Bandwidth Measurement and Metering

For supported software information, click here.

Each Versa Networks software license specifies the amount of bandwidth that a Versa Operating System™ (VOS™) device is allowed to transmit and receive. When the VOS device exceeds its allotted bandwidth, it is considered to be out of compliance, and you must either upgrade your license or pay additional fees.

To determine whether bandwidth usage complies with the terms of your software license, Versa Networks uses the 95th percentile bandwidth-measurement method. With this method, bandwidth usage is at or below a maximum level 95 percent of the time, and 5 percent of the time, you can experience traffic bursts that exceed the 95th percentile and even that exceed the maximum bandwidth rate allowed by your license without incurring additional charges.

95th Percentile Measurement

After you activate a license subscription, a VOS device begins measuring transmitted and received data for each organization (that is, for each tenant) or for each interface using the 95th percentile method.

Note: The 2016 vCPE licensing model used per-tenant statistics. The later vCPE licensing model uses per-interface statistics.

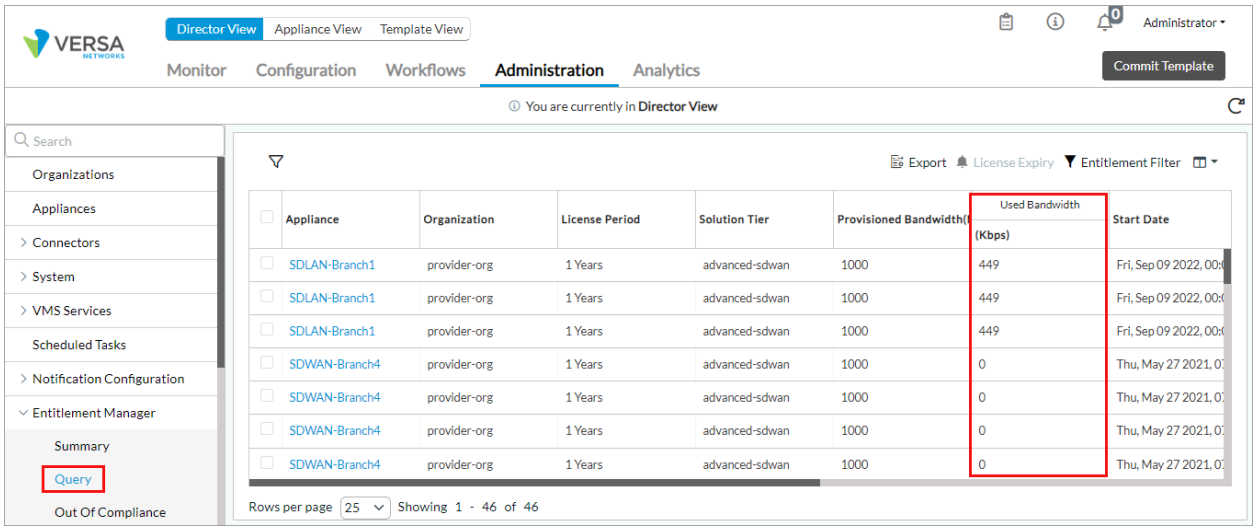
The VOS device records the traffic usage data every 5 minutes, storing it in a VOS database bin. It then calculates the average bandwidth used, in Kbps, for each 5-minute interval.

Over the course of a monthly billing cycle (typically 30 days), the VOS devices take just over 8,600 samples (12 samples/hour * 24 hours/day * 30 days/month = 8,640). The samples values are then sorted, and the value that falls on the 95th percentile becomes the reference value for the month's bandwidth usage. The top 5th percentile represents short-lived traffic bursts, and it is ignored for billing purposes. The 95th percentile value is recalculated each month.

