Protocols in Cisco SD-WAN

This chapter discusses the protocols supported in Cisco SD-WAN.

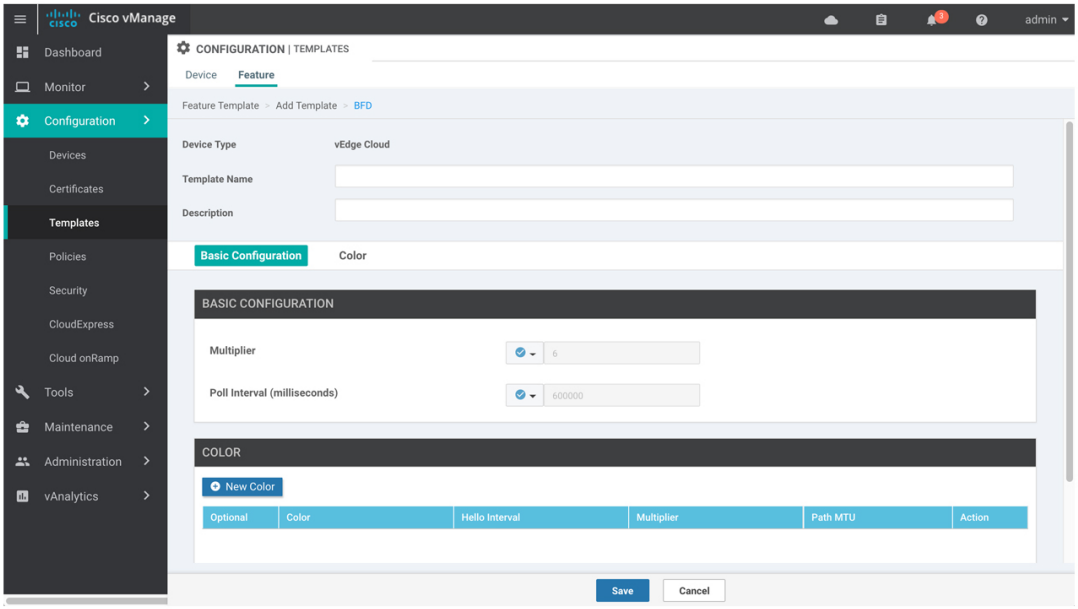
BFD

Use the BFD template for vEdge routers and Cisco IOS XE routers.

The BFD protocol, which detects link failures as part of the Cisco SD-WAN high availability solution, is enabled by default on all vEdge routers, and you cannot disable it.

Navigate to the Template Screen

1. In vManage NMS, select **Configuration** > **Templates**.
2. In the Device tab, click **Create Template**.
3. From the Create Template drop-down, select **From Feature Template**.
4. From the Device Model drop-down, select the type of device for which you are creating the template.
5. To create a custom template for BFD, select the Factory_Default_BFD_Template and click **Create Template**. The BFD template form is displayed. The top of the form contains fields for naming the template, and the bottom contains fields for defining BFD parameters. You may need to click a tab or the plus sign (+) to display additional fields.
6. In the Template Name field, enter a name for the template. The name can be up to 128 characters and can contain only alphanumeric characters.



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7. In the Template Description field, enter a description of the template. The description can be up to 2048 characters and can contain only alphanumeric characters.

When you first open a feature template, for each parameter that has a default value, the scope is set to Default (indicated by a check mark), and the default setting or value is shown. To change the default or to enter a value, click the scope drop-down to the left of the parameter field and select one of the following:

Table 1:

Parameter Scope	Scope Description
Device Specific (indicated by a host icon)	Use a device-specific value for the parameter. For device-specific parameters, you cannot enter a value in the feature template. You enter the value when you attach a Viptela device to a device template . When you click Device Specific, the Enter Key box opens. This box displays a key, which is a unique string that identifies the parameter in a CSV file that you create. This file is an Excel spreadsheet that contains one column for each key. The header row contains the key names (one key per column), and each row after that corresponds to a device and defines the values of the keys for that device. You upload the CSV file when you attach a Viptela device to a device template. For more information, see Create a Template Variables Spreadsheet . To change the default key, type a new string and move the cursor out of the Enter Key box. Examples of device-specific parameters are system IP address, hostname, GPS location, and site ID.
Global (indicated by a globe icon)	Enter a value for the parameter, and apply that value to all devices. Examples of parameters that you might apply globally to a group of devices are DNS server, syslog server, and interface MTUs.

Configure BFD for Application-Aware Routing

To configure the BFD timers used by application-aware routing, click the **Basic Configuration** tab and configure the following parameters:

Table 2:

Parameter Name	Description
Multiplier	Specify the value by which to multiply the poll interval, to set how often application-aware routing acts on the data plane tunnel statistics to figure out the loss and latency and to calculate new tunnels if the loss and latency times do not meet configured SLAs.*Range:* 1 through 6*Default:* 6
Poll Interval	Specify how often BFD polls all data plane tunnels on a vEdge router to collect packet latency, loss, and other statistics used by application-aware routing.*Range:* 1 through 4,294,967,296 ($2^{32} – 1$) milliseconds*Default:* 600,000 milliseconds (10 minutes)

To save the feature template, click **Save**.

CLI equivalent:

```
bfd  app-route
  multiplier number
  poll-interval milliseconds
```

Configure BFD on Transport Tunnels

To configure the BFD timers used on transport tunnels, click the **Color** tab. Next, click **Add New Color**, and configure the following parameters:

Table 3:

Parameter Name	Description
Color	From the drop-down, choose the color of the transport tunnel for data traffic moving between vEdge routers. The color identifies a specific WAN transport provider.*Values:* 3g, biz-internet, blue, bronze, custom1, custom2, custom3, default, gold, green, lte, metro-ethernet, mpls, private1 through private6, public-internet, red, silver*Default:* default
Hello Interval	Specify how often BFD sends Hello packets on the transport tunnel. BFD uses these packets to detect the liveness of the tunnel connection and to detect faults on the tunnel.*Range:* 100 through 60000 milliseconds*Default:* 1000 milliseconds (1 second)
Multiplier	Specify how many Hello packet intervals BFD waits before declaring that a tunnel has failed. BFD declares that the tunnel has failed when, during all these intervals, BFD has received no Hello packets on the tunnel. This interval is a multiplier of the Hello packet interval time.*Range:* 1 through 60*Default:* 7 (for hardware vEdge routers), 20 (for vEdge Cloud software routers)

Parameter Name	Description
Path MTU Discovery	Click On to enable path MTU discovery for the transport tunnel, or Off to disable. When PMTU discovery is enabled, the path MTU for the tunnel connection is checked periodically, about once per minute, and it is updated dynamically. When PMTU discovery is disabled, the expected tunnel MTU is 1472 bytes, but the effective tunnel MTU is 1468 bytes.*Default:* Enabled
Add	Click Add to save the data traffic transport tunnel color.

To add another color, click **Add New Colo**r.

A table lists the transport tunnel colors.

To edit a color, click the Pencil icon. The Update Color popup is displayed. After you make the desired changes, click **Save Changes**.

To remove a color, click the trash icon to the right of the entry.

To save the feature template, click **Save**.

CLI equivalent:

```
bfd  color color
  hello-interval milliseconds
  multiplier number
  pmtu-discovery
```

Other Supported Protocols

This topic lists all the other protocols supported in Cisco SD-WAN.

- DHCP Server: See the System and Interfaces guide for more information.
- BGP, OSPF, OMP: See the Unicast Overlay Routing chapter in this guide for more information.
- PIM, IGMP: See the Multicast Overlay Routing chapter in this guide for more information.