GM | **T-BC** | **T-TSC**	Indicates the clock type for G.8275.1 profile. G.8275.2 profile supports three clock types: • T-GM: Telecommunication Grandmaster • T-BC: Telecommunication Boundary Clock • T-TSC: Telecommunication Time Slave Clock
master	Configure master clock.
slave	Configure telecom slave clock.

Command Default

The default PTP profile defined in the IEEE-1588 standard is used if this configuration is not used.

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **clock-type** can be configured only when G.8275.1 is selected as the PTP profile.

Note The **clock-selection telecom-profile** and **clock-advertisement telecom-profile** commands are deprecated from Release 6.1.2Release 6.3.2Release 6.6.25. They are replaced by the **clock profile** command.

Note Configuring the G.8265.1 profile using **clock profile** command is equivalent to using **clock-selection telecom-profile** and **clock-advertisement telecom-profile** commands to configure the G.8265.1 profile in the earlier releases.

Example

The following example shows configuring G.8265.1 profile:

```
Router(config)#ptp
Router(config-ptp)#
clock profile g.8265.1
```

The following example shows configuring G.8275.1 profile with T-BC clock type:

```
Router(config)#ptp
Router(config-ptp)#clock profile g.8275.1 T-BC
```

cos

To specify the Class of Service (CoS) value to use for Precision Time Protocol (PTP) packets sent by the router, use the **cos** command in PTP profile configuration mode or interface PTP configuration mode. To remove, use the **no** form of this command.

cos *number*

no cos

Syntax Description

number	Specifies the Class of Service (CoS) value to use in the Ethernet header when running over IPv4 or Ethernet.

Command Default

The default CoS value is 6.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **cos** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly it is used in the interface PTP configuration mode to set the CoS value for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the CoS value to 3 in the PTP configuration profile p1:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# cos 3
```

The following example overrides the CoS value in the profile and sets it to be 2 for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# cos 2
```

delay-request

To configure settings for the PTP delay request message, use the **delay-request** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

delay-request {**frequency** *number* | **interval** *number*}
no delay-request

Syntax Description

frequency	Specifies the delay interval. 1- One per second frequency 2- Two per second frequency 4- Four per second frequency 8- Eight per second frequenc 16- Sixteen per second frequency 32- Thirty Two per second frequency 64- Sixty Four second frequency 128- One Hundred and Twenty Eight second frequency
interval	Specifies the time interval in seconds at which messages are sent. 1- One second interval 2- Two second interval 4- Four second interval 8- Eight second interval 16- Sixteen second interval

Command Default

The default interval is two seconds between messages.

Command Modes

PTP configuration mode

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **delay-request** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly it is used in interface PTP configuration mode to set the delay-request message settings for a specific interface. Any values set in interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the delay request interval in the PTP configuration profile to 8 seconds:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# delay-request interval 8
```

delay-response

To configure settings for the PTP delay response message, use the **delay-response** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

delay-response {**grant-duration** *duration* | **timeout** *value*}
no delay-response

Syntax Description

grant-duration <60-1000>	Specifies the grant duration. If a port is in the slave state, this is the length of grant-duration is requested. If the port is in master state, this is the maximum grant-duration is allowed in seconds.
timeout<100-100000>	Specifies delay response timeout value. If delay-response messages are not received from a master clock for, the master is no longer qualified for selection. This setting only applies if the clock-selection telecom-profile is specified in milliseconds.

Command Default

Default is grant-duration 600, timeout 5000.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **delay-response** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it can be used in the interface PTP configuration mode to set the delay response value for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the PTP delay response timeout to 200 milliseconds in the PTP configuration profile:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# delay-response timeout 200
```

The following example overrides the delay response timeout value in the profile and sets it to be 150 milliseconds for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
```

```
Router(config-if-ptp)# delay-response timeout 150
```

domain

To specify the domain number for the PTP clock, use the **domain** command in PTP clock configuration mode. To remove, use the **no** form of this command.

domain *number*
no domain

Syntax Description

number	Specifies the domain number to use for this clock.

Command Default

Default is 0.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

PTP uses the specified domain number in all its PTP messages and ignores all PTP messages received from a different domain.

Example

The following example sets the domain to 200:

```
Router(config)# ptp
Router(config-ptp)# clock
Router(config-ptp-clock)# domain 200
```

dscp

To set the Differentiated Services Code Point (DSCP) value for use in Precision Time Protocol (PTP) packets sent by the router, use the **dscp** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

dscp *number*
no dscp

Syntax Description

number	Specifies the DSCP value to use (0-63).

Command Default

The default DSCP value is 46.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **dscp** command is used configure the global PTP configuration profile which is associated with many interfaces. Similarly, it is used in the interface PTP configuration mode to set the DSCP value for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the DSCP value to 20 for PTP operation:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# dscp 20
```

The following example overrides the DSCP value in the profile and sets it to be 42 for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# dscp 42
```

identity

To configure the PTP clock identity, use the **identity** command in PTP clock configuration mode. To remove, use the **no** form of this command.

identity {**eui-64** *number* | **mac-address** *address*}
no identity

Syntax Description

eui-64 *number*	Specifies the full EUI-64 number to determine the clock identity.
mac-address *address*	Specifies the router to determine the clock identity. Use one of the following addressing options to identify the router: • Use the router's built-in MAC address as the clock identity. • Enter a MAC address (H.H.H format).

Command Default

The router for the clock identity is derived from the router MAC address.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

You can specify a MAC address or a complete EUI-64 value to derive the clock identity. If you do not use this command, clock identity is derived from the router MAC address.

Example

The following example sets the clock identity to a MAC address A.B.C:

```
Router(config)# ptp
Router(config-ptp)# clock
Router(config-ptp-clock)# identity mac-address A.B.C
```

local-priority

To configure priority for a port in the G.8275.1 profile, use the **local-priority** command in the virtual-port mode of PTP and Interface PTP configuration mode. To remove, use the **no** form of this command.

local-priority {*priority-value*}
no local-priority

Syntax Description

priority-value	Indicates the priority value set for a port in the G.8275.1 profile. This priority value is used in the profile's alternate Best Master Clock Algorithm (BMCA). **Note** Lower number indicates higher priority value.

Command Default

The allowed range for the priority values are 1–255. The default priority value is 128.

Command Modes

PTP configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The configured local priority value is ignored if the G.8275.1 BMCA is not in use and a warning message is displayed in the **show ptp configuration-errors** command.

Note The per-master priority value that is configured on a master clock overrides the per-port local priority value.

Example

The following example shows configuring priority 1 for a port in the G.8275.1 profile:

```
Router(config)# int TenGigE0/0/0/0
Router(config-if)# ptp
Router(config-if-ptp)# local-priority 1
```

log best-master-clock changes

To enable logging of changes to the best master clock for Precision Time Protocol (PTP), use the **log best-master-clockchanges** command in PTP configuration mode. To remove, use the **no** form of this command.

log best-master-clock changes
no log best-master-clock changes

Command Default

None

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **log best-master-clock change** command is configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it is used in the interface PTP configuration mode to set the settings for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets up PTP to log the best master clock changes:

```
Router(config)# ptp
Router(config-ptp)# log best-master-clock changes
```

master

To add a master to the list of acceptable Precision Time Protocol (PTP) masters for an interface or profile, use the **master** command in PTP profile configuration or Interface PTP configuration mode. To remove, use the **no** form of this command.

master { **ethernet** *address* | **ipv4** *address* | **ipv6** *address* | **clock-class** *class* | **delay-symmetry** *number* | **multicast** | **non-negotiated** | **priority** *number* }
no master

Syntax Description

ethernet *address*	Specifies the ethernet address of a master.
ipv4 *address*	Specifies the IPv4 address of a master.
ipv6 *address*	Specifies the IPv6 address of a master.
clock-class *class*	Overrides the clock class received in announce messages from this master.
delay-symmetry *number*	Specifies the expected asymmetry.
multicast	Indicates that the master sends multicast message.
non-negotiated	Specifies non-negotiated unicast message.
priority *number*	Indicates the priority for selecting between multiple masters (lower numbers are higher priority).

Command Default

None

Command Modes

PTP profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The address type used to configure the master must match the PTP transport type configured on the interface. If multiple masters are configured, the router attempts to communicate with all configured masters and selects between the available ones based on priority.

Example

s

The following example assigns two masters to the profile and gives higher priority to the master with IPv4 address 10.10.4.5:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# master ipv4 10.10.4.5 priority 1
```

```
Router(config-ptp-profile)# master ipv4 10.10.4.7 priority 2
```

min-clock-class

To configure the minimum clock class accepted from a Precision Time Protocol (PTP) master port, use the **min-clock-class** command in the PTP configuration mode. To remove, use the **no** form of this command.

min-clock-class *class*
no min-clock-class

Syntax Description

class	Indicates that the minimum clock class accepted. The range is 0–255. Foreign clocks with a clock class greater than this value is **not** be considered in the BMCA.

Command Default

Nones

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The clocks with higher clock-class number than the minimum clock-class number will not be considered for a parent clock. This command is used to override the platform value (if needed).

Note The clock-class values are not numerically ordered (lower value of clock-class has higher importance).

Example

The following example configures the minimum clock class to 7:

```
Router(config)# ptp
Router(config-ptp)# min-clock-class 7
```

multicast

To allow multicast messages to be sent, use the **multicast** command in PTP profile configuration mode or Interface PTP configuration mode. To remove, use the **no** form of this command.

multicast { **disable** | **mixed** | **target-address** { **ethernet** *address* } }
no multicast

Syntax Description

target-address ethernet *forwardable mac-address* | *non-forwardable mac-address*	Indicates the Ethernet multicast group address to send the multicast messages. This command supports either forwarding or nonforwarding Ethernet MAC addresses only. • Forwarding MAC-address: 01-1B-19-00-00-00 • Nonforwarding MAC-address: 01-80-C2-00-00-0E
disable	Disable multicast transport.
mixed	Mixed-mode multicast.

Command Default

By default, multicast messaging is disabled for PTP.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

When multicast is configured, announce and sync messages are sent as multicast messages. Delay-response messages are sent as unicast messages.

Example

The following example enables PTP multicast messages in the configuration profile:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# multicast
```

The following example enables PTP multicast messages in the configuration profile to be sent to the forwarding mac-address:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# multicast target-address ethernet 01-1B-19-00-00-00
```

The following example overrides the multicast setting in the profile and removes it for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# no multicast
```

port state

To configure the state for a PTP port, use the **port state** command in the PTP profile configuration mode or the Interface PTP configuration mode. To remove, use the **no** form of this command.

port state [**any** | **master-only** | **slave-only**]
no port state

Syntax Description

any	Configure any port state.
slave-only	Configures the port state to be a slave.
master-only	Configures the port state to be a master. The **master-only** keyword is used for multicast transport mode.

Command Default

Dynamic port state changes are based on the peers with which the port communicates.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The following example configures the PTP port state to be slave-only:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp)# port state slave-only
```

The following example configures the PTP port state to be master-only:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp)# port state master-only
```

profile (interface)

To assign a Precision Time Protocol (PTP) configuration profile to an interface, use the **profile** command in interface PTP configuration mode. To remove, use the **no** form of this command.

profile *profile-name*
no profile

Syntax Description

Pprofile *profile-name*	Name of profile to associate with the Interface.

Command Default

None

Command Modes

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

A PTP profile is a configuration template that is applied to multiple interfaces. You must define the profile using the **profile** command in PTP configuration mode.

Example

The following example shows how to assign a configuration profile to a specific interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if)# ptp
Router(config-if-ptp)# profile tp128
```

profile (PTP)

To enter Precision Time Protocol (PTP) profile configuration mode and run PTP profile configuration commands, use the **profile** command in PTP configuration mode or interface PTP configuration mode. To remove, use the **no** form of this command.

profile *name*
no profile

Syntax Description

name	Enters PTP profile configuration mode for the specified profile name.

Command Default

None

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

A Precision Time Protocol (PTP) profile is a configuration template that is applied to multiple interfaces. From PTP profile configuration mode, the following PTP profile configuration commands are available:

```
Router(config-ptp-profile)# ?

  announce         Announce message options
  clock            PTP clock-operation to use
  cos              Specify the COS value to use
  delay-asymmetry  Delay asymmetry to apply to all masters on an interface
  delay-request    Configure the sending of delay-request messages
  delay-response   Delay-Response message options
  dscp             Specify the DSCP value to use
  interop          Interfaces using this profile should interoperate with a peer clock
running a different profile
  ipv4-ttl         Specify the IPv4 TTL value to use
  ipv6-hop-limit   Specify the IPv6 hop limit value to use
  master           Add a master to listen to on interfaces using this profile
  multicast        Allow multicast messages to be sent
  port             PTP port options
  slave            Add a slave to announce to on this interface
  source           PTP source address options
  sync             Sync message options
  transport        PTP transport type to use on this interface
  unicast-grant    Unicast grant options
```

Example

The following example shows how to configure the profile tp128:

```
Router(config)# ptp
Router(config-ptp)# profile tp128
```

```
Router(config-ptp-profile)#
```

ptp

To enter Precision Time Protocol (PTP) configuration mode and run PTP configuration commands, use the **ptp** command. Using the command from global configuration mode enter the PTP configuration mode. To remove, use the **no** form of this command.

ptp
no ptp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global PTP configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

PTP configuration commands are run from global configuration mode by preceding the command string with the **ptp** keyword. From PTP configuration mode, the following PTP configuration commands are available:

```
Router(config-ptp)# ?
   apts                             Enable assisted partial timing support
   clock                            PTP Clock Configuration
   detect-ptsf-unusable             Enable the servo to disqualify a foreign master from
selection if it is found to be PTSF-unusable
   double-failure-clock-class       The clock class to use when both PTP and syncE are lost

  freerun-clock-class              The clock class to use when the PTP servo is freerunning

  frequency                         Precision Time Protocol frequency configuration
  holdover-spec-clock-class         The clock class to use while in holdover-spec
  holdover-spec-duration            Specify duration of holdover-spec
  holdover-spec-traceable-override  Override time-traceability to true while in holdover-spec

  ipv6-verify-checksum              Verify UDP checksum for IPv6 packets
  log                               Precision Time Protocol logging configuration
  min-clock-class                   Clocks with a clock-class higher than minimum clock
class will not be considered for selection as a parent clock.
  network-type                      The type of network
phase-difference-threshold-breach Value at which a bistate alarm is triggered when the phase
 difference for any foreign master is exceeded in nanoseconds
  physical-layer-frequency          Disable PTP as a source for frequency as only physical
 layer frequency sources are used
  profile                           PTP Profile Configuration
  servo-slow-tracking              Restrict the rate, in ns per second, at which the servo
 may track to update the time and attain sync
  startup-clock-class               The clock class to use when PTP starts up
  time-of-day                       Precision Time Protocol time-of-day configuration
  transparent-clock                 Configure transparent clock
  uncalibrated-clock-class          Clock class to be used while acquiring phase-lock to a
 parent clock
  uncalibrated-traceable-override   Override time-traceability to true while acquiring phase
```

```
lock to a parent clock
 utc-offset                      Configure the UTC offset
 virtual-port                    PTP Virtual Port Configuration
```

Example

The following example shows how to enter the PTP configuration mode from global configuration mode:

```
Router(config)# ptp
Router(config-ptp)#
```

The following example shows how to enter the interface PTP configuration mode:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if)# ptp
Router(config-if-ptp)#
```

show ptp advertised-clock

To display properties of the clock that the system advertises over Precision Time Protocol (PTP), use the **show ptp advertised-clock** command in EXEC mode.

show ptp advertised-clock

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The following shows information about the PTP advertised clock. Output displays the clock identity and the clock properties.

```
Router# show ptp advertised-clock

Sun Feb 11 17:54:34.475 UTC
Clock ID: Local Clock (8a96fffe84e4d8)
Clock properties:
Domain: 0, Priority1: 128, Priority2: 128, Class: 248
Accuracy: 0xfe, Offset scaled log variance: 0xffff
Time Source: Internal
Timescale: PTP
No frequency or time traceability
Current UTC offset: 37 seconds (valid)
```

show ptp foreign-masters

To display the Precision Time Protocol (PTP) foreign master clocks that are available to the router, use the **show ptp foreign-masters** command in EXEC mode.

show ptp foreign-masters [*brief*] {**interface** *name* | **location** *node*}
show ptp foreign-masters best

Syntax Description

brief	Lists all foreign-masters known on the router, ordered by the interface on which they were discovered. If this option is omitted, the output also include detailed clock properties, unicast messages that are granted from the master, length of time the master has been qualified, and information about the clock peer.
name	Displays foreign masters that are discovered by the specified interface. For more information, use the question mark (?) online help function.
node	Displays foreign masters tdiscovered by the specified node
best	Displays the state of the best foreign master found in the network

Command Default

This command has no default values or behavior.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

This command displays the state of foreign masters for the PTP processes. It is only relevant when running as a boundary clock; in grandmaster mode, no relevant output gets displayed.

The **show ptp foreign-masters**command with the **best** keyword collects grandmaster information from all RPs and filters out all but the grandmaster on the active timing card. If the active timing card does not support running as slave, no foreign masters are displayed and instead, it is indicated that slaving is not supported (refer examples section).

Example

The following shows output with the brief option:

```
Router# show ptp foreign-masters brief

M=Multicast,Q=Qualified,GM=Grandmaster

Interface         Transport Address                   Priority1 State
Gi0/2/0/0         IPv4      192.168.172.122           13        M,Q
                  IPv4      192.168.172.123           17        M
Gi0/2/0/1         IPv6      fe80::2b0:4aff:fe6b:f4fc  1         Q,GM
```

```
                 IPv6      fe80::2b0:4aff:fe6b:1234  18        Q
Gi0/3/0/0        Ethernet  00b0.4a6b.f4fc
```

The example indicates if the foreign-master is multicast and the clock that is being used as the grandmaster.

Example

The following example shows output for the location 0/2/CPU0, including the brief option:

```
Router# show ptp foreign-masters brief location 0/2/CPU0

M=Multicast,Q=Qualified,GM=Grandmaster

Interface         Transport Address                   Priority1 State
Gi0/2/0/0         IPv4      192.168.172.122           13        M,Q
                  IPv4      192.168.172.123           17        M
Gi0/2/0/1         IPv6      fe80::2b0:4aff:fe6b:f4fc  1         Q,GM
                  IPv6      fe80::2b0:4aff:fe6b:1234  18        Q
```

Example

The following example shows output for the interface GigabitEthernet0/2/0/0, without the brief option:

```
Router# show ptp foreign-masters brief interface GigabitEthernet0/2/0/0

Interface GigabitEthernet0/2/0/3 (PTP port number 27):

    IPv4, Address 172.108.11.25
       Configured priority: None
       Announce granted:   every 2 seconds,   600 seconds
       Sync granted:       16 per-second,     400 seconds
       Delay-Resp granted: 16 per-second,     600 seconds
       Qualified for 6 days, 2 hours, 11 minutes
       Clock ID: ACDE48FFFE234567
       Clock properties:
          Priority1: 1, Priority2: 83, Class: 6, Accuracy: 0x2B
          Offset scaled log variance: 0x27FF, Steps-removed: 5
          Domain: 0, Time Source: GPS, Timescale: PTP
          Frequency-traceable, Time-traceable
          Current UTC offset: 25 seconds
       Parent properties:
          Clock-ID: BADE48FFFE234367
          Port number: 3, Steps Removed: 2

    IPv4, Address 172.108.11.23, Multicast
       Configured priority: 27
       Announce granted: every 2 seconds,   600 seconds
       Qualified for 5 days, 4 hours, 27 minutes
       Clock ID: ACDE48FFFE234567
       Clock properties:
          Priority1: 7, Priority2: 83, Class: 6, Accuracy: 0x2B
          Offset scaled log variance: 0x27FF, Steps-removed: 5
          Domain: 0, Time Source: GPS, Timescale: PTP
```

```
      Frequency-traceable, Time-traceable
      Current UTC offset: 25 seconds
   Parent properties:
      Clock-ID: BADE48FFFE234367
      Port number: 5, Steps Removed: 1

IPv4, Address 172.108.11.18, Multicast
   Configured priority: 11
   Not qualified
```

Example

The following example shows state information for the best foreign master in the network:

```
Router# show ptp foreign-masters best

    Used to set system frequency and time
    IPv4, Address 1.2.3.4
    Received on interface GigabitEthernet0/2/0/3 (port number 0x1007)
    Clock ID: ACDE48FFFE234567
    Best foreign-master for 5 days, 4 hours, 27 minutes
    Advertised for 5 days, 4 hours, 20 minutes
    Clock properties:
       Priority1: 7, Priority2: 83, Class: 6, Accuracy: 0x2B
       Offset scaled log variance: 0x27FF, Steps-removed: 5
       Domain: 0, Time Source: GPS, Timescale: PTP
       Frequency-traceable, Time-traceable
       Current UTC offset: 25 seconds
    Parent properties:
       Clock-ID: BADE48FFFE234367
       Port number: 0x0005
```

This example indicates the display when slaving is not supported on the active timing card:

```
Router # show ptp foreign-masters best
PTP slaving is not supported on the RSP.
```

show ptp interfaces

To display a summary of the Precision Time Protocol (PTP) port state for the specified interface, use the **show ptp interfaces** command in EXEC mode.

show ptp interfaces [**brief**] *interface*
show ptp interfaces summary location *node*

Syntax Description

interface	Specifies the interface. For more information, use the question mark (?) online help function.
brief	Displays a one-line summary of the functional state of the interface (or all interfaces).
location *node*	Displays information for the specified node

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The output displays Local Priority value only if the configured profile is G.8275.1 profile.

The following shows the output for a GigabitEthernet0/2/0/3 interface in master state:

```
Router# show ptp interfaces GigabitEthernet0/2/0/3

      GigabitEthernet0/2/0/3 is in MASTER state
       PTP port number: 1
       IPv4 transport: IPv4 address 1.2.3.4
       Linestate: Up

       Mechanism: Two-step delay-request-response
          Sync rate: every 2 seconds
          Announce rate: every 8 seconds, timeout 5
          Delay-Req rate: every 4 seconds
       CoS: 6, DSCP: 46
       Platform capabilities:
          Supported:     One-step, Ethernet
          Not-Supported: IPv6, Multicast, Slave
          Max-Sync-rate: 4 per second
       Master state only
       23 Unicast peers
```

Example

The following shows that the GigabitEthernet0/1/0/3 interface is in the uncalibrated state:

```
Router# show ptp interfaces GigabitEthernet0/1/0/3

     GigabitEthernet0/1/0/3 is in UNCALIBRATED state
       PTP port number: 4
       IPv4 transport: IPv4 address 5.4.3.2
       Linestate: Up
       Mechanism: Two-step delay-request-response, Slave-only
          Sync rate: 2 per second
          Announce rate: 2 per second, timeout 4
          Delay-Req interval: 4 per second
       CoS: 5, DSCP: 23
       Platform capabilities:
          Supported:     One-step, Ethernet, Multicast, Slave
          Not-Supported: IPv6
          Max-Sync-rate: 2 per second
       Master table:
       (K = Known, Q = Qualified, GM = Grandmaster)
          IPv4 address 5.4.3.3: priority 5, multicast, K,Q,GM
          IPv4 address 5.4.3.4: priority not set
          MAC-address 12ab.7431.327c: priority 3, K
       Slave state only
```

Example

The following shows output with the **brief** keyword specified:

```
Router# show ptp interfaces brief

 Intf              Port         Port                Line
 Name              Number       State        Transport  State     Mechanism
 ------------------------------------------------------------------------------
 Gi0/2/0/0         1            MASTER       IPv4       Up        2-step DRRM
 Gi0/2/0/1         5            PASSIVE      Ethernet   Up        1-step DRRM
 Gi0/2/0/2         23           MASTER       Ethernet   Up        2-step DRRM
 Gi0/2/0/0         6            INIT         IPv4       Down      2-step DRRM
```

Example

The following shows summary output for the location 0/2/cpu0:

```
Router# show ptp interfaces summary location 0/2/cpu0

     ====================================
     Interface port states
     ====================================
      INIT                   11
      LISTENING              27
      PASSIVE                12
      PRE-MASTER              2
      MASTER                 50
      UNCALIBRATED            0
```

```
SLAVE                    1
FAULTY                   0
-------------------------
Total                  103
```

show ptp local-clock

To display properties of the local Precision Time Protocol (PTP) clock, use the **show ptp local-clock** command in EXEC mode.

show ptp local-clock

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The following shows information about the local PTP clock:

```
Router# show ptp local-clock
Fri Dec 15 17:56:49.344 UTC
Clock ID: 008a96fffe84e4d8
Clock properties:
Domain: 0, Priority1: 128, Priority2: 128, Class: 7
Accuracy: 0xfe, Offset scaled log variance: 0xffff
Time Source: Internal
Timescale: PTP
No frequency or time traceability
Current UTC offset: 37 seconds (valid)
Virtual Port:
Configured: False, Connected: False
Local clock is grandmaster
APTS: Disabled
```

show ptp packet-counters

To display counters for packets that are received and send by Precision Time Protocol (PTP), use the **show ptp packet-counters** command in EXEC mode.

show ptp packet-counters location *node*
show ptp packet-counters *interface* **detail**
show ptp packet-counters *interface* **master** {**ipv4** *ipv4-address* | **ipv6** *ipv4-address* | **ethernet** *ethernet-address*}

Syntax Description

location *node*	Displays information for the specified node
interface	Specifies the interface.
detail	Displays detailed information.
master	Displays information about the PTP master.
ipv4-address	Specifies an IPv4 address.
ipv6-address	Specifies an IPv6 address.
ethernet-address	Specifies an Ethernet address.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The following displays the packet counters for the GigabitEthernet0/2/0/1 interface:

```
Router# show ptp packet-counters GigabitEthernet0/2/0/1

        Packets                       Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                         3              83              11
        Sync                             0              32               5
        Follow-Up                        0              31               0
        Delay-Req                       22               0               0
        Delay-Resp                       0              21               7
        Pdelay-Req                       0               7               0
        Pdelay-Resp                      0               0               0
        Pdelay-Resp-Follow-Up            0               0               0
        Signaling                        2               1               0
```

```
    Management                    0             0             0
    Other                         0             3            12
                                -----         -----         -----
    TOTAL                        27           178            35
```

Example

The following displays the packet counters with other details for the GigabitEthernet0/2/0/1 interface:

```
Router# show ptp packet-counters GigabitEthernet0/2/0/1 details

     Packets                     Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                    3              83              11
        Sync                        0              32               5
        Follow-Up                   0              31               0
        Delay-Req                  22               0               0
        Delay-Resp                  0              21               7
        Pdelay-Req                  0               7               0
        Pdelay-Resp                 0               0               0
        Pdelay-Resp-Follow-Up       0               0               0
        Signaling                   2               1               0
        Management                  0               0               0
        Other                       0               3              12
                                -----           -----           -----
        TOTAL                      27             178              35

    Master IPv4 5.4.3.4:
        Packets                 Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                    1              40               1
        Sync                        0              23               4
        Follow-Up                   0              14               0
        Delay-Req                  12               0               0
        Delay-Resp                  0              10               7
        Pdelay-Req                  0               7               0
        Pdelay-Resp                 0               0               0
        Pdelay-Resp-Follow-Up       0               0               0
        Signaling                   2               1               0
        Management                  0               0               0
        Other                       0               3              12
                                -----           -----           -----
       TOTAL                       15              98              24

    Master Ethernet 12ab.7431.327c:
        Packets                 Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                    2              43              10
        Sync                        0               9               1
        Follow-Up                   0              17               0
        Delay-Req                  10               0               0
        Delay-Resp                  0              11               0
        Pdelay-Req                  0               0               0
        Pdelay-Resp                 0               0               0
        Pdelay-Resp-Follow-Up       0               0               0
        Signaling                   0               0               0
        Management                  0               0               0
        Other                       0               0               0
                                -----           -----           -----
        TOTAL                      12              80              11
```

Example

The following displays the packet counters for the master with IPv4 address 5.4.3.4 for the GigabitEthernet0/2/0/1 interface:

```
Router# show ptp packet-counters GigabitEthernet0/2/0/1 master ipv4 5.4.3.4

      Master IPv4 5.4.3.4:
        Packets                      Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                        1              40               1
        Sync                            0              23               4
        Follow-Up                       0              14               0
        Delay-Req                      12               0               0
        Delay-Resp                      0              10               7
        Pdelay-Req                      0               7               0
        Pdelay-Resp                     0               0               0
        Pdelay-Resp-Follow-Up           0               0               0
        Signaling                       2               1               0
        Management                      0               0               0
        Other                           0               3              12
                                    -----           -----           -----
        TOTAL                          15              98              24
```

Example

The following displays the packet counters for the location 0/2/cpu0 for the GigabitEthernet0/2/0/1 interface:

```
Router# show ptp packet-counters location 0/2/cpu0

     Packets                     Sent        Received         Dropped
        ------------------------------------------------------------------
        Announce                 1735             101              52
        Sync                     3753              32               5
        Follow-Up                3751              32               7
        Delay-Req                   0            4073             108
        Delay-Resp               4073               0               0
        Pdelay-Req                  0               7               0
        Pdelay-Resp                 0               0               0
        Pdelay-Resp-Follow-Up       0               0               0
        Signaling                  73              18               0
        Management                  0               0               0
        Other                       0               3             218
                                -----           -----           -----
        TOTAL                   13385            4266             390

        Drop Reason                                    Drop Count
        ---------------------------------------------------------
        Not ready for packets                                289
        Wrong domain number                                   71
        Packet too short                                       1
        Local packet received, same port number                7
        Local packet received, higher port number             11
        Local packet received, lower port number              11
        No timestamp received with packet                      0
        Zero timestamp received with packet                    0
                                                           -----
    TOTAL
```

show ptp unicast-peers

To display information on the peers to which Precision Time Protocol (PTP) is sending unicast messages, use the **show ptp unicast-peers** command in EXEC mode.

show ptp unicast-peers *interface*

Syntax Description

interface	Displays information for the specified interface.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

Example

The following example shows PTP unicast peer information for the GigabitEthernet0/2/0/1 interface:

```
Router# show ptp unicast-peers GigabitEthernet0/2/0/1

Interface GigabitEthernet0/2/0/1:
    IPv4-address 1.2.3.4
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    IPv4-address 1.2.3.5
      Announce granted:   every 1 second,   400 seconds
    IPv4-address 1.2.3.6
      Delay-Resp granted: 16 per second,    600 seconds
```

Example

The following example shows PTP unicast peer information for all interfaces:

```
Router# show ptp unicast-peers

Interface GigabitEthernet0/2/0/1:
    IPv4-address 1.2.3.4
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    IPv4-address 1.2.3.5
      Announce granted:   every 1 second,   400 seconds
```

```
    IPv4-address 1.2.3.6
      Delay-Resp granted: 16 per second,    600 seconds

Interface GigabitEthernet0/3/0/2:
    Mac-address 00b0.4a6b.f4fc
      Announce granted:   every 2 seconds,  600 seconds
      Sync granted:       16 per second,    600 seconds
      Delay-Resp granted: 16 per second,    600 seconds
    Mac-address 00b0.4a6b.f4fd
      Announce granted:   every 1 second,   400 seconds

Interface GigabitEthernet0/3/0/3:
    No known peers
```

source IPv4 address

To specify the source IPv4 address to use when sending IPv4 packets, use the **source ipv4 address** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

source ipv4 address *address*

Syntax Description

address	Specifies an IPv4 address.

Command Default

None

Command Modes

Interface PTP configuration

PTP profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **source ipv4 address** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it is also used in the interface PTP configuration mode to set the source IPv4 address for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example specifies the source IPv4 address 10.10.10.4 for PTP packets:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# source ipv4 address 10.10.10.4
```

The following example overrides the source IPv4 address in the profile and sets it to be 10.10.10.6 for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
ROuter(config-if-ptp)# source ipv4 address 10.10.10.6
```

sync

To configure settings for PTP sync messages, use the **sync** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

sync { **frequency** *frequency* | **grand-duration** *duration* | **timeout** *timeout* | **interval** *interval* }
no sync

Syntax Description

frequency *frequency*	Specifies multiple sync messages per second (2, 4, 8, 16, 32, 64, or 128). Frequency of 4 means that four messages are sent per second.
interval*interval*	Specifies one or fewer sync messages per second (every 1, 2,4, 8, or 16 seconds). Interval of 2 means that a sync message is sent every two seconds.
grant-duration *duration*	Specifies the announce grant duration (60-1000 seconds). If the port is in the slave state, this is the grant that is requested. If the port is in the master state, this is the maximum grant that is allowed.
timeout *timeout*	Specifies the time after which the sync message times out (100-10000 milliseconds).

Command Default

Defaults: interval 1, timeout 5000

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **sync** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it is used in the interface PTP configuration mode to set the sync value for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the PTP sync timeout to 2000 milliseconds:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# sync timeout 2000
```

The following example overrides the sync frequency value in the profile and sets it to be 32 per second frequency for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# sync frequency 32
```

time-of-day

To set the priority used by Precision Time Protocol (PTP) when selecting between PTP and other sources for time-of-day on the router (for example GPS), use the **time-of-day** command in PTP configuration mode. To remove, use the **no** form of this command.

time-of-day priority *number*
no time-of-day

Syntax Description

priority	*number*	Specifies the time of day priority to rank a foreign PTP grand master against other time sources, such as GPS (1-254).

Command Default

The default is priority 100.

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

NA

The following example sets the time of day priority to 200:

```
Router(config)# ptp
Router(config-ptp)# time-of-day priority 200
```

timescale

To set the time scale to use when advertising time for Precision Time Protocol (PTP), use the **timescale** command in PTP clock configuration mode. To remove, use the **no** form of this command.

timescale {**ARB** | **PTP**}
no timescale

Syntax Description

ARB	Specifies ARB (arbitrary) time.
PTP	Specifies PTP time.

Command Default

The default value is derived from platform default PTP properties.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

Use this command to override the platform value, if needed.

Example

The following example sets the time scale to ARB:

```
Router(config)# ptp
Router(config-ptp)# clock
Router(config-ptp-clock)# timescale ARB
```

time-source

To set the time source advertised in announcement messages by the local clock for Precision Time Protocol (PTP), use the **time-source** command in PTP clock configuration mode. To remove, use the **no** form of this command.

time-source *source*
no time-source

Syntax Description

source	Specifies the type of time source to advertise for the internal clock: GPS, NTP, PTP, atomic-clock, handset, internal oscillator, other, or terrestrial radio.

Command Default

The default is the value that is specified by the platform internal oscillator.

Command Modes

PTP clock configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

Use this command to override the platform value, if needed, using any of the time-source values specified in the IEEE 1588-2008 standard.

Example

The following example sets the time source to PTP:

```
Router(config)# ptp
Router(config-ptp)# clock
Router(config-ptp-clock)# time-source ptp
```

transport

To specify the PTP transport type, use the **transport** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

transport {**ethernet** | **ipv4** | **ipv6** }
no transport

Syntax Description

ethernet	Specifies that Ethernet is used as the transport type on the interface.
ipv4	Specifies IPv4 is used as the transport type on the interface
ipv6	Specifies IPv6 is used as the transport type on the interface

Command Default

None

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **transport** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it is used in the interface PTP configuration mode to set the transport type for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

Example

The following example sets the transport type to be Ethernet:s

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# transport ethernet
```

The following example overrides the transport type in the profile and sets it to be IPv4 for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# transport ipv4
```

uncalibrated-clock-class

To configure the clock-class that is advertised when PTP is in ACQUIRING state and the interface is connected to the Best Master is in Uncalibrated state, use the **uncalibrated-clock-class** command in the PTP configuration mode. To remove, use the **no** form of this command.

uncalibrated-clock-class *class*

Syntax Description

class	Indicates the advertised clock-class when PTP is in ACQUIRING state. The range is 0–255.

Command Default

The default clock class can be obtained from the platform properties.

Command Modes

PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

This command is used to override the platform value, if needed.

Example

The following example configures the clock class to 255:

```
Router(config)# ptp
Router(config-ptp)# uncalibrated-clock-class 255
```

unicast-grant invalid-request

To specify whether unicast grant requests with unacceptable parameters are denied or granted with reduced parameters, use the **unicast-grant invalid-request** command in PTP profile configuration or interface PTP configuration mode. To remove, use the **no** form of this command.

unicast-grant invalid-request { **deny** | **reduce** }
no unicast-grant invalid-request

Syntax Description

deny	Indicates that unicast grant requests with unacceptable parameters are denied. For example, assume that a request for a grant is received with a packet interval of 1 per second and duration of 600 seconds, and that the maximum packet interval is 2 per second and duration is 500 seconds. If **deny** is configured, the grant will be denied.
reduce	Indicates that unicast grant requests with unacceptable parameters are granted with reduced parameters. For example, assume that a request for a grant is received with a packet interval of 1 per second and duration of 600 seconds. The maximum packet interval is 2 per second and duration is 500 seconds. If **reduce** is configured, a grant with packet interval of 2-per-second and duration of 500 seconds will be granted.

Command Default

The default is **reduce**.

Command Modes

PTP profile configuration

Interface PTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced on the Cisco NCS 5500 Series Routers.

Usage Guidelines

The **unicast-grant invalid-request** command is used configure the global PTP configuration profile which is then associated with many interfaces. Similarly, it is used in the interface PTP configuration mode to set the unicast-grant invalid-request value for a specific interface. Any values set in the interface PTP configuration mode override the settings in the PTP configuration profile associated with the interface.

The following example determines that unicast grant requests with unacceptable parameters are granted with reduced parameters:

```
Router(config)# ptp
Router(config-ptp)# profile p1
Router(config-ptp-profile)# unicast-grant invalid-request reduce
```

The following example overrides the unicast grant value in the profile and sets it to be deny for the interface:

```
Router(config)# interface TenGigE 0/0/0/10
Router(config-if) ptp
```

```
Router(config-if-ptp)# profile p1
Router(config-if-ptp)# unicast-grant invalid-request deny
```

virtual-port

To configure a virtual port using Precision Time Protocol (PTP), use the **virtual-port** command in PTP configuration mode or interface PTP configuration mode. To remove, use the **no** form of this command.

virtual-port { *clock accuracy* | *clock class* | *offset log scaled variance* | *priority1* | *priority2* | *gm-threshold-breach* }
no virtual-port

Syntax Description

clock accuracy *clock accuracy*	Specifies the clock-accuracy value to use for the peer clock.
clock class *clock class*	Specifies the clock class mapping for use.
offset log scaled variance*offset log scaled variance*	Specifies the Offset Scaled Log Variance (OSLV) value to use for the peer clock.
priority 1 *timeout*	Specifies the priority1 value to use for the peer clock.
priority 2	Specifies the priority2 value to use for the peer clock.
gm-threshold-breach	Specifies the threshold value for the Time of Day (ToD) offset between the virtual port and best PTP timeTransmitter. If the offset passes the threshold, the router provides a notification in the form of a syslog message.

Command Default

None

Command Modes

PTP configuration

Command History

Release	Modification
Release 6.1.2	This command was introduced on the Cisco NCS 5500 Series Routers.

Command History

Release	Modification
Release 24.4.1	The **gm-threshold-breach** keyword was introduced in the PTP virtual port command.
Release 6.6.25	This command was introduced on the Cisco NCS 560 Series Routers.
Release 6.3.2	This command was introduced on the Cisco NCS 540 Series Routers.

Usage Guidelines

Precision Time Protocol (PTP) profile is a configuration template that is applied to multiple interfaces. From PTP profile configuration mode, the following PTP profile configuration commands are available:

Example

The following example shows how to configure the profile tp128:

```
Router(config)# ptp
Router(config-ptp)# virtual-port
Router(config-ptp-vp)#clock accuracy
Router(config-ptp-vp)#clock class
Router(config-ptp-vp)#offset log scaled variance
Router(config-ptp-vp)#priority1
Router(config-ptp-vp)#priority2
```

Zero Touch Provisioning (ZTP) Commands

This chapter describes the commands that can be used to manually invoke Zero Touch Provisioning (ZTP).

Manually invoking ZTP helps you to provision the router in stages and it is ideal to test configurations without having to restart a router.

For more information about ZTP, see ZTP chapter in the *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

ztp bootz-server

To store the bootstrap server information that the router receives from the Bootz server during the initial boot process, use the **ztp bootz-server** command in XR Config mode.

When the standby control cards or line cards are inserted dynamically on the router, the ZTP-Bootz workflow uses this server information to communicate with the Bootz server and obtain the ownership vouchers for the standby control cards or line cards based on the serial number of the cards.

ztp bootz-server ip *ip-address* **port** *port* { **trust-anchor** *trust-anchor* }

Syntax Description

ip *ip-address*	Specifies the IPv4 or IPv6 address or hostname of the Bootz server.
port *port*	Specifies the port number of the Bootz server.
trust-anchor *trust-anchor*	Specifies the trust anchor certificate path for the Bootz server.

Command Default

No default behavior or values

Command Modes

XR Config mode

Command History

Release	Modification
Release 24.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Examples

This example shows how to configure the **ztp bootz-server** command by providing the trust anchor certificate path for the Bootz server.

```
RP/0/RP0/CPU0:ios(config)#ztp bootz-server ip 1.1.1.1 port 5000 trust-anchor
/misc/disk1/ta.cert
```

This example shows the stored server information.

```
RP/0/RP0/CPU0:ios#show running-config ztp
Thu Aug 29 12:35:07.013 IST
ztp
 bootz-server ip 1.1.1.1 port 5000 trust-anchor /misc/disk1/ta.cert action none
!
```

ztp breakout

Manual Zeo Touch Provisioning (ZTP) invocation using CLI commands allows ZTP to run over more interfaces.

To invoke platform interface discovery before invoking DHCP, use the **ztp breakout** command in EXEC mode.

.

ztp breakout [debug] [verbose]{[nosignal-stay-in-breakout-mode] | [nosignal-stay-in-state-noshut] | [hostname] | [apply *configuration* **]}**

Syntax Description

debug	Run with additional logging to the console(cisco-support)
verbose	Run with logging to the console(cisco-support).
apply *configuration*	XR configuration commands to apply(cisco-support)
hostname	XR hostname to set(cisco-support)
nosignal-stay-in-breakout-mode	On no signal, prefer interfaces to remain in breakout mode(cisco-support)
nosignal-stay-in-state-noshut	On no signal, prefer interfaces to be noshut(cisco-support)

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **ztp breakout** command to perform a 4x10 breakout detection on all 40 Gigabit ports. By default if no link is detected on any of the four 10Gigabit interfaces, the port will remain in 40 Gig mode. The **nosignal-stay-in-breakout-mode** argument will force the port in breakout mode when all breakout interfaces from the same physical port have no signal locked, and place the four 10Gigabitinterfaces in shutdown mode. The **nosignal-stay-in-state-noshut** argument will leave the port in breakout mode and place the four 10Gigabit interfaces in no shutdown mode.

No progress logs are shown by default, although there will be XR syslogs for important events. If you wish to see more logs, add **verbose** after the **ztp terminate** command. If these logs are not enough, add **debug** before **verbose**.

Logs can be found in **disk0:/ztp/ztp.log**.

ztp clean

Manual Zeo Touch Provisioning (ZTP) invocation using CLI commands allows ZTP to run over more interfaces.

To remove all Zero Touch Provisioning (ZTP) logs and settings saved on disk, use the **ztp clean** command in EXEC mode.

ztp clean [debug] [verbose]

Syntax Description

debug	Run with additional logging to the console(cisco-support).
verbose	Run with logging to the console(cisco-support)

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

If you wish to run ZTP as if from a clean boot, use the **ztp clean** command to remove all ZTP logs and settings. Use **commit replace** to reload, and then ZTP will run again as if from first boot.

No progress logs are shown by default, although there will be XR syslogs for important events. If you wish to see more logs, add **verbose** after the **ztp clean** command. If these logs are not enough, add **debug** before **verbose**.

Logs can be found in **disk0:/ztp/ztp.log**.

This example shows how to remove all ZTP files saved on disk:

```
RP/0/RP0/CPU0:router#ztp clean verbose
Mon Oct 10 17:03:43.581 UTC
Remove all ZTP temporary files and logs? [confirm] [y/n] :y
All ZTP files have been removed.
If you now wish ZTP to run again from boot, do 'conf t/commit replace' followed by reload.
```

ztp initiate

To invoke a new ZTP DHCP session, use the **ztp initiate** command in EXEC mode.

ztp initiate {[apply *configuration* **]** | **[dataport]** | **[dhcp4]** | **[dhcp6]** | **[dhcp4-client-identifier]** | **[dhcp6-client-identifier]** | **[dscp** *value* **]** | **[dscp6** *value* **]** | **[hostname]** | **[interface]** | **[management]** | **[noprompt]} [debug] [verbose]**

Syntax Description

debug	Run with additional logging to the console(cisco-support)
verbose	Run with logging to the console(cisco-support)
apply *configuration*	XR configuration commands to apply(cisco-support)
dataport	Send DHCP requests on all ADMIN UP physical LC interfaces.
dhcp4	Send only DHCP IPv4 requests(cisco-support)
dhcp6	Send only DHCP IPv6 requests(cisco-support)
dhcp4-client-identifier	Override default dhcp-client-identifier(cisco-support)
dhcp6-client-identifier	Override default dhcp6-client-id(cisco-support)
dscp *value*	DSCP/Prec Value(cisco-support)
dscp6 *value*	DSCP6/Prec Value(cisco-support)
hostname	XR hostname to set(cisco-support)
interface	Send DHCP requests only on the given interface(cisco-support)
management	Send DHCP requests on the platforms management interface(cisco-support)
noprompt	Run without prompting(cisco-support)

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **ztp initiate** command to forceably inititate the ZTP, ignoring username configuration. **ztp initiate** allows the execution of a script even when the system has already been configured. This command is useful for testing ZTP without forcing a reload. This command is particularly useful to test scripts or if some manual operations are required before provisioning the box. **ztp initiate** can specify any data interfaces and management interface on the system to be used for the whole ZTP process. If you don't specify an interface, ztp will be invoked on management interface only.

No progress logs are shown by default, although there will be XR syslogs for important events. If you wish to see more logs, add **verbose** after the **ztp initiate** command. For more details, add **debug** before **verbose**.

Logs can be found in **disk0:/ztp/ztp.log**.

Example

This example shows how to bring up the interface manually:

```
RP/0/RP0/CPU0:router#ztp initiate debug verbose interface TenGigE 0/0/0/0
Invoke ZTP? (this may change your configuration) [confirm] [y/n] :
```

This example shows how to get rid of the prompting:

```
RP/0/RP0/CPU0:router#ztp initiate noprompt
Mon Jun 27 20:40:10.353 UTC
ZTP will now run in the background.
Please use "show logging" or look at /disk0:/ztp/ztp.log to check progress.
```

This example shows how to invoke the breakout discovery and ZTP, ZTP is invoked on the interfaces which are up:

```
RP/0/RP0/CPU0:router# ztp breakout debug verbose
RP/0/RP0/CPU0:router# ztp initiate dataport debug verbose
Invoke ZTP? (this may change your configuration) [confirm] [y/n] :
```

ztp terminate

To terminate all existing Zero Touch Provisioning (ZTP) processes, use the **ztp terminate** command in EXEC mode.

ztp terminate [debug] [verbose] [noprompt]

Syntax Description

debug	Run with additional logging to the console(cisco-support).
verbose	Run with logging to the console(cisco-support)
noprompt	Run without prompting(cisco-support)

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

If you want to terminate an already running ZTP process, use the **ztp terminate** command. Be careful to use the **ztp terminate** command because unproperly usage of this command may leave your system in a partially configured state.

No progress logs are shown by default, although there will be XR syslogs for important events. If you wish to see more logs, add **verbose** after the **ztp terminate** command. If these logs are not enough, add **debug** before **verbose**.

Logs can be found in **disk0:/ztp/ztp.log**.

Note Unproperly cleanup of the interface IP configuration in Linux in the XR namespace may cause the same IP present in the global Virtual Routing and Forwarding (VRF) and XR namespace at the same time.

Example

This example shows how to terminate the ZTP sessions in progress:

```
RP/0/RP0/CPU0:router#ztp terminate verbose
Mon Oct 10 16:52:38.507 UTC
Terminate ZTP? (this may leave your system in a partially configured state) [confirm] [y/n]
 :y
ZTP terminated
```

Software Package Management Commands

This chapter describes the Cisco IOS XR commands used to add packages to a router storage device, activate or deactivate packages, upgrade or downgrade existing packages, and display information about packages.

For detailed information about the concepts and tasks necessary to manage Cisco IOS XR software see .

show zapdisk locations

To display location information where zapdisk operation is supported, use the **show zapdisk locations** command in XR EXEC mode.

show zapdisk locations [*output-modifiers* { **begin** *line* | **exclude** *line* | **file** | **include** *line* | **utility** *line* }]

Syntax Description

output-modifiers **begin** *line*	(Optional) Displays information from the line that matches to the given content. For example, if you want to display the running configuration starting from the interface configurations, you can enter as **| begin interface**.
output-modifiers **exclude** *line*	(Optional) Displays information by filtering out lines that contain the given content. For example, if you want to view a configuration but skip all lines that mention "interface", you can enter as **| exclude interface**.
output-modifiers **include** *line*	(Optional) Displays information that includes the content that you have given. For example, if you want to view lines that contain the word "interface" within a configuration, you can enter as **| include interface**.
output-modifiers **utility** *line*	(Optional) Specifies various Unix command-line tools to manipulate or analyze the command's output. For example, if you want to sort the output of a command alphabetically, you can enter as **| utility sort**.

output-modifiers **file**	(Optional) Saves the information to a specific file. For example, if you want save information to a perticular file, you can enter as **`| file filename vrf vrfname`**. You can save the content in the following locations: • *filename* - Save the output to a specified filename in VRF. • *append* - Add the output to the end of an existing file. • *config* - Save the output to the device's configuration. • *disk0* - Store the output on the device's disk0 storage. • *ftp* - Transfer and save the output to an FTP server. • *harddisk* - Save the output to the device's internal hard disk. • *http* - Send the output to an HTTP server. • *https* - Send the output to an HTTPS server. • *rootfs* - Save the output to the root file system of the device. • *scp* - Securely copy the output to a remote server using SCP. • *sftp* - Securely transfer the output to a remote server using SFTP. • *tftp* - Transfer the output to a TFTP server.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
root-lr	Execute

The following example shows sample output from the **show zapdisk locations** command:

```
Router# show zapdisk locations
0/RP1     Fully qualified location specification
0/7        Fully qualified location specification
0/4        Fully qualified location specification
all        all locations
```

zapdisk start location

To erase data from the disk memory of RSPs and line cards, use the **zapdisk start location** command in XR EXEC mode.

zapdisk start location *node-id*

Syntax Description

location *node-id*	Specifies the node location or all node locations. The node-id argument is entered in the rack/slot/module notation. Displays the information about a specific node.

Command Default

Disabled.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

After the command is executed, the card is shut down. Do not reload the card.

Caution This command should not be used during normal operation of the router. The command should be used only when you have planned to delete the data from the card during return material authorization (RMA).

Task ID

Task ID	Operations
root-lr	Execute

The following example shows how to erase data from the line card location 0/4:

```
Router# zapdisk start location 0/4
Action on designated location is in progress, more detail logs will be located in sysadmin
 at
/misc/disk1/tftpboot/zapdisk.log once action is completed
```

install activate

To add software functionality to the active software set, use the **install activate** command in XR EXEC mode.

install activate { *package-name* | **id** *id-number* | **issu** [*package-name* | **abort** | **auto-abort-cleanup** | **cleanup** | { **id** *id-number* } | **load** | **noprompt** | **run**] | **nooptim** | **noprompt** | **process-restart** | **reload** | **synchronous** } [**replace** | **restrict-release**]

Syntax Description

package name	Specifies the package name. **Note** Multiple packages can be activated at one time. Up to 64 packages can be specified in a single **install activate** command. However, the number of packages is limited based on the length of the character entered. The character length should not exceed 1024.
id *id-number*	Specifies the ID number of an **install add** operation. The command activates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.
issu	Performs an in-service software upgrade.
nooptim	Executes install operation in traditional mode.
noprompt	(Optional) Sets Yes to any response prompted from an install operation when this keyword is used in the command. **Note** The command functionality remains unaltered even if the keyword is not specified.
process-restart	Restarts the process.
reload	Reloads the process.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.
abort	(Optional) Specifies abort operation
auto-abort-cleanup	(Optional) Specifies an auto abort cleanup of the v2 nodes if an abort occurs.
cleanup	(Optional) Specifies cleanup operation.
load	(Optional) Specifies interactive mode load operation.
run	(Optional) Specifies run operation.

replace	(Optional) Replaces the active packages with the ones provided in this command.
restrict-release	(Optional) Doesn't allow packages from other releases.

Command Default

If the **install prepare** command was not executed prior to **install activate**, executing the **install activate** command without any keywords aborts the process.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **install activate** command to activate software packages or SMUs for all valid cards. Information within the package is used to verify compatibility with the target cards and with the other active software. Actual activation is performed only after the package compatibility and application program interface (API) compatibility checks have passed.

Specifying Packages to Activate

You can either use the **id** *id-number* keyword and argument to activate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Upgrading and Downgrading Packages

- To upgrade a package, activate the later version of the package; the earlier version is automatically deactivated.
- To downgrade a package, activate the earlier version of the package; the later version is automatically deactivated.

Note Activating a Software Maintenance Update (SMU) does not cause any earlier SMUs, or the package to which the SMU applies, to be automatically deactivated.

Activating a Package for All Secure Domain Routers

To activate a package for all secure domain routers (SDRs) in the system, use the **install activate** command in XR EXEC mode.

Activating New Versions of the Currently Active Packages

Use the **install activate** command with the **if-active** keyword to activate the package only on SDRs where an earlier version of the package is already active. This command is available only in XR EXEC mode.

The **if-active** keyword is used only for optional packages or SMUs for optional packages.

Router Reloads Following Package Activation

If the activation requires a reload of the SDR, a confirmation prompt appears. Use the **install activate** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the package activation. The router reloads if required.

Node Reloads Following Package Activation

If a software operation requires a node reload, the config-register for that node should be set to autoboot. If the config-register for the node is not set to autoboot, the system automatically changes the setting and the node reloads. A message describing the change is displayed.

Synchronous Mode

Use the **install activate** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

When the **install activate** command is run in asynchronous mode, the system may stay in synchronous mode for a short period of time while the system checks for questions to ask the user.

Press **Ctrl-C** during a synchronous operation to abort the operation or make the operation asynchronous.

Auto-abort Option

Use the **auto-abort-timer** keyword to provide a safety mechanism for the instance that a package is activated and access to the router is lost. This option automatically rolls back to the current committed loadpath, thereby undoing any changes that are activated with the **install activate** command. After the installation, if the activated software is working correctly, use the **install commit** command to cancel the timer and commit the new loadpath.

Note The changes made to the active software set are not persistent during route processor (RP) reloads. Use the **install commit** command to make changes persistent.

ISSU

Note the following prerequisites before activating software packages using ISSU:

Note the following restrictions regarding ISSU:

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

The following example shows how to activate a package that was installed in an **install add** operation that was assigned install operation id 2:

```
Router# install activate id 2

Install operation 3 '(admin) install activate id 2' started by user 'lab' via
CLI at 01:10:21 UTC Thu Jan 03 2010.
Info:     This operation will activate the following package:
Info:         disk0:-mcast-p-4.0.0
Info:     Install Method: Parallel Process Restart
The install operation will continue asynchronously.
Info:     The changes made to software configurations will not be persistent
Info:     across system reloads. Use the command '(admin) install commit' to
Info:     make changes persistent.
Info:     Please verify that the system is consistent following the software
Info:     change using the following commands:
Info:         show system verify
Info:         install verify packages
Install operation 3 completed successfully at 01:11:30 UTC Thu Jan 03 2008.
```

The following example shows how to activate a package on all nodes. Use the **install commit** command to make the changes persistent across DSDRSC reloads.

```
Router# install activate disk0:-mpls-4.0.0 synchronous

Install operation 15 'install activate disk0:-mpls-p-4.0.0 synchronous'
started by user 'user_b' at 19:15:33 UTC Sat Apr 08 2010.
Info:     The changes made to software configurations will not be persistent
Info:     across system reloads. Use the command 'admin install commit' to make
Info:     changes persistent.
Info:     Please verify that the system is consistent following the software
Info:     change using the following commands:
Info:         show system verify
Info:         install verify
Install operation 15 completed successfully at 19:16:18 UTC Sat Apr 08 2010.

Router# install commit

Install operation 16 'install commit' started by user 'user_b' at 19:18:58 UTC
Sat Apr 08 2006.
Install operation 16 completed successfully at 19:19:01 UTC Sat Apr 08 2010.
```

The following example shows how to activate multiple software packages using the wildcard syntax:

```
Router# install activate disk0:*4.0*

Install operation 2 '(admin) install activate disk0:*4.0*' started
  by user 'user_a' via CLI at 04:30:01 PST Fri Dec 28 2009.
    Info:     This operation will activate the following packages:
    Info:         disk0:asr9k-fwdg-4.0.0
    Info:         disk0:asr9k-admin-4.0.0
    Info:         disk0:asr9k-fpd-4.0.0
    Info:         disk0:asr9k-diags-4.0.0
    Info:         disk0:asr9k-mgbl-4.0.0
    Info:         disk0:asr9k-mpls-4.0.0
    Info:         disk0:asr9k-mcast-4.0.0
    Info:         disk0:asr9k-k9sec-4.0.0
    Warning:  The following packages are already active on the specified nodes:
    Warning:      asr9k-admin-4.0.0
    Warning:      asr9k-fwdg-4.0.0
    Warning:  Please check:
    Warning:   - check the name of the packages being activated.
```

```
Warning:   - check the set of active packages using 'show install active'.
Info:     Install Method: Parallel Process Restart
Info:     The changes made to software configurations will not be
 persistent across     system reloads. Use the command '(admin)
Info:     install commit' to make changes persistent.
Info:     Please verify that the system is consistent following the
 software change     using the following commands:
Info:         show system verify
Info:         install verify packages
Install operation 2 completed successfully at 04:32:01 PST Fri Dec 28 2009.
```

install add source

To copy the contents of a package installation envelope (PIE) file to a storage device, use the **install add** command in XR EXEC mode.

install add source *source-path* { **tftp** | **harddisk** | **sftp** | **ftp** | **http** | **https** | **ftp** } *source-path* { *pakage-name* | **vrf** } [**nooptim** | **synchronous**]

Syntax Description

source *source-path*	(Optional) Specifies the source location of the PIE files to be appended to the PIE filenames. Location options are as follows: • **disk0:** • **disk1:** • **compactflash:** • **harddisk:** • **ftp:**//*username* **:** *password*@*hostname* or *ip-address*/*directory-path* • **rcp:**//*username*@*hostname* or *ip-address*/*directory-path* • **tftp:**//*hostname* or *ip-address*/*directory-path* • **http:**//*hostname* or *ip-address*/*directory-path* • **https:**//*hostname* or *ip-address*/*directory-path* • **https:**//*username* **:** *password*@*ip-address*/*directory-path*
package name	Enter the package name(s) separated by space. Example: tftp://server/directory/ file1 file2 file3
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.
nooptim	(Optional) This mode doesn't optimise install add operation.

Command Default

Packages are added to the storage device, but are not activated.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **install add** command to unpack the package software files from a PIE file and copy them to the boot device (usually disk0:) .

From Cisco IOS XR Software Release 6.0.1 onwards, you must use a forward slash ('/') to the source location of the PIE file while using **install add** command. For example, instead of **install add harddisk:***file*, use **install add harddisk:/***file*.

Synchronous Mode

Use the **install add** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

TFTP Services and Image Size

Some Cisco IOS XR images may be larger than 32 MB, and the TFTP services provided by some vendors may not support a file this large. If you do not have access to a TFTP server that supports files larger than 32 MB:

- Download the software image using FTP or rcp.
- Use a third-party or freeware TFTP server that supports file sizes larger than 32 MB.

Adding Multiple Packages

To add multiple PIE files, use the **source** keyword to specify the directory path location of the PIE files. Then list all the PIE filenames, as necessary. This alleviates the need to repeat the directory location for each PIE file. Up to 32 files can be added, of which 16 can be tar files.

Following is an example of the **install add** command using the **source** keyword:

```
Router# install add source tftp://192.168.201.1/images/myimages/comp-mini.pie
```

In the previous example, three PIE files are added from the following locations:

- tftp://192.168.254.254/images/user/mcast-p.pie
- tftp://192.168.254.254/images/user/pies/mpls-p.pie
- ftp://1.2.3.4/other_location/mgbl-p.pie

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

The following example shows how to add a PIE file for all SDRs in the system. In the following example, a Multiprotocol Label Switching (MPLS) package is added in synchronous mode. This operation copies the files required for the package to the storage device. This package remains inactive until it is activated with the **install activate** command.

```
Router# install add tftp://209.165.201.1/mpls.pie synchronous

Install operation 4 'install add /tftp://209.165.201.1/mpls.pie synchronous'
  started by user
'user_b' at 03:17:05 UTC Mon Nov 14 2005.
Info:     The following package is now available to be activated:
Info:
Info:         disk0:mpls-3.3.80
Info:
Install operation 4 completed successfully at 03:18:30 UTC Mon Nov 14 2005.
```

install commit

To save the active software set to be persistent across designated system controller (DSC) reloads, use the **install commit** command in XR EXEC mode.

install commit [**sdr** | **synchronous**]

Syntax Description

sdr	(Optional) Commits the active software set for a specific SDR. The *sdr-name* argument is the name assigned to the SDR.
synchronous	Executes install operation in synchronous mode.

Command Default

None.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When a package is activated, it becomes part of the current running configuration. To make the package activation persistent across designated secure domain router shelf controller (DSDRSC) reloads, enter the **install commit** command. On startup, the DSDRSC of the SDR loads this committed software set.

If the system is restarted before the active software set is saved with the **install commit** command, the previously committed software set is used.

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

The following example shows how to make the current active software set persistent across DSDRSC reloads for all SDRs in the system:

```
Router# install commit

Install operation 16 'install commit' started by user 'user_b' at 19:18:58 UTC
Sat Apr 08 2006.
Install operation 16 completed successfully at 19:19:01 UTC Sat Apr 08 2006.
```

install deactivate

To remove a package from the active software set, use the **install deactivate** command in XR EXEC mode.

install deactivate { *package-name* | **id** *id-number* | **issu** [*package-name* | **abort** | **auto-abort-cleanup** | **cleanup** | { **id** *id-number* } | **load** | **noprompt** | **run**] | **process-restart** | **reload** | **superseded** { **synchronous** } }

Syntax Description

id *id-number*	Specifies the ID number of an **install add** operation. The command deactivates all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified.
package name	Specifies the package name. Press **?** after a partial package name to display all possible matches available for activation. If there is only one match, press [TAB] to fill in the rest of the package name. Up to 32 packages can be specified.
auto-abort-cleanup	(Optional) Specifies an auto abort cleanup of the v2 nodes if an abort occurs.
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.
superceded	Deactivates the superceded packages.
abort	(Optional) Specifies ISSU abort operation
cleanup	(Optional) Specifies ISSU cleanup operation.
load	(Optional) Specifies ISSU interactive mode load operation.
run	(Optional) Specifies ISSU run operation.
noprompt	(Optional) Sets Yes to any response prompted from an install operation when this keyword is used in the command. **Note** The command functionality remains unaltered even if the keyword is not specified.
process-restart	Restarts the process.
reload	Reloads the process.

Command Default

The **install deactivate** operation is performed in asynchronous mode: The command runs in the background, and the router prompt is returned as soon as possible.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Deactivating a package removes the activated package from the active software set from all nodes or from a single node. When a deactivation is attempted, the system runs an automatic check to ensure that the package is not required by other active packages. The deactivation is permitted only after all compatibility checks have passed.

The following conditions apply to software deactivation:

- A feature package cannot be deactivated if active packages need it to operate.
- To downgrade a package, activate the earlier version. The later package version is deactivated automatically.

Specifying Packages to Deactivate

You can either use the **id** *add-id* keyword and argument to deactivate all packages that were added in one or more specific **install add** operations, or specify packages by name. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Router Reloads

If the deactivation requires a router reload, a confirmation prompt appears. Use the **install deactivate** command with the **prompt-level none** keywords to automatically ignore any reload confirmation prompts and proceed with the package deactivation. The router reloads if required.

Node Reloads

If a software operation requires a node reload, the config-register for that node should be set to autoboot. If the config-register for the node is not set to autoboot, then the system automatically changes the setting and the node reloads. A message describing the change is displayed.

Synchronous Operation

Use the **install deactivate** command with the **synchronous** keyword to complete the operation before the prompt is returned. A progress bar indicates the status of the operation. For example:

```
- 1% complete: The operation can still be aborted (ctrl-c for options)
\ 10% complete: The operation can still be aborted (ctrl-c for options)
```

Auto Abort Option

Use the **auto-abort-cleanup** keyword to provide a safety mechanism for the instance that a package is deactivated and for some reason access to the router is lost. This option automatically rolls back to the current committed loadpath, thereby undoing any changes that are deactivated with the **install deactivate** command. After the installation, if the activated software is working correctly, use the **install commit** command to cancel the timer and commit the new loadpath.

Use the **install commit** command to make changes persistent across route processor (RP) reloads.

Superceded SMUs

When you install a reload SMU which supercedes the existing SMU the router reboots and SMU is placed in the superceded list automatically. If the superceded reload SMU is deactivated and fully supercedes the existing SMU, then router will not reboot when you run the **install deactivate superceded** command

These prerequisites must be met before you can perform ISSU:

- You must have enough disk space for V1 and V2 images, PIEs and SMUs. This prerequisite is no different than that of a non-ISSU downgrade.
- Cisco recommends that you do a backup of the ASCII configuration before each downgrade.

Note the following restrictions regarding ISSU:

- Refer to your release notes for a complete list of hardware that cannot be deactivated during the ISSU process. If you have any non-supported hardware running in your system, the deactivated process automatically shuts them down and reloads them after the deactivation is complete.
- Ethernet OAM flaps after an ISSU deactivation.
- ISSU is not supported on the NV cluster set-up.

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

To deactivate all the fully superceded SMUs, use the install deactivate superceded command.

```
Router# install deactivate superceded
```

The following example shows how to deactivate a package on all supported nodes. The operation is performed in synchronous mode.

```
Router# install deactivate
disk0:-mpls-3.8.0 synchronous

Install operation 14 'install deactivate disk0:-mpls-3.8.0 synchronous'
started by user 'user_b' at 18:38:37 UTC Sat Apr 08 2006.
Info:     The changes made to software configurations will not be persistent
Info:     across system reloads. Use the command 'admin install commit' to make
Info:     changes persistent.
Info:     Please verify that the system is consistent following the software
Info:     change using the following commands:
Info:         show system verify
Info:         install verify
Install operation 14 completed successfully at 18:39:20 UTC Sat Apr 08 2006.
```

The following example shows how to deactivate a package, pausing the operation before locking the configuration for the actual software deactivation. While the operation is paused, you can enter a configuration mode and perform configurations. When you want to complete the operation, you enter the **install operation** *id* **complete** command or the **install operation** *id* **attach synchronous** command.

```
Router# install deactivate
disk0:comp--3.8.0.07I.CSCsr09575-1.0.0
pause sw-change

Install operation 12 '(admin) install deactivate disk0:comp--3.8.0.07I.CSCsr09575-1.0.0
  pause sw-change' started by user 'admin' via CLI at 09:06:26 BST Mon Jul 07 2008.
Info: This operation will reload the following nodes in parallel:
Info: 0/0/CPU0 (RP) (SDR: Owner)
Info: 0/1/CPU0 (LC(E3-GE-4)) (SDR: Owner)
Info: 0/5/CPU0 (LC(E3-OC3-POS-4)) (SDR: Owner)
Proceed with this install operation (y/n)? [y]
The install operation will continue asynchronously.
RP/0/0/CPU0:ensoft-gsr13(admin)#
Info: Install Method: Parallel Reload
Info: Install operation 12 is pausing before the config lock is applied
  for the software change as requested by the user.
Info: No further install operations will be allowed until the operation
  is resumed.
Info: Please continue the operation using one of the following steps:
Info: - run the command '(admin) install operation 12 complete'.
Info: - run the command '(admin) install operation 12 attach synchronous'
  and then answer the query.
```

install remove

To delete inactive packages from a storage device, use the **install remove** command in XR EXEC mode.

install remove { *package-name* | **id** *id-number* | **inactive** [**all** | **synchronous**] } [**synchronous**]

Syntax Description

id *id-number*	Specifies the ID number of an **install add** operation. The command deletes all packages that were added in the specified **install add** operation. The ID number of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. Up to 16 **install add** operations can be specified
package name	Specifies the package name. **Note** Multiple packages can be removed at the same time. Up to 32 package pairs can be specified.
inactive	Removes all inactive, noncommitted packages from the boot device (usually disk0:).
synchronous	(Optional) Performs the command in synchronous mode. This mode allows the installation process to finish before the prompt is returned.

Command Default

The operation is performed in asynchronous mode: The **install remove** command runs in the background, and the EXEC prompt is returned as soon as possible.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Note Only inactive packages can be removed. (Packages cannot be in the active or committed software set.)

- To remove all inactive packages from the boot device (usually **disk0:**), use the **install remove** command with the **inactive** keyword.
- To remove a specific inactive package from a storage device, use the **install remove** command with the *package name* arguments.

Note When removing all inactive packages from the boot device, use the **show version**, **show install active**, or **show install committed** command to determine the device used as the boot device.

- To remove all packages that were added in one or more specific **install add** operations, use the **id** *id-number* keyword and argument. The operation ID of an **install add** operation is indicated in the syslog displayed during the operation and in the output of the **show install log** command. If you specify packages according to operation ID, all the packages that were added by the specified operation must still be on the router.

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

The following example shows how to remove a specific inactive package. In this example, the operation is run in test mode. The operation is then confirmed and the package is removed.

