



## Enhancements to Data Models

This section provides an overview of the enhancements made to data models.

- [OAM for MPLS and SR-MPLS in mpls-ping and mpls-traceroute Data Models, on page 1](#)

# OAM for MPLS and SR-MPLS in mpls-ping and mpls-traceroute Data Models

*Table 1: Feature History Table*

Feature Name	Release Information	Description
YANG Data Models for MPLS OAM RPCs	Release 7.3.2	<p>This feature introduces the <code>Cisco-IOS-XR-mpls-ping-act</code> and <code>Cisco-IOS-XR-mpls-traceroute-act</code> YANG data models to accommodate operations, administration and maintenance (OAM) RPCs for MPLS and SR-MPLS.</p> <p>You can access these Cisco IOS XR native data models from the <a href="#">Github</a> repository.</p>

The `Cisco-IOS-XR-mpls-ping-act` and `Cisco-IOS-XR-mpls-traceroute-act` YANG data models are introduced to provide the following options:

- Ping for MPLS:
  - MPLS IPv4 address
  - MPLS TE
  - FEC-129 Pseudowire
  - FEC-128 Pseudowire
  - Multisegment Pseudowire

- Ping for SR-MPLS:
  - SR policy name or BSID with LSP end-point
  - SR MPLS IPv4 address
  - SR Nil-FEC labels
  - SR Flexible Algorithm
- Traceroute for MPLS:
  - MPLS IPv4 address
  - MPLS TE
- Traceroute for SR-MPLS:
  - SR policy name or BSID with LSP end-point
  - SR MPLS IPv4 address
  - SR Nil-FEC labels
  - SR Flexible Algorithm

The following example shows the ping operation for an SR policy and LSP end-point:

```
<mpls-ping xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-ping-act">
  <sr-mpls>
    <policy>
      <name>srte_c_10_ep_10.10.10.1</name>
      <lsp-endpoint>10.10.10.4</lsp-endpoint>
    </policy>
  </sr-mpls>
  <request-options-parameters>
    <brief>true</brief>
  </request-options-parameters>
</mpls-ping>
```

#### Response:

```
<?xml version="1.0"?>
<mpls-ping-response xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-ping-act">
  <request-options-parameters>
    <exp>0</exp>
    <fec>false</fec>
    <interval>0</interval>
    <ddmap>false</ddmap>
    <force-explicit-null>false</force-explicit-null>
  <packet-output>
    <interface-name>None</interface-name>
    <next-hop>0.0.0.0</next-hop>
  </packet-output>
  <pad>abcd</pad>
  <repeat>5</repeat>
  <reply>
    <dscp>255</dscp>
    <reply-mode>default</reply-mode>
    <pad-tlv>false</pad-tlv>
  </reply>
  <size>100</size>
```

```

<source>0.0.0.0</source>
<destination>127.0.0.1</destination>
<sweep>
  <minimum>100</minimum>
  <maximum>100</maximum>
  <increment>1</increment>
</sweep>
<brief>true</brief>
<timeout>2</timeout>
<ttl>255</ttl>
</request-options-parameters>
<replies>
  <reply>
    <reply-index>1</reply-index>
    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
  <reply>
    <reply-index>2</reply-index>
    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
  <reply>
    <reply-index>3</reply-index>
    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
  <reply>
    <reply-index>4</reply-index>
    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
  <reply>
    <reply-index>5</reply-index>
    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
</replies>
</mpls-ping-response>

```

The following example shows the ping operation for an SR policy BSID and LSP end-point:

```

<mpls-ping xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-ping-act">
  <sr-mpls>
    <policy>
      <bsid>1000</bsid>
      <lsp-endpoint>10.10.10.4</lsp-endpoint>
    </policy>
  </sr-mpls>
  <request-options-parameters>
    <brief>true</brief>
  </request-options-parameters>
</mpls-ping>

