Configure Adaptive Shaping

For supported software information, click here.

In an SD-WAN deployment, adaptive shaping allows a spoke or hub device to enforce a dynamic egress shaping rate on any device that is sending it traffic, to force the sending device to limit the amount of traffic that it sends. From the sender's perspective, only the traffic destined to the device on which adaptive shaping is configured is shaped; no other egress traffic is affected.

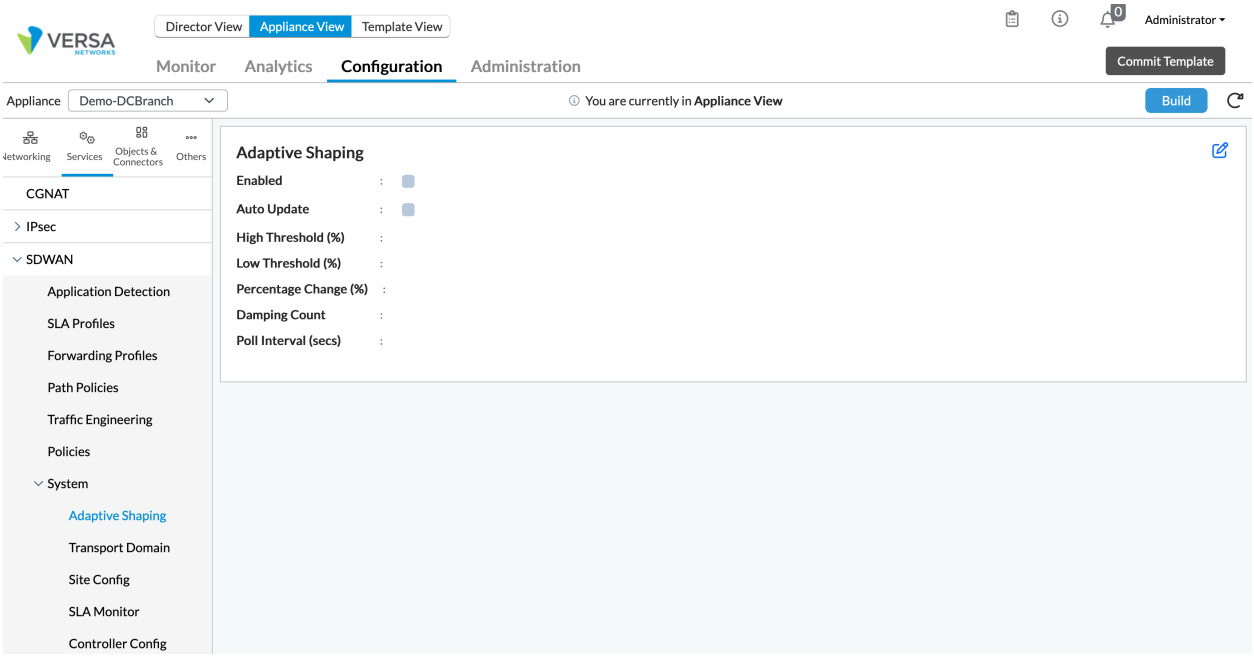
One use case for adaptive shaping is in a hub-and-spoke topology in which the amount of downlink traffic that the hub's WAN link can process is limited. If the amount of traffic that the spokes send to the hub were to exceed this limit, the hub's operation might become choked or the ISP might drop the traffic before it reaches the hub. If you configure adaptive shaping on the hub, when the hub's traffic becomes congested, the hub advertises a different transmission rate to the branches, and the branches then adjust their volume of traffic that they send to the hub. Using adaptive shaping allows you to increase the number of branches connected to a hub without having to manually change the traffic transmission rate of each branch.