```
Router# install remove
disk0:-diags-3.7.90 test

Install operation 30 'install remove disk0:-diags-3.7.90 test' started by user 'user_b' at
 23:40:22 UTC Sat Apr 15 2006.
Warning:  No changes will occur due to 'test' option being specified. The
Warning:  following is the predicted output for this install command.
Info:     This operation will remove the following package:
Info:         disk0:-diags-3.7.90
Info:     After this install remove the following install rollback points will
Info:     no longer be reachable, as the required packages will not be present:
Info:         4, 9, 10, 14, 15, 17, 18
Proceed with removing these packages? [confirm] y

The install operation will continue asynchronously.
Install operation 30 completed successfully at 23.
```

The following example shows how to remove all inactive packages from the boot device:

```
Router# install remove inactive synchronous

   instdir[198]: %INSTALL-INSTMGR-6-INSTALL_OPERATION_STARTED :
Install operation 8 '(admin) install remove inactive' started by user 'user_b'
Install operation 8 '(admin) install remove inactive' started by user 'user_b' at
   09:25:41 UTC Tue Aug 15 2006.
Info:     This operation will remove the following package:
Info:         disk0:-compmgmt__installmgr-0.0.5
Proceed with removing these packages? [confirm]
The install operation will continue asynchronously.
```

show install

To display active packages, use the **show install** command in XR EXEC mode.

show install { **active** | **committed** | **inactive** | **issu** [**inventory** | **stage**] | **log** [*log-id* | **detail** | **reverse**] | **package** *package-name* [**detail** | **verbose**] | **prepare** | **repository** [**all**] | **request** | **superseded** | **which** *file-name* [**detail**] } [**summary** | *output-modifiers* { **begin** *line* | **exclude** *line* | **file** | **include** *line* | **utility** *line* }]

Syntax Description

active	Displays active packages installed.
committed	Displays committed software packages.
inactive	Displays the inactive packages.
issu	Displays ISSU information.
log	Displays log file.
package	Displays information about package.
prepare	Displays prepared packages that are ready for activation.
repository	Displays SDR software repository.
request	Displays the list of incomplete installation requests, running and queued.
superseded	Displays superseded package.
Which	Displays the origin of a named process, component, or package.
detail	(Optional) Displays a detailed summary of the active packages for a system, secure domain router (SDR), or node.
summary	(Optional) Displays a summary of the active packages in a system or SDR. Use this command to display the default software profile for SDRs
verbose	(Optional) Displays a detailed summary of the active packages for a system, SDR, or node, including component and file information for each package.
output-modifiers **begin** *line*	(Optional) Displays information from the line that matches to the given content. For example, if you want to display the running configuration starting from the interface configurations, you can enter as **`| begin interface`**.
output-modifiers **exclude** *line*	(Optional) Displays information by filtering out lines that contain the given content. For example, if you want to view a configuration but skip all lines that mention "interface", you can enter as **`| exclude interface`**.
output-modifiers **include** *line*	(Optional) Displays information that includes the content that you have given. For example, if you want to view lines that contain the word "interface" within a configuration, you can enter as **`| include interface`**.

output-modifiers **utility** *line*	(Optional) Specifies various Unix command-line tools to manipulate or analyze the command's output. For example, if you want to sort the output of a command alphabetically, you can enter as **`| utility sort`**.
output-modifiers **file**	(Optional) Saves the information to a specific file. For example, if you want to save information to a specific file, you can enter as **`| file filename vrf vrfname`**. You can save the content in the following locations: • *filename* - Save the output to a specified filename in VRF. • *append* - Add the output to the end of an existing file. • *config* - Save the output to the device's configuration. • *disk0* - Store the output on the device's disk0 storage. • *ftp* - Transfer and save the output to an FTP server. • *harddisk* - Save the output to the device's internal hard disk. • *http* - Send the output to an HTTP server. • *https* - Send the output to an HTTPS server. • *rootfs* - Save the output to the root file system of the device. • *scp* - Securely copy the output to a remote server using SCP. • *sftp* - Securely transfer the output to a remote server using SFTP. • *tftp* - Transfer the output to a TFTP server.

Command Default

None.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show install** command to display the active software set for all nodes, or for specific nodes. Enter the command in XR EXEC mode to display information for all nodes in all SDRs.

Summary, Detailed, and Verbose Information

Use the **summary** keyword to display a summary of the active packages in a system or SDR. Use the **detail** keyword to display the active packages for each node in an SDR, or in all SDRs. Use the **verbose** keyword to display additional information, including component and file information for each package.

Displaying the Default SDR Software Profile

When an SDR is created, the nodes assigned to that SDR are configured with the default software profile. To view a summary of the default SDR software configuration, enter the **show install active summary** command in XR EXEC mode. Any new nodes that are configured to become a part of an SDR boot with the default software profile listed in the output of this command.

Task ID

Task ID	Operations
root-system	execute
cisco-support	execute
root-lr	execute

Use the **summary** keyword to display a summary of the active packages in the system. This command also shows the default software profile used for new SDRs.

```
# show install active summary

Thu May 20 10:14:38.919 DST
  Active Packages:
    disk0:-upgrade-p-3.9.0
    disk0:-k9sec-p-3.9.0
    disk0:-mpls-p-3.9.0
    disk0:-mgbl-p-3.9.0
    disk0:-mcast-p-3.9.0
    disk0:-doc-p-3.9.0
    disk0:comp--mini-3.9.0
    disk0:-fpd-3.9.0
    disk0:-diags-p-3.9.0
```

Table 30: show install Field Descriptions

Field	Description
Boot Device	Device where the node stores the active software.
Boot Image	Location on the DSC of the active minimum boot image (MBI) used to boot the node.
Active Packages	Active packages loaded on the node.

Network Configuration Protocol Commands

This chapter includes commands to configure the Network Configuration (Netconf) Protocol. More details on the Netconf protocol and the Yang model, please see the *System Security Configuration Guide for Cisco NCS 5500 Series RoutersSystem Security Configuration Guide for Cisco NCS 540 Series RoutersSystem Security Configuration Guide*.

netconf-yang agent rate-limit

To set the rate-limit for the netconf yang agent, use the **netconf-yang agent rate-limit** command in the appropriate mode. To delete the set rate-limit, use the **no** form of the command.

netconf-yang agent rate-limit *bytes*
no netconf-yang agent rate-limit *bytes*

Syntax Description

bytes	The number of bytes to process per second. Range is 4096-4294967295. It is based on the size of the request(s) from the client to the netconf server.

Command Default

By default, no limit is set

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Use the **show netconf-yang rate-limit** command to check if the set limit is adequate.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **netconf-yang agent rate-limit** command:

```
RP/0/RP0/CPU0:router # netconf-yang agent rate-limit 5000
```

clear netconf-yang agent rate-limit

To clear the set rate-limit statistics, use the **clear netconf-yang agent rate-limit** command in the appropriate mode.

clear netconf-yang agent rate-limit

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **clear netconf-yang agent rate-limit** command:

```
RP/0/RP0/CPU0:router # clear netconf-yang agent rate-limit
```

clear netconf-yang agent session

To clear the specified netconf agent session, use the **clear netconf-yang agent session** in XR EXEC mode.

clear netconf-yang agent session *session-id*

Syntax Description

session-id	The session-id which needs to be cleared.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

The **show netconf-yang clients** command can be used to get the required session-id(s).

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to use the **clear netconf-yang agent session** command:

```
RP/0/RP0/CPU0:router (config) #  clear netconf-yang agent session 32125
```

netconf-yang agent session

To set the session details (limits and timeouts) for a netconf-yang agent, use the **netconf-yang agent session** command in the appropriate mode. To remove the configured session limits and timeouts, use the **no** form of the command.

netconf-yang agent session { **limit** *value* | **absolute-timeout** *value* | **idle-timeout** *value* }
no netconf-yang agent session { **limit** *value* | **absolute-timeout** *value* | **idle-timeout** *value* }

Syntax Description

limit *value*	Sets the maximum count for concurrent netconf-yang sessions. Range is 1 to 1024.
absolute-timeout *value*	Enables session absolute timeout and sets the absolute session lifetime. Range is 1 to 1440. Unit is minutes.
idle-timeout *value*	Enables session idle timeout and sets the idle session lifetime. Range is 1 to 1440. Unit is minutes.

Command Default

By default, no limits are set

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read, write

Example

This command shows how to use the **netconf-yang agent session** command:

```
RP/0/RP0/CPU0:router (config) #   netconf-yang agent session limit
```

netconf-yang agent ssh

To enable netconf agent over SSH (Secure Shell) , use the **netconf-yang agent ssh** command in XR Config mode. To disable netconf, use the **no** form of the command.

netconf-yang agent ssh

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

SSH is currently the supported transport method for Netconf.

Task ID

Task ID	Operation
config-services	read, write

Examples

This example shows how to use the **netconf-yang agent ssh** command:

```
Router# configure
Router(config)#  netconf-yang agent ssh
```

show netconf-yang clients

To display the client details for netconf-yang, use the **show netconf-yang clients** command in XR EXEC mode.

show netconf-yang clients

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang clients** command:

```
RP/0/RP0/CPU0:router (config) #  sh netconf-yang clients
Netconf clients
client session ID|   NC version|    client connect time|        last OP time|        last
OP type|    <lock>|
 22969|                    1.1|          0d  0h  0m  2s|            11:11:24|
close-session|        No|
 15389|                    1.1|          0d  0h  0m  1s|            11:11:25|
get-config|        No|
```

Table 31: Field descriptions

Field name	Description
Client session ID	Assigned session identifier
NC version	Version of the Netconf client as advertised in the hello message
Client connection time	Time elapsed since the client was connected
Last OP time	Last operation time
Last OP type	Last operation type

Lock (yes or no)	To check if the session holds a lock on the configuration datastore

show netconf-yang rate-limit

To display the statistics of the total data dropped , due to the set rate-limit, use the **show netconf-yang rate-limit** command in the appropriate mode.

show netconf-yang rate-limit

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang rate-limit** command:

```
RP/0/RP0/CPU0:router # show netconf-yang rate-limit
rate-limit statistics
Total data dropped: 0 Bytes
```

show netconf-yang statistics

To display the statistical details for netconf-yang, use the **show netconf-yang statistics** command in XR EXEC mode.

show netconf-yang statistics

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show netconf-yang statistics** command:

```
RP/0/RP0/CPU0:router (config) #  sh netconf-yang statistics
Summary statistics
                        # requests|             total time|   min time per request|   max
 time per request|   avg time per request|
other                             0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
close-session                     4|       0h  0m  0s   3ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
kill-session                      0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get-schema                        0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get                               0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
get-config                        1|       0h  0m  0s   1ms|       0h  0m  0s   1ms|
 0h  0m  0s   1ms|       0h  0m  0s   1ms|
edit-config                       3|       0h  0m  0s   2ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
commit                            0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
cancel-commit                     0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
lock                              0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
unlock                            0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
```

```
discard-changes                      0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
validate                             0|       0h  0m  0s   0ms|       0h  0m  0s   0ms|
 0h  0m  0s   0ms|       0h  0m  0s   0ms|
xml parse                            8|       0h  0m  0s   4ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
netconf processor                    8|       0h  0m  0s   6ms|       0h  0m  0s   0ms|
 0h  0m  0s   1ms|       0h  0m  0s   0ms|
```

Table 32: Field descriptions

Field name	Description
Requests	Total number of processed requests of a given type
Total time	Total processing time of all requests of a given type
Min time per request	Minimum processing time for a request of a given type
Max time per request	Maximum processing time for a request of a given type
Avg time per request	Average processing time for a request type

ssh server capability netconf-xml

To enable NETCONF reach XML subsystem via port 22, use the **ssh server capability netconf-xml** command in in the XR Config mode. Use **no** form of this command to disable NETCONF reach XML subsystem.

ssh server capability netconf-xml

Syntax Description

This command has no keywords or arguments.

Command Default

Port 22 is the default port.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
crypto	read, write

Examples

This example shows how to use the **ssh server capability netconf-xml** command:

```
Router# configure
Router(config)# ssh server capability netconf-xml
```

ssh server netconf port

To configure a port for the netconf SSH server, use the **ssh server netconf port** command in XR Config mode. To return to the default port, use the **no** form of the command.

ssh server netconf port *port number*

Syntax Description

port *port-number*	Port number for the netconf SSH server (default port number is 830).

Command Default

The default port number is 830.

Command Modes

XR Config mode

Usage Guidelines

Starting with IOS-XR 6.0.0 it is no longer sufficient to configure a netconf port to enable netconf subsystem support. ssh server netconf needs to be at least configured for one vrf.

Task ID

Task ID	Operations
crypto	read, write

Examples

This example shows how to use the ssh server netconf port command with port 831:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ssh
```

Related Commands

Command	Description
ssh server netconf	Configures the vrf(s), where netconf subsystem requests are to be received.
netconf-yang agent ssh	Configures the **ssh netconf-yang backend** for the netconf subsystem (Required to allow the system to service netconf-yang requests). For more information, see the *Cisco ASR 9000 Series Aggregation Services Router System Management Command Reference*.

Data Collection Manager (DCM) Commands

This module describes the commands used to set and configure the Data Collection Manager (DCM) and bulkstat commands.

For more information about DCM, see the DCM chapter in the *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

add cmd

To add a show command to a command data set, use the **add cmd** command in command data set mode. To remove a show command from the data set, use the **no** form of this command.

add cmd *command-line*
no add cmd *command-line*

Syntax Description

command-lne	Specifies show commands for which the output should be collected.

Command Default

None

Command Modes

Command bulkstat data set configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **add cmd** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat data show-snmp type command
RP/0/RP0/CPU0:router (config-bs-ds-cmd) # add cmd show ip interface brief
```

context

To configure context for a data group, use the **context** command under bulkstat data group configuration mode. To remove the context for a data group, use the **no** form of this command.

context *name*
no context *name*

Syntax Description

name	Context name to collect data.

Command Default

None

Command Modes

Bulkstat data group configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

```
RP/0/RP0/CPU0:router (config-bs-dg) # context cont1
```

data-group

To add a data group to a data profile, use the **data-group** command in bulkstat profile configuration mode. To remove a data group from a profile, use the no form of this command.

data-group *name*
no data-group *name*

Syntax Description

name	Data group name. The data group should already be configured before being used to add a data group to a profile.

Command Default

None

Command Modes

Bulkstat profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can add one or more data groups to a profile, but one data group can be linked to one data profile only.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **data-group** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat profile p1
RP/0/RP0/CPU0:router (config-bs-profile) # data-group data1
```

discard

To discard the raw data for a data group, use the **discard** command under data group configuration mode. To reset back to default, use the **no** form of this command.

discard
no discard

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Bulkstat data group configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **discard** command:

```
RP/0/RP0/CPU0:router (config) # bulkstat data-group d1
RP/0/RP0/CPU0:router (config-bs-dg) # discard
```

enable

To enable a profile for collection and transfer, use the **enable** command in bulkstat profile configuration mode. To disable the profile, use the **no** form of this command.

enable
no enable

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Bulkstat profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If the **enable** command is used multiple times, one after the other, the last one in the sequence is considered final.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **enable** command:

```
RP/0/RP0/CPU0:router (config) # bulkstat profile p1
RP/0/RP0/CPU0:router (config-bs-profile) # enable
```

bulkstat filter

To configure a bulk-statistics filter set, use the **bulkstat filter** command in global configuration mode. To remove the filter set configuration, use the **no** form of this command.

bulkstat filter *filter-set-name*
no bulkstat filter *filter-set-name*

Syntax Description

filter-set-name	Name of the bulkstat filter set.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduction.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **bulkstat filter** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat filter vlan1
```

interval (bs-profile)

To configure interval parameters for a data group, use the **interval** command in bulkstat data group configuration mode. To reset the interval parameters for a data group to the default value, use the **no** form of this command.

interval transfer { **process** <*1800-604800*> | **raw** } *seconds*
no interval transfer { **process** <*1800-604800*> | **raw** } *seconds*

Syntax Description

process<*1800-604800*>	Process files.
raw	Raw files.
seconds	Period in seconds.

Command Default

None

Command Modes

Bulkstat datagroup confihuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **interval** command:

```
RP/0/RP0/CPU0:router ( config-bs-profile) # interval tranfer process 1000
```

object (bs-ds-snmp)

To add an object to an Simple Network Management Protocol (SNMP) data set, use the **object** command in bulkstat snmp data set configuration mode. To remove an object from a data set, use the **no** form of this command.

object {*oid* | *word* } **alias** *alias-name*
noobject {*oid* | *word* } **alias** *alias-name*

Syntax Description

oid	Object identifier (in dotted decimal notation).
word	Object descriptor.
alias *alias-name*	Name that is associated with an object. If the SNMP agent only can understand the dotted notation OID, you can specifiy an alias name. This name is used to represent the object in the file containing the collected data.

Command Default

None

Command Modes

Bulkstat snmp data set configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **object** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat data interface-stats type snmp
RP/0/RP0/CPU0:router (config-bs-ds-snmp) # object 1.3.6.1.2.1.2.2.1.10
```

process (bs-dg)

To configure process related parameters for a data group, use the **process** command in bulkstat data group configuration mode. To remove process related parameters from a data group, use the **no** form of this command.

process
no process

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Bulkstat data-group configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **process** command:

```
RP/0/RP0/CPU0:router (config) bulkstat data-group d1
RP/0/RP0/CPU0:router (config-bs-dg) # process
```

bulkstat profile

To configure a bulkstat profile, use the **bulkstat profile** command in global configuration mode. To remove the bulkstat profile configuration, use the **no** form of this command.

bulkstat profile *profile-name*
no bulkstat profile *profile-name*

Syntax Description

profile-name	Name of a bulkstat profile.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **bulkstat profile** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat profile bulk1
```

range

To configure a range instance use the **range** command under bulkstat snmp instance configuration mode. To remove the range instance from instance-set configuration, use the **no** form of this command.

range start *id* **end** *id*
no range start *id* **end** *id*

Syntax Description

start *id*	Range Start Instance identifier in OID format.
end *id*	Range End Instance identifier in OID format.

Command Default

None

Command Modes

Bulkstat snmp instance configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Multiple range(s) can be configured in the same instance set. Overlapping of instances is allowed. System will not check for overlapping instance configuration.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to use the **range** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat instance in-name type snmp
RP/0/RP0/CPU0:router (config-bs-is-snmp) # range start 1 end 10
```

repetition

To configure a repetition instance, use the **repetition** command under bulkstat snmp instance configuration mode. To remove the repetition instance from instance set configuration, use the **no** form of this command.

repetition oid *name* **max** *value*
no repetition oid *name* **max** *value*

Syntax Description

oid *name*	Object Identifier or descriptor.
max *value*	Number of maximum possible repetitions. Range is 1-2147483647.

Command Default

None

Command Modes

Bulkstat snmp instance configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can configure multiple repetitions in the same instance set, however, you must avoid overlapping of instances.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to run the **repetition** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat instance in-name type snmp
RP/0/RP0/CPU0:router (config-bs-is-snmp) # repetition oid 1.1 max 100
```

bulkstat data

To configure a bulkstat data set for command type, use the **bulkstat data** command d in global configuration mode. To remove the data set configuration from command type, use the **no** form of this command.

bulkstat data *show-stats* **type command**
no bulkstat data *show-stats* **type command**

Syntax Description

show-stats	Name of a data set.
type	Specifies the type of a data set.
command	Creates a command data set.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read, write

Example

This example shows how to run the **bulkstat data** command:

```
RP/0/RP0/CPU0:router # config
RP/0/RP0/CPU0:router (config) # bulkstat data show-snmp type command
```

show bulkstat data-group

To display the details of the bulkstat data-group , use the **show bulkstat data-group** command in EXEC mode.

show bulkstat data-group [**word** *data-group name* **process**] [**distribution** | **object** | **percentile** | **summary**]

Syntax Description

word	Displays details for the data-group name.
process	Displays processing data.
distribution	Displays distribution data.
object	Displays object-processed data.
percentile	Displays percentile data.
summary	Displays summary data .

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read

Example

This example shows how to use the **show bulkstat data-group** command:

```
RP/0/RP0/CPU0:router # show bulkstat data-group
Data-group Name    : dg
Oper state         : Active
Repetitions left   : -
Polling Interval   : 10(secs)
Discard Raw Data   : No
Collect type       : snmp
Data set name      : ds
Instance set name  : is
```

```
DCM Config Result  : /local/snmp/1
DCM Subscription ID: 1
```

show bulkstat profile

To display the details of the bulkstat profile, use the **show bulkstat profile** command in the EXEC mode.

show bulkstat profile [**file** *file-name* | **name** *profile-name*]

Syntax Description

file *file-name*	Bulkstat profile-file details.
name*profile-name*	Bulkstat profile details.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bulkstat	read

Example

This example show how to use the **show bulkstat profile**command:

```
RP/0/RP0/CPU0:router # show bulkstat profile
Profile Name  : pf
Admin Status  : Enabled
Enable Reason : Config
Oper Status   : Active

Data-group's in profile:
Name                            Oper State     Repetitions Left
-------------------------------------------------------------------
dg                              Active
```

This example show how to use the **show bulkstat profile** command with the **file** keyword:

```
RP/0/RP0/CPU0:router # show bulkstat profile file
Profile Name                          : pf
Curr file size                        : 3010(bytes)
Time left for raw data transfer       : 22(secs)
```

show dcm assa

To display the Active Session Slot Array (ASSA) details for DCM, use the **show dcm assa** command in EXEC mode.

show dcm assa

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
dcm	read

Example

This example show the output for the **show dcm assa** command:

```
RP/0/RP0/CPU0:router #  show dcm assa
slot                state
----------------------------------
0                DCM_ASSA_FREE
1                DCM_ASSA_FREE
2                DCM_ASSA_FREE
3                DCM_ASSA_FREE
4                DCM_ASSA_FREE
5                DCM_ASSA_FREE
6                DCM_ASSA_FREE
7                DCM_ASSA_FREE
8                DCM_ASSA_FREE
9                DCM_ASSA_FREE
10               DCM_ASSA_FREE
```

show dcm client

To get the details of the Data Collection Manager (DCM) client(s), use the **show dcm client** command in the EXEC mode.

show dcm client [*id* | *name*] **subscription id** *value*

Syntax Description

id	Client id.
name	Client name.
subscription id*value*	Subscription id.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
dcm	read

Example

This example shows the output for the **show dcm client** commands:

```
RP/0/RP0/CPU0:router #  show dcm client bulkstat-client subscription id 1
client name:    Bulkstat-Client
client id:      1
subscriptions:  1,

data-provider:  snmp
config id        subscription
------------------------------
1                 1
```

show dcm data-providers

To display the data-providers for DCM, use the **show dcm data-providers** command in EXEC mode.

show dcm data-providers

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
dcm	read

Example

This example shows the output for the **show dcm data-providers** command:

```
RP/0/RP0/CPU0:router #  show dcm data-providers
data-provider name      data provider id
-----------------------------------------
cli                             1
snmp                            3
expression                      2

Router#show bulkstat profile
Profile Name  : pf
Admin Status  : Enabled
Enable Reason : Config
Oper Status   : Active

Data-group's in profile:
Name                            Oper State     Repetitions Left
-------------------------------------------------------------------------
dg                              Active
```

show dcm session

To display the active sessions for DCM, use the **show dcm session** command in EXEC mode.

show dcm session

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
dcm	read, write

Example

This example shows the display output of the **show dcm session** command:

```
RP/0/RP0/CPU0:router #  show dcm session
```

Simple Network Management Protocol (SNMP) Server Commands

This chapter describes the Cisco IOS XR software commands used to configure and monitor the Simple Network Management Protocol (SNMP) for network monitoring and management.

For detailed information about SNMP concepts, configuration tasks, and examples, see the *Implementing SNMP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

Note The **snmp-server** commands enable SNMP on Management Ethernet interfaces by default. For information about how to enable SNMP server support on other inband interfaces, see the *Implementing Management Plane Protection on Cisco IOS XR Software* module in *System Security Configuration Guide for Cisco NCS 5500 Series RoutersSystem Security Configuration Guide for Cisco NCS 540 Series RoutersSystem Security Configuration Guide*.

snmp-server traps bgp updown

To enable Border Gateway Protocol (BGP) to receive Simple Network Management Protocol (SNMP) notifications when a BGP peer changes state in IPv4 neighbor sessions, use the **snmp-server traps bgp updown** command in global configuration mode.

snmp-server traps bgp [updown]

Syntax Description

bgp	Specifies IPv4 neighbor sessions.
updown	(Optional) Specifies trap notifications.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

SNMP notifications are sent as traps.

BGP generates traps when:

- A neighbor's session state has changed.
- A neighbor prefix limit has exceeded.
- A neighbor prefix count is under the limit.

Multiple traps can be generated when the neighbor is not in steady state.

Configure **snmp-server traps bgp updown** command to prevent the generation multiple traps.

When you configure the **snmp-server traps bgp updown** command, traps are sent out only when the BGP neighbor goes to established state or moves out from the established state. The prefix limit traps remain unaffected.

When you configure the **bgp** keyword, traps are sent for IPv4 neighbor sessions only.

Example

The following example shows how to enable the router to send BGP state-change notifications to the host at the address myhost.cisco.com using the community string defined as public in IPv4 neighbor sessions only:

```
Router(config)# snmp-server traps bgp updown
Router(config)# snmp-server host myhost.cisco.com version 2c public
```

Related References

#unique_240

snmp-server engineid local
snmp-server host
snmp-server traps snmp
snmp-server traps syslog

snmp-server drop report acl

To apply an ACL policy for restricting an SNMPv3 unknown engine-id report to be sent out to NMS, use the **snmp-server drop report acl** command in the configuration mode.

snmp-server drop report acl IPv4 *IPv4-acl-name* **IPv6** *IPv6-acl-name*

Syntax Description

acl	Specifies IP Access Control Lists (ACL) policy
IPv4 *IPv4-acl-name*	Defines an IPv4 ACL name.
IPv6 *IPv6-acl-name*	Defines an IPv6 ACL name.

Command Default

Unknown engine-id reports will be sent to all polling stations (even if other ACLs are configured).

Command Modes

Configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To drop an unknown engine-id report, you can either configure IPv4/IPv6 ACL name or both. When router is polled with wrong engine-id or no engine-id during a snmpv3 packet exchange, the unknown engine-id report will be sent based on the ACL policy that is configured.

Unknown engine-id reports will be sent only to polling station addresses that are permitted by ACL.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the unknown engin-id report:

```
RP/0/RP0/CPU0:router (config) #  snmp-server drop report acl IPv4 nms-block IPv6
nms-block-ipv6
```

snmp-server drop unknown-user

To avoid error PDUs being sent out of router when polled with incorrect SNMPv3 user name, use the **snmp-server drop unknown-user** command in the appropriate mode. If the configuration is not set, by default it will respond with error PDUs.

snmp-server drop unknown-user

Syntax Description

drop unknown-user	Drop the error PDUs to be sent when router is polled with incorrect SNMPv3 user name.

Command Default

Unknown error PDUs will be sent when router is polled with incorrect SNMPv3 user name.

Command Modes

XR config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to configure the SNMP server to drop the error PDUs:

```
RP/0/RP0/CPU0:router (config) #  snmp-sever drop unknown-user
```

snmp-server mibs sensormib cache

To enable and configure caching for sensor mib values, use **snmp-server mibs sensormib cache** command in global configuration mode. To restore the default values, use the **no** form of this command.

snmp-server mibs sensormib cache

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration mode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Example

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs sensormib cache
```

snmp-server timeouts duplicate

To set the timeout value for the snmp-sever duplicate request feature, use the **snmp-server timeouts duplicate** command in the appropriate mode. To delete the set value, use the **no** form of the command.

snmp-server timeouts duplicate *timeout-value*
no snmp-server timeouts duplicate *timeout-value*

Syntax Description

timeout-value Timeout value in seconds. Range is 0 to 20 seconds.

- 0- To Remove this feature support. i.e SNMP will process all the packets irrespective of duplicate (retry) Packets.
- 1- This is the default value, i.e if no configuration is present , then, the timeout value is set to 1. If any packet takes more than 1 second for getting processed, then the Duplicate drop feature is enabled.
- 2 to 20 - if the packet processing is done between 2 and 20 seconds, then the Duplicate drop feature is enabled.

Command Default

1 second

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example shows how to use the **snmp-server timeouts duplicate** command:

```
RP/0/RP0/CPU0:router (config) #  snmp-server timeouts duplicate 10
```

add (bulkstat object)

To add a MIB object to a Simple Network Management Protocol (SNMP) bulk statistics object list, use the **add** command in bulk statistics object list configuration mode. To remove a MIB object from an SNMP bulk statistics object list, use the **no** form of this command.

add {*object-nameOID*}
no add {*object-nameOID*}

Syntax Description

object-name	Name of the MIB object to add to the list. Object names are limited to those with mappings shown in the **show snmp mib object-name** command.
OID	Object identifier (OID) of the MIB object to add to the list.

Command Default

No MIB objects are configured for an object list.

Command Modes

Bulk statistics object list configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All object names and OIDs in a single object list should belong to the same MIB index, but the objects need not belong to the same MIB table. For example, it is possible to group ifInoctets and a CISCO-IF-EXTENSION-MIB object in the same schema because the containing tables are indexed by the ifIndex (in the IF-MIB).

The **add** command should be repeated as necessary until all MIB objects have been added to the object list.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to add various MIB objects to an object list.

```
RP/0/RP0/CPU0:router(config-bulk-objects)# add 1.3.6.1.2.1.2.2.1.11
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifAdminStatus
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifDescr
```

buffer-size

To configure a maximum buffer size for the transfer of bulk statistics files, use the **buffer-size** command in bulk statistics transfer configuration mode. To remove a previously configured buffer size from the configuration, use the **no** form of this command.

buffer-size *bytes*
no buffer-size [*bytes*]

Syntax Description

bytes	Size of the bulk statistics transfer buffer, in bytes. The valid range is from 1024 to 2147483647. The default is 2048.

Command Default

The default bulk statistics transfer buffer is 2048 bytes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A configured buffer size limit is available primarily as a safety feature. Normal bulk statistics files should not generally meet or exceed the default value while being transferred.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to set the buffer size to 1024 bytes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
```

clear snmp counters

To clear the Simple Network Management Protocol (SNMP) packet statistics shown by the **show snmp** command, use the **clear snmp counters** command in XR EXEC mode.

clear snmp counters

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **clear snmp counters** command provides the ability to clear all SNMP counters used in the **show snmp** command without restarting any processes.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to clear the SNMP counters:

```
RP/0/RP0/CPU0:router# clear snmp counters
```

enable (bulkstat)

To begin the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **enable** command in bulk statistics transfer configuration mode. To disable the bulk statistics data collection and transfer process for a specific bulk statistics configuration, use the **no** form of this command.

enable
no enable

Syntax Description

This command has no keywords or arguments.

Command Default

Bulk statistics transfer is disabled.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Specific bulk statistics configurations are identified with a name, as specified in the **snmp-server mib bulkstat transfer-id** command. The **enable** command begins the periodic MIB data collection and transfer process.

Collection (and subsequent file transfer) starts only if this command is used. Conversely, the **no enable** command stops the collection process. Subsequently, issuing the **enable** command starts the operations again.

Each time the collection process is started using the **enable** command, data is collected into a new bulk statistics file. When the **no enable** command is used, the transfer process for any collected data immediately begins (in other words, the existing bulk statistics file are transferred to the specified management station).

To successfully enable a bulk statistics configuration, at least one schema with a non-zero number of objects must be configured.

Task ID

Task ID	Operation
snmp	read, write

The following example shows the bulk statistics transfer configuration named bulkstat1 as enabled:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

format (bulkstat)

To specify the format to be used for the bulk statistics data file, use the **format** command in bulk statistics transfer configuration mode. To disable a previously configured format specification and return to the default, use the **no** form of this command.

format {**bulkBinary** | **bulkASCII** | **schemaASCII**}
no format [**bulkBinary** | **bulkASCII** | **schemaASCII**]

Syntax Description

bulkBinary	Binary format.
bulkASCII	ASCII format.
schemaASCII	A human-readable ASCII format that contains additional bulk statistics schema tags. This is the default.

Command Default

The default bulk statistics transfer format is schemaASCII

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The bulk statistics data file (VFile) contains two types of fields: tags and data. Tags are used to set off data to distinguish fields of the file. All other information is in data fields.

Transfers can only be performed using schemaASCII format.

For each transfer/schema pair there is a header with tags for each object collected, followed by the collected data. For example, if the transfer name is T1 and the schemas in it are S1 (which collects ifInOctets and ifOutOctets) and S2 (which collects ifInUcastPkts and ifInDiscards). Then the output file looks like this:

```
Schema-def cempt1.cempWild "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempWild: 1339491515, 8695772.1, processor, 2
cempt1.cempWild: 1339491515, 8695772.2, reserved, 11
cempt1.cempWild: 1339491515, 8695772.3, image, 12
cempt1.cempWild: 1339491575, 8695772.1, processor, 2
cempt1.cempWild: 1339491575, 8695772.2, reserved, 11
cempt1.cempWild: 1339491575, 8695772.3, image, 12
Schema-def cempt1.cempRepeat "%u, %s, %s, %d" Epochtime instanceoid
1.3.6.1.4.1.9.9.221.1.1.1.1.3 1.3.6.1.4.1.9.9.221.1.1.1.1.2
cempt1.cempRepeat: 1339491515, 8695772.1, processor, 2
cempt1.cempRepeat: 1339491515, 8695772.2, reserved, 11
cempt1.cempRepeat: 1339491515, 8695772.3, image, 12
cempt1.cempRepeat: 1339491515, 26932192.1, processor, 2
cempt1.cempRepeat: 1339491515, 26932192.2, reserved, 11
cempt1.cempRepeat: 1339491515, 26932192.3, image, 12
```

```
cempt1.cempRepeat: 1339491515, 35271015.1, processor, 2
cempt1.cempRepeat: 1339491515, 35271015.2, reserved, 11
cempt1.cempRepeat: 1339491515, 35271015.3, image, 12
cempt1.cempRepeat: 1339491515, 36631989.1, processor, 2
cempt1.cempRepeat: 1339491515, 36631989.2, reserved, 11
cempt1.cempRepeat: 1339491515, 36631989.3, image, 12
cempt1.cempRepeat: 1339491515, 52690955.1, processor, 2
cempt1.cempRepeat: 1339491515, 52690955.2, reserved, 11
cempt1.cempRepeat: 1339491515, 52690955.3, image, 12
```

Task ID

Task ID	Operation
snmp	read, write

This example shows how to specify the data format:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
```

instance (bulkstat schema)

To configure the MIB object instances to be used in a Simple Network Management Protocol (SNMP) bulk statistics schema, use the **instance** command in bulk statistics configuration mode. To remove the instance definition, use the **no** form of this command.

instance {**exact** | **wild** } {**interface** *interface-id* [**sub-if**] | **oid** *oid*}
no instance

Syntax Description

exact	Specifies that the specified interface or object identifier (OID), when appended to the object list, is the complete OID to be used in this schema.
wild	Specifies that all instances that fall within the the specified OID or interface are included in this schema.
interface *interface-id*	Specifies an interface to be used to define the schema instance.
[**sub-if**]	(Optional) Specifies that the object instances are polled for all subinterfaces of the specified interface in addition to the object instances for the main interface.
oid *oid*	Specifies an OID to be used to define the schema instance.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance** command specifies the instance information for objects in the schema being configured. The specific instances of MIB objects for which data is collected are determined by appending the value of the instance command to the objects specified in the associated object list. In other words, the schema object-list when combined with the schema instance specifies a complete MIB object identifier.

The **instance exact** command indicates that the specified instance, when appended to the object list, is the complete OID.

The **instance wild** command indicates that all subindices of the specified OID belong to this schema. For example, the command `instance wild oid 1` includes all subindices of the instance, such as 1.1, 1.2 and so on. It does not include other instances that start with the number 1, such as 10 and 11.

Instead of specifying an OID, you can specify a specific interface. The **interface** *interface-id* keyword and argument allow you to specify an interface name and number instead of specifying the ifIndex OID for the interface.

The optional **sub-if** keyword, when added after specifying an interface, includes the ifIndexes for all subinterfaces of the interface you specified.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following examples show two different ways to configure an instance.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance wild oid 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface FastEthernet 0/1.25
```

instance range

To specify a range of instances for objects in a schema, use the **instance** command in bulk statistics schema configuration mode. To remove the configured instance information, use the **no** form of this command.

instance range start *start-oid* **end** *end-oid*
no instance

Syntax Description

start *start-oid*	Specifies the first OID value of a range of values.
end *end-oid*	Specifies the last OID value of a range of values.

Command Default

No instances are configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a range of instances.

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance range start 1 end 2
```

instance repetition

To configure bulk statistics data collection to begin at a particular instance of a MIB object and to repeat for a given number of instances , use the **instance repetition** command in bulk statistics schema configuration mode. To delete a previously configured repetition of instances, use the **no** form of this command.

instance repetition *oid-instance* **max** *repeat-number*
no instance

Syntax Description

oid-instance	Object ID of the instance to be monitored.
max *repeat-number*	Specifies the number of times the instance should repeat.

Command Default

No instance repetition is configured.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **instance repetition** command is used to configure data collection to repeat for a certain number of instances of a MIB object.

Only one **instance** command can be configured per schema. If multiple **instance** commands are used, the later commands overwrite the earlier ones.

Task ID

Task ID	Operation
snmp	read, write

The following example configures 4 repetitions of the OID of value 1.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets

RP/0/RP0/CPU0:router(config-bulk-objects)# exit
RP/0/RP0/CPU0:router(config)# snmp mib-server bulkstat schema IFMIB

RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 1
```

```
RP/0/RP0/CPU0:router(config-bulk-sc)# instance repetition 1 max 4
```

notification linkupdown

To enable or disable linkUp and linkDown trap notifications on a Simple Network Management Protocol (SNMP) interface, use the **notification linkupdown** command in SNMP interface configuration mode. To revert to the default setting, use the **no** form of this command.

notification linkupdown disable
no notification linkupdown disable

Syntax Description

disable	Disables linkUp and linkDown trap notifications on an SNMP interface.

Syntax Description

This command has no keywords or arguments.

Command Default

By default, for all main interfaces the linkUp and linkDown trap notifications are enabled; for all subinterfaces they are disabled.

Command Modes

SNMP interface configuration

SNMP interface subset configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Enabling of linkUp and linkDown notifications is performed globally using the **snmp-server traps snmp** command. Issue the **notification linkupdown** command to disable linkUp and linkDown notifications on an interface.

Use the **no** form of this command to enable linkUp and linkDown notifications on an interface, if linkUp and linkDown notifications have been disabled.

You can also use the **snmp-server interface subset** command to enable or disable groups of interfaces.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to disable linkUp and linkDown trap notifications on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface tengige 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)# notification linkupdown disable
```

object-list

To specify the bulk statistics object list to be used in the bulk statistics schema, use the **object-list** command in bulk statistics schema configuration mode. To remove an object list from the schema, use the **no** form of this command.

object-list *list-name*
no object-list [*list-name*]

Syntax Description

list-name	Name of a previously configured bulk statistics object list.

Command Default

No bulk statistics object list is specified.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command associates a bulk statistics object list with the schema being configured. The object list should contain a list of MIB objects to be monitored. Only one object list can be specified for each schema. Use the **snmp-server mib bulkstat object-list** command to create an object list.

Task ID

Task ID	Operation
snmp	read, write

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema schema1
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list obj1
```

poll-interval

To configure the polling interval for a bulk statistics schema, use the **poll-interval** command in bulk statistics schema configuration mode. To remove a previously configured polling interval, use the **no** form of this command.

poll-interval *minutes*
no poll-interval

Syntax Description

minutes	Integer in the range from 1 to 20000 that specifies, in minutes, the polling interval of data for this schema. The default is 5.

Command Default

Object instances are polled once every five minutes.

Command Modes

Bulk statistics schema configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **poll-interval** command sets how often the MIB instances specified by the schema and associated object list are to be polled. Collected data is stored in the local bulk statistics file for later transfer.

Task ID

Task ID	Operation
snmp	read, write

In this example, the polling interval for bulk statistics collection is set to once every 3 minutes in the schema called GigE2/1-CAR:

```
Router# config
Router(config)# snmp-server mib bulk schema GigE2/1-CAR
Router(config-bulk-sc)# poll-interval 3
```

retain

To configure the retention interval for bulk statistics files, use the **retain** command in bulk statistics transfer configuration mode. To remove a previously configured retention interval from the configuration, use the **no** form of this command.

retain *minutes*
no retain [*minutes*]

Syntax Description

minutes	Length of time, in minutes, that the local bulk statistics file should be kept in system memory (the retention interval). The valid range is 0 to 20000. The default is 0.

Command Default

The bulk statistics file retention interval is 0 minutes.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **retain** command specifies how long the bulk statistics file should be kept in system memory, in minutes, after the completion of the collection interval and a transmission attempt is made. The default value of zero (0) indicates that the file is deleted immediately from local memory after a successful transfer.

If the **retry** command is used, you should configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (retain default is 0), no retries are attempted.

Note Once a successful transmission has occurred the bulk file is not retained regardless of the retain time.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the bulk statistics transfer retention interval is set to 10 minutes:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

retry

To configure the number of retries that should be attempted for a bulk statistics file transfer, use the **retry** command in bulk statistics transfer configuration mode. To return the number of bulk statistics retries to the default, use the **no** form of this command.

retry *number*
no retry [*number*]

Syntax Description

number	Number of transmission retries. The valid range is from 0 to 100.

Command Default

No retry attempts are made.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If an attempt to send the bulk statistics file fails, the system can be configured to attempt to send the file again using the **retry** command. One retry includes an attempt first to the primary destination and then, if the transmission fails, to the secondary location; for example, if the retry value is 1, an attempt will be made first to the primary URL, then to the secondary URL, then to the primary URL again, and then to the secondary URL again.

If the **retry** command is used, you should also use the **retain** command to configure a retention interval greater than 0. The interval between retries is the retention interval divided by the retry number. For example, if **retain 10** and **retry 2** are configured, retries are attempted once every 5 minutes. Therefore, if the **retain** command is not configured (or the **retain 0** command is used) no retries are attempted.

Task ID

Task ID	Operation
snmp	read, write

In the following example, the number of retries for the bulk statistics transfer is set to 2:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user:pswrd@host/folder/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 2
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 10
```

```
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

schema

To specify the bulk statistics schema to be used in a specific bulk statistics transfer configuration, use the **schema** command in bulk statistics transfer configuration mode. To remove a previously configured schema from a specific bulk statistics transfer configuration, use the **no** form of this command.

schema *schema-name*
no schema [*schema-name*]

Syntax Description

schema-name	Name of a previously configured bulk statistics schema.

Command Default

No bulk statistics schema is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The schema must be previously defined using the **snmp-server mib bulkstat schema** command.

Repeat the **schema** command as desired for a specific bulk statistics transfer configuration. Multiple schemas can be associated with a single transfer configuration; all collected data will be in a single bulk statistics data file (VFile).

Task ID

Task ID	Operation
snmp	read, write

This example adds three different schemas to a bulk statistics transfer configuration:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema ATM2/0-CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# schema Ethernet2/1-IFMIB
```

show snmp

To display the status of Simple Network Management Protocol (SNMP) communications, use the **show snmp** command in EXEC mode.

show snmp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the `show snmp` command to show counter information for SNMP operations. It also displays the chassis ID string defined with the **snmp-server chassis-id** command.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the `show snmp` command:

```
RP/0/RP0/CPU0:router# show snmp

  Chassis: 01506199
  37 SNMP packets input
  0 Bad SNMP version errors
  4 Unknown community name
  0 Illegal operation for community name supplied
  0 Encoding errors
  24 Number of requested variables
  0 Number of altered variables
  0 Get-request PDUs
  28 Get-next PDUs
  0 Set-request PDUs
  78 SNMP packets output
  0 Too big errors (Maximum packet size 1500)
  0 No such name errors
  0 Bad values errors
  0 General errors
  24 Response PDUs
  13 Trap PDUs
  SNMP logging: enabled
```

```
Logging to 172.25.58.33.162, 0/10, 13 sent, 0 dropped.
```

show snmp Field Descriptions describes the significant fields shown in the display.

Table 33: show snmp Field Descriptions

Field	Description
Chassis	Chassis ID string.
SNMP packets input	Total number of SNMP packets input.
Bad SNMP version errors	Number of packets with an invalid SNMP version.
Unknown community name	Number of SNMP packets with an unknown community name.
Illegal operation for community name supplied	Number of packets requesting an operation not allowed for that community.
Encoding errors	Number of SNMP packets that were improperly encoded.
Number of requested variables	Number of variables requested by SNMP managers.
Number of altered variables	Number of variables altered by SNMP managers.
Get-request PDUs	Number of get requests received
Get-next PDUs	Number of get-next requests received.
Set-request PDUs	Number of set requests received.
SNMP packets output	Total number of SNMP packets sent by the device.
Too big errors	Number of SNMP packets that were larger than the maximum packet size.
Maximum packet size	Maximum size of SNMP packets.
No such name errors	Number of SNMP requests that specified a MIB object that does not exist.
Bad values errors	Number of SNMP set requests that specified an invalid value for a MIB object.
General errors	Number of SNMP set requests that failed due to some other error. (It is not a noSuchName error, badValue error, or any of the other specific errors.)
Response PDUs	Number of responses sent in reply to requests.
Trap PDUs	Number of SNMP traps sent.
SNMP logging	Enabled or disabled logging.
sent	Number of traps sent.

Field	Description
dropped	Number of traps dropped. Traps are dropped when the trap queue for a destination exceeds the maximum length of the queue, as set by the **snmp-server queue-length** command.

show snmp context-mapping

To display the SNMP context mapping table, use the **show snmp context-mapping** command in EXEC mode.

show snmp context-mapping

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The SNMP agent handles queries based on SNMP contexts created by client features. Use the **show snmp context-mapping** command to display the SNMP context mapping table. Each entry in the table includes the name of an SNMP context created by a client instance and the name of the client that created the context.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp context-mapping** command:

```
RP/0/RP0/CPU0:router# show snmp context-mapping

Wed Aug 6 01:42:35.227 UTC
Context-name                  Feature-name                  Feature
ControlEthernet0_RP0_CPU0_S0  ControlEthernet0_RP0_CPU0_S0  BRIDGEINST
ControlEthernet0_RP1_CPU0_S0     ControlEthernet0_RP1_CPU0_S0     BRIDGEINST
```

Table 34: show snmp context-mapping Field Descriptions

Field	Definition
Context-name	Name of an SNMP context.
Feature-name	Name of the instance that created the context.
Feature	Name of the client whose instance created the context.

show snmp context

To display the enhanced SNMP context mappings, use the **show snmp context** command in EXEC mode.

show snmp context

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp context** command to display the protocol instance, topology and VRF mappings associated with an SNMP context.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp context** command:

```
RP/0/RP0/CPU0:router# show snmp context

Tue Dec 21 03:41:08.065 PST
Context-name       Vrf-name      Topology-Name   Instance-Name             Feature
con5                  vf5           tp5             in5                     OSPF
con6                  vf6           tp6             in6                     OSPF
con7                  vf7           tp7             in7                     OSPF
con8                  vf8           tp8             in8                     OSPF
```

show snmp engineid

To display the identification of the local Simple Network Management Protocol (SNMP) engine that has been configured on the router, use the **show snmp engineid** command in XR EXEC mode.

show snmp engineid

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An *SNMP engine* is a copy of SNMP that can reside on a local device.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp engineid** command:

```
RP/0/RP0/CPU0:router# show snmp engineid

  Local SNMP engineID: 00000009020000000C025808
```

show snmp entity

To display the entPhysicalName and entPhysicalIndex mappings, use the **show snmp entity** command in EXEC mode.

show snmp entity

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp entity** command to view the entity index to use in the **snmp test trap entity** command. To use the **show snmp entity** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp entity** command:

```
RP/0/RP0/CPU0:router# show snmp entity

Mon Nov 15 11:19:23.609 UTC
entPhysicalIndex:     172193 entPhysicalName: portslot 0/0/CPU0/1
entPhysicalIndex:     322450 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:     345071 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     346659 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     349835 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     546880 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     845998 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:     847586 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    1192623 entPhysicalName: 0/25/CPU0
entPhysicalIndex:    1227530 entPhysicalName: voltages 0/21/CPU0
entPhysicalIndex:    1460256 entPhysicalName: temperatures 0/18/CPU0
entPhysicalIndex:    1795138 entPhysicalName: temperatures 0/20/CPU0
entPhysicalIndex:    3079213 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3080801 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:    3082421 entPhysicalName: slot 7/0
entPhysicalIndex:    5037675 entPhysicalName: 0/21/CPU0
entPhysicalIndex:    5509481 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6182130 entPhysicalName: voltages 0/9/CPU0
entPhysicalIndex:    6369487 entPhysicalName: portslot 0/9/CPU0/2
```

```
entPhysicalIndex:    8392407 entPhysicalName: temperatures 0/17/CPU0
entPhysicalIndex:    8548798 entPhysicalName: 0/21/CPU0 - host
entPhysicalIndex:   10735504 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10737188 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   10738808 entPhysicalName: slot 1/1
entPhysicalIndex:   11312388 entPhysicalName: slot 7
entPhysicalIndex:   11314008 entPhysicalName: slot 3
entPhysicalIndex:   12644344 entPhysicalName: voltages 0/19/CPU0
entPhysicalIndex:   12761695 entPhysicalName: slot 24
entPhysicalIndex:   12763283 entPhysicalName: slot 20
entPhysicalIndex:   12907576 entPhysicalName: voltages 0/0/CPU0
entPhysicalIndex:   13262622 entPhysicalName: slot 16
entPhysicalIndex:   13290941 entPhysicalName: temperatures 0/16/CPU0
entPhysicalIndex:   13404457 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13406077 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13701859 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13900492 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13903700 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   13905384 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   14106204 entPhysicalName: portslot 0/8/CPU0/2
entPhysicalIndex:   14256525 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   14979942 entPhysicalName: slot 2/2
entPhysicalIndex:   14981562 entPhysicalName: voltages 0/2/CPU0
entPhysicalIndex:   15141782 entPhysicalName: 0/19/CPU0
entPhysicalIndex:   15873651 entPhysicalName: temperatures 0/22/CPU0
entPhysicalIndex:   15986678 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15988234 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   15991442 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16136999 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16138619 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16285636 entPhysicalName: temperatures 0/1/CPU0
entPhysicalIndex:   16287256 entPhysicalName: voltages 0/1/CPU0
entPhysicalIndex:   16606045 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   16607633 entPhysicalName: voltages 0/8/CPU0
entPhysicalIndex:   16733769 entPhysicalName: 0/2/CPU0 - host
entPhysicalIndex:   16949774 entPhysicalName: portslot 0/0/CPU0/0
entPhysicalIndex:   17098539 entPhysicalName: temperatures 0/0/CPU0
entPhysicalIndex:   17122684 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17124272 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17127448 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17205790 entPhysicalName: 0/2/CPU0
entPhysicalIndex:   17322905 entPhysicalName: temperatures 0/7/CPU0
entPhysicalIndex:   17324589 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17595466 entPhysicalName: 0/25/CPU0 - host
entPhysicalIndex:   17620307 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17621991 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   17623611 entPhysicalName: voltages 0/7/CPU0
entPhysicalIndex:   18003523 entPhysicalName: temperatures 0/21/CPU0
entPhysicalIndex:   18237837 entPhysicalName: voltages 0/18/CPU0
entPhysicalIndex:   18571163 entPhysicalName: voltages 0/20/CPU0
---More---
```

show snmp group

To display the names of groups on the router, security model, status of the different views, and storage type of each group, use the **show snmp group** command in

XR EXEC

mode.

show snmp group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp group** command:

```
RP/0/RP0/CPU0:router# show snmp group

  groupname: public security model:snmpv1
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile

  groupname: public security model:snmpv2c
  readview : v1default writeview: -
  notifyview: v1default
  row status: nonVolatile
```

Table 35: show snmp group Field Descriptions

Field	Definition
groupname	Name of the Simple Network Management Protocol (SNMP) group or collection of users that have a common access policy.

Field	Definition
readview	String identifying the read view of the group.
security model	Security model used by the group, either v1, v2c, or v3.
writeview	String identifying the write view of the group.
notifyview	String identifying the notify view of the group.
row status	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

show snmp host

To display the configured Simple Network Management Protocol (SNMP) notification recipient host, User Datagram Protocol (UDP) port number, user, and security model, use the **show snmp host** command in

XR EXEC

mode.

show snmp host

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp host** command:

```
RP/0/RP0/CPU0:router# show snmp host

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3auth security model: v3 auth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3noauth security model: v3 noauth

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userV3priv security model: v3 priv

  Notification host: 10.50.32.170 udp-port: 2345 type: trap
  user: userv2c security model: v2c
```

Table 36: show snmp host Field Descriptions

Field	Definition
Notification host	Name or IP address of target host.
udp-port	UDP port number to which notifications are sent.
type	Type of notification configured.
user	Security level of the user.
security model	Version of SNMP used to send the trap, either v1, v2c, or v3.

show snmp informs details

To show the details about the informs generated for each host, the drop and retry count and the timestamp, use the **show snmp informs details** command in XR EXEC mode.

show snmp informs details

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp informs details** command shows these details:

Field	Description
InformOID	Generated inform.
Sent	Number of times the Inform is sent from the inform host and port configiured.
Drop	Number of times the Inform is sent from the inform host and port configiured.
Retry	Number of times the Inform retries from the inform host and port configiured
Last-sent	Time stamp when the last inform was sent from the host and port.
Last-drop	Time stamp when the last inform dropped from the host and port.
Host	Configured address of the host to receive traps.
udp-port	Configured port to receive traps.

Task ID

Task ID	Operations
snmp	read, write

```
Router# show snmp informs details
Mon Apr  7 17:14:17.212 UTC
HOST:9.22.24.150, udp-port:5555
------------------------------
InformOID                          Sent    Drop    Retry   Last-sent
Last-drop
ciscoConfigManMIB.2.0.1            8       2       6       Mon Apr 07 14 17:12:54      Mon
 Apr 07 14 17:12:42
ciscoFlashDeviceInsertedNotif      4       1       3       Mon Apr 07 14 17:12:55      Mon
 Apr 07 14 17:12:42
ciscoFlashDeviceRemovedNotif       4       1       3       Mon Apr 07 14 17:12:54      Mon
 Apr 07 14 17:12:42
ciscoMgmt.117.2.0.1                8       2       6       Mon Apr 07 14 17:12:53      Mon
 Apr 07 14 17:12:42
ciscoMgmt.117.2.0.2                4       1       3       Mon Apr 07 14 17:12:52      Mon
 Apr 07 14 17:12:42|
```

show snmp interface

To display the interface index identification numbers (ifIndex values) for all the interfaces or a specified interface, use the **show snmp interface** command in the appropriate mode.

show snmp interface [*type interface-path-id* **ifindex**]

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
ifindex	(Optional) Displays the ifIndex value for the specified interface.

Command Default

Enter the **show snmp interface** command without keywords or arguments to display the ifIndex value for all interfaces.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read

This example displays the ifIndex value for a specific interface:

```
Router# show snmp interface pos 0/1/0/1 ifindex

ifName : POS0/1/0/1            ifIndex : 12
```

The following example displays the ifIndex value for all interfaces:

```
Router# show snmp interface
```

```
ifName : Loopback0             ifIndex : 1
ifName : POS0/1/0/1            ifIndex : 12
ifName : POS0/1/4/2            ifIndex : 14
ifName : POS0/1/4/3            ifIndex : 15
ifName : POS0/6/0/1            ifIndex : 2
ifName : POS0/6/4/4            ifIndex : 18
ifName : POS0/6/4/5            ifIndex : 19
ifName : POS0/6/4/6            ifIndex : 20
ifName : Bundle-POS24          ifIndex : 4
ifName : Bundle-Ether28        ifIndex : 5
ifName : Bundle-Ether28.1      ifIndex : 7
ifName : Bundle-Ether28.2      ifIndex : 8
ifName : Bundle-Ether28.3      ifIndex : 9
ifName : MgmtEth0/RP0/CPU0/0   ifIndex : 6
ifName : MgmtEth0/RP1/CPU0/0   ifIndex : 10
ifName : GigabitEthernet0/1/5/0  ifIndex : 11
ifName : GigabitEthernet0/1/5/1  ifIndex : 13
ifName : GigabitEthernet0/1/5/2  ifIndex : 3
ifName : GigabitEthernet0/6/5/1  ifIndex : 16
ifName : GigabitEthernet0/6/5/2  ifIndex : 17
ifName : GigabitEthernet0/6/5/7  ifIndex : 21
```

Table 37: show snmp interface Field Descriptions

Field	Definition
ifName	Interface name.
ifIndex	ifIndex value.

show snmp interface notification

To display the linkUp and linkDown notification status for a subset of interfaces, use the **show snmp interface notification** command in EXEC mode.

show snmp interface notification {**subset** *subset-number* | **regular-expression** *expression* | [*type interface-path-id*]}

Syntax Description

subset *subset-number*	Specifies the identifier of the interface subset. The subset-number argument is configured using the **snmp-server interface subset** command.
regular-expression *expression*	Specifies a subset of interfaces matching a regular expression, for which to display information.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Regular expressions have two constraints:

- Regular expressions must always be entered within double quotes to ensure that the CLI interprets each character correctly.
- All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)<\/\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)<\/\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in for more information regarding regular expressions.

When using the **subset** or **regular-expression** keywords, the actual display might not match the configuration if there are higher priority *subset-number* values that actually apply to the interface. This can happen for a set of interfaces that are included in two or more configured regular expressions or where an individual interface configuration is enabled.

Task ID

Task ID	Operation
snmp	read

The following example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a specific *subset-number* :

```
RP/0/RP0/CPU0:router# show snmp interface notification subset 3
```

This example illustrates how to display linkUp and linkDown notification status for a subset of interfaces identified by a regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface notification regular-expression
"^Gig[a-zA-Z]+[0-9/]+\."
```

show snmp interface regular-expression

To display interface names and indices assigned to interfaces that match a regular expression, use the **show snmp interface regular-expression** command in EXEC mode.

show snmp interface regular-expression *expression*

Syntax Description

expression	Specifies a subset of interfaces matching a regular expression, for which to display information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)</\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)</\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in for more information regarding regular expressions.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to display information for interfaces that match the given regular expression:

```
RP/0/RP0/CPU0:router# show snmp interface regular-expression "^Gig[a-zA-Z]+[0-9/]+\."
```

show snmp mib

To display a list of MIB module object identifiers (OIDs) registered on the system, use the **show snmp mib** command in EXEC mode.

show snmp mib [*object-name* | **dll**]

Syntax Description

object-name	(Optional) Specific MIB object identifier or object name.
dll	(Optional) Displays a list of all MIB DLL filenames and the OID supported by each DLL filename on the system.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show snmp mib** command to display a list of the MIB module instance identifiers registered on the system.

Although the **show snmp mib** command can be used to display a list of MIB OIDs registered on the system, the use of a Network Management System (NMS) application is the recommended alternative for gathering this information.

The **show snmp mib** command is intended only for network managers who are familiar with Abstract Syntax Notation One (ASN.1) syntax and the Structure of Management Information (SMI) of Open Systems Interconnection (OSI) Reference Model.

SNMP management information is viewed as a collection of managed objects residing in a virtual information store termed the *MIB*. Collections of related objects are defined in MIB modules. These modules are written using a subset of ASN.1 termed the *SMI.*

The definitions for the OIDs displayed by this command can be found in the relevant RFCs and MIB modules. For example, RFC 1907 defines the system.x, sysOREntry.x, snmp.x, and snmpTrap.x OIDs, and this information is supplemented by the extensions defined in the CISCO-SYSTEM-MIB.

Use the **detailed** keyword to display a list of the MIB module instance identifiers registered on the system. The output displays additional details, such as DLL and configuration information.

Use the **dll** keyword to display a list of the MIB modules loaded into the agent. This command can be used to find the supported MIBs.

Note This command produces a high volume of output if SNMP is enabled on the system. To exit from a --More-- prompt, press **Crtl-Z**.

Task ID

Task ID	Operations
snmp	read

The following example shows sample output from the **show snmp mib** command:

```
RP/0/RP0/CPU0:router# show snmp mib

1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
1.3.6.1.2.1.47.1.3.1.1.1
--More-
```

This example shows sample output from the **show snmp mib** command with the **detailed** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib detailed

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
1.3.6.1.2.1.47.1.1.1.1.2
1.3.6.1.2.1.47.1.1.1.1.3
1.3.6.1.2.1.47.1.1.1.1.4
1.3.6.1.2.1.47.1.1.1.1.5
1.3.6.1.2.1.47.1.1.1.1.6
1.3.6.1.2.1.47.1.1.1.1.7
1.3.6.1.2.1.47.1.1.1.1.8
1.3.6.1.2.1.47.1.1.1.1.9
1.3.6.1.2.1.47.1.1.1.1.10
1.3.6.1.2.1.47.1.1.1.1.11
1.3.6.1.2.1.47.1.1.1.1.12
1.3.6.1.2.1.47.1.1.1.1.13
1.3.6.1.2.1.47.1.1.1.1.14
```

```
1.3.6.1.2.1.47.1.1.1.1.15
1.3.6.1.2.1.47.1.1.1.1.16
1.3.6.1.2.1.47.1.2.1.1.2
1.3.6.1.2.1.47.1.2.1.1.3
1.3.6.1.2.1.47.1.2.1.1.4
1.3.6.1.2.1.47.1.2.1.1.5
1.3.6.1.2.1.47.1.2.1.1.6
1.3.6.1.2.1.47.1.2.1.1.7
1.3.6.1.2.1.47.1.2.1.1.8
--More--
```

This example shows sample output from the **show snmp mib** command with the **dll** keyword:

```
RP/0/RP0/CPU0:router# show snmp mib dll

Entitymib:dll=/pkg/lib/mib/libEntitymib.dll, config=Entity.mib, loaded
bgp4mib:dll=/pkg/lib/mib/libbgp4mib.dll, config=bgp4.mib, loaded
cdpmib:dll=/pkg/lib/mib/libcdpmib.dll, config=cdp.mib, loaded
ciscoprocessmib:dll=/pkg/lib/mib/libciscoprocessmib.dll,
 config=ciscoprocess.mib, loaded
ciscosyslogmib:dll=/pkg/lib/mib/libciscosyslogmib.dll,
 config=ciscosyslog.mib, loaded
ciscosystemmib:dll=/pkg/lib/mib/libciscosystemmib.dll,
 config=ciscosystem.mib, loaded
confcopymib:dll=/pkg/lib/mib/libconfcopymib.dll, config=confcopy.mib,
 loaded
configmanmib:dll=/pkg/lib/mib/libconfigmanmib.dll, config=configman.mib,
 loaded
dot3admib:dll=/pkg/lib/mib/libdot3admib.dll, config=dot3ad.mib,
 loaded
fabhfrmib:dll=/pkg/lib/mib/libfabhfrmib.dll, config=fabhfr.mib,
 loaded
fabmcastapplmib:dll=/pkg/lib/mib/libfabmcastapplmib.dll,
 config=fabmcastappl.mib, loaded
fabmcastmib:dll=/pkg/lib/mib/libfabmcastmib.dll, config=fabmcast.mib,
 loaded
flashmib:dll=/pkg/lib/mib/libflashmib.dll, config=flash.mib,
 loaded
hsrpmib:dll=/pkg/lib/mib/libhsrpmib.dll, config=hsrp.mib, loaded
icmpmib:dll=/pkg/lib/mib/libicmpmib.dll, config=icmp.mib, loaded
ifmib:dll=/pkg/lib/mib/libifmib.dll, config=if.mib, loaded
ipmib:dll=/pkg/lib/mib/libipmib.dll, config=ip.mib, loaded
mempoolmib:dll=/pkg/lib/mib/libmempoolmib.dll, config=mempool.mib,
 loaded
mplsldpmib:dll=/pkg/lib/mib/libmplsldpmib.dll, config=mplsldp.mib,
 loaded
.
.
.
```

show snmp mib bulkstat transfer

To display completed local bulk statistics files, use the **show snmp mib bulkstat transfer** command in EXEC mode.

show snmp mib bulkstat transfer [*transfer-name*]

Syntax Description

transfer-name	Specifies a named transfer file to display.

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp mib bulkstat transfer** command lists all bulk statistics virtual files (VFiles) on the system that have finished collecting data. (Data files that are not complete are not displayed.)

The output lists all of the completed local bulk statistics files, the remaining time left before the bulk statistics file is deleted (remaining retention period), and the state of the bulk statistics file. The state of the bulk statistics file should be Retry. Retry indicates that one or more transfer attempts have failed and that the file transfer will be attempted again. The number of retry attempts remaining is displayed in parenthesis. After the successful retry or retry attempts, the local files created by the MIB process in the router are deleted and data collection begins again.

To display only the status of a named transfer (as opposed to all configured transfers), specify the name of the transfer in the *transfer-name* argument. The *transfer-name* argument names a file which is supposed to be created even before the retries.

Task ID

Task ID	Operation
snmp	read

```
RP/0/RP0/CPU0:router# show snmp mib bulkstat transfer

Transfer Name : ifmib
 Retained files

 File Name        : Time Left (in seconds)   :STATE
 ----------------------------------------------------------
```

```
ifmib_Router_020421_100554683 : 173 : Retry (2 Retry attempt(s) Left)
```

show snmp mib ifmib cache

To show the Ifindex that has exceeded the threshold time for processing, the request type and the time stamp, use the **show snmp mib ifmib cache** command in XR EXEC mode. The threshold time for the data to create an entry is 500 milli seconds.

show snmp mib ifmib cache

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 500 entries. An entry will be added when the difference between Cache in and Cache out time is more than 500 milli seconds. The timeout value cannot be changed.

The **show snmp mib ifmib cache** command shows these details:

Field	Description
Index	Interface index.
MIB IN	Time stamp of the request when IFMIB starts processing.
Cache In	Time stamp in milli seconds when data retrieval from the cache starts for the request. It is offset from MIB IN time stamp.
Cache Out	Time stamp in milli seconds when data is retrieved from cache. It is offset from MIB IN time stamp.
MIB Out	Time stamp in milli seconds of the response from IF MIB. It is offset from MIB IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp mib ifmib cache
```

```
IFIndex     Type          MIB IN                    CACHE IN[ms]          CACHE OUT[ms]
       MIB OUT[ms]

2           NEXT          Mar 18 07:14:41.815           4                    701
           701

2           NEXT          Mar 18 07:15:36.815           0                    679
           679

2           NEXT          Mar 18 07:16:00.735           0                    684
           684
```

show snmp mib ifmib general

To show how many requests get data from internal cache and how many requests are sent to statsd to get data, use the **show snmp mib ifmib general** command in XR EXEC mode.

show snmp mib ifmib general

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default IFMIB internal cache is 15 seconds. To change the duration, use the command:

```
snmp-server ifmib internal cache max-duration <0-60>
```

The default duration is 15 seconds, 0 seconds to disable the IFMIB internal cache.

To service the requests from Stats cache instead of Drivers, use the command:

```
snmp-server ifmib stats cache
```

The **show snmp mib ifmib general** command shows these details:

Field	Description
Cache Hit	Number of times the request retrieves data from IFMIB internal cache.
Cache Miss	Number of times the request processed from statsd, and not from IFMIB internal cache
Last Access Time	Latest time stamp of corresponding hit or miss.
Count	Number of times the data is retrieved.

The Cache Hit and Cache Miss are 32 bit counters. The maximum value is 2^31 and reset to 0 if the maximum value is exceeded.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# Show snmp mib ifmib general
 Fri Mar 14 05:05:50.408 PDT

Type                    Count            Last Access Time

Cache Hit               328              Mar 14 05:05:47.480

Cache Miss               2               Mar 14 05:05:47.386
```

show snmp mib ifmib statsd

To show the Ifindex that has exceeded the threshold time for processing, the request type and the time stamp, use the **show snmp mib ifmib statsd** command in XR EXEC mode. The threshold time for the data to create an entry is 500 milli seconds.

show snmp mib ifmib statsd

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 500 entries. An entry will be added when the difference between Stats in and Stats out time is more than 500 milli seconds. The timeout value cannot be changed.

The **show snmp mib ifmib statsd** command shows these details:

Field	Description
Index	Interface index.
MIB IN	Time stamp of the request when IFMIB starts processing.
Stats In	Time stamp in milli seconds when data retrieval from the Statsd starts for the request. It is offset from MIB IN time stamp.
Stats Out	Time stamp in milli seconds when data is retrieved from Statsd. It is offset from MIB IN time stamp.
MIB Out	Time stamp in milli seconds of the response from IF MIB. It is offset from MIB IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp mib ifmib statsd
```

```
IFIndex    Type          MIB IN                    STATS IN[ms]      STATS OUT[ms]     MIB
 OUT[ms]

2          NEXT          Mar 18 07:14:41.815         4                   701
701

2          NEXT          Mar 18 07:15:36.815         0                   679
679

2          NEXT          Mar 18 07:16:00.735         0                   684
684
```

show snmp request drop summary

To show the summary of overall packet drop, use the **show snmp request drop summary** command in XR EXEC mode.

show snmp request drop summary

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp request drop summary** command shows these details:

Field	Description
NMS Address	Address of network management station from which request is received.
IN Q	Number of packets dropped in incoming queue as the dropped packets are not processed more than 10 seconds.
Encode	Number of packets dropped because of encode errors.
Duplicate	Number of requests dropped with duplicate request feature.
Stack	Numbers of requests are dropped in stack.
AIPC	Number of packets dropped at AIPC module.
Overload	Number of packets dropped because of overload control notification.
Timeout	Number of packets are dropped because of slow response from MIB.
Internal	Number of packets dropped because of internal failures.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request drop summary
 Fri Mar 14 05:32:31.732 PDT
NMS Address          INQ   Encode    Duplicate   Stack    AIPC   Overload   Timeout
Internal
 1.2.3.4              0     0         0           0      0         218        0         0

NMS Address : 1:2:3::4
INQ      Encode     Duplicate    Stack    AIPC    Overload     Timeout     Internal
0         0          0            0       0       109          0           0
```

show snmp request duplicates

To display the number of duplicate protocol data unit (PDU) requests dropped by the SNMP agent, use the **show snmp request duplicates** command in EXEC mode.

show snmp request duplicates

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read

This example illustrates sample output from the **show snmp request duplicates** command:

```
RP/0/RP0/CPU0:router# show snmp request duplicates

No of Duplicate request received/Dropped : 0
```

show snmp request incoming-queue detail

To show the details of the queue of incoming SNMP requests, use the **show snmp request incoming-queue detail** command in XR EXEC mode.

show snmp request incoming-queue detail

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command shows an output for maximum of 15 queues and an additional general queue. The entry will be deleted when any queue is not polled for 30 minutes.

