Cisco IOS XRv 9000 Appliance

This chapter introduces Cisco IOS XRv 9000 as an Appliance and describes the concepts associated with Appliance. This chapter also talks about tasks required to upgrade, downgrade and reinstall the IOS XRv 9000 software on Appliance.

Note Cisco IOS XRv 9000 Appliance is introduced in Cisco IOS XR Release 6.1.2

Introducing Cisco IOS XRv 9000 Appliance

Cisco IOS XRv 9000 Appliance is a package of UCS hardware and Cisco XRv 9000 Router software with all applicable licenses. The Appliance package enables you to virtualize your network routing function without having operational concerns about ownership of hardware and software.

Cisco IOS XRv 9000 Appliance is the pre-installed Cisco IOS XRv 9000 Router software that is sent from the factory on a bare metal UCS server hardware. It supports hyper scalability as it can scale to 70 Million route prefixes when run as a Virtual Route Reflector. Therefore, the extra layer of software (hypervisor) is not required.

The Appliance also supports Zero Touch Provisioning (ZTP) which allows easier insertion into existing networks.

A single PID for the Appliance is inclusive of hardware, software, licenses, and services. The single PID for the Appliance simplifies the support and service experience as it eliminates the need to have separate service contract for software and hardware.

Note

- Licensing is disabled.
- Adding and removing any hardware is not supported.

The below table lists supported UCS server and Appliance PID:

Table 1:

Cisco IOS XR Release	Supported UCS Server Model	Single PID for Appliance
Release 6.1.2 and until Release 7.2.2	UCS C220 M4S	ASR-XRV9000-APLN
Release 6.6.2	UCS C220 M5SX (UCSC-C220-M5SX)	XRV9000-APLN-ROUT

Following are the default console settings:

- baud rate 115200 bps
- no parity
- 2 stop bits and
- 8 data bits

Appliance Physical Connections Overview

The rare panel view of the Appliance is similar to UCS server. However, some interfaces that are available on the UCS server are not used in the Appliance. The below topics show the usage and mapping of the interfaces in Appliance.

UCS M5 based Appliance Rear Panel Features

This figure shows an overview of UCS M5 based Appliance rear panel features:

Figure 1: UCS M5 based Appliance Rear Panel Features

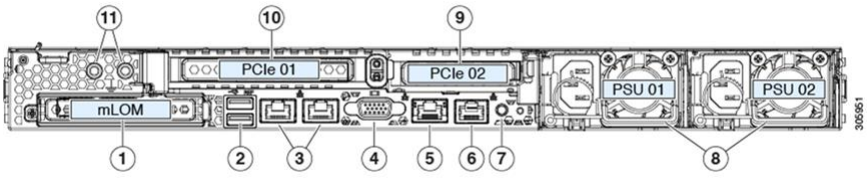

Table 2: Mapping of the Interfaces in Appliance

	Interface Description	In Appliance
1	Modular LAN-on-motherboard (mLOM) card bay (x16 PCIe lane)	Not used
2	USB 3.0 ports (two)	Used to connect keyboard for Admin console

	Interface Description	In Appliance
3	Dual 1-Gb/10-Gb Ethernet ports (LAN1 and LAN2)	LAN1 is mapped to XR Management Interface. LAN2 is not used.
4	VGA video port (DB-15 connector)	Mapped to Admin console The VGA connector can be connected to a regular VGA monitor, and a USB keyboard plugged into the USB port. Alternatively a UCS USB/VGA breakout cable and be plugged into the front of the server (cable ships with server).
5	1-Gb Ethernet dedicated management port	Mapped to Cisco Integrated Management Controller (CIMC)
6	Serial port (RJ-45 connector)	Mapped to XR console The serial port should be cabled to a device that will allow you keyboard/video access over that serial port.
7	Rear unit identification button/LED	Mapped to CIMC
8	Power supplies (two, redundant as 1+1)	-
9	PCIe riser 2/slot 2 (x16 lane)	Includes eight 10G Ethernet ports
10	PCIe riser 1/slot 1 (x16 lane)	
11	Threaded holes for dual-hole grounding lug	Used only if required