To configure adaptive shaping, you do the following:

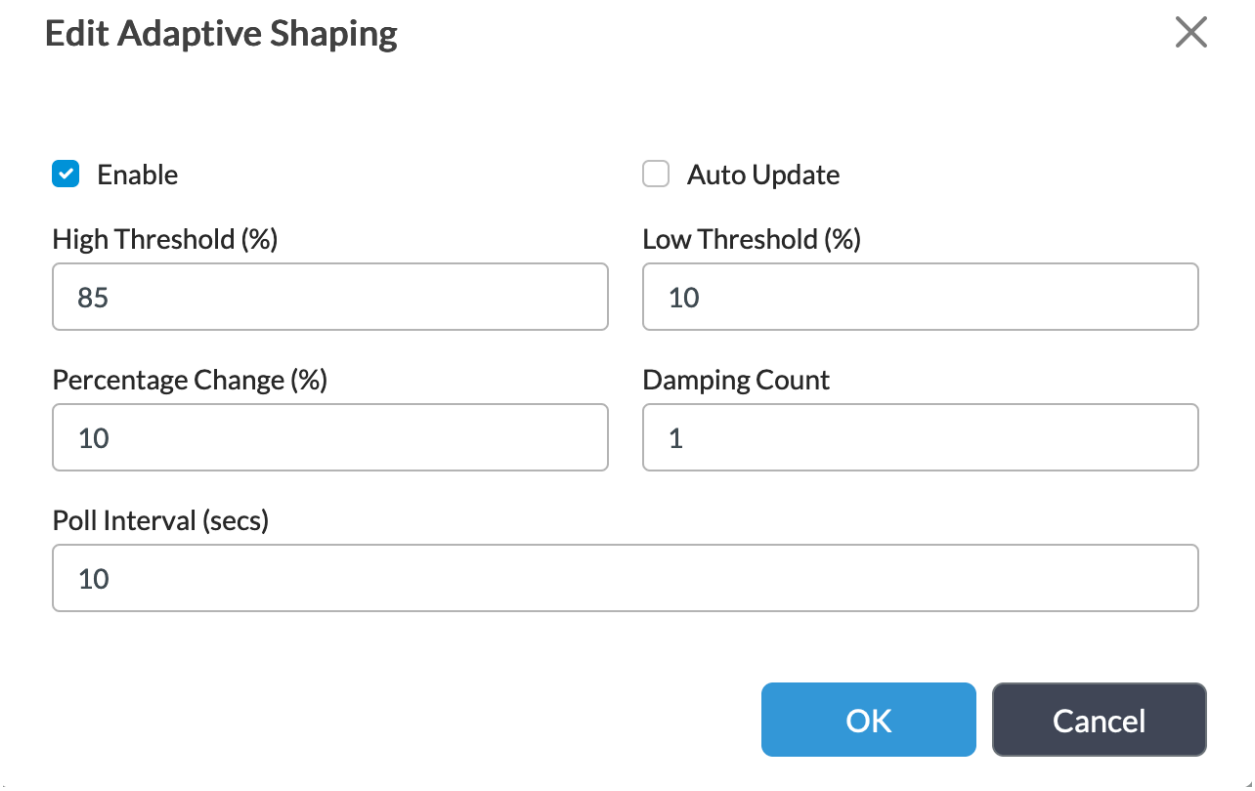
1. Enable adaptive shaping on the hub.
2. Configure the input rate on the SD-WAN site's WAN interfaces. You must specify an input rate range for egress traffic on a branch's WAN interface. This input rate is advertised to other branches in the network. It is recommended that you use adaptive shaping configuration on hub should only as a secondary solution.
3. Associate interfaces with branches. Branches respond to adaptive shaping requests from the hub only if CoS is configured on the branches' interfaces.

Enable Adaptive Shaping on the Hub

1. In Director view:
   a. Select the Configuration tab in the top menu bar.
   b. Select Devices > Devices in the horizontal menu bar.
   c. Select the organization from the left navigation panel.
   d. Select a hub from the list of devices in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. In the Services tab, select SD-WAN > System > Adaptive Shaping. The main pane displays the Adaptive Shaping pane.