This command shows these details:

Field	Description
NMS Address	Source address (IPv4 or IPv6) of network management system (NMS) queue. Specifies the NMS packet requests in this queue.
Q Depth	Number of packets to be processed in the queue.
Deque Count	Number of packets that are processed.
Priority	Priority of queue with packets to be processed. The priority ranges from 1 to 5, 1 indicates low priority and 5 indicates high priority.
Enque time	Time stamp of last request in the queue.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request incoming-queue detail
 Wed Mar 12 05:16:59.505 PDT

NMS ADDRESS          Q Depth      Deque count          Priority             Enque time
```

```
4.5.6.7               0                1223              1                     Wed Mar 12
05:16:25

1.2.3.4               0                1193              1                     Wed Mar 12
05:15:06

General Q             0                 0                0                     Wed Mar 12
05:14:49

NMS ADDRESS       : 4:5:6::7

  Q Depth     Deque count           Priority               Enque time

  0                1220               1                    Wed Mar 12 05:16:02

NMS ADDRESS       : 1:2:3::4

  Q Depth     Deque count          Priority               Enque time

  0               1221               1                      Wed Mar 12 05:15:37
```

show snmp request overload stats

To show the number of packets dropped due to overload feature, use the **snmp request overload stats** command in XR EXEC mode.

show snmp request overload stats

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command displays the latest 100 entries.

The show snmp request overload stats command shows these details:

Field	Description
StartTime	Time when overload control notification is received.
InQInDrop	Number of packet drops before inserting in incoming queue.
InQOutDrop	Number of packets dropped from incoming queue.
EndTime	Time when overload control notification ends.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request overload stats
Thu Mar 13 07:00:45.575 UTC
StartTime                          InQInDrop        InQOutDrop                EndTime

Thu Mar 13 07:00:28                   1               0                         Thu Mar
13 07:00:38
```

show snmp request type detail

To shows the group that is polled frequently and from which network management system (NMS), use the **show snmp reqest type detail** command in XR EXEC mode.

show snmp request type detail

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp request type detail** command shows these details:

Field	Description
NMS Address	Address of Network Management Station from which the request is received.
Request	Number of requests from NMS.
SNMPD	Number of requests to snmpd.
Interface	Number of requests to mibd_interface.
Entity	Number of requests to mibd_entity.
Route	Number of requests to mibd_route.
Infra	Number of requests to mibd_infra.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp request type detail
Wed Mar 12 05:17:34.838 PDT
NMS Address      Request    AGENT    INTERFACE    ENTITY    ROUTE    INFRA
1.2.3.4          1193       52         742         70       267        123
4.5.6.7          1223       52         742         100      267        123
```

```
1:2:3::4          1221        52          742         100         265         123
4:5:6::7          1220        52          742         100         265         122
```

show snmp request type summary

To show the types of requests sent from each network management system (NMS), use the **show snmp request type summary** command in .

show snmp request type summary

This command has no keywords or arguments.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **show snmp request type summary** command shows these details:

Field	Description
NMS address	IP address of the NMS that sent the request.
Get	Number of requests of Get type.
Getnext	Number of requests of Getnext type.
Getbulk	Number of requests of Getbulk type.
Set	Number of requests of Set type.
Test	Number of requests of Test type that is part of Set request.

Task ID

Task ID	Operations
snmp	read, write

```
show snmp request type summary
 Wed Mar 12 05:17:14.643 PDT
NMS Address           Get      GetNext      GetBulk      Set      Test
 1.2.3.4              0          1254         0           0         0
 4.5.6.7              0          5101         0           0         0

NMS Address : 1:2:3::4
 Get      GetNext      GetBulk      Set      Test
  0          2536        0           0         0
NMS Address : 4:5:6::7
 Get      GetNext      GetBulk      Set      Test
  0          3817        0           0         0
```

show snmp statistics oid group

To show the statistics of object ID (OID), use the **show snmp statistics oid group** command in XR EXEC mode.

show snmp statistics oid group {**interface** | **infra** | **route** | **entity**}

Syntax Description

interface	mibd_interface sub-agent process
infra	mibd_infra sub-agent process
route	mibd_route sub-agent process
entity	mibd_entity sub-agent process

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The latest 500 entries for each group is displayed and a maximum of 2000 entries is displayed for four groups.

The **show snmp statistics oid group** command shows these details:

Field	Description
SerNum	Unique serial number for each request processing in sub-agents.
Type	Request type.
NumObj	Number of OIDs processing in this request.
MIBMGR-IN	Time stamp of request received from AIPC.
PDU-IN	Time stamp of request sent to MIB for processing. This will be offset in milli seconds from MIBMGR_IN time stamp.
FROM-MIB	Time stamp of response sent from MIB after processing. This will be offset in milli seconds from MIBMGR_IN time stamp.
PDU-OUT	Time stamp of response sent to SNMP through AIPC . This will be offset in milli seconds from MIBMGR_IN.

Field	Description
OID	OID info processing this request.
MIB-IN	Time stamp of the request sent to MIB for each OID.
MIB-OUT	Time stamp of response sent from MIB after processing. This will be offset in milli seconds from MIB-IN.
ExpNext	Request Exp-Next.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics oid group interface
Thu Mar 13 07:10:30.310 UTC
SerNum: 2489   Type: GETNEXT     NumObj: 1
  MIBMGR-IN    PDU-IN[ms]          PDU-OUT[ms]          MIBMGR-OUT[ms]
  Mar 13 07:00:49.933                1030                 1030
    OID: 1.3.6.1.2.1.10.32.4.2.0      Exp-Next: Yes
      MIB-IN : Mar 13 07:00:49.933   MIB-OUT[ms] : 1030
SerNum: 10203    Type: GETNEXT     NumObj: 1
  MIBMGR-IN      PDU-IN[ms]          PDU-OUT[ms]           MIBMGR-OUT[ms]
  Mar 13 06:36:16.976    0             1031                  1031
    OID: 1.3.6.1.2.1.10.32.4.2.0  Exp-Next: Yes
      MIB-IN : Mar 13 06:36:16.976   MIB-OUT[ms] : 1031
```

show snmp statistics pdu

To show if processing time of any protocol data unit (PDU) is more than threshold limit, use the **show snmp statistics pdu nms** command in XR EXEC mode.

show snmp statistics pdu nms[address]

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The PDU processing time can exceed the threshold limit in these scenarios:

- SNMPD not able to dispatch the request to MIB because of any failures in snmpd.
- MIB response after threshold limit.
- MIB does not respond to SNMPD.

Default threshold limit is 2 seconds. To change the default threshold value, use the command:

```
Snmp-server timeouts pdu stats <1-10>
```

The maximum number of entries per network management system (NMS) is 500 and the maximum number of NMS is 30.

This command shows these details:

Field	Description
NMS	Address of Network Management Station from which request has arrived.
Port	Port number of application that requested the SNMP query.
REQID	Request ID for each PDU.
Type	Type of PDU.
SerNum	The unique number generated for every request and sent to all MIBDs.
Timeout	If the request was timeout out set to TRUE, else set to FALSE.
InputQ-In	Time stamp of the PDU when queued into input Q.

Field	Description
InputQ-Out	Time stamp of the PDU when queued into input Q, This will be in milliseconds, Offset from INPUT-IN time stamp.
ProcQ-In	Time stamp of the PDU when queued into Processing Q. This will be in milliseconds, Offset from INPUT-IN time stamp.
Response	Time stamp in milli seconds of the PDU when response is received from sub agents. Offset from INPUT-IN time stamp.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics pdu nms
 Thu Mar 13 08:03:17.322 UTC
NMS: 64.103.222.6   PORT: 35028
  REQID:962974264  TYPE: 161  SerNum: 9428 TIMEOUT: No
  INPUTQ-IN                   INPUTQ-OUT[ms]       PROCQ-IN[ms]        RESPONSE[ms]
 Mar 13 08:03:15.269           0                    0                   1056
```

show snmp statistics poll oid all

To show all object IDs (OIDs) polled from all network management system (NMS) and how many times it has polled, use the **show snmp statistics poll oid all** command in XR EXEC mode.

For this command to work, the following configuration has to be committed:

(config)#snmp-server oid-poll-stats

show snmp statistics poll oid all

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The maximum number of entries equals the number of OIDs that were polled. The maximum number of NMS details for each OID is 15.

The **show snmp statistics poll oid all** command shows these details:

Field	Description
Object ID	OID requested from NMS.
NMS	List of NMS IP address requested for each OID.
Count	Number of times OID is polled for each NMS.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics poll oid all
 Object ID   :   1.3.6.1.2.1.1.3
 NMS                 COUNT
 10.2.1.3              10
 10.3.1.2              30
 10.4.1.3              20
 10.12.1.3             5

Object ID    :    1.3.6.1.2.1.1.4
NMS                   COUNT
```

```
10.2.1.3                10
10.3.1.2                5
10.4.1.3                20
10.12.1.3               30

Object ID   :  1.3.6.1.2.1.1.5
NMS                   COUNT
10.2.1.3                10
10.3.1.2                3
10.4.1.3                2
```

Show snmp statistics poll oid nms

To show which object ID (OID) is polled from which network management system (NMS) and how many times it has polled, use the **show snmp statistics poll oid nms** command in XR EXEC mode.

show snmp statistics poll oid nms<V4 / V6 address>

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp statistics poll oid nms** command shows these details:

Field	Description
Object ID	OID requested from NMS.
NMS	List of NMS IP address requested for each OID.
Count	Number of times OID is polled for each NMS.

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp statistics poll nms 1.2.3.4
 NMS Address   : 1.2.3.4
Object ID                  Count
1.3.6.1.2.1.2.2.1.2        14
```

show snmp statistics slow oid

To show the object ID (OID) that has exceeded beyond the threshold time for processing and the number of times that the threshold limit is exceeded with the latest timestamp, use the **show snmp statistics slow oid** command in XR EXEC mode.

show snmp statistics slow oid

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default threshold limit for this data as 500 milli seconds. To change the default value, use the command:

```
Snmp-server logging threshold oid-processing < <0-20000>
```

The latest 500 entries for each sub agent is displayed and a total of upto 2000 entries is maintained.

The **show snmp statistics slow oid** command shows these details:

Field	Description
Type	Request type for slow OID.
Exact OID	Requested OID from NMS.
Resp OID	Response OID for the Request type and EXACT OID.
Slow Count	Number of times OID is slow.
Slow Time	Time taken for processing the OID in milli seconds.
Time Stamp	Time stamp of the slow OID when MIB responded to MIBD.

Task ID

Task ID	Operations
snmp	read, write

This example shows a slow OIDs that exceeds the specified threshold time.

```
RP/0/RP0/CPU0:router# show snmp statistics slow oid
 Group:agent

  TYPE                : GETNEXT
  REQ_OID          : 1.3.6.1.2.1.1.1.0
  RESP_OID        : 1.3.6.1.2.1.1.1.2
  COUNT              : 2
  TIME[ms]           : 0
  TIME_STAMP    : Mar 13 05:36:52.279

Group:infra

Group:route

  TYPE               : GETNEXT
  REQ_OID        :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP  : Mar 13 05:36:52.279
  TYPE               : GET
  REQ_OID        :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP  : Mar 13 05:36:52.279

Group:entity

Group:interface

  TYPE                : GETNEXT
  REQ_OID          : 1.3.6.1.2.1.2.1
  RESP_OID        : 1.3.6.1.2.1.2.1.0
  COUNT              : 1
  TIME[ms]           : 0
  TIME_STAMP   : Mar 13 05:36:52.279
```

show snmp statistics slow oid [after/before] hh:mm:ss day mday year

To show the object ID (OID) that has exceeded beyond the threshold time for processing and the number of times that the threshold limit is exceeded with the latest timestamp, use the **show snmp statistics slow oid [after/before] hh:mm:ss day mday year** command in XR EXEC mode.

show snmp statistics slow oid[after/before] hh:mm:ss day mday year

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Default threshold limit for this data as 500 milli seconds. To change the default value, use the command:

```
Snmp-server logging threshold oid-processing < <0-20000>
```

The latest 500 entries for each sub agent is displayed and a total of upto 2000 entries is maintained.

The **show snmp statistics slow oid [after/before] hh:mm:ss day mday year** command shows these details:

Field	Description
Type	Request type for slow OID.
Exact OID	Requested OID from NMS.
Resp OID	Response OID for the Request type and EXACT OID.
Slow Count	Number of times OID is slow.
Slow Time	Time taken for processing the OID in milli seconds.
Time Stamp	Time stamp of the slow OID when MIB responded to MIBD.

Task ID

Task ID	Operations
snmp	read, write

This example shows a slow OIDs that exceeds the specified threshold time.

```
RP/0/RP0/CPU0:router# show snmp statistics slow oid
Group:agent

  TYPE                : GETNEXT
  REQ_OID           : 1.3.6.1.2.1.1.1.0
  RESP_OID         : 1.3.6.1.2.1.1.1.2
  COUNT               : 2
  TIME[ms]            : 0
  TIME_STAMP     : Mar 13 05:36:52.279

Group:infra
Group:route
  TYPE               : GETNEXT
  REQ_OID         :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP   : Mar 13 05:36:52.279

  TYPE               : GET
  REQ_OID         :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  RESP_OID       :
1.3.6.1.2.1.4.34.1.3.4.20.254.128.0.0.0.0.0.0.254.8.255.254.203.38.197.0.0.0.2
  COUNT            : 4
  TIME[ms]         : 14
  TIME_STAMP   : Mar 13 05:36:52.279

Group:entity
Group:interface
  TYPE                : GETNEXT
  REQ_OID          : 1.3.6.1.2.1.2.1
  RESP_OID        : 1.3.6.1.2.1.2.1.0
  COUNT             : 1
  TIME[ms]          : 0
  TIME_STAMP    : Mar 13 05:36:52.279
```

show snmp traps details

To show the details about the traps generated for each host, the sent and drop count and the timestamp, use the **show snmp traps details** command in XR EXEC mode.

show snmp traps details

This command has no keywords or arguments.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show snmp traps details** command shows these details:

Field	Description
TrapOID	Generated trap.
Sent	Number of times the trap sent from the host and port configured.
Drop	Number of times the trap dropped from the host and port configured.
Last-sent	Time stamp when the last trap was sent from the host and port.
Last-drop	Time stamp when the last trap dropped from the host and port.
Host	Configured address of the host to receive traps
udp-port	Configured port to receive traps

Task ID

Task ID	Operations
snmp	read, write

```
RP/0/RP0/CPU0:router# show snmp traps details
Mon Apr  7 17:14:07.241 UTC
HOST:9.22.24.150, udp-port:3333
```

```
------------------------------
TrapOID                          Sent    Drop     Last-sent                     Last-drop
ciscoConfigManMIB.2.0.1            2         0      Mon Apr 07 14 17:12:29          ~
ciscoFlashDeviceInsertedNotif      1         0      Mon Apr 07 14 17:12:28          ~
ciscoFlashDeviceRemovedNotif       1         0      Mon Apr 07 14 17:12:28          ~
```

show snmp users

To display information about the configured characteristics of Simple Network Management Protocol (SNMP) users, use the **show snmp users** command in EXEC mode.

show snmp users

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An SNMP user must be part of an SNMP group, as configured using the **snmp-server user** command.

Use the **show snmp users** command to display information about all configured users.

When configuring SNMP, you may see the logging message "Configuring snmpv3 USM user." USM stands for the User-Based Security Model (USM) for SNMP Version 3 (SNMPv3). For further information about USM, see RFC 3414, *User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)*.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp users** command:

```
RP/0/RP0/CPU0:router# show snmp users

  User name:user1
  Engine ID:localSnmpID
  storage-type:nonvolatile active
```

Table 38: show snmp users Field Descriptions

Field	Definition
User name	String identifying the name of the SNMP user.
Engine ID	String identifying the name of the copy of SNMP on the device.

Field	Definition
storage-type	Settings that are set in volatile or temporary memory on the device, or in nonvolatile or persistent memory where settings remain after the device is turned off and on again.

show snmp view

To display the family name, storage type, and status of a Simple Network Management Protocol (SNMP) configuration and associated MIB, use the **show snmp view** command in EXEC mode.

show snmp view

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show snmp view** command to display the SNMP view configuration.

Task ID

Task ID	Operations
snmp	read

This example shows sample output from the **show snmp view** command:

```
Router# show snmp view
View Family Name/View Family Subtree/View Family Mask/View Family Type/storage/status
myview               mib-2                -          included         nonvolatile active
myview               cisco                -          included         nonvolatile active
myview               atEntry              -          excluded         nonvolatile active
v1default            iso                  -          included         permanent   active
v1default            internet             -          included         volatile    active
v1default            internet.6.3.15      -          excluded         volatile    active
v1default            internet.6.3.16      -          excluded         volatile    active
v1default            internet.6.3.18      -          excluded         volatile    active
```

Table 39: show snmp view Field Descriptions

Field	Definition
View Family Name	String identifying the name of the SNMP family.
View Family Subtree	String identifying the name of the SNMP MIB.
View Family Mask	String identifying the name of the SNMP family mask. A hyphen (-) appears in this column when no mask is associated.
View Family Type	String identifying if the SNMP family is either included or excluded.
storage	String identifying the type of memory storage, for example, volatile.

Field	Definition
status	String identifying the status of the configuration, either active or nonactive.

snmp-server chassis-id

To provide a message line identifying the Simple Network Management Protocol (SNMP) server serial number, use the **snmp-server chassis-id** command in global configuration mode. To restore the default value, if any, use the **no** form of this command.

snmp-server chassis-id *serial-number*
no snmp-server chassis-id

Syntax Description

serial-number	Unique identification string to identify the chassis serial number.

Command Default

On hardware platforms, where the serial number can be read by the device, the default is the serial number. For example, some Cisco devices have default chassis ID values of their serial numbers.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server chassis-id** command to provide a message line identifying the SNMP server serial number.

The chassis ID message can be displayed with the **show snmp** command.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to specify the chassis serial number 1234456:

```
RP/0/RP0/CPU0:router# snmp-server chassis-id 1234456
```

snmp-server community-map

To associate a Simple Network Management Protocol (SNMP) community with an SNMP context, security name, or a target-list use the **snmp-server community-map** command in global configuration mode. To change an SNMP community mapping to its default mapping, use the **no** form of this command.

snmp-server community-map [**clear** | **encrypted**] *community-string* [**context** *context-name*] [**security-name** *security-name*] [**target-list** *target*]
no snmp-server community-map [**clear** | **encrypted**] *community-string*

Syntax Description

clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the community-string argument is encrypted text.
community-string	Name of the community.
context *context-name*	(Optional) Name of the SNMP context to which this community name is to be mapped.
security-name *security-name*	(Optional) Security name for this community. By default, the *string* is the security name.
target-list *target*	(Optional) Name of the target list for this community.

Command Default

The value of the *community-string* argument is also the security name.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community-map** command to map an SNMPv1 or SNMPv2c community name to one or more of the following:

- **context name**—Maps a community name to a specific SNMP context name. This allows MIB instances in an SNMP context to be accessed through SNMPv1 or SNMPv2c using this community name.
- **security name**—By default, the community name is used to authenticate SNMPv1 and SNMPv2c. Configure a security name for a community name to override the default and authenticate SNMP with the security name.
- **target**—Target list identifies a list of valid hosts from which SNMP access can be made using a specific security name. When such mapping is done for a particular community name, SNMP access is allowed only from hosts included in the target list.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

Task ID

Task ID	Operations
snmp	read, write

This example maps the community name “sample 2” to the SNMP context name “sample1”:

```
RP/0/RP0/CPU0:router(config)# snmp-server community-map sample2 context sample1
```

snmp-server community

To configure the community access string to permit access to the Simple Network Management Protocol (SNMP), use the **snmp-server community** command in global configuration mode. To remove the specified community string, use the **no** form of this command.

snmp-server community [**clear** | **encrypted**] *community-string* [**view** *view-name*] [**RO** | **RW**] [**SDROwner** | **SystemOwner**] [*access-list-name*]
no snmp-server community *community-string*

Syntax Description

clear	(Optional) Specifies that the entered *community-string* is clear text and should be encrypted when displayed by the **show running** command.
encrypted	(Optional) Specifies that the entered *community-string* is encrypted text and should be displayed as such by the **show running** command.
community-string	Community string that acts like a password and permits access to the SNMP protocol. The maximum length of the *community-string* argument is 32 alphabetic characters. If the **clear** keyword was used, *community-string* is assumed to be clear text. If the **encrypted** keyword was used, *community-string* is assumed to be encrypted. If neither was used, *community-string* is assumed to be clear text.
view *view-name*	(Optional) Specifies the name of a previously defined view. The view defines the objects available to the community.
RO	(Optional) Specifies read-only access. Authorized management stations are able only to retrieve MIB objects.
RW	(Optional) Specifies read-write access. Authorized management stations are able both to retrieve and to modify MIB objects.
SDROwner	(Optional) Limits access to the owner service domain router (SDR).
SystemOwner	(Optional) Provides system-wide access.
access-list-name	(Optional) Name of an access list of IP addresses allowed to use the community string to gain access to the SNMP agent.

Command Default

By default, an SNMP community string permits read-only access to all MIB objects.

By default, a community string is assigned to the SDR owner.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server community** command to configure the community access string to permit access to SNMP.

To remove the specified community string, use the **no** form of this command.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

When the **snmp-server community** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server community** command is entered with the **SystemOwner** keyword, SNMP access is granted to .

Task ID

Task ID	Operations
snmp	read, write

This example shows how to assign the string comaccess to SNMP, allowing read-only access, and to specify that IP access list 4 can use the community string:

```
RP/0/RP0/CPU0:router(config)# snmp-server community comaccess ro 4
```

The following example shows how to assign the string mgr to SNMP, allowing read-write access to the objects in the restricted view:

```
RP/0/RP0/CPU0:router(config)# snmp-server community mgr view restricted rw
```

This example shows how to remove the community comaccess:

```
RP/0/RP0/CPU0:router(config)#no snmp-server community comaccess
```

snmp-server contact

To set the Simple Network Management Protocol (SNMP) system contact, use the **snmp-server contact** command in global configuration mode. To remove the system contact information, use the **no** form of this command.

snmp-server contact *system-contact-string*
no snmp-server contact

Syntax Description

system-contact-string	String that describes the system contact information. The maximum string length is 255 alphanumeric characters.

Command Default

No system contact is set.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server contact** command to set the system contact string. Use the **no** form of this command to remove the system contact information.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system contact string:

```
RP/0/RP0/CPU0:router(config)# snmp-server contact Dial System Operator at beeper # 27345
```

snmp-server context

To create a Simple Network Management Protocol (SNMP) context, use the **snmp-server context** command in global configuration mode. To remove an SNMP context, use the **no** form of this command.

snmp-server context *context-name*
no snmp-server context *context-name*

Syntax Description

context-name	Name of the SNMP context.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

This command creates an SNMP context. By default, all the SNMP MIB instances are in a default context. Create an SNMP context and map it to a particular feature to enable similar instances of the same object to co-exist in different SNMP contexts.

Task ID

Task ID	Operations
snmp	read, write

This example creates a new SNMP context named “sample1:”

```
RP/0/RP0/CPU0:router(config)# snmp-server context sample1
```

snmp-server context mapping

To map an SNMP context with a protocol instance, topology or VRF entity, use the **snmp-server context mapping** command in global configuration mode.

snmp-server context mapping *context-name* [**feature** *feature-name*] [**instance** *instance-name*] [**topology** *topology-name*] [**vrf** *vrf-name*]

Syntax Description

context-name	Name of the SNMP context.
feature *feature-name*	Specifies the protocol for which to map the context. Available options are: • **bridge**—Layer 2 VPN bridge • **vrf**—Virtual Routing and Forwarding
instance *instance-name*	Maps the context to the specified protocol instance.
topology *topology-name*	Maps the context to the specified protocol topology.
vrf *vrf-name*	Maps the context to the specified VRF logical entity.

Command Default

No context mappings exist by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A device can support multiple instances of a logical network entity, such as protocol instances or VRFs. Most existing MIBs cannot distinguish between these multiple logical network entities. For example, the original OSPF-MIB assumes a single protocol instance on a device, but you can now configure multiple OSPF instances on a device.

The **snmp-server context mapping** command maps a context to a protocol instance, topology or VRF logical entity.

Note The snmp-server context mapping command does not work for OSPF and OSPFv3. Refer to the **snmp context** commands.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to map an snmp context to an OSPF instance:

```
RP/0/RP0/CPU0:router(config)# snmp-server context mapping con5 feature ospf instance in1
```

snmp-server engineid local

To specify Simple Network Management Protocol (SNMP) engine ID on the local device, use the **snmp-server engineid local** command in global configuration mode. To return the engine ID to the default, use the **no** form of this command.

snmp-server engineid local *engine-id*
no snmp-server engineid local *engine-id*

Syntax Description

engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).

Command Default

An SNMP engine ID is generated automatically.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:router(config)# snmp-server engineID local 00:00:00:09:00:00:00:a1:61:6c:20:61
```

snmp-server engineid remote

To specify a Simple Network Management Protocol (SNMP) engine ID on a remote device, use the **snmp-server engineid remote** command in global configuration mode. To return the engine ID to the default, use the **no** form of this command.

snmp-server engineid remote *ip-address engine-id* **udp-port** *port*
no snmp-server engineid remote *ip-address engine-id* **udp-port** *port*

Syntax Description

ip-address	IP address of remote SNMP notification host
engine-id	Character string that identifies the engine ID. Consists of up to 24 characters in hexadecimal format. Each hexadecimal number is separated by a colon (:).
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

Command Default

An SNMP engine ID is generated automatically.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to configure the SNMP engine ID on the local device:

```
RP/0/RP0/CPU0:Router(config)# snmp-server engineID remote 172.16.4.1
00:00:00:09:00:00:00:a1:61:6c:20:61
```

snmp-server group

To configure a new Simple Network Management Protocol (SNMP) group, or a table that maps SNMP users to SNMP views, use the **snmp-server group** command in global configuration mode. To remove a specified SNMP group, use the **no** form of this command.

snmp-server group *name* {**v1** | **v2c** | **v3** {**auth** | **noauth** | **priv**}} [**read** *view*] [**write** *view*] [**notify** *view*] [**context** *context-name*] [*access-list-name*]
no snmp-server group *name*

Syntax Description

name	Name of the group.
v1	Specifies a group that uses the SNMPv1 security model. The SNMP v1 security model is the least secure of the possible security models.
v2c	Specifies a group that uses the SNMPv2c security model. The SNMPv2c security model is the second least secure of the possible security models.
v3	Specifies a group that uses the SNMPv3 security model. The SNMP v3 security is the most secure of the possible security models.
auth	Specifies authentication of a packet without encrypting it.
noauth	Specifies no authentication of a packet.
priv	Specifies authentication of a packet with encryption.
read *view*	(Optional) Specifies a read view string (not to exceed 64 characters) that is the name of the view that allows only the contents of the agent to be viewed.
write *view*	(Optional) Specifies a write view string (not to exceed 64 characters) that is the name of the view used to enter data and configure the contents of the agent.
notify *view*	(Optional) Specifies a notify view string (not to exceed 64 characters) that is the name of the view used to specify a notify or trap.
context *context-name*	(Optional) Specifies the SNMP context to associate with this SNMP group and associated views.
access-list-name	(Optional) Access list string (not to exceed 64 characters) that is the name of the access list.

Command Default

See Table 1.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This table describes the default values for the different views:

Table 40: snmp-server group Default Descriptions

Default	Definition
read *view*	Assumed to be every object belonging to the Internet (1.3.6.1) object identifier (OID) space, unless the user uses the **read** option to override this state.
write *view*	Nothing is defined for the write view (that is, the null OID). You must configure write access.
notify *view*	Nothing is defined for the notify view (that is, the null OID). If a view is specified, any notifications in that view that are generated are sent to all users associated with the group (provided an SNMP server host configuration exists for the user).

Configuring Notify Views

Do not specify a notify view when configuring an SNMP group for the following reasons:

- The **snmp-server host** command autogenerates a notify view for the user, and then adds it to the group associated with that user.
- Modifying the notify view of the group affects all users associated with that group.

The notify view option is available for two reasons:

- If a group has a notify view that is set using SNMP, you may need to change the notify view.
- The **snmp-server host** command may have been configured before the **snmp-server group** command. In this case, reconfigure the **snmp-server host** command or specify the appropriate notify view.

Instead of specifying the notify view for a group as part of the **snmp-server group** command, use the following commands in global configuration mode:

- **snmp-server user**—Configures an SNMP user.
- **snmp-server group**—Configures an SNMP group, without adding a notify view.
- **snmp-server host**—Autogenerates the notify view by specifying the recipient of a trap operation.

Working with Passwords and Digests

No default values exist for authentication or privacy algorithms when this command is configured. In addition, no default passwords exist. The minimum length for a password is one character, although we recommend using eight characters for security. A plain-text password or localized Message Digest 5 (MD5) password can be specified. Forgotten passwords cannot be recovered, and the user must be reconfigured.

SNMP Contexts

SNMP contexts provide Virtual Private Network (VPN) users with a secure way of accessing MIB data. When a VPN is associated with a context, that VPN's specific MIB data exists in that context. Associating a VPN with a context enables service providers to manage networks with multiple VPNs. Creating and associating a context with a VPN enables a provider to prevent the users of one VPN from accessing information about users of other VPNs on the same networking device.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to configure an SNMP version 3 group named group1 that requires the authentication of packets with encryption:

```
RP/0/RP0/CPU0:router(config)# snmp-server group group1 v3 priv
```

snmp-server host

To specify the recipient of a Simple Network Management Protocol (SNMP) notification operation, use the **snmp-server host** command in global configuration mode. To remove the specified host, use the **no** form of this command.

snmp-server host *address* [**clear** | **encrypted**] [**informs**] [**traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]
nosnmp-server host *address* [**clear** | **encrypted**] [**informs**] [**traps**] [**version** {**1** | **2c** | **3** {**auth** | **noauth** | **priv**}}] *community-string* [**udp-port** *port*] [*notification-type*]

Syntax Description

address	Name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
informs	(Optional) Specifies to send inform messages to this host.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version	(Optional) Specifies the version of the SNMP used to send the traps.
1	Specifies SNMPv1, the default.
2c	Specifies SNMPv2C.
3	Specifies SNMPv3. Version 3 is the most secure model because it allows packet encryption. If you specify the SNMPv3 keyword, you must specify the security level.
auth	Enables Message Digest 5 (MD5) algorithm and Secure Hash Algorithm (SHA) packet authentication.
noauth	Specifies that the noAuthNoPriv security level applies to this host. This is the default security level for SNMPv3.
priv	Enables Data Encryption Standard (DES) packet encryption (also called "privacy").
community-string	Password-like community string sent with the notification operation. We recommend defining this string using the **snmp-server community** command prior to using the **snmp-server host** command.
udp-port *port*	(Optional) Specifies the User Datagram Protocol (UDP) port of the host to use. Range is from 1 to 65535. The default UDP port is 161.

notification-type	(Optional) Type of notification to be sent to the host. If no type is specified, all available notifications are sent. The notification type can be one or more of these keywords: • **bgp** —Enables SNMP Border Gateway Protocol Version 4 (BGPv4) traps. • **config** —Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is (1) ciscoConfigManEvent. • **copy-complete** —Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps. • **entity** —Controls Entity MIB modification notifications. This notification type is defined in the ENTITY-MIB (enterprise 1.3.6.1.2.1.47.2) as: (1) entConfigChange. • **fabric** —Enables SNMP fabric traps. • **fru-ctrl** —Enables SNMP entity field-replaceable unit (FRU) control traps. • **mpls** —Enables SNMP Multiprotocol Label Switching (MPLS) traps. • **sensor** —Enables SNMP entity sensor traps. • **snmp** —Enables SNMP traps. • **syslog** —Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.

Command Default

This command is disabled by default. No notifications are sent.

The default UDP port is 161.

When this command is entered without keywords, the default is to send all trap types to the host.

If no version keyword is entered, the default is version 1.

If version 3 is specified, but the security level is not specified, the default security level is noauth.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps. Traps are unreliable because the receiver does not send acknowledgments when it receives traps. The sender cannot determine if the traps were received. Traps are discarded as soon as they are sent. Traps are also sent only once.

When the **snmp-server host** command is not entered, no notifications are sent. To configure the device to send SNMP notifications, configure at least one **snmp-server host** command. When the command is entered without keywords, all trap types are enabled for the host.

To enable multiple hosts, issue a separate **snmp-server host** command for each host. You can specify multiple notification types in the command for each host.

When multiple **snmp-server host** commands are given for the same host and kind of notification (trap), each succeeding **snmp-server host** command overwrites the previous command. Only the last **snmp-server host** command is in effect. For example, if an **snmp-server host** command with the **traps** keyword is entered for a host and then another command with the **traps** keyword is entered for the same host, the second command replaces the first.

Either a host name or IP address can be used to specify the host.

The **snmp-server host** command is used with the **snmp-server engineid** command. Use the **snmp-server traps** command to specify which SNMP notifications are sent globally. For a host to receive most notifications, at least one **snmp-server traps** command and the **snmp-server host** command for that host must be enabled.

However, some notification types cannot be controlled with the **snmp-server traps** command. For example, some notification types are always enabled. Other notification types are enabled by a different command.

The availability of a notification-type depends on the device type and Cisco software features supported on the device.

To display which notification types are available on the system, use the question mark (**?**) online help function at the end of the **snmp-server host** command.

The **no snmp-server host** command used with no keywords disables traps.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to send RFC 1157 SNMP traps to the host specified by the name myhost.cisco.com. Other traps are enabled, but only SNMP traps are sent because only the **snmp** keyword is specified in the **snmp-server host** command. The community string is defined as comaccess.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com comaccess snmp
```

This example shows how to send the SNMP traps to address 172.30.2.160:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host 172.30.2.160 public snmp
```

This example shows how to enable the router to send all traps to the host, myhost.cisco.com, using the community string public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
```

```
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

This example shows how to prevent traps from being sent to any host. The BGP traps are enabled for all hosts, but only the configuration traps are enabled to be sent to a host.

```
RP/0/RP0/CPU0:router(config)# snmp-server traps bgp
RP/0/RP0/CPU0:router(config)# snmp-server host hostabc public config
```

snmp-server ifindex persist

To enable ifIndex persistence globally on all Simple Network Management Protocol (SNMP) interfaces, use the **snmp-server ifindex persist** command in global configuration mode. To disable global interface persistence, use the **no** form of this command.

snmp-server ifindex persist
no snmp-server ifindex persist

Syntax Description

This command has no keywords or arguments.

Command Default

Global interface persistence is disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server ifindex persist** command to enable ifIndex persistence on all interfaces that have entries in the ifIndex table of the IF-MIB. When enabled, this command retains the mapping between the ifName object values and the ifIndex object values (generated from the IF-MIB) persistent during reloads, allowing for consistent identification of specific interfaces using SNMP. Applications such as device inventory, billing, and fault detection depend on this feature.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable ifIndex persistence globally:

```
RP/0/RP0/CPU0:router(config)# snmp-server ifindex persist
```

snmp-server ifmib ifalias long

To enable the ifAlias IF-MIB object to accept an interface alias name that exceeds the 64-byte default, use the **snmp-server ifmib ifalias long** command. Use the **no** form of this command to revert to the default length.

snmp-server ifmib ifalias long
no snmp-server ifmib ifalias long

Syntax Description

This command has no keywords or arguments.

Command Default

Global interface persistence is disabled.

The alias name is 64 bytes in length.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server ifmib ifalias long** command to enable the IF-MIB object ifAlias to accept an interface alias name that is greater than 64 bytes in length. The default length for the alias name is 64 bytes.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the IF-MIB object ifAlias:

```
RP/0/RP0/CPU0:router(config)# snmp-server ifmib ifalias long
RP/0/RP0/CPU0:router(config)# exit

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes
RP/0/RP0/CPU0:router#
```

snmp-server ifmib internal cache max-duration

To configure the refresh interval for the IF-MIB statistics cache, use the **snmp-server ifmib internal cache max-duration** command in global configuration mode. To revert to the default cache interval, use the **no** form of this command.

snmp-server ifmib internal cache max-duration *timeout*

Syntax Description

timeout	Length of time before the cache is refreshed. Values can range from 0 to 60 seconds. The default is 15.

Command Default

timeout: 15 seconds

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server ifmib internal cache max-duration** command controls the refresh interval of the cache. If the *timeout* value in the **snmp-server ifmib internal cache max-duration** command is set to zero, the cache is disabled. By default, the counters are cached for 15 secs in the ifmib internal cache, after which it will be discarded.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to change the refresh interval for the IF-MIB statistics cache.

```
RP/0/RP0/CPU0:routerrouter(config)# snmp-server ifmib internal cache max-duration 60
```

snmp-server ifmib ipsubscriber

To enable IP subscriber interfaces in the interfaces MIB (IF-MIB), use the **snmp-server ifmib ipsubscriber** command in global configuration mode. To disable IP subscriber interfaces, use the **no** form of this command.

snmp-server ifmib ipsubscriber
no snmp-server ifmib ipsubscriber

Syntax Description

This command has no keywords or arguments.

Command Default

Ip subscriber interfaces are not enabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

This example shows how to enable IP subscriber interfaces in the IF-MIB:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server ifmib ipsubscriber
```

snmp-server ifmib stats cache

To enable retrieval of cached statistics instead of real-time statistics, use the **snmp-server ifmib stats cache** command. To revert to the default, use the **no** form of this command.

snmp-server ifmib stats cache
no snmp-server ifmib stats cache

Syntax Description

This command has no keywords or arguments.

Command Default

Cached statistics are not enabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Cisco IOS XR statistics infrastructure maintains a cache of statistics for all interfaces. This cache is updated every 30 seconds. Use the **snmp-server ifmib stats cache** command to enable the IF-MIB to retrieve these cached statistics rather than real-time statistics. Accessing cached statistics is less CPU-intensive than accessing real-time statistics.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the IF-MIB caches statistics:

```
RP/0/RP0/CPU0:router(config)# snmp-server ifmib stats cache
RP/0/RP0/CPU0:router(config)# exit

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:yes
RP/0/RP0/CPU0:router#
```

snmp-server inform

To configure Simple Network Management Protocol (SNMP) inform message options, use the **snmp-server inform** command in global configuration mode. To revert to the default informs options, use the **no** form of this command.

snmp-server inform {**pending** *max-no* | **retries** *no-retries* | **timeout** *seconds*}
no snmp-server inform {**pending** *max-no* | **retries** *no-retries* | **timeout** *seconds*}

Syntax Description

pending *max-no*	Specifies the maximum number of inform messages to hold in the queue. The default is 25.
retries *no-retries*	Specifies the retry count for inform messages. Values can be from 1 to 100. The default is three.
timeout *seconds*	Specifies the inform message timeout value in seconds. The default is 15.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To enable the sending of SNMP inform messages, use the **snmp-server host** command with the **informs** keyword. When SNMP server informs are enabled, the SNMP version can be only SNMPv2C or SNMPv3.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure SNMP inform messages:

```
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com informs comaccess
RP/0/RP0/CPU0:router(config)# snmp-server inform pending 40
RP/0/RP0/CPU0:router(config)# snmp-server inform retries 10
```

snmp-server interface

To enable an interface to send Simple Network Management Protocol (SNMP) trap notifications and enter SNMP interface configuration mode, use the **snmp-server interface** command in global configuration mode. To disable the sending of SNMP trap notifications on an interface, use the **no** form of this command.

snmp-server interface *type interface-path-id*
no snmp-server interface *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

Ethernet interfaces are enabled to send SNMP trap notifications. SNMP trap notifications are disabled on all other physical and logical interfaces.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server interface** command enters SNMP interface configuration mode for you to configure the available SNMP options.

Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is and the module is CPU0. Example: interface .

Task ID

Task ID	Operations
snmp	read, write

This example shows how to assign ifIndex persistence on interface 0/0/1/0:

```
RP/0/RP0/CPU0:router(config)# snmp-server interface pos 0/0/1/0
RP/0/RP0/CPU0:router(config-snmp-if)#
```

snmp-server interface subset

To enter snmp-server interface subset configuration mode for a set of interfaces, use the **snmp-server interface subset** command in global configuration mode. To revert to the default interface settings, use the **no** form of this command.

snmp-server interface subset *subset-number* **regular-expression** *expression*
no snmp-server interface subset *subset-number*

Syntax Description

subset-number	Identifying number of the interface subset, which also indicates its relative priority.
regular-expression *expression*	Specifies for which subset of interfaces to enter snmp-server interface subset configuration mode. The *expression* argument must be entered surrounded by double quotes.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The *subset-number* argument is used to set the priority for an interface that matches more than one configured regular expressions. Lower values of the *subset-number* have a higher priority. If a single interface becomes part of a multiple-interface configured regular expression, the configuration with the lower *subset-number* value is applied.

Regular expressions have two constraints:

- Regular expressions must always be entered within double quotes to ensure that the CLI interprets each character correctly.
- All characters that are part of a regular expression are considered regular characters with no special meaning. In order to enter special characters, such as "\" or "?," they must be preceded by the backslash character "\." For example, to enter the regular expression ([A-Z][A-Z0-9]*)\b[^>]*>(.*?)<\/\1, you would enter ([A-Z][A-Z0-9]*)\\b[^>]*>(.*\?)<\/\\1.

Refer to the *Understanding Regular Expressions, Special Characters, and Patterns* module in for more information regarding regular expressions.

From the snmp-server interface mode of a subset of interfaces, SNMP linkUp and linkDown notifications can be enabled or disabled using the **notification linkupdown disable** command.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to configure all Gigabit Ethernet interfaces:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server int subset 2
    regular-expression "^Gig[a-zA-Z]+[0-9/]+\."
RP/0/RP0/CPU0:router(config-snmp-if-subset)#
```

snmp-server ipv4 dscp

To mark packets with a specific differentiated services code point (DSCP) value, use the **snmp-server ipv4 dscp** command in global configuration mode. To remove matching criteria, use the **no** form of this command.

snmp-server ipv4 dscp *value*
no snmp-server ipv4 dscp [*value*]

Syntax Description

value	Value of the DSCP. The DSCP value can be a number from 0 to 63, or it can be one of the following keywords: **default**, **ef**, **af11**, **af12**, **af13**, **af21**, **af22**, **af23**, **af31**, **af32**, **af33**, **af41**, **af42**, **af43**, **cs1**, **cs2**, **cs3**, **cs4**, **cs5**, **cs6**, **cs7**.

Command Default

The IP DSCP default value for SNMP traffic is 0.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server ipv4 dscp** command to specify an IP DSCP value to give SNMP traffic higher or lower priority in your network.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure the DSCP value to af32:

```
RP/0/RP0/CPU0:router(config)# snmp-server ipv4 dscp af32
```

snmp-server ipv4 precedence

To mark packets with a specific precedence level to use for packet matching, use the **snmp-server ipv4 precedence** command in global configuration mode. To restore the system to its default interval values, use the **no** form of this command.

snmp-server ipv4 precedence *value*
no snmp-server ipv4 precedence [*value*]

Syntax Description

value Value of the precedence. The precedence value can be a number from 0 to 7, or it can be one of the following keywords:

critical

Set packets with critical precedence (5)

flash

Set packets with flash precedence (3)

flash-override

Set packets with flash override precedence (4)

immediate

Set packets with immediate precedence (2)

internet

Set packets with internetwork control precedence (6)

network

Set packets with network control precedence (7)

priority

Set packets with priority precedence (1)

routine

Set packets with routine precedence (0)

Command Default

The IP Precedence default value for SNMP traffic is 0.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server ipv4 precedence** command to specify an IP Precedence value to give SNMP traffic higher or lower priority in your network.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the precedence to 2:

```
RP/0/RP0/CPU0:router(config)# snmp-server ipv4 precedence 2
```

snmp-server location

To specify the system location for Simple Network Management Protocol (SNMP), use the **snmp-server location** command in global configuration mode. To remove the location string, use the **no** form of this command.

snmp-server location *system-location*
no snmp-server location

Syntax Description

system-location	String indicating the physical location of this device. The maximum string length is 255 alphanumeric characters.

Command Default

No system location string is set.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to specify a system location string:

```
RP/0/RP0/CPU0:router(config)# snmp-server location Building 3/Room 214
```

snmp-server mib bulkstat max-procmem-size

To configure the overall per-process memory size limit used by all bulk statistics files in the process, use the **snmp-server mib bulkstat max-procmem-size** command in global configuration mode. To remove the overall per-process memory size, use the **no** form of this command.

snmp mib bulkstat max-procmem-size *size*
no snmp mib bulkstat max-procmem-size [*size*]

Syntax Description

size	Overall per-process memory size limit in kilobytes. The valid range is from 100 to 200000. The default is 200000.

Command Default

The maximum process memory size is 200000 KB.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Currently 300 MB is the maximum process memory available for MIB and SNMP processes.

Task ID

Task ID	Operation
snmp	read, write

This example sets the maximum process memory size to 100000 KB.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat max-procmem-size 100000
```

snmp-server mib bulkstat object-list

To configure a Simple Network Management Protocol (SNMP) bulk statistics object list and enter bulk statistics objects configuration mode, use the **snmp-server mib bulkstat object-list** in global configuration mode. To remove an SNMP object list configuration, use the **no** form of this command.

snmp-server mib bulkstat object-list *object-list-name*
no snmp-server mib bulkstat object-list *object-list-name*

Syntax Description

object-list-name	Name or object identifier (OID) of the bulk statistics object list to configure.

Command Default

No SNMP bulk statistics object list is configured.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat object-list** command allows you to name an object list. Bulk statistics object lists are used for the Periodic MIB Data Collection and Transfer Mechanism.Use the **add** command to add objects to the object list configured with the **snmp-server mib bulkstat object-list** command. Bulk statistics object lists can be reused in multiple schemas.

Task ID

Task ID	Operation
snmp	read, write

In this example, a bulk statistics object list called ifmib is configured to include two objects:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifOutOctets
RP/0/RP0/CPU0:router(config-bulk-objects)# add ifInOctets
```

snmp-server mib bulkstat schema

To configure a Simple Network Management Protocol (SNMP) bulk statistics schema and enter bulk statistics schema configuration mode, use the **snmp-server mib bulkstat schema** command in global configuration mode. To remove the SNMP bulk statistics schema, use the **no** form of this command.

snmp-server mib bulkstat schema *schema-name*
no snmp-server mib bulkstat schema *schema-name*

Syntax Description

schema-name	Specifies the name of the schema to configure.

Command Default

No schemas are configured.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server mib bulkstat schema** command names the schema and enters bulk statistics schema configuration mode. Bulk statistics schema configuration mode is used to configure the object list, instance, and polling interval to be used in the schema.

The specific instances of MIB objects for which data should be collected are determined by appending the value of the **instance** command to the objects specified in the object list.

Multiple schemas can be associated with a single bulk statistics file when configuring the bulk statistics transfer options.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a bulk statistics schema called GigE0/6/5/0:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat schema tengige 0/6/5/0
RP/0/RP0/CPU0:router(config-bulk-sc)# object-list ifmib
RP/0/RP0/CPU0:router(config-bulk-sc)# poll-interval 3
RP/0/RP0/CPU0:router(config-bulk-sc)# instance exact interface tengige 0/6/5/0 subif
RP/0/RP0/CPU0:router(config-bulk-sc)# exit
```

snmp-server mib bulkstat transfer-id

To identify the bulk statistics transfer configuration and enter bulk statistics transfer configuration mode, use the **snmp-server mib bulkstat transfer-id** command in global configuration mode. To remove a previously configured transfer, use the **no** form of this command

snmp-server mib bulkstat transfer-id *transfer-id*
no snmp-server mib bulkstat transfer-id *transfer-id*

Syntax Description

transfer-id	Name of the transfer configuration.

Command Default

Bulk statistics transfer is not configured.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The name, *transfer-id*, you specify for the bulk statistics transfer configuration is used in the filename of the bulk statistics file when it is generated and is used to identify the transfer configuration in the output of the **show snmp mib bulkstat transfer** command.

Task ID

Task ID	Operation
snmp	read, write

In this example, The bulk statistics transfer is given the name bulkstat1 and contains two schemas:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema IFMIB
RP/0/RP0/CPU0:router(config-bulk-tr)# schema CAR
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary
ftp://user1:pswrd@cbin2-host/users/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary
tftp://user1@10.1.0.1/tftpboot/user1/bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# format schemaASCII
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 30
RP/0/RP0/CPU0:router(config-bulk-tr)# retry 5
RP/0/RP0/CPU0:router(config-bulk-tr)# buffer-size 1024
RP/0/RP0/CPU0:router(config-bulk-tr)# retain 30
RP/0/RP0/CPU0:router(config-bulk-tr)# end
```

snmp-server mibs cbqosmib persist

To enable persistent storage of the CISCO-CLASS-BASED-QOS-MIB data across process restarts, switchovers, and device reloads, use the **snmp-server mibs cbqosmib persist** command in global configuration mode. To disable persistent storage of the MIB data, use the **no** form of this command.

snmp-server mibs cbqosmib persist
no snmp-server mibs cbqosmib persist

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable persistent storage of CISCO-CLASS-BASED-QOS-MIB data:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib persist
```

snmp-server mibs cbqosmib cache

To enable and configure caching of the QoS MIB statistics, use the **snmp-server mibs cbqosmib cache** command in global configuration mode. To disable caching, use the **no** form of this command.

snmp-server mibs cbqosmib cache {**refresh time** *time* | **service-policy count** *count*}
no snmp-server mibs cbqosmib cache [**refresh time** *time* | **service-policy count** *count*]

Syntax Description

refresh	Enables QoS MIB caching with a specified cache refresh time.
time *time*	Specifies the cache refresh time, in seconds. The *time* argument can be between 5 and 60. The default is 30.
service-policy	Enables QoS MIB caching with a limited number of service policies to cache.
count *count*	Specifies the maximum number of service policies to cache. The count argument can be between 1 and 5000.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

Example

This example illustrates how to enable QoS MIB caching with a refresh time:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib cache refresh time 45
```

This example illustrates how to enable QoS MIB caching with a service policy count limitation:

```
RP/0/RP0/CPU0:router(config)# snmp-server mibs cbqosmib cache service-policy count 10
```

snmp-server notification-log-mib

To configure the NOTIFICATION-LOG-MIB, use the **snmp-server notification-log-mib** command in global configuration mode. To remove the specified configuration, use the **no** form of this command.

snmp-server notification-log-mib {**globalAgeOut** *time* | **globalSize** *size* | **default** | **disable** | **size** *size*}
no snmp-server notification-log-mib {**globalAgeOut** | **globalSize** | **default** | **disable** | **size**}

Syntax Description

globalAgeOut *time*	Specifies how much time, in minutes, a notification remains in the log. Values for the *time* argument can range from 0 to 4294967295; the default is 15.
globalSize *size*	Specifies the maximum number of notifications that can be logged in all logs. The default is 500.
default	Specifies to create a default log.
disable	Specifies to disable logging to the default log.
size *size*	Specifies the maximum number of notifications that the default log can hold. The default is 500.

Command Default

NOTIFICATION-LOG-MIB notifications are not logged.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Logging of NOTIFICATION-LOG-MIB notifications begins when the default log is created. Named logs are not supported, therefore only the default log can be created.

Task ID

Task ID	Operations
snmp	read, write

The following example creates a default log for notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib default
```

This example removes the default log:

```
RP/0/RP0/CPU0:router(config)# no snmp-server notification-log-mib default
```

This example configures the size of all logs to be 1500:

```
RP/0/RP0/CPU0:router(config)# snmp-server notification-log-mib globalSize 1500
```

snmp-server packetsize

To establish control over the largest Simple Network Management Protocol (SNMP) packet size permitted when the SNMP server is receiving a request or generating a reply, use the **snmp-server packetsize** command in global configuration mode. To restore the default value, use the **no** form of this command.

snmp-server packetsize *size*
no snmp-server packetsize

Syntax Description

size	Packet size, in bytes. Range is from 484 to 65500. The default is 1500.

Command Default

size: 1500

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server packetsize** command to establish control over the largest SNMP packet size permitted when the SNMP server is receiving a request or generating a reply.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the maximum size of SNMP packets to 1024 bytes:

```
RP/0/RP0/CPU0:router(config)# snmp-server packetsize 1024
```

snmp-server queue-length

To establish the message queue length for each trap host for Simple Network Management Protocol (SNMP), use the **snmp-server queue-length** command in global configuration mode. To restore the default value, use the **no** form of this command.

snmp-server queue-length *length*
no snmp-server queue-length

Syntax Description

length	Integer that specifies the number of trap events that can be held before the queue must be emptied. Range is from 1 to 5000.

Command Default

length : 100

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server queue-length** command to define the length of the message queue for each trap host. After a trap message is successfully sent, Cisco IOS XR software continues to empty the queue at a throttled rate to prevent trap flooding.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to set the SNMP notification queue to 20 events:

```
RP/0/RP0/CPU0:router(config)# snmp-server queue-length 20
```

snmp-server target list

To create a Simple Network Management Protocol (SNMP) target list, use the **snmp-server target list** command in global configuration mode. To remove an SNMP target list, use the **no** form of this command.

snmp-server target list *target-list* {**vrf** *vrf-name* | **host** *hostname*}
no snmp-server target list *target-list*

Syntax Description

target-list	Name of the target list.
vrf *vrf-name*	Specifies the name of the VRF hosts included in the target list.
host *hostname*	Assigns a hostname to the target list. The *hostname* variable is a name or IP address.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to create an SNMP target list and assign hosts to the list. When a target list is mapped to a community name using the **snmp-server community-map** command, SNMP access is restricted to the hosts in the target list (for that community name).

Task ID

Task ID	Operations
snmp	read, write

In this example, a new target list “sample3” is created and assigned to the vrf server “server2:”

```
RP/0/RP0/CPU0:router(config)# snmp-server target list sample3 vrf server2
```

snmp-server throttle-time

To specify the throttle time for handling incoming Simple Network Management Protocol (SNMP) messages, use the **snmp-server throttle-time** command in global configuration mode. To restore the throttle time to its default value, use the **no** form of this command.

snmp-server throttle-time *time*
no snmp-server throttle-time

Syntax Description

time	Throttle time for the incoming queue, in milliseconds. Values can be from 50 to 1000.

Command Default

time : 0

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server throttle-time 500
```

snmp-server timeouts subagent

To change the timeout used by the SNMP agent while it waits for a response from a subagent, use the **snmp-server timeouts subagent** command in global configuration mode. SNMP subagents are feature-specific entities that register with the SNMP agent and implement sets of MIB objects.

snmp-server timeouts subagent *timeout*
no snmp-server timeouts subagent *timeout*

Syntax Description

timeout <1-20>	The timeout used by the SNMP agent when waiting for a response from a MIB module, in seconds. The default is 10.

Command Default

timeout : 10

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the timeout is set to 8 seconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server timeouts subagent 8
```

snmp-server trap-source

To specify the interface (and hence the corresponding IP address) from which a Simple Network Management Protocol (SNMP) trap should originate, use the **snmp-server trap-source** command in global configuration mode. To remove the source designation, use the **no** form of this command.

snmp-server trap-source *type interface-path-id*
no snmp-server trap-source

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

No interface is specified.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When an SNMP trap is sent from a Cisco SNMP device, it has a notification address of the interface it happened to exit at that time. Use the **snmp-server trap-source** command to monitor notifications from a particular interface.

Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is and the module is CPU0. Example: interface .

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to specify that the IP address for interface 0/0/1/0 is the source for all SNMP notifications:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-source tengige 0/0/1/0
```

snmp-server trap-timeout

To define how often to try resending trap messages on the retransmission queue, use the **snmp-server trap-timeout** command in global configuration mode. To restore the default value, use the **no** form of this command.

snmp-server trap-timeout *seconds*
no snmp-server trap-timeout *seconds*

Syntax Description

seconds	Integer that sets the interval for resending the messages, in seconds). Value can be from 1 to 1000.

Command Default

seconds : 30

Command Modes

Global configuration

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Before Cisco IOS XR software tries to send a trap, it looks for a route to the destination address. If there is no known route, the trap is saved in a retransmission queue. Use the **snmp-server trap-timeout** command to determine the number of seconds between retransmission attempts.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to set an interval of 20 seconds to try resending trap messages on the retransmission queue:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap-timeout 20
```

snmp-server trap authentication vrf disable

To disable authentication traps on VPNs, use the **snmp-server trap authentication vrf disable** command in global configuration mode.

snmp-server trap authentication vrf disable

Syntax Description

This command has no keywords or arguments.

Command Default

Authentication traps are enabled on VPNs by default.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read, write

This example illustrates how to disable authentication traps on VPNs:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap authentication vrf disable
```

snmp-server trap link ietf

To enable the varbind used for linkUp and linkDown SNMP traps to utilize the RFC 2863 standard varbind, use the **snmp-server trap link ietf** command in global configuration mode. To restore the default value, use the **no** form of this command..

snmp-server trap link ietf
no snamp-server trap link ietf

Syntax Description

This command has no keywords or arguments.

Command Default

The default varbind used is cisco.

Command Modes

XR config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For more information about linkUP and linkDown notifications, see RFC 2863, *The Interface Group MIB*, and RFC 3418, *Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)*.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the RFC 2863 standard varbind:

```
RP/0/RP0/CPU0:router# snmp-server trap link ietf
```

snmp-server trap throttle-time

To specify the throttle time for handling more Simple Network Management Protocol (SNMP) traps, use the **snmp-server trap throttle-time** command in

XR Config

mode. To restore the throttle time to its default value, use the **no** form of this command.

snmp-server trap throttle-time *time*
no snmp-server trap throttle-time

Syntax Description

time	Throttle time in milliseconds. Values can be from 10 to 500.

Command Default

250

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

In the following example, the trap throttle time is set to 500 milliseconds:

```
RP/0/RP0/CPU0:router(config)# snmp-server trap throttle-time 500
```

snmp-server traps

To enable Simple Network Management Protocol (SNMP) trap notifications, use the **snmp-server traps** command in global configuration mode. To disable SNMP notifications, use the **no** form of this command.

snmp-server traps *notification-type*
no snmp-server traps [*notification-type*]

Syntax Description *notification-type*

(Optional) Type of notification (trap) to enable or disable. If no type is specified, all notifications available on the device are enabled or disabled.

The notification type can be one or more of the following keywords:

- bfd - Enables Bidirectional Forwarding Detection (BFD) traps.
- bgp - Enables BGP4-MIB and CISCO-BGP4-MIB traps.
- bridgemib - Enables SNMP traps for the Bridge MIB.
- blukstat - Enable Data-Collection-MIB Collection notifications.
- config - Controls configuration notifications, as defined in the CISCO-CONFIG-MAN-MIB (enterprise 1.3.6.1.4.1.9.9.43.2). The notification type is: (1) ciscoConfigManEvent.
- copy-complete - Enables CISCO-CONFIG-COPY-MIB ccCopyCompletion traps.
- cem - Enable SNMP CISCO-CEM-MIB traps
- diameter - Enable SNMP diameter traps
- ds1 - Enables SNMP Cisco DS1 traps.
- ds2 - Enables SNMP Cisco DS2 traps.
- entity - Enable SNMP entity traps.
- entity-redundancy - Enable SNMP CISCO-ENTITY-REDUNDANCY-MIB traps.
- entity-state - Enable SNMP entity-state traps.
- ethernet - Enable SNMP Ethernet traps
- fabric - Enable SNMP fabric traps
- fiberchannel - Enable SNMP Cisco fibrechannel traps
- flash - Enable flash-mib traps
- frequency - Enable Frequency Synchronization traps
- fabric bundle - Enables SNMP fabric bundle traps.
- fabric plane - Enables SNMP fabric plane state-change traps.
- flash insertion - Enables ciscoFlashDeviceInsertedNotif.
- flash removal - Enables ciscoFlashDeviceRemovedNotif.
- fru-ctrl - Enables SNMP entity field-replaceable unit (FRU) control traps.
- gnss - Enable GNSS traps
- hsrp - Enables SNMP HSRP traps.
- ipsec - Enable SNMP IPSec traps
- ipsla - Enable SNMP RTTMON-MIB IPSLA traps
- ipsec tunnel start - Enables SNMP IPsec tunnel start traps.

- ipsec tunnel stop - Enables SNMP IPsec tunnel stop traps.
- isakmp - Enables ISAKMP traps.
- isis - Enable SNMP isis traps
- l2tun - Enable L2TUN traps
- l2vpn all - Enables all Layer 2 VPN traps.
- l2vpn vc-down - Enables Layer 2 VPN VC down traps.
- l2vpn vc-up - Enables Layer 2 VPN VC up traps.
- mpls - Enable SNMP MPLS traps
- msdp - Enable SNMP MSDP traps
- mpls frr all - Enables all MPLS fast reroute MIB traps.
- mpls frr protected - Enables MPLS fast reroute tunnel protected traps.
- mpls ldp - Enables SNMP Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traps.
- mpls traffic-eng - Enables SNMP MPLS traffic engineering traps.
- msdp peer-state-change - Enables SNMP MSDP Peer state change traps.
- ntp - Enables SNMP Cisco NTP traps.
- optical - Enable SNMP Cisco optical traps
- optical-ots - Enable SNMP Cisco optical ots traps
- ospf - Enable SNMP ospf traps
- ospfv3 - Enable SNMP ospfv3 traps
- otn - Enables SNMP Cisco optical transport network (OTN) traps.
- pim - Enables SNMP PIM traps.
- pki - Enable SNMP traps for certificate expiry
- power - Enable SNMP entity power traps
- rf - Enables RF-MIB traps.
- sensor - Enables SNMP entity sensor traps.
- snmp - Enables SNMP traps.
- syslog - Controls error message notifications (Cisco-syslog-MIB). Specify the level of messages to be sent with the **logging history** command.
- system - Enables SNMP SYSTEMMIB-MIB traps.
- vpls - Enables virtual private LAN service (VPLS) traps.
- vrrp events - Enables Virtual Router Redundancy Protocol (VRRP) traps.
- vrrp - Enable VRRP traps

Note
To display the trap notifications supported on a platform, use the online help (**?**) function.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server traps** command to enable trap requests for the specified notification types. To configure the router to send SNMP notifications, specify at least one **snmp-server traps** command. When the command is entered with no keyword, all notification types are enabled. When a notification type keyword is specified, only the notification type related to that keyword is enabled. To enable multiple types of notifications, issue a separate **snmp-server traps** command for each notification type.

More information about individual MIBs can be found in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

Some SNMP trap notifications require additional Task IDs as indicated in the following table:

Notification Type	Task ID	Operations
bfd	bgp	read, write
	ospf	read, write
	isis	read, write
	mpls-te	read, write
	snmp	read, write
bgp	bgp	read, write
copy-complete	config-services	read, write
ipsec	crypto	read, write

Notification Type	Task ID	Operations
isakmp	crypto	read, write
l2vpn	l2vpn	read, write
mpls frr	mpls-ldp	read, write
	mpls-te	read, write
mpls l3vpn	ipv4	read, write
	mpls-ldp	read, write
	mpls-te	read, write
mpls ldp	mpls-ldp	read, write
	mpls-te	read, write
mpls traffic-eng	mpls-ldp	read, write
	mpls-te	read, write
ospf	ospf	read, write
syslog	sysmgr	read, write
vpls	l2vpn	read, write

This example shows how to enable the router to send all traps to the host specified by the name myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public
```

snmp-server traps mpls l3vpn

To enable the sending of MPLS Layer 3 VPN Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps mpls l3vpn** command in global configuration mode. To disable MPLS Layer 3 VPN SNMP notifications, use the **no** form of this command.

snmp-server traps mpls l3vpn {**all** | **max-threshold-cleared** | **max-threshold-exceeded** | **max-threshold-reissue-notif-time** *seconds* | **mid-threshold-exceeded** | **vrf-down** | **vrf-up**}
no snmp-server traps mpls l3vpn

Syntax Description

all	Enables all MPLS Layer 3 VPN traps.
max-threshold-cleared	Enables maximum threshold cleared traps.
max-threshold-exceeded	Enables maximum threshold exceeded traps.
max-threshold-reissue-notif-time *seconds* *<0-2147483647>*	Specifies the time interval for reissuing a maximum threshold notification, in seconds <0-2147483647>.
mid-threshold-exceeded	Enables mid-threshold exceeded traps.
vrf-down	Enables VRF down traps.
vrf-up	Enables VRF up traps.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable the device to send MPLS Layer 3 VPN traps:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps mpls l3vpn all
```

snmp-server traps ospf errors

To enable Open Shortest Path First (OSPF) error Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf errors** command in global configuration mode. To disable OSPF error SNMP notifications, use the **no** form of this command.

snmp-server traps ospf errors {**authentication-failure** | **bad-packet** | **config-error** | **virt-authentication-failure** | **virt-bad-packet** | **virt-config-error**}
no snmp-server traps ospf errors {**authentication-failure** | **bad-packet** | **config-error** | **virt-authentication-failure** | **virt-bad-packet** | **virt-config-error**}

Syntax Description

authentication-failure	Enables SNMP traps for authentication failure errors on physical interfaces.
bad-packet	Enables SNMP traps for bad packet errors on physical interfaces.
config-error	Enables SNMP traps for configuration errors on physical interfaces.
virt-authentication-failure	Enables SNMP traps for authentication failure errors on virtual interfaces.
virt-bad-packet	Enables SNMP traps for bad packet errors on virtual interfaces.
virt-config-error	Enables SNMP traps for configuration errors on virtual interfaces.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

For a complete description of OSPF error notifications and additional MIB functions, see the OSPF-TRAP-MIB in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps ospf errors** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the router to send OSPF error notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospf errors
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps ospf lsa

To enable Open Shortest Path First (OSPF) link-state advertisement Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf lsa** command in global configuration mode. To disable OSPF link state SNMP notifications, use the **no** form of this command.

snmp-server traps ospf lsa {**lsa-maxage** | **lsa-originate**}
no snmp-server traps ospf lsa {**lsa-maxage** | **lsa-originate**}

Syntax Description

lsa-maxage	Enables SNMP traps for link-state advertisement maxage.
lsa-originate	Enables SNMP traps for new link-state advertisement origination.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

For a complete description of OSPF link-state advertisement notifications and additional MIB functions, see the OSPF-TRAP-MIB in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps ospf lsa** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the router to send OSPF link-state advertisement notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospf lsa lsa-maxage
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps ospf retransmit

To enable Open Shortest Path First (OSPF) retransmission Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospf retransmit** command in global configuration mode. To disable OSPF retransmission SNMP notifications, use the **no** form of this command.

snmp-server traps ospf retransmit {**packets** | **virt-packets**}
no snmp-server traps ospf retransmit {**packets** | **virt-packets**}

Syntax Description

packets	Enables SNMP traps for packet retransmissions on physical interfaces.
virt-packets	Enables SNMP traps for packet retransmissions on virtual interfaces.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

For a complete description of OSPF retransmission notifications and additional MIB functions, see the OSPF-TRAP-MIB in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps ospf retransmit** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the router to send OSPF retransmission notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospf retransmit packets
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps ospf state-change

To enable Simple Network Management Protocol (SNMP) notifications for Open Shortest Path First (OSPF) neighbor state change, use the **snmp-server traps ospf state-change** command in global configuration mode. To disable OSPF state-change SNMP notifications, use the **no** form of this command.

snmp-server traps ospf state-change {**if-state-change** | **neighbor-state-change** | **virtif-state-change** | **virtneighbor-state-change**}
no snmp-server traps ospf state-change {**if-state-change** | **neighbor-state-change** | **virtif-state-change** | **virtneighbor-state-change**}

Syntax Description

if-state-change	Enables SNMP traps for OSPF non-virtual interface state chages.
neighbor-state-change	Enables SNMP traps for OSPF neighbor state changes
virtif-state-change	Enables SNMP traps for OSPF virtual interface state changes.
virtneighbor-state-change	Enables SNMP traps for OSPF virtual neighbor state changes.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

Use the **snmp-server traps ospf state-change** command to enable or disable OSPF server state-change notifications, as defined in the MIB. One notification type is ospfNbrStateChange.