UCS M4 based Appliance Rear Panel Features

This figure shows an overview of UCS M4 based Appliance rear panel features:

Figure 2: UCS M4 based Appliance Rear Panel Features

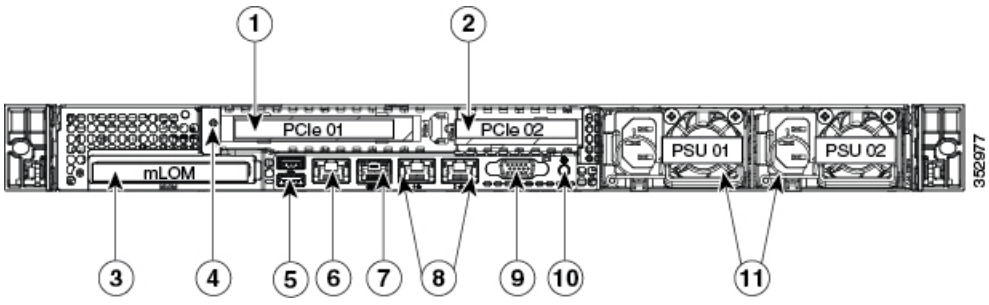

Table 3: Mapping of the Interfaces in Appliance

	Interface Description	In Appliance
1	PCIe riser 1/slot 1	Includes eight 10G Ethernet ports
2	PCIe riser 2/slot 2	
3	Modular LAN-on-motherboard (mLOM) card slot	Not used
4	Grounding-lug hole (for DC power supplies)	Used only if required
5	USB 3.0 ports (two)	Used to connect keyboard for Admin console
6	1-Gb Ethernet dedicated management port	Mapped to Cisco Integrated Management Controller (CIMC)
7	Serial port (RJ-45 connector)	Mapped to XR console The serial port should be cabled to a device that will allow you keyboard/video access over that serial port.
8	Dual 1-Gb Ethernet ports (LAN1 and LAN2)	LAN1 is mapped to XR Management Interface. LAN2 is not used.
9	VGA video port (DB-15)	Mapped to Admin console The VGA connector can be connected to a regular VGA monitor, and a USB keyboard plugged into the USB port. Alternatively a UCS USB/VGA breakout cable and be plugged into the front of the server (cable ships with server).
10	Rear unit identification button/LED	Mapped to CIMC
11	Power supplies (up to two, redundant as 1+1)	-

Interface Enumeration and Physical Mapping

The PCIe02 adapter is physically inserted upside down relative to PCIe01. Therefore the last four ports of PCIe02 interface are upside down. Hence the physical to XR port mapping is from left to right as shown in the below table:

0	**1**	**2**	**3**	**7**	**6**	**5**	**4**
PCIe01				PCIe02			

Configuring the Appliance

The Appliance can be configured in three ways:

Manual Configuration Using CLIs

To start the manual configuration:

1. Connect to the XR console (or a controller) through the serial port

Note During installation of Appliance if you use a vga image, you cannot access XR console after powering on the VM. Therefore, we recommend using a non-vga Appliance image for the installation.

2. Login to the XR console using admin password

Note You can use default credentials username as <*root*> and password as <*lab*>. If you still cannot login, use <*root*> as the user name <*Cisco123*> as password.

3. Configure the router manually using CLIs

   For information on specific IOS XR configuration refer, ASR 9000 System Management Configuration Guide.

   For information on specific IOS XR configuration CLIs refer, ASR 9000 System Management Command Reference.

IOS XRv 9000 does not support all the features supported on IOS XR. Refer the latest IOS XRv 9000 Router Release Notes to know the features supported on IOS XRv 9000 Router.

Automated Configuration Through Zero Touch Provisioning

Zero Touch Provisioning (ZTP) helps in auto provisioning after the software installation of the router using iPXE.

ZTP auto provisioning involves:

- Configuration—Downloads and executes the configuration files. The first line of the file must contain the code *!! IOS XR* for ZTP to process the file as a configuration.
- Script—Downloads and executes the script files. These script files include a programmatic approach to complete a task. For example, scripts created using IOS XR commands to perform patch upgrades. The first line of the file must contain the code *#! /bin/bash* or *#! /bin/sh* for ZTP to process the file as a script.