```

**Response:**

```

<?xml version="1.0"?>
<mpls-ping-response xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-ping-act">
  <request-options-parameters>
    <exp>0</exp>
    <fec>>false</fec>
    <interval>0</interval>
    <ddmap>>false</ddmap>
    <force-explicit-null>>false</force-explicit-null>
    <packet-output>
      <interface-name>None</interface-name>
      <next-hop>0.0.0.0</next-hop>
    </packet-output>
    <pad>abcd</pad>
    <repeat>5</repeat>
    <reply>
      <dscp>255</dscp>
      <reply-mode>default</reply-mode>
      <pad-tlv>>false</pad-tlv>
    </reply>
    <size>100</size>
    <source>0.0.0.0</source>
    <destination>127.0.0.1</destination>
    <sweep>
      <minimum>100</minimum>
      <maximum>100</maximum>
      <increment>1</increment>
    </sweep>
    <brief>>true</brief>
    <timeout>2</timeout>
    <ttl>255</ttl>
  </request-options-parameters>
  <replies>
    <reply>
      <reply-index>1</reply-index>
      <return-code>3</return-code>
      <return-char>!</return-char>
      <reply-addr>14.14.14.3</reply-addr>
      <size>100</size>
    </reply>
    <reply>
      <reply-index>2</reply-index>
      <return-code>3</return-code>
      <return-char>!</return-char>
      <reply-addr>14.14.14.3</reply-addr>
      <size>100</size>
    </reply>
    <reply>
      <reply-index>3</reply-index>
      <return-code>3</return-code>
      <return-char>!</return-char>
      <reply-addr>14.14.14.3</reply-addr>
      <size>100</size>
    </reply>
    <reply>
      <reply-index>4</reply-index>
      <return-code>3</return-code>
      <return-char>!</return-char>
      <reply-addr>14.14.14.3</reply-addr>
      <size>100</size>
    </reply>
    <reply>
      <reply-index>5</reply-index>

```

```

    <return-code>3</return-code>
    <return-char>!</return-char>
    <reply-addr>14.14.14.3</reply-addr>
    <size>100</size>
  </reply>
</replies>
</mpls-ping-response>

```

The following example shows the traceroute operation for an SR policy and LSP end-point:

```

<mpls-traceroute xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-traceroute-act">
<sr-mpls>
<policy>
  <name>srte_c_10_ep_10.10.10.1</name>
  <lsp-endpoint>10.10.10.4</lsp-endpoint>
</policy>
</sr-mpls>
<request-options-parameters>
  <brief>true</brief>
</request-options-parameters>
</mpls-traceroute>

```

### Response:

```

<?xml version="1.0"?>
<mpls-traceroute-response xmlns="http://cisco.com/ns/yang/Cisco-IOS-XR-mpls-traceroute-act">

  <request-options-parameters>
    <exp>0</exp>
    <fec>false</fec>
    <ddmap>false</ddmap>
    <force-explicit-null>false</force-explicit-null>
    <packet-output>
      <interface-name>None</interface-name>
      <next-hop>0.0.0.0</next-hop>
    </packet-output>
    <reply>
      <dscp>255</dscp>
      <reply-mode>default</reply-mode>
    </reply>
    <source>0.0.0.0</source>
    <destination>127.0.0.1</destination>
    <brief>true</brief>
    <timeout>2</timeout>
    <ttl>30</ttl>
  </request-options-parameters>
  <paths>
    <path>
      <path-index>0</path-index>
      <hops>
        <hop>
          <hop-index>0</hop-index>
          <hop-origin-ip>11.11.11.1</hop-origin-ip>
          <hop-destination-ip>11.11.11.2</hop-destination-ip>
          <mtu>1500</mtu>
          <dsmap-label-stack>
            <dsmap-label>
              <label>16003</label>
            </dsmap-label>
          </dsmap-label-stack>
          <return-code>0</return-code>
          <return-char> </return-char>
        </hop>

```

```
<hop>
  <hop-index>1</hop-index>
  <hop-origin-ip>11.11.11.2</hop-origin-ip>
  <hop-destination-ip>14.14.14.3</hop-destination-ip>
  <mtu>1500</mtu>
  <dsmapi-label-stack>
    <dsmapi-label>
      <label>3</label>
    </dsmapi-label>
  </dsmapi-label-stack>
  <return-code>8</return-code>
  <return-char>L</return-char>
</hop>
<hop>
  <hop-index>2</hop-index>
  <hop-origin-ip>14.14.14.3</hop-origin-ip>
  <hop-destination-ip></hop-destination-ip>
  <mtu>0</mtu>
  <dsmapi-label-stack/>
  <return-code>3</return-code>
  <return-char>!</return-char>
</hop>
</hops>
</path>
</paths>
</mpls-traceroute-response>
```