For example, the OSPF ospfNbrStateChange notification is defined in the OSPF MIB as follows:

```
!     ospfNbrStateChange NOTIFICATION-TYPE
!         OBJECTS {
!                     ospfRouterId, -- The originator of the trap
!                     ospfNbrIpAddr,
!                     ospfNbrAddressLessIndex,
!                     ospfNbrRtrId,
!                     ospfNbrState  -- The new state
!                   }
!         STATUS             current
```

For a complete description of these notifications and additional MIB functions, see the OSPF-TRAP-MIB in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps ospf state-change** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable the router to send OSPF state-change notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospf state-change neighbor-state-change
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps ospfv3 errors

To enable Open Shortest Path First (OSPF) Version 3 error Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps ospfv3 errors** command in global configuration mode. To disable OSPFv3 error SNMP notifications, use the **no** form of this command.

snmp-server traps ospfv3 errors [**bad-packet** | **config-error** | **virt-bad-packet** | **virt-config-error**]
no snmp-server traps ospfv3 errors [**bad-packet** | **config-error** | **virt-bad-packet** | **virt-config-error**]

Syntax Description

bad-packet	Enables SNMP traps for bad packet errors on physical interfaces.
config-error	Enables SNMP traps for configuration errors on physical interfaces.
virt-bad-packet	Enables SNMP traps for bad packet errors on virtual interfaces.
virt-config-error	Enables SNMP traps for configuration errors on virtual interfaces.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

For a complete description of OSPFv3 error notifications and additional MIB functions, see the OSPFV3-MIB in the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

The **snmp-server traps ospfv3 errors** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the router to send OSPF error notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospfv3 errors
```

```
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps pim interface-state-change

To enable Protocol Independent Multicast (PIM) interface status notification, use the **snmp-server traps pim interface-state-change** command in global configuration mode. To disable this command so no notification is sent, use the **no** form of this command.

snmp-server traps pim interface-state-change
no snmp-server traps pim interface-state-change

Syntax Description

This command has no keywords or arguments.

Command Default

Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Use the **snmp-server traps pim interface-state-change** command to send notifications when a PIM interface changes status from up to down. When the status is up, the notification signifies the restoration of a PIM interface. When the status is down, the notification signifies the loss of a PIM interface.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to use the **snmp-server traps pim interface-state-change** command:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps pim interface-state-change
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps ospfv3 state-change

To enable Simple Network Management Protocol (SNMP) notifications for Open Shortest Path First (OSPF) Version 3 state changes, use the **snmp-server traps ospfv3 state-change** command in global configuration mode. To disable OSPFv3 state-change SNMP notifications, use the **no** form of this command.

snmp-server traps ospfv3 state-change [**if-state-change** | **neighbor-state-change** | **nssa-state-change** | **restart-helper-status-change** | **restart-status-change** | **restart-virtual-helper-status-change** | **virtif-state-change** | **virtneighbor-state-change**]
no snmp-server traps ospfv3 state-change [**if-state-change** | **neighbor-state-change** | **nssa-state-change** | **restart-helper-status-change** | **restart-status-change** | **restart-virtual-helper-status-change** | **virtif-state-change** | **virtneighbor-state-change**]

Syntax Description

if-state-change	Enables SNMP traps for OSPFv3 non-virtual interface state chages.
neighbor-state-change	Enables SNMP traps for OSPFv3 neighbor state changes
nssa-state-change	Enables SNMP traps for OSPFv3 not so stubby area (NSSA) status changes.
restart-helper-status-change	Enables SNMP traps for OSPFv3 restart helper status changes.
restart-status-change	Enables SNMP traps for OSPFv3 restart status changes.
restart-virtual-helper-status-change	Enables SNMP traps for OSPFv3 virtual helper restart status changes.
virtif-state-change	Enables SNMP traps for OSPFv3 virtual interface state changes.
virtneighbor-state-change	Enables SNMP traps for OSPFv3 virtual neighbor state changes.

Command Default

SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

SNMP notifications can be sent as traps.

Use the **snmp-server traps ospfv3 state-change** command to enable or disable the various OSPFv3 server state-change notifications, as defined in the MIB.

The **snmp-server traps ospfv3 state-change** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable the router to send OSPFv3 NSSA state-change notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps ospfv3 state-change nssa-state-change
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps pim invalid-message-received

To enable notifications for monitoring invalid Protocol Independent Multicast (PIM) protocol operations, such as invalid register received and invalid join or prune received, use the **snmp-server traps pim invalid-message-received** command in global configuration mode. To disable this command so that no notification is sent, use the **no** form of this command.

snmp-server traps pim invalid-message-received
no snmp-server traps pim invalid-message-received

Syntax Description

This command has no keywords or arguments.

Command Default

Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

A router can receive a join or prune message in which the RP specified in the packet is not the RP for the multicast group. Or a router can receive a register message from a multicast group in which it is not the RP.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to use the **snmp-server traps pim invalid-message-received** command:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps pim invalid-message-received
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps pim neighbor-change

To enable Protocol Independent Multicast (PIM) neighbor status down notifications, use the **snmp-server traps pim neighbor-change** command in global configuration mode. To disable PIM neighbor down notifications, use the **no** form of this command.

snmp-server traps pim neighbor-change
no snmp-server traps pim neighbor-change

Syntax Description

This command has no keywords or arguments.

Command Default

PIM Simple Network Management Protocol (SNMP) notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server traps pim neighbor-change** command to send notifications when a PIM neighbor changes status from up to down on an interface. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the router to send PIM neighbor status down notifications to the host at the address myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps pim neighbor-change
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps pim rp-mapping-change

To enable notifications indicating a change in the rendezvous point (RP) mapping information due to either Auto-RP or bootstrap router (BSR) messages, use the **snmp-server traps pim rp-mapping-change** command in global configuration mode. To disable this command so no notification is sent, use the **no** form of this command.

snmp-server traps pim rp-mapping-change
no snmp-server traps pim rp-mapping-change

Syntax Description

This command has no keywords or arguments.

Command Default

PIM SNMP notifications are disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

PIM notifications are defined in the CISCO-PIM-MIB.my and PIM-MIB.my files that can be accessed from the SNMP Object Navigator, available through cisco.com at http://tools.cisco.com/Support/SNMP/do/BrowseMIB.do?local=en&step=2.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to use the **snmp-server traps pim rp-mapping-change** command:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps pim rp-mapping-change
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server traps rsvp

To enable the sending of Resource Reservation Protocol (RSVP) notifications, use the **snmp-server traps rsvp** command in global configuration mode. To disable RSVP notifications, use the **no** form of this command.

snmp-server traps rsvp {**all** | **lost-flow** | **new-flow**}

Syntax Description

all	Enables the sending of both new flow lost flow traps.
lost-flow	Enables the sending of traps when a flow is deleted.
new-flow	Enables the sending of traps when a flow is created.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
mpls-te	read, write
ouni	read, write
snmp	read, write

This example illustrates how to enable all SNMP RSVP MIB traps.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server traps rsvp all
```

snmp-server traps selective-vrf-download role-change

To attempt to download only those prefixes and labels to a physical entity required to forward traffic through the physical entity, use the **snmp-server trap selective-vrf-download role-change** command in global configuration mode.

snmp-server trap selective-vrf-download role-change

This command has no keywords or arguments.

Command Default

Selective VRF downloads are disabled.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The selective VRF download feature makes a best effort to download only those prefixes and labels to a physical entity required to forward traffic through the physical entity. This is accomplished by characterizing roles for physical entities based on their configuration.

From a network management point of view the CISCO-SELECTIVE-VRF-DOWNLOAD-MIB:

- Lists the state relating to the selective VRF download feature for each physical entity capable of forwarding packets.
- Lists the role change history per address family (ipv4 and ipv6) for each physical entity capable of forwarding packets.
- Lists the VRF tables selectively downloaded to each physical entity capable of forwarding packets.

Task ID

Task ID	Operation
snmp	read, write
basic-services	read, write

This example shows how to enable the selective VRF downloads:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps selective-vrf-download role-change
```

snmp-server traps snmp

To enable the sending of RFC 1157 Simple Network Management Protocol (SNMP) notifications, use the **snmp-server traps snmp** command in the appropriate configuration mode. To disable RFC 1157 SNMP notifications, use the **no** form of this command.

snmp-server traps snmp [**authentication** | **coldstart** | **linkdown** | **linkup** | **warmstart**]
no snmp-server traps snmp [**authentication** | **coldstart** | **linkdown** | **linkup** | **warmstart**]

Syntax Description

authentication	(Optional) Controls the sending of SNMP authentication failure notifications.
linkup	(Optional) Controls the sending of SNMP linkUp notifications
linkdown	(Optional) Controls the sending of SNMP linkDown notifications
coldstart	(Optional) Controls the sending of SNMP coldStart notifications.
warmstart	(Optional) Controls the sending of SNMP warmStart notifications.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps snmp** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

The optional **authentication** keyword controls the sending of SNMP authentication failure notifications. In order to send notifications, you must configure at least one **snmp-server host** command. An authentication Failure (4) trap signifies that the sending device is the addressee of a protocol message that is not properly authenticated. The authentication method depends on the version of SNMP being used. For SNMPv1 or SNMPv2, authentication failure occurs for packets with an incorrect community string. For SNMPv3, authentication failure occurs for packets with an incorrect Secure Hash Algorithm (SHA) or Message Digest 5 (MD5) authentication key or for a packet that is outside the authoritative SNMP engine's window, for example, the packets that are configured outside access lists or time ranges. In such an instance, only a report Protocol Data Unit (PDU) is generated, and authentication failure traps are not generated.

The optional **linkup** keyword controls the sending of SNMP linkUp notifications. The linkUp(3) trap signifies that the sending device recognizes one of the communication links represented in the agent's configuration coming up.

The optional **linkdown** keyword controls the sending of SNMP linkDown notifications. The linkDown(2) trap signifies that the sending device recognizes a failure in one of the communication links represented in the agent's configuration.

The **snmp-server traps snmp** command with the **linkup** or **linkdown** keywords globally enables or disables SNMP linkUp and linkDown traps. After enabling either of these traps globally, you can enable or disable these traps on specific interfaces using the **no notification linkupdown disable** command in interface configuration mode. According to RFC 2863, linkUp and linkDown traps are enabled for interfaces that do not operate on top of any other interface (as defined in the ifStackTable), and are disabled otherwise. This means that you do not have to enable linkUp and linkdown notifications on such interfaces. However, linkUp and linkDown notifications will not be sent unless you enable them globally using the **snmp-server traps snmp** command.

The optional **coldstart** keyword controls the sending of SNMP coldStart notifications. The coldStart(0) trap signifies that the sending device is reinitializing itself such that the agent's configuration or the protocol entity implementation may be altered.

The optional **warmstart** keyword controls the sending of SNMP coldStart notifications. The warmStart(1) trap signifies that the sending device is reinitializing itself such that neither the agent configuration nor the protocol entity implementation is altered.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to enable the device to send all traps to the host myhost.cisco.com using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com public snmp
```

The following example shows how to enable only linkUp and linkDown traps:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkup
RP/0/RP0/CPU0:router(config)# snmp-server traps snmp linkdown
```

snmp-server traps syslog

To enable Simple Network Management Protocol (SNMP) notifications of Cisco-syslog-MIB error messages, use the **snmp-server traps syslog** command in the appropriate configuration mode. To disable these types of notifications, use the **no** form of this command.

snmp-server traps syslog
no snmp-server traps syslog

Syntax Description

This command has no keywords or arguments.

Command Default

SNMP notifications are disabled by default.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp-server traps syslog** command is used with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications.

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enable Cisco-syslog-MIB error message notifications to the host at the address myhost.cisco.com, using the community string defined as public:

```
RP/0/RP0/CPU0:router(config)# snmp-server traps syslog
RP/0/RP0/CPU0:router(config)# snmp-server host myhost.cisco.com version 2c public
```

snmp-server user

To configure a new user to a Simple Network Management Protocol (SNMP) group, use the **snmp-server user** command in global configuration mode. To remove a user from an SNMP group, use the **no** form of this command.

snmp-server user *username groupname* { **remote** | **v1** | **v2c** | **v3** [**auth** { **md5** | **sha** } { **clear** | **encrypted** } *auth-password* [**priv** { **3des** | **aes** *aes-bit-encryption* | **des56** } { **clear** | **encrypted** } *priv-password*]] } [**SDROwner** | **SystemOwner**] [*access-list-name*]
no snmp-server user *username groupname*

Syntax Description

username	Name of the user on the host that connects to the agent. **Note** The recommended range for a user-defined username is 2-253 characters.
groupname	Name of the group to which the user belongs.
remote	Specifies a remote SNMP entity to which the user belongs
v1	Specifies that the SNMPv1 security model should be used.
v2c	Specifies that the SNMPv2c security model should be used.
v3	Specifies that the SNMPv3 security model should be used.
auth	(Optional) Specifies which authentication level should be used. If this keyword is used, you must specify an authentication level and an authorization password.
md5	Specifies the HMAC-MD5-96 authentication level.
sha	Specifies the HMAC-SHA-96 authentication level.
clear	Specifies that an unencrypted password follows.
encrypted	Specifies that an encrypted password follows.
auth-password	Authentication password, which is a string (not to exceed 64 characters) that enables the agent to receive packets from the host.
priv	(Optional) Specifies that encryption parameters follow.
3des	Specifies the 168-bit Triple Data Encryption Standard (3DES) level of encryption for the user.
aes *aes-bit-encryption*	Specifies the Advanced Encryption Standard (AES) level of encryption for the user. Supported options are 128, 192 and 256 bit encryption.
des56	Specifies the 56-bit Data Encryption Standard (DES) level of encryption for the user.

priv-password	Privacy password, which can be clear or encrypted text, according to what is specified.
SDROwner	(Optional) Limits access to the agents for the owner secure domain router (SDR) only.
SystemOwner	(Optional) Provides system-wide access to the agents for all SDRs.
access-list-name	(Optional) Access list to be associated with this SNMP user. The *access-list-name* argument represents a value from 1 to 99, that is, the identifier of the standard IP access list.

Command Default

By default, access is limited to agents on the owner SDR only.

See also Table 1.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use 3DES and AES encryption standards, you must have installed the security package (k9sec). For information on installing software packages, see *Upgrading and Managing Cisco IOS XR Software* in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

Note Only one remote host can be assigned to the same username for SNMP version 3. If you configure the same username with different remote hosts, only the last username and remote host combination will be accepted and will be seen in the **show running** configuration. In the case of multiple SNMP managers, multiple unique usernames are required.

Table 41: snmp-server user Default Descriptions

Characteristic	Default
passwords	Text strings are assumed.
access lists	Access from all IP access lists is permitted.

SDR and System-wide Access

When the **snmp-server user** command is entered with the **SDROwner** keyword, SNMP access is granted only to the MIB object instances in the owner SDR.

When the **snmp-server user** command is entered with the **SystemOwner** keyword, SNMP access is granted to .

Task ID

Task ID	Operations
snmp	read, write

The following example shows how to enter a plain-text password for the string *abcd* for user2 in group2:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 clear abcd
```

To learn if this user has been added to the configuration, use the **show snmp user** command.

If the localized Message Digest 5 (MD5) or Secure Hash Algorithm (SHA) digest is known, specify that string instead of the plain-text password. The digest should be formatted as AA:BB:CC:DD where AA, BB, CC, and DD are hexadecimal values. The digest should also be exactly 16 octets long.

This example shows how to specify the command with a digest name of 00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF:

```
RP/0/RP0/CPU0:router(config)# snmp-server user user2 group2 v3 auth md5 encrypted
     00:11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF
```

snmp-server view

To create or update a Simple Network Management Protocol (SNMP) view entry, use the **snmp-server view** command in global configuration mode. To remove the specified server view entry, use the **no** form of this command.

snmp-server view *view-name oid-tree* {**excluded** | **included**}
no snmp-server view *view-name oid-tree* {**excluded** | **included**}

Syntax Description

view-name	Label for the view record being updated or created. The name is used to reference the record.
oid-tree	Object identifier (OID) of the ASN.1 subtree to be included or excluded from the view. To identify the subtree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a word, such as *system*. Replace a single subidentifier with the asterisk (*) wildcard to specify a subtree family; for example 1.3.*.4.
excluded	Excludes the MIB family from the view.
included	Includes the MIB family in the view.

Command Default

No view entry exists.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Other SNMP commands require a view as a keyword. Use the **snmp-server view** command to create a view to be used as keywords for other commands that create records including a view.

Instead of defining a view explicitly, you can rely on the following predefined views, which are supported by the SNMP agent:

all

Predefined view indicating that a user can see all objects.

CfgProt

Predefined view indicating that a user can see all objects except the SNMPv3 configuration tables.

vacmViewTreeFamilyEntry

Predefined view indicating that a user can see the default configuration of vacmViewTreeFamilyEntry.

The predefined views supported on Cisco IOS XR software, however, do not match the predefined views specified in RFC 3415.

Task ID

Task ID	Operations
snmp	read, write

This example creates a view that includes all objects in the MIB-II subtree:

```
RP/0/RP0/CPU0:router(config)# snmp-server view mib2 1.3.6.1.2.1 included
```

This example shows how to create a view that includes all objects in the MIB-II system group and all objects in the Cisco enterprise MIB:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.4.1.9 included
```

This example shows how to create a view that includes all objects in the MIB-II system group except for sysServices (System 7) and all objects for interface 1 in the MIB-II interfaces group:

```
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1 included
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.1.7 excluded
RP/0/RP0/CPU0:router(config)# snmp-server view view1 1.3.6.1.2.1.2.2.1.*.1 included
```

snmp-server vrf

To configure the VPN routing and forwarding (VRF) properties of Simple Network Management Protocol (SNMP), use the **snmp-server vrf** command in global configuration mode. To remove the configuration, use the **no** form of this command.

snmp-server vrf *vrf-name*[**host** *address* [**clear** | **encrypted**][**traps**][**version** {**1** | **2c** | **3** *security-level*}] *community-string*[**udp-port** *port*]][**context** *context-name*]
no snmp-server vrf *vrf-name*

Syntax Description

vrf-name	Name of the VRF.
host *address*	(Optional) Specifies the name or IP address of the host (the targeted recipient).
clear	(Optional) Specifies that the *community-string* argument is clear text.
encrypted	(Optional) Specifies that the *community-string* argument is encrypted text.
traps	(Optional) Specifies that notifications should be sent as traps. This is the default.
version {**1** | **2c** | **3**}	(Optional) Specifies the version of the SNMP used to send the traps. The default is SNMPv1. When the **version** keyword is used, one of these keywords must be specified: • **1**—SNMPv1 • **2c**—SNMPv2C • **3**—SNMPv3
security-level	(Optional) Security level for SNMPv3. Options are: • **auth**—authNoPriv • **noauth**—noAuthNoPriv • **priv**—authPriv
community-string	Specifies the community string for SNMPv1 and SNMPv2, or the SNMPv3 user.
udp-port *port*	(Optional) Specifies the UDP port to which notifications should be sent.
context *context-name*	(Optional) Name of the context that must be mapped to VRF identified by value of the *vrf-name* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to enter SNMP VRF configuration mode and configure an SNMP notification recipient on a VRF. You can also map a VRF to an SNMP context.

SNMP notification recipient that is reachable by way of a VRF can be configured. Notification is forwarded to the recipient represented by its address using the routing table instance identified by the VRF name.

The *address* argument can be either a host name or an IP address.

Use the **clear** keyword to specify that the clear text community string you enter is displayed encrypted in the **show running** command output. To enter an encrypted string, use the **encrypted** keyword. To enter a clear text community string that is not encrypted by the system, use neither of these keywords.

An SNMP context identified by the value of the *context-name* argument can be mapped to a VRF in this mode. This context must be created using **snmp-server context** command.

Task ID

Task ID	Operations
snmp	read, write

This example shows how to configure a host IP address for a VRF name:

```
RP/0/RP0/CPU0:router(config)# snmp-server vrf vrfa
RP/0/RP0/CPU0:router(config-snmp-vrf)# host 12.21.0.1 traps version
2c public udp-port 2525
```

snmp test trap all

To send a Simple Network Management Protocol (SNMP) trap message to the trap receivers for all supported traps, use the **snmp test trap all** command in EXEC mode.

snmp test trap all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use the **snmp test trap** command, SNMP must be configured on the router. This command is not intended for testing scalability, performance, or high availability scenarios.

Use the **snmp test trap all** command to generate test traps for all supported traps. The following traps are supported:

- coldStart—SNMP agent Initializing and its configuration may have changed.
- warmStart—SNMP agent Initializing and its configuration is unaltered.
- linkUp—Interface ifOperStatus is Up.
- linkDown—Interface ifOperStatus is Down.
- clogMessage Generated—Syslog message generated.
- ciscoFlashDeviceInsertedNotif—Flash device inserted.
- ciscoFlashDeviceRemovedNotif—Flash device removed.
- ciscoRFProgressionNotif—RF state change.
- ciscoRFSwactNotif—Switchover.
- ciscoConfigManEvent—Command-line interface (CLI) configuration management event.
- newRoot—SNMP agent is a new root of the spanning tree.
- topologyChange—Bridge port has transitioned to the Forwarding state.
- cefcFanTrayOperStatus—Fan tray cefcFanTrayOperStatus is Up.
- cefcModuleStatusChange—Module cefcModuleOperStatus is OK (module up) or module cefcModuleOperStatus is Failed (module down).

- entSensorThresholdNotification—entSensorValue crossed the entSensorthresholdValue.
- cefcPowerStatusChange—Redundant PowerSupply fails.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap all** command:

```
RP/0/RP0/CPU0:router# snmp test trap all
```

snmp test trap entity

To send a test SNMP Entity trap message to the trap receivers, use the **snmp test trap entity** command in EXEC mode.

snmp test trap entity {**fru** {**power status-change failed** | **module status-change** {**up** | **down**} | **fan-tray oper-status up**} | **sensor threshold-notification**}[**entity-index** *index*]

Syntax Description

fru	Sends a field replacement unit trap.
power status-change failed	Sends a cefcPowerStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
module status-change{**up** | **down**}	Sends a cefcModuleStatusChange trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
fan-tray oper-status up	Sends a cefcFanTrayOperStatus trap for the CISCO-ENTITY-FRU-CONTROL-MIB.
sensor	Sends a sensor trap.
threshold-notification	Sends a entSensorThresholdNotification trap for the CISCO-ENTITY-SENSOR-MIB.
entity-index *index*	Specifies the physical index for which to generate the trap.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap entity** command tests the sending of Entity MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use the **snmp test trap** command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap entity** command:

```
RP/0/RP0/CPU0:router# snmp test trap entity sensor threshold index
```

snmp test trap infra

To send a test Simple Network Management Protocol (SNMP) Infra trap message to the trap receivers, use the **snmp test trap infra** command in EXEC mode.

snmp test trap infra {**bridge** {**new-root** | **topology-change**} | **config event** | **flash** {**device-inserted** | **device-removed**} | **redundancy** {**progression** | **switch**} | **syslog message-generated**}

Syntax Description

bridge	Sends a bridge trap.
new-root	Sends a newRoot trap for the BRIDGE-MIB.
topology-change	Sends a topologyChange trap for the BRIDGE-PORT.
config event	Sends a ciscoConfigManEvent trap for the CISCO-CONFIG-MAN-MIB.
flash	Sends a flash trap.
device-inserted	Sends a ciscoFlashDeviceInsertedNotif trap for the CISCO-FLASH-MIB.
device-removed	Sends a ciscoFlashDeviceRemovedNotif trap for the CISCO-FLASH-MIB.
redundancy	Sends an RF trap.
progression	Sends a ciscoRFProgressionNotif trap for the CISCO-RF-MIB.
switch	Sends a ciscoRFSwactNotif trap for the CISCO-RF-MIB.
syslog message-generated	Sends a clogMessageGenerated for the CISCO-SYSLOG-MIB.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap infra** command tests the sending of Infra MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap infra** command:

```
RP/0/RP0/CPU0:router# snmp test trap infra syslog message-generated
```

snmp test trap interface

To send a test Simple Network Management Protocol (SNMP) interface trap message to the trap receivers, use the **snmp test trap interface** command in EXEC mode.

snmp test trap interface [**link-down** | **link-up**] [**sonet-line-status** | **sonet-path-status** | **sonet-section-status**]

ifindex *index*

Syntax Description

link-down	Sends a linkDown trap for the IF-MIB.
link-up	Sends a linkUp trap for the IF-MIB.
sonet-line-status	sends a sonet-line-status for the MIB.
sonet-path-status	sends a sonet-path-status for the MIB.
sonet-section-status	sends a sonet-section-status for the MIB.
ifindex *index*	Specifies the interface index for which to send the IF-MIB trap.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap interface** command tests the sending of IF-MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

This example illustrates how to use the **snmp test trap interface** command:

```
RP/0/RP0/CPU0:router# snmp test trap interface link-down
```

snmp test trap snmp

To send a test Simple Network Management Protocol (SNMP) trap message to the trap receivers, use the **snmp test trap snmp** command in EXEC mode.

snmp test trap snmp {**cold-start** | **warm-start**}

Syntax Description

cold-start	Sends a coldStart trap for the SNMPv2-MIB.
warm-start	Sends a warmStart trap for the SNMPv2-MIB.

Command Default

None

Command Modes

EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **snmp test trap snmp** command tests the sending of MIB traps. It is not intended for testing scalability, performance, or high availability scenarios. To use this command, SNMP must be configured on the router.

Task ID

Task ID	Operation
snmp	read

The following example illustrates how to use the **snmp test trap snmp** command:

```
RP/0/RP0/CPU0:router# snmp test trap snmp cold-start
```

transfer-interval

To configure how long bulk statistics should be collected before a bulk statistics transfer is initiated, use the **transfer-interval** command in bulk statistics transfer configuration mode. To remove a previously configured interval from a bulk statistics configuration, use the **no** form of this command.

transfer-interval *minutes*
no transfer-interval *minutes*

Syntax Description

minutes	Length of time, in minutes, that the system should collect MIB data before attempting the transfer operation. The valid range is from 0 to 4294967295. The default is 30.

Command Default

Bulk statistics file transfer operations start 30 minutes after the **enable (bulkstat)** command is used.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Bulk statistics data is collected into a new file when a transfer attempt begins, which means that this command also configures the collection interval.

If the maximum buffer size for a bulk statistics file is reached before the transfer interval time expires, the transfer operation is still initiated, and bulk statistics MIB data are collected into a new file in the system buffer.

Task ID

Task ID	Operation
snmp	read, write

The following example shows how to configure a transfer interval of 20 minutes for the bulk statistics configuration bulkstat1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer-id bulkstat1
RP/0/RP0/CPU0:router(config-bulk-tr)# transfer-interval 20
```

url

To specify the host to which bulk statistics files should be transferred, use the **url** command in bulk statistics transfer configuration mode. To remove a previously configured destination host, use the **no** form of this command.

url [**primary** | **secondary**] *url*
no url [**primary** | **secondary**] *url*

Syntax Description

primary	Specifies the URL to be used first for bulk statistics transfer attempts.
secondary	Specifies the URL to be used for bulk statistics transfer attempts if the transfer to the primary URL is not successful.
url	Destination URL address for the bulk statistics file transfer. Use FTP or TFTP. The syntax for these URLs is as follows: • **ftp:**[[[//*username* [:*password*]**@**]*location*]/*directory*]/*filename* • **tftp:**[[/*location*]/*directory*]/*filename* The location argument is typically an IP address.

Command Default

No host is specified.

Command Modes

Bulk statistics transfer configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For bulk statistics transfer retry attempts, a single retry consists of an attempt to send first to the primary URL, and then to the secondary URL.

Task ID

Task ID	Operation
snmp	read, write

In the following example, an FTP server is used as the primary destination for the bulk statistics file. If a transfer to that address fails, an attempt is made to send the file to the TFTP server at 192.168.10.5. No retry command is specified, which means that only one attempt to each destination will be made.

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# snmp-server mib bulkstat transfer ifMibTesting
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting1
RP/0/RP0/CPU0:router(config-bulk-tr)# schema carMibTesting2
RP/0/RP0/CPU0:router(config-bulk-tr)# url primary ftp://user2:pswd@192.168.10.5/functionality/

RP/0/RP0/CPU0:router(config-bulk-tr)# url secondary tftp://user2@192.168.10.8/tftpboot/
RP/0/RP0/CPU0:router(config-bulk-tr)# enable
RP/0/RP0/CPU0:router(config-bulk-tr)# exit
```

Process and Memory Management Commands

This chapter describes the Cisco IOS XR software commands used to manage processes and memory.

For more information about using the process and memory management commands to perform troubleshooting tasks, see .

clear context

To clear core dump context information, use the **clear context** command in the appropriate mode.

clear context location {*node-id* | **all**}

Syntax Description

location {*node-id* | **all**}	(Optional) Clears core dump context information for a specified node. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear context** command to clear core dump context information. If you do not specify a node with the **location** *node-id* keyword and argument, this command clears core dump context information for all nodes.

Use the **show context** command to display core dump context information.

Task ID

Task ID	Operations
diag	execute

The following example shows how to clear core dump context information:

```
RP/0/RP0/CPU0:router# clear context
```

dumpcore

To manually generate a core dump, use the **dumpcore** command in EXEC mode or Admin EXEC mode.

dumpcore {**running** | **suspended**} *job-id* **location** *node-id*

Syntax Description

running	Generates a core dump for a running process.
suspended	Suspends a process, generates a core dump for the process, and resumes the process.
job-id	Process instance identifier.
location *node-id*	Generates a core dump for a process running on the specified node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

Admin EXEC

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

When a process crashes on the Cisco IOS XR software, a core dump file of the event is written to a designated destination without bringing down the router. Upon receiving notification that a process has terminated abnormally, the Cisco IOS XR software then respawns the crashed process. Core dump files are used by Cisco Technical Support Center engineers and development engineers to debug the Cisco IOS XR software.

Core dumps can be generated manually for a process, even when a process has not crashed. Two modes exist to generate a core dump manually:

- **running** —Generates a core dump for a running process. This mode can be used to generate a core dump on a critical process (a process whose suspension could have a negative impact on the performance of the router) because the core dump file is generated independently, that is, the process continues to run as the core dump file is being generated.
- **suspended** —Suspends a process, generates a core dump for the process, and resumes the process. Whenever the process is suspended, this mode ensures data consistency in the core dump file.

Core dump files contain the following information about a crashed process:

- Register information
- Thread status information
- Process status information
- Selected memory segments

The following scenarios are applicable for creating full or sparse core dumps:

- Without the **exception sparse** configuration or exception sparse OFF, and default core size (4095 MB), a full core is created till the core size. Beyond this, only stack trace is collected.
- With non-default core size and without the **exception sparse** configuration, or exception sparse OFF , a full core is created until the core size limit is reached. Beyond the core size limit, only the stack trace is collected.
- With the exception sparse ON and default core size (4095 MB), a full core is created until the sparse size limit is reached, and a sparse core is created thereafter till the core size. Beyond this, only stack trace is collected.
- With non-default core size and with the exception sparse ON, a full core is created until the sparse size limit is reached. Beyond the sparse size limit, only the stack trace is collected.

Note By default, full core dumps are created irrespective of the **exception sparse** configuration. If there is not enough free shared memory available, then the core dump process fails.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to generate a core dump in suspended mode for the process instance 52:

```
RP/0/RP0/CPU0:router# dumpcore suspended 52

RP/0/RP0/CPU0:Sep 22 01:40:26.982 : sysmgr[71]: process in stop/continue state 4104
RP/0/RP0/CPU0Sep 22 01:40:26.989 : dumper[54]: %DUMPER-4-CORE_INFO : Core for pid = 4104
 (pkg/bin/devc-conaux) requested by pkg/bin/dumper_gen@node0_RP0_CPU0
RP/0/RP0/CPU0Sep 22 01:40:26.993 : dumper[54]: %DUMPER-6-SPARSE_CORE_DUMP :
 Sparse core dump as configured dump sparse for all
RP/0/RP0/CPU0Sep 22 01:40:26.995 : dumper[54]: %DUMPER-7-DLL_INFO_HEAD : DLL path
 Text addr.  Text size   Data addr.  Data size   Version
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libplatform.dll  0xfc0d5000  0x0000a914  0xfc0e0000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.996 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysmgr.dll  0xfc0e2000  0x0000ab48  0xfc0c295c  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libinfra.dll  0xfc0ed000  0x00032de0  0xfc120000  0x00000c90        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libios.dll  0xfc121000  0x0002c4bc  0xfc14e000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.997 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libc.dll  0xfc150000  0x00077ae0  0xfc1c8000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsyslog.dll  0xfc1d2000  0x0000530c  0xfc120c90  0x00000308        0
RP/0/RP0/CPU0Sep 22 01:40:26.998 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbackplane.dll  0xfc1d8000  0x0000134c  0xfc0c2e4c  0x000000a8        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libnodeid.dll  0xfc1e5000  0x00009114  0xfc1e41a8  0x00000208        0
RP/0/RP0/CPU0Sep 22 01:40:26.999 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttyserver.dll  0xfc1f1000  0x0003dfcc  0xfc22f000  0x00002000        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
```

```
 /pkg/lib/libttytrace.dll  0xfc236000  0x00004024  0xfc1e44b8  0x000001c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.000 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libdebug.dll  0xfc23b000  0x0000ef64  0xfc1e4680  0x00000550        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_procfs_util.dll  0xfc24a000  0x00004e2c  0xfc1e4bd0  0x000002a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdb.dll  0xfc24f000  0x000452e0  0xfc295000  0x00000758        0
RP/0/RP0/CPU0Sep 22 01:40:27.001 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbutils.dll  0xfc296000  0x0000ae08  0xfc295758  0x000003ec        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_svr_error.dll  0xfc2a1000  0x0000172c  0xfc1e4e78  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.002 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_tty_error.dll  0xfc2a3000  0x00001610  0xfc1e4f00  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libwd_evm.dll  0xfc2a5000  0x0000481c  0xfc295b44  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.003 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb.dll  0xfc2aa000  0x000051dc  0xfc295ccc  0x00000188        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttydb_error.dll  0xfc23a024  0x00000f0c  0xfc295e54  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.004 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/librs232.dll  0xfc2b0000  0x00009c28  0xfc2ba000  0x00000470        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_rs232_error.dll  0xfc2bb000  0x00000f8c  0xfc295edc  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.005 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libst16550.dll  0xfc2bc000  0x00008ed4  0xfc2ba470  0x00000430        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libconaux.dll  0xfc2c5000  0x00001dc0  0xfc2ba8a0  0x000001a8        0
RP/0/RP0/CPU0Sep 22 01:40:27.006 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/lib_conaux_error.dll  0xfc1ee114  0x00000e78  0xfc295f64  0x00000088        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttyutil.dll  0xfc2c7000  0x00003078  0xfc2baa48  0x00000168        0
RP/0/RP0/CPU0Sep 22 01:40:27.007 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libbag.dll  0xfc431000  0x0000ee98  0xfc40cc94  0x00000368        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libchkpt.dll  0xfc474000  0x0002ecf8  0xfc4a3000  0x00000950        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libsysdbbackend.dll  0xfc8ed000  0x0000997c  0xfc8d3aa8  0x0000028c        0
RP/0/RP0/CPU0Sep 22 01:40:27.008 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmtconnection.dll  0xfce85000  0x00004208  0xfce8a000  0x00000468
0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttymgmt.dll  0xfcea4000  0x0000e944  0xfce8abf0  0x000003c8        0
RP/0/RP0/CPU0Sep 22 01:40:27.009 : dumper[54]: %DUMPER-7-DLL_INFO :
 /pkg/lib/libttynmspc.dll  0xfcec7000  0x00004a70  0xfcec6644  0x000002c8        0
RP/0/RP0/CPU0Sep 22 01:40:28.396 : dumper[54]: %DUMPER-5-CORE_FILE_NAME :
 Core for process pkg/bin/devc-conaux at harddisk:/coredump/devc-conaux.by.
 dumper_gen.sparse.20040922-014027.node0_RP0_CPU0.ppc.Z
RP/0/RP0/CPU0Sep 22 01:40:32.309 : dumper[54]: %DUMPER-5-DUMP_SUCCESS : Core dump success
```

exception filepath

To modify core dump settings, use the **exception filepath** command in the appropriate configuration mode. To remove the configuration, use the **no** form of this command.

Syntax Description

filepath-name	Local file system or network protocol, followed by the directory path. All local file systems are supported. The following network protocols are supported: TFTP and FTP.

Command Default

If you do not specify the order of preference for the destination of core dump files using the **choice** *preference* keyword and argument, the default preference is the primary location or 1.

Core dump files are sent compressed.

The default file naming convention used for core dump files is described in exception filepath, on page 536.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **exception filepath** command to modify core dump settings, such as the destination file path to store core dump files, file compression, and the filename appended to core dumps.

Up to three user-defined locations may be configured as the preferred destinations for core dump files:

- Primary location—The primary destination for core dump files. Enter the **choice** keyword and a value of **1** (that is, **choice 1**) for the *preference* argument to specify a destination as the primary location for core dump files.
- Secondary location—The secondary fallback choice for the destination for core dump files, if the primary location is unavailable (for example, if the hard disk is set as the primary location and the hard disk fails). Enter the **choice** keyword and a value of **2** (that is, **choice 2**) for the *preference* argument to specify a destination as the secondary location for core dump files.
- Tertiary location—The tertiary fallback choice as the destination for core dump files, if the primary and secondary locations fail. Enter the **choice** keyword and a value of 3 (that is, **choice 3**) for the *preference* argument to specify a destination as the tertiary location for core dump files.

When specifying a destination for a core dump file, you can specify an absolute file path on a local file system or on a network server. The following network protocols are supported: TFTP and FTP.

In addition to the three preferred destinations that can be configured, Cisco IOS XR software provides three default fallback destinations for core dump files in the event that user-defined locations are unavailable.

The default fallback destinations are:

Note If a default destination is a boot device, the core dump file is not sent to that destination.

We recommend that you configure at least one preferred destination for core dump files as a preventive measure if the default fallback paths are unavailable. Configuring at least one preferred destination also ensures that core dump files are archived because the default fallback destinations store only the first and last core dump files for a crashed process.

Note Cisco IOS XR software does not save a core file on a local storage device if the size of the core dump file creates a low-memory condition.

By default, Cisco IOS XR software assigns filenames to core dump files according to the following format:

process [.by. *requester* |.abort][.sparse]. *date-time* . *node* . *processor-type* [.Z]

For example:

```
packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

exception filepath, on page 536 Describes the default core dump file naming convention.

Table 42: Default Core Dump File Naming Convention Description

Field	Description
process	Name of the process that generated the core dump.
.by. *requester* | .abort	If the core dump was generated because of a request by a process (requester), the core filename contains the string ".by.*requester*" where the *requester* variable is the name or process ID (PID) of the process that requested the core dump. If the core dump was due to a self-generated abort call request, the core filename contains the string ".abort" instead of the name of the requester.
.sparse	If a sparse core dump was generated instead of a full core dump, "sparse" appears in the core dump filename.
.date-time	Date and time the dumper process was called by the process manager to generate the core dump. The *.date-time* time-stamp variable is expressed in the *yyyy.mm.dd-hh.mm.ss* format. Including the time stamp in the filename uniquely identifies the core dump filename.
. node	Node ID, expressed in the *rack/slot* notation, where the process that generated the core dump was running.
.processor-type	Type of processor (mips or ppc).
.Z	If the core dump was sent compressed, the filename contains the .Z suffix.

You can modify the default naming convention by specifying a filename to be appended to core dump files with the optional **filename** *filename* keyword and argument and by specifying a lower and higher limit ranges of values to be appended to core dump filenames with the *lower-limit* and *higher-limit* arguments,

respectively. The filename that you specify for the *filename* argument is appended to the core dump file and the lower and higher limit ranges of core dump files to be sent to a specified destination before the filenames are recycled. Valid values for the *lower-limit* argument are 0 to 4. Valid values for the *higher-limit* argument are 5 to 64. A hyphen (-) must immediately follow the *lower-limit* argument. In addition, to uniquely identify each core dump file, a value is appended to each core dump file, beginning with the lower-limit value specified with the *lower-limit* argument and continuing until the higher-limit value specified with the *higher-limit* argument has been reached. When the configured higher-limit value has been reached, Cisco IOS XR software begins to recycle the values appended to core dump files, beginning with the lower-limit value.

Task ID

Task ID	Operations
diag	read, write

The following example shows how to configure the core dump setting for the primary user-defined preferred location. In this example, core files are configured to be sent uncompressed; the filename of core dump files is set to “core” (that is, all core filenames will be named core); the range value is set from 0 to 5 (that is, the values 0 to 5 are appended to the filename for the first five generated core dump files, respectively, before being recycled); and the destination is set to a directory on the hard disk.

The following example shows how to use the command:

```
Router(config)# exception choice 1 compress off filename core 0-5 filepath /harddisk:/corefile
```

follow

To unobtrusively debug a live process or a live thread in a process, use the **follow** command in EXEC mode or Admin EXEC mode.

Command Modes

EXEC

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use this command to unintrusively debug a live process or a live thread in a process. This command is particularly useful for debugging deadlock and livelock conditions, for examining the contents of a memory location or a variable in a process to determine the cause of a corruption issue, or in investigating issues where a thread is stuck spinning in a loop. A livelock condition is one that occurs when two or more processes continually change their state in response to changes in the other processes.

The following actions can be specified with this command:

- Follow all live threads of a given process or a given thread of a process and print stack trace in a format similar to core dump output.
- Follow a process in a loop for a given number of iterations.
- Set a delay between two iterations while invoking the command.
- Set the priority at which this process should run while this command is being run.
- Dump memory from a given virtual memory location for a given size.
- Display register values and status information of the target process.

Take a snapshot of the execution path of a thread asynchronously to investigate performance-related issues by specifying a high number of iterations with a zero delay.

Task ID

Task ID	Operations
basic-services	read

The following example shows how to use the **follow** command to debug the process associated with job ID 257 for one iteration:

```
Router# follow job 257 iteration 1

Attaching to process pid = 28703 (pkg/bin/packet)
No tid specified, following all threads

DLL Loaded by this process
--------------------------------

DLL path                Text addr. Text size  Data addr. Data size  Version
```

```
/pkg/lib/libovl.dll      0xfc0c9000 0x0000c398 0xfc0c31f0 0x0000076c        0
/pkg/lib/libplatform.dll 0xfc0d6000 0x0000aa88 0xfc0e1000 0x00002000        0
/pkg/lib/libsysmgr.dll   0xfc0e3000 0x0000aeac 0xfc0c395c 0x00000388        0
/pkg/lib/libinfra.dll    0xfc0ee000 0x000332ec 0xfc122000 0x00000c70        0
/pkg/lib/libios.dll      0xfc123000 0x0002c4bc 0xfc150000 0x00002000        0
/pkg/lib/libc.dll        0xfc152000 0x00077ae0 0xfc1ca000 0x00002000        0
/pkg/lib/libsyslog.dll   0xfc1d4000 0x0000530c 0xfc122c70 0x00000308        0
/pkg/lib/libbackplane.dll 0xfc1da000 0x0000134c 0xfc0c3e6c 0x000000a8        0
/pkg/lib/libnodeid.dll   0xfc1e7000 0x000091fc 0xfc1e61a8 0x00000208        0
/pkg/lib/libdebug.dll    0xfc23e000 0x0000ef64 0xfc1e6680 0x00000550        0
/pkg/lib/lib_procfs_util.dll 0xfc24d000 0x00004e2c 0xfc1e6bd0 0x000002a8        0
/pkg/lib/libsysdb.dll    0xfc252000 0x00046224 0xfc299000 0x0000079c        0
/pkg/lib/libsysdbutils.dll 0xfc29a000 0x0000ae04 0xfc29979c 0x000003ec        0
/pkg/lib/libwd_evm.dll   0xfc2a9000 0x0000481c 0xfc299b88 0x00000188        0
/pkg/lib/lib_mutex_monitor.dll 0xfc35e000 0x00002414 0xfc340850 0x00000128        0
/pkg/lib/libchkpt.dll    0xfc477000 0x0002ee04 0xfc474388 0x00000950        0
/pkg/lib/libpacket_common.dll 0xfc617000 0x000130f0 0xfc6056a0 0x000007b0        0

Iteration 1 of 1
------------------------------

Current process = "pkg/bin/packet", PID = 28703 TID = 1

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x48204410 [<N/A>]

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 2

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0xfc48d848 [chk_evm_thread]

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 3

trace_back: #0 0xfc17d54c [SignalWaitinfo]
trace_back: #1 0xfc161c64 [sigwaitinfo]
trace_back: #2 0xfc10302c [event_signal_thread]

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 4

trace_back: #0 0xfc1106c4 [MsgReceivePulse]
trace_back: #1 0xfc0fc604 [msg_receive_async]
trace_back: #2 0xfc0ffa70 [event_dispatch]
trace_back: #3 0xfc0ffc5c [event_block_async]
trace_back: #4 0xfc35e36c [receive_events]

ENDOFSTACKTRACE

Current process = "pkg/bin/packet", PID = 28703 TID = 5

trace_back: #0 0xfc17d564 [SignalWaitinfo_r]
```

```
trace_back: #1 0xfc161c28 [sigwait]
trace_back: #2 0x48203928 [<N/A>]

ENDOFSTACKTRACE
```

The following example shows how to use the **follow** command to debug TID 5 of the process associated with job ID 257 for one iteration:

```
Router# follow job 257 iteration 1 thread 5

Attaching to process pid = 28703 (pkg/bin/packet)

DLL Loaded by this process
------------------------------

DLL path                 Text addr. Text size  Data addr. Data size  Version
/pkg/lib/libovl.dll      0xfc0c9000 0x0000c398 0xfc0c31f0 0x0000076c        0
/pkg/lib/libplatform.dll 0xfc0d6000 0x0000aa88 0xfc0e1000 0x00002000        0
/pkg/lib/libsysmgr.dll   0xfc0e3000 0x0000aeac 0xfc0c395c 0x00000388        0
/pkg/lib/libinfra.dll    0xfc0ee000 0x000332ec 0xfc122000 0x00000c70        0
/pkg/lib/libios.dll      0xfc123000 0x0002c4bc 0xfc150000 0x00002000        0
/pkg/lib/libc.dll        0xfc152000 0x00077ae0 0xfc1ca000 0x00002000        0
/pkg/lib/libsyslog.dll   0xfc1d4000 0x0000530c 0xfc122c70 0x00000308        0
/pkg/lib/libbackplane.dll 0xfc1da000 0x0000134c 0xfc0c3e6c 0x000000a8        0
/pkg/lib/libnodeid.dll   0xfc1e7000 0x000091fc 0xfc1e61a8 0x00000208        0
/pkg/lib/libdebug.dll    0xfc23e000 0x0000ef64 0xfc1e6680 0x00000550        0
/pkg/lib/lib_procfs_util.dll 0xfc24d000 0x00004e2c 0xfc1e6bd0 0x000002a8        0
/pkg/lib/libsysdb.dll    0xfc252000 0x00046224 0xfc299000 0x0000079c        0
/pkg/lib/libsysdbutils.dll 0xfc29a000 0x0000ae04 0xfc29979c 0x000003ec        0
/pkg/lib/libwd_evm.dll   0xfc2a9000 0x0000481c 0xfc299b88 0x00000188        0
/pkg/lib/lib_mutex_monitor.dll 0xfc35e000 0x00002414 0xfc340850 0x00000128        0
/pkg/lib/libchkpt.dll    0xfc477000 0x0002ee04 0xfc474388 0x00000950        0
/pkg/lib/libpacket_common.dll 0xfc617000 0x000130f0 0xfc6056a0 0x000007b0        0

Iteration 1 of 1
------------------------------

Current process = "pkg/bin/packet", PID = 28703 TID = 5

trace_back: #0 0xfc17d564 [SignalWaitinfo_r]
trace_back: #1 0xfc161c28 [sigwait]
trace_back: #2 0x48203928 [<N/A>]

ENDOFSTACKTRACE
```

The following example shows how to use the **follow** command to debug the chain of threads blocking thread 2 associated with the process assigned PID 139406:

```
Router# follow process 139406 blocked iteration 1 thread 2

Attaching to process pid = 139406 (pkg/bin/lpts_fm)

DLL Loaded by this process
------------------------------

DLL path                 Text addr. Text size  Data addr. Data size  Version
/pkg/lib/libplatform.dll 0xfc0d6000 0x0000aa88 0xfc0e1000 0x00002000        0
/pkg/lib/libsysmgr.dll   0xfc0e3000 0x0000aeac 0xfc0c395c 0x00000388        0
/pkg/lib/libinfra.dll    0xfc0ee000 0x000332ec 0xfc122000 0x00000c70        0
/pkg/lib/libios.dll      0xfc123000 0x0002c4bc 0xfc150000 0x00002000        0
/pkg/lib/libc.dll        0xfc152000 0x00077ae0 0xfc1ca000 0x00002000        0
```

```
/pkg/lib/libltrace.dll   0xfc1cc000 0x00007f5c 0xfc0c3ce4 0x00000188        0
/pkg/lib/libsyslog.dll   0xfc1d4000 0x0000530c 0xfc122c70 0x00000308        0
/pkg/lib/libbackplane.dll 0xfc1da000 0x0000134c 0xfc0c3e6c 0x000000a8        0
/pkg/lib/libnodeid.dll   0xfc1e7000 0x000091fc 0xfc1e61a8 0x00000208        0
/pkg/lib/libdebug.dll    0xfc23e000 0x0000ef64 0xfc1e6680 0x00000550        0
/pkg/lib/lib_procfs_util.dll 0xfc24d000 0x00004e2c 0xfc1e6bd0 0x000002a8        0
/pkg/lib/libsysdb.dll    0xfc252000 0x00046224 0xfc299000 0x0000079c        0
/pkg/lib/libsysdbutils.dll 0xfc29a000 0x0000ae04 0xfc29979c 0x000003ec        0
/pkg/lib/libwd_evm.dll   0xfc2a9000 0x0000481c 0xfc299b88 0x00000188        0
/pkg/lib/libbag.dll      0xfc40c000 0x0000ee98 0xfc41b000 0x00000368        0
/pkg/lib/libwd_notif.dll 0xfc4f8000 0x00005000 0xfc4fd000 0x00001000        0
/pkg/lib/libifmgr.dll    0xfc665000 0x00029780 0xfc68f000 0x00003000        0
/pkg/lib/libnetio_client.dll 0xfca6a000 0x000065c8 0xfca2c4f8 0x000001b4        0
/pkg/lib/libpa_client.dll 0xfcec5000 0x00006e9c 0xfcecc000 0x00003000        0
/pkg/lib/libltimes.dll   0xfcecf000 0x00002964 0xfcdc4f20 0x000000a8        0

Iteration 1 of 1
-------------------------------

Current process = "pkg/bin/lpts_fm", PID = 139406 TID = 2

trace_back: #0 0xfc110744 [MsgSendv]
trace_back: #1 0xfc0fbf04 [msg_sendv]
trace_back: #2 0xfc0fbbd8 [msg_send]
trace_back: #3 0xfcec7580 [pa_fm_close]
trace_back: #4 0xfcec78b0 [pa_fm_process_0]

ENDOFSTACKTRACE

REPLY (node node0_RP1_CPU0, pid 57433)

No specific TID, following all threads of 57433 (pkg/bin/lpts_pa)
---------------------------------------------------------------------

DLL Loaded by this process
-------------------------------

DLL path                 Text addr. Text size  Data addr. Data size  Version
/pkg/lib/libplatform.dll 0xfc0d6000 0x0000aa88 0xfc0e1000 0x00002000        0
/pkg/lib/libsysmgr.dll   0xfc0e3000 0x0000aeac 0xfc0c395c 0x00000388        0
/pkg/lib/libinfra.dll    0xfc0ee000 0x000332ec 0xfc122000 0x00000c70        0
/pkg/lib/libios.dll      0xfc123000 0x0002c4bc 0xfc150000 0x00002000        0
/pkg/lib/libc.dll        0xfc152000 0x00077ae0 0xfc1ca000 0x00002000        0
/pkg/lib/libltrace.dll   0xfc1cc000 0x00007f5c 0xfc0c3ce4 0x00000188        0
/pkg/lib/libsyslog.dll   0xfc1d4000 0x0000530c 0xfc122c70 0x00000308        0
/pkg/lib/libbackplane.dll 0xfc1da000 0x0000134c 0xfc0c3e6c 0x000000a8        0
/pkg/lib/libnodeid.dll   0xfc1e7000 0x000091fc 0xfc1e61a8 0x00000208        0
/pkg/lib/libdebug.dll    0xfc23e000 0x0000ef64 0xfc1e6680 0x00000550        0
/pkg/lib/lib_procfs_util.dll 0xfc24d000 0x00004e2c 0xfc1e6bd0 0x000002a8        0
/pkg/lib/libsysdb.dll    0xfc252000 0x00046224 0xfc299000 0x0000079c        0
/pkg/lib/libsysdbutils.dll 0xfc29a000 0x0000ae04 0xfc29979c 0x000003ec        0
/pkg/lib/libwd_evm.dll   0xfc2a9000 0x0000481c 0xfc299b88 0x00000188        0
/pkg/lib/lrdlib.dll      0xfc2f6000 0x0000a900 0xfc2f551c 0x00000610        0
/pkg/lib/liblrfuncs.dll  0xfc30e000 0x00001998 0xfc2ebd80 0x000001ec        0
/pkg/lib/libdscapi.dll   0xfc310000 0x0000457c 0xfc2f5b2c 0x0000035c        0
/pkg/lib/liblrdshared.dll 0xfc315000 0x00005fec 0xfc31b000 0x00002000        0
/pkg/lib/libbag.dll      0xfc40c000 0x0000ee98 0xfc41b000 0x00000368        0
/pkg/lib/libchkpt.dll    0xfc477000 0x0002ee04 0xfc474388 0x00000950        0
/pkg/lib/libwd_notif.dll 0xfc4f8000 0x00005000 0xfc4fd000 0x00001000        0
/pkg/lib/libltrace_sdt.dll 0xfc65c000 0x000034fc 0xfc65b73c 0x00000568        0
/pkg/lib/libfabhandle.dll 0xfc6be000 0x00003354 0xfc65bca4 0x00000248        0
/pkg/lib/libfsdb_ltrace_util_rt.dll 0xfc6ea000 0x00001b74 0xfc605e50 0x00000108        0
/pkg/lib/libbcdl.dll     0xfc6fb000 0x0000f220 0xfc6fa6e8 0x0000045c        0
/pkg/lib/liblpts_pa_fgid.dll 0xfc8d7000 0x00006640 0xfc7acd5c 0x00000208        0
```

```
/pkg/lib/libfgid.dll     0xfc910000 0x0001529c 0xfc926000 0x00002000        0
/pkg/lib/libltimes.dll   0xfcecf000 0x00002964 0xfcdc4f20 0x000000a8        0

Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 1

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x48201904 [<N/A>]
trace_back: #6 0x48201e3c [<N/A>]

ENDOFSTACKTRACE

Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 2

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x4821e978 [<N/A>]

ENDOFSTACKTRACE

Current process = "pkg/bin/lpts_pa", PID = 57433 TID = 3

trace_back: #0 0xfc1106dc [MsgReceivev]
trace_back: #1 0xfc0fc840 [msg_receivev]
trace_back: #2 0xfc0fc64c [msg_receive]
trace_back: #3 0xfc0ffa70 [event_dispatch]
trace_back: #4 0xfc0ffc2c [event_block]
trace_back: #5 0x482064c4 [<N/A>]

ENDOFSTACKTRACE
```

monitor threads

To display auto-updating statistics on threads in a full-screen mode, use the **monitor threads** command in

monitor threads [**dumbtty**] [**iteration** *number*]

Syntax Description

dumbtty	(Optional) Displays the output of the command as if on a dumb terminal (the screen is not refreshed).
iteration *number*	(Optional) Number of times the statistics display is to be updated, in the range from 0 to 4294967295.

Command Default

When all keywords are omitted, the **monitor threads** command displays the first ten threads for the local node, sorted in descending order by the time used. The display is cleared and updated every 5 seconds until you quit the command.

Command Modes

EXEC

Admin EXEC

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **monitor threads** command to show the top ten threads based on CPU usage. The display refreshes every 10 seconds.

- To change the parameters displayed by the **monitor threads** command, enter one of the key commands described in **Interactive Display Commands for the monitor threads command**.
- To terminate the display and return to the system prompt, enter the **q** key.
- To list the interactive commands, type ? during the display.

Interactive Display Commands for the monitor threads command describes the available interactive display commands.

Table 43: Interactive Display Commands for the monitor threads Command

Command	Description
?	Displays the available interactive commands.
d	Changes the delay interval between updates.

Command	Description
k	Kills a process.
l	Refreshes the screen.
n	Changes the number of threads to be displayed.
q	Quits the interactive display and returns the prompt to EXEC mode.

Task ID

Task ID	Operations
basic-services	execute

The following example shows sample output from the **monitor threads** command:

```
RP/0/RP0/CPU0:router# monitor threads

195 processes; 628 threads;
CPU states: 98.2% idle, 0.9% user, 0.7% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    12   1       10 Rcv     0:00:09     0.42% procnto-600-smp-cisco-instr
     1    25   1       10 Run     0:00:30     0.36% procnto-600-smp-cisco-instr
   342     1   1       19 Rcv     0:00:07     0.20% wdsysmon
    52     5   0       21 Rcv     0:00:03     0.15% devc-conaux
    52     3   1       18 Rcv     0:00:02     0.07% devc-conaux
532670     1   0       10 Rply    0:00:00     0.07% top
   293     6   0       55 Rcv     0:00:06     0.03% shelfmgr
    55     8   0       10 Rcv     0:00:02     0.03% eth_server
   315     3   0       10 Rcv     0:00:11     0.03% sysdb_svr_local
    55     7   0       55 Rcv     0:00:11     0.02% eth_server
```

The following example shows sample output from the **monitor threads** command using the optional **location** keyword:

```
RP/0/RP0/CPU0:router# monitor threads location 0/RP0/CPU0

Computing times...195 processes; 628 threads;
CPU states: 95.1% idle, 2.7% user, 2.0% kernel
Memory: 2048M total, 1576M avail, page size 4K

   JID   TID LAST_CPU PRI STATE  HH:MM:SS      CPU  COMMAND
     1    25   0       10 Run     0:00:32     2.08% procnto-600-smp-cisco-instr
   265     5   0       10 SigW    0:00:09     0.89% packet
   279     1   1       10 Rcv     0:00:00     0.65% qsm
557246     1   0       10 Rply    0:00:00     0.51% top
   293     5   1       55 Rcv     0:00:01     0.07% shelfmgr
   180    13   1       10 Rcv     0:00:02     0.07% gsp
   315     3   0       10 Rcv     0:00:12     0.07% sysdb_svr_local
    55     7   1       55 Rcv     0:00:12     0.04% eth_server
   180     1   0       10 Rcv     0:00:01     0.04% gsp
   298     9   0       10 Rcv     0:00:01     0.04% snmpd
```

Monitor threads Field Descriptions describes the significant fields shown in the display.

Table 44: monitor threads Field Descriptions

Field	Description
JID	Job ID.
TIDS	Thread ID.
LAST_CPU	Number of open channels.
PRI	Priority level of the thread.
STATE	State of the thread.
HH:MM:SS	Run time of process since last restart.
CPU	Percentage of CPU used by process thread.
COMMAND	Process name.

Using Interactive Commands

When the **n** or **d** interactive command is used, the **monitor threads** command prompts for a number appropriate to the specific interactive command. The following example shows sample output from the **monitor threads** command using the interactive **n** command after the first display cycle to change the number of threads:

```
RP/0/RP0/CPU0:router# monitor threads

Computing times... 87 processes; 249 threads;
CPU states: 84.8% idle, 4.2% user, 10.9% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:10    10.92% kernel
553049     1  10 Rply    0:00:00     4.20% top
    58     3  10 Rcv     0:00:24     0.00% sysdbsvr
     1     3  10 Rcv     0:00:21     0.00% kernel
    69     1  10 Rcv     0:00:20     0.00% wdsysmon
     1     5  10 Rcv     0:00:20     0.00% kernel
   159     2  10 Rcv     0:00:05     0.00% qnet
   160     1  10 Rcv     0:00:05     0.00% netio
   157     1  10 NSlp    0:00:04     0.00% envmon_periodic
   160     9  10 Intr    0:00:04     0.00% netio
n

Enter number of threads to display: 3
Please enter a number between 5 and 40
Enter number of threads to display: 8
87 processes; 249 threads;
CPU states: 95.3% idle, 2.9% user, 1.7% kernel
Memory: 256M total, 175M avail, page size 4K

   JID   TID PRI STATE  HH:MM:SS      CPU  COMMAND
     1     6  10 Run     0:00:11     1.76% kernel
    69     1  10 Rcv     0:00:20     1.11% wdsysmon
    58     3  10 Rcv     0:00:24     0.40% sysdbsvr
```

```
   157     1  10 NSlp    0:00:04     0.23% envmon_periodic
   159    19  10 Rcv     0:00:02     0.20% qnet
553049     1  10 Rply    0:00:00     0.20% top
   159    12  10 Rcv     0:00:03     0.13% qnet
   160     1  10 Rcv     0:00:05     0.10% netio
```

When a number outside the acceptable range is entered, the acceptable range is displayed:

```
Please enter a number between 5 and 40
Enter number of threads to display:
```

process

To start, terminate, or restart a process, use the **process** command in admin EXEC mode.

process { **crash** | **restart** | **shutdown** | **start** } { *executable-name job-id* } **location** { *node-id* | **all** }

Syntax Description

crash	Crashes a process.
restart	Restarts a process.
shutdown	Stops a process. The process is not restarted (even if considered "mandatory□?).
start	Starts a process.
executable-name	Executable name of the process to be started, terminated, or restarted. Supplying an executable name for the executable-name argument performs the action for all the simultaneously running instances of the process, if applicable.
job-id	Job ID of the process instance to be started, terminated, or restarted. Supplying a job ID for the *job-id* argument performs the action for only the process instance associated with the job ID.
location { *node-id* | **all**}	Starts, terminates, or restarts a process on the designated node. The *node-id* argument is entered in the *rack/slot* notation. The **all** keyword specifies all nodes.

Command Default

None

Command Modes

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Under normal circumstances, processes are started and restarted automatically by the operating system as required. If a process crashes, it is automatically restarted.

Use this command to manually start, stop, or restart individual processes.

Caution Manually stopping or restarting a process can seriously impact the operation of a router. Use these commands only under the direction of a Cisco Technical Support representative.

process shutdown

The **process shutdown** command shuts down (terminates) the specified process and copies associated with the specified process. The process is not restarted, even if considered "mandatory.□? Use the **show processes** command to display a list of executable processes running on the system.

Caution Stopping a process can result in an RP switchover, system failure or both. This command is intended for use only under the direct supervision of a Cisco Technical Support representative.

process restart

The **process restart** command restarts a process, such as a process that is not functioning optimally.

process start

The **process start** command starts a process that is not currently running, such as a process that was terminated using the **process kill** command. If multiple copies are on the system, all instances of the process are started simultaneously.

Task ID

Task ID	Operations
root-lr	execute

The following example shows how to restart a process. In this example, the IS-IS process is restarted:

```
Router# process restart isis

RP/0/RSP0/CPU0:router#RP/0/RSP0/CPU0:Mar 30 15:24:41 : isis[343]: %ISIS-6-INFO_ST
RTUP_START : Cisco NSF controlled start beginning
RP/0/RSP0/CPU0:router#RP/0/RSP0/CPU0:Mar 30 15:24:52 : isis[352]: %ISIS-6-INFO_ST
RTUP_FINISH : Cold controlled start completed
```

The following example shows how to terminate a process. In this example, the IS-IS process is stopped:

```
Router# process shutdown isis
#
```

The following example shows how to start a process. In this example, the IS-IS process is started:

```
Router# process start isis

RP/0/RP0/CPU0:router#RP/0/RP0/CPU0:Mar 30 15:27:19 : isis[227]:
   %ISIS-6-INFO_STARTUP_START : Cold controlled start beginning
RP/0/RP0/CPU0:Mar 30 15:27:31 : isis[352]: %ISIS-6-INFO_STARTUP_FINISH :
   Cold controlled start completed
```

process mandatory

To set the mandatory reboot options for a process, use the **process mandatory** command in the appropriate mode.

process mandatory
process mandatory {**on** | **off**} {*executable-namejob-id*} **location** *node-id*

process mandatory toggle
process mandatory toggle {*executable-namejob-id*} **location** *node-id*

Syntax Description

on	Turns on mandatory process attribute.
off	Turns off the mandatory process attribute. The process is not considered mandatory.
toggle	Toggles a mandatory process attribute.
executable-name	Executable name of the process to be terminated. Specifying an executable name for the *executable-name* argument terminates the process and all the simultaneously running copies, if applicable.
job-id	Job ID associated with the process to be terminated. Terminates only the process associated with the job ID.
location *node-id*	Sets the mandatory settings for a process on a designated node. The node-id argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If a process unexpectedly goes down, the following action occurs based on whether the process is considered mandatory.

- If the process is mandatory and the process cannot be restarted, the node automatically reboots.
- If the process is not mandatory and cannot be restarted, it stays down and the node does not reboot.

Task ID

Task ID	Operations
root-lr	execute

The following example shows how to turn on a mandatory attribute. In this example, the mandatory attribute is turned on for the media_ether_config_di process.

```
RP/0/RP0/CPU0:router# process mandatory on media_ether_config_di
```

The following example shows how to turn the reboot option on. In this example, the router is set to reboot the node if a mandatory process goes down and cannot be restarted.

```
RP/0/RP0/CPU0:router# process mandatory reboot enable

RP/0/RP00/CPU0:Mar 19 19:28:10 : sysmgr[71]: %SYSMGR-4-MANDATORY_REBOOT_ENABLE :
mandatory reboot option enabled by request
```

The following example shows how to turn off the reboot option. In this example, the router is set *not* to reboot the node if a mandatory process goes down and cannot be restarted. In this case, the mandatory process is restarted, but the node is not rebooted.

```
RP/0/RP0/CPU0:router# process mandatory reboot disable

RP/0/RP00/CPU0:Mar 19 19:31:20 : sysmgr[71]: %SYSMGR-4-MANDATORY_REBOOT_OVERRIDE
: mandatory reboot option overridden by request
```

show context

To display core dump context information, use the **show context** command in administration EXEC mode or EXEC mode.

show context [*coredump-occurrence* | **clear**] [**location** {*node-id* | **all**}]

Syntax Description

coredump-occurrence	(Optional) Core dump context information to be displayed based on the occurrence of the core dump. Valid values are 1 to 10.
clear	(Optional) Clears the current context information.
location { *node-id* | **all**}	Displays core dump information that occurred on the designated node. The *node-id* argument is expressed in the *rack/slot* notation. The **all** keyword specifies to display information for all nodes.

Command Default

If no *coredump-occurrence* value is specified, core dump context information for all core dumps is displayed.

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show context** command to display core dump context information. This command displays context information for the last ten core dumps. Cisco Technical Support Center engineers and development engineers use this command for post-analysis in the debugging of processes.

Use the clear context, on page 532 command to clear core dump context information.

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show context** command:

```
RP/0/RP0/CPU0:router# show context

Crashed pid = 20502 (pkg/bin/mbi-hello)
Crash time: Thu Mar 25, 2004: 19:34:14
Core for process at disk0:/mbi-hello.20040325-193414.node0_RP0_CPU0

    Stack Trace
```

```
#0 0xfc117c9c
#1 0xfc104348
#2 0xfc104154
#3 0xfc107578
#4 0xfc107734
#5 0x482009e4
                Registers info
             r0       r1       r2       r3
  R0   0000000e  481ffa80  4820c0b8  00000003
             r4       r5       r6       r7
  R4   481ffb18  00000001  481ffa88  48200434
             r8       r9      r10      r11
  R8   00000000  00000001  00000000  fc17ac58
            r12      r13      r14      r15
  R12  481ffb08  4820c080  481ffc10  00000001
            r16      r17      r18      r19
  R16  481ffc24  481ffc2c  481ffcb4  00000000
            r20      r21      r22      r23
  R20  00398020  00000000  481ffb6c  4820a484
            r24      r25      r26      r27
  R24  00000000  00000001  4820efe0  481ffb88
            r28      r29      r30      r31
  R28  00000001  481ffb18  4820ef08  00000001
            cnt       lr      msr       pc
  R32  fc168d58  fc104348  0000d932  fc117c9c
            cnd      xer
  R36  24000022  00000004

                      DLL Info
DLL path    Text addr.  Text size   Data addr. Data size   Version
/pkg/lib/libinfra.dll  0xfc0f6000  0x00032698  0xfc0f5268  0x00000cb4
```

The following example shows sample output from the **show context** command. The output displays information about a core dump from a process that has not crashed.

```
RP/0/RP0/CPU0:router# show context

node:      node0_RP0_CPU0
------------------------------------------------------------------

Crashed pid = 28703 (pkg/bin/packet)
Crash time: Tue Sep 21, 2004: 02:48:00
Core for process at harddisk:/packet.by.dumper_gen.20040921-024800.node0_RP0_CPU0.ppc.Z
```

show context Field Descriptions describes the significant fields shown in the display.

Table 45: show context Field Descriptions

Field	Description
Crashed pid	Process ID (PID) of the crashed process followed by the executable path.
Crash time	Time and date the crash occurred.
Core for process at	File path to the core dump file.
Stack Trace	Stack trace information.
Registers Info	Register information related to crashed threads.

Field	Description
DLL Info	Dynamically loadable library (DLL) information used to decode the stack trace.

show dll

To display dynamically loadable library (DLL) information, use the **show dll** command in administation EXEC or EXEC mode.

show dll [**pid** { **location** *node-id* }]

Syntax Description

pid	Process ID of the process.
dllname *dll-virtual-path*	(Optional) Displays the process IDs (PIDs) of the process that have downloaded the DLL specified for the *dll-virtual-path* argument.
location *node-id*	(Optional) Displays DLLs for the specified node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show dll** command. In this example, the output displays all the DLLs loaded on the router.