Note ZTP is supported only on management interface.

For more information on auto provisioning using ZTP, refer Zero Touch Provisioning section.

Automated Configuration using CVAC and USB

The Cisco IOS XRv 9000 Appliance supports auto configuring using CVAC. You should supply a plain-text configuration file **iosxr_config.txt** that has standard XR configurations on a USB drive to CVAC and boot the Appliance. This only works if no other configuration, including initial username and password has been configured.

For more information on how to boot Appliance using CVAC, refer the section CVAC - Bootstrap Configuration Support.

Software Management

As an IOS XR based product, the IOS XRv 9000 Appliance inherits a lot of the capabilities for software management from IOS XR. This section describes the concepts and tasks necessary to upgrade, downgrade and reinstall the IOS XRv 9000 Router software.

Note The FPD related commands are not supported on IOS XRv 9000 Appliance. That includes **fpd auto-update** command.

Software Management through UCS

The Appliance device comes with IOS XRv 9000 software preinstalled. User can reimage the device with the desired version of the software (Release 6.1.1 or later) anytime by one of these methods:

- Reinstall the OS using CIMC
- Reinstall the OS from the USB Port
- Reinstalling the OS using a PXE Installation Server

Note Reinstalling the OS will remove all the existing configurations and system information.

After the OS is installed perform the basic configuration as discussed in the *Configuring the Appliance* section.

Reinstall IOS XRv 9000 software using CIMC

Cisco Integrated Management Controller (CIMC) is used to manage the physical device and can be accessed through a web browser. CIMC is used to:

- remotely power on/off the Appliance,
- remotely access the console,
- reinstall the software, and

- upgrade firmware.

You can use CIMC to reinstall IOS XRv 9000 software remotely on the Appliance. By default CIMC has a dedicated GigE port on the Appliance. You must configure the CIMC port with an IP Address to access CIMC from a web browser. The option to configure CIMC port is available during power-on the device on the VGA console.

After configuring the IP Address on the CIMC port, log into CIMC from a web browser and use KVM (keyboard, video, and mouse) console.

When updating to Cisco IOS XRv version 7.0.1 or later on a UCS bare metal server, the KVM console is no longer available. Instead, you should use the telnet port, which allows access to both the XR and Calvados consoles.

Instead of using CD/DVD or floppy drives physically connected to the server, the KVM console uses virtual media, which are actual disk drives or disk image files that are mapped to virtual CD/DVD or floppy drives.

For more information on launching KVM console, refer KVM Console.

Note The ISO version of the IOS XRv 9000 software must be used for software installation and reinstallation.

Reinstalling the OS using CIMC

Follow the below procedure to reinstall the OS on M4 and M5 UCS based Appliance:

Before you begin

- Download the desired ISO image file (Release 6.1.1 or later version) to your machine
- You must log in as the user with admin privileges to install the OS
- You must be running CIMC latest version.

Step 1 Copy OS installation ISO disk image files to your computer.

Step 2 If CIMC is not open, then log in.

Step 3 In the Navigation pane, click the Launch KVM.

Step 4 Select either Java based KVM or HTML based KVM.

The GUI for Java based KVM and HTML based KVM is similar. The Java based KVM and HTML based KVM console are collectively called as KVM console.

The KVM Console opens in a separate window.

Step 5 Select Virtual Media>Activate Virtual Device in the KVM console.

Step 6 Select Virtual Media>Map CD/DVD. Then browse the ISO installation disk image stored locally and click Map Device.

Step 7 Select Power>Reset System (warm boot) in the KVM console.

When the server reboots, it begins the installation process. After the installation process completes, refer the section *Configuring the Appliance* to go through how to configure the device. To retain the console access you can check if

COM0 is mapped to SOL. So, you can either disable SOL or map SOL to COM1. After this, the physical Serial Port is map to the XR Console.

Reinstalling the OS from a USB Port

The Appliance supports booting an operating system from any USB port. However, there are a few guidelines that you must keep in mind, prior to booting an BIOS from a USB port.

