New Features for Cisco IOS-XE 17.5.1

This section contains the following:

RFC4884 ICMPv6 and MPLSv6

RFC 4884 redefines selected ICMP error messages to support multi-part operation.

A multi-part ICMP message carries all of the information that ICMP messages carried previously, as well as additional information that applications may require.

RFC 4884 feature introduces an 8-bit length attribute to the following ICMPv6 messages with extensions.

- Destination Unreachable (type = 1)

- Time Exceeded (type = 3)

As part of RFC 4884 feature, for applications like MPLS/trace route which add extensions to type 1 and type 3 ICMPv6 error messages, original datagram length will be added in ICMPv6 header.

Also, infra is added as part of RFC 4884 support. If any new application is adding extensions it has to call defined registries to be compliant with RFC 4884.

Backward compatibility is also taken care of as part of this feature.

This feature is enabled by default and a CLI *[no]* **ipv6 icmp od-length enable** is provided which is enabled by default.

Command Example

```
ipv6 icmp od-length enable
```

Limitations

RFC4884 ICMP v4 and MPLS v4 extensions will be supported in the IOS-XE 17.6.1 release.

Netboot Support

The Netboot (TFTP boot) feature is now supported on the ESR6300. The ESR6300 has two Combo ports, Copper and Fiber ports (SFP) ports that support TFTP boot.

The Netboot (TFTP boot) feature allows the user to recover their router in the case that there is no image in the bootflash or USB.

The following configuration needs to be in place in ROMMON:

- WAN port Gigabit-Ethernet 0/0/0 or 0/0/1 should be connected to a TFTP network

- Path to image should be in a TFTP directory

- set IP_ADDRESS=<IP address of router>

- set IP_SUBNET_MASK=<mask>

- set DEFAULT_GATEWAY=<IP address of gateway>

- boot tftp://<server IP address>/<path to image>

Alarm port Support on the ESR6300

There is one alarm port available on the ESR6300. The IOS name for the alarm port is Alarm Contact 0.

The following configuration commands are available in IOS:

- alarm contact 0 enable

- alarm contact 0 description

- alarm contact 0 severity

- alarm contact 0 trigger

The configuration commands also have their equivalent **no** prefaces.

Alarm Contact Command

The ESR6300 supports only one alarm contact, which is Alarm Contact 0. Options are described in the following table:

description	The description string is up to 80 alphanumeric characters in length and is included in any generated system messages.
severity	For severity, enter critical, major, minor or none. If you do not configure a severity, the default is minor.
trigger	For trigger, enter open or closed. If you do not configure a trigger, the alarm is triggered when the circuit is closed.

| enable | Provides a mechanism for you to enable or disable alarm conditions for a port. |

Alarm Trigger Command

The **trigger** command has two options as shown below:

closed	Assert alarm when contact is closed.
	Closed means that no current flows through the contact (normally open contact). The alarm is generated when current does flow.
open	Assert alarm when contact is open.
	Open means that the normal condition has current flowing through the contact (normally closed contact). The alarm is generated when the current stops flowing.

Note   See the Alarm Port Configuration Examples, on page 3 for command examples.

Alarm LEDs

The alarm LED behavior is described in the following table:

Severity	LED Status
Critical	Flashing Red
Major	Flashing Red
Minor	Red

Note   The LED behavior depends on both the trigger configuration as well as the severity configuration. The LED behavior does not differentiate between the Critical and Major severity.

Alarm Port Configuration Examples

To configure the feature, the alarm contact 0 needs to be enabled first. Perform the following:

```
Router#config term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#alarm contact 0 enable
Router(config)#alarm contact 0 description test
Router(config)#alarm contact 0 severity critical
```

Alarm Enable/Disable

The alarm needs to be enabled to configure the severity and trigger. The following example shows the errors when the alarm is not enabled:

```
Router(config)#alarm contact 0 trigger open
Alarm / Digital IO Port 0 is not enabled.

Router(config)#alarm contact 0 severity major
Alarm / Digital IO Port 0 is not enabled.
```

Enabling the Alarm and Setting the Severity

See the following example:

```
Router(config)#alarm contact 0 enable

Router(config)#alarm  contact 0 severity ?
  critical  Critical alarm severity
  major     Major alarm severity
  minor     Minor alarm severity
  none      No alarm severity

Router(config)#alarm contact 0 severity major
Router(config)#end
Router#
*Oct 16 14:54:54.518: %IIOT_ALARM_CONTACT-0-EXTERNAL_ALARM_CONTACT_ASSERT: External
alarm/digital IO port (External alarm contact on Motherboard) asserted

*Oct 16 14:54:54.518: %IIOT_ALARM_CONTACT-0-EXTERNAL_ALARM_CONTACT_ASSERT: External
alarm/digital IO port (ASSERT) asserted
ha
*Oct 16 14:54:54.733: %SYS-5-CONFIG_I: Configured from console by cons
```