```
RP/0/RP0/CPU0:router# show dll

DLL path                              Text VA    Text Sz    Data VA    Data Sz    Refcount
-------------------------------------------------------------------------------------------
/lib/libui.dll                        0xfc000000 0x00007000 0xfc007000 0x00001000    1
/disk0/-base-0.48.0/lib/liblogin.dll 0xfc008000 0x00006000 0xfc00e000 0x00001000    1
/mbi/lib/libbanner.dll                0xfc00f000 0x00003000 0xfc012000 0x00001000    1
/disk0/-base-0.48.0/lib/libaaav2.dll 0xfc013000 0x0000f000 0xfc022000 0x00001000    1
/disk0/-base-0.48.0/lib/libaaatty.dll 0xfc023000 0x00004000 0xfc027000 0x00001000    1
/mbi/lib/libtermcap.dll               0xfc028000 0x00003000 0xfc02b000 0x00001000    1
/mbi/lib/lib_show_dll.dll             0xfc02c000 0x00004000 0xfc030000 0x00001000    1
/mbi/lib/libihplatform.dll            0xfc0bf2d4 0x00000c18 0xfc1e4f88 0x00000068    1
/lib/libovl.dll                       0xfc0c8000 0x0000c3b0 0xfc0c21f0 0x0000076c   23
```

```
/disk0/-admin-0.48.0/lib/libfqm_ltrace_util_common.dll 0xfc0d43b0 0x00000bfc 0xfc391f7c
0x00000068    1
/lib/libplatform.dll                0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                  0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  166
/lib/libinfra.dll                   0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                     0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                       0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll              0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                  0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/disk0/-base-0.48.0/lib/liblpts_ifib_platform.dll 0xfc1d730c 0x00000cc8 0xfcef4000 0x00000068
    1
/lib/libbackplane.dll               0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/disk0/-base-0.48.0/lib/libipv6_platform_client.dll 0xfc1d934c 0x00000c48 0xfcef4f8c
0x00000068    1
/mbi/lib/libpkgfs_node.dll          0xfc1da000 0x000092d4 0xfc1e4000 0x000001a8    3
```

The following example shows sample output from the **show dll** command with the optional **jobid** *job-id* keyword and argument:

```
RP/0/RP0/CPU0:router# show dll jobid 186

DLLs mapped by PID 86111
DLL path                            Text VA    Text Sz    Data VA    Data Sz    Refcount
------------------------------------------------------------------------------------------
/lib/libovl.dll                     0xfc0c8000 0x0000c3b0 0xfc0c21f0 0x0000076c   23
/lib/libplatform.dll                0xfc0d5000 0x0000aa88 0xfc0e0000 0x00002000  165
/lib/libsysmgr.dll                  0xfc0e2000 0x0000ab48 0xfc0c295c 0x00000368  167
/lib/libinfra.dll                   0xfc0ed000 0x0003284c 0xfc120000 0x00000c70  169
/lib/libios.dll                     0xfc121000 0x0002c4bc 0xfc14e000 0x00002000  166
/lib/libc.dll                       0xfc150000 0x00077ae0 0xfc1c8000 0x00002000  175
/mbi/lib/libltrace.dll              0xfc1ca000 0x00007f5c 0xfc0c2cc4 0x00000188   96
/lib/libsyslog.dll                  0xfc1d2000 0x0000530c 0xfc120c70 0x00000308  129
/lib/libbackplane.dll               0xfc1d8000 0x0000134c 0xfc0c2e4c 0x000000a8  163
/lib/libnodeid.dll                  0xfc1e5000 0x000091fc 0xfc1e41a8 0x00000208  163
/mbi/lib/libinst_mem.dll            0xfc232000 0x000044f8 0xfc1e43b0 0x00000108    4
/lib/libdebug.dll                   0xfc23c000 0x0000ef64 0xfc1e4680 0x00000550  159
```

show dll Field Descriptions describes the significant fields shown in the display.

Table 46: show dll Field Descriptions

Field	Description
DLL path	Physical path of the DLL on the router.
Text VA	Virtual address of the text segment of the DLL.
Text Sz	Size of the text segment of the DLL.
Data VA	Virtual address of the data segment of the DLL.
Data Sz	Size of the data segment of the DLL.
Refcount	Number of clients using the DLL.

The following example shows sample output from the **show dll** command with the optional **dllname** *dll-virtual-path* keyword and optional argument:

```
RP/0/RP0/CPU0:router# show dll dllname /pkg/lib/libinst_mem.dll

PID:     4102  Refcount: 1
PID:     4105  Refcount: 1
PID:    24600  Refcount: 1
PID:    86111  Refcount: 1
```

show dll dllname Field Descriptions describes the significant fields shown in the display.

Table 47: show dll dllname Field Descriptions

Field	Description
PID:	Process ID of the process.
Refcount	Number of references to the DLL by the process.

The following example shows sample **show dll** output from the command with the optional **memory** keyword:

```
RP/0/RP0/CPU0:router# show dll memory
------------------------------------------------------------------------------

Total DLL Text - 14778896 bytes  Total DLL Data - 12688500 bytes
Total DLL Memory - 27467396 bytes
```

show exception

To display the configured core dump settings, use the **show exception** command in adminstration EXEC or EXEC mode.

show exception

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show exception** command to display the configured core dump settings.

Task ID

Task ID	Operations
diag	read

The following example shows sample output from the **show exception** command for a specific process:

```
RP/0/RP0/CPU0:router# show excep core-options process upgrade_daemon location 0/6/cpu0
Exception path for choice 1 is not configured or removed
Exception path for choice 2 is not configured or removed
Exception path for choice 3 is not configured or removed
Default fallback/copy path = /misc/disk1/
```

show memory

To display the available physical memory and memory usage information of processes on the router, use the **show memory** command in EXEC or administration EXEC mode.

show memory [*jobid* | **summary** [**bytes** | **detail**]] **location** *node-id*

Syntax Description

job id	(Optional) Job ID associated with a process instance. Specifying a job ID for the *job-id* argument displays the memory available and memory usage information for only the process associated with the specified job ID. If the *job-id* argument is not specified, this command displays information for all running processes.
summary	(Optional) Displays a summary of the physical memory and memory usage information.
bytes	(Optional) Displays numbers in bytes for an exact count.
detail	(Optional) Displays numbers in the format "nnn.dddM" for more detail.
location *node-id*	Displays the available physical memory from the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To display detailed memory information for the entire router, enter the **show memory** command without any parameters.

Task ID

Task ID	Operations
basic-services	read

This example shows partial sample output from the **show memory** command entered without keywords or arguments. This command displays details for the entire router.

```
Router# show memory

  Physical Memory:2048M total
   Application Memory :1802M (1636M available)
   Image:116M (bootram:116M)
   Reserved:128M, IOMem:0, flashfsys:0
   Total shared window:0

  kernel:jid 1
```

```
Address         Bytes           What
0008f000        12288           Program Stack
000b2000        12288           Program Stack
Total Allocated Memory:0
Total Shared Memory:0

sbin/devc-pty:jid 68
Address         Bytes           What
4817f000        4096            Program Stack (pages not allocated)
48180000        516096          Program Stack (pages not allocated)
481fe000        8192            Program Stack
48200000        28672           Physical Mapped Memory
48207000        4096            ANON FIXED ELF SYSRAM
48208000        4096            ANON FIXED ELF SYSRAM
```

This example shows sample output from the **show memory** command entered with the job ID 7 to show the memory usage information for the process associated with this job identifier:

```
Router# show memory 7

  Physical Memory: 256M total
   Application Memory : 249M (217M available)
   Image: 2M (bootram: 2M)
   Reserved: 4M, IOMem: 0, flashfsys: 0

  sbin/pipe: jid 7
  Address         Bytes           What
  07f7c000        126976          Program Stack (pages not allocated)
  07f9b000        4096            Program Stack
  07f9d000        126976          Program Stack (pages not allocated)
  07fbc000        4096            Program Stack
  07fbe000        126976          Program Stack (pages not allocated)
  07fdd000        4096            Program Stack
  07fdf000        126976          Program Stack (pages not allocated)
  07ffe000        4096            Program Stack
  08000000        122880          Program Stack (pages not allocated)
  0801e000        8192            Program Stack
  08020000        12288           Physical Mapped Memory
  08023000        4096            Program Text or Data
  08024000        4096            Program Text or Data
  08025000        16384           Allocated Memory
  08029000        16384           Allocated Memory
  7c001000        319488          DLL Text libc.dll
  7e000000        8192            DLL Data libc.dll
```

This example shows how to display a detailed summary of memory information for the router:

```
Router# show memory summary detail

  Physical Memory: 256.000M total
   Application Memory : 140.178M (15.003M available)
   Image: 95.739M (bootram: 95.739M)
   Reserved: 20.000M, IOMem: 0, flashfsys: 0
   Shared window fibv6: 257.980K
   Shared window PFI_IFH: 207.925K
   Shared window aib: 8.972M
   Shared window infra_statsd: 3.980K
   Shared window ipv4_fib: 1.300M
   Shared window atc_cache: 35.937K
   Shared window qad: 39.621K
```

```
Total shared window: 10.805M
Allocated Memory: 49.933M
Program Text: 6.578M
Program Data: 636.000K
Program Stack: 4.781M
```

Table 48: show memory summary Field Descriptions

Field	Description
Physical Memory	Available physical memory on the router.
Application Memory	Current memory usage of all the processes on the router.
Image	Memory that is currently used by the image and available memory.
Reserved	Total reserved memory.
IOMem	Available I/O memory.
flashfsys	Total flash memory.
Shared window fibv6	Internal shared window information.
Shared window PFI_IFH	Internal shared window information.
Shared window aib	Internal shared window information.
Shared window infra_statsd	Internal shared window information.
Shared window ipv4_fib	Internal shared window information.
Shared window atc_cache	Internal shared window information.
Shared window qad	Internal shared window information.
Total shared window	Internal shared window information.
Allocated Memory	Amount of memory allocated for the specified node.
Program Text	Internal program test information.
Program Data	Internal program data information.
Program Stack	Internal program stack information.

show memory compare

To display details about heap memory usage for all processes on the router at different moments in time and compare the results, use the **show memory compare** command in EXEC or administration EXEC mode.

show memory compare {**start** | **end** | **report**}

Syntax Description

start	Takes the initial snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_start.out.
end	Takes the second snapshot of heap memory usage for all processes on the router and sends the report to a temporary file named /tmp/memcmp_end.out. This snapshot is compared with the initial snapshot when displaying the heap memory usage comparison report.
report	Displays the heap memory comparison report, comparing heap memory usage between the two snapshots of heap memory usage.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show memory compare** command to display details about the heap memory usage of all processes on the router at different moments in time and compare the results. This command is useful for detecting patterns of memory usage during events such as restarting processes or configuring interfaces.

Use the following steps to create and compare memory snapshots:

1. Enter the **show memory compare** command with the **start** keyword to take the initial snapshot of heap memory usage for all processes on the router.

Note The snapshot is similar to that resulting from entry of the show memory heap, on page 565 command with the optional **summary** keyword.

2. Perform the test you want to analyze.
3. Enter the **show memory compare** command with the **end** keyword to take the snapshot of heap memory usage to be compared with the initial snapshot.
4. Enter the **show memory compare** command with the **report** keyword to display the heap memory usage comparison report.

Task ID

Task ID	Operations
basic-services	read

This example shows sample output from the **show memory compare** command with the **report** keyword:

```
Router# show memory compare report

  JID   name                 mem before   mem after    difference   mallocs  restarted
  ---   ----                 ----------   ---------    ----------   -------  ---------
  84    driver_infra_partner 577828       661492       83664        65
  279   gsp                  268092       335060       66968        396
  236   snap_transport       39816        80816        41000        5
  237   mpls_lsd_agent       36340        77340        41000        5
  268   fint_partner         24704        65704        41000        5
  90    null_caps_partner    25676        66676        41000        5
  208   aib                  55320        96320        41000        5
  209   ipv4_io              119724       160724       41000        5
  103   loopback_caps_partne 33000        74000        41000        5
  190   ipv4_arm             41432        82432        41000        5
  191   ipv6_arm             33452        74452        41000        5
  104   sysldr               152164       193164       41000        5
  85    nd_partner           37200        78200        41000        5
  221   clns                 61520        102520       41000        5
  196   parser_server        1295440      1336440      41000        5
  75    bundlemgr_distrib    57424        98424        41000        5
  200   arp                  83720        124720       41000        5
  201   cdp                  56524        97524        41000        5
  204   ether_caps_partner   39620        80620        41000        5
  206   qosmgr               55624        96624        41000        5
  240   imd_server           92880        104680       11800        28
  260   improxy              77508        88644        11136        10
  111   nrssvr               29152        37232        8080         60
  275   sysdb_svr_local      1575532      1579056      3524         30
  205   cfgmgr               31724        33548        1824         25
  99    sysdb_svr_shared     1131188      1132868      1680         14
  51    mbus-rp              26712        27864        1152         4
  66    wdsysmon             298068       299216       1148         15
  168   netio                1010912      1012060      1148         6
  283   itrace_manager       17408        17928        520          3
  59    devc-conaux          109868       110300       432          4
  67    syslogd_helper       289200       289416       216          2
  117   fctl                 41596        41656        60           2
  54    sysmgr               171772       171076       -696         -5
  269   ifmgr                539308       530652       -8656        -196        *
```

Table 49: show memory compare report Field Descriptions

Field	Description
JID	Process job ID.
name	Process name.
mem before	Heap memory usage at start (in bytes).

Field	Description
mem after	Heap memory usage at end (in bytes).
difference	Difference in heap memory usage (in bytes).
mallocs	Number of unfreed allocations made during the test period.
restarted	Indicates if the process was restarted during the test period.

show memory heap

To display information about the heap space for a process, use the **show memory heap** command in EXEC or administration EXEC mode.

show memory heap [**allocated**] [**dllname**] [**failure**] [**free**] { *jobid* | **all** }

Syntax Description

allocated	(Optional) Displays a list of all allocated heap blocks.
dllname	(Optional) Displays heaps with dynamic link library (DLL) names.
failure	(Optional) Displays a summary of heap failures.
free	(Optional) Displays a list of all free heap blocks.
summary	(Optional) Displays a summary of the information about the heap space.
job-id	Job ID associated with the process instance.
all	(Optional) Displays information about the heap space for all processes. The **all** keyword is only available when the **failure** or **summary** keywords are used.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

This example shows sample output from the **show memory heap** command, specifying a job ID for the *job-id* argument:

```
Router# show memory heap 111

  Malloc summary for pid 16433:
    Heapsize 16384: allocd 6328, free 8820, overhead 1236
```

```
  Calls: mallocs 144; reallocs 73; frees 5; [core-allocs 1; core-frees 0]
Block Allocated List
Total      Total      Block       Name/ID/Caller
Usize      Size       Count

0x000008c1 0x000008cc 0x00000001  0x7c018a10
0x000005ac 0x00000974 0x00000079  0x7c02b9e0
0x000004f0 0x000004f8 0x00000001  0x7c02b6fc
0x00000080 0x00000088 0x00000001  0x7c01936c
0x00000034 0x00000048 0x00000001  0x7c018954
0x00000024 0x00000030 0x00000001  0x7c019278
0x00000018 0x00000020 0x00000001  0x7c019b2c
0x00000008 0x00000010 0x00000001  0x7c017178
0x00000008 0x00000010 0x00000001  0x7c00fb54
0x00000008 0x00000010 0x00000001  0x7c00fb80
0x00000008 0x00000010 0x00000001  0x7c00fbb8
```

Table 50: show memory heap Field Descriptions

Field	Description
Malloc summary for pid	System-defined process ID (PID).
Heapsize	Size of the heap as allocated from the system by the malloc library.
allocd	Bytes allocated to the process.
free	Bytes available in the heap.
overhead	Malloc library overhead in bytes.
mallocs	Number of malloc calls.
reallocs	Number of realloc calls.
frees	Number of invocations to the caller interface provided in the malloc library for deallocating the memory.
[core-allocs 1; core-frees 0]	Number of core memory units, the memory units in the malloc library allocated by the system for the heap, allocated, and freed.

The following example shows sample output from the **show memory heap** command, specifying the **summary** *job-id* keyword and argument:

```
Router# show memory heap summary 65

  Malloc summary for pid 20495 process pcmciad:
    Heapsize 65536: allocd 40332, free 16568, overhead 8636
    Calls: mallocs 883; reallocs 3; frees 671; [core-allocs 4; core-frees 0]
  Band size 16, element per block 48, nbuint 1
    Completely free blocks: 0
    Block alloced: 2, Block freed: 0
    allocs: 85, frees: 20
    allocmem: 1040, freemem: 496, overhead: 448
    blocks: 2, blknodes: 96
  Band size 24, element per block 34, nbuint 1
    Completely free blocks: 0
```

```
  Block alloced: 1, Block freed: 0
  allocs: 243, frees: 223
  allocmem: 480, freemem: 336, overhead: 168
  blocks: 1, blknodes: 34
Band size 32, element per block 26, nbuint 1
  Completely free blocks: 0
  Block alloced: 1, Block freed: 0
  allocs: 107, frees: 97
  allocmem: 320, freemem: 512, overhead: 136
  blocks: 1, blknodes: 26
Band size 40, element per block 22, nbuint 1
  Completely free blocks: 0
  Block alloced: 2, Block freed: 0
  allocs: 98, frees: 74
  allocmem: 960, freemem: 800, overhead: 240
  blocks: 2, blknodes: 44
Band size 48, element per block 18, nbuint 1
  Completely free blocks: 0
  Block alloced: 1, Block freed: 0
  allocs: 53, frees: 42
  allocmem: 528, freemem: 336, overhead: 104
  blocks: 1, blknodes: 18
Band size 56, element per block 16, nbuint 1
  Completely free blocks: 0
  Block alloced: 1, Block freed: 0
  allocs: 8, frees: 4
  allocmem: 224, freemem: 672, overhead: 96
  blocks: 1, blknodes: 16
Band size 64, element per block 14, nbuint 1
  Completely free blocks: 0
  Block alloced: 1, Block freed: 0
  allocs: 6, frees: 2
  allocmem: 256, freemem: 640, overhead: 88
  blocks: 1, blknodes: 14
Band size 72, element per block 12, nbuint 1
  Completely free blocks: 0
  Block alloced: 1, Block freed: 0
  allocs: 1, frees: 0
  allocmem: 72, freemem: 792, overhead: 80
  blocks: 1, blknodes: 12
```

Table 51: show memory heap summary Field Descriptions

Field	Description
Malloc summary for pid	System-defined process ID (pid).
Heapsize	Size of the heap as allocated from the system by the malloc library.
allocd	Bytes allocated to the process.
free	Bytes available in the heap.
overhead	Malloc library overhead in bytes.
mallocs	Number of malloc calls.
reallocs	Number of realloc calls.

Field	Description
frees	Number of invocations to the caller interface provided in the malloc library for deallocating the memory.
[core-allocs 1; core-frees 0]	Number of core memory units, the memory units in the malloc library allocated by the system for the heap, allocated and freed.
Band size	Small memory elements are arranged in bands. The band size specifies the size of elements within the band.
element per block	Number of elements per block in the band.
nbunit	Number of memory unit one block consists of. Any block in any band should be of a size that is an integer multiple of this basic unit.
Completely free blocks	Number of blocks in the band completely free (available for allocation).
Block alloced	Number of blocks currently allocated for the band.
allocs	Number of allocations currently performed from the band.
frees	Number of free calls that resulted in memory being returned to the band.
allocmem	Amount of memory currently allocated from the band.
overhead	Amount of memory in bytes as overhead for managing the band.
blocks	Number of blocks currently in the band.
blknodes	Number of nodes (elements) in all the blocks in the band.

show processes

To display information about active processes, use the **show processes** command in EXEC or administration EXEC mode.

show processes { *job-id process-name* | **aborts** | **all** | **blocked** | **boot** | **cpu** | **distribution** *process-name* | **dynamic** | **failover** | **family** | **files** | **location** *node-id* | **log** | **mandatory** | **memory** | **pidin** | **searchpath** | **signal** | **startup** | **threadname** } [**location** *node-id*] [**detail**] [**run**]

Syntax Description

job-id	Job identifier for which information for only the process instance associated with the *job-id* argument is displayed.
process-name	Process name for which all simultaneously running instances are displayed, if applicable.
aborts	Displays process abort information.
all	Displays summary process information for all processes.
blocked	Displays details about reply, send, and mutex blocked processes.
boot	Displays process boot information.
cpu	Displays CPU usage for each process.
distribution	Displays the distribution of processes.
dynamic	Displays process data for dynamically created processes.
failover	Displays process switchover information.
family	Displays the process session and family information.
files	Displays information about open files and open communication channels.
location *node-id*	Displays information about the active processes from a designated node. The *node-id* argument is entered in the *rack/slot* notation.
log	Displays process log.
mandatory	Displays process data for mandatory processes.
memory	Displays information about the text, data, and stack usage for processes.
pidin	Displays all processes using the QNX command.
searchpath	Displays the search path.
signal	Displays the signal options for blocked, pending, ignored, and queued signals.
startup	Displays process data for processes created at startup.
threadname	Displays thread names.

detail	(Optional) Displays more detail. This option is available only with the *process-name* argument.
run	(Optional) Displays information for only running processes. This option is available only with the *process-name* argument.

Command Default

None

Command Modes

Administration EXEC

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **show processes** command to display general information about the active processes. To display more detailed information for a process, specify a job ID or process for the *job-id* argument or *process-name* argument, respectively.

You can also use the **monitor processes** command to determine the top processes and threads based on CPU usage.

Task ID

Task ID	Operations
basic-services	read

The **show processes** command with the *process-name* argument displays detailed information about a process:

```
RP/0/RSP0/CPU0:router# show processes ospf

Tue Jul 28 09:23:17.212 DST
                  Job Id: 338
                     PID: 336152
         Executable path: /disk0/asr9k-rout-3.9.0.14I/bin/ospf
              Instance #: 1
              Version ID: 00.00.0000
                 Respawn: ON
           Respawn count: 1
  Max. spawns per minute: 12
            Last started: Tue Jul 14 15:26:26 2009
           Process state: Run
           Package state: Normal
       Started on config: cfg/gl/ipv4-ospf/proc/100/ord_z/config
                    core: MAINMEM
                Max. core: 0
                Placement: Placeable
             startup_path: /pkg/startup/ospf.startup
                   Ready: 1.312s
               Available: 1.334s
        Process cpu time: 93.382 user, 13.902 kernel, 107.284 total
JID   TID CPU Stack pri state        TimeInState    HR:MM:SS:MSEC   NAME
338     1   0  116K  10 Receive        0:00:00:0375    0:00:47:0139 ospf
```

```
338     2     0  116K  10 Receive         0:00:05:0734    0:00:00:0029 ospf
338     3     1  116K  10 Receive         0:00:06:0765    0:00:00:0056 ospf
338     4     1  116K  10 Receive         0:00:00:0096    0:00:00:0698 ospf
338     5     1  116K  10 Receive         0:49:33:0609    0:00:00:0129 ospf
338     6     1  116K  10 Sigwaitinfo   329:56:49:0531    0:00:00:0000 ospf
338     7     0  116K  10 Receive         0:00:00:0816    0:00:58:0676 ospf
338     8     1  116K  10 Receive         0:00:06:0765    0:00:00:0043 ospf
338     9     1  116K  10 Condvar        82:30:01:0311    0:00:00:0029 ospf
338     10    1  116K  10 Receive        82:30:05:0188    0:00:00:0478 ospf
338     11    0  116K  10 Receive       329:54:49:0318    0:00:00:0005 ospf
------------------------------------------------------------------------------
```

Table 52: show processes Field Descriptions

Field	Description
Job id	Job ID. This field remains constant over process restarts.
PID	Process ID. This field changes when process is restarted.
Executable path	Path for the process executable.
Instance	There may be more than one instance of a process running at a given time (each instance may have more than one thread).
Version ID	API version.
Respawn	ON or OFF. The field indicates if this process restarts automatically in case of failure.
Respawn count	Number of times this process has been started or restarted (that is, the first start makes this count 1).
Max. spawns per minute	Number of respawns not to be exceeded in 1 minute. If this number is exceeded, the process stops restarting.
Last started	Date and time the process was last started.
Process state	Current state of the process.
Started on config	Configuration command that started (or would start) this process.
core	Memory segments to include in core file.
Max. core	Number of times to dump a core file. 0 = infinity.

The **show processes** command with the **memory** keyword displays details of memory usage for a given process or for all processes, as shown in the following example:

```
Router# show processes memory

  JID    Text     Data     Stack    Dynamic  Process
  55     28672    4096     69632    17072128 eth_server
  317    167936   4096     45056    10526720 syslogd
  122    512000   4096     77824    9797632  bgp
  265    57344    4096     57344    5877760  parser_server
  254    40960    4096     143360   3084288  netio
```

```
  63     8192     4096     24576    2314240  nvram
  314    4096     4096     36864    1699840  sysdb_svr_local
  341    495616   4096     40960    1576960  wdsysmon
  259    53248    4096     28672    1490944  nvgen_server
  189    32768    4096     32768    1425408  hd_drv
  69     77824    4096     110592   1421312  qnet
  348    323584   4096     40960    1392640  ospf
  347    323584   4096     40960    1392640  ospf
  346    323584   4096     40960    1392640  ospf
  345    323584   4096     40960    1392640  ospf
  344    323584   4096     40960    1392640  ospf
  261    323584   4096     40960    1392640  ospf
   --More--
```

Table 53: show processes memory Field Descriptions

Field	Description
JID	Job ID.
Text	Size of text region (process executable).
Data	Size of data region (initialized and uninitialized variables).
Stack	Size of process stack.
Dynamic	Size of dynamically allocated memory.
Process	Process name.

The **show processes** command with the **all** keyword displays summary information for all processes, as shown in the following example:

```
Router# show processes all

  JID    LAST STARTED            STATE    RE-     PLACE-  MANDA-  MAINT- NAME(IID) ARGS
                                          START   MENT    TORY    MODE
  ------------------------------------------------------------------------------------
  82     03/16/2007 14:54:52.488 Run      1               M       Y      wd-mbi(1)
  58     03/16/2007 14:54:52.488 Run      1               M       Y      dllmgr(1)-r 60 -u
30
  74     03/16/2007 14:54:52.488 Run      1               M       Y      pkgfs(1)
  57     03/16/2007 14:54:52.488 Run      1                       Y      devc-conaux(1) -h
-d
                                                                         librs232.dll -m
                                                                         libconaux.dll -u
                                                                         libst16550.dll
  76     03/16/2007 14:54:52.488 Run      1                       Y      devc-pty(1) -n 32
  56     Not configured          None     0                       Y      clock_chip(1) -r
-b
   --More--
```

Table 54: show processes all Field Description

Field	Description
JID	Job ID.

Field	Description
Last Started	Date when the process was last started.
State	State of the process.
Restart	Number of times the process has restarted since the node was booted. If a node is reloaded, the restart count for all processes is reset. Normally, this value is 1, because usually processes do not restart. However, if you restart a process using the **process restart** command, the restart count for the process increases by one.
Placement	Indicates whether the process is a placeable process or not. Most processes are not placeable, so the value is blank. ISIS, OSPF, and BGP are examples of placeable processes.
Mandatory	M indicates that the process is mandatory. A mandatory process must be running. If a mandatory process cannot be started (for example, sysmgr starts it but it keeps crashing), after five attempts the sysmgr causes the node to reload in an attempt to correct the problem. A node cannot function properly if a mandatory process is not running.
Maint Mode	Indicates processes that should be running when a node is in maintenance mode. Maintenance mode is intended to run as few processes as possible to perform diagnostics on a card when a problem is suspected. However, even the diagnostics require some services running.
Name (IID)	Name of the process followed by the instance ID. A process can have multiple instances running, so the IID is the instance ID.
Args	Command-line arguments to the process.

Object Tracking Commands

This chapter describes the Cisco IOS XR software commands used to track objects. For information about how to use these commands to configure object tracking, see *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

action

To configure a track to implement actions based on changes in the state of the track, use the **action** command in the track configuration mode. To delete the configuration of action tracking, use the **no** form of this command.

action {**track-up** | **track-down**} **error-disable interface** *interface-name* [**auto-recover**]
no action {**track-up** | **track-down**} **error-disable interface** *interface-name* [**auto-recover**]

Syntax Description

track-up	Configures action on the track when the track goes up.
track-down	Configures action on the track when the track goes down.
error-disable	Disables the specified interface when the track state changes.
interface *interface name*	Name of the interface to be disabled.
auto-recover	(Optional) Allows the interface that is error-disabled by object tracking to auto-recover. Autorecovery of the interface occurs when the track state changes to the pre-error-disabled state.

Command Default

No default behavior or values

Command Modes

Track configuration (config track)

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use the **action** command, you must be in a user group that is associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to configure the **action** command:

```
Router# configure
Router(config)# track t1
Router(config-track)# type route reachability route ipv4 192.2.0.1/24
Router(config)# action track-down error-disable interface GigabitEthernet 0/0/0/1 auto-recover
```

delay

To configure the delay, in seconds, before the track or interface state should be polled for a change in status, use the **delay** command in track configuration mode. To delete the configuration of delay tracking, use the **no** form of this command.

delay {**up** | **down**} *seconds*
no delay {**up** | **down**} [*seconds*]

Syntax Description

delay up	*seconds*	Sets delay of from 1 to 180 seconds before communication of up status of the tracked object or list of objects.
delay down	*seconds*	Sets delay of from 1 to 180 seconds before communication of down status of the tracked object or list of objects.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **delay** command can be used in conjunction with all track types:

- type line-protocol state
- type list boolean
- type route reachability

When using the **no** form of the command, the use of the *seconds* argument is optional.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows that the tracking process is configured to notify the network administrator that the interface should be polled for its up state in five-second intervals:

```
RP/0/RP0/CPU0:router# configuration
RP/0/RP0/CPU0:router(config)# track name1
RP/0/RP0/CPU0:router(config-track)# delay up 5
```

interface (track)

To select an interface object type for tracking purposes, use the **interface** command in interface configuration mode. To delete the configuration of a track based on a particular interface object type, use the **no** form of this command.

interface *type interface-path-id*
no interface *type interface-path-id*

Syntax Description

type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To access the **interface** command, you must be in line protocol tracking configuration submode.

For information about interface keywords, see *Interface and Hardware Component Command Reference for Cisco NCS 5500 and NCS 540 and NCS 560 Series Routers*.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows the **interface** command in the context of object tracking:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
```

```
RP/0/RP0/CPU0:router(config-track-line-prot)# interface GigabitEthernet0/1
```

object

To configure an object for tracking, use the **object** command in list tracking configuration mode. To delete a previously configured track based on an object, use the **no** form of this command.

object *object-name* [**not**]
no object *object-name*

Syntax Description

object-name	Name of the object to be tracked.
not	(Optional) Deletes a preivously configured track based on whether an interface object is not up or down.

Command Default

No default behavior or values

Command Modes

List tracking configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To delete a previously configured track based on whether an interface object is *not* up or down, use the **not** keyword together with the **object** command in a list of tracked objects based on a Boolean expression.

The **object** command can be used only for a track based on a Boolean expression.

Task ID

Task ID	Operations
sysmgr	read, write

The following example shows how to configure an object, using the optional **not** keyword, in a tracked list of objects based on a Boolean calculation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track connection100
RP/0/RP0/CPU0:router(config-track-list)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object obj3 no
```

route ipv4

To configure that an IP prefix and subnet mask should be used as the basis to track route reachability, use the **route ipv4** command in route tracking configuration mode. To remove this configuration, use the **no** form of the command.

route ipv4 *IP prefix and subnet mask*
no route ipv4

Syntax Description

IP prefix and subnet mask	Network and subnet mask; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The *IP prefix* and *subnet mask* arguments are optional for the **no** form of this command.

Task ID

Task ID	Operations
sysmgr	read, write

The following example displays use of the **route ipv4** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 10.56.8.10/16
```

show track

To display information about objects that are tracked and to specify the format of the report, use the **show track** command in EXEC mode.

show track [*track-name* | **interface** | **ipv4 route**] [**brief**]

Syntax Description

track-name	(Optional) Name of track used for tracking objects; for example, track1.
brief	(Optional) Displays a single line of information related to the preceding argument or keyword.
interface	(Optional) Displays tracked interface objects.
ipv4 route	(Optional) Displays the tracked IPv4 route objects.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show track** command to display information about objects that are tracked by the tracking process. When no arguments or keywords are specified, information for all objects is displayed.

Task ID

Task ID	Operations
sysmgr	read

The following sample output illustrates use of the **show track** command:

```
RP/0/RP0/CPU0:router# show track

Track track3
        List boolean and is UP
        7 changes, last change 16:04:28 IST Mon Jul 02 2018
                object track2 UP
                object track1 UP
Track track1
        Interface GigabitEthernet0/0/0/1 line-protocol
        Line protocol is UP
        7 changes, last change 16:04:28 IST Mon Jul 02 2018
Track track2
        Interface GigabitEthernet0/1/0/1 line-protocol
        Line protocol is UP
```

```
7 changes, last change 16:02:41 IST Mon Jul 02 2018
```

threshold weight

To configure tracking threshold values based on weights, use the **threshold weight** command in track list threshold configuration mode. To remove a threshold weight, use the **no** form of the command.

threshold weight up *weight* [**down** *weight*]

Syntax Description

up	Maximum threshold value for the specific range beyond which a track is set to the DOWN state.
weight	Percentage limit to define the maximum threshold value.
down	Minimum threshold value for the specific range below which a track is set to the DOWN state.
weight	Percentage limit to define the minimum threshold value.

Command Default

None

Command Modes

Tack list threshold configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **threshold weight** command to specify the threshold value used to determine the state of a threshold-weighted list.

- A threshold-weighted list is set to the UP state when the cumulative sum of the weight of objects is between UP threshold value and DOWN threshold value.
- A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects is out of the range in a configuration.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to specify the weight thresholds for a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# threshold weight up 18 down 5
```

track

To initiate or identify a tracking process used to track the status of an object or list of objects, use the **track** command in global configuration mode. To remove the tracking process, use the **no** form of this command.

track *track-name*
no track *track-name*

Syntax Description

track *track-name*	Name of track used for tracking objects; for example, track1.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When you use the **track** command, you enter track configuration mode.

You can configure up to 1500 tracks. The Cisco IOS XR Software rejects configurations with more than 1500 tracks.

Task ID

Task ID	Operations
sysmgr	read, write

This example shows that the tracking process is configured to notify the network administrator about the up state of the tracked object list every five seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
RP/0/RP0/CPU0:router# track LIST2 delay up 5
```

type line-protocol state

To configure tracking of the line protocol state of an interface object, use the **type line-protocol** command in track configuration mode. To delete the configuration of line-protocol tracking, use the **no** form of this command.

type line-protocol state
no type line-protocol state

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **type line-protocol state** command can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

The **type line-protocol state** command enters line-protocol tracking configuration mode.

Task ID

Task ID	Operations
sysmgr	read, write

This example shows how to use the **type line-protocol state** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track12
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
```

type list boolean

To configure a tracked list of objects based on a Boolean calculation, use the **type list boolean** command in track configuration mode. To remove an object tracking list based on a Boolean calculation, use the **no** form of the command.

type list boolean {**and** | **or**}
no type list boolean {**and** | **or**}

Syntax Description

and	Specifies that the list is up if all objects are up, or down if one or more objects are down. For example, when tracking two interfaces, up means that both interfaces are up, and down means that either interface is down.
or	Specifies that the list is up if at least one object is up. For example, when tracking two interfaces, up means that either interface is up, and down means that both interfaces are down.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **type list boolean** command enters the list tracking configuration mode, and can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

To remove a track based on whether an interface object is *not* up or down, use the **not** keyword together with the **object** command as shown in the example that follows.

Task ID

Task ID	Operations
sysmgr	read, write

This example shows how to use the **type list boolean** command in creating a list of objects to be tracked:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track LIST2
RP/0/RP0/CPU0:router(config-track)# type list boolean and
RP/0/RP0/CPU0:router(config-track-list)# object IPSec1 not
RP/0/RP0/CPU0:router(config-track-list)# object IPSec2
```

```
RP/0/RP0/CPU0:router(config-track-list)# object PREFIX1
RP/0/RP0/CPU0:router(config-track-list)# exit
RP/0/RP0/CPU0:router(config)# track IPSec1
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface tengige 0/0/0/3
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config-track)# track IPSec2
RP/0/RP0/CPU0:router(config-track)# type line-protocol state
RP/0/RP0/CPU0:router(config-track-line-prot)# interface ATM0/2/0.1
RP/0/RP0/CPU0:router(config-track-line-prot)# exit
RP/0/RP0/CPU0:router(config)# track PREFIX1
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# route ipv4 7.0.0.0/24
RP/0/RP0/CPU0:router(config-track-route)# exit
RP/0/RP0/CPU0:router(config-track)# interface service-ipsec 1
RP/0/RP0/CPU0:router(config-if)# vrf 1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 70.0.0.2 255.255.255.0
RP/0/RP0/CPU0:router(config-if)# profile vrf_1_ipsec
RP/0/RP0/CPU0:router(config-if)# line-protocol track LIST2
RP/0/RP0/CPU0:router(config-if)# tunnel source 80.0.0.2
RP/0/RP0/CPU0:router(config-if)# tunnel destination 80.0.0.1
RP/0/RP0/CPU0:router(config-if)# service-location preferred-active 0/2/0
RP/0/RP0/CPU0:router(config-if)# commit
```

type list threshold percentage

To configure a tracked list of objects based on a percentage threshold, use the **type list threshold percentage** command in track configuration mode. To remove an object tracking list based on a percentage threshold, use the **no** form of the command.

type list threshold percentage

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **threshold percentage** command to specify the tracking threshold value used to determine the state of a percentage threshold-weighted list. A percentage threshold-weighted list is set to the UP state when the percentage of objects in the UP state is between UP threshold value to DOWN threshold value. A percentage threshold-weighted list is set to the DOWN state when the percentage of objects is out of the range in a configuration.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to add objects to a percentage threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track 4
RP/0/RP0/CPU0:router(config-track)# type list threshold percentage
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3
```

type list threshold weight

To configure a tracked list of objects based on a weight threshold, use the **type list threshold weight** command in track configuration mode. To remove an object tracking list based on a weight threshold, use the **no** form of the command.

type list threshold weight

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **threshold weight** command to specify the threshold value used to determine the state of a threshold-weighted list. When the cumulative sum of the weight of objects in the UP state is between UP threshold value to DOWN threshold value, the threshold-weighted list is set to the UP state. A threshold-weighted list is set to the DOWN state when the cumulative sum of the weight of objects in the UP state is out of the range in a configuration.

Use the **object** command to add tracked objects to the threshold-weighted list. A maximum of 200 track objects are allowed.

Task ID

Task ID	Operation
sysmgr	read, write

This example illustrates how to add objects to a threshold-weighted list:

```
RP/0/RP0/CPU0:router(config)# track t4
RP/0/RP0/CPU0:router(config-track)# type list threshold weight
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 1 weight 10
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 2 weight 5
RP/0/RP0/CPU0:router(config-track-list-threshold)# object 3 weight 3
```

type route reachability

To configure the routing process to notify the tracking process when the route state changes due to a routing update, use the **type route reachability** command in track configuration mode. To remove a track based on route reachability, use the **no** form of this command.

type route reachability
no type route reachability

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A tracked IP-route object is considered up and reachable when a routing-table entry exists for the route and the route is not inaccessible.

The **type route reachability** command can be used in conjunction with the **delay** command to configure the delay, in seconds, before the track or interface state should be polled for a change in its status.

The route reachability tracking process is based on either of the following, depending on your router type:

- **vrf**—A VRF table name.
- **route**—An IPv4 prefix consisting of the network and subnet mask (for example, 10.56.8.10/16).

Task ID

Task ID	Operations
sysmgr	read, write

This example shows how to track for route reachability:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
```

type rtr

To configure the router to track the return code of IP service level agreement (SLA) operations, use the **type rtr** command in track configuration mode. To remove a track based on IP SLA return code, use the **no** form of this command.

type rtr *ipsla-no* **reachability**
no type rtr

Syntax Description

ipsla-no	IP SLA operation number. Values can range from 1 to 2048.
reachability	Tracks whether the route is reachable or not.

Command Default

None

Command Modes

Track configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **type rtr** command in conjunction with a configuration that uses:

- The

  track keyword in the **permit** command within an ACL definition. For example:

```
ipv4 access-list abf-track
  10 permit any any nexthop track track1 1.2.3.4
```

- An IP service level agreement configuration.

Task ID

Task ID	Operation
sysmgr	read, write

This example shows how to configure IPSLA object tracking:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type rtr 1 reachability
```

vrf (track)

To configure a VRF table to be used as the basis to track route reachability, use the **vrf** command in route tracking configuration mode. To delete the configuration of a VRF table for the purpose of IP route tracking purposes, use the **no** form of the command.

vrf *vrf-table-name*
no vrf [*vrf-table-name*]

Syntax Description

vrf-table-name	Network and subnet; for example, 10.56.8.10/16.

Command Default

No default behavior or values

Command Modes

Route tracking configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read, write

The following example displays the use of the **vrf** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# track track22
RP/0/RP0/CPU0:router(config-track)# type route reachability
RP/0/RP0/CPU0:router(config-track-route)# vrf vrf1
```

Network Time Protocol (NTP) Commands

This chapter describes the Cisco IOS XR Network Time Protocol (NTP) commands used to perform basic network time management tasks, including synchronizing time settings and coordinating time distribution over the network.

When an NTP server or client is configured, NTP features are available on all router interfaces. NTP features can be disabled for any specified interface, local or remote, to the route processor (RP).

For detailed information about NTP concepts, configuration tasks, and examples, see the *Implementing NTP on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

ntp passive

To configure passive Network Time Protocol (NTP) associations, use the **ntp passive** command in global configuration mode. To disable the passive NTP associations, use the **no** form of this command.

ntp passive
no ntp passive

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP associations are configured by default.

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to configure the 'passive' peer mode of NTP. Peer mode configurations can be ‘symmetric active’ or ‘symmetric passive’ mode as per NTP RFC standard 5905. In the symmetric variant, a peer operates as both a server and client using either a symmetric active or symmetric passive association.

The passive mode is created when a message is received from a peer operating in the symmetric active mode and persists only as long as the peer is reachable and operating at a stratum level less than or equal to the host. Otherwise, the association is dissolved.

Task ID

Task ID	Operations
Ip-services	read, write

The following example shows how to configure the NTP passive mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ntp passive
```

access-group (NTP)

To control access to Network Time Protocol (NTP) services for an IPv4 or IPv6 access list, use the **access-group** command in one of the NTP configuration modes. To remove the **access-group** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

access-group [**vrf** *vrf-name*] [**ipv4** | **ipv6**] {**peer** | **query-only** | **serve** | **serve-only**} *access-list-name*
no access-group [**vrf** *vrf-name*] [**ipv4** | **ipv6**] {**peer** | **query-only** | **serve** | **serve-only**}

Syntax Description

vrf *vrf-name*	(Optional) Applies the access control configuration to a specified nondefault VRF. If not specified, the configuration is applied to the default VRF.
ipv4	(Optional) Specifies an IPv4 access list (default).
ipv6	(Optional) Specifies an IPv6 access list.
peer	Allows time requests and NTP control queries and allows a networking device to synchronize to the remote system.
query-only	Allows only NTP control queries. Cisco IOS XR software uses NTP Version 4, but the RFC for Version 3 (RFC 1305: *Network Time Protocol (Version 3)—Specification, Implementation and Analysis*) still applies.
serve	Allows time requests and NTP control queries, but does not allow the networking device to synchronize to the remote system.
serve-only	Allows only time requests.
access-list-name	Name of an IPv4 or IPv6 access list.

Command Default

No NTP access control is configured.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The access group options are scanned in the following order from least restrictive to most restrictive:

1. **peer**—Allows time requests and NTP control queries and allows the router to synchronize itself to a system whose address passes the access list criteria.

2. **serve**—Allows time requests and NTP control queries, but does not allow the router to synchronize itself to a system whose address passes the access list criteria.
3. **serve-only**—Allows only time requests from a system whose address passes the access list criteria.
4. **query-only**—Allows only NTP control queries from a system whose address passes the access list criteria.

Access is granted for the first match that is found. If no access groups are specified, all access is granted to all sources. If any access groups are specified, only the specified access is granted. This facility provides minimal security for the time services of the system. However, it can be circumvented by a determined programmer. If tighter security is desired, use the NTP authentication facility.

If you use the **access-group** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to allow itself to be synchronized by a peer from an IPv4 access list named access1 and to restrict access to allow only time requests from an IPv4 access list named access2:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group peer access1
RP/0/RP0/CPU0:router(config-ntp)# access-group serve-only access2
```

The following example shows how to configure the router to allow itself to be synchronized by peers from the IPv6 access list named access20 that route through the vrf10 VRF:

```
RP/0/RP0/CPU0:router(config-ntp)# access-group vrf vrf10 ipv6 peer access20
```

Related Commands

Command	Description
ipv4 access-list	Defines an IPv4 access list by name.
ipv6 access-list	Defines an IPv6 access list by name.
vrf	Configures a VRF instance for a routing protocol.

authenticate (NTP)

To enable Network Time Protocol (NTP) authentication, use the **authenticate** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authenticate
no authenticate

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP authentication is configured.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **authenticate** command to prevent the system from synchronizing with unauthenticated and unconfigured network peers.

If the **authenticate** command is specified, and when a symmetric active, broadcast, or multicast NTP packet is received, the system will not synchronize to the peer unless the packet carries one of the authentication keys specified in the **trusted-key** command.

You must enable **authenticate** when enabling **broadcast client** or **multicast client** command in NTP configuration mode unless you have other measures (such as using the **access-group** command in NTP configuration mode) to prevent unauthorized hosts from communicating with the NTP service on the device.

The **authenticate** command does not ensure authentication of peer associations that are created using the **server** and **peer** commands in NTP configuration mode. When creating associations using the **server** and **peer** commands in NTP configuration mode, specify the **key** keyword to ensure the authentication of packets that move to and from the remote peer.

Use the **no authenticate** command to allow synchronizing with unauthenticated and unconfigured network peers.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to a system that provides an authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
```

```
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

authentication-key (NTP)

To define an authentication key for a trusted Network Time Protocol (NTP) time source, use the **authentication-key** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

authentication-key *key-number* **md5** [**clear** | **encrypted**] *key-name*
no authentication-key *key-number*

Syntax Description

key-number	Authentication key. A number in the range from 1 to 65535.
md5	Provides message authentication support using the Message Digest 5 (MD5) algorithm.
clear	(Optional) Specifies that the key value entered after this keyword is unencrypted.
encrypted	(Optional) Specifies that the key value entered after this keyword is encrypted.
key-name	Key value. The maximum length is 32 characters.

Command Default

No authentication key is defined for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **authentication-key** command to define authentication keys for use with trusted NTP time sources.

Note When this command is written to NVRAM, the key is encrypted so that it is not displayed when the configuration is displayed.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in their NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
```

```
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

broadcast

To create a Network Time Protocol (NTP) broadcast server on a specified NTP interface, use the **broadcast** command in NTP interface configuration mode. To remove the command from the configuration file and restore the system to its default condition, use the **no** form of this command.

broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]
no broadcast [**destination** *ip-address*] [**key** *key-id*] [**version** *number*]

Syntax Description

destination *ip-address*	(Optional) Specifies the host IPv4 address.
key *key-id*	(Optional) Defines the authentication key, where *key-id* is the authentication key to use when sending packets to this peer. The key identified by the *key-id* value is also used for packets received from the peer.
version *number*	(Optional) Specifies a number from 1 to 4, indicating the NTP version.

Command Default

No NTP broadcast servers are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast** command to create an NTP broadcast server on an NTP interface to send NTP broadcast packets.

Use the **broadcast client** command to set a specific interface to receive NTP broadcast packets.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets to destination host IP address 10.0.0.0:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast destination 10.0.0.0
```

broadcast client

To allow a networking device to receive Network Time Protocol (NTP) broadcast packets on an interface, use the **broadcast client** command in NTP interface configuration mode. To remove the configuration and restore the system to its default condition, use the **no** form of this command.

broadcast client
no broadcast client

Syntax Description

This command has no keywords or arguments.

Command Default

No NTP broadcast clients are configured.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcast client** command to configure and create an NTP broadcast client and to associate the client with an interface to receive and handle NTP broadcast packets. If no NTP client has been created for an interface, the received NTP broadcast packets are dropped. Use this command to allow the system to listen to broadcast packets on an interface-by-interface basis.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure interface 0/0/0/1 to send NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp interface tengige 0/0/0/1
RP/0/RP0/CPU0:router(config-ntp-int)# broadcast client
```

broadcastdelay

To set the estimated round-trip delay between a Network Time Protocol (NTP) client and an NTP broadcast server, use the **broadcastdelay** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

broadcastdelay *microseconds*
no broadcastdelay *microseconds*

Syntax Description

microseconds	Estimated round-trip time for NTP broadcasts, in microseconds. The range is from 1 to 999999. The default is 3000.

Command Default

microseconds: 3000

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **broadcastdelay** command to change the default round-trip delay time on a networking device that is configured as a broadcast client.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the estimated round-trip delay between a networking device and the broadcast client to 5000 microseconds:

```
RP/0/RP0/CPU0:router(config-ntp)# broadcastdelay 5000
```

interface (NTP)

To enter a Network Time Protocol (NTP) interface mode and run NTP interface configuration commands, use the **interface** command in one of the NTP configuration modes. To remove an NTP interface configuration, use the **no** form of this command.

interface *type interface-path-id* [**vrf** *vrf-name*] [**disable**]
no interface *type interface-path-id* [**disable**]

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
vrf *vrf-name*	(Optional) Applies the interface configuration to a specific nondefault VRF.
disable	(Optional) Disables NTP on the specified interface.

Command Default

No NTP interfaces are configured.

Command Modes

NTP configuration mode

VRF-specific NTP configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **interface** command to place the router in NTP interface configuration mode, from which NTP broadcast and multicast servers and clients can be configured. By default, after the NTP process is started, NTP features become available for all interfaces. To exit NTP interface configuration mode, use the **exit** command.

If you use the **interface** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

By default, NTP is enabled on every interface. To disable NTP on a specific interface, use the **interface** command with the **disable** keyword. To reenable NTP on an interface, use the **no** form of the **interface** command with the **disable** keyword.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# interface TenGiGE 0/1/1/0 vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-int)#
```

The following example shows a different way to enter a VRF-specific NTP interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf_10
RP/0/RP0/CPU0:router(config-ntp-vrf)# interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)#
```

master (NTP)

To configure the router to use its own Network Time Protocol (NTP) master clock to synchronize with peers when an external NTP source becomes unavailable, use the **master** command in NTP configuration mode. To restore the system to its default condition, use the **no** form of this command.

master [*stratum*]
no master [*stratum*]

Syntax Description

stratum	(Optional) NTP stratum number that the system claims. Range is from 1 to 15. The default is 8.

Command Default

By default, the master clock function is disabled. When the function is enabled, the default stratum is 8.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP uses the concept of a "stratum" to describe how many NTP "hops" away a machine is from an authoritative time source. A stratum 1 time server has a radio or atomic clock attached directly. A stratum 2 time server receives its time through NTP from a stratum 1 time server, a stratum 3 from a stratum 2, and so on.

Caution Use the **master** command with extreme caution. It is easy to override other valid time sources using this command, especially if a low-stratum number is configured. Configuring multiple machines in the same network with the **master** command can lead to instability in time-keeping if the machines do not agree on the time.

The networking device is normally synchronized, directly or indirectly, with an external system that has a clock. Cisco IOS XR software does not support directly attached radio or atomic clocks. The **master** command should be used only when there is a temporary disruption in a reliable time service. It should not be employed as an alternative source by itself in the absence of a real-time service.

If the system has the **master** command configured and it cannot reach any clock that has a lower stratum number, the system claims to be synchronized at the configured stratum number. Other systems synchronize with it through NTP.

Note The system clock must have been manually set from some source before the **master** command has an effect. This precaution protects against the distribution of erroneous time after the system is restarted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device as an NTP master clock to which peers may synchronize:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# master 9
```

master primary-reference-clock

To configure the router to use PTP and external timing sources, such as such as PTP grandmaster, Data over Cable Service Interface Specification (DOCSIS) Timing Interface [DTI] or global positioning system (GPS) clock, as the time-of-day source for NTP and operating system time, use the **master primary-reference-clock** command in NTP configuration mode. To remove the PTP configuration, use the **no** form of this command.

master primary-reference-clock
no master primary-reference-clock

Syntax Description

This command has no keywords or arguments.

Command Default

PTP is not used as the time-of-day source for NTP.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

PTP must be enabled on the router before this command can be used. If PTP is not enabled, you receive an error message similar to the following when you try to commit the configuration:

```
RP/0/RP0/CPU0:router(config)# ntp master primary-reference-clock
RP/0/RP0/CPU0:router(config)# commit

% Failed to commit one or more configuration items. Please issue
'show configuration failed' from this session to view the errors

RP/0/RP0/CPU0:router(config)# show configuration failed
[:::]
ntp
 master primary-reference-clock
!!% 'ip-ntp' detected the 'fatal' condition 'PTP is not supported on this platform'
!
end
```

To verify that PTP is used as the reference clock, use the **show ntp association** command.

```
RP/0/RP0/CPU0:router# show ntp association

  address           ref clock        st   when  poll reach  delay  offset  disp
*~127.127.45.1     .PTP.            0    54    64   377    0.00   6.533   1.905

* sys_peer, # selected, + candidate, - outlayer, x falseticker, ~ configured
```

Task ID

Task ID	Operation
ip-services	read, write

This example shows how to configure PTP as the reference clock for NTP:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# master primary-reference-clock
```

max-associations

To set the maximum number of Network Time Protocol (NTP) associations, use the **max-associations** command in NTP configuration mode. To restore the default setting, use the **no** form of this command.

max-associations *number*
no max-associations *number*

Syntax Description

number	Maximum number of NTP associations. Range is from 0 to 4294967295. The default is 100.

Command Default

The default setting for the maximum number of NTP associations is 100.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **max-associations** command to specify the maximum number of associations for an NTP server.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to set the maximum number of associations to 200:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# max-associations 200
```

multicast client

To configure an NTP interface as an NTP multicast client, use the **multicast client** command in NTP interface configuration mode. To remove the NTP multicast client configuration from an interface, use the **no** form of this command.

multicast client [*ip-address*]
no multicast client [*ip-address*]

Syntax Description

ip-address	IPv4 or IPv6 IP address of the multicast group to join. The default is the IPv4 address 224.0.1.1.

Command Default

The interface is not configured as an NTP multicast client.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **multicast client** command to configure an NTP interface to receive multicast packets that are sent to an IPv4 or IPv6 multicast group IP address. If you do not specify an IP address, the interface is configured to receive multicast packets sent to the IPv4 multicast group address 224.0.1.1. You can configure multiple multicast groups on the same interface.

To prevent synchronization with unauthorized systems, whenever this command is specified, authentication must be enabled using the **authenticate (NTP)** command or access must be restricted to authorized systems using the **access-group (NTP)** command. See the documentation of the respective commands for more information.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to receive NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast client
```

multicast destination

To configure an NTP interface as an NTP multicast server, use the **multicast destination** command in NTP interface configuration mode. To remove the NTP multicast server configuration from an interface, use the **no** form of this command.

multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]
no multicast destination *ip-address* [**key** *key-id*] [**ttl** *ttl*] [**version** *number*]

Syntax Description

ip-address	The IPv4 or IPv6 multicast group IP address to which to send NTP multicast packets.
key *key-id*	(Optional) Specifies an authentication key, where the value of the *key-id* argument is the authentication key to use when sending multicast packets to the specified multicast group.
ttl *ttl*	(Optional) Specifies the time to live (TTL) of a multicast packet.
version *number*	(Optional) Specifies the NTP version number.

Command Default

The interface is not configured as an NTP multicast server.

Command Modes

NTP interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the router to send NTP multicast packets to the multicast group address of 224.0.1.1:

```
RP/0/RP0/CPU0:router(config)# ntp interface TenGigE 0/1/1/0
RP/0/RP0/CPU0:router(config-ntp-int)# multicast destination 224.0.1.1
```

ntp

To enter Network Time Protocol (NTP) configuration mode and run NTP configuration commands, use the **ntp** command in global configuration mode.

ntp [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Enters a VRF-specific NTP configuration mode.

Command Default

No defaults behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

NTP configuration commands can also be run from global configuration mode by preceding the command string with the **ntp** keyword. From NTP configuration mode, the following NTP configuration commands are available:

```
RP/0/RP0/CPU0:router(config-ntp)# ?

    access-group        Control NTP access
    authenticate        Authenticate time sources
    authentication-key  Authentication key for trusted time sources
    broadcastdelay      Estimated round-trip delay
    commit              Commit the configuration changes to running
    default             Set a command to its defaults
    describe            Describe a command without taking real actions
    do                  Run an exec command
    exit                Exit from this submode
    interface           Configure NTP on an interface
    master              Act as NTP master clock
    max-associations    Set maximum number of associations
    no                  Negate a command or set its defaults
    peer                Configure NTP peer
    port                Enable NTP port
    server              Configure NTP server
    show                Show contents of configuration
    source              Configure interface for source address
    trusted-key         Key numbers for trusted time sources
    update-calendar     Periodically update calendar with NTP time
```

Use the **ntp** command with the **vrf** *vrf-name* keyword and argument to enter an NTP configuration mode specific to the specified VRF.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to enter NTP configuration mode:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)#
```

The following example shows how to enter an NTP configuration mode for a VRF called VRF1:

```
RP/0/RP0/CPU0:router(config)# ntp vrf vrf1
RP/0/RP0/CPU0:router(config-ntp-vrf)#
```

ntp clear

To clear all Network Time Protocol (NTP) peers or a specific NTP peer, use the **ntp clear** command in EXEC mode.

ntp clear {*peer* | **all** | **vrf** *vrf-name ip-address*}

Syntax Description

peer	IPv4 address or hostname of the NTP peer to be cleared.
all	Clears all NTP peers.
vrf *vrf-name*	Clears a peer on the specified nondefault VRF.
ip-address	IPv4 or IPv6 IP address of the peer.

Command Default

No defaults behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to clear all NTP peers:

```
RP/0/RP0/CPU0:router# ntp clear all
```

ntp reset drift

To reset the NTP drift and loopfilter state, use the **ntp reset drift** command in EXEC mode.

ntp reset drift

Syntax Description

This command has no keywords or arguments.

Command Default

No defaults behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **ntp reset drift** command to set the loopfilter state to NSET (never set) and reset the drift. Resetting the loopfilter state and drift enables the router to relearn the frequency of the NTP server clock. This is necessary if there is a synchronization error caused by a large frequency error. This can arise, for example, if the router switches from synchronizing with one NTP server to synchronizing with another NTP server with a different frequency.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to reset the NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# ntp reset drift

Thu Nov 13 11:21:04.381 JST
```

The following example shows NTP status before and after resetting NTP drift and loopfilter state:

```
RP/0/RP0/CPU0:router# show ntp status

Thu Nov 13 11:20:53.122 JST

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.2787 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
clock offset is -3.172 msec, root delay is 189.289 msec
root dispersion is 70.03 msec, peer dispersion is 0.11 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0002785891 s/s
system poll interval is 128, last update was 199 sec ago
```

```
RP/0/RP0/CPU0:router# ntp reset drift
Thu Nov 13 11:21:04.381 JST

RP/0/RP0/CPU0:router# show ntp status
Thu Nov 13 11:21:10.595 JST

Clock is unsynchronized, stratum 16, no reference clock
nominal freq is 1000.0000 Hz, actual freq is 1000.0000 Hz, precision is 2**24
reference time is CCC60CBE.9F836478 (11:17:34.623 JST Thu Nov 13 2008)
clock offset is -3.172 msec, root delay is 0.000 msec
root dispersion is 0.09 msec, peer dispersion is 0.00 msec
loopfilter state is 'NSET' (Never set), drift is 0.0000000000 s/s
system poll interval is 64, last update was 216 sec ago
```

show ntp associations

To display the status of Network Time Protocol (NTP) associations, use the **show ntp associations** command in privileged EXEC System Admin EXEC mode.

show ntp associations [**detail**] [**location** *node-id*]

Syntax Description

detail	(Optional) Displays detailed information about each NTP association.
location *node-id*	(Optional) Displays the status of NTP associations from the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

None

Command Modes

EXEC

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Output for the **show ntp associations** command is displayed only if NTP is configured on the router.

Task ID

Task ID	Operations
ip-services	read

This example shows sample output from the **show ntp associations** command:

```
Router# show ntp associations

Wed Jul 30 04:03:13.471 PST DST

     address         ref clock     st  when  poll reach  delay  offset    disp
~172.19.69.1      172.24.114.33     3    25    64    3    2.89  57550122  39377
~2001:db8::feed   .INIT.           16     -    64    0    0.00   0.000   15937
~2001:db8::beef vrf vrf_1
                  .INIT.           16     -    64    0    0.00   0.000   16000
* sys_peer, # selected, + candidate, - outlayer, x falseticker, ~ configured
```

Table 55: show ntp associations Field Descriptions

Field	Description
*	Peer has been declared the system peer and lends its variables to the system variables.
#	Peer is a survivor, but not among the first six peers sorted by synchronization distance. If the association is ephemeral, it may be demobilized to conserve resources.
+	Peer is a survivor and a candidate for the combining algorithm.
-	Peer is discarded by the clustering algorithm as an outlier.
x	Peer is discarded by the intersection algorithm as a falseticker.
~	Indicates peer is statically configured.
address	IPv4 or IPv6 address of the peer. If a nondefault VRF is configured for the peer, the VRF follows the address.
ref clock	Reference clock type or address for the peer.
st	Stratum setting for the peer.
when	Time since last NTP packet was received from peer, in milliseconds.
poll	Polling interval, in seconds.
reach	Peer reachability (bit string, in octal).
delay	Round-trip delay to peer, in milliseconds.
offset	Relative time difference between a peer clock and a local clock, in milliseconds.
disp	Dispersion.

This example shows sample output from the **show ntp associations** command with the **detail** keyword:

```
Router# show ntp associations detail

172.19.69.1 configured, our_master, sane, valid, stratum 2
ref ID 171.68.10.150, time C4143AAE.00FCF396 (18:27:58.003 UTC Tue Mar 30 2004)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 5.23 msec, root disp 4.07, reach 3, sync dist 0.0077
delay 1.9829 msec, offset -3.7899 msec, dispersion 0.0358
precision 2**18, version 4
org time C4143B8D.7EBD5FEF (18:31:41.495 UTC Tue Mar 30 2004)
rcv time C4143B8D.801DFA44 (18:31:41.500 UTC Tue Mar 30 2004)
xmt time C4143B8D.7F595E44 (18:31:41.497 UTC Tue Mar 30 2004)
filtdelay =     2.99    1.98    1.98    1.99    1.99    1.99    2.98    1.98
filtoffset =   -3.89   -3.74   -3.78   -3.81   -3.76   -3.73   -4.08   -3.64
filterror =     0.00    0.02    0.03    0.05    0.06    0.08    0.09    0.32

2001:0DB8::FEED vrf xxx configured, candidate, sane, valid, stratum 2
ref ID 64.103.34.14, time CB0C8C66.38285D84 (14:00:22.219 JST Fri Dec 14 2007)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 181.17 msec, root disp 3.19, reach 377, sync dist 0.1463
```

```
delay 104.9158 msec, offset -15.4552 msec, dispersion 0.0439
precision 2**16, version 4
org time CB0C8D0A.70282853 (14:03:06.438 JST Fri Dec 14 2007)
rcv time CB0C8D0A.81CA0E2B (14:03:06.506 JST Fri Dec 14 2007)
xmt time CB0C8D0A.66AAB677 (14:03:06.401 JST Fri Dec 14 2007)
filtdelay =   105.90  104.92  104.91  104.91  105.90  105.85  105.90  104.91
filtoffset =  -15.92  -15.67  -15.54  -15.59  -15.58  -15.54  -15.41  -14.36
filterror =     0.02    0.03    0.05    0.06    0.08    0.09    0.11    1.05

2001:0DB8::BEEF vrf yyy configured, our_master, sane, valid, stratum 2
ref ID 64.104.193.12, time CB0C8CC1.2C14CED1 (14:01:53.172 JST Fri Dec 14 2007)
our mode client, peer mode server, our poll intvl 64, peer poll intvl 64
root delay 160.83 msec, root disp 4.35, reach 377, sync dist 0.1372
delay 104.9302 msec, offset -14.6327 msec, dispersion 0.0183
precision 2**18, version 4
org time CB0C8CCB.684619D8 (14:02:03.407 JST Fri Dec 14 2007)
rcv time CB0C8CCB.79782B09 (14:02:03.474 JST Fri Dec 14 2007)
xmt time CB0C8CCB.5E9A5429 (14:02:03.369 JST Fri Dec 14 2007)
filtdelay =   104.93  104.93  104.93  104.93  104.93  104.93  104.93  104.93
filtoffset =  -14.71  -14.53  -14.78  -14.73  -14.70  -14.52  -14.59  -14.50
filterror =     0.00    0.02    0.03    0.05    0.06    0.08    0.09    0.11
```

Table 56: show ntp associations detail Field Descriptions

Field	Descriptions
vrf	Nondefault VRF, if specified for this peer.
configured	Statically configured peer.
dynamic	Dynamically discovered peer.
our_master	Synchronization of the local machine to this peer.
sane	Passing of basic sanity checks by this peer.
ref ID	Address of machine to which the peer is synchronized.
time	Last time stamp that the peer received from its master.
our mode	`Mode relative to peer (active/passive/client/server/bdcast/bdcast client).`
peer mode	Mode of peer relative.
our poll intvl	Poll interval to peer.
peer poll intvl	Poll interval of interval.
root delay	Delay along path to root (ultimate stratum 1 time source).
root disp	Dispersion of path to root.
reach	Peer reachability (bit string in octal).
sync dist	Peer synchronization distance.

Field	Descriptions
delay	Round-trip delay to peer.
offset	Offset of peer clock relative to this clock.
dispersion	Dispersion of peer clock.
precision	Precision of peer clock in (Hertz) Hz.
version	NTP version number that peer is using.
org time	Originate time stamp.
rcv time	Receive time stamp.
xmt time	Transmit time stamp.
filtdelay	Round-trip delay of each sample, in milliseconds.
filtoffset	Clock offset of each sample, in milliseconds.
filterror	Approximate error of each sample.

peer (NTP)

To configure the system clock to synchronize a peer or to be synchronized by a peer, use the **peer** command in one of the NTP configuration modes. To remove the **peer** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

peer [**vrf** *vrf-name*] [**ipv4** | **ipv6**] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*] [**prefer**] [**burst**] [**iburst**]
no peer [**vrf** *vrf-name*] [**ipv4** | **ipv6**] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the peer configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the peer providing or being provided with the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. The authentication key is also used for packets received from the peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred peer that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default No peers are configured by default.

Command Modes NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **peer** command to allow this machine to synchronize with the peer, or conversely.

Caution Although using the **prefer** keyword can help reduce the switching among peers, you should avoid using the keyword because it interferes with the source selection mechanism of NTP and can result in a degradation in performance.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

To provide peer-level service (as opposed to client/server-level service), it may be necessary to explicitly specify the NTP version for the peer if it is not version 4.

If you use the **peer** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a networking device to allow its system clock to be synchronized with the clock of the peer (or conversely) at IP address 10.0.0.0 using NTP. The source IP address is the address of interface 0/0/0/1.

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# peer 10.0.0.0 minpoll 8 maxpoll 12 source tengige 0/0/0/1
```

server (NTP)

To allow the system clock to be synchronized by a time server, use the **server** command in one of the NTP configuration modes. To remove the **server** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

server [**vrf** *vrf-name*][**ipv4** | **ipv6**] *ip-address* [**version** *number*] [**key** *key-id*] [**minpoll** *interval*] [**maxpoll** *interval*] [**source** *type interface-path-id*][**prefer**] [**burst**] [**iburst**]
no server [**vrf** *vrf-name*] [**ipv4** | **ipv6**] *ip-address*

Syntax Description

vrf *vrf-name*	(Optional) Applies the server configuration to the specified nondefault VRF.
ipv4	(Optional) Specifies an IPv4 IP address.
ipv6	(Optional) Specifies an IPv6 IP address.
ip-address	IPv4 or IPv6 address of the time server providing the clock synchronization.
version *number*	(Optional) Defines the Network Time Protocol (NTP) version number, where the *number* argument is a value from 1 to 4. The default is 4.
key *key-id*	(Optional) Defines the authentication key, where the *key-id* argument is the authentication key to use when packets are sent to this peer. By default, no authentication key is used.
minpoll *interval*	(Optional) Defines the shortest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 6.
maxpoll *interval*	(Optional) Defines the longest polling interval, where the *interval* argument is specified in powers of two seconds. Range is from 4 to 17. The default value is 10.
source	(Optional) Specifies the IP source address. The default is the outgoing interface.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
prefer	(Optional) Makes this peer the preferred server that provides synchronization.
burst	(Optional) Sends a series of packets instead of a single packet within each synchronization interval to achieve faster synchronization.
iburst	(Optional) Sends a series of packets instead of a single packet within the initial synchronization interval to achieve faster initial synchronization.

Command Default

No servers are configured by default.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The value for the **minpoll** keyword must be less than or equal to the value for the **maxpoll** keyword. If this is not the case, the system issues an error message.

Using the **prefer** keyword reduces switching back and forth among servers.

If you use the **server** command in a VRF-specific NTP configuration mode, the command is applied to the specific VRF. If you are not in a VRF-specific NTP configuration mode, the command is applied to the default VRF unless you use the **vrf** *vrf-name* keyword and argument to specify a VRF.

Note To change the configuration of a specific IP address from peer to server or from server to peer, use the **no** form of the **peer** or **server** command to remove the current configuration before you perform the new configuration. If you do not remove the old configuration before performing the new configuration, the new configuration does not overwrite the old configuration.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure a router to allow its system clock to be synchronized with the clock of the peer at IP address 209.165.201.1 using NTP:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# server 209.165.201.1 minpoll 8 maxpoll 12
```

show calendar

To display the system time and date, use the **show calendar** command in the EXEC System Admin EXEC.

show calendar

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The time format of the **show calendar** output depends on the time format set using the **clock timezone** command.