- The BIOS installation process requires a bootable USB drive. Refer *Creating a Bootable USB Drive* section.
- To maintain the boot order configuration, it is recommended that you use an internal USB port for booting an BIOS.
- The USB port must be enabled prior to booting an OS from it.

Note By default, the USB ports are enabled. If you have disabled a USB port, you must enable it prior to booting an BIOS from it.

- After you boot the BIOS from the USB port, you must set the second-level boot order so that the server boots from that USB source every time.

Installing an operating system from a USB port:

1. Power cycle the Appliance
2. During boot process, select the USB Boot Option, and continue
3. The system will install the image from USB drive to harddisk drive and then reboots.

Note USB drive with large memory size won't boot. Hence, we recommend to use 8GB USB drive.

Reinstalling an OS Using a PXE Installation Server

Before you begin

- Verify that the server can be reached over a VLAN.
- You must log in as a user with admin privileges to install an OS.

Step 1 Set the boot order to PXE first.

Step 2 Reboot the server.

If a PXE install server is available on the VLAN, the installation process begins when the server reboots. PXE installations are typically automated and require no additional user input. Refer to the installation guide for the OS being installed to guide you through the rest of the installation process.

What to do next

After the OS installation is complete, reset the LAN boot order to its original setting.

Creating a Bootable USB drive

To create a bootable USB drive you need UNetbootin-an external open source software.

Before you begin

- Download the desired Cisco IOS XRv 9000 ISO installation file to your laptop or server.
- Download the UNetbootin app from this link: https://unetbootin.github.io/

Step 1 Copy the OS installation disk image files to your computer

Note We recommend to use ISO version of the IOS XRv 9000 software installation file for reinstallation.

Step 2 Format the USB disk to fat32 format

Step 3 Run UNetbootin and load the ISO installation file

Step 4 Build the USB disk. Follow the instructions provided in this link: https://unetbootin.github.io/

Step 5 Edit the syslinux.cfg file on the USB to use *Panini-no-issu* boot menu item as the default option.

By default, the BIOS displays the list of items that the user has to select.

For Mac OS users, use terminal to go to the mount point, and use Vi editor to edit the file. For example: */Volumes/MYDISK*.

Software Management using IOS XR

The IOS XRv 9000 software can be upgraded or downgraded using any of these methods:

- IOS XR CLI commands
- ZTP bash scripting (of install commands)
- IOS XR supported manageability interfaces

For information on the upgrade and downgrade procedures, see the upgrade document. It is available along with the software images.

Software Upgrade Using CLI

Before you begin

- Download the desired ISO image file to your machine.

Step 1 install commit

Example:

```
router# install commit
```

Commit the current version of IOS XRv 9000 software installed on the Appliance.

Step 2 install add source <*filepath*>

Example:

```
router# install add source tftp://192.0.2.4/fakepath/xrv9k-fullk9-x.iso
```

Locate the ISO disk image file that has to be installed on the Appliance.

Step 3 install activate <*filename*>

Example:

```
router# install activate xrv9k-fullk9-x.iso
```

Activates the IOS XRv 9000 new image version. The router reboots.

Step 4 show version

Example:

```
router# show version
```

Verify the new image version installed.

Step 5 install commit

Example:

```
router# install commit
```

Commits the new version.

Cisco IOS XRv 9000 Appliance Hardware Monitoring

The hardware monitoring on Cisco IOS XRv 9000 Appliance enables you to view harware environmental parameters of the Appliance in the same way as you would see on a conventional hardware router. Based on the interfaces involved in retrieving information, the Appliance hardware information is grouped into these three sections:

- Hardware Environment Monitoring—This includes power supply unit, fan, voltage, current, and temperature information; also inludes hardware failure warning and alarms information.
- Host OS Level Monitoring—This includes processor, core, memory, and HDD utilization information.

- SFP Optic Monitoring—This includes optical diagnostics and SFP OIR (online insertion and removal) monitoring information.

Hardware Environment Monitoring

In Cisco IOS XRv 9000 Appliance, the system continuosly monitor hardware to collect information on power consumption and report hardware failure. You can view these information using below commands in system admin mode.