Viewing The Configuration

To view the configuration:

```
Router#show alarm
Alarm contact 0:
Description: External alarm contact on Motherboard
Status: Not Asserted
Application: Dry
Severity: major
Trigger: Open
Mode: Input
Router#

Router#show facility-alarm status
System Totals  Critical: 0  Major: 1  Minor: 0

Source                    Time                 Severity    Description [Index]
------                    ------               --------    -------------------

External alarm contact    Oct 16 2023 14:46:14  MAJOR       External alarm contact on
Motherboard [0]

Async0/2/0                Oct 15 2023 18:58:08  INFO        Physical Port Administrative
 State Down [2]

GigabitEthernet0/0/0      Oct 15 2023 18:58:21  INFO        Physical Port Administrative
 State Down [2]
```

```
GigabitEthernet0/0/1      Oct 15 2023 18:58:21   INFO      Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/0      Oct 15 2023 18:58:20   INFO      Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/1      Oct 15 2023 18:58:20   INFO      Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/2      Oct 15 2023 18:58:20   INFO      Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/3      Oct 15 2023 18:58:20   INFO      Physical Port Administrative
 State Down [2]

Cellular0/3/0             Oct 15 2023 18:58:22   INFO      Physical Port Administrative
 State Down [2]

Cellular0/3/1             Oct 15 2023 18:58:22   INFO      Physical Port Administrative
 State Down [2]

Router#
Router#show facility-alarm status major
System Totals  Critical: 0  Major: 1  Minor: 0

Source                    Time                   Severity   Description [Index]
------                    ------                 --------   -------------------

External alarm contact    Oct 16 2023 14:46:14   MAJOR      External alarm contact on
Motherboard [0]
```

Alarm Trigger Commands

See the following example:

```
Router#show run | sec alarm
alarm contact 0 enable
alarm contact 0 trigger Open
logging alarm informational
Router#
Router#show alarm
Alarm contact 0:
   Description: External alarm contact on Motherboard
   Status:      Asserted
   Application: Dry
   Severity:    minor
   Trigger:     Open
   Mode:        Input
Router#
Router#show facility-alarm status
System Totals  Critical: 0  Major: 0  Minor: 1

Source                    Time                   Severity   Description [Index]
------                    ------                 --------   -------------------

External alarm contact    Oct 16 2023 14:54:54   MINOR      External alarm contact on
Motherboard [0]

Async0/2/0                Oct 15 2023 18:58:08   INFO      Physical Port Administrative
 State Down [2]

GigabitEthernet0/0/0      Oct 15 2023 18:58:21   INFO      Physical Port Administrative
 State Down [2]
```

```
GigabitEthernet0/0/1       Oct 15 2023 18:58:21   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/0       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/1       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/2       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/3       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

Cellular0/3/0              Oct 15 2023 18:58:22   INFO       Physical Port Administrative
 State Down [2]

Cellular0/3/1              Oct 15 2023 18:58:22   INFO       Physical Port Administrative
 State Down [2]

Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#alarm  contact 0 trigger closed
Router(config)#
*Oct 16 14:58:19.548: %IIOT_ALARM_CONTACT-0-EXTERNAL_ALARM_CONTACT_CLEAR: External
alarm/digital IO port (External alarm contact on Motherboard) cleared

*Oct 16 14:58:19.549: %IIOT_ALARM_CONTACT-0-EXTERNAL_ALARM_CONTACT_CLEAR: External
alarm/digital IO port (CLEAR) cleared

Router#sh facility-alarm status
System Totals  Critical: 0  Major: 0  Minor: 0

Source                   Time               Severity    Description [Index]
------                   ------             --------    -------------------

Async0/2/0               Oct 15 2023 18:58:08   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/0/0       Oct 15 2023 18:58:21   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/0/1       Oct 15 2023 18:58:21   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/0       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/1       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/2       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

GigabitEthernet0/1/3       Oct 15 2023 18:58:20   INFO       Physical Port Administrative
 State Down [2]

Cellular0/3/0              Oct 15 2023 18:58:22   INFO       Physical Port Administrative
 State Down [2]

Cellular0/3/1              Oct 15 2023 18:58:22   INFO       Physical Port Administrative
 State Down [2]
```

```
Router#

Router#show alarm
Alarm contact 0:
   Description: External alarm contact on Motherboard
   Status:      Not Asserted
   Application: Dry
   Severity:    minor
   Trigger:     Closed
   Mode:        Input
```