4. Click the Edit icon. In the Edit Adaptive Shaping popup window, enter information for the following fields.



Field	Description
Enable	Click to activate adaptive shaping.
Auto Update	(For Releases 22.1.1 and later.) Click to use the available bandwidth instead of the link speed or the configured bandwidth to implement adaptive shaping. You may want to use this option if the bandwidth on a WAN interface is not guaranteed, for example, if the WAN interface is a satellite link or it is in motion and so the bandwidth that the interface receives varies due to the weather or the signal strength. To have the VOS device determine the available bandwidth, you must configure a monitor, as described in Configure Automatic DIA Bandwidth Monitoring. To check the bandwidth calculated by the bandwidth monitoring, see View the Monitored Bandwidth. Note that when Auto Update is enabled, the advertised adaptive shaping pipe rate is in the range between the Minimum Input Rate and the Input Rate configured for the Shaping Rate (see Configuring the WAN Interface Input Rate, below). *Default:* Disabled
High Threshold	Enter the upper bandwidth limit, which is a percentage of the input rate configured on the interface. When the amount of traffic transmitted to the hub exceeds this value, the hub advertises a higher shaping rate to the connected branches. The effect is that the branches reduce the rate at which they send traffic to the hub. *Range*: 1 through 100 percent *Default:* 80 percent
Low Threshold	Enter the lower bandwidth limit, which is a percentage of the input rate configure on the interface. When the amount of traffic transmitted to the hub falls below this value, the hub advertises a lower shaping rate. The

Field	Description
	effect is that the branches increase the rate at which they send traffic to the hub. *Range*: 1 through 100 percent *Default*: 10 percent
Percentage Change	Enter the percentage value to decrease (for the high threshold) or increase (for the low threshold) the bandwidth rate that is advertised to the branches. The advertised value is then decreased or increased by the configured value. *Range*: 1 through 100 percent *Default*: 10 percent
Damping Count	Enter the number of times per poll interface that the hub checks the rate at which traffic is transmitted to it from its branches before determining whether to implement the adaptive shaping rules. *Range*: 1 through 10 *Default*: 1
Poll Interval	Enter a value for how often the hubs checks the rate at which traffic is transmitted to it from its branches. *Range*: 5 through 3600 seconds *Default*: 10 seconds

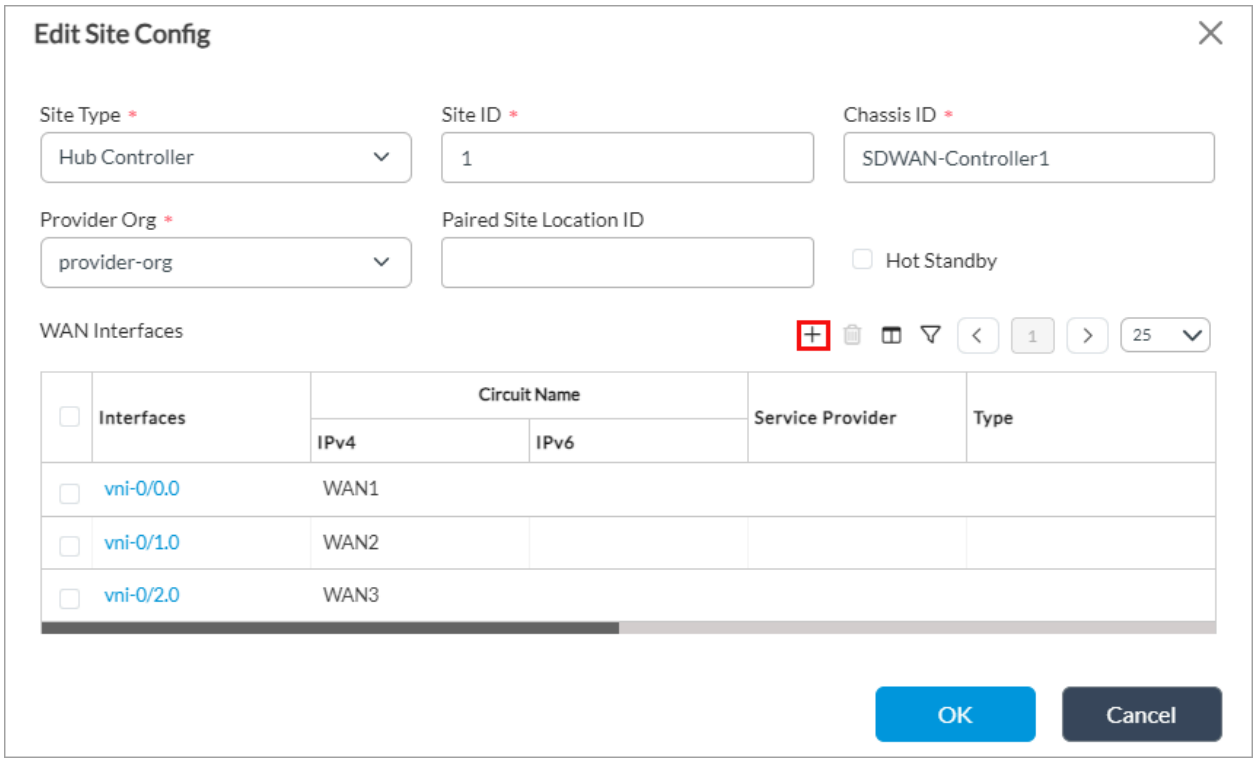
4. Click OK.