Task	Use this command

To view the chassis fan information.	`sysadmin-vm:0_RP0# show environment fan`
	`Sun Nov  26 20:00:46.373 UTC`
	
	`                          Fan speed (rpm)`
	`  Location      FRU Type           FAN_0   FAN_1   FAN_2`
	`FAN_3   FAN_4   FAN_5`
	
	`0/FT0         XRV-FAN-C220M4=     7700    7500    7700`
	`7700    7700    7500`
	
	There are six fans in the Cisco IOS XRv 9000 Appliance. These fans do not support OIR, hence you must shut down the Appliance in order to replace fans.
	
	Unlike other hardware platforms, the Cisco IOS XR software running on the Appliance does not manage the fan speed. Instead, they are controlled by UCS Cisco Integrated Management Controller (CIMC) system.

Task	Use this command
To view the power tray information.	

Task	Use this command
	sysadmin-vm:0_RP0# **show environment power** CHASSIS LEVEL POWER INFO: 0 Total output power capacity (-) : 0W + 0W Total output power required : 0W Total power input : 0W **Total power output :** **108W** Power Shelf 0: Power Supply ------Input---- ------Output--- Status Module Type Volts Amps Volts Amps 0/PT0-PM0 Cisco 0.0 0.0 **12.1** **4.0** OK 0/PT0-PM1 Cisco 0.0 0.0 **12.0** **5.0** OK Total of Power Shelf 0: 0W/ 0.0A 108W/ 9.0A Location Card Type Power Power Status Allocated Used Watts Watts 0/0 R-IOSXRV9000-LC-A 0 - - 0/RP0 R-IOSXRV9000-RP-A 0 - - 0/FT0 XRV-FAN-C220M4= 0 - - In the above command output, only the highlighted field information (Power Module and Output) has a meaningful readings for the Cisco IOS XRv 9000 Appliance. The Total Power output is the sum of power output (power output = Volts*Amps) of each power module where. There are not input Volt/Amp sensors in the Appliance and there are

Task	Use this command
	no capacity, required, allocated, and used power data available for the Appliance.
To view the temperature information.	`sysadmin-vm:0_RP0# show environment temperature`

```
  Location  TEMPERATURE                 Value   Crit Major
 Minor Minor Major  Crit
            Sensor                    (deg C)   (Lo)  (Lo)
  (Lo)   (Hi)   (Hi)    (Hi)

--------------------------------------------------------------

  0/RP0
            Front (FP_TEMP_SENSOR)          27    -10    -5
    0     40    45    50
            Hub (PCH_TEMP_SENS)             37    -10    -5
    0     80    85    90
            Inlet (RISER1_INLET_TMP)        34    -10    -5
    0     60    70    80
            Outlet (RISER1_OUTLETTMP)       34    -10    -5
    0     60    70    80
            Inlet (RISER2_INLET_TMP)        35    -10    -5
    0     60    70    80
            Outlet (RISER2_OUTLETTMP)       38    -10    -5
    0     60    70    80
            Processor (P1_TEMP_SENS)        39    -10    -5
    0     92    97   100
            Processor (P2_TEMP_SENS)        46    -10    -5
    0     92    97   100
            Memory (DDR4_P1_A1_TEMP)        33    -10    -5
   -1     65    85    90
            Memory (DDR4_P1_A2_TEMP)         0    -10    -5
   -1     65    85    90
            Memory (DDR4_P1_A3_TEMP)         0    -10    -5
   -1     65    85    90
...
  0/PT0-PM0
            PM0-Supply (PSU_TEMP)           33    -10    -5
   -1     60    65    70
  0/PT0-PM1
            PM1-Supply (PSU_TEMP)           28    -10    -5
   -1     60    65    70
```

Note Few temperature readings for memory slots are zero because there are no DDR memory inserted in those memory slots.

