



Forward Error Correction

Forward Error Correction (FEC) is a mechanism to recover lost packets on a link by sending extra “parity” packets for every group (N) of packets. As long as the receiver receives a subset of packets in the group (at-least N-1) and the parity packet, up to a single lost packet in the group can be recovered. FEC is supported on Cisco IOS XE SD-WAN devices.

Table 1: Feature History

Release	Description
Cisco IOS XE SD-WAN Release 16.11.x	Feature introduced. Forward Error Correction (FEC) is a mechanism to recover lost packets on a link by sending extra “parity” packets for every group (N) of packets.

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Configure Forward Error Correction for a Policy

- Step 1** Select **Configuration > Policies**.
- Step 2** Select **Centralized Policy** at the top of the page and then click **Add Policy**.
- Step 3** Click **Next** to select Configure Traffic Rules
- Step 4** Select **Traffic Data**, and from the Add Policy drop-down menu select click **Create New**.
- Step 5** Click **Sequence Type** in the left panel.
- Step 6** From the Add Data Policy pop-up menu, select **QoS**.
- Step 7** Click **Sequence Rule**.
- Step 8** In the **Applications/Application Family List/Data Prefix**, Select one or more applications or lists..
- Step 9** Click **Actions** and select **Loss Correction**.
- Step 10** In the Actions area, select one of the following:

- **FEC Adaptive**—Only send FEC information only when the system detects a packet loss.

Note The **FEC Adaptive** option is not supported on Cisco IOS XE SD-WAN devices.

Note FEC adaptive only works when the **app-route** interval is set at least twice that of the BFD Hello packet interval.

- **FEC Always**—Always send FEC information with every transmission
- **Packet Duplication** check box—Duplicates packets through secondary links to reduce packet loss if one link goes down

Step 11 Click **Save Match and Actions**.

Step 12 Click **Save Data Policy**.

Step 13 Click **Next** and take these actions to create a Centralized Policy:

- a) Enter a Name and Description.
- b) Select **Traffic Data Policy**.
- c) Choose VPNs/site list for the policy.
- d) Save the policy.

Monitor Forward Error Correction Tunnel Information

Step 1 Select **Monitor > Network**.

Step 2 Select a device group.

Step 3 In the left panel, click **Tunnel**, which displays under WAN

The WAN tunnel information includes the following:

- A graph that shows the total tunnel loss for the selected tunnels.
- A graph that shows the FEC loss recovery rate for the selected tunnels. The system calculates this rate by dividing the total number of reconstructed packets by the total number of lost packets on FEC:
- A table that provides the following information for each tunnel endpoint:
 - Name of the tunnel endpoint
 - Communications protocol that the endpoint uses
 - State of the endpoint
 - Jitter, in ms, on the endpoint
 - Packet loss percentage for the endpoint
 - FEC loss recovery percentage for the endpoint
 - Latency, in ms, on the endpoint
 - Total bytes transmitted from the endpoint
 - Total bytes received by the endpoint

- Application usage link
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Monitor Forward Error Application Family Information

Step 1 Select **Monitor** > **Network**.

Step 2 Select a device group.

Step 3 In the left panel, click **DPI Applications**, which displays under **Applications**.

The FEC Recovery Rate application information includes the following:

- A graph for which you can select any of the following perspectives:
 - Application Usage—Usage of various types of traffic for the selected application families, in KB.
 - FEC Recovery Rate—FEC loss recovery rate for the selected application families. The system calculates this rate by dividing the total number of reconstructed packets by the total number of lost FEC-enabled packets.
 - A table that provides the following for each application family:
 - Name of the application family.
 - Packet Delivery Performance for the application family.
 - Note** If you need to see the packet delivery performance for the selected application family, ensure that packet duplication is enabled. Packet delivery performance is calculated based on the formula as displayed in the Cisco vManage tooltip for the **Packet Delivery Performance** column.
 - Traffic usage, in KB, MB, or GB for the selected application family.
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