Configure the WAN Interface Input Rate

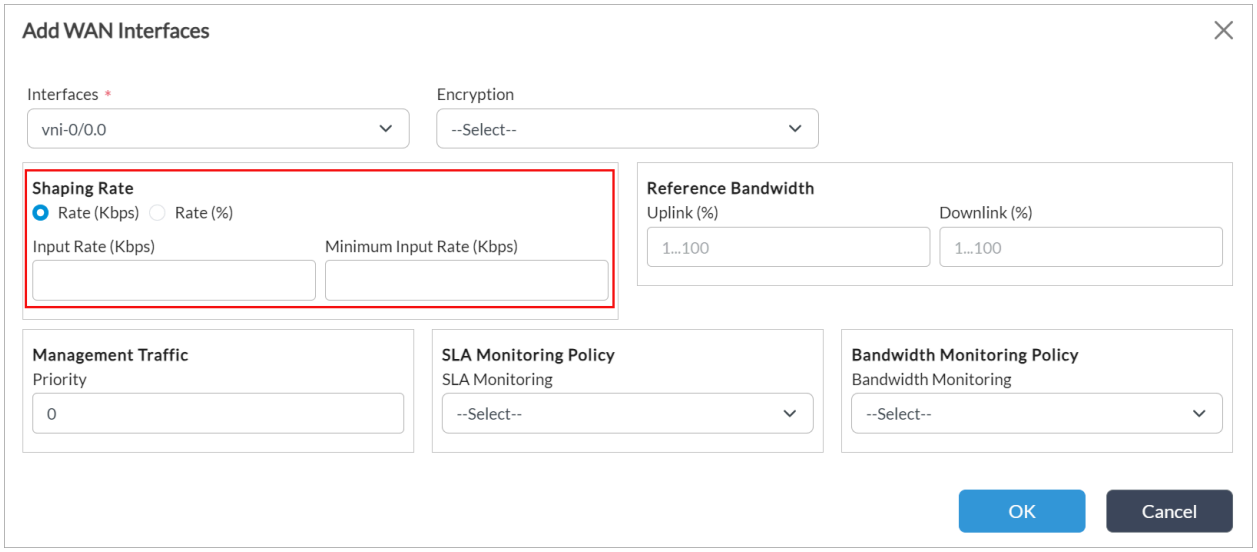
For adaptive shaping to work on the hub, you must configure the WAN interface input rate for the WAN interfaces at the SD-WAN site.

To configure the input rate:

1. In Director view:
   a. Select the Configuration tab in the top menu bar.
   b. Select Devices > Devices in the horizontal menu bar.
   c. Select an organization in left navigation bar.
   d. Select a Controller node in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Services > SD-WAN > System > Site Configuration in the left menu bar.
4. Click the Edit icon. The Edit Site Configuration popup window displays.



5. In the Site Type field, select Hub Controller. For information about configuring the other fields, see Configure SD-WAN Sites.
6. In the WAN Interfaces field, click the Add icon to add a WAN interface. The Add WAN Interfaces popup window displays.



7. In the Shaping Rate group of fields, enter the input rate and the minimum input rate in either Kbps or as a percentage of the interface bandwidth. For information about configuring the other fields, see Configure SD-WAN Sites.
8. Click OK.
9. Click OK on the Edit Site Configuration popup window.

Configure CoS on the Branch Interfaces

The final step in configuring adaptive shaping is to associate the WAN interfaces with branches. Branches respond to adaptive shaping requests from the hub only if CoS is configured on the branch interfaces. For more information, see Configure CoS.

Supported Software Information

Releases 20.2 and later support all content described in this article, except:

- Releases 22.1.1 adds the Auto Update option, to use the available bandwidth instead of the link speed or the configured bandwidth to implement adaptive shaping.

Additional Information

Configure CoS
Configure SD-WAN Sites