Task	Use this command

To view the voltage information.	`sysadmin-vm:0_RP0# show environment voltage`
	`Sun Nov 26 20:00:32.333 UTC`
	
	`Location VOLTAGE Value Crit Minor Minor Crit`
	`Sensor (mV) (Lo) (Lo) (Hi) (Hi)`
	
	`0/RP0`
	`Board (P12V_V_MOIN) 12036 10148 10797 13157 13806`
	`Board (P12V_AUX_V_MOIN) 12095 10148 10797 13157 13806`
	`Board (P12V_STBY_V_MOIN) 12064 10150 10788 13166 13804`
	`Board (P5V_V_MOIN) 5005 4301 4535 5452 5687`
	`Board (P5V_AUX) 5026 4319 4555 5428 5688`
	`Board (P3V3_V_MOIN) 3376 2848 3008 3584 3744`
	`Board (P3V3_AUX) 3312 2842 3014 3580 3737`
	`Board (P3V_BAT_V_MOIN) 2995 2246 2543 3588 3760`
	`Board (P1V8_AUX) 1794 1591 1677 1911 1981`
	`Board (P1V5_AUX) 1489 1326 1404 1599 1677`
	`Board (P1V2_AUX) 1193 1061 1123 1279 1342`
	`...`
	The above voltage readings are from the UCS mother board.

Task	Use this command

To view hardware failure information	`sysadmin-vm:0_RP0# show logging | i envmon`
	
	`Mon Oct 2 09:38:06.390 UTC`
	`0/RP0/ADMIN0:Oct 1 16:58:44.394 : envmon[2332]:`
	`%PKT_INFRA-FM-6-FAULT_INFO : Power Module insertion :INFO :0/PT0-PM0:`
	`0/RP0/ADMIN0:Oct 2 09:26:37.657 : envmon[2332]:`
	`%PKT_INFRA-FM-6-FAULT_INFO : Power Module insertion :INFO :0/PT0-PM1:`
	`0/RP0/ADMIN0:Oct 2 09:37:03.605 : envmon[2332]:`
	`%PKT_INFRA-FM-6-FAULT_INFO : Power Module removal :INFO :0/PT0-PM1:`
	`0/RP0/ADMIN0:Oct 2 09:37:50.221 : envmon[2332]:`
	`%PKT_INFRA-FM-6-FAULT_INFO : Power Module insertion :INFO :0/PT0-PM1:`
	
	Before executing the above command, remove and re-insert power module (0/PT0-PM1). The power module supports OIR.
	
	In the above command output the highlighted row captures the power module removal and insertion information.
	
	Note The first two insertions in the above command output are from the system boot.

To view alarms	`sysadmin-vm:0_RP0# show alarms`
	
	`Thu Oct 19 12:28:59.400 UTC`
	
	`Active Alarms`
	`Location Severity Group Set time`
	`Description`
	`0/PT0-PM0 major environ 10/19/17 12:27:34 Power Module Error (PM_OUTPUT_STAGE_OT).`
	`0/PT0-PM0 major environ 10/19/17 12:27:34 Power Module Shutdown (PM_OC_SHUTDOWN).`
	`0/PT0-PM1 major environ 10/19/17 12:27:34 Power Module Fault (PM_VOUT_VOLT_OOR).`
	`0/RP0 major environ 10/19/17 12:27:34 Processor (P1_TEMP_SENS): temperature alarm.`
	`0/RP0 major environ 10/19/17 12:27:40 Board (P3V3_AUX): low voltage alarm.`

Host Level Monitoring Information

You can monitor the host OS level utilization information for the Appliance and XRv 9000 VM as well. Use the below show commands in system admin mode to view the information.

Task	Use this command

To view the CPU information.	`sysadmin-vm:0_RP0# show virtual-platform cpu`
	`System CPU utilization`
	`Linux 3.14.23-WR7.0.0.2_standard (host) 11/27/17`
	`_x86_64_ (16 CPU)`
	
	`02:27:49 CPU %usr %nice %sys %iowait %irq %soft %steal %guest %gnice %idle`
	`02:27:49 all 4.06 0.00 4.66 0.01 0.00 0.06 0.00 0.00 0.00 91.21`
	`02:27:49 0 0.84 0.00 1.72 0.02 0.00 0.30 0.00 0.00 0.00 97.12`
	`02:27:49 1 2.08 0.00 2.31 0.01 0.00 0.10 0.00 0.00 0.00 95.50`
	`02:27:49 2 0.99 0.00 1.73 0.01 0.00 0.05 0.00 0.00 0.00 97.22`
	`...`
	`02:27:49 14 2.40 0.00 1.64 0.00 0.00 0.00 0.00 0.00 0.00 95.96`
	`02:27:49 15 1.24 0.00 1.41 0.00 0.00 0.00 0.00 0.00 0.00 97.35`