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show calendar** command:

```
Router# show calendar

01:29:28 UTC Thu Apr 01 2004
```

show ntp status

To display the status of Network Time Protocol (NTP), use the **show ntp status** command in EXEC mode.

show ntp status [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays the status of NTP from the designated node. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

No defaults behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ip-services	read

This example shows sample output from the **show ntp status** command:

```
RP/0/RP0/CPU0:router# show ntp status

Clock is synchronized, stratum 3, reference is 192.168.128.5
nominal freq is 1000.0000 Hz, actual freq is 1000.0021 Hz, precision is 2**24
reference time is CC38EC6A.8FCCA1C4 (10:10:02.561 JST Tue Jul 29 2008)
clock offset is -124.051 msec, root delay is 174.060 msec
root dispersion is 172.37 msec, peer dispersion is 0.10 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is -0.0000021106 s/s
system poll interval is 32, last update was 19 sec ago
```

Table 57: show ntp status Field Descriptions

Field	Description
synchronized	Synchronized system to an NTP peer.
stratum	NTP stratum of this system.
reference	IPv4 address or first 32 bits of the MD5 hash of the IPv6 address of the peer to which clock is synchronized.
vrf	VRF through which the peer routes.

Field	Description
nominal freq	Nominal frequency in Hertz (Hz) of the system hardware clock.
actual freq	Measured frequency in Hz of the system hardware clock.
precision	Precision of the clock of this system in Hz.
reference time	Reference time stamp.
clock offset	Offset of clock to synchronized peer, in milliseconds.
root delay	Total delay along path to root clock, in milliseconds.
root dispersion	Dispersion of root path.
peer dispersion	Dispersion of synchronized peer.
loopfilter state	The state of the clock state machine transition function.
drift	Drift of the hardware clock.
system poll interval	Poll interval of the peer.
last update	Time the router last updated its NTP information.

source (NTP)

To use a particular source address in Network Time Protocol (NTP) packets, use the **source** command in one of the NTP configuration modes. To remove the **source** command from the configuration file and restore the system to its default condition, use the **no** form of this command.

source [**vrf** *vrf-name*] *type interface-path-id*
no source

Syntax Description

vrf *vrf-name*	(Optional) Applies the source address configuration to the specified nondefault VRF.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	(Optional) Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

The source address is determined by the outgoing interface.

Command Modes

NTP configuration

VRF-specific NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **source** command to use a particular source IP address for all NTP packets. The address is taken from the named interface. This command is useful if the address on an interface cannot be used as the destination for reply packets. If the **source** keyword has been configured with the **server** (NTP) or **peer** (NTP) command, that value overrides the global value.

Use the **source** command in a VRF-specific NTP configuration mode or use the **vrf** *vrf-name* keyword and argument to configure the source address for a specific nondefault VRF. Otherwise, the configuration is applied to the default VRF.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to use the IP address of interface 0/0/0/1 as the source address of all outgoing NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# source tengige 0/0/0/1
```

trusted-key

To designate a Network Time Protocol (NTP) trusted key, use the **trusted-key** command in NTP configuration mode. To remove the **trusted-key** command from the configuration file and restore the system to its default condition with respect to this command, use the **no** form of this command.

trusted-key *key-number*
no trusted-key *key-number*

Syntax Description

key-number	Authentication key number to be trusted. Range is from 1 to 65535.

Command Default

No NTP trusted key is designated.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If authentication is enabled, use the **trusted-key** command to define one or more key numbers (corresponding to the keys defined with the **authentication-key** [NTP] command) that a NTP system must provide in its NTP packets for this system to synchronize to it. Because the other system must know the correct authentication key, this precaution provides protection against accidentally synchronizing the system to a system that is not trusted.

Task ID

Task ID	Operations
ip-services	read, write

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in its NTP packets:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# authenticate
RP/0/RP0/CPU0:router(config-ntp)# authentication-key 42 md5 clear key1
RP/0/RP0/CPU0:router(config-ntp)# trusted-key 42
```

update-calendar

To update the calendar periodically from Network Time Protocol (NTP), use the **update-calendar** command in NTP configuration mode. To remove the **update-calendar** command from the configuration file and restore the system to its default condition with respect to the command, use the **no** form of this command.

update-calendar
no update-calendar

Syntax Description

This command has no keywords or arguments.

Command Default

This command is disabled.

Command Modes

NTP configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Your router has a calendar that is separate from the software clock. This calendar runs continuously, even if the router is powered off or rebooted.

If a router is synchronized to an outside time source through NTP, it is a good idea to update the router's calendar with the time learned from NTP. Otherwise, the calendar may gradually lose or gain time.

After you configure the **update-calendar** command, NTP updates the calendar with the software clock every hour.

Task ID

Task ID	Operations
ip-services	read, write

This example shows how to configure the router to update the calendar periodically from the software clock:

```
RP/0/RP0/CPU0:router(config)# ntp
RP/0/RP0/CPU0:router(config-ntp)# update-calendar
```

Hardware Redundancy and Node Administration Commands

This module describes the commands used to manage the hardware redundancy, power, and administrative status of the nodes on a router running Cisco IOS XR software.

fpd auto-reload (Cisco IOS XR 64-bit)

To enable or disable automatic reload of a line card after successful FPD upgrade, use the **fpd auto-reload** command in XR Config mode and System Admin Config mode.

fpd auto-reload { **enable** | **disable** }

Syntax Description

enable	Enables LC auto reload after FPD auto upgrade.
disable	Disables LC auto reload after FPD auto upgrade.

Command Default

None.

Command Modes

XR Config mode

System Admin Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command is supported on Cisco IOS XR 64-bit OS.

Task ID

Task ID	Operation
system	read, write

Examples

The following example shows how to enable automatic LC reload after successful FPD upgrades:

```
Router# configure
Router(config)# fpd auto-reload enable
```

fpd auto-upgrade

To enable the automatic upgrade of FPD images during a software upgrade, use the **fpd auto-upgrade** command in XR Config mode and System Admin Config mode. To disable automatic FPD upgrades, use the **no** form of this command.

fpd auto-upgrade { **enable** | **disable** }

Syntax Description

enable	Enables FPD auto upgrade.
disable	Disables FPD auto upgrade.

Command Default

FPD images are not automatically upgraded.

Command Modes

XR Config mode

System Admin Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

By default automatic upgrades of the FPD images are not performed during a software upgrade. Once the **fpd auto-upgrade** command is enabled, when you upgrade the software and an FPD upgrade is required, the FPD upgrade is done automatically before the router is rebooted. The automatic FPD upgrade works only if the FPD image is upgraded together with the mini installation PIE. For example, use the **install add** and **install activate** commands as shown here:

```
Router# install add ncs5500-mpls-1.0.0.0-r244142I.x86_64.rpm
Router# install activate ncs5500-mpls-1.0.0.0-r244142I.x86_64.rpm
```

Task ID

Task ID	Operation
system	read, write

Examples

The following example shows how to enable automatic FPD upgrades:

```
Router# configure
Router(config)# fpd auto-upgrade enable
```

hw-module reset auto

To reset a specific node, use the **hw-module reset auto** command in administration configuration mode. To disable the reset feature on a specific node, use the **no** form of this command.

hw-module reset auto [**disable**] **location** *node-id*
no hw-module reset auto [**disable**] **location** *node-id*

Syntax Description

disable	Disables the node reset feature on the specified node.
location *node-id*	Identifies the node you want to reload. The *node-id* argument is entered in the *rack/slot* notation.

Command Default

The node reset feature is enabled for all nodes.

Command Modes

Administration configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **hw-module reset auto** command is used to reload Cisco IOS XR software on a specific node. The node reloads with the current running configuration and active software set for that node.

Task ID

Task ID	Operations
root-system	read, write
root-lr	read, write

The following example shows how to reload a node:

```
Router# configure
Router(config)# hw-module reset auto location 0/2/CPU0

RP/0/RP0/CPU0:router# RP/0/RP0/CPU0:Apr  2 22:04:43.659 : shelfmgr[294]:
%S HELFMGR-3-USER_RESET : Node 0/2/CPU0 is reset due to user reload request
```

hw-module fault-recovery

To configure the number of times a fault recovery can take place before permanently shutting down a line card, fabric card, shelf controller, or a route processor, use the **hw-module fault-recovery** command in System Admin mode.

hw-module fault-recovery location *hw-module-location* **count** *count*

Syntax Description

location *hw-module-location*	Specifies the hardware module for which fault recovery limit is configured. The *hw-module-location* argument is expressed in the **rack/slot/module** notation.
count*count*	Specifies the number of times a hardware module can attempt fault recovery before permanently shutting down. The *count* value can have range from 1 to 3.

Command Default

This feature is disabled by default.

Command Modes

System Admin Config

Command History

Release	Modification
Release 24.3.1	The command was introduced.

Usage Guidelines

You must enable this command for each location. To apply this configuration to all the locations, specify each location individually and then save your changes. The router prompt displays the *location all* option, but it is not functional.

Task ID

Task ID	Operation
config-services	read,write

The configuration example shows the fault recovery attempts on the fabric card FC0:

```
Router#configure
Router (config)#hw-module fault-recovery location 0/FC0 count 1
Router(config)#commit
```

power-mgmt redundancy

To control the power budget so as to not exceed the power capacity, use the **power-mgmt redundancy**-num-pms command. To restore default (N+1) power module redundancy, use the **no** form of this command.

By default, power module redundancy is set to (N+1). There is no power tray level redundancy.

power-mgmt redundancy-num-pms [*integer*] **location** { *node-id* }
no power-mgmt redundancy-num-pms location { *node-id* }

Syntax Description

integer	Number of redundant power modules that the user wants to configure. The total number of functioning power modules in the system is at least *integer* number more than the number of power modules needed to support the power required for all the cards in the system. Range of *integer* is from 0 to 8. 0 means no power redundancy is required.
location {*node-id* | **all**}	Specifies the location of the module. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

The Cisco ASR9000 router family has one logical power shelf consisting of one or more power trays, where each power tray contains three or four power modules.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

If the system is planned to have power module redundancy (N+x), then this command can be used to set the number of power modules required for power redundancy.

This example shows how to configure power module level redundancy:

```
sysadmin-vm:0_RP0(config)# power-mgmt redundancy-num-pms 2
Mon Apr  29 11:46:18.885 UTC+00:00
```

power-mgmt action

To disable the power budget control, use the **power-mgmt action disable** command in the System Admin Config mode.

power-mgmt action disable

Syntax Description

disable	Disables the power budget control.

Command Default

Power budget control is set to (N+1) and enabled by default.

Command Modes

System Admin Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command is available in Cisco IOS XR 64 bit OS.

Power-management action is done at the chassis level.

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The power manager automatically calculates power required for each card. The system will only power up line cards if there is sufficient power. Use the **power-mgmt action disable** command to disable enforcement of power budgeting line card boot requests. This is not recommended, allowing for situations where chassis can overdraw current, causing instability or immediate chassis reset.

Use the **show environment** command with the **power** option to display power related information.

Use show power budge profile to view power requirements for each card type.

Before a card powers up its basic or upper layers, it must request budget. If that budget is not available, the boot request is denied.

If **power-mgmt action** command is enabled, it only prevents previously unpowered line cards from coming up in the event of low power budget scenarios. Reloading an operational line card cannot release its reserved budget. Therefore, a line card can be reloaded, even in low power budget scenarios, and allowed to return to operational. If configured with **power-mgmt action disable** command, line cards can always be given an allocated power budget and allowed to boot, regardless of available power.

This example shows you how to disable the chassis power management control:

```
sysadmin-vm:0_RP0# config
sysadmin-vm:0_RP0(config)# power-mgmt action disable
```

show environment

To display environmental monitor parameters for the system, use the **show environment** command in the appropriate mode.

Syntax Description

all	(Optional) Displays information for all environmental monitor parameters.
fans	(Optional) Displays information about the fans.
power-supply	(Optional) Displays power supply voltage and current information.
temperatures	(Optional) Displays system temperature information.
voltages	(Optional) Displays system voltage information.
node-id	(Optional) Node whose information you want to display. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

All environmental monitor parameters are displayed.

Command Modes

System Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **show environment** command displays information about the hardware that is installed in the system, including fans, LEDs, power supply voltage, and current information and temperatures.

Task ID

Task ID	Operations
system	read

The following example shows sample output from the **show environment** command with the **temperatures** keyword:

```
sysadmin-vm:0_RP0# show environment temperatures
Mon Apr  29 11:24:32.508 UTC+00:00
================================================================================
Location  TEMPERATURE                Value   Crit Major Minor Minor Major  Crit
          Sensor                   (deg C)   (Lo) (Lo)  (Lo)  (Hi)  (Hi)   (Hi)
```

```
--------------------------------------------------------------------------------
0/0
          CPU_PVCCIN_TEMP                27    -10    -5     0   105   115   125
          CPU_VDDQ_TEMP                  26    -10    -5     0   105   115   125
          P1V05_CPU_TEMP                 26    -10    -5     0   105   115   125
          P1V0_ALD_CORE_AVDD_TEMP        26    -10    -5     0   105   115   125
          ALDRIN_DIE_TEMP                31    -10    -5     0   103   105   110
          P1V2_JER0_HBM_VDDO_TEMP        26    -10    -5     0   105   115   125
          P1V2_JER0_HBM_VDCC_TEMP        25    -10    -5     0   105   115   125
          P0V8_J2C_TRVDD_TEMP            34    -10    -5     0   105   115   125
          J2C_VDDC_TEMP                  37    -10    -5     0   105   115   125
          J2C_DIE_TEMP                   38    -10    -5     0   103   105   110
          J2C_TMP421_LOCAL_TEMP          26    -10    -5     0   110   117   125
          P0V8_PHY234_VDDC_TEMP          33    -10    -5     0   105   115   125
          P0V8_PHY01_VDDC_TEMP           35    -10    -5     0   105   115   125
          P1V15_PHY_AVDD12_TEMP          35    -10    -5     0   105   115   125
          P3V3_SFP_TEMP                  33    -10    -5     0   105   115   125
          MT3722_DIE_CHIP0_TEMP          47    -10    -5     0   103   105   110
          MT3722_DIE_CHIP1_TEMP          47    -10    -5     0   103   105   110
          MT3722_DIE_CHIP2_TEMP          43    -10    -5     0   103   105   110
          MT3722_DIE_CHIP3_TEMP          41    -10    -5     0   103   105   110
          MT3722_DIE_CHIP4_TEMP          44    -10    -5     0   103   105   110
          J2C_HBM_DIE_TEMP               30    -10    -5     0    90    93    95
          CPU                            31    -10    -5     0    90    96   102
```

show environment temperatures Field Descriptions describes the significant fields shown in the display.

Table 58: show environment temperatures Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format *rack*/*slot*.
Modules	Module for which temperature information is displayed.
Inlet Temperature (deg C)	Current temperature of the inlet sensor, in degrees Celsius. **Note** The inlet temperature corresponds to the room air temperature entering the router.
Exhaust Temperature (deg C)	Current temperature of the exhaust sensor, in degrees Celsius. **Note** The exhaust temperature corresponds to the air being exhausted from the router.
Hotspot Temperature (deg C)	Current temperature of the hotspot, in degrees Celsius.

show environment leds Field Descriptionsdescribes the significant fields shown in the display.

Table 59: show environment leds Field Descriptions

Field	Description
rack_num/*slot_num*/*:	Rack number and slot number where the node resides.

Field	Description
Module (host) LED status says:	Current LED status of the specified node.

The following example shows sample output from the **show environment** command the with the **power-supply** keyword:

```
sysadmin-vm:0_RP0#show environment power
Mon Apr  29 11:25:39.863 UTC+00:00
================================================================================
CHASSIS LEVEL POWER INFO: 0
================================================================================
   Total output power capacity (N + 0)             :   18000W +       0W
   Total output power required                      :    8615W
   Total power input                                :    3761W
   Total power output                               :    3388W

Power Group 0:
================================================================================
   Power       Supply     ------Input----   ------Output---      Status
   Module      Type        Volts     Amps    Volts     Amps
================================================================================
   0/PM0       3kW-AC      227.3      2.7     12.2     45.7    OK
   0/PM1       3kW-AC      227.3      2.4     12.2     39.0    OK
   0/PM2       3kW-AC      227.9      2.7     12.2     45.2    OK
   0/PM3       3kW-AC      228.4      2.7     12.2     45.7    OK

Total of Power Group 0:       2391W/ 10.5A      2142W/175.6A

Power Group 1:
================================================================================
   Power       Supply     ------Input----   ------Output---      Status
   Module      Type        Volts     Amps    Volts     Amps
================================================================================
   0/PM4       3kW-AC      228.2      3.3     12.2     56.6    OK
   0/PM5       3kW-AC      228.4      2.7     12.2     45.5    OK

Total of Power Group 1:       1370W/  6.0A      1246W/102.1A

================================================================================
   Location     Card Type            Power       Power       Status
                                     Allocated   Used
                                     Watts       Watts
================================================================================
   0/0          NC57-48Q2D-S          500         157       ON
   0/1          NC55-36X100G-A-SE    1050         500       ON
   0/2          NC57-48Q2D-SE-S       500         181       ON
   0/3          NC55-24X100G-SE       940         488       ON
   0/4                -                25           -       RESERVED
   0/5          NC57-36H6D-S         1000         500       ON
   0/6          NC57-48Q2D-SE-S       500         195       ON
   0/7          NC55-MOD-A-S          600         181       ON
   0/RP0        NC55-RP2-E             80          53       ON
   0/RP1        NC55-RP-E              80          40       ON
   0/FC0              -                25           -       RESERVED
   0/FC1        NC55-5508-FC2         320         183       ON
   0/FC2        NC55-5508-FC2         320         183       ON
   0/FC3        NC55-5508-FC2         320         185       ON
   0/FC4              -                25           -       RESERVED
   0/FC5        NC55-5508-FC2         320         180       ON
   0/FT0        NC55-5508-FAN2        660          85       ON
   0/FT1        NC55-5508-FAN2        660          87       ON
   0/FT2        NC55-5508-FAN2        660          82       ON
```

```
0/SC0          NC55-SC                   15           15        ON
0/SC1          NC55-SC                   15           15        ON
```

This table describes the significant fields shown in the display.

Table 60: show environment power-supply Field Descriptions

Field	Description
R/S/I	Rack number, slot number, and interface for which information is displayed, in the format PEM/Power Module/* (for example 0/PM0/*).
Modules	Module for which power information is displayed.
Capacity	Power capacity of each power module in Watts.
Status	Operational status of power modules.
Power Draw	Real (measured) power drawn from each power module.
Voltage	Real (measured) power module voltage.
Current	Real (measured) power module current draw.
Power Shelves Type	AC or DC.
Total Power Capacity	Sum of the power capacity of each of the modules installed in the chassis.
Usable Power Capacity	Sum of the power capacity of each of the powered and operational power modules installed in the chassis.
Supply Failure Protected Capacity	Protected power capacity of the chassis with power module redundancy (ASR 9010 AC 3+3, ASR 9010 DC 5+1, ASR 9006 AC 2+1, ASR 9010 DC 2+1).
Feed Failure Protected Capacity	Feed protected power capacity. This value applies to the ASR 9010 AC system only.
Worst Case Power Used	Sum of the estimated power draw of each of the load modules in the chassis. Load modules can be fan trays, RSPs and line cards.
Worst Case Power Available	Usable power capacity minus the worst case power used.
Supply Protected Capacity Available	Supply failure protected capacity minus the worst case power used.
Feed Protected Capacity Available	Feed failure protected capacity minus the worst case power used.
Power Budget Enforcement	This field displays the Power Budget Enforcement status as Enabled or Disabled.
Power Budget Mode	This field displays the power redundancy mode used (for example, N+1).
N+1 Supply Failure Protected Capacity	This field represents the Supply Protected Power capacity of the chassis with power module redundancy in N+1 mode.

show fpd package

To display information about the supported Modular Port Adapters (MPAs) and their interface processors for your current software release. This command provides details on the required Field Programmable Device (FPD) images and the minimum hardware requirements for these modules. use the **show fpd package** command in EXEC mode.

show fpd package

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If there are multiple FPD images for your card, use the **show fpd package** command to determine which FPD image to use if you only want to upgrade a specific FPD type.

Task ID

Task ID	Operations
sysmgr	read

The following example shows sample output from the **show fpd package** command:

```
RP/0/RP0/CPU0:router#show fpd package
Mon Apr 29 14:04:49.225 IST

================================ ================================================
                                        Field Programmable Device Package
                                 ================================================
                                                 Req     SW      Min Req   Min Req
Card Type            FPD Description             Reload  Ver     SW Ver  Board Ver
================== ========================== ====== ======= ======== =========
--------------------------------------------------------------------------------
NC55-12X100G-SE-PR   Bootloader(A)               YES     1.20      1.20      0.0
                     IOFPGA(A)                   YES     0.12      0.12      0.0
                     MIFPGA                      YES     0.03      0.03      0.0
                     SATA-INTEL_240G(A)          NO    1132.00   1132.00     0.0
                     SATA-INTEL_480G(A)          NO    1132.00   1132.00     0.0
                     SATA-M500IT-MC(A)           NO      3.00      3.00      0.0
                     SATA-M500IT-MU-A(A)         NO      5.00      5.00      0.0
                     SATA-M500IT-MU-B(A)         NO      4.00      4.00      0.0
                     SATA-M5100(A)               NO     75.00     75.00      0.0
                     SATA-M600-MCT(A)            NO      5.00      5.00      0.0
```

```
                    SATA-M600-MU(A)           NO      6.00      6.00      0.0
                    SATA-Micron(A)            NO      1.00      1.00      0.0
                    SATA-SMART-128G(A)        NO   1241.00   1241.00      0.0
--------------------------------------------------------------------------------
NC55-12X100GE-PROT  Bootloader(A)             YES     1.22      1.22      0.0
                    IOFPGA(A)                 YES     0.15      0.15      0.0
                    MIFPGA                    YES     0.09      0.09      0.0
                    SATA-INTEL_240G(A)        NO    1132.00   1132.00     0.0
                    SATA-INTEL_480G(A)        NO    1132.00   1132.00     0.0
                    SATA-M500IT-MC(A)         NO      3.00      3.00      0.0
                    SATA-M500IT-MU-A(A)       NO      5.00      5.00      0.0
                    SATA-M500IT-MU-B(A)       NO      4.00      4.00      0.0
                    SATA-M5100(A)             NO     75.00     75.00      0.0
                    SATA-M600-MCT(A)          NO      5.00      5.00      0.0
                    SATA-M600-MU(A)           NO      6.00      6.00      0.0
                    SATA-Micron(A)            NO      1.00      1.00      0.0
                    SATA-SMART-128G(A)        NO   1241.00   1241.00      0.0
--------------------------------------------------------------------------------
NC55-18H18F         Bootloader(A)             YES     1.20      1.20      0.0
                    IOFPGA(A)                 YES     0.22      0.22      0.0
                    MIFPGA                    YES     0.03      0.03      0.0
                    SATA-INTEL_240G(A)        NO    1132.00   1132.00     0.0
                    SATA-INTEL_480G(A)        NO    1132.00   1132.00     0.0
                    SATA-M500IT-MC(A)         NO      3.00      3.00      0.0
                    SATA-M500IT-MU-A(A)       NO      5.00      5.00      0.0
                    SATA-M500IT-MU-B(A)       NO      4.00      4.00      0.0
                    SATA-M5100(A)             NO     75.00     75.00      0.0
                    SATA-M600-MCT(A)          NO      5.00      5.00      0.0
                    SATA-M600-MU(A)           NO      6.00      6.00      0.0
                    SATA-Micron(A)            NO      1.00      1.00      0.0
                    SATA-SMART-128G(A)        NO   1241.00   1241.00      0.0
--------------------------------------------------------------------------------
NC55-24H12F-SE      Bootloader(A)             YES     1.20      1.20      0.0
                    IOFPGA(A)                 YES     0.09      0.09      0.0
                    MIFPGA                    YES     0.03      0.03      0.0
                    SATA-INTEL_240G(A)        NO    1132.00   1132.00     0.0
                    SATA-INTEL_480G(A)        NO    1132.00   1132.00     0.0
                    SATA-M500IT-MC(A)         NO      3.00      3.00      0.0
                    SATA-M500IT-MU-A(A)       NO      5.00      5.00      0.0
                    SATA-M500IT-MU-B(A)       NO      4.00      4.00      0.0
                    SATA-M5100(A)             NO     75.00     75.00      0.0
                    SATA-M600-MCT(A)          NO      5.00      5.00      0.0
                    SATA-M600-MU(A)           NO      6.00      6.00      0.0
                    SATA-Micron(A)            NO      1.00      1.00      0.0
                    SATA-SMART-128G(A)        NO   1241.00   1241.00      0.0
--------------------------------------------------------------------------------
NC55-24X100G-SE     Bootloader(A)             YES     1.20      1.20      0.0
                    IOFPGA(A)                 YES     0.13      0.13      0.0
                    MIFPGA                    YES     0.03      0.03      0.0
                    SATA-INTEL_240G(A)        NO    1132.00   1132.00     0.0
                    SATA-INTEL_480G(A)        NO    1132.00   1132.00     0.0
                    SATA-M500IT-MC(A)         NO      3.00      3.00      0.0
                    SATA-M500IT-MU-A(A)       NO      5.00      5.00      0.0
                    SATA-M500IT-MU-B(A)       NO      4.00      4.00      0.0
                    SATA-M5100(A)             NO     75.00     75.00      0.0
                    SATA-M600-MCT(A)          NO      5.00      5.00      0.0
                    SATA-M600-MU(A)           NO      6.00      6.00      0.0
                    SATA-Micron(A)            NO      1.00      1.00      0.0
                    SATA-SMART-128G(A)        NO   1241.00   1241.00      0.0
--------------------------------------------------------------------------------
NC55-32T16Q4H-A     Bootloader(A)             YES     0.05      0.05      0.0
                    DBFPGA(A)                 YES     0.14      0.14      0.0
                    IOFPGA(A)                 YES     0.93      0.93      0.0
                    MIFPGA                    YES     0.60      0.60      0.0
```

```
                        SATA-INTEL_240G(A)          NO    1132.00   1132.00     0.0  ?
                        SATA-INTEL_480G(A)          NO    1132.00   1132.00     0.0
                        SATA-M500IT-MC(A)           NO      3.00      3.00      0.0
                        SATA-M500IT-MU-A(A)         NO      5.00      5.00      0.0
                        SATA-M500IT-MU-B(A)         NO      4.00      4.00      0.0
                        SATA-M5100(A)               NO     75.00     75.00      0.0
                        SATA-M600-MCT(A)            NO      5.00      5.00      0.0
                        SATA-M600-MU(A)             NO      6.00      6.00      0.0
                        SATA-Micron(A)              NO      1.00      1.00      0.0
                        SATA-SMART-128G(A)          NO   1241.00   1241.00      0.0
                        TimingIC-A                  YES     7.216     7.216     0.0
                        TimingIC-B                  YES     7.216     7.216     0.0
----------------------------------------------------------------------------------
```

This table describes the significant fields shown in the display:

Table 61: show fpd package Field Descriptions

Field	Description
Card Type	Module part number.
FPD Description	Description of all FPD images available for the line card.
Type	Hardware type. Possible types can be: • MPA - Modular Port Adapters • LC - Line card
Subtype	FPD subtype. These values are used in the **upgrade hw-module fpd** command to indicate a specific FPD image type to upgrade.
SW Version	FPD software version recommended for the associated module running the current Cisco IOS XR software.
Min Req SW Vers	Minimum required FPD image software version to operate the card. Version 0.0 indicates that a minimum required image was not programmed into the card.
Min Req HW Vers	Minimum required hardware version for the associated FPD image. A minimum hardware requirement of version 0.0 indicates that all hardware can support this FPD image version.

Note In the **show fpd package** command output, the "subtype" column shows the FPDs that correspond with each line card image. To upgrade a specific FPD with the **upgrade hw-module fpd** command, replace the *fpga-type* argument with the appropriate FPD from the "subtype" column, as shown in the following example:

```
Router# upgrade hw-module fpd fpga2 location 0/3/1 reload
```

show hw-module fpd

To display field-programmable device (FPD) compatibility for all modules or a specific module, use the **show hw-module fpd** command in the EXEC or administration EXEC mode.

show hw-module fpd location {*node-id* | **all**}

Syntax Description

location {*node-id* | **all**}	Specifies the location of the module. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.

Command Default

No default behavior or values

Command Modes

EXEC

Administration EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
sysmgr	read
root-lr	read

The following is sample output from the **show hw-module fpd**:

```
Router#show hw-module fpd
Mon Apr 29 14:30:53.049 IST

Auto-upgrade:Disabled
                                                                          FPD Versions
                                                                          ==============
Location   Card type            HWver FPD device       ATR Status    Running   Programd
-------------------------------------------------------------------------------------
0/0        NC57-48Q2D-S         0.2   MIFPGA                CURRENT     0.99      0.21

0/0        NC57-48Q2D-S         1.0   TimingIC-A            CURRENT     7.216     7.216

0/0        NC57-48Q2D-S         1.0   TimingIC-B            CURRENT     7.216     7.216

0/0        NC57-48Q2D-S         0.2   ALDRINFPGA            CURRENT     1.06      1.06

0/0        NC57-48Q2D-S         0.2   Bootloader            CURRENT     1.00      1.00

0/0        NC57-48Q2D-S         0.2   DBFPGA                CURRENT     0.14      0.14
```

0/0	NC57-48Q2D-S	0.2	IOFPGA	CURRENT	0.105	0.105
0/0	NC57-48Q2D-S	0.2	SATA-Micron	CURRENT	1.00	1.00
0/1	NC55-36X100G-A-SE	1.0	MIFPGA	CURRENT	0.03	0.03
0/1	NC55-36X100G-A-SE	1.0	Bootloader	CURRENT	0.15	0.15
0/1	NC55-36X100G-A-SE	1.0	DBFPGA	CURRENT	0.14	0.14
0/1	NC55-36X100G-A-SE	1.0	IOFPGA	CURRENT	0.26	0.26
0/2	NC57-48Q2D-SE-S	0.2	MIFPGA	CURRENT	0.21	0.21
0/2	NC57-48Q2D-SE-S	1.0	TimingIC-A	CURRENT	7.216	7.216
0/2	NC57-48Q2D-SE-S	1.0	TimingIC-B	CURRENT	7.216	7.216
0/2	NC57-48Q2D-SE-S	0.2	ALDRINFPGA	CURRENT	1.06	1.06
0/2	NC57-48Q2D-SE-S	0.2	Bootloader	CURRENT	1.00	1.00
0/2	NC57-48Q2D-SE-S	0.2	DBFPGA	CURRENT	0.14	0.14
0/2	NC57-48Q2D-SE-S	0.2	IOFPGA	CURRENT	0.105	0.105
0/2	NC57-48Q2D-SE-S	0.2	SATA-Micron	CURRENT	1.00	1.00
0/3	NC55-24X100G-SE	1.0	MIFPGA	CURRENT	0.03	0.03
0/3	NC55-24X100G-SE	1.0	Bootloader	CURRENT	1.20	1.20
0/3	NC55-24X100G-SE	1.0	IOFPGA	CURRENT	0.13	0.13
0/3	NC55-24X100G-SE	1.0	SATA-M600-MCT	CURRENT	5.00	5.00
0/5	NC57-36H6D-S	1.0	MIFPGA	CURRENT	0.40	0.40
0/5	NC57-36H6D-S	1.0	TimingIC-A	CURRENT	7.216	7.216
0/5	NC57-36H6D-S	1.0	TimingIC-B	CURRENT	7.216	7.216
0/5	NC57-36H6D-S	1.0	Bootloader	CURRENT	0.02	0.02
0/5	NC57-36H6D-S	1.0	DBFPGA	CURRENT	0.14	0.14
0/5	NC57-36H6D-S	1.0	IOFPGA	CURRENT	0.47	0.47
0/5	NC57-36H6D-S	1.0	SATA-Micron	CURRENT	1.00	1.00
0/6	NC57-48Q2D-SE-S	0.2	MIFPGA	CURRENT	0.21	0.21
0/6	NC57-48Q2D-SE-S	1.0	TimingIC-A	CURRENT	7.216	7.216
0/6	NC57-48Q2D-SE-S	1.0	TimingIC-B	CURRENT	7.216	7.216
0/6	NC57-48Q2D-SE-S	0.2	ALDRINFPGA	CURRENT	1.06	1.06
0/6	NC57-48Q2D-SE-S	0.2	Bootloader	CURRENT	1.00	1.00
0/6	NC57-48Q2D-SE-S	0.2	DBFPGA	CURRENT	0.14	0.14
0/6	NC57-48Q2D-SE-S	0.2	IOFPGA	CURRENT	0.105	0.105

0/6	NC57-48Q2D-SE-S	0.2	SATA-Micron	CURRENT	1.00	1.00
0/7	NC55-MOD-A-S	0.302	MIFPGA	CURRENT	0.16	0.16
0/7	NC55-MOD-A-S	0.302	Bootloader	CURRENT	1.03	1.03
0/7	NC55-MOD-A-S	0.302	DBFPGA	CURRENT	0.14	0.14
0/7	NC55-MOD-A-S	0.302	IOFPGA	CURRENT	0.14	0.14
0/7	NC55-MOD-A-S	0.302	SATA-M600-MCT	CURRENT	5.00	5.00
0/RP0	NC55-RP2-E	1.0	TimingIC-A	CURRENT	7.216	7.216
0/RP0	NC55-RP2-E	1.0	TimingIC-B-0	CURRENT	7.216	7.216
0/RP0	NC55-RP2-E	1.0	TimingIC-B-1	CURRENT	7.216	7.216
0/RP0	NC55-RP2-E	1.0	Bootloader	CURRENT	0.09	0.09
0/RP0	NC55-RP2-E	1.0	IOFPGA	CURRENT	0.50	0.50
0/RP0	NC55-RP2-E	1.0	OMGFPGA	CURRENT	0.52	0.52
0/RP0	NC55-RP2-E	1.0	SATA-Micron	CURRENT	1.00	1.00
0/RP1	NC55-RP-E	1.0	Bootloader	CURRENT	1.24	1.24
0/RP1	NC55-RP-E	1.0	IOFPGA	CURRENT	0.23	0.23
0/RP1	NC55-RP-E	1.0	OMGFPGA	CURRENT	0.61	0.61
0/RP1	NC55-RP-E	1.0	SATA-M5100	CURRENT	75.00	75.00
0/FC1	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC1	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.19	0.19
0/FC1	NC55-5508-FC2	1.0	SATA-INTEL_240G	CURRENT	1132.00	1132.00
0/FC2	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC2	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.19	0.19
0/FC2	NC55-5508-FC2	1.0	SATA-INTEL_240G	CURRENT	1132.00	1132.00
0/FC3	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC3	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.19	0.19
0/FC3	NC55-5508-FC2	1.0	SATA-INTEL_240G	CURRENT	1132.00	1132.00
0/FC5	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC5	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.19	0.19
0/FC5	NC55-5508-FC2	1.0	SATA-M5100	CURRENT	75.00	75.00
0/SC0	NC55-SC	1.4	Bootloader	CURRENT	1.74	1.74
0/SC0	NC55-SC	1.4	IOFPGA	CURRENT	0.11	0.11
0/SC1	NC55-SC	1.4	Bootloader	CURRENT	1.74	1.74

```
0/SC1       NC55-SC              1.4    IOFPGA                CURRENT      0.11       0.11
fpd
```

Table 62: show hw-module fpd Field Descriptions

Field	Description
Location	Module location.
Card Type	Module part number.
HW Version	Hardware model version for the module.
FPD device	Specific FPD device on the card.
ATR	The attribute of the FPD, which usually indicates its current status.
Status	Currently running FPD image status.
FPD Versions Running	Currently running FPD image version.
FPD Versions Programd	The version of the FPD that is programmed or available for upgrade.

show hw-module profile

To display the active profiles on the router, use the **show hw-module profile** command in EXEC mode.

show hw-module profile { **mdb-scale** | **npu-operating-mode** }

Syntax Description

mdb-scale	Display mdb scale profile
npu-operating-mode	Display NPU operating mode

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show hw-module profile** command displays only active profiles. If a profile has been configured and the line card has not be reloaded since the configuration, the profile is not active. Use the **show running-config hw-module profile** command to view configured profiles.

Task ID

Task ID	Operation
root-lr	read

This example shows sample output from the **show hw-module profile**command with the **mdb-scale** keyword:

```
RP/0/RP0/CPU0:routerS#show hw-module profile mdb-scale
Mon Apr 29 14:33:14.412 IST
MDB scale profile: N/A
```

This example shows sample output from the **show hw-module profile**command with the **npu-operating-mode** keyword:

```
RP/0/RP0/CPU0:router#show hw-module profile npu-operating-mode
Mon Apr 29 14:34:35.151 IST
NPU Operation mode: Compatibility Mode
```

show inventory

To retrieve and display information about all the Cisco products that are installed in the router, use the **show inventory** command in the Admin EXEC mode or XR EXEC mode.

System Admin EXEC mode Mode
show inventory [**all** | **chassis** | **fan** | **location** { *node-id* } | **power** | **raw**]
XR EXEC Mode
show inventory [*locationspecifier* | **all** | **location** { *locationspecifier* | **all** } | **oid** | **raw**]

Syntax Description

all	(Optional) Displays inventory information for all the physical entities in the chassis.
location {*node-id*}	(Optional) Displays inventory information for a specific node, or for all nodes in the chassis.
raw	(Optional) Displays raw information about the chassis for diagnostic purposes.
chassis	(Optional) Displays inventory information for the entire chassis.
fan	(Optional) Displays inventory information for the fans.
power	(Optional) Displays inventory information for the power supply.

Command Default

All inventory information for the entire chassis is displayed.

Command Modes

EXEC

Administration EXEC

Command History

Usage Guidelines

Enter the **show inventory** command with the **raw** keyword to display every RFC 2737 entity installed in the router, including those without a PID, unique device identifier (UDI), or other physical identification.

If any of the Cisco products do not have an assigned PID, the output displays incorrect PIDs, and version ID (VID) and serial number (SN) elements may be missing.

For UDI compliance products, the PID, VID, and SN are stored in EEPROM. Use the **show inventory** command to display this information.

The following example shows partial sample output from the **show inventory** command with the **raw** keyword:

```
RP/0/RP0/CPU0:router#show inventory raw
Mon Apr 29 14:37:31.513 IST
NAME: "Rack 0-Line Card Slot 0", DESCR: "NC5 Line Card Slot"
PID: N/A               , VID: N/A, SN: N/A

NAME: "0/0", DESCR: "NCS 5700 32x1/10/25G + 16x1/10/25/50G + 2x400G Line Card BASE"
PID: NC57-48Q2D-S      , VID: V00, SN: JAE262009MM

NAME: "0/0-MPA bay 0", DESCR: "MPA Container"
PID: N/A               , VID: N/A, SN: N/A

NAME: "0/0-MPA bay 1", DESCR: "MPA Container"
```

```
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-Motherboard", DESCR: "Motherboard Module"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-CPU_PVCCIN_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-CPU_VDDQ_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V05_CPU_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V0_ALD_CORE_AVDD_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V2_JER0_HBM_VDDO_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V2_JER0_HBM_VDDC_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P0V8_J2C_TRVDD_IOUT", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-J2C_VDDC_IOUT1", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-J2C_VDDC_IOUT2", DESCR: "Current Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-CPU_PVCCIN_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-CPU_VDDQ_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V05_CPU_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V0_ALD_CORE_AVDD_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-ALDRIN_DIE_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V2_JER0_HBM_VDDO_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P1V2_JER0_HBM_VDCC_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P0V8_J2C_TRVDD_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-J2C_VDDC_TEMP", DESCR: "Temperature Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P12V0_DM1_VOUT", DESCR: "Voltage Sensor"
PID: N/A                , VID: N/A, SN: N/A

NAME: "0/0-P3V3_ADVANCE_VOUT", DESCR: "Voltage Sensor"
PID: N/A                , VID: N/A, SN: N/A
```

```
NAME: "0/0-P2V5_ADVANCE_VOUT", DESCR: "Voltage Sensor"
PID: N/A               , VID: N/A, SN: N/A

NAME: "0/0-P1V2_ADVANCE_VOUT", DESCR: "Voltage Sensor"
PID: N/A               , VID: N/A, SN: N/A

NAME: "0/0-P1V8_ADVANCE_VOUT", DESCR: "Voltage Sensor"
PID: N/A               , VID: N/A, SN: N/A

NAME: "0/0-P1V0_ALD_CORE_VDD_VOUT", DESCR: "Voltage Sensor"
PID: N/A               , VID: N/A, SN: N/A
```

show led

To display LED information for the router, or for a specific LED location, use the **show led** command in Administration EXEC mode.

Syntax Description

Command Default

If no node is specified, information about all LEDs on the router is displayed.

Command Modes

Command History

Usage Guidelines

Enter the **show platform** command to see the location of all nodes installed in the router.

The following example sample output from the **show led** command.

```
sysadmin-vm:0_RP0#show led
Mon Apr  29 09:17:24.120 UTC+00:00
============================================================
Location  LED Name                       Mode          Color
============================================================
0
          0-Chassis RP Status            WORKING     GREEN
          0-Chassis FC Status            WORKING     GREEN
          0-Chassis LC Status            WORKING     GREEN
          0-Chassis PM Status            WORKING     GREEN
          0-Chassis PWR MGMT Status      WORKING     GREEN
          0-Chassis Attention (ATTN)     WORKING     OFF
          0-Chassis FT Status            WORKING     GREEN
0/0
          0/0-Status (STS)               WORKING     GREEN
          0/0-Attention (ATTN)           WORKING     OFF
0/1
          0/1-Status (STS)               WORKING     GREEN
          0/1-Attention (ATTN)           WORKING     OFF
0/2
          0/2-Status (STS)               WORKING     GREEN
          0/2-Attention (ATTN)           WORKING     OFF
0/3
          0/3-Status (STS)               WORKING     GREEN
          0/3-Attention (ATTN)           WORKING     OFF
0/5
          0/5-Status (STS)               WORKING     GREEN
          0/5-Attention (ATTN)           WORKING     OFF
0/6
          0/6-Status (STS)               WORKING     GREEN
          0/6-Attention (ATTN)           WORKING     OFF
0/7
          0/7-Status (STS)               WORKING     GREEN
          0/7-Attention (ATTN)           WORKING     OFF
0/RP0
          0/RP0-Status (STS)             WORKING     GREEN
          0/RP0-Attention (ATTN)         WORKING     OFF
          0/RP0-Active (ACT)             WORKING     GREEN
0/RP1
          0/RP1-Status (STS)             WORKING     GREEN
          0/RP1-Attention (ATTN)         WORKING     OFF
          0/RP1-Active (ACT)             WORKING     AMBER
0/FC1
          0/FC1-Status (STS)             WORKING     GREEN
```

```
          0/FC1-Attention (ATTN)        WORKING     OFF
0/FC2
          0/FC2-Status (STS)            WORKING     GREEN
          0/FC2-Attention (ATTN)        WORKING     OFF
0/FC3
          0/FC3-Status (STS)            WORKING     GREEN
          0/FC3-Attention (ATTN)        WORKING     OFF
0/FC5
          0/FC5-Status (STS)            WORKING     GREEN
          0/FC5-Attention (ATTN)        WORKING     OFF
0/FT0
          0/FT0-FT Status (FT STS)      WORKING     GREEN
          0/FT0-FC Status (FC STS)      WORKING     GREEN
          0/FT0-Attention (ATTN)        WORKING     OFF
0/FT1
          0/FT1-FT Status (FT STS)      WORKING     GREEN
          0/FT1-FC Status (FC STS)      WORKING     GREEN
          0/FT1-Attention (ATTN)        WORKING     OFF
0/FT2
          0/FT2-FT Status (FT STS)      WORKING     GREEN
          0/FT2-FC Status (FC STS)      WORKING     GREEN
          0/FT2-Attention (ATTN)        WORKING     OFF
0/PM0
          0/PM0-Fail                    WORKING     OFF
          0/PM0-OK                      WORKING     GREEN
0/PM1
          0/PM1-Fail                    WORKING     OFF
          0/PM1-OK                      WORKING     GREEN
0/PM2
          0/PM2-Fail                    WORKING     OFF
          0/PM2-OK                      WORKING     GREEN
0/PM3
          0/PM3-Fail                    WORKING     OFF
          0/PM3-OK                      WORKING     GREEN
0/PM4
          0/PM4-Fail                    WORKING     OFF
          0/PM4-OK                      WORKING     GREEN
0/PM5
          0/PM5-Fail                    WORKING     OFF
          0/PM5-OK                      WORKING     GREEN
0/SC0
          0/SC0-Status (STS)            WORKING     GREEN
          0/SC0-Attention (ATTN)        WORKING     OFF
          0/SC0-Active (ACT)            WORKING     GREEN
0/SC1
          0/SC1-Status (STS)            WORKING     GREEN
          0/SC1-Attention (ATTN)        WORKING     OFF
```

show operational

To display all operational data provided as XML schema, use the **show operational** command in EXEC mode.

show operational *mda-class*[*mda-class*][*mda-class/naming=value*][**descriptive**]

Syntax Description

mda-class	Name of the management data API (MDA) class to output. To specify a class name in hierarchy, all classes must be specified from the top of the class to the specific class name that you are interested in. MDA classes are case-sensitive. To view all available MDA classes, use the question mark (**?**) online help function.
descriptive	Displays more descriptive information.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Although the **show operational** command uses the schema database, the command displays the information in a string format like the other **show** commands. No XML related setups or knowledge is required to use the command.

Task ID

Task ID	Operations
Depends on the MDA class for which you are displaying the information	read

The following example shows sample output from the **show operational** command. Not all the output is shown.

```
RP/0/RP0/CPU0:router# show operational BGP DefaultVRF GlobalProcessInfo descriptive
[BGP DefaultVRF GlobalProcessInfo]
InStandaloneMode: true[Standalone or Distributed mode]
RouterID: 0.0.0.0[Router ID for the local system]
ConfiguredRouterID: 0.0.0.0[Configured router ID]
LocalAS: 10[Local autonomous system #]
RestartCount: 1[No of times BGP has started]
ISRedistributeIBGPToIGPsEnabled: false[Redistribute iBGP into IGPs enabled]
IsFastExternalFalloverEnabled: true[Fast external fallover enabled]
IsBestpathMissingMEDIsWorstEnabled: false[Bestpath: Treat missing MED as worst]
.
.
.
DefaultLocalPreference: 100[Default local preference]
KeepAliveTime: 60[Default keepalive timer (seconds)]
HoldTime: 180[Default hold timer (seconds)]
GenericScanPeriod: 60[Period (in seconds) of generic scanner runs]
.
.
```

```
.
VrfIsActive: true[VRF state ]
VrfName: "default"[Name of the VRF ]
```

This example shows sample output from the **show operational** command where only the top-level MDA class is specified. Not all of the output is shown.

```
RP/0/RP0/CPU0:router# show operational Inventory
Mon Apr 29 14:53:48.625 IST
[Inventory]
Entities
  Entity/Name=Rack 0
    Attributes
      InvBasicBag
        Description: NCS5500 8 Slot Single Chassis
        VendorType: 1.3.6.1.4.1.9.12.3.1.3.1682
        Name: Rack 0
        HardwareRevision: V01
        SoftwareRevision: 24.2.1.34I
        SerialNumber: FGE2012067X
        ManufacturerName: Cisco Systems, Inc.
        ModelName: NCS-5508
        assetIdStr: FGE2012067X
        IsFieldReplaceableUnit: true
        CompositeClassCode: 65536
        Alias: FGE2012067X
        UnrecognizedFRU: false
        UniqueID: 8384513
        AllocatedPower: 0
        PowerCapacity: 0
      InvAssetBag
        PartNumber: A0
        ManufacturerAssemblyNumber: 73-17789-01
        ManufacturerAssemblyRevision: A0
        ManufacturerCommonLanguageEquipmentIdentifier: CMMT810BRA
      FRUInfo
        CardAdministrativeState: 2
        PowerAdministrativeState: 2
        CardOperationalState: 2
        CardMonitorState: -1

 --More--
```

show platform

To display information and status for each node in the system, use the **show platform** command in EXEC or administration EXEC mode.

System Admin EXEC Mode
show platform [**detail** | **slices**] [**location** [*node-id*]]
XR EXEC Mode
show platform

Syntax Description

location *node-id*	Specifies the target node. The *node-id* argument is entered in the *rack/slot* notation.
slices	Displays summary of node forwarding slices.
detail	Speciies details of node type and state

Command Modes

EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.
Release 5.2.3	The output for the **detail** keyword captures card failure events and the reason for failure when **show platform** command is run in System Admin EXEC mode.

Usage Guidelines

The **show platform** command provides a summary of the nodes in the system, including node type and status.

For NCS 6008, EP1 will be displayed as, **Not allowed online**, until the required license is bought.

The following example shows sample output from the **show platform**command:

```
RP/0/RP0/CPU0:router#show platform
Mon Apr 29 14:55:30.938 IST
Node              Type                       State             Config state
--------------------------------------------------------------------------------
0/0/CPU0          NC57-48Q2D-S               IOS XR RUN        NSHUT
0/0/NPU0          Slice                      UP
0/1/CPU0          NC55-36X100G-A-SE          IOS XR RUN        NSHUT
0/1/NPU0          Slice                      UP
0/1/NPU1          Slice                      UP
0/1/NPU2          Slice                      UP
0/1/NPU3          Slice                      UP
0/2/CPU0          NC57-48Q2D-SE-S            IOS XR RUN        NSHUT
0/2/NPU0          Slice                      UP
0/3/CPU0          NC55-24X100G-SE            IOS XR RUN        NSHUT
0/3/NPU0          Slice                      UP
0/3/NPU1          Slice                      UP
0/3/NPU2          Slice                      UP
0/3/NPU3          Slice                      UP
0/5/CPU0          NC57-36H6D-S               IOS XR RUN        NSHUT
0/5/NPU0          Slice                      UP
```

```
0/6/CPU0          NC57-48Q2D-SE-S            IOS XR RUN        NSHUT
0/6/NPU0          Slice                      UP
0/7/CPU0          NC55-MOD-A-S               IOS XR RUN        NSHUT
0/7/NPU0          Slice                      UP
0/RP0/CPU0        NC55-RP2-E(Active)         IOS XR RUN        NSHUT
0/RP1/CPU0        NC55-RP-E(Standby)         IOS XR RUN        NSHUT
0/FC1             NC55-5508-FC2              OPERATIONAL       NSHUT
0/FC2             NC55-5508-FC2              OPERATIONAL       NSHUT
0/FC3             NC55-5508-FC2              OPERATIONAL       NSHUT
0/FC5             NC55-5508-FC2              OPERATIONAL       NSHUT
0/FT0             NC55-5508-FAN2             OPERATIONAL       NSHUT
0/FT1             NC55-5508-FAN2             OPERATIONAL       NSHUT
0/FT2             NC55-5508-FAN2             OPERATIONAL       NSHUT
0/PM0             N9K-PAC-3000W-B            OPERATIONAL       NSHUT
0/PM1             N9K-PAC-3000W-B            OPERATIONAL       NSHUT
0/PM2             NC55-PWR-3KW-AC            OPERATIONAL       NSHUT
0/PM3             NC55-PWR-3KW-AC            OPERATIONAL       NSHUT
0/PM4             N9K-PAC-3000W-B            OPERATIONAL       NSHUT
0/PM5             N9K-PAC-3000W-B            OPERATIONAL       NSHUT
0/SC0             NC55-SC                    OPERATIONAL       NSHUT
0/SC1             NC55-SC                    OPERATIONAL       NSHUT
```

The following example shows sample output from the **show platform**command in system admin mode:

```
sysadmin-vm:0_RP0#show platform
Mon Apr  29 09:27:02.124 UTC+00:00
Location  Card Type                HW State      SW State      Config State
------------------------------------------------------------------------------
0/0       NC57-48Q2D-S             OPERATIONAL   OPERATIONAL   NSHUT
0/1       NC55-36X100G-A-SE        OPERATIONAL   OPERATIONAL   NSHUT
0/2       NC57-48Q2D-SE-S          OPERATIONAL   OPERATIONAL   NSHUT
0/3       NC55-24X100G-SE          OPERATIONAL   OPERATIONAL   NSHUT
0/5       NC57-36H6D-S             OPERATIONAL   OPERATIONAL   NSHUT
0/6       NC57-48Q2D-SE-S          OPERATIONAL   OPERATIONAL   NSHUT
0/7       NC55-MOD-A-S             OPERATIONAL   OPERATIONAL   NSHUT
0/RP0     NC55-RP2-E               OPERATIONAL   OPERATIONAL   NSHUT
0/RP1     NC55-RP-E                OPERATIONAL   OPERATIONAL   NSHUT
0/FC1     NC55-5508-FC2            OPERATIONAL   OPERATIONAL   NSHUT
0/FC2     NC55-5508-FC2            OPERATIONAL   OPERATIONAL   NSHUT
0/FC3     NC55-5508-FC2            OPERATIONAL   OPERATIONAL   NSHUT
0/FC5     NC55-5508-FC2            OPERATIONAL   OPERATIONAL   NSHUT
0/FT0     NC55-5508-FAN2           OPERATIONAL   N/A           NSHUT
0/FT1     NC55-5508-FAN2           OPERATIONAL   N/A           NSHUT
0/FT2     NC55-5508-FAN2           OPERATIONAL   N/A           NSHUT
0/PM0     NC55-PWR-3KW-AC          OPERATIONAL   N/A           NSHUT
0/PM1     NC55-PWR-3KW-AC          OPERATIONAL   N/A           NSHUT
0/PM2     NC55-PWR-3KW-AC          OPERATIONAL   N/A           NSHUT
0/PM3     NC55-PWR-3KW-AC          OPERATIONAL   N/A           NSHUT
0/PM4     N9K-PAC-3000W-B          OPERATIONAL   N/A           NSHUT
0/PM5     NC55-PWR-3KW-AC          OPERATIONAL   N/A           NSHUT
0/SC0     NC55-SC                  OPERATIONAL   OPERATIONAL   NSHUT
0/SC1     NC55-SC                  OPERATIONAL   OPERATIONAL   NSHUT
```

show redundancy

To display the status of route processor redundancy, use the **show redundancy** command in EXEC mode.

show redundancy [**location** {*node-id* | **all**} | **statistics** | **summary**]

Syntax Description

location {*node-id* | **all**}	(Optional) Specifies the node for which to display LED information. The *node-id* argument is expressed in the *rack/slot* notation. Use the **all** keyword to indicate all nodes.
statistics	(Optional) Displays redundancy statistics information.
summary	(Optional) Displays a summary of all redundant node pairs in the router.

Command Default

Route processor redundancy information is displayed for all nodes in the system.

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show redundancy** command to display the redundancy status of the . The **show redundancy** command also displays the boot and switchover history for the RPs. . To view the nonstop routing (NSR) status of the standby RPs in the system, use the **summary** keyword.

Task ID

Task ID	Operations
system	read
basic-services	read (for **statistics** keyword)

```
RP/0/RP0/CPU0:router# show redundancy
Mon Apr 29 15:11:38.718 IST
Redundancy information for node 0/RP0/CPU0:
==========================================
Node 0/RP0/CPU0 is in ACTIVE role
Partner node (0/RP1/CPU0) is in STANDBY role
Standby node in 0/RP1/CPU0 is ready
Standby node in 0/RP1/CPU0 is NSR-ready

Reload and boot info
----------------------
RP reloaded Sat Apr 27 10:50:01 2024: 2 days, 4 hours, 21 minutes ago
```

```
Active node booted Sat Apr 27 10:50:01 2024: 2 days, 4 hours, 21 minutes ago
Standby node boot Sat Apr 27 15:34:50 2024: 1 day, 23 hours, 36 minutes ago
Standby node last went not ready Mon Apr 29 10:39:47 2024: 4 hours, 31 minutes ago
Standby node last went ready Mon Apr 29 10:39:50 2024: 4 hours, 31 minutes ago
Standby node last went not NSR-ready Sat Apr 27 15:29:44 2024: 1 day, 23 hours, 41 minutes
 ago
Standby node last went NSR-ready Sat Apr 27 15:39:22 2024: 1 day, 23 hours, 32 minutes ago
There have been 0 switch-overs since reload

Active node reload "CARD_SHUTDOWN"
Standby node reload "CARD_SHUTDOWN "
```

Table 63: show redundancy Field Descriptions

Field	Description
Node */*/* is in *XXX* role	Current role of the primary route processor, where (*/*/*) is the route processor ID in the format *rack*/*slot*/*module*, and *XXX* is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP0/CPU0 is in active role.
Partner node (*/*/*) is in *XXX* role	Current role of the secondary (or partner) route processor, where (*/*/*) is the route processor ID in the *rack*/*slot*/*module* format, and *XXX* is the role of the route processor (active or standby). In the example, this field shows that the node with the ID 0/RP1/CPU0 is in standby role.
Standby node in (*/*/*) is ready	Current state of the standby node, where (*/*/*) is the standby route processor ID. In the example, the standby node is ready.
Standby node in (*/*/*) is NSR-ready	Current state of the standby node regarding nonstop routing (NSR), where (*/*/*) is the standby route processor ID. In the example, the standby node is NSR-ready.
Reload and boot info	General overview of the active and standby route processors' reload and boot history.

show version

To display the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images, use the **show version** command in appropriate configuration mode.

show version [**detail**]

Syntax Description

detail	Specifies detail log of system hardware and software status

Command Default

No default behavior or values

Command Modes

XR EXEC

Command History

Release	Modification
Release 5.0.0	This command was introduced.

Usage Guidelines

The **show version** command displays a variety of system information, including hardware and software version, router uptime, boot settings (configuration register), and active software.

Task ID

Task ID	Operations
basic-services	read

This example shows partial output from the **show version** command for for IOS XR 64 Bit version:

```
RP/0/RP0/CPU0:router#show version
Mon Apr 29 15:13:48.798 IST
Cisco IOS XR Software, Version 24.2.1.34I
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
 Built By     : swtools
 Built On     : Mon Apr 22 02:27:23 PDT 2024
 Built Host   : iox-ucs-032
 Workspace    : /auto/iox-ucs-032-san1/prod/24.2.1.34I.SIT_IMAGE/ncs5500/ws
 Version      : 24.2.1.34I
 Location     : /opt/cisco/XR/packages/
 Label        : 24.2.1.34I

cisco NCS-5500 () processor
System uptime is 2 days 4 hours 23 minutes
```

The following is sample output from the **show version** command with the detail keyword:

```
RP/0/RP0/CPU0:router#show version detail
Mon Apr 29 15:13:57.610 IST
Cisco IOS XR Software, Version 24.2.1.34I
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
 Built By     : swtools
```

```
 Built On     : Mon Apr 22 02:27:23 PDT 2024
 Built Host   : iox-ucs-032
 Workspace    : /auto/iox-ucs-032-san1/prod/24.2.1.34I.SIT_IMAGE/ncs5500/ws
 Version      : 24.2.1.34I
 Location     : /opt/cisco/XR/packages/
 Label        : 24.2.1.34I

cisco NCS-5500 () processor
Cisco NCS-5508 (Intel(R) Xeon(R) CPU D-1528 @ 1.90GHz) processor with 32GB of memory
MSFT_5508_VigorLS System uptime is 2 days 4 hours 23 minutes
NCS5500 8 Slot Single Chassis
```

Frequency Synchronization Commands

This chapter describes the Cisco IOS XR frequency synchronization commands that are used to distribute precision frequency around a network.

For detailed information about frequency synchronization concepts, configuration tasks, and examples, see the *Configuring Frequency Synchronization on Cisco IOS XR Software* configuration module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

clear frequency synchronization esmc statistics

To clear the Ethernet Synchronization Messaging Channel (ESMC) statistics, use the **clear frequency synchronization esmc statistics** command in EXEC mode.

clear frequency synchronization esmc statistics interface { *interface* | **all** | **summary** **location** { *node-id* | **all** } }

Syntax Description

interface	The command can be restricted to clear the ESMC statistics for a particular interface by specifying the interface.
node-id	The output can be restricted to clear the ESMC statistics for a particular node by specifying the location. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to clear the ESMC statistics:

```
RP/0/0RP0/CPU0:router:hostname# clear frequency synchronization esmc statistics interface
gigabitethenet 0/1/0/1
```

clear frequency synchronization wait-to-restore

To clear the wait-to-restore timer, use the **clear frequency synchronization wait-to-restore** command in EXEC mode.

clear frequency synchronization wait-to-restore { { **all** | **sync** *port-num* **location** *node-id* } | **interface** { *type interface-path-id* | **all** } }

Syntax Description

all	Clears all wait-to-restore timers.
interface *type interface-path-id*	Clears the wait-to-restore timers for a specific interface or all interfaces.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to clear the frequency synchronization wait-to-restore timer on la specific interface:

```
RP/0/0RP0/CPU0:router:hostname#clear frequency synchronization wait-to-restore interface
gigabitethenet 0/1/0/1
```

clock-interface sync

To configure a clock interface for frequency synchronization on a specific node, use the **clock-interface sync** command in global configuration mode. To remove the clock interface from a node, use the **no** form of this command.

clock-interface sync *port-id* **location** *node-id*
no clock-interface sync *port-id* **location** *node-id*

Syntax Description

port-id	Clock interface port number.
location *node-id*	Specifies the node for clock interface frequency synchronization. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

This example shows how to configure a clock interface for frequency synchronization on a specific node:

```
Router# config
Router(config)# clock-interface sync 0 location 0/RP0/CPU0
Router(config-clock-if)# frequency synchronization
Router(config-clk-freqsync)#
```

Frequency Synchronization

To enable Frequency Synchronization globally on the router and to configure Frequency Synchronization options for a controller or interface, use the **frequency synchronization** command in the appropriate configuration mode. To disable Frequency Synchronization, use the **no** form of this command.

frequency synchronization
no frequency synchronization

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Global configuration (config)

Interface configuration (config-interface)

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuration of Frequency Synchronization on the router involves enabling it both in global configuration, and at the interface, where you can configure additional commands.

When you configure Frequency Synchronization in global configuration mode, the default clocking is configured for line timing mode.

Task ID

Task ID	Operations
ethernet-services	execute

The following example shows how to enable Frequency Synchronization in global configuration:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname(config)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-freqsync)# commit
```

Examples

The following example shows how to enable Frequency Synchronization on an Ethernet interface:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname(config)# interface gigabitEthernet 0/5/0/0
RP/0/0RP0/CPU0:router:hostname(config-if)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)#
```

gps-input

To configure the GPS input parameters on an interface, use the **gps-input** command in clock interface port parameters configuration mode. To revert to the default parameters, use the **no** form of this command.

gps-input { **offset** { **gps** | **tai** | **utc** } | **tod-format** { **cisco** | **ntp4** | **gprmc** } | **baud-rate** *baud-rate-value* } [**pps-input** { **rs422** | **ttl** }]

Syntax Description

tod-format	Specifies the format of the time-of-day messages.
gprmc	Specifies that the received time of day messages are in the NMEA GPRMC format.
cisco	Specifies that received time-of-day messages are in the Cisco ASCII format.
ntp4	Specifies that received time-of-day messages are in the NTP Type 4 format.
offset	Specifies the leap second correction to be applied on GPS input time. This is an optional parameter. If no option is specified, the GPS input time is based on UTC (Coordinated Universal Time) and the leap second correction is performed accordingly.
gps	Specifies the GPS input time based on GPS epoch.
tai	Specifies the GPS input time based on TAI (Temps Atomique International also known as International Atomic Time) time scale and no leap second correction is required.
utc	Specifies the GPS input time based on UTC.
rs422	Specifies that received 1PPS messages are in RS-422 mode.
ttl	Specifies that received 1PPS messages are in TTL mode.
baud-rate*baud-rate-value*	Specifies the baud-rate for the ToD UART input.

Command Default

GPS parameters are not configured.

Command Modes

Clock interface port parameters configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **gps-input** command to specify input parameters for a clock interface that is configured for GPS timing.

Task ID

Task ID	Operation
drivers	read, write

This example shows how to specify sample input parameters for a clock interface:

```
Router# configure
Router(config)# clock-interface sync 2 location 0/RP0/CPU0
Router(config-clock-if)# port-parameters
Router(config-clk-parms)# gps-input tod-format cisco pps-input rs422 offset utc
```

log selection

To enable logging of changes or errors to, use the **log selection** command in configuration mode. To disable logging, use the **no** form of this command.

log selection {**changes** | **errors**}
no log selection

Syntax Description

changes	Logs every time there is a change to the selected source, including any logs that the **errors** keyword logs.
errors	Logs only when there are no available frequency sources, or when the only available frequency source is the internal oscillator.

Command Default

No default behavior or values

Command Modes

Frequency synchronization configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

This example shows how to enable logging of changes to frequency synchronization:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname#(config)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname#(config-freqsync)# log selection changes

#
```

quality receive

To configure all the Synchronization Status Message (SSM) quality levels (QLs) for the frequency source from the receive interface, use the **quality receive** command in the appropriate SyncE mode. To return to the default levels, use the no form of this command.

quality receive itu-t option { **exact** *ql-option ql* | **highest** *ql-option ql* | **lowest** *ql-option ql* [**highest** *ql*] }
no quality receive receive

Syntax Description

ql-option Quality Level (QL) ITU-T options.

Valid values are:

- **1**—ITU-T Option 1
- **2 generation 1**—ITU-T Option 2 Generation 1
- **2 generation 2**—ITU-T Option 2 Generation 2

ql Quality Level (QL) value.

For line interfaces and clock interface with SSM support, any of the following combinations of QL values can be specified to modify the QL value received via SSM:

- If the **exact** keyword is used and the received or default QL is not DNU, then this value is used (rather than the received/default QL).
- If the **lowest** keyword is used and the received QL is a lower quality than this, then the received QL value is ignored and DNU is used instead.
- If the **highest** keyword is used and the received QL is higher quality than this, then the received QL value is ignored and this value is used instead.
- If the **lowest** and **highest** keywords are used, the behavior is as above. The maximum QL must be at least as high quality as the minimum QL.

Valid QL values for ITU-T Option 1 are:

- DNU
- EEC1
- PRC
- PRTC
- SSU-A
- SSU-B
- SEC
- eEEC
- ePRC
- ePRTC

Valid QL values for ITU-T Option 2 Generation 1 are:

- EEC2
- PRS
- PRTC
- STU
- ST2
- ST3
- SMC
- ST4
- RES
- eEEC
- ePRTC
- ePRC
- DUS

Valid QL values for ITU-T Option 2 Generation 2 are:

- PRS
- EEC2
- STU
- ST2
- TNC
- ST3E
- ST3
- SMC
- ST4
- PROV
- eEEC
- ePRTC
- PRTC
- ePRC
- DUS

Command Default

QL is unmodified.

Command Modes

Interface SyncE

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In cases where the clock interface supports SSM but it is not always enabled, all options are available. For clock interfaces where SSM is disabled or not being received, the QL used with the **exact** keyword specifies a precise QL to use for the interface. The QL specified with the **lowest** and **highest** keywords only acts on a received QL, which is only detected in cases where SSM is not running and a loopback has been detected. In this case the **lowest** and **highest** QL values modify the effective input QL.

Note If SSM is disabled, only the exact QL option is available.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to configure all the SSM quality levels for the frequency source from the receive interface:

```
Router# configure
Router(config)# int HundredGigE0/0/1/0
Router(config-if)# frequency synchronization
Router(config-if-freqsync)# quality receive exact itu-t option 2 generation 2 ST3
```

port-parameters

To specify the type of external clock source for a clock interface, use the **port-parameters** command in clock interface configuration mode. To remove the clock source definition, use the **no** form of this command.

port-parameters {**bits-input** *mode* | **bits-output** *mode* | **dti** | **ics**}
no port-parameters {**bits-input** *mode* | **bits-output** *mode* | **dti** | **ics**}

Syntax Description

{**bits-input** }	Specifies a building integrated timing supply (BITS) input timing device.
{**bits-output**}	Specifies a building integrated timing supply (BITS) output timing device.
mode	Type of BITS signal. Valid options are: • **2m** • **6m-output-only** • **e1** • **t1**

Command Default

No clocking type is defined.

Command Modes

Clock interface configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
drivers	read, write

This example shows how to configure the external clock source to be DTI:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# clock-interface sync 1 location 0/RSP0/CPU0
RP/0/RP0/CPU0:router(config-clock-if)# port-parameters dti
```

quality transmit

To configure all the Synchronization Status Message (SSM) quality levels for the frequency source from the transmit interface, use the **quality transmit** command in the appropriate frequency synchronization mode. To return to the default levels, use the **no** form of this command.

quality transmit itu-t option { **exact** *ql-option ql* | **highest** *ql-option ql* | **lowest** *ql-option ql* [**highest** *ql*] }
no quality transmit

Syntax Description

ql-option	Quality Level (QL) ITU-T options. Valid values are: • **1**—ITU-T Option 1 • **2 generation 1**—ITU-T Option 2 Generation 1 • **2 generation 2**—ITU-T Option 2 Generation 2
ql	Quality Level (QL) value. • If the **exact** keyword is used and the received or default QL is not DNU, then this value is used (rather than the received/default QL). • If the **lowest** keyword is used and the received QL is a lower quality than this, then the received QL value is ignored and DNU is used instead. • If the **highest** keyword is used and the received QL is higher quality than this, then the received QL value is ignored and this value is used instead. • If the **lowest** and **highest** keywords are used, the behavior is as above. The maximum QL must be at least as high quality as the minimum QL.

Valid QL values for ITU-T Option 1 are:

- EEC1
- PRC
- PRTC
- SSU-A
- SSU-B
- SEC
- DNU
- eEEC
- ePRC
- ePRTC
- PRC

Valid QL values for ITU-T Option 2 Generation 1 are:

- EEC2
- PRS
- PRTC
- STU
- SMC
- ST2
- ST3
- eEEC
- ePRC
- ePRTC
- SMC
- ST4
- RES
- DUS

Valid QL values for ITU-T Option 2 Generation 2 are:

- EEC2
- PROV
- PRS
- PRTC
- STU
- ST2
- TNC
- eEEC
- ePRC
- ePRTC
- ST3E
- ST3
- SMC
- ST4
- PROV
- DUS

Command Default

The QL is unmodified

Command Modes

Interface SyncE

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If the interface is the selected source, DNU is always sent regardless of this configuration.

This configuration has no effect when SSM is disabled.

Note For clock interfaces that do not support SSM, only the lowest QL can be specified. In this case, rather than sending DNU, the output is squelched, and no signal is sent.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example show how to configure all the SSM quality levels for the frequency source from the transmit interface:

```
Router# configure
Router(config)# int HundredGigE0/0/1/0
Router(config-if)# frequency synchronization
Router(config-if-freqsync)# quality transmit exact itu-t option 2 generation 2 ST3
```

selection input

To configure an interface so that it is available as a timing source for selection by the system, use the **selection input** command in the appropriate frequency synchronization configuration mode. To remove the interface as an available timing source, use the **no** form of this command.

selection input
no selection input

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Controller frequency synchronization configuration

Interface frequency synchronization configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to configure an interface so that it is available as a timing source for selection by the system:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname(config)# interface gigabitethernet 0/1/0/1
RP/0/0RP0/CPU0:router:hostname(config-if)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# selection input
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# commit
```

show frequency synchronization clock-interfaces

To display the frequency synchronization information for all clock-interfaces or for a specific node, use the **show frequency synchronization clock-interfaces** command in EXEC mode.

show frequency synchronization clock-interfaces [**brief**] [**location** *node-id*]

Syntax Description

brief	Displays summary information for all clock interfaces.
location *node-id*	Displays information for a specific interface. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

The following example shows the output for the **show frequency synchronization clock-interfaces** command:

```
Router# show frequency synchronization clock-interfaces brief
Flags: > - Up D - Down S - Assigned for selection
d - SSM Disabled s - Output squelched L - Looped back
Node 0/RP0/CPU0:
==============
Fl Clock Interface QLrcv QLuse Pri QLsnd Output driven by
===== ================== ===  === ====== === ====== ========================
D Sync0 n/a n/a n/a n/a n/a
D Sync1 n/a n/a n/a n/a n/a
>S Sync2 None PRC 100 n/a n/a
>S Internal0 n/a SEC 255 n/a n/a
```

show Frequency Synchronization configuration-errors

To display information about any configuration inconsistencies that are detected, but that are not rejected by verification, use the **show frequency synchronization configuration-errors** command in EXEC mode.

show frequency synchronization configuration-errors [**location** *node-id*]

Syntax Description

location	Location of the card, specified by *node-id*.
node-id	The output can be restricted to a particular node by specifying the location. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

This example shows the normal output for the **show frequency synchronization configuration-errors** command:

```
Router# show frequency synchronization configuration-errors

Node 0/RP0/CPU0:
==============
  interface GigabitEthernet0/0/0/0 frequency synchronization

* frequency synchronization is enabled on this interface, but isn't enabled globally.

* The QL that is configured is from a different QL option set than is configured globally.
```

show Frequency Synchronization interfaces

To show the Frequency Synchronization information for all interfaces or for a specific interface, use the **show frequency synchronization interfaces** command in EXEC mode.

show frequency Synchronization { **brief** | **summary** [**location** *node-id*] | *type interface-path-id* }

Syntax Description

brief	Displays brief information for all interfaces.
summary [**location** *node-id*]	Displays summary information for all notes or a specific node. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.
type interface-path-id	Displays information for a specific interface.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows the display output for the **show frequency synchronization interfaces** command:

```
RP/0/0RP0/CPU0:router:hostname# show frequency synchronization interfaces

Interface GigabitEthernet0/0/0/0 (Up)
  Assigned as input for selection
  SSM Enabled
    Peer Up for 00:01:30, last SSM received 0.345s ago
    Peer has come up 4 times and timed out 3 times
    ESMC SSMs        Total  Information     Event        DNU
      Sent:          98765        98665       100         50
      Received:      54321        54320         1      54300
    13 malformed packets received
    11 received packets were not handled
  Input:
    Restore in 00:03:30
    Last received QL: Opt-II,2/PRC
    Effective QL: DNU, Priority 100
```

```
  Output:
    Selected source: Sync0 [0/0/CPU0]
    Selected source QL: OPT-II,2/SEC
    Effective QL: OPT-II,2/SEC
    Output is squelched
  Next selection points: LC_INGRESS

Interface SONET0/2/0/0 (Up)
  Assigned as input for selection
  SSM Enabled
  Input:
    Restore in 00:03:30
    Last received QL: Opt-II,2/PRC
    Effective QL: DNU, Priority 100
  Output:
    Selected source: Sync0 [0/0/CPU0]
    Selected source QL: OPT-II,2/SEC
    Effective QL: OPT-II,2/SEC
    Output is squelched
  Next selection points: LC_INGRESS
```

The output in brief mode is as follows:

```
Flags:  > - Up                D - Down              S - Assigned for selection
        d - SSM Disabled      x - Peer timed out    i - Init state
        s - Output squelched
Fl   Interface                QLrcv QLuse Pri QLsnd Source
==== ======================== ===== ===== === ===== ======================
>S   GigabitEthernet0/0/0/0   ST2   ST3   100 PRC   Sync0 [0/0/CPU0]
>S   GigabitEthernet0/0/0/1   PROV  DNU   100 PRC   Sync0 [0/0/CPU0]
DdS  GigabitEthernet0/1/0/0   n/a   ST3   50        Sync0 [0/0/CPU0]
D    SONET0/1/0/0             n/a   n/a   100 DNU   Sync0 [0/0/CPU0]
>    GigabitEthernet0/12/0/13 PRC   n/a   200 DNU   Sync0 [0/0/CPU0]
```

The output in summary mode is as follows, for each node:

```
Node 0/0/CPU0:
  34 Ethernet interfaces in Synchronous mode, 10 assigned for selection, 23 with SSM enabled

  ESMC SSMs        Total  Information    Event        DNU
    Sent:         198765       189665     9100        650
    Received:     654321       654320       91      54321

  12 SONET interfaces in Synchronous mode, 5 assigned for selection, 11 with SSM enabled
```

show frequency synchronization ptp

To display whether a PTP clock is available to frequency synchronization, use the **show frequency synchronization ptp** command in EXEC mode.

show frequency synchronization ptp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show frequency synchronization ptp** command shows whether a PTP clock is available to frequency synchronization or not. Options are “available” or “not available”.

Note This is not to be confused with output from the **show frequency synchronization selection** command, which displays the status of the timing stream from the PTP source.

Task ID

Task ID	Operation
ethernet-services	read

This example shows sample output from the **show frequency synchronization ptp** command:

```
Router# show frequency synchronization ptp

Wed Feb 13 13:56:55.412 PST
Node 0/RP0/CPU0
==============
  PTP is unavailable.
```

show frequency synchronization selection

To display the frequency synchronization selection information for all selection points or for a specific node, use the **show frequency synchronization selection** command in EXEC mode.

show frequency synchronization selection { **location** *node-id* }

Syntax Description

location *node-id*	Displays information for a specific node on the router. The *node-id* argument is entered in the *rack*/*slot*/*module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show frequency synchronization selection** command shows the status of the timing stream from the timing source

Task ID

Task ID	Operations
ethernet-services	execute

Examples

This example shows the normal output for the **show frequency synchronization selection** command:

```
Router# show frequency synchronization selection
Node 0/0/CPU0:
==============
Selection point: ETH_RXMUX (0 inputs, 0 selected)
Last programmed 1w2d ago, and selection made 1w2d ago
Next selection points
SPA scoped : None
Node scoped : None
Chassis scoped: T0-SEL-B 1588-SEL
Router scoped : None
Uses frequency selection

Selection point: LC_TX_SELECT (1 inputs, 1 selected)
Last programmed 01:53:50 ago, and selection made 01:53:50 ago
Next selection points
SPA scoped : None
Node scoped : None
Chassis scoped: None
Router scoped : None
Uses frequency selection
Used for local line interface output
```

```
S Input Last Selection Point QL Pri Status
== ======================== ======================== ===== === ===========
7 Sync2 [0/RP0/CPU0] 0/RP0/CPU0 T0-SEL-B 1 PRC 100 Available

Node 0/RP0/CPU0:
==============
Selection point: T0-SEL-B (2 inputs, 1 selected)
Last programmed 01:53:50 ago, and selection made 00:34:20 ago
Next selection points
SPA scoped : None
Node scoped : None
Chassis scoped: LC_TX_SELECT
Router scoped : None
Uses frequency selection
Used for local line interface output
S Input Last Selection Point QL Pri Status
== ======================== ======================== ===== === ===========
1 Sync2 [0/RP0/CPU0] n/a PRC 100 Locked
Internal0 [0/RP0/CPU0] n/a SEC 255 Available

Selection point: 1588-SEL (2 inputs, 1 selected)
Last programmed 01:53:50 ago, and selection made 00:34:19 ago
Next selection points
SPA scoped : None
Node scoped : None
Chassis scoped: None
Router scoped : None
Uses frequency selection
S Input Last Selection Point QL Pri Status
== ======================== ======================== ===== === ===========
1 Sync2 [0/RP0/CPU0] n/a PRC 100 Locked
Internal0 [0/RP0/CPU0] n/a SEC 255 Available

Selection point: CHASSIS-TOD-SEL (2 inputs, 1 selected)
Last programmed 01:53:50 ago, and selection made 01:53:49 ago
Next selection points
SPA scoped : None
Node scoped : None
Chassis scoped: None
Router scoped : None
Uses time-of-day selection
S Input Last Selection Point Pri Time Status
== ======================== ======================== === ==== ===========
1 Sync2 [0/RP0/CPU0] n/a 100 Yes Available
Internal0 [0/RP0/CPU0] n/a 255 No Available
```

show frequency synchronization selection back-trace

To display the path that was followed by the clock source that is being used to drive a particular interface use the **show frequency synchronization selection back-trace** command in EXEC mode.

show frequency synchronization selection back-trace {**clock-interface sync** *port-nu* | **interface** *type interface-path-id* | **ptp location** *node-id*}

Syntax Description

clock-interface sync *port- nu*	Displays the path to the specified clock interface.
interface *type interface-path-id*	Displays the path to the specified interface.
ptp location *node-id*	Displays the path to the specified PTP clock location.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show frequency synchronization selection back-trace** command displays the trace from the specified target interface, back to the clock source being used to drive it. The display includes the selection points that are being hit along the way.

Task ID

Task ID	Operation
ethernet-services	read

This example shows sample output from the **show frequency synchronization selection back-trace** command:

```
Router# show frequency synchronization selection back-trace interface GigabitEthernet0/2/0/0

Selected Source: GigabitEthernet0/3/0/0
Selection Points:
  0/2/CPU0 LC_TX_SELECT 1
  0/RP0/CPU0 T0_SEL_B 1
  0/RP0/CPU0 T4_SEL_A 1
  0/3/CPU0 ETH_RXMUX 1
  0/3/CPU0 EZ_RX_0_9 1
```

show frequency synchronization selection forward-trace

To display the path that was recovered from a particular interface, use the **show frequency synchronization selection forward-trace**

show frequency synchronization selection forward-trace {**clock-interface sync** *port-nu* | **interface** *type interface-path-id* | **ptp location** *node-id* | **gnss-receiver** *number* }

Syntax Description

clock-interface sync *port- nu*	Displays the path to the specified clock interface.
interface *type interface-path-id*	Displays the path to the specified interface.
ptp location *node-id*	Displays the path to the specified PTP clock location.
ntp location *node-id*	Displays the path to the specified NTP clock location.
gnss-receiver *number*	Specifies the number of gnss-receiver ranging from 0-4294967295.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show frequency synchronization selection forward-trace** command displays the trace from the specified interface, out to all selection points that receive the clock from the interface, and from any interfaces that are potentially being driven by this clock source.

Task ID

Task ID	Operation
ethernet-services	read

This example shows sample output from the **show frequency synchronization selection forward-trace** command:

```
Router# show frequency synchronization selection forward-trace clock-interface sync 2
location 0/RP0/CPU0
0/RP0/CPU0 T0-SEL-B
0/0/CPU0 LC_TX_SELECT
FortyGigE0/0/1/2
TenGigE0/0/0/12

0/RP0/CPU0 1588-SEL
0/RP0/CPU0 CHASSIS-TOD-SEL
```

ssm disable

To disable Synchronization Status Messaging (SSM) on an interface, use the **ssm disable** command in the appropriate frequency synchronization configuration mode. To return SSM to the default value of enabled, use the **no** form of this command.

ssm disable
no ssm disable

Command Default

Enabled

Command Modes

Interface frequency synchronization configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For frequency synchronization interfaces, the **ssm disable** command disables sending ESMC packets, and ignores any received ESMC packets.

The received QL value that is used if SSM is disabled depends on the option:

- Option 1: DNU
- Option 2: STU

Note If a clock interface does not support SSM, you are advised to disable SSM on the clock interface. This ensures that the clock interface output is squelched if the output QL from the clock interface would otherwise be DNU.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to disable SSM on an interface:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname(config)# interface gigabitethernet 0/1/0/1
RP/0/0RP0/CPU0:router:hostname(config-if)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# ssm disable
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# commit
```

time-of-day-priority

To control the order for which sources are selected for time-of-day (ToD), use the **time-of-day-priority** command in the appropriate frequency synchronization configuration mode. To revert to the default time-of-day priority, use the **no** form of this command.

time-of-day-priority *priority*
no time-of-day-priority

Syntax Description

priority	Priority that is used for frequency synchronization as the source for the ToD. Values can range from 1 (highest priority) to 254 (lowest priority).

Command Default

The default priority is 100.

Command Modes

Interface frequency synchronization

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **time-of-day-priority** to prioritize between different sources of the ToD source.

Task ID

Task ID	Operation
ethernet-services	read, write

This example shows how to configure the ToD priority for frequency synchronization:

```
RP/0/0RP0/CPU0:router:hostname(config)# interface Gig 0/1/0/0
RP/0/0RP0/CPU0:router:hostname(config-if)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# time-of-day-priority 200
```

wait-to-restore

To configure the wait-to-restore time for frequency synchronization on an interface, use the **wait-to-restore** command in the appropriate frequency synchronization configuration mode. To return the wait-to-restore time to the default value, use the **no** form of this command.

wait-to-restore *minutes*
no wait-to-restore *minutes*

Syntax Description

minutes	The delay time (in minutes) between when an interface comes up and when it is used for synchronization. The range is 0 to 12.

Command Default

There is a 5-minute delay for frequency synchronization after an interface comes up.

Command Modes

Interface frequency synchronization (config-if-freqsync)

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The wait-to-restore time is in minutes. When the configuration is changed, it does not affect any timers that are currently running. Any currently running wait-to-restore timers can be cleared using the **clear frequency synchronization wait-to-restore** command.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to configure the wait-to-restore time for frequency synchronization on an interface:

```
RP/0/0RP0/CPU0:router:hostname# config
RP/0/0RP0/CPU0:router:hostname(config)# interface gigabitethernet 0/1/0/1
RP/0/0RP0/CPU0:router:hostname(config-if)# frequency synchronization
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# wait-to-restore 0
RP/0/0RP0/CPU0:router:hostname(config-if-freqsync)# selection input
RP/0/0RP0/CPU0:router:hostname(config-sonet-freqsync)# commit
```

Configuration Management Commands

This module describes the Cisco IOS XR commands used to manage your basic configuration.

For detailed information about configuration management concepts, tasks, and examples, see .

activate advanced

To enable access to advanced system admin commands and configurations, use the **activate advanced** command in Admin EXEC mode. These commands and configurations allow access to the advanced functionalities of the system admin services.

activate advanced

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

This command should not be used unless specifically requested by Cisco TAC or another Cisco support representative.

Task ID

Task ID	Operation
admin	read, write, execute

This example shows sample output from the **activate advanced** command:

```
# activate advanced
Advanced commands must be used carefully. Continue? [yes,NO] yes
Tue Aug  29 20:05:16.635 UTC
```

apply-group-remove

To remove one or more configuration groups from an existing apply-group, use the **apply-group-remove** command in the same configuration mode in which the group was applied.

apply-group-remove *group-nameexisting-group-name*

Syntax Description

group-name	Name of the group you want to remove from an existing group. Up to eight group names can be specified in this command at a time.
existing-group-name	Name of the applied (pre-defined) group from which a group will be removed.

Command Default

None

Command Modes

Global configuration or any configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Consider, you have configured four groups, g10 g20 g30 g40 using the **apply-group** command. To remove g20, you can use the **apply-group-remove** command to edit the **apply-group** command configuration.

Note This command is not a configuration command and will not be seen in **show configuration** or **show run** commands.

Note This command has to be executed in the same configuration mode as the **apply-group** command used to configure the groups.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to remove the group, G-OSPF-B, using this command:

```
RP/0/RP0/CPU0:router configure
RP/0/RP0/CPU0:router (config)# router ospf 0
RP/0/RP0/CPU0:router (config-ospf)# apply-group-remove G-OSPF-B
```

exclude-group

To exclude (or override) a configuration group (or groups) to be inherited by the router configuration, use the **exclude-group** command in the appropriate configuration mode. To delete the set exclusion, use the **no** form of this command.

exclude-group *group-name*

Syntax Description

group-name	Configuration group name that needs to be excluded.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

More than one configuration group can be excluded simultaneously. A maximum of eight groups can be specified at one time.

Note From Release 6.3.1 onwards, you can enter Flexible CLI config groups, **apply-group** and **exclude-group** command in any order as long as the entire commit has all the group definitions needed.

Task ID

Task ID	Operation
config-services	read, write

Example

This example shows how to delete the group G_interface using the **exclude-group** command:

```
RP/0/RP0/CPU0:router (config) # exclude-group G_interface

exclude-group G_INTERFACE
ipv4 address 12.21.50.100 255.255.0.0
!
interface GigabitEthernet0/0/0/1
ipv4 address 12.21.51.100 255.255.0.0
```

service cli commit-optimized enable

To prevent the re-application of the commands which are already present in the running configuration of the router, use the **service cli commit-optimized enable** command in XR Config mode.

service cli commit-optimized enable

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR Config mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

None

Example

```
Router# configure
Router(config)# service cli commit-optimized enable
Router(config)# commit
```

show apply-group

To display the applied configuration groups, use the **show apply-group** command in EXEC mode.

show apply group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The output of this show command indicates if the group is a part of the global apply-group or is a part of the sub-mode level apply-group.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to use the **show apply-group** command:

```
RP/0/RP0/CPU0:router #  show apply-group
             Global       Non-Global
Groups Reference Count Reference Count
------ --------------- ---------------
B               1             0
C               1             0
```

Reference count can either be 0 ro 1. 0 indicates that the group is not applied globally; 1 indicates that the group is globally applied.

show configuration failed

To display information about a configuration that failed during the last commit , use the **show configuration failed** command in EXEC mode.

show configuration failed [**inheritance**]

Syntax Description

inheritance	Displays the failed configuration details at the inheritance level.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Without the inheritance keyword, this command displays the failed configuration information in brief.

Task ID

Task ID	Operation
config-services	read

Example

This example shows how to run the **show configuration failed** command:

Note When there are two (or more) groups that have failed, the ordering of the failed groups is displayed in the same order as the apply-group statement.

```
RP/0/RP0/CPU0:router (config) #  show config failed
!! SEMANTIC ERRORS: This configuration was rejected by
!! the system due to semantic errors. The individual
!! errors with each failed configuration command can be
!! found below.
apply-group GROUP-1 GROUP-2 GROUP-3 GROUP-4 GROUP-5
!% Please issue "show configuration failed inheritance" for details.
Applying following groups failed: GROUP-2 GROUP-4 GROUP-5
```

snmp-server script

To map the script file with custom OID, use the **snmp-server script** command in XR Config mode.

snmp-server script script-oid *oid-number* **script-filename** *file-name*

Syntax Description

script-oid*oid-number*	The OID number to be added as custom OID. The custom OID number has to be followed by root OID 1.3.6.1.4.1.9.9.999998.
script-filename*file-name*	The name of the script file to be mapped.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
snmp	read,write

Examples

This example shows how to map the script file with custom OID.

```
Router(config)#snmp-server script script-oid 1.3.6.1.4.1.9.9.999998.10 script-filename
show_lldp_string.py
```

abort

To terminate a configuration session and discard all uncommitted changes without system confirmations, use the **abort** command in any configuration mode.

abort

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **abort** command to terminate a configuration session and return to EXEC mode from any configuration mode. This command discards all uncommitted configuration changes. You are prompted to commit the changes.

Task ID

Task ID	Operations
Task ID for the feature or mode impacted by the command	Operation for the feature or mode impacted by the command

The following example shows how to use the **abort** command to discard all changes made during a configuration session:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)#
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# abort
RP/0/RP0/CPU0:router#
```

admin

To enter Admin EXEC mode, use the **admin** command in EXEC mode.

admin

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines Use the **admin** command to enter System Admin EXEC mode mode. Administration commands are used to execute various administration plane commands.

Note Administration commands can be run only by entering administration mode and not by prefixing the **admin** command with the keyword in XR EXEC mode mode.

Task ID

Task ID	Operations
admin	read, write, execute

The following example shows how to enter System Admin EXEC mode mode:

```
RP/0/RP0/CPU0:router# admin
RP/0/RP0/CPU0:router(admin)#
```

To use administration configuration mode, use the **configure** command in System Admin EXEC mode mode:

alias

To create a command alias, use the **alias** command in global Configuration mode. To delete an alias, use the **no** form of this command.

alias *alias-name*
no alias *alias-name*

Syntax Description

alias-name	Name of the command alias. Alias names can be a single word or multiple words joined by a hyphen (-) or an underscore (_).

Command Default

No command aliases are configured.

Command Modes

Global Configuration mode

Admin EXEC mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Cisco IOS XR software supports generic alias definitions for various entities. Any physical or logical entity can have an alias as a reference. For example, an alias can refer to a command, a partial command, a group of commands, a location, or an IP address.

An alias must first be defined. The alias can then be used in command lines in place of the defined entity.

Following is a list of properties for an alias:

- An alias can be used anywhere and in any mode.
- An alias can have zero, one, or many parameters.
- An alias can refer to those parameters with the $ sign.
- If an alias refers to more than one command, the commands must be separated by a semicolon (;).
- The size of the **alias** command is limited to 1024 characters.

The alias command can be used anywhere. If the content referenced by the alias is invalid or inappropriate in that context or mode, the system issues a warning message containing the substituted content.

An alias name should not be a subset of the keywords that it represents as alias. Substitution is done only when the entered input match fails completely. For instance, the attempt to define an alias with “config? as the alias name fails, as shown in the following example:

```
RP/0/RP0/CPU0:router(config)# alias config set_host hostname router
RP/0/RP0/CPU0:router(config)# show configuration

alias set_host hostname router
```

Use the **show aliases** command to display all command aliases or the command aliases in a specified mode.

Task ID

Task ID	Operations
logging	read, write

The following example shows how to create an alias named ipbr for the **show ipv4 interface brief** command, commit the configuration, enter XR EXEC mode and then enter the configured alias:

The following example shows the use of a parameter name in an alias definition:

```
RP/0/RP0/CPU0:router(config)# alias shint (intname) show interface $intname
```

The following example shows an alias defined with one parameter and two commands:

```
RP/0/RP0/CPU0:router(config)# alias shint_both (intname) show interface $intname;show run
interface $intname
```

apply-group

To cause the configuration commands contained for creating a group or multiple groups to be inherited by the router configuration within which it is applied, use the **apply-group** command in the appropriate configuration mode. To remove a group configuration, use the **no** form of this command.

apply-group *group-name* [*group-name*]
no apply-group

Syntax Description

group-name	Name of the configuration group to apply. The group must be previously defined. Up to eight group names can be specified at one time.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuration statements in configuration groups come into effect only when the configuration groups are applied in the system configuration, and the configuration statements have the correct context and inheritance priority in the mode in which the configuration groups are applied. The maximum number of configuration groups that can be specified in a single **apply-group** command is eight.

To change the composition of an **apply-group** command, you must specify all desired groups. For example, if you used the command `apply-group g10 g20 g30`, and now you want to add the group g15, use the command `apply-group g10 g15 g20 g30`. If you now want to delete group g20, use the command `apply-group g10 g15 g30`. If you use the **no apply-group** command, all groups are removed from the configuration.

Note From the Release 6.3.1 onwards, you are able to enter the Flexible CLI config group definition, **apply-group** and **exclude-group** command in any order as long as the entire commit has all the group definitions needed.

Note Use multi-line configuration style to configure Flexible CLI configuration groups by entering each configuration mode in a separate line, one configuration per line. This is important so that the configuration properties are fully inherited and for better readability during troubleshooting.

Task ID

Task ID	Operation
config-services	read, write

This example applies a configuration group to a specific OSPF instance:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# router ospf 0
RP/0/RP0/CPU0:router(config-ospf)# apply-group G-OSPF-B
```

apply-template

To apply a template to the target configuration, use the **apply-template** command in global Configuration mode.

apply-template *template-name* [**(***param-list***)**]

Syntax Description

template-name	Name of the template to be applied to the running configuration. Use the **template** command to define a template.
param-list	(Optional) Up to five template parameters.

Command Default

No templates are applied to the target configuration.

Command Modes

Global Configuration mode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **apply-template** command to apply a template to the target configuration. Templates allow you to create a template name that represents a group of configuration commands.

Use the **template** command to define a template. Use the **end-template** command to exit template configuration mode and return to global configuration mode. Use the **show-running** command with the optional **template** *template-name* keyword and argument to display the contents of a template.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to define a template and then apply the template to the target configuration:

```
RP/0/RP0/CPU0:router(config)# template hostname-template
RP/0/RP0/CPU0:router(config-TPL)# hostname router1
RP/0/RP0/CPU0:router(config-TPL)# end-template
RP/0/RP0/CPU0:router(config)# apply-template hostname-template
```

clear comment

To discard a comment associated with a configuration, use the **clear comment** command in any configuration or global Configuration mode.

clear comment

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The **clear comment** command clears any comments that were added for a specific configuration in the configuration file. After you enter the **clear comment** command, enter the configuration for which you want to delete the comment on a separate line.

The comment is displayed in the output of the **show running-config** command:

```
RP/0/RP0/CPU0:router# show running-config
...
!router1 is located in xxx
hostname router1
...
```

Task ID

Task ID	Operations
Task ID for the feature or configuration mode impacted by the command	Operation for the feature or configuration mode impacted by the command

The following example shows how to discard the comment associated with the configuration ipv4 address 10.0.0.1 255.0.0.0.

```
RP/0/RP0/CPU0:router(config-if)# clear comment
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
```

clear configuration commits

To delete old commit IDs from the commit database to free up disk space, use the **clear configuration commits** command in Admin EXEC mode or EXEC mode.

clear configuration commits {**diskspace** *kilobytes* | **oldest** *number-of-commits*}

Syntax Description

diskspace *kilobytes*	Deletes as many commit IDs (beginning with the oldest available commit ID) from the commit database as required to free the number of kilobytes (KB) specified for the *kilobytes* argument. The range for the number of kilobytes of disk space to free is 1 to 4194304. **Note** The amount of disk space freed may vary depending on the size and number of commits present in the commit database.
oldest *number-of-commits*	Deletes the number of commit IDs specified for the *number-of-commits* argument. **Note** Use the online help (**?**) function to display the range of commit IDs available for deletion.

Command Default

None

Command Modes

EXEC

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear configuration commits** command to delete the number of commit IDs available for rollback operations. The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Note The **clear configuration commits** command deletes commits from the commit database only. The running configuration, thus, is not changed.

Note When a commit ID is deleted from the commit database, it is no longer available for rollback and can no longer be used to display commit changes (with the **show configuration rollback changes** command).

Use the **rollback configuration** command to roll back the current running configuration to a previous configuration. Use the **show configuration rollback changes** command to display a list of the commit IDs available for rollback operations or to display the changes that would be made by the **rollback configuration** command.

Task ID

Task ID	Operations
config-services	execute

The following example shows how to delete the oldest 16 commit IDs to free up disk space. After entering this command, you will be prompted to confirm the deletion.

```
RP/0/RP0/CPU0:router# clear configuration commits oldest 16

Deleting 16 rollback points '1000000021' to '1000000036'
256 KB of disk space will be freed. Continue with deletion?[confirm] y
```

clear configuration inconsistency

To clear an inconsistency alarm for a router configuration or admin plane configuration, use the **clear configuration inconsistency** command in EXEC mode.

clear configuration inconsistency

Syntax Description

This command has no keywords or arguments.

Command Default

EXEC mode: Clears the inconsistency alarms for an SDR configuration.

Command Modes

Admin EXEC mode

EXEC mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

An inconsistency alarm is set when there is a failure to restore the configuration; this can occur during router startup, or when a line card or card is inserted or removed.

If an inconsistency alarm is set, a message similar to the following example is displayed:

```
RP/0/0/CPU0:May 26 11:58:40.662 : cfgmgr-rp[130]: %MGBL-CONFIGCLI-3
   BATCH_CONFIG_FAIL : 28 config(s) failed during startup. To view
   failed config(s) use the command - "show configuration failed startup"

RP/0/0/CPU0:May 26 11:58:41.731 : cfgmgr-rp[130]:
   %MGBL-CONFIG-3-ADMIN_INCONSISTENCY_ALARM : Admin plane configuration
   inconsistency alarm has been raised. Configuration commits will be
   blocked until an ADMIN plane 'clear configuration inconsistency' command
   has been run to synchronize persisted admin plane configuration with
   running admin configuration.
```

When the inconsistency alarm is set, all configuration commit operations fail until the alarm is cleared using the **clear configuration inconsistency** command. This command clears the alarm and removes the failed configuration.

For example, the following configuration commit fails to finish due to an existing inconsistency alarm:

```
RP/0/RP0/CPU0:router# configure

ADMIN plane running configuration is inconsistent with persistent
  configuration.
No configuration commits will be allowed until an admin plane
'clear configuration inconsistency' command is performed.
RP/0/RP0/CPU0:router(config)# hostname router2
RP/0/RP0/CPU0:router(config)#commit

ADMIN plane running configuration is inconsistent with persistent
```

```
  configuration.
No configuration commits will be allowed until an admin plane
'clear configuration inconsistency' command is performed.
```

Enter the **clear configuration inconsistency** command to clear the alarm and allow commit operations to continue.

Note To reapply the failed configuration, you must reapply and recommit the configuration. Use the **load configuration failed** command with the **startup** keyword to populate the target configuration with the contents of the previous failed configuration from the startup configuration.

Use the **show configuration history** command with the **alarm** keyword to view the inconsistency alarm set and alarm clear events in the configuration history log.

Command Modes

To clear the inconsistency alarms for the router, enter the **clear configuration inconsistency** command in EXEC mode.

Task ID

Task ID	Operations
config-services	execute

The following example shows how to clear the inconsistency alarms for an SDR configuration. The command is entered in XR EXEC mode and impacts only that SDR.

In the following example, a history of the inconsistency alarms set and cleared for the configuration are displayed using the **show configuration history** command with the **alarm** keyword:

```
RP/0/RP0/CPU0:router# show configuration history alarm

  Sno.  Event      Info                          Time Stamp
  ~~~~  ~~~~~      ~~~~                          ~~~~~~~~~~
  1     alarm      inconsistency alarm raised    Thu Jun 22 15:23:15 2009
  2     alarm      inconsistency alarm cleared   Thu Jun 22 15:42:30 2009
  3     alarm      inconsistency alarm raised    Sun Jul  9 13:39:57 2009
  4     alarm      inconsistency alarm cleared   Sun Jul  9 14:15:48 2009
  5     alarm      inconsistency alarm raised    Sat Jul 15 18:18:26 2009
  6     alarm      inconsistency alarm cleared   Sat Jul 15 19:21:03 2009
```

clear configuration inconsistency replica

To resolve configuration inconsistencies on a replica node, use the **clear configuration inconsistency replica** command in administration EXEC or EXEC mode.

clear configuration inconsistency replica location *node-id*

Syntax Description

location *node-id*	Resolves the configuration inconsistencies on the designated node. The *node-id* argument is expressed in the *rack/slot* notation.

Command Default

EXEC or XR EXEC mode: Resolves any configuration inconsistencies for the router configuration.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

In XR EXEC mode, the replica nodes are the that can become the .

Use the **clear configuration inconsistency replica** command if there is a configuration inconsistency between the standby DSC and the current active DSC; or alternatively, if the configuration on any nodes that could become the DSC is not the same as the configuration on the current DSC. To determine if you have a configuration inconsistency, use the **show configuration inconsistency replica** command.

To clear configuration inconsistencies for an SDR configuration, enter the **clear configuration inconsistency replica** command in XR EXEC mode for that SDR.

Task ID

Task ID	Operations
config-services	execute

The following example shows how to clear any configuration inconsistencies for the DSC configuration by using the **clear configuration inconsistency replica** command in XR EXEC mode:

```
RP/0/RP0/CPU0:router# clear configuration inconsistency replica location 0/rp1/cpu0

The replica has been repaired.
```

clear configuration sessions

To clear (end) an active configuration session, use the **clear configuration sessions** command in Administration EXEC or EXEC mode..

clear configuration sessions

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear configuration sessions** command to clear a configuration session. This command can be used to end the configuration sessions of another user. Any uncommitted changes to a user's target configuration are discarded.

Use the **show configuration sessions** command to identify active configuration sessions.

When a configuration session is cleared, a message is displayed on the terminal of the terminated user. For example:

```
RP/0/RP0/CPU0:router(config)# This configuration session was terminated by user 'user_a'
from line 'aux0_0_CPU0'
```

Task ID

Task ID	Operations
config-services	execute

The following example shows how to clear an active configuration session. In this example, the **show configuration sessions** command displays the active configuration session. The **clear configuration sessions** command clears the active configuration session.

```
RP/0/RP0/CPU0:router# show configuration sessions

Current Configuration Session   Line           User      Date                      Lock
00000211-002c409b-00000000      con0_1_CPU0  UNKNOWN   Mon Feb  2 01:02:09 2009
```

configuration commit auto-save

To enable automatic saving of the running configuration to a specified file on every commit, use the **configuration commit auto-save** command in global Configuration mode. To disable automatic saving of the running configuration to a specified file on every commit, use the **no** form of the command.

Caution Saving the running configuration to a file is CPU intensive.

configuration commit auto-save [**filename** *file_path* | **password** { **clear** { **encryption-aes** | **encryption-default** } *password* | **encrypted** | { **encryption-aes** | **encryption-default** } *password* } | **maximum** *number* | **timestamp** | **wait-time** *duration*]

Syntax Description

filename *file_path*	Specifies the location to which to save the running configuration.
password *password*	Specifies the password of the remote URL.
clear	Specifies an unencrypted password.
encryption-aes	Saves the password in aes encrypted form.
encryption-default	Saves password in default encrypted form.
encrypted	Specifies an encrypted password.
maximum *number*	Specifies how many maximum auto-saves are possible.
timestamp	Includes the timestamp in the auto-save filename.
wait-time*duration*	Specifies how long to wait to auto-save after the commit done to start the next auto-save.The *duration*can be specified as: days *days* | hours *hours* | minutes *minutes* | seconds *seconds*

Command Default

None

Command Modes

Global Configuration mode

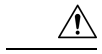
Command History

Release	Modification
Release 7.10.1	This command was modified to support public key authentication.
Release 7.9.1	This command was modified to include, **scp**,**sftp**, **password**, **wait-time**, **timestamp**, and **maximum** keywords.
Release 6.1.2	The command was enhanced to save the copy of your config with unique filename

Usage Guidelines

The **configuration commit auto-save** command configures the system to save the running configuration to the specified file and location every time a **commit** command is run. Alternatively, you can save the configuration on a one-time basis by specifying the **save-running** keyword when you run the **commit** command. Use the following syntax when using **tftp**, **ftp**, **scp**, **sftp** or **rcp** as options.

[***tftp*|*ftp**rcp**scp**sftp***]



Caution Saving the running configuration to a file is CPU intensive.

Task ID

Task ID	Operations
config-services	write

The following example shows how to configure the system to save the running configuration to the file `//test-folder/test_123`, backup encrypted password,append time-stamp, configure maximum number of auto-save files possible, and specify wait-time before backing up the files whenever the configuration is commited:

```
Router#configure
Router(config)#configuration commit auto-save
Router(config-cfg-autosave)#filename sftp://user1@server1://test-folder/test_123
Router(config-cfg-autosave)#password clear encryption-default cisco
Router(config-cfg-autosave)#timestamp
Router(config-cfg-autosave)#maximum 10
Router(config-cfg-autosave)#wait-time days 0 hours 0 minutes 0 seconds 5
Router(config-cfg-autosave)#commit
```

While you are using public key authentication to save the running configuration, you don't need to mention password.

configure

To enter global configuration mode or administration configuration mode, use the **configure** command in EXEC mode or Admin EXEC mode.

configure [**exclusive** | **terminal**]

Syntax Description

exclusive	(Optional) Locks the router configuration. The system configuration can be made only from the login terminal.
terminal	(Optional) Configures the system from the login terminal. This is the default.

Command Default

If the **configure** command is entered without a keyword, the system is configured from the login terminal.

Command Modes

EXEC

Admin EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuration modes are used to enter changes to a target configuration session and commit those changes to the running configuration. A router running Cisco IOS XR software contains multiple configurations:

- The configuration for a . This mode is used to configure - specific features such as routing protocols.
- The administration configuration for system-wide resources and settings. Some features can be configured only in administration configuration mode.

XR Config mode

Use the **configure** command in XR EXEC mode to enter XR Config mode and create a new target configuration for an SDR. From global configuration mode, you can enter any configuration mode. Configuration changes entered in global configuration mode impact the SDR to which the user is currently logged in.

System Admin Config mode

Use the **configure** command in System Admin EXEC mode to enter System Admin Config mode and create a new target configuration. From System Admin EXEC mode , you can enter any configuration mode. Configuration changes entered in System Admin EXEC mode can impact resources for the entire router. See the command reference documentation for a specific command to determine the impact of commands entered in System Admin EXEC mode.

Router Prompt

After you enter the **configure** command, the system appends "(config)" to the router prompt, indicating that the router is in a configuration mode. For example:

- The following prompt indicates that you are in global configuration mode for an SDR:

```
RP/0/RP0/CPU0:router(config)#
```

- The following prompt indicates that you are in administration configuration mode:

```
RP/0/RP0/CPU0:router(admin-config)#
```

Locking a Configuration Session

To lock the configuration so that no other user can commit changes to the running configuration during your configuration session, issue the **configure** command with the **exclusive** keyword.

Committing Changes and Returning to XR EXEC mode or System Admin EXEC mode

Changes to the target configuration remain inactive until the **commit** command is entered. To leave global configuration or administration configuration mode and return to the XR EXEC mode or System Admin EXEC mode prompt, issue the **end** or **exit** command; you are prompted to commit any uncommitted changes.

To leave configuration mode and return directly to XR EXEC mode or System Admin EXEC mode without being prompted to commit changes and without saving changes to the target configuration, enter the **abort** command in any configuration mode.

The following example shows how to enter global configuration mode from XR EXEC mode and then enter interface configuration mode to configure an IPv4 address , the **configure** command commits the configuration, and the **end** command terminates the configuration session and return the router to XR EXEC mode.

description (interface)

To add a description to an interface configuration, use the **description** command in interface configuration mode. To remove the description, use the **no** form of this command.

description
no description

Syntax Description

Comment or a description applied to the interface. The maximum number of characters is 1022.

Command Default

No description is configured.

Command Modes

Interface configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **description** command to add a description to an interface configuration. The maximum number of characters is 1022.

Task ID

Task ID	Operations
interface	read, write

The following example shows how to add a description to an interface configuration. In this example, the **description** command names a Management Ethernet interface.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface mgmteth 0/

1/CPU0/0
RP/0/RP0/CPU0:router(config-if)# description Management Ethernet Interface
```

do

To execute an EXEC mode command from a configuration mode, use the **do** command in any configuration mode.

do *exec-command*

Syntax Description

exec-command	XR EXEC mode command to be executed.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To display the various XR EXEC mode commands that are available to execute with the **do** command, use the online help (?) function at the configuration mode prompt.

Note The **configure** and **describe** commands are not supported with the **do** command.

Task ID

The following example shows how to execute an XR EXEC command from interface configuration mode. In this example, the **do** command displays output from the **show protocols** command within interface configuration mode:

```
RP/0/RP0/CPU0:router(config)# interface tengige 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# do show protocols

Routing Protocol "BGP 1"

Address Family IPv4 Unicast:
  Distance: external 20 internal 200 local 200
```

end-group

To exit from configuration group submode and return to global configuration mode, use the **end-group** command in group configuration mode.

end-group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Group configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

After you have included all configuration statements that you want in a particular configuration group, use the **end-group** command to exit group configuration mode.

Task ID

Task ID	Operation
config-services	read, write

This example shows how to complete the configuration of a configuration group and exit group configuration mode:

```
RP/0/RP0/CPU0:router(config)# group g-int-gige
RP/0/RP0/CPU0:router(config-GRP)# interface 'GigabitEthernet.*'
RP/0/RP0/CPU0:router(config-GRP-if)# mtu 1514
RP/0/RP0/CPU0:router(config-GRP-if)# end-group
RP/0/RP0/CPU0:router(config)#
```

end-template

To exit template configuration mode and return to Global Configuration mode, use the **end-template** command in template configuration mode.

end-template

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Template configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **end-template** command to exit template configuration mode after you have completed the template definition.

To define a template, use the **template** command. To apply a template to the target configuration, use the **apply-template** command. To view the contents of a template, use the **show running-config** command with the optional **template** *template-name* keyword and argument.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to enter template configuration mode, define a template named “hostname-template” and then exit from template configuration mode:

```
RP/0/RP0/CPU0:router(config)# template hostname-template
RP/0/RP0/CPU0:router(config-TPL)# hostname router-cs1
RP/0/RP0/CPU0:router(config-TPL)# end-template
RP/0/RP0/CPU0:router(config)#
```

end

To terminate a configuration session and return directly to EXEC mode or Admin EXEC mode, use the **end** command in any configuration mode.

end

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

Use the **end** command to exit any configuration mode and return directly to XR EXEC mode System Admin EXEC mode. If you enter this command without committing the changes to the target configuration, you are prompted to do so:

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]:
```

- Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to XR EXEC mode System Admin EXEC mode.

  If errors are found in the running configuration, the configuration session does not end. To view the errors, enter the **show configuration** (config) command with the **failed** keyword.

- Entering **no** exits the configuration session and returns the router to XR EXEC mode System Admin EXEC mode without committing the configuration changes.
- Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

Note Entering **Ctrl-Z** is functionally equivalent to entering the **end** command.

Use the **abort** command to exit the configuration session and return to XR EXEC mode System Admin EXEC mode without being prompted to commit changes and without saving changes to the target configuration.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to use the **end** command to end a configuration session. Changes stored in the target configuration are committed by answering **yes**.

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# interface tengige 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# end

Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]: yes
RP/0/RP0/CPU0:router#
```

exit

To close an active terminal session and log off the router, use the **exit** command in EXEC mode or Admin EXEC mode..

To return the router to the next higher configuration mode, use the **exit** command in any configuration mode.

exit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Any configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To log off from a terminal session, enter the **exit** command in XR EXEC mode System Admin EXEC mode.

When exiting from global or administration configuration mode to XR EXEC mode System Admin EXEC mode, you are prompted to commit any uncommitted configuration changes.

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]:
```

- Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to XR EXEC mode System Admin EXEC mode.

  If errors are found in the running configuration, the configuration session does not end. To view the errors, enter the **show configuration** (config) command with the **failed** keyword.
- Entering **no** exits the configuration session and returns the router to XR EXEC mode System Admin EXEC mode without committing the configuration changes.
- Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

Note Entering the **exit** command from global configuration is functionally equivalent to entering the **end** command.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to return the router to the next higher command mode. In this example, the **exit** command exits from interface configuration mode and returns to global configuration mode. The **exit** command is entered a second time to exit from global configuration mode and return to XR EXEC mode. Because the configuration has not been committed explicitly (with the **commit** command), the system prompts to commit the configuration changes made during the session.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.0.0.1 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# exit
RP/0/RP0/CPU0:router(config)# exit
Uncommitted changes found, commit them before exiting(yes/no/cancel)?[cancel]: yes
```

The following example shows how to use the **exit** command from XR EXEC mode to log off from a terminal session:

```
RP/0/RP0/CPU0:router# exit

router con0_RP1_CPU0 is now available

Press RETURN to get started.
```

group (configuration)

To define a configuration group containing configuration statements that can be applied in the router configuration, use the **group** command in global configuration mode. To remove a configuration group from the running configuration, use the **no** form of this command.

group *group-name config-statements*
no group *group-name*

Syntax Description

group-name	Name of the configuration group.
config-statements	Series of configuration statements, starting in global configuration mode, that comprise this configuration group.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **group** command enters group configuration mode where you can list a series of configuration statements that can then be used elsewhere in the router configuration. Most configuration commands can be used in group configuration mode. You must be in a user group associated with a task group that includes the appropriate task IDs for each of the command statements that you list within a configuration group.

The *group-name* argument is limited to 32 characters and is case-sensitive. It must not contain any of these special characters:

- ` - grave
- ' - single quote
- " - double quote
- < - less than
- > - greater than
- (- open parenthesis
-) - close parenthesis
- [- open bracket
-] - close bracket
- { - open brace

- } - close brace
- / - slash
- \ - backslash
- & - ampersand
- ^ - caret
- ! - exclamation point
- ? - question mark
- ~ - tilde
- * - asterisk
- % - percent sign
- = - equal sign
- , - comma
- + - plus sign
- | - vertical bar
- - space

A configuration group can be removed from the running configuration, only if it is not used by a configured **apply-group** command.

To exit from configuration group submode and return to global configuration mode, use the **end-group** command.

Regular expressions are used within the configuration statements to make them widely applicable. POSIX 1003.2 regular expressions are supported in the names of configuration statements. Single quotes are used to delimit a regular expression. For example, to specify the regular expression GigabitEthernet.* that matches all GigabitEthernet interfaces, enter the regular expression within single quotes as 'GigabitEthernet.*'.

To display a list of available interface types for your router configuration, enter **interface ?** at the configuration group prompt:

```
RP/0/RP0/CPU0:router(config-GRP)# interface ?

  ATM              'RegExp': ATM Network Interface(s)
  BVI              'RegExp': Bridge-Group Virtual Interface
  Bundle-Ether     'RegExp': Aggregated Ethernet interface(s)
  Bundle-POS       'RegExp': Aggregated POS interface(s)
  GigabitEthernet  'RegExp': GigabitEthernet/IEEE 802.3 interface(s)
  IMA              'RegExp': ATM Network Interface(s)
  Loopback         'RegExp': Loopback interface(s)
  MgmtEth          'RegExp': Ethernet/IEEE 802.3 interface(s)
  Multilink        'RegExp': Multilink network interface(s)
  Null             'RegExp': Null interface
  POS              'RegExp': Packet over SONET/SDH network interface(s)
  PW-Ether         'RegExp': PWHE Ethernet Interface
  PW-IW            'RegExp': PWHE VC11 IP Interworking Interface
  Serial           'RegExp': Serial network interface(s)
  tunnel-ip        'RegExp': GRE/IPinIP Tunnel Interface(s)
```

```
tunnel-mte       'RegExp': MPLS Traffic Engineering P2MP Tunnel interface(s)
tunnel-te        'RegExp': MPLS Traffic Engineering Tunnel interface(s)
tunnel-tp        'RegExp': MPLS Transport Protocol Tunnel interface
```

Note Although you are required to enter only enough characters for the interface type to be unique, it is recommended that you enter the entire phrase. All interface types used in regular expressions are case-sensitive.

For example, you can use the command `interface 'GigabitEthernet.*'`, but not `interface 'gigabite.*'`. To specify a subinterface, prefix the expression with the characters \. (backslash period), for example: `interface 'GigabitEthernet.*\..*'`. Refer to the *Configuring Flexible Command Line Interface Configuration Groups* module in the *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers* for more extensive examples.

Task ID

Task ID	Operation
config-services	read, write

This example shows the definition of a configuration group to configure Gigabit Ethernet interfaces with ISIS routing parameters:

```
RP/0/RP0/CPU0:router(config)# group g-isis-gige
RP/0/RP0/CPU0:router(config-GRP)# router isis '.*'
RP/0/RP0/CPU0:router(config-GRP-isis)# interface 'GigabitEthernet.*'
RP/0/RP0/CPU0:router(config-GRP-isis-if)# lsp-interval 20
RP/0/RP0/CPU0:router(config-GRP-isis-if)# hello-interval 40
RP/0/RP0/CPU0:router(config-GRP-isis-if)# address-family ipv4 unicast
RP/0/RP0/CPU0:router(config-GRP-isis-if-af)# metric 10
RP/0/RP0/CPU0:router(config-GRP-isis-if-af)# end-group
RP/0/RP0/CPU0:router(config)#
```

To illustrate the use of this configuration group, assume that you want to configure Gigabit Ethernet interfaces with ISIS routing parameters, as shown here:

```
router isis green
 interface GigabitEthernet0/0/0/0
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/1
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/2
  lsp-interval 20
  hello-interval 40
```

```
  address-family ipv4 unicast
   metric 10
  !
 !
 interface GigabitEthernet0/0/0/3
  lsp-interval 20
  hello-interval 40
  address-family ipv4 unicast
   metric 10
  !
 !
!
```

There are three possible ways to use the configuration group to configure these interfaces. The first is by applying the group within the interface configuration, as shown here:

```
router isis green
 interface GigabitEthernet0/0/0/0
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/1
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/2
  apply-group g-isis-gige
  !
 !
 interface GigabitEthernet0/0/0/3
  apply-group g-isis-gige
 !
!
```

The second way to configure these interfaces using the configuration group is to apply the configuration group within the **router isis** configuration, as shown here:

```
router isis green
 apply-group g-isis-gige
 interface GigabitEthernet0/0/0/0
 !
 interface GigabitEthernet0/0/0/1
 !
 interface GigabitEthernet0/0/0/2
 !
 interface GigabitEthernet0/0/0/3
 !
!
```

In this situation, any other Gigabit Ethernet interfaces that you configure in ISIS green configuration inherit the configuration group configurations.

The third way to configure these interfaces using the configuration group is to apply the group at the global level, as shown here:

```
apply-group g-isis-gige
router isis green
 interface GigabitEthernet0/0/0/0
 !
```

```
 interface GigabitEthernet0/0/0/1
 !
 interface GigabitEthernet0/0/0/2
 !
 interface GigabitEthernet0/0/0/3
 !
!
```

In this example, the configuration of the group is applied to all Gigabit Ethernet interfaces configured for ISIS.

hostname

To specify or modify the hostname for the router, use the **hostname** command in global Configuration mode.

hostname *name*

Syntax Description

name	New hostname for the router.

Command Default

The factory-assigned default hostname is “ios.”

Command Modes

Global Configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The hostname is used in prompts and default configuration filenames.

No blank or space characters are permitted as part of a name. Do not expect case to be preserved. Uppercase and lowercase characters look the same to many Internet software applications. It may seem appropriate to capitalize a name the same way you might do in English, but conventions dictate that computer names appear all lowercase. For more information, see RFC 1178, *Choosing a Name for Your Computer*.

Task ID

Task ID	Operations
root-lr	read, write

The following example shows how to change the router hostname:

```
RP/0/RP0/CPU0:router(config)# hostname router1
```

load

To populate the target configuration with the contents of a previously saved configuration file, use the **load** command in global configuration or administration configuration mode.

load *device***:***directory-path*

Syntax Description

device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

If the full path of the file is not specified, the present working directory is used.

Command Modes

Administration configuration

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load** command to populate the target configuration with the contents of a previously saved configuration. When loading a file, you must specify the device, directory path, and filename of the configuration file.

Use the **commit** command in conjunction with the **load** command. Load a new configuration with the **load** command, and use the **commit** command with the **replace** keyword to have the loaded configuration become the active (running) configuration.

Use the **show configuration failed** (config) command with the optional **load** keyword to display syntax errors that occurred during the last load operation.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to load a target configuration file into the current configuration session. The current configuration session is then populated with the contents of the file.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# load disk1:myconfig.cfg
RP/0/RP0/CPU0:router(config)# show config

Building configuration...
interface TenGigE 0/3/0/0
 description My 10 GE Interface
```

```
 ipv4 address 10.10.11.20 255.0.0.0
!
end
```

load commit changes

To populate the target configuration with changes from previous configuration commits, use the **load commit changes** command in global configuration or administration configuration mode.

load commit changes {*commit-id* | **since** *commit-id* | **last** *number-of-commits*}

Syntax Description

commit-id	Specific configuration commit.
since *commit-id*	Loads all configuration changes committed into the target buffer since (and including) a specific configuration commit, *commit-id*.
last *number-of-commits*	Loads the configuration changes into the target buffer that have been made during the last number of configuration commits specified with the *number-of-commits* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load commit changes** command to populate the target configuration with changes from previous configuration commits. The changes are not applied until you enter the **commit** command.

Use the **show configuration** (config) command to display the target configuration.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with changes from a previous configuration commit:

```
RP/0/RP0/CPU0:router(config)# load commit changes since 1000000006

Building configuration...
Loading.
223 bytes parsed in 1 sec (222)bytes/sec
```

load configuration failed

To populate the target configuration with the contents of the previous failed configuration commit, use the **load configuration failed** command in global configuration or administration configuration mode.

load configuration failed {**commit** | **startup** [**previous** *number-of-reloads*] [**noerror**]}

Syntax Description

commit	Loads the failed configuration from the last commit.
startup	Loads the failed configuration from the startup configuration.
previous *number-of-reloads*	(Optional) Loads the failed configurations from a previous router reload. Valid *number-of-reloads* values are 1 to 4.
noerror	(Optional) Excludes the error reasons when the failed configurations are loaded.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load configuration failed** command to populate the target configuration with the contents of the previous failed configuration commit.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of the previous failed configuration commit:

```
RP/0/RP0/CPU0:router(config)# load configuration failed startup
Loading.
32 bytes parsed in 1 sec (31)bytes/sec
```

load configuration removed

To populate the target configuration with the contents of the previous removed configuration, use the **load configuration removed** command in global configuration or administration configuration mode.

load configuration removed *config-id*

Syntax Description

config-id	Identifier of the removed configuration to load.

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load configuration removed** command to populate the target configuration with the contents of the removed configuration during installation operations.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of the removed configuration during installation:

```
RP/0/RP0/CPU0:router(config)# load configuration removed 20070316021626.cfg
```

load rollback changes

To populate the target configuration with the contents of a previous configuration, use the **load rollback changes** command in global configuration or administration configuration mode.

load rollback changes {*commit-id* | **last** *number-of-commits* | **to** *commit-id*}

Syntax Description

commit-id	Rolls back the configuration changes for a specific configuration commit.
last *number-of-commits*	Rolls back to the configuration that existed before the last number of commits (specified with the *number-of-commits* argument) were made.
to *commit-id*	Rolls back to the running configuration that existed before the configuration specified with the *commit-id* argument.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **load rollback changes** command to load rollback configuration changes to the target configuration. This command is similar to the **rollback configuration** command. The difference between the commands is that the **load rollback changes** command copies the rollback changes to the target configuration and does not commit the changes until the changes are explicitly committed with the **commit** command.

Use the **show configuration rollback changes** command to display rollback changes.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to populate the target configuration with the contents of a previous configuration:

```
RP/0/RP0/CPU0:router(config)# load rollback changes 1000000004

Building configuration...
Loading.
302 bytes parsed in 1 sec (301)bytes/sec
```

man

Cisco IOS XR software provides online help for standard command-line interface (CLI) commands using manual (man) pages. To display manual pages, use the **man** command in or XR EXEC mode.

man {**command** *command-name* | **feature** [*feature-name*] | **keyword** *keywords*}

Syntax Description

command *command-name*	Displays the manual pages for a specific command. The *command-name* argument must include the complete command name.
feature [*feature-name*]	Displays all commands available in the feature. Use the **man** command with the **feature** keyword to list the available feature names.
keyword *keywords*	Displays a list of command names that match the keywords. Enter one or more keywords to match in a command. When entering multiple keywords, the keywords must be entered in the same sequential order as they are in the command.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You must have the documentation PIE installed before you can use the **man** command. If you attempt to run this command without the documentation PIE installed, an error is displayed as shown in the following example:

```
RP/0/RP0/CPU0:router# man command show install

Building index table...
Warning. Unable to get directory info for '/pkg/man' :No such file or directory.
 Discarding!
man [5521656]:Building index table failed. No entries found
```

For information about installing optional software PIEs, see the *Upgrading and Managing Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

Use the **man** command to display the manual pages for a specific command on the basis of the command name, a feature, or a keyword. Each man page contains the command name, syntax, command mode, usage, examples, and related commands.

The **man** command queries and displays command information about the router. A query can be based on keywords or a feature. The **feature** *feature-name* keyword and argument display all commands that match the feature. For example, entering **man feature - base-1** displays all commands that match the -base-1 feature. The **keyword** *keywords* keyword and argument display all commands that contain the specified keyword. For example, **man keyword ipv4** displays all commands that contain ipv4.

Task ID

Task ID	Operations
basic-services	read

The following example shows how to display the manual page for the **arp timeout** command:

```
RP/0/RP0/CPU0:router# man command arp timeout

COMMAND
arp timeout

DESCRIPTION


To specify how long dynamic entries learned on an interface remain in the
Address Resolution Protocol (ARP) cache, use the arp timeout command in
interface configuration mode. To remove the arp timeout command from the
configuration file and restore the system to its default condition with
respect to this command, use the no form of this command.

arp timeout seconds

no arp timeout<seconds>

SYNTAX DESCRIPTION

seconds
Time, in seconds, for which an entry remains in the ARP cache. The
range is from 0 to 4294967. A value of 0 means that entries are never
cleared from the cache. The default is 14400.

DEFAULTS

Entries remain in the ARP cache for 14400 seconds (4 hours).

COMMAND MODES

Interface configuration

COMMAND HISTORY

Release
Modification
```

```
Release 2.0
This command was introduced.

USAGE GUIDELINES

To use the arp timeout command, you must be a member of a user group
associated with the cef task ID.

For detailed information about user groups and task IDs, refer to the
Configuring AAA Services on Cisco IOS-XR Software module of the Cisco IOS-XR
System Security Configuration Guide.

This command is ignored when issued on interfaces that do not use ARP. Also,
ARP entries that correspond to the local interface or that are statically
configured by the user never time out.

The show interfaces command displays the ARP timeout value in
hours:minutes:seconds, as follows:

* * * * * * * * * * * * * * * * * * START OF LISTING * * * * * * * * * * * * * * * * * *

ARP type: ARPA, ARP Timeout 04:00:00
* * * * * * * * * * * * * * * * * * END OF LISTING * * * * * * * * * * * * * * * * * *

EXAMPLES

The following example shows how to set the ARP timeout to 3600 seconds to
allow entries to time out more quickly than the default:

* * * * * * * * * * * * * * * * * * START OF LISTING * * * * * * * * * * * * * * * * * *
RP/0/RP0/CPU0:router# configure

RP/0/RP0/CPU0:router(config)# interface MgmtEth 0/RP1/CPU0/0

RP/0/RP0/CPU0:router(config-if)# arp timeout 3600
* * * * * * * * * * * * * * * * * * END OF LISTING * * * * * * * * * * * * * * * * * *

RELATED COMMANDS

Command
Description

clear arp-cache
Deletes all dynamic entries from the ARP cache.

show arp (cache)
Displays the entries in the ARP table.

show interfaces
Displays statistics for all interfaces configured on the networking
device.
```

more

To display the contents of a file, use the **more** command in mode.

more [**/ascii** | **/binary** | **/ebcdic**] *filesystem***:***directory-path* **location** [*node-id*]

Syntax Description

/ascii	(Optional) Displays a binary file in ASCII format.
/binary	(Optional) Displays a file in hexadecimal or text format.
/ebcdic	(Optional) Displays a binary file in ebcdic format.
filesystem:directory-path	File system location of the file to be displayed. Include the file system alias for the *filesystem* argument, followed by a colon, and the directory path of the file to be displayed.
location [*node-id*]	(Optional) Displays the contents of a file on a designated node nodes.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **more** command to display any text file, especially an ASCII file stored on the router or accessible through the network. The file can be a configuration file or any other text file.

Task ID

Task ID	Operations
filesystem	execute

The following example shows partial sample output from the **more** command. The output displays a configuration file saved on the hard disk drive.

```
# more harddisk:/user/alternate.cfg

!! Last configuration change at 15:52:55 UTC Fri Feb 13 2009 by UNKNOWN
!
line console
exec-timeout 0 0
!
interface MgmtEth0/RP1/CPU0/0
 ipv4 address 10.32.45.154 255.0.0.0
```

```
 !
interface TenGigE0/1/0/0
 ipv4 address 10.32.45.155 255.0.0.0
 keepalive disable
 !
interface TenGigE0/1/0/1
 ipv4 address 10.32.45.156 255.0.0.0
 keepalive disable
 !
interface TenGigE0/1/0/2
/ip
 ipv4 address 10.32.45.157 255.0.0.0
 keepalive disable
 !
interface TenGigE0/1/0/3
 ipv4 address 10.32.45.158 255.0.0.0
 keepalive disable
 !
interface TenGigE0/2/0/0
 ipv4 address 10.32.45.159 255.0.0.0
 keepalive disable
 !
 --More--
```

The following example shows partial sample output from the **more** command. The output begins with unfiltered output from the first line that contains the regular expression “ipv4.” In this example, a new search is specified that begins with output lines that contain the regular expression “ipv4.”

```
RP/0/RP0/CPU0:router# more disk0:config.backup | begin ipv4

ipv4 address 2.2.2.2 255.255.255.255
!
interface TenGigE0/3/1/0
 shutdown
!
interface TenGigE0/3/1/2
 shutdown
!
interface TenGigE0/2/1/0
 ipv4 address 10.0.0.1 255.255.255.0
 keepalive disable
!
interface TenGigE0/2/1/1
  ipv4 address 10.0.0.1 255.255.255.0
  keepalive disable
!
interface TenGigE0/2/1/2
  ipv4 address 10.0.0.1 255.255.255.0
  keepalive disable
!
interface TenGigE0/2/1/3
 shutdown
!
  /ipv4

filtering...
 ipv4 address 10.0.0.1 255.255.255.0
 proxy-arp disable
 shutdown
!
interface TenGigE 0/1/0/0
 ipv4 address 10.0.0.1 255.255.255.0
```

```
 proxy-arp disable
!
route ipv4 0.0.0.0/0 12.25.26.5
route ipv4 223.255.254.254/32 12.25.0.1
end
```

The following example shows partial sample output of the **more** command on the sample file config.backup in disk0:. The command usage is `more disk0:config.backup | include log`. At the --More-- prompt, a new search is specified that begins with output lines that contain the regular expression “aaa.”

```
RP/0/RP0/CPU0:router# more disk0:config.backup | include log

logging trap
logging trap informational
logging console debugging
logging history size 1
.
.
.
/aaa

filtering...
aaa authentication login default none
```

The following example shows partial sample output from the **more** command. The output excludes lines that contain the regular expression “alias.” In this example, at the --More-- prompt, a new search is specified, beginning with output lines that contain the regular expression “ipv4 address.”

```
RP/0/RP0/CPU0:router# more disk0:myconfig/file | exclude alias

Building configuration...
!! Last configuration change at 18:17:00 UTC Thu May 16 2009 by lab
!
hostname router
line console
 exec-timeout 0 0
 width 132
 length 0
 session-timeout 0
/ipv4 address

filtering...
ipv4 address 10.10.1.1 255.255.255.255
!
interface Loopback200
 ipv4 address 10.20.1.1 255.255.255.255
!
interface TenGigE0/0/0/0
 ipv4 address 10.30.1.1 255.255.0.0
 keepalive 100
!
interface preconfigure TenGigE0/1/0/1
 shutdown
end
```

pwd (config)

To display the current configuration submode from a configuration submode, use the **pwd** command in any supported configuration submode.

pwd

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following example shows how to use the **pwd** command from an interface configuration submode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/6/4/5
RP/0/RP0/CPU0:router(config-if)# pwd

interface TenGigE0/6/4/5
RP/0/RP0/CPU0:router(config-if)#
```

root

To return to configuration mode from a configuration submode, use the **root** command in any supported configuration submode.

root

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any subconfiguration mode except the following:

- The **root** command is not available under the route-policy submodes, because it requires the **end-policy** command to exit out of the configuration.
- The **root** command is not available in template submode, but is available in the submodes configurable under the template submode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows how to use the **root** command to return to configuration mode from the interface configuration submode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# root
RP/0/RP0/CPU0:router(config)#
```

The following example shows how to use the **root** command from a submode configurable under the template submode. In this example, the **root** command is used to return to configuration mode from the username submode:

Note The recommended range for a user-defined username is 2-253 characters.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# template test
```

```
RP/0/RP0/CPU0:router(config-TPL)# username xyz
RP/0/RP0/CPU0:router(config-un)# root
RP/0/RP0/CPU0:router(config)# show conf

Building configuration...
template test
 username xyz
 !
 end-template
 end
```

Tip The **root** command is not available from the template submode, but is available in the submodes configurable under the template submode.

rollback configuration

To roll back the running configuration to a previous configuration, use the **rollback configuration** command in mode.

Syntax Description

last *number-of-commits*	Rolls back to the configuration that existed before the last number of commits (specified with the *number-of-commits* argument) were made.
to *commit-id*	Rolls back to the running configuration that existed before the configuration specified with the *commit-id* argument.
force	(Optional) Specifies to override any commit blocks.
label *label*	(Optional) Assigns a text label to this rollback. The *label* argument must begin with a letter.
comment	(Optional) Assigns a text to this rollback. The argument can be up to 60 characters long.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Each time the **commit** command is entered, a commit ID is assigned to the new configuration. You can revert the system to the configuration of a previous commit ID with the **rollback configuration** command:

- Use the **to** keyword to revert to the configuration that existed *before* the configuration specified with the *commit-id* argument.
- Use the **last** keyword to revert to the configuration that existed *before* the last number of configuration commits (specified with the *number-of-commits* argument) were made.
- Use **show configuration commit list** to display a list of the commit IDs available for rollback operations.

Note The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Use the **force** keyword to override commits that would fail otherwise. This is useful in the event of a low-memory condition on the router, to revert to a commit that would remove a configuration that caused the low-memory condition.

Note The rollback operation may fail if you try to rollback two (or more) commits where the individual commits involve the configuration and removing of the configuration of the same item, and there is a dependency of one item over another in any of the individual commit operations.

Task ID

Task ID	Operations
root-lr (EXEC)	read, write

Rolling Back to a Specific Commit ID

The following example shows how to roll back to a specific commit ID. In this example, the **show configuration commit list** command displays the available rollback points. The configuration is then rolled back to a prior commit with the **rollback configuration** command.

```
RP/0/RP0/CPU0:router# show configuration commit list

SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000009  lab       con0_0_C  Rollback    02:41:08 UTC Sun Sep 26 2009
2    1000000008  lab       con0_0_C  CLI         02:40:30 UTC Sun Sep 26 2009
3    1000000007  lab       con0_0_C  CLI         02:39:54 UTC Sun Sep 26 2009
4    1000000006  lab       con0_0_C  Rollback    02:38:40 UTC Sun Sep 26 2009
5    1000000005  lab       con0_0_C  CLI         02:37:35 UTC Sun Sep 26 2009
6    1000000004  lab       con0_0_C  CLI         02:37:04 UTC Sun Sep 26 2009

RP/0/RP0/CPU0:router# rollback configuration to 1000000008

Loading Rollback Changes.
Loaded Rollback Changes in 1 sec
Committing.
1 items committed in 1 sec (0)items/sec
Updating.RP/0/RP0/CPU0:Sep 26 02:42:09.318 : config_rollback[65707]: %LIBTARCFG-
6-COMMIT : Configuration committed by user 'lab'.   Use 'show commit changes 100
0000010' to view the changes.

Updated Commit database in 1 sec
Configuration successfully rolled back to '1000000008'.
```

Rolling Back to a Span of Configuration Commits

The following example shows how to roll back to the configuration that existed prior to the last two configuration commits:

```
RP/0/RP0/CPU0:router# rollback configuration last 2

Loading Rollback Changes.
Loaded Rollback Changes in 1 sec
Committing.
1 items committed in 1 sec (0)items/sec
Updating.
Updated Commit database in 1 sec
Configuration successfully rolled back 2 commits.
```

save configuration

To save the contents of a configuration to a file, use the **save configuration** command in mode.

save configuration *device*:*directory-path*

Syntax Description

running	Saves the contents of the running configuration.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save a configuration to a file, use the **save configuration** command.

To save a configuration that failed to a file, use the **save configuration failed** command.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0: from XR Config mode:

```
RP/0/RP0/CPU0:router(config)# save configuration disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

save configuration changes

To save the changes of a configuration to a file, use the **save configuration changes** command in mode.

save configuration changes *device***:***directory-path*

Syntax Description	
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save the configuration changes to be made during a replace operation to a file, use the **save configuration changes** command.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0: from XR Config mode:

```
RP/0/RP0/CPU0:router(config)# save configuration changes disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

save configuration commit changes

To save the changes for a commit, or a series of commits, to a file, use the **save configuration commit changes** command in mode.

save configuration commit changes {*commit-id* | **last** *number-of-commits* | **since** *commit-id*} *device***:***directory-path*

Syntax Description

commit-id	Specific commit ID.
last *number-of-commits*	Saves changes made in the most recent *number-of-commits*.
since *commit-id*	Saves changes made since (and including) a specific *commit-id*.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **save configuration commit changes** command to save the changes made in a commit operation to a file. You can specify a specific commit ID, all the changes since a specified commit ID, or the changes that occurred during the last *n* commits.

Task ID

Task ID	Operations
config-services	read

The following example saves the changes from the last two commit operations to disk0:

```
RP/0/RP0/CPU0:router# save configuration commit changes last 2 disk0:sample1

Destination file name (control-c to abort): [/sample1]?
Building configuration.
5 lines built in 1 second
[OK]
```

save configuration failed

To save the contents of the failed configuration, use the **save configuration failed** command in mode.

Syntax Description

load	Saves the failed configuration (syntax errors) in the last reload.
noerrors	Excludes the error reasons from the saved configuration.
startup	Saves the failed configuration during startup.
previous *number*	Saves a failed startup configuration from the specified previous sessions. The *number* argument is a value between 1 and 4 that indicates how many failed startup configurations to save.
device: directory-path	Storage device and directory path of the configuration file to be saved.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To save a configuration to a file, use the **save configuration** command.

To save a configuration that failed to a file, use the**save configuration failed** command.

To save a configuration that failed during startup to a file, use the **save configuration failed** command with the **startup** keyword.

Task ID

Task ID	Operations
config-services	read

The following example saves the failed configuration to disk0:

```
RP/0/RP0/CPU0:router# save configuration failed disk1:/configs
```

save configuration merge

To save the contents of a merged configuration to a file, use the **save configuration merge** command in mode.

save configuration merge *device*:*directory-path*

Syntax Description

device : *directory-path*	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows the configuration saved to disk0:

```
RP/0/RP0/CPU0:router# save configuration merge disk0:sample3

Destination file name (control-c to abort): [/sample3]?
Building configuration.
1 lines built in 1 second
[OK]
```

save configuration removed

To save the contents of a removed configuration to a file, use the **save configuration removed** command in global configuration or administration configuration mode.

save configuration removed *removed-configuration-file device*:*directory-path*

Syntax Description

removed-configuration-file	Specifies the name of the removed configuration file.
device:*directory-path*	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

Global configuration

Administration configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When a package is deactivated, the configuration belonging to that package is removed from the running configuration and saved to a file. To save a copy of the removed configuration file, use the **save configuration removed** command.

Task ID

Task ID	Operations
config-services	read

To view a list of the available removed configuration files, use the **save configuration removed** command followed by a question mark:

```
RP/0/RP0/CPU0:router(config)# save configuration removed ?

    20051208042507.cfg  Removed configuration.
    20051208044553.cfg  Removed configuration.
    <cr>
```

In the following example, a removed configuration is saved to disk0: and assigned the filename "sample3:"

```
RP/0/RP0/CPU0:router(config)# save configuration removed 20051208042507.cfg disk0:sample3

  Destination file name (control-c to abort): [/sample3]?
```

```
Building configuration.
1 lines built in 1 second
[OK]
```

save rollback changes

To save the rollback changes, use the **save rollback changes** command in mode.

save rollback changes {*commit-id* | **last** *number-of-commits* | **to commit-id**} *device***:***directory-path*

Syntax Description

commit-id	Specific commit ID.
last *number-of-commits*	Saves the rollback changes for the last *n* commits
to *commit-id*	Saves rollback changes up to a specific *commit-id*.
device: directory-path	Storage device and directory path of the configuration file to be loaded into the target configuration.

Command Default

None

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **save rollback changes** command to save the changes that would be made in a configuration rollback to a specific commit point or for a series of commits.

Task ID

Task ID	Operations
config-services	read

The following example shows that the rollback changes for the commit point 5 are saved to the file sample4 on disk0:

```
RP/0/RP0/CPU0:router# save rollback changes last 1 disk0:sample4

Destination file name (control-c to abort): [/sample4]?
Building configuration.
6 lines built in 1 second
[OK]
```

set default-afi

To set the default address family identifier (AFI) for the current session, use the **set default-afi** command in or XR EXEC mode.

set default-afi {**all** | **ipv4** | **ipv6**}

Syntax Description

all	Sets the default AFI to IPv4 and IPv6 for the current session.
ipv4	Sets the default AFI to IPv4 for the current session. This is the default setting.
ipv6	Sets the default AFI to IPv6 for the current session.

Command Default

The default AFI setting is set to IPv4 for all sessions.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-afi** command to set the default AFI for the current session. This command acts as a keystroke shortcut for **show** commands. If the default AFI setting is set to IPv4, then you would not have to specify the **ipv4** keyword for **show** commands that support the **ipv4** keyword. For example, if the AFI setting is set to IPv4, you could issue the **show route** command without specifying the **ipv4** keyword to display IPv4 routes in the Routing Information Base (RIB).

Use the **show default-afi-safi-vrf** command to display the default AFI setting.

Task ID

Task ID	Operations
basic-services	read, write

The following example shows how to set the default AFI to IPv6:

```
RP/0/RP0/CPU0:router# set default-afi ipv6

%% Default Address Family Identifier is set to 'ipv6'
```

set default-safi

To set the default subaddress family identifier (SAFI) for the current session, use the **set default-safi** command in or XR EXEC mode.

set default-safi {**all** | **multicast** | **unicast**}

Syntax Description

all	Sets the default SAFI to multicast and unicast for the current session.
multicast	Sets the default SAFI to multicast for the current session.
unicast	Sets the default SAFI to unicast for the current session. This is the default setting.

Command Default

The default SAFI setting is set to unicast for all sessions.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-safi** command to set the default SAFI setting for the current session. This command acts as a keystroke shortcut for **show** commands. If the default SAFI setting is set to unicast, you would not have to specify the **unicast** keyword for **show** commands that support that keyword. For example, if the default SAFI setting is set to unicast, you could issue the **show router** command without specifying the **unicast** keyword to display information about unicast address prefixes in the Routing Information Base (RIB).

Use the **show default-afi-safi-vrf** command to display the default SAFI setting.

Task ID

Task ID	Operations
basic-services	read, write

The following example shows how to set the default SAFI to multicast:

```
RP/0/RP0/CPU0:router# set default-safi multicast

%% Default Sub-Address Family Identifier is set to 'multicast'
```

set default-vrf

To set the default VPN routing and forwarding (VRF) instance for the current session, use the **set default-vrf** command in or XR EXEC mode.

set default-vrf {*name* | **none**}

Syntax Description

name	Default VPN routing and forwarding name.
none	Sets the default VPN routing and forwarding name to empty.

Command Default

The default VRF setting is set to empty.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **set default-vrf** command to set the default VRF setting for the current session. This command acts as a keystroke shortcut for **show** commands. For example, if the default VRF is configured, you can issue the **show route** command without specifying the VRF name.

When the default VRF for the session is set to **none**, then IPv4 routes for the system default VRF are displayed.

Note To override the default VRF setting, specify the VRF name in the **show** command.

Use the **show default-afi-safi-vrf** command to display the default VRF setting.

Task ID

Task ID	Operations
basic-services	read, write

In the following example, the default VRF is set to “dft_vrf:”

```
RP/0/RP0/CPU0:router# set default-vrf dft_vrf

  %% Default Virtual Routing/Forwarding is set to 'dft_vrf'
```

In the following command, the **show route** command is entered without specifying a VRF name. The results for the "dft_vrf" VRF are displayed because the default VRF was set to “dft_vrf.”

```
RP/0/RP0/CPU0:router# show route ipv4

  % No matching vrf found
```

When the default VRF for the session is set to **none**, the system default VRF routes are displayed. In the following example, the default VRF is set to (empty) and the **show route** command displays the system default VRF information:

```
RP/0/RP0/CPU0:router# set default-vrf none

%% Default Virtual Routing/Forwarding is set to ''

RP/0/RP0/CPU0:router# show route ipv4

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local

Gateway of last resort is 12.29.0.1 to network 0.0.0.0

  S*   0.0.0.0/0 [1/0] via 12.29.0.1, 00:31:30
  L    10.10.10.10/32 is directly connected, 3d02h, Loopback1
  C    12.29.0.0/16 is directly connected, 00:31:30, MgmtEth0/0/CPU0/0
  L    12.29.56.21/32 is directly connected, 00:31:30, MgmtEth0/0/CPU0/0
```

show

To display information about the system configuration or operational state, use the **show** command in EXEC mode, administration EXEC mode, or any configuration mode.

show *command*[| **begin** *regular-expression* | | **exclude** *regular-expression* | | **file** *filesystem:* | | **include** *regular-expression*]

Syntax Description

command	Supported **show** command.
|	Vertical bar (the "pipe" symbol) indicates that an output processing specification follows.
regular-expression	(Optional) Regular expression found in **show** command output.
begin	(Optional) Begins unfiltered output of the **show** command with the first line that contains the regular expression.
exclude	(Optional) Displays output lines that do not contain the regular expression.
file *filesystem:*	(Optional) Writes the output lines that contain the regular expression to the specified file on the specified file system. Include the file system alias for the *filesystem* argument, followed by a colon, and the directory path and filename.
include	(Optional) Displays output lines that contain the regular expression.

Command Default

None

Command Modes

EXEC

Administration EXEC

Any configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show** commands display information about the system and its configuration. To display a list of the available **show** commands, use the question mark (?) online help function.

Filtering Output

Search options for the **show** command are shown in this table.

Table 64: Show Command Search Options

Command	Purpose
show *command* | **begin** *regular-expression*	Begins unfiltered output of the **show** command command with the first line that contains the regular expression.
show *command* | **exclude** *regular-expression*	Displays output lines that do not contain the regular expression.
show *command* | **include** *regular-expression*	Displays output lines that contain the regular expression.
show *command* | **file** *filesystem:*	Writes the output lines that contain the regular expression to the specified file on the specified file system.

Adding a Filter at the --More-- Prompt

You can also specify a filter at the --More-- prompt of a **show** command output. To filter output from the --More-- prompt, enter a forward slash (/) followed by a regular expression. The filter remains active until the command output finishes or is interrupted (using **Ctrl-Z** or **Ctrl-C**).

- If a filter is specified at the original command or a previous --More-- prompt, a second filter cannot be applied.
- The use of the **begin** keyword does not constitute a filter.
- The minus sign (–) preceding a regular expression displays output lines that do not contain the regular expression.
- The plus sign (+) preceding a regular expression displays output lines that contain the regular expression.

Task ID

Task ID	Operations
Task ID for the feature used with the **show** command	read

For example, the **show interfaces** command requires read privileges in the interface task ID.

The following example shows output from the **show interface | include protocol** command. In this example, the **show** command command includes only lines in which the regular expression "protocol" appears:

```
RP/0/RP0/CPU0:router# show interface | include protocol

  Null0 is up, line protocol is up
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/0 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/1 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/2 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
  TenGigE0/2/0/3 is administratively down, line protocol is administratively down
  0 drops for unrecognized upper-level protocol
```

```
FastEthernet0/RP0/CPU0/0 is administratively down, line protocol is administratively
down
FastEthernet0/RP0/CPU0/0 is administratively down, line protocol is administratively
down
0 drops for unrecognized upper-level protocol
```

On most systems, the **Ctrl-Z** key combination can be entered at any time to interrupt the output and return to EXEC mode. For example, use the **show running-config | begin hostname** command to start the display of the running configuration file at the line containing the hostname setting, then use **Ctrl-Z** when you get to the end of the information you are interested in.

The following example shows sample output from the **show configuration running | begin line** command. The output begins with unfiltered output from the first line that contains the regular expression "line." In this example, at the --More-- prompt, a new search is specified that begins with output lines that contain the regular expression "ipv4."

Note The use of the **begin** keyword does not constitute a filter.

```
RP/0/RP0/CPU0:router# show configuration running | begin line

  Building configuration...
  line console
   exec-timeout 120 120
  !
  logging trap
  --More--
  /ipv4

  filtering...
  route ipv4 0.0.0.0 255.255.0.0 pos0/2/0/0
  interface TenGigE0/2/0/0
   ipv4 address 172.19.73.215 255.255.0.0
  end
```

show aliases

To display all defined aliases or the aliases defined in a specified mode, use the **show aliases** command in mode.

show aliases

Syntax Description

This command has no keywords or arguments.

Command Default

Displays all aliases currently configured on the system.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show aliases** command to display all aliases currently configured on the system.

Task ID

Task ID	Operations
basic-services	read

The following example illustrates sample output from the **show aliases** command. The output displays a summary of all the command aliases configured.

```
RP/0/RP0/CPU0:router# show aliases

exec mode aliases:
ipv4_brief              show ipv4 interface brief

interface mode aliases:
sample_int              tengige 0/2/0/0
```

show commit changes diff

To display the difference between the currently running configuration and the target configuration (the configuration before the commit command), use the **show commit changes diff** command in the appropriate mode.

show commit changes diff

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global ConfigurationXR Config

Command History

Release	Modification
Release 9.2.0	This command was introduced.
Release 9.2.1	Class-map was supported.
Release 9.3.1	Policy-map was supported.

Usage Guidelines

The **show commit changes diff** command displays the output by prepending symbols based on the configuration event:

Symbol	Event
+	Add
-	Delete
<-	Modify for old value
+>	Modify for new value

Task ID

Task ID	Operations
config-services	read

This example shows the output of **show commit changes diff** command for adding a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
+  policy-map pshow
+   class c1
+    set precedence 1
+   !
+   class c2
+    police rate 100 kbps
+    !
+   !
+   class class-default
+   !
```

```
+   end-policy-map
+  !
```

This example shows the output of **show commit changes diff** command for adding a class-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
 !
+  class-map match-any c
+   match precedence 1 2 3
+   match qos-group 2
+   end-class-map
end
```

This example shows the output of **show commit changes diff** command for deleting a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
-  policy-map pshow
-   class c1
-    set precedence 1
-   !
-   class c2
-    police rate 100 kbps
-    !
-   !
-   class class-default
-   !
-   end-policy-map
-  !
```

This example shows the output of **show commit changes diff** command for deleting a class-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
  !
-  class-map match-any c1
-   match precedence 1
-   end-class-map
end
```

This example shows the output of **show commit changes diff** command for modifying a policy-map:

```
RP/0/RP0/CPU0:router# show commit changes diff
   policy-map pshow
   -  class c1
   -   set precedence 1
    !
    class c2
   <-  police rate 100 kbps
   +>  police rate 200 kbps
      !
   +    set precedence 1
    !
   +   class c3
   +    shape average 100 kbps
     !
    end-policy-map
   !
end
```

This example shows the output of **show commit changes diff** command for modifying a class -map:

```
RP/0/RP0/CPU0:router# show commit changes diff
   policy-map pshow
  class-map match-any c
    - match precedence 1 2 3
    <- match qos-group 2
    +> match qos-group 2 4 5
    + match dscp 1 2 3
  end-class-map
```

show configuration changes

To display the configuration changes to be made during a replace operation, use the **show configuration changes** command in global configuration or administration configuration mode.

show configuration changes [**diff**]

Syntax Description

diff	(Optional) Displays the changes in UNIX-like format.

Command Default

None

Command Modes

Global Configuration mode

Admin Configuration mode

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read
basic-services	read

The following example shows the changes to be made during a replace operation:

```
Router(config)# show configuration changes diff

  Building configuration...
  # hostname router
  # hostname bla
  - logging console
  - telnet vrf default ipv4 server disable
  - domain ipv4 host xhu-u5
  - domain ipv4 host coax-u10
  - domain ipv4 host coax-u10.cisco.com
  - domain name
  - interface Loopback1
  -  ipv4 address 10.0.0.2 255.255.255.224
  - !
  - interface Loopback2
  -  description
  - !
  - interface Loopback5
  -  description
  - !
```

```
- interface Loopback6
-  description
- !
- interface MgmtEth0/0/CPU0/0
-  ipv4 address 10.0.0.1 255.255.255.224
- !
- interface GigabitEthernet0/2/0/0
-  shutdown
- !
- interface GigabitEthernet0/2/0/1
-  shutdown
- !
- interface GigabitEthernet0/2/0/2
-  shutdown
- !
- router static
-  address-family ipv4 unicast
-   0.0.0.0/0 255.255.255.224
-  !
- !
end
```

Show configuration commit changes

To display the changes made to the running configuration by previous configuration commits, a configuration commit, or for a range of configuration commits, use the **show configuration commit changes** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

show configuration commit changes {*commit-id* | **since** *commit-id* | **last** *number-of-commits* } [**diff**]

Syntax Description

since	Displays all changes committed to the running configuration since (and including) a specific configuration commit.
commit-id	Displays configuration changes for a specific configuration commit.
last *number-of-commits*	Displays the changes made to the running configuration during the last number of configuration commits specified for the *number-of-commits* argument.
diff	(Optional) Displays added lines, changed lines, and deleted lines.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Usage Guidelines

Each time a configuration is committed with the **commit** command, the configuration commit operation is assigned a commit ID. The **show configuration commit changes** command displays the configuration changes made since the specified commit.

To display a list of the available commit IDs, enter the **show configuration commit list** command. You can also display the commit IDs by entering the **show configuration commit changes** command with the online help function (**?**).

You can't view commit IDs from a different release if the syntax or semantics of the configuration changed in the current release.

Note Syntax of a configuration refers to its structure and format, while the semantics of a configuration refers to its backend interpretation.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration commit changes** command. The output displays commit IDs.

```
RP/0/RP0/CPU0:router# show configuration commit list

SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000077  lab       con0_1_C  CLI         15:42:45 UTC Fri Jan 30 2009
2    1000000076  lab       con0_1_C  Rollback    15:30:39 UTC Fri Jan 30 2009
3    1000000075  lab       con0_1_C  Rollback    15:25:26 UTC Fri Jan 30 2009
4    1000000074  lab       con0_1_C  Rollback    15:04:29 UTC Fri Jan 30 2009
5    1000000073  lab       con0_1_C  CLI         14:49:07 UTC Fri Jan 30 2009
6    1000000072  lab       con0_1_C  CLI         14:48:35 UTC Fri Jan 30 2009
```

The following example shows sample output from the **show configuration commit changes** command with the *commit-id* argument. In this example, the output displays the changes made in the configuration commit assigned commit ID 1000000077.

```
RP/0/RP0/CPU0:router# show configuration commit changes 1000000077

Building configuration...
alias exec shrun show configuration running
alias exec shver show version
end
```

The following example shows sample output from the **show configuration commit changes** command with the **since** *commit-id* keyword and argument. In this example, the output displays the configuration changes made since the configuration commit assigned commit ID 1000000077 was committed.

```
RP/0/RP0/CPU0:router# show configuration commit changes since 1000000077

Building configuration...
no hw-module node 0/RP0/CPU0 shutdown
hostname router
logging trap
no logging console
logging history size 1
alias exec shrun show configuration running
alias exec shver show version
interface MgmtEth0/RP1/CPU0/0
 ipv4 address 12.25.34.10 255.255.0.0
 no shutdown
 !
 interface preconfigure MgmtEth0/RP0/CPU0/0
 no shutdown
 !
no route ipv4 0.0.0.0/0 12.7.0.1
route ipv4 0.0.0.0/0 12.25.0.1
route ipv4 223.255.254.254/32 12.25.0.1
telnet ipv4 server enable
end
```

The following example shows sample output from the **show configuration commit changes** command with the **diff** keyword. In the display, the following symbols signify changes:

+ indicates an added line.

– indicates a deleted line.

# indicates a modified line.

```
RP/0/RP0/CPU0:router# show configuration commit changes last 1 diff

Building configuration...
+ interface Loopback1000
+ ipv4 address 190.190.180.1 255.255.255.255
!
end

+ interface Loopback1000
+ ipv4 address 190.190.180.1 255.255.255.255
  !
  end
```

show configuration commit list

To display information about the configuration commits stored in the commit database, use the **show configuration commit list** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

show configuration commit list [*number-of-commits*] [**detail**]

Syntax Description

number-of-commits	(Optional) Number of commits (beginning with the most recent commit) that are available for rollback.
detail	(Optional) Displays detailed commit information, including comments.

Command Default

If this command is entered without any optional arguments or keywords, the output displays information about all the configuration commits stored in the commit database.

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration commit list** command to list the commit IDs (up to 100) that are available for rollback.

Note The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration commit list** command. The output displays the commit IDs that are available for rollback.

```
RP/0/RP0/CPU0:router# show configuration commit list
```

```
SNo. Label/ID    User      Line        Client      Time Stamp
~~~~ ~~~~~~~~    ~~~~      ~~~~        ~~~~~~      ~~~~~~~~~~
1    1000000010  UNKNOWN   con0_0_C  Rollback    02:25:53 UTC Fri Feb 06 2009
2    1000000009  UNKNOWN   con0_0_C  CLI         02:23:09 UTC Fri Feb 06 2009
3    1000000008  UNKNOWN   con0_0_C  CLI         02:22:54 UTC Fri Feb 06 2009
4    1000000007  UNKNOWN   con0_0_C  CLI         02:22:18 UTC Fri Feb 06 2009
5    1000000006  UNKNOWN   con0_0_C  CLI         02:07:21 UTC Fri Feb 06 2009
```

show configuration commit list Field Descriptions describes the significant fields shown in the display.

Table 65: show configuration commit list Field Descriptions

Field	Description
SNo.	Serial number of the commit entry.
Label/ID	If a label was assigned to a commit, the first 10 characters of the label display; otherwise, the autogenerated commit ID displays.
User	User who executed the commit.
Line	Line in which the user session was established. In some cases, this field may display "UNKNOWN" or "SYSTEM". These fields indicate that an internal commit was made by the system.
Client	The management interface used to make the commit.
Time Stamp	Time and date when the commit was executed.

show configuration (config)

To display information about the current configuration session (target configuration), use the **show configuration** command in any configuration mode.

show configuration [**merge**] [**running**]

Syntax Description

merge	(Optional) Displays the configuration that occurs if the contents of the uncommitted changed (target configuration) are committed to the running configuration.
running	(Optional) Displays the running (committed) configuration.

Command Default

When the **show configuration** command is entered without an argument, the uncommitted changes to the target configuration are displayed.

Command Modes

Any configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration** command to display details on uncommitted configuration changes.

Use the **show configuration** command with the **running** keyword to display the running (active) configuration.

Prior to committing the target configuration, use the **show configuration** command with the **merge** keyword from any configuration mode to display the result of merging the target configuration with the running configuration.

Task ID

Task ID	Operations
basic-services	read

In this example, the **show configuration** command displays uncommitted changes made during a configuration session:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige0/3/0/3
RP/0/RP0/CPU0:router(config-if)# description faq
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.10.11.20 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# show configuration

Building configuration...
interface TenGigE0/3/0/3
 description faq
 ipv4 address 10.10.11.20 255.0.0.0
```

```
 end
```

The following example shows sample output from the **show configuration** command with the optional **merge** keyword. The command is entered during a configuration session. The output displays the result of merging the target and running configuration, without committing the changes.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface tengige0/3/0/3
RP/0/RP0/CPU0:router(config-if)# description faq
RP/0/RP0/CPU0:router(config-if)# ipv4 address 10.10.11.20 255.0.0.0
RP/0/RP0/CPU0:router(config-if)# show configuration merge

Building configuration...
hostname router
interface TenGigE0/0/0/0
 ipv4 address 1.2.3.4 255.0.0.0
 exit
interface TenGigE0/3/0/3
 description faq
 ipv4 address 1.1.1.1 255.0.0.0
 shutdown
 end
```

show configuration failed incompatible

To display any configurations that were removed from the running configuration because they were not understood by the software being activated, use the **show configuration failed incompatible** command in EXEC or administration EXEC mode.

show configuration failed incompatible

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Any configurations in the running configuration that are not understood by new software being installed are removed from the running configuration. To see which configurations were removed, use the **show configuration failed incompatible** command.

Task ID

Task ID	Operations
config-services	read

Examples

This example shows how to use the **show configuration failed incompatible** command:

```
Router# configure
Router(config)# show configuration failed incompatible
```

show configuration failed (config)

To display information about a configuration that failed during the last commit, use the **show configuration failed** command in any configuration mode.

show configuration failed [**load** | **noerrors**]

Syntax Description

load	(Optional) Displays any syntax errors found in a configuration loaded with the **load** command.
noerrors	(Optional) Displays the configuration that failed in last commit without the error reasons.

Command Default

Displays the details of the failed configuration including error reasons.

Command Modes

Any configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
basic-services	read

The following example shows a failed commit operation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# taskgroup bgp
RP/0/RP0/CPU0:router(config-tg)# description this is an example of an invalid task group
RP/0/RP0/CPU0:router(config-tg)# commit
% Failed to commit one or more configuration items.
Please use 'show configuration failed' to view the errors
```

The following example shows sample output from the **show configuration failed** command. The output displays the configuration items that failed during the last commit operation.

```
RP/0/RP0/CPU0:router(config-tg)# show configuration failed

!! CONFIGURATION FAILED DUE TO SEMANTIC ERRORS
taskgroup bgp
!!% Usergroup/Taskgroup names cannot be taskid names
!
```

The following example shows sample output from the **show configuration failed** command with the optional **no errors** keyword. The output displays the configuration items that failed during the last commit operation without an error description.

```
RP/0/RP0/CPU0:router(config-tg)# show configuration failed noerrors

!! CONFIGURATION FAILED DUE TO SEMANTIC ERRORS
taskgroup bgp
!
```

show configuration failed remove

To display information about a configuration that failed while being removed during installation operations, use the **show configuration failed remove** command in mode.

show configuration failed remove

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows a failed commit operation:

```
RP/0/RP0/CPU0:router# show configuration failed remove

!! SEMANTIC ERRORS: This configuration was rejected by
!! the system due to semantic errors. The individual
!! errors with each failed configuration command can be
!! found below.

multicast-routing
 no address-family ipv4
 !!% Process did not respond to sysmgr
 address-family ipv4
  no interface all enable
!!% Process did not respond to sysmgr
!
!
```

show configuration failed rollback

To display information about a configuration that failed in the last rollback operation, use the **show configuration failed rollback** command in EXEC mode.

show configuration failed rollback

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read
root-lr	read

Examples

This example shows how to use the **show configuration failed rollback** command:

```
Router# configure
Router(config)# show configuration failed rollback
```

show configuration failed startup

To display information about a configuration that failed at startup, use the **show configuration failed** command in EXEC mode.

show configuration failed startup [**noerror** | **previous** *number*]

Syntax Description

noerror	(Optional) Displays the configuration that failed at startup without an error reason.
previous *number*	(Optional) Displays the previous failed startup configuration or configurations. The *number* argument is a value from 1 to 4, which displays the failed startup configurations in previous of sessions.

Command Default

If no keywords are specified, this command displays the details of the failed startup configuration including error reasons.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

Examples

This example shows how to use the **show configuration failed startup** command:

```
Router# configure
Router(config)# show configuration failed startup
```

show configuration history

To display a history of configuration events, use the **show configuration history** command in the appropriate mode.

show configuration history [**alarm** | **backup** | **cfs-check** | **commit** | **rebase** | **shutdown** | **startup**] [**first** *number* | **last** *number* | **reverse**] [**detail**]

Syntax Description

alarm	(Optional) Displays alarm events.
backup	(Optional) Displays configuration backup events.
cfs-check	(Optional) Displays CFS check events.
commit	(Optional) Displays commit events.
rebase	(Optional) Displays commit database consolidation events.
shutdown	(Optional) Displays shutdown events.
startup	(Optional) Displays startup events, including alternate configurations, failed configurations, and other events.
first *number*	(Optional) Displays the first x number of events, where x is the *number* argument.
last *number*	(Optional) Displays the last *x number* events. Replace with the number of events to display.
reverse	(Optional) Displays the most recent events first.
detail	(Optional) Displays detailed information, including comments.

Command Default

When entered without any optional arguments or keywords, this command displays all configuration events. The oldest events are displayed at the top of the list for each event type.

Command Modes

XR EXEC

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration history** command to display information about the last (up to) 1500 configuration events.

Use one of the available keywords to display the configuration event only for that event type. Use the **first** *number* and **last** *number* keywords and arguments to display a specified number of events. Use the **reverse** keyword to display the newest events at the top of the list.

Task ID

Task ID	Operations
config-services	read

In the following example, the **show configuration history** command is used to display the history of all configuration events for an SDR:

```
RP/0/RP0/CPU0:router# show configuration history

Sno.  Event      Info                          Time Stamp
~~~~  ~~~~~      ~~~~                          ~~~~~~~~~~
1     alarm      inconsistency alarm raised    Thu Jun 22 15:23:15 2009
2     startup    configuration applied         Thu Jun 22 15:23:32 2009
3     OIR config restore                       Thu Jun 22 15:23:25 2009
4     OIR config restore                       Thu Jun 22 15:23:33 2009
5     OIR config restore                       Thu Jun 22 15:23:33 2009
6     OIR config restore                       Thu Jun 22 15:23:34 2009
7     OIR config restore                       Thu Jun 22 15:23:34 2009
8     OIR config restore                       Thu Jun 22 15:23:35 2009
9     OIR config restore                       Thu Jun 22 15:23:36 2009
10    OIR config restore                       Thu Jun 22 15:23:37 2009
11    OIR config restore                       Thu Jun 22 15:23:37 2009
12    OIR config restore                       Thu Jun 22 15:23:38 2009
13    OIR config restore                       Thu Jun 22 15:23:38 2009
14    OIR config restore                       Thu Jun 22 15:23:39 2009
15    OIR config restore                       Thu Jun 22 15:23:39 2009
16    OIR config restore                       Thu Jun 22 15:23:40 2009
17    OIR config restore                       Thu Jun 22 15:23:40 2009
18    OIR config restore                       Thu Jun 22 15:23:42 2009
19    OIR config restore                       Thu Jun 22 15:23:42 2009
20    OIR config restore                       Thu Jun 22 15:23:42 2009
21    OIR config restore                       Thu Jun 22 15:23:43 2009
 --More--
```

In the following example, the **show configuration history** command is used to display only the startup configuration events:

```
RP/0/RP0/CPU0:router# show configuration history startup

Sno.  Event      Info                          Time Stamp
~~~~  ~~~~~      ~~~~                          ~~~~~~~~~~
1     startup    configuration applied         Thu Jun 22 15:23:32 2009
2     startup    configuration applied         Sat Jul  1 15:02:24 2009
3     startup    configuration applied         Sat Jul  8 17:36:52 2009
4     startup    configuration applied         Sun Jul  9 13:40:27 2009
5     startup    configuration applied         Sat Jul 15 18:18:54 2009
```

In the following example, the **show configuration history** command with the **commit detail** keywords is used to display additional details regarding the commit events:

```
RP/0/RP0/CPU0:router# show configuration history commit detail

1)  Event: commit         Time: Thu Jun 22 15:44:33 2009
```

```
     Commit ID: 1000000001 Label:
     User: lab        Line: vty0
     Client: CLI           Comment:

2)  Event: commit         Time: Thu Jun 22 16:58:18 2009
     Commit ID: 1000000002 Label:
     User: lab        Line: vty2
     Client: CLI           Comment:

3)  Event: commit         Time: Thu Jun 22 16:58:39 2009
     Commit ID: 1000000003 Label:
     User: lab        Line: vty2
     Client: CLI           Comment:

4)  Event: commit         Time: Sat Jul  1 15:29:31 2009
     Commit ID: 1000000001 Label:
     User: lab        Line: vty0
     Client: CLI           Comment:

5)  Event: commit         Time: Sat Jul  1 15:32:25 2009
     Commit ID: 1000000002 Label:
     User: lab        Line: vty0
  --More--
```

Table 66: show configuration history Field Descriptions

Field	Description
SNo.	Serial number of the entry.
Event	Type of configuration event.
Info	Summary of the configuration action.
Time Stamp	Time and date when the event was run.
Label/ID	If a label was assigned to a commit, the first 10 characters display; otherwise, the autogenerated commit ID displays.
User	User who issued the command.
Line	Line in which the user session was established. In some cases, this field may display “UNKNOWN” or “SYSTEM”. These fields indicate that an internal action was made by the system.
Client	The management interface used to make the event.

show configuration persistent

To display the persistent configuration, use the **show configuration persistent** command in or XR EXEC mode.

show configuration persistent [**diff**]

Syntax Description

diff	(Optional) Displays the difference between the running configuration and persistent configuration. This option is available only on the .

Command Default

If no argument is specified, the **show configuration persistent** command displays the entire contents of the persistent configuration file.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The persistent configuration is the configuration stored in nonvolatile memory, from which the running configuration is restored after the router is reloaded. The running configuration should be the same as the persistent configuration. Use the **show configuration persistent** command with the **diff** keyword to check if there is a difference between the running configuration and the persistent configuration.

Task ID

Task ID	Operations
config-services	read

The following example shows that there is no difference between the running configuration and the persistent configuration:

```
RP/0/RP0/CPU0:router# show configuration persistent diff

Building configuration...
  end
```

The following example shows a difference between the running configuration and the persistent configuration:

```
RP/0/RP0/CPU0:router# show configuration persistent diff

Building configuration...
router vrrp
interface tengige0/1/0/1.1
```

```
vrrp 1 preempt delay 300
!
interface tengiget0/1/0/1.2
vrrp 1 preempt delay 300
!
interface tengige0/1/0/1.3
vrrp 1 preempt delay 300
```

show configuration removed

To display a configuration removed during installation operations, use the **show configuration removed** command in EXEC or administration EXEC mode.

show configuration removed *config-id*

Syntax Description

config-id	Name of removed configuration. Type (?) to see a list of the names of all removed configurations.

Command Default

None

Command Modes

EXEC

Administration EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read

The following example shows a removed configuration:

```
RP/0/RP0/CPU0:router# show configuration removed 20060301112919.cfg

xml agent corba
http server
end
```

show configuration rollback changes

To display changes that would be made by the **rollback configuration** command or to display the list of commit IDs, use the **show configuration rollback changes** command in EXEC, administration EXEC, administration configuration, or global configuration mode.

show configuration rollback changes {*commit-id* | **to** *commit-id* | **last** *number-of-commits*} [**diff**]

Syntax Description

commit-id	Name of configuration. When a specific *commit-id* is specified, only the changes that would occur if only the specified commit is rolled back are displayed.
to *commit-id*	Displays the changes that will occur to the running configuration if the system is rolled back to the configuration specified with the *commit-id* argument.
last *number-of-commits*	Displays the changes that will occur to the running configuration if the system is rolled back to the last number of commits specified with the *number-of-commits* argument.
diff	(Optional) Displays added lines, changed lines, and deleted lines.

Command Default

None

Command Modes

EXEC

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note The most recent 100 commits are retained by the system. As new commit IDs are added, the oldest commit IDs are discarded and are no longer available for rollback operations.

Use the *commit-id* argument without the **to** keyword to display the changes for a particular commit. This can be useful for troubleshooting actions of the **rollback configuration** command.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration rollback changes** command with the **to** *commit-id* keyword and argument. The output displays the configuration changes that would occur if the configuration were to be rolled back to the configuration commit specified for the argument.

```
RP/0/RP0/CPU0:router# show configuration rollback changes to 1000000007

Building configuration...
hostname old-name
end
```

The following example shows sample output from the **show configuration rollback changes** command **last** *number-of-commits* keyword and argument. The output displays the configuration changes that would occur if the configuration were to be rolled back to the number of configuration commits specified for the argument.

```
RP/0/RP0/CPU0:router# show configuration rollback changes last 2

Building configuration...
hostname orig_name
interface POS0/1/0/1
 shutdown
!
end
```

The following example shows sample output from the **show configuration rollback changes** command with the **diff** keyword.

In the display, the following symbols signify changes:

- + indicates an added line.
- – indicates a deleted line.
- # indicates a modified line.

```
RP/0/RP0/CPU0:router
show configuration rollback changes last 1 diff

Building configuration...
 interface Loopback1000
#  ipv4 address 1.1.1.1 255.255.255.255
!
end
```

show configuration running-config

To display the running configuration, use the **show configuration running-config** command in .

show configuration running-config [*config-keyword*]

Syntax Description		
	config-keyword	(Optional) Specific configuration to display.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the *config-keyword* argument to display the running configuration for a specific keyword only.

Task ID

Task ID	Operations
basic-services	read

This example shows the currently running (committed) configuration:

```
Router# show configuration running-config
  Tue Nov 12 12:22:40.576 UTC
!! Building configuration...
!! IOS XR Configuration 7.10.2
!! Last configuration change at Tue Nov 12 11:31:59 2024 by cafyauto
!
hostname pp-r1-pod1
logging archive
 device harddisk
 severity debugging
 file-size 1
 frequency daily
 archive-size 1047
 archive-length 100
!
logging console disable
logging monitor debugging
logging buffered 125000000
logging buffered debugging
logging 5.15.4.54 vrf default port default
logging hostnameprefix pp-r1-pod1
username cafyauto
 group root-lr
 group cisco-support
```

```
 secret 10
$6$SjlY0PAdH80.....$0ejICE1yv2tdqHaSPGTeaqx/f9dvC1qlxarZFoQezOQC5zHPOvXvlIxbrGGsbtMLBco1dA3.BLAK/r/IEEHXc1
!
grpc
 port 57777
!
```

The above sample displays only a part of the actual output; the actual output displays more details.

show configuration running

To display the running configuration, use the **show configuration running** command in the appropriate mode.

show configuration running [*config-keyword*]

Syntax Description

config-keyword	(Optional) Specific configuration to display.

Command Default

None

Command Modes

Administration EXEC

Administration configuration

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration running** command to display the currently active configuration.

Task ID

Task ID	Operations
basic-services	read

This example shows the currently running (committed) configuration from administration mode.

```
RP/0/RP0/CPU0:router(admin)# show configuration running

Building configuration...
username lab
 secret 5 $1$XNWt$j8RscNdncKSRoMSnqSpbj/
 group root-system
!
end
```

show configuration sessions

To display the active configuration sessions, use the **show configuration sessions** command in mode.

show configuration sessions [**detail**]

Syntax Description

detail	(Optional) Displays detailed information.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show configuration sessions** command to display the active configuration sessions. Use the **clear configuration sessions** command to clear a configuration session. The **show configuration sessions** command can be used with the **clear configuration sessions** command to verify that an active configuration session was cleared.

Task ID

Task ID	Operations
config-services	read

The following example shows sample output from the **show configuration sessions** command:

```
RP/0/RP0/CPU0:router# show configuration sessions

Current Configuration Session  Line       User     Date                     Lock
00000050-001200bb-00000000     con0_5_CPU cisco    Fri Feb 16 17:23:47 2007
```

Table 67: show configuration sessions Field Descriptions

Field	Description
Session	System-generated configuration session ID number.
Line	Line in which the user session was established. In some cases, this field may display “UNKNOWN” or “SYSTEM.” These fields indicate that an internal commit was made by the system.
User	User who initiated the configuration session.
Date	Time and date the configuration session was started.

Field	Description
Lock	Locked running-configuration. An asterisk (*) displayed in this field means the session has been locked. Only one session can lock the running configuration at a time.

show default-afi-safi-vrf

To display the default address family identifier (AFI), subaddress family identifier (SAFI), and VPN routing and forwarding (VRF) instance for the current session, use the **show default-afi-safi-vrf** command in or XR EXEC mode.

show default-afi-safi-vrf

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show default-afi-safi-vrf** command to display the default AFI and SAFI settings for the current session. The AFI and SAFI settings are controlled by the following commands:

- set default-vrf, on page 766
- set default-safi, on page 765
- set default-afi, on page 764

Task ID

Task ID	Operations
basic-services	read

The following example shows sample output from the **show default-afi-safi-vrf** command:

```
RP/0/RP0/CPU0:router# show default-afi-safi-vrf

%% Default AFI/SAFI/VRF for this session is:
     Address Family Identifier:       'ipv4'
     Sub-Address Family Identifier:   'unicast'
     Virtual Routing/Forwarding:      ''
```

show history

To display a history of commands executed in XR EXEC XR Config mode use the **show history** command in one of the supported modes.

show history [**detail**]

Syntax Description

detail	(Optional) Displays detailed history information.

Command Default

None

Command Modes

XR EXEC

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show history** command displays a history of the command entered for the current command mode. For example, enter the **show history** command to display a history of commands entered in XR EXEC mode. Enter the **show history** command in XR Config mode to display a history of the commands entered in XR Config mode.

Task ID

Task ID	Operations
config-services	read
basic-services	read

In the following example, the **show history** command is run in XR EXEC mode to display a history of the command entered in XR EXEC mode:

```
RP/0/RP0/CPU0:router# show history
configure
admin
show history
```

In the following example, the **show history** command is run in XR Config mode to display a history of the command entered in XR Config mode:

```
Router# configure
Router(config)# show history
Tue Nov 12 12:22:56.003 UTC
  show variables boot
   show fpd package
```

```
 show hw-module fpd
show frequency synchronization selection back-trace
show frequency synchronization selection back-trace time-of-day
show frequency synchronization selection back-trace time-of-day location 0/RP0/CPU0
show configuration running-config
```

show running-config

To display the contents of the currently running configuration or a subset of that configuration, use the **show running-config** command in the appropriate mode.

show running-config [[**exclude**] *command*] [**sanitized**]

Syntax Description

exclude	(Optional) Excludes a specific configuration from the display.
command	(Optional) Command for which to display the configuration.
sanitized	(Optional) Displays a sanitized configuration for safe distribution and analysis.

Command Default

The **show running-config** command without any arguments or keywords displays the entire contents of the running configuration file.

Command Modes

System Admin EXEC

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You can display either the entire running configuration, or a subset of the running configuration. The subset may be all the commands within a specified command mode.

Note In Cisco IOS XR software, the running configuration is automatically used at system startup, reset, or power cycle. The running configuration is the committed configuration.

Sanitized Output

Use the **show running-config** command with the **sanitized** keyword to display the contents of the active running configuration without installation-specific parameters. Some configuration details, such as IP addresses, are replaced with different addresses. The sanitized configuration can be used to share a configuration without exposing the configuration details.

Command Modes

When the **show running-config** command is entered in administration configuration mode, the configuration for the administration plane is displayed, including the configured logical routers for the system. When the **show running-config** command is entered in any global configuration mode, or in EXEC mode, the configuration for the specific secure domain router (SDR) is displayed.

The **inheritance** and **no-annotations** keywords are not supported in administration EXEC or configuration modes.

Excluding Parts of the Display

Use the **exclude** keyword followed by a *command* argument to exclude a specific configuration from the display.

Task ID

Task ID	Operations
config-services	read

This example shows how to enter the **show running-config** command with the question mark (?) online help function to display the available subsets of the running configuration that can be entered to display a subset of the running configuration:

```
RP/0/RP0/CPU0:router# show running-config ?

aaa                Authentication, Authorization and Accounting
alias              Create an alias for entity
aps                Configure SONET Automatic Protection Switching (APS)
arp                Global ARP configuration subcommands
as-path            BGP autonomous system path filter
as-path-set        Define an AS-path set
banner             Define a login banner
cdp                Enable CDP, or configure global CDP subcommands
cef                CEF configuration commands
cinetd             Global Cisco inetd configuration commands
class-map          Configure QoS Class-map command
clock              Configure time-of-day clock
community-list     Add a community list entry
community-set      Define a community set
controller         Controller configuration subcommands
dhcp               Dynamic Host Configuration Protocol
domain             Domain service related commands
exception          Coredump configuration commands
exclude            Exclude a feature or configuration item from display
explicit-path      Explicit-path config commands
extcommunity-set   Define an extended communitiy set
fault              Fault related commands
forward-protocol   Controls forwarding of physical and directed IP broadcasts
ftp                Global FTP configuration commands
--More--
```

This example shows sample output from the **show running-config** command with the **sanitized** keyword displays a sanitized version of the running configuration. The sanitized configuration can be used to share a configuration without exposing specific configuration details.

```
RP/0/RP0/CPU0:router# show running-config sanitized


Building configuration...

!! Last configuration change at 05:26:50 UTC Thu Jan 19 2009 by <removed>
!
snmp-server traps fabric plane
snmp-server traps fabric bundle state
```

```
hostname <removed>
line console
exec-timeout 0 0
!
exception choice 1 compress off filepath <removed>
logging console debugging
telnet vrf <removed> ipv4 server max-servers no-limit
snmp-server ifindex persist
snmp-server host 10.0.0.1 traps version <removed> priv <removed> udp-port 2555
snmp-server view <removed> <removed> included
snmp-server community <removed> RO LROwner
snmp-server community <removed> RO LROwner
snmp-server group <removed> v3 priv read <removed> write <removed>
snmp-server traps snmp
snmp-server traps syslog
interface Loopback10
!
interface Loopback1000
!
 --More--
```

template

To create a template name and enter template configuration mode, use the **template** command in configuration mode. To remove a template definition, use the **no** form of this command.

template *name*
no template *name*

Syntax Description

name	Unique name for the template to be created.

Command Default

No templates are defined.

Command Modes

XR Config

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **template** command to enter template configuration mode. From template configuration mode, you can group a subset of configuration commands in a named template. Commonly used sets of configuration commands can be grouped into a named template. Defining a template is similar to creating a C macro function. A template provides modularity and ease of use during user configuration.

Use the **end-template** command to exit template configuration mode. After defining a template, use the **apply-template** command to apply the template. Use the **show running-config** command with the optional **template** keyword and *template-name* argument to display the contents of a template.

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to enter template configuration mode to create a template. In this example, a template named “pre-pos” is defined for the preconfigured Packet-over-SONET/SDH (POS) interface 0/1/0/1. The **end-template** command is used to exit from template configuration mode.

```
Router# configure
Router(config)# template pre-pos
Router(config-TPL)# interface preconfigure pos0/1/0/0
Router(config-if-pre)# ipv4 address 10.3.32.154 255.0.0.0
Router(config-if-pre)# end-template
```

Note After configuring a template, you may want to display the contents of the configured template. To display a template configuration, use the **show running-config** command with the **template** *name* keyword and argument.

The following example shows sample output from the **show running-config** command with the **template** *name* keyword and argument. In this example, the output displays the contents of a template named "pre-pos."

```
Router# show running-config template pre-pos

template pre-pos
 interface preconfigure POS0/1/0/0
  ipv4 address 10.3.32.154 255.0.0.0
!
end-template
```

Call Home Commands

This module describes the Cisco IOS XR software commands for configuring and sending Call Home messages.

For detailed information about Call Home concepts, configuration tasks, and examples, see the *Configuring Call Home on Cisco IOS XR Software* module in *System Management Configuration Guide for Cisco NCS 5500 Series RoutersSystem Management Configuration Guide for Cisco NCS 540 Series RoutersSystem Management Configuration Guide for Cisco NCS 560 Series Routers*.

contact smart-licensing

To send notification emails to your Smart Licensing account, use **contact smart-licensing** command in the **call-home** configuration mode. To disable the contact, use the **no** form of this command.

contact smart-licensing
no contact smart-licensing

Syntax Description

This command has no keywords or arguments.

Command Default

contact smart-licensing is not configured.

Command Modes

call-home configuration mode.

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

The Smart Call Home back-end service uses the email address configured in your Smart Licensing account as the destination address for the notification mails. Enabling Smart Licensing also enables call-home which changes several mandatory configurations in call-home. **contact smart-licensing** is one of the configurations that is automatically added when you enable smart-licensing.

Note The **contact-email-addr** command and the **contact smart-licensing** command cannot be configured simultaneously.

Task ID

Task ID	Operation
call-home	Read, Write

Example

This example shows how to configure the contact email address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# call-home
RP/0/RP0/CPU0:router(config-call-home)# contact smart-licensing
```

active

To enable a Call Home profile, use the **active** command in call home profile configuration mode. To disable a profile, use the **no** form of this command.

active
no active

Syntax Description

This command has no keywords or arguments.

Command Default

A profile is disabled by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You must enable a profile using the **active** command so that call home messages can be triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to activate a profile:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# active
```

call-home

To enter call home configuration mode to configure Call Home, use the **call-home** command in global configuration mode. To remove all Call Home settings and set the technical assistance center (TAC) profile as the default, use the **no** form of this command.

call-home
no call-home

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to enter call home configuration mode:

```
RP/0/RP0/CPU0:router(config)# call-home
RP/0/RP0/CPU0:router(config-call-home)#
```

Related Commands

Command	Description
show call-home, on page 836	Displays information regarding the Call Home configuration.

call-home request

To send a customer request to Cisco, use the **call-home request** command in EXEC mode.

call-home request { **bugs-list** | **command-reference** | **config-sanity** | **output-analysis** " *show-command* " | **product-advisory** | **registration-info** } {**ccoid** *ccoid* | **profile** *profile-name*}

Syntax Description

bugs-list	Sends output of the following commands: • **show running-config sanitized** • **show version** • **show diag**
command-reference	Sends output of the following commands: • **show running-config sanitized** • **show version** • **show diag**
config-sanity	Sends output of the following commands: • **show running-config sanitized** • **show version**
output-analysis *show-command*	Sends output from the specified show command. The *show-command* argument should be enclosed in quotes ("").
product-advisory	Sends output of all commands included in the enventory message in addition to the output from the **show running-config sanitized** command.
ccoid *ccoid*	Specifies the Smart Call Home user registered ID.
profile *profile-name*	Specifies the profile to which to send the message.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The message uses the specified profile or the CiscoTAC-1 profile if no profile name is specified to send out the request the the Cisco backend. This ensures that users who use a transport gateway can use a different profile than the CiscoTAC-1 profile to send the request to their email server first before forwarding to the Cisco backend. CiscoTAC-1 or any profile specified needs to be enabled before you can send out the request.

If the CCO ID is not specified, the contact email address of the device is used.

Each message sent includes the CLI command ouput specified for each subcommand. After the message is sent, a syslog message is displayed indicating whether the request was sent successfully or not.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a message with output from the **show version** command to engineer@cisco.com:

```
RP/0/RP0/CPU0:router(config)# call-home request config-sanity ccoid
xyz
RP/0/RP0/CPU0:router(config)# call-home request bugs-list
RP/0/RP0/CPU0:router(config)# call-home request output-analysis "show log"
profile TG
RP/0/RP0/CPU0:router(config)#  call-home request output-analysis "show
running-config"
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.
show call-home, on page 836	Displays information regarding the Call Home configuration.

call-home send

To send the output from a specific command as a Call Home message, use the **call-home send** command in EXEC mode.

call-home send "*cli-command*" {**email** *email-address* | **tac-service-request** *service-number*}
call-home send " *show ip int br* " { **email** *email-address* | **http** *http* | **tac-service-request** *service-number* }

Syntax Description

cli-command	Any CLI command that can be run at the prompt.
email *email-address*	Specifies the email address to which to send the call home message.
tac-service-request *service-number*	Specifies the Technical Assistance Center (TAC) service request number.

Command Default

If no email address is specified, attach@cisco.com is used.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The specified CLI command is generally a show command with output that is required by the TAC to analyze a specific issue. The CLI command must be enclosed in quotes. The CLI command output is sent to the specified email address in long text format with the service request number in the subject of the email. If no email address is specified, the TAC service request number must be specified. By default, messages are sent to attach@cisco.com. If no TAC service request number is specified, TAC email is rejected.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a message with output from the **show version** command to engineer@cisco.com:

```
RP/0/RP0/CPU0:router(config)# call-home send "show version" engineer@cisco.com
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.
show call-home, on page 836	Displays information regarding the Call Home configuration.

call-home send alert-group inventory

To send an inventory Call Home message to all subscribed profiles or the specified profile, use the **call-home send alert-group inventory** command in EXEC mode.

call-home send alert-group inventory [**profile** *profile-name*]

Syntax Description

profile *profile-name*	Specifies the profile to which to send the inventory Call Home message.

Command Default

If no profile is specified, the message is sent to all subscribed profiles.

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The profile specified by the *profile-name* argument does not need to be subscribed to the inventory alert-group.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send an inventory message to the myprofile profile:

```
RP/0/RP0/CPU0:router(config)# call-home send alert-group inventory profile myprofile
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.
show call-home, on page 836	Displays information regarding the Call Home configuration.

call-home test

To send a test Call Home message to the specified profile, use the **call-home test** command in EXEC mode.

call-home test [*test-message-text*] **profile** *profile-name*

Syntax Description

test-message-text	Text to be sent in the test message. If the message text is not specified, a default message is sent.
profile *profile-name*	Specifies the profile to which to send the test call home message.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to send a test Call Home message:

```
RP/0/RP0/CPU0:router(config)# call-home test "this is a test message" profile myprofile
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.
show call-home, on page 836	Displays information regarding the Call Home configuration.

contact-email-addr

To specify a contact email address for the system, use the **contact-email-addr** command in call home configuration mode. To disable the contact email address, use the **no** form of this command.

contact-email-addr *email-addr*
no contact-email-addr *email-addr*

Syntax Description

email-addr	The email address of the system contact.

Command Default

No contact email address is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The contact email address is a mandatory user-configurable field that must be configured before Call Home messages are triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contact email address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# contact-email-addr contact@cisco.com
```

contract-id

To specify a contract identifier for the system, use the **contract-id** command in call home configuration mode. To disable the contract identifier, use the **no** form of this command.

contract-id *contract-id-string*
no contract-id *contract-id-string*

Syntax Description

contract-id-string	A string that identifies a service contract.

Command Default

No contract ID is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The contract ID is an optional user-configurable field that can be used for contract information or any other identification information for the support service.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contract ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# contract-id contract
```

customer-id

To specify a customer identifier for the system, use the **customer-id** command in call home configuration mode. To disable the customer identifier, use the **no** form of this command.

customer-id *contract-id-string*
no customer-id *contract-id-string*

Syntax Description

customer-id-string	A string that identifies the customer.

Command Default

No customer ID is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The customer ID is an optional user-configurable field that can be used for contract information or any other identification information of a support service.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the customer ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# customer-id cisco
```

destination address

To specify an email address to which Call Home messages are sent, use the **destination address** command in call home profile configuration mode. To disable the contract identifier, use the **no** form of this command.

destination address *email-address*
no destination address *email-address*

Syntax Description

email-address	Email address to which short-text and long-text Call Home messages and XML-based Call Home messages are to be sent.

Command Default

No destination email address is defined.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You must define a destination email address to send out Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the destination email address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination address user@cisco.com
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.

destination message-size-limit

To specify the message size limit for call home messages for a specific profile, use the **destination message-size-limit** command in Call Home profile configuration mode. To disable the message size limit, use the **no** form of this command.

destination message-size-limit *maximum-size*
no destination message-size-limit *maximum-size*

Syntax Description

maximum-size	Maximum message size in bytes.

Command Default

The default maximum message size is 3 Mbytes.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The destination maximum message size can be optionally set to limit the size of Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the contract ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination maximum-message-size 2000
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.

destination transport-method

To specify the transport method for Call Home messages for a specific profile, use the **destination transport-method** command in call home profile configuration mode. To disable the transport method, use the **no** form of this command.

destination transport-method email
no destination transport-method email

Syntax Description

email	Email is used to send call home messages.

Command Default

The default transport method is email.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The only transport method supported in this release is email.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the transport method to be email:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination transport-method email
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.

destination preferred-msg-format

To specify the message format for a profile, use the **destination preferred-msg-format** command in call home profile configuration mode. To revert to the default message format, use the **no** form of this command.

destination preferred-msg-format {**long-text** | **short-text** | **xml**}
no destination preferred-msg-format {**long-text** | **short-text** | **xml**}

Syntax Description

long-text	Specifies to send clear text long Call Home messages, that contain formatting to enable easy readability.
short-text	Specifies to send clear text short Call Home messages, that are designed for use with text pagers.
xml	Specifies to send the same text as the long text messages, with the addition of XML tagging and Adaptive Messaging Language (AML) specific transport information to allow machine-readable parsing and correct routing of the message.

Command Default

The default message format is xml.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the message format to short text:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# destination preferred-msg-format short-text
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.

mail-server

To specify and configure the various mail servers for sending Call Home messages, use the **mail-server** command in call home configuration mode. To remove the mail server configuration, use the **no** form of this command.

mail-server {*ip-addressname*} **priority** *priority*
no mail-server {*ip-addressname*} **priority** *priority*

Syntax Description

ip-address	An IPv4 address to use as the mail server.
name	Name of server to use as the mail server.
priority *priority*	Priority to be used to determine which of multiple configured servers to use as the mail server. Values can be from 1 to 100. A server with a lower priority is tried first.

Command Default

No mail server is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

You must configure a mail server if the user profile is configured to send email messages only. Only IPv4 addresses are supported.

Up to five mail servers can be configured. Specify a priority for each mail server so the system knows which to try first.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure a mail server:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# em
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

phone-number

To specify a phone number to contact regarding the system, use the **phone-number** command in call home configuration mode. To remove the configured phone number, use the **no** form of this command.

phone-number *phone-number-string*
no phone-number *phone-number-string*

Syntax Description

phone-number-string	Phone number of the contact for the system. The number should always begin with a plus sign (+).

Command Default

No phone number is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The phone number is an optional user-configurable field.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the phone number of the system contact:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# phone-number +15435432101
```

profile (call home)

To enter call home profile configuration mode to create a user-defined profile or configure an existing Call Home profile, use the **profile** command in call home configuration mode. To delete a user-defined profile, use the **no** form of this command.

profile *profile-name*
no profile *profile-name*

Syntax Description

profile-name	A string that identifies the name of profile to create or configure.

Command Default

The tac profile exists by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the profile command to create a new profile or modify an existing profile. When you use the **no profile** command, the user-defined profile is deleted and the CiscoTAC-1 profile is set to default. A warning message is displayed when the CiscoTAC-1 profile is set to default.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to create a profile called new-profile:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile new-profile
RP/0/RP0/CPU0:router(config-call-home-profile)#
```

Related Commands

Command	Description
active	Enables a Call Home profile.
destination address	Specifies an email address to which Call Home messages are sent.

rate-limit

To specify a Call Home event trigger rate limit, use the **rate-limit** command in call home configuration mode. To disable the configured rate limit, use the **no** form of this command.

rate-limit *events-count*
no rate-limit *events-count*

Syntax Description

events-count	Number of events that can be triggered per minute. The default is five events. The maximum is five events.

Command Default

5 events per minute

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

Example

The following example shows how to configure the rate limit to be 3 events per minute:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# rate-limit 3
```

sender

To specify the from and reply-to email addresses for Call Home email messages, use the **sender** command in call-home configuration mode. To remove these email addresses from the configuration, use the **no** form of this command.

sender {**from** | **reply-to**}*email-address*
no sender {**from** | **reply-to**}*email-address*

Syntax Description

from	Specifies the email address to be used as the from field in Call Home email messages.
reply-to	Specifies the email address to be used as the reply-to field in Call Home email messages.
email-address	A string that identifies a valid email address.

Command Default

No sender email is configured.

Command Modes

Call-home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the from and reply-to email addresses:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# sender from user1@cisco.com
RP/0/RP0/CPU0:router(config-call-home)# sender reply-to user1@cisco.com
```

service active

To enable the Call Home capability, use the **service active** command in call home configuration mode. To disable the Call Home capability, use the **no** form of this command.

service active
no service active

Syntax Description

This command has no keywords or arguments.

Command Default

Call Home is disabled by default.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

It is mandatory to enable the Call Home capability using the **service active** command to allow events to get triggered and send out Call Home messages.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to enable the Call Home capability:

```
RP/0/RP0/CPU0:router(config-call-home)# service active
```

show call-home

To display information regarding the Call Home configuration, use the **show call-home** command in EXEC mode.

show call-home [**detail**]

Syntax Description

detail	Displays Call Home general settings, alert group settings, and all available profiles.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read

The following example shows how to display detailed call home configuration information:

```
RP/0/RP0/CPU0:router# show call-home detail

Wed Apr  6 02:00:27.789 DST

Current call home settings:
    call home feature : disable
    call home message's from address: Not yet set up
    call home message's reply-to address: Not yet set up

    contact person's email address: Not yet set up

    contact person's phone number: Not yet set up
    street address: Not yet set up
    customer ID: Not yet set up
    contract ID: Not yet set up
    site ID: Not yet set up

    Mail-server: Not yet set up
    Rate-limit: 5 event(s) per minute

Available alert groups:
    Keyword                  State   Description
    ------------------------ ------- --------------------------------
```

```
    inventory                Enable  inventory info
    syslog                   Enable  syslog info

Profiles:

Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com

    Periodic inventory info message is scheduled every 24 day of the month at 16:35

    Alert-group              Severity
    -----------------------  ------------

    inventory                normal

    Syslog-Pattern           Severity
    -----------------------  ------------
    .*                       major
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

show call-home alert-group

To display available Call Home alert groups, use the **show call-home alert-group** command in EXEC mode.

show call-home alert-group

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to display Call Home alert group information:

```
RP/0/RP0/CPU0:router# show call-home alert-group

Tue Apr  5 06:51:02.860 DST

Available alert groups:
    Keyword                  State   Description
    ------------------------ ------- --------------------------------

    inventory                Enable  inventory info
    syslog                   Enable  syslog info
```

show call-home mail-server status

To displays the status of the configured mail servers, use the **show call-home mail-server status** command in EXEC mode.

show call-home mail-server status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home mail-server status** command:

```
RP/0/RP0/CPU0:router# show call-home mail-server status

Please wait. Checking for mail server status ...

Mail-server[1]: Address: 64.102.124.15 Priority: 50 [Available]
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

show call-home profile

To display the Call Home profiles, use the **show call-home profile** command in EXEC mode.

show call-home profile {**all***profile-name*}

Syntax Description

all	Displays information for all profiles.
profile-name	Name of the profile for which to display information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home profile** command:

```
RP/0/RP0/CPU0:router# show call-home profile CiscoTAC-1

Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com

   Periodic inventory info message is scheduled every 4 day of the month at 12:19

    Alert-group               Severity
    ------------------------  ------------
    environment               minor

    Syslog-Pattern            Severity
    ------------------------  ------------
    .*                        major
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

show call-home statistics

To display Call Home statistics, use the **show call-home statistics** command in EXEC mode.

show call-home statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read

The following example shows sample output from the **show call-home statistics** command:

```
RP/0/RP0/CPU0:router# show call-home statistics

Message Types    Total                Email
-------------   -------------------- --------------------
Total Success   2                    2
    Environment 0                    0
    Inventory   2                    2
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Total In-Queue  0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Total Failed    0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0
```

```
Total Ratelimit
      -dropped  0                    0
    Environment 0                    0
    Inventory   0                    0
    SysLog      0                    0
    Test        0                    0
    Request     0                    0
    Send-CLI    0                    0

Last call-home message sent time: 2010-04-21 01:06:44 GMT+00:00
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

show call-home trace

To display Call Home trace information, use the **show call-home trace** command in EXEC mode.

show call-home trace {**all** | **error** | **event**} {**file** *filename* **original location** *node-id* | **hexdump** | **last** *n* | **location** {*node-id* | **all**} | **reverse** | **stats** | **tailf** | **unique** | **verbose** | **wrapping**}

Syntax Description

all	(Optional) Displays both error and event traces.
error	(Optional) Displays error trace entries.
event	(Optional) Displays event trace entries.
file *filename* **original location** *node-id*	(Optional) Specifies a filename and original location of the file to display.
hexdump	(Optional) Displays traces in hexadecimal format.
last *n*	(Optional) Displays the last *n* number of traces only.
location {*node-id* | **all**}	Specifies the RP node for which to display the execution path monitoring information. The *node-id* argument is expressed in the *rack/slot* notation. The **all** keyword specifies all RP nodes.
reverse	(Optional) Displays the most recent traces first.
stats	(Optional) Displays execution path statistics.
tailf	(Optional) Displays new traces as they are added.
unique	(Optional) Displays unique entries only, along with the count of the number of times this entry appears.
verbose	(Optional) Displays additional internal debugging information.
wrapping	(Optional) Displays wrapping entries.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
call-home	read

The following example shows how to display Call Home trace information:

```
RP/0/RP0/CPU0:router# show call-home trace event last 15 stats

Wed Apr  6 05:11:59.984 DST
/dev/shmem/ltrace/call_home/trace wrapping: 28.672 Mbytes/sec for 512 entries
59 wrapping entries (512 possible, 0 filtered, 59 total)
Mar  3 13:26:20.281 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:26:20.281 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:27:20.283 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:27:20.283 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:28:20.285 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:28:20.285 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:29:20.287 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:29:20.287 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:30:20.289 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:30:20.289 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:31:20.290 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
Mar  3 13:31:20.290 call_home/trace 0/RSP0/CPU0 t14 processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:32:21.067 call_home/trace 0/RSP0/CPU0 t14 Checking mail server access during
boot-up
Mar  3 13:32:21.067 call_home/trace 0/RSP0/CPU0 t9  processing mail server status checking
 event: data1 0x5005784c, str1
Mar  3 13:33:21.069 call_home/trace 0/RSP0/CPU0 t9  Checking mail server access during
boot-up
```

Related Commands

Command	Description
call-home, on page 815	Enters call home configuration mode to configure the call home feature.

site-id

To specify a site identifier for the system, use the **site-id** command in call-home configuration mode. To disable the site identifier, use the **no** form of this command.

site-id *site-id-string*
no site-id *site-id-string*

Syntax Description

site-id-string	A string that identifies the site.

Command Default

No site ID is defined.

Command Modes

Call-home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The site ID is an optional user-configurable field that can be used to specify a Cisco-supplied site ID or other data meaningful to the support service.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the site ID:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# site-id Cisco-site
```

street-address

To specify the street address of the system, use the **street-address** command in call home configuration mode. To remove the street address configuration, use the **no** form of this command.

street-address *street-address*
no street-address *street-address*

Syntax Description

street address	A string that identifies the street address of the system.

Command Default

No street address is defined.

Command Modes

Call home configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The street address is an optional user-configurable field that can be used to provide the address of the system to the support service.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the street address:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# street-address 170 West Tasman Dr.
San Jose, CA 95134 USA
```

subscribe-to-alert-group inventory

To configure a destination profile to receive messages for the inventory alert group, use the **subscribe-to-alert-group inventory** command in call home profile configuration mode. To disable the subscription, use the **no** form of this command.

subscribe-to-alert-group inventory [**periodic** {**daily** | **monthly** *day-of-month* | **weekly** *day-of-week*} *time*]
no subscribe-to-alert-group inventory [**periodic** {**daily** | **monthly** *day-of-month* | **weekly** *day-of-week*} *time*]

Syntax Description

periodic	Specifies to send an inventory message periodically.
daily	Sends daily inventory messages.
monthly *day-of-month*	Sends monthly inventory messages on the day of the month specified.
weekly *day-of-week*	Sends weekly inventory messages on the day of the week specified.
time	Time to send the inventory message, in the format `hour:minutes`.

Command Default

The inventory alert group is disabled by default. The default severity for the inventory alert group is normal.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

At least one alert group subscription is mandatory for a profile so that a valid event can be triggered.

There are two types of subscription for an inventory alert group. One is normal subscription, meaning that the severity is set to normal, and any (online insertion and removal) OIR event triggers the event. The second is periodic subscription, using the **periodic** keyword, meaning that an event is triggered only when the specified time arrives.

Task ID

Task ID	Operation
call-home	read, write

This example shows how to configure the sending of inventory messages every Monday:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
```

```
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# subscribe-to-alert-group inventory periodic
 weekly monday
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.
subscribe-to-alert-group syslog, on page 850	Configures a destination profile to receive messages for the syslog alert group.

subscribe-to-alert-group syslog

To configure a destination profile to receive messages for the syslog alert group, use the **subscribe-to-alert-group syslog** command in call home profile configuration mode. To disable the subscription, use the **no** form of this command.

subscribe-to-alert-group syslog severity *severity-level* **pattern** *match*
no subscribe-to-alert-group syslog severity *severity-level* **pattern** *match*

Syntax Description

severity	Specifies the the lowest level of severity events to include in a syslog alert.
severity-level	• **catastrophic**—Includes network-wide catastrophic events in the alert. This is the highest severity. • **critical**—Includes events requiring immediate attention (system log level 1). • **debugging**—Includes debug events (system log level 7). This is the lowest severity. • **disaster**—Includes events with significant network impact. • **fatal**—Includes events where the system is unusable (system log level 0). • **major**—Includes events classified as major conditions (system log level 2). • **minor**—Includes events classified as minor conditions (system log level 3) • **normal**—Specifies the normal state and includes events classified as informational (system log level 6). This is the default. • **notification**—Includes events informational message events (system log level 5). • **warning**—Includes events classified as warning conditions (system log level 4).
pattern	Specifies a syslog string pattern to match.
match	A string that when matched in the syslog message, is included in the alert notification. If the pattern contains spaces, you must enclose it in quotes (" ").

Command Default

The syslog alert group is disabled by default. The default severity for the syslog alert group is debugging.

Command Modes

Call home profile configuration

Command History

Release	Modification
Release 7.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

At least one alert group subscription is mandatory for a profile so that a valid event can be triggered.

Task ID

Task ID	Operation
call-home	read, write

The following example shows how to configure the syslog alert group to include severity notification:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config) call-home
RP/0/RP0/CPU0:router(config-call-home)# profile my-profile
RP/0/RP0/CPU0:router(config-call-home-profile)# subscribe-to-alert-group syslog severity
notification pattern "UPDOWN"
```

Related Commands

Command	Description
profile (call home), on page 832	Enters call home profile configuration mode to create or configure a Call Home profile.