# Packet Duplication for Noisy Channels

*Table 1: Feature History*

| Feature Name | Release Information | Description |
|---|---|---|
| Packet Duplication for Noisy Channels | Cisco IOS XE SD-WAN Release 16.12.1b | This feature helps mitigate packet loss over noisy channels, thereby maintaining high application QoE for voice and video. |

## Information about Packet Duplication

Cisco IOS XE SD-WAN devices use packet duplication to overcome packet loss.

Packet duplication sends copies of packets on alternate available paths to reach Cisco IOS XE SD-WAN devices. If one of the packets is lost, a copy of the packet is forwarded to the server. Receiving Cisco IOS XE SD-WAN devices discard copies of the packet and forward one packet to the server.

Packet duplication is suitable for edges with multiple access links. Once packet duplication is configured and pushed to your device, you can see the tunnel packet duplication statistics.

## Configure Packet Duplication

**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** twice 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 the **Pack Duplication** option to enable the packet duplication feature.

- **FEC Adaptive**—Only send Forward Error Correction (FEC) information when the system detects a packet loss.

- **FEC Always**—Always send FEC information with every transmission.

- **None**—Use when no loss protection is needed.

- **Packet Duplication**—Enable when packets need to be duplicated and sent on the next available links to reduce packet loss.

**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:

- Enter a Name and a Description.

- Select **Traffic Data Policy**.

- Choose **VPNs/site list** for the policy.

- Save the policy.

# Monitor Packet Duplication Per Application

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

**Step 2**      Select a device group.

**Step 3**      In the left panel, click **Applications**.

**Step 4**      On the Application usage tab, select the application family of interest, and click on the Application family listed.

**Step 5**      If packet duplication is enabled for any application, vManage displays Packet Delivery Performance as GOOD, MODERATE, or POOR or the field displays as N/A.

**Step 6**      GOOD and MODERATE performance is a clickable link. When clicking on the link, the status pops up a window.

**Step 7**      On the pop-up window, you see Application, Packet Delivery Performance, Overall for the Application, Average Drop Rate, and Overall for the Application information. The time slot graph represents the packets transmitted with different available link colors and the overall performance calculated when packet duplication is enabled.

**Step 8**      If you hover over the time slot, you can see the performance status and the average drop rate for each link.