To view disk information	`sysadmin-vm:0_RP0# show virtual-platform disk`
	
	`System Disk Utilization`
	`Filesystem 1K-blocks Used Available Use% Mounted on`
	`/dev/mapper/panini_vol_grp-host_lv0 991512 425304 498624 47% /`
	`...`
	`/dev/mapper/panini_vol_grp-host_data_scratch_lv0 2007248 3036 1884200 1% /misc/scratch`
	`/dev/mapper/panini_vol_grp-host_data_config_lv0 95088 44 87876 1% /misc/config`
	`/dev/mapper/panini_vol_grp-host_data_log_lv0 479560 8080 435640 2% /var/log`
	`none 512 0 512 0% /mnt`
	`/dev/loop5 6060604 1330192 4399508 24% /lxc_rootfs/panini_vol_grp-xr_lv0`

To view memory information	`sysadmin-vm:0_RP0# show virtual-platform memory`
	`System Memory Usage`
	`MemTotal: 131982032 kB`
	`MemFree: 109636132 kB`
	`MemAvailable: 111675924 kB`
	`...`
	`HugePages_Total: 12`
	`...`
	`Hugepagesize: 1048576 kB`
	`...`
	In the above command output, the MemFree information is helpful to check if the Cisco IOS XRv 9000 system is experience memory exhaustion. The Hugepages field values help triage for VPE issue.

Task	Use this command
To view processor information	sysadmin-vm:0_RP0# **show virtual-platform processor** System Processor Information --- processor : 0 vendor_id : GenuineIntel cpu family : 6 ... flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb xsaveopt pln pts dtherm tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm rdseed adx smap ... processor : 1 ... The above command displays the detailed information of sixteen cores in the Appliance. The flags information are useful to check if the CPU is properly set in a XRv9000 VM hypervisor settings.

Environmental Monitoring through UCS Cisco Integrated Management Controller (CIMC)

In Release prior to 6.4.1 , there is no XR based environment monitoring capability in the Appliance.

However, since the Appliance is built on a UCS server, server environmental monitoring can also be done through SNMP or IPMI interfaces directly through CIMC. Refer to the Cisco UCS Server documentation on how to configure and use SNMP or IPMI monitoring via CIMC.

SFP Optic Monitoring Information

Cisco IOS XRv 9000 extracts optic health information from SFPs plugged into a NIC. The information includes vendor name, part number, current receiving power and transmiting power. To view the information use **show controllers <interface> physical**command in XR EXEC mode:

```
RP/0/RP0/CPU0:SS_Node1# show controllers TenGigE 0/0/0/1 physical
SFP EEPROM  port:1
        Xcvr Type: SFP
        Xcvr Code: SFP-10G-SR
        Encoding: 64B66B
        Bit Rate: 10300 Mbps
        Link Reach 50u fiber: 80 meter
        Link Reach 62.5u fiber: 20 meter
        Vendor Name: CISCO-JDSU
        Vendor OUI: 00.01.9c
        Vendor Part Number: PLRXPL-SC-S43-CS (rev.: 1   )
        Laser wavelength: 850 nm (fraction: 0.00 nm)
        Optional SFP Signal: Tx_Disable, Tx_Fault, LOS
        Vendor Serial Number: JUS1734G1L5
```

```
        Date Code (yy/mm/dd): 13/10/13  lot code:
        Diagnostic Monitoring: DOM, Int. Cal.,
        Enhanced Options: SW RX LOS Mon., SW TX Fault Mon, SW TX Disable, Alarm/Warning
Flags

...

        Temperature: 28.445
        Voltage: 3.300 Volt
        .
```

SFP OIR (online insertion and removal) information is monitored by polling the status of all SFPs every 5 seconds. The change in state is captured and reflected in a syslog message.

```
RP/0/RP0/CPU0:SS_Node1# show logging | i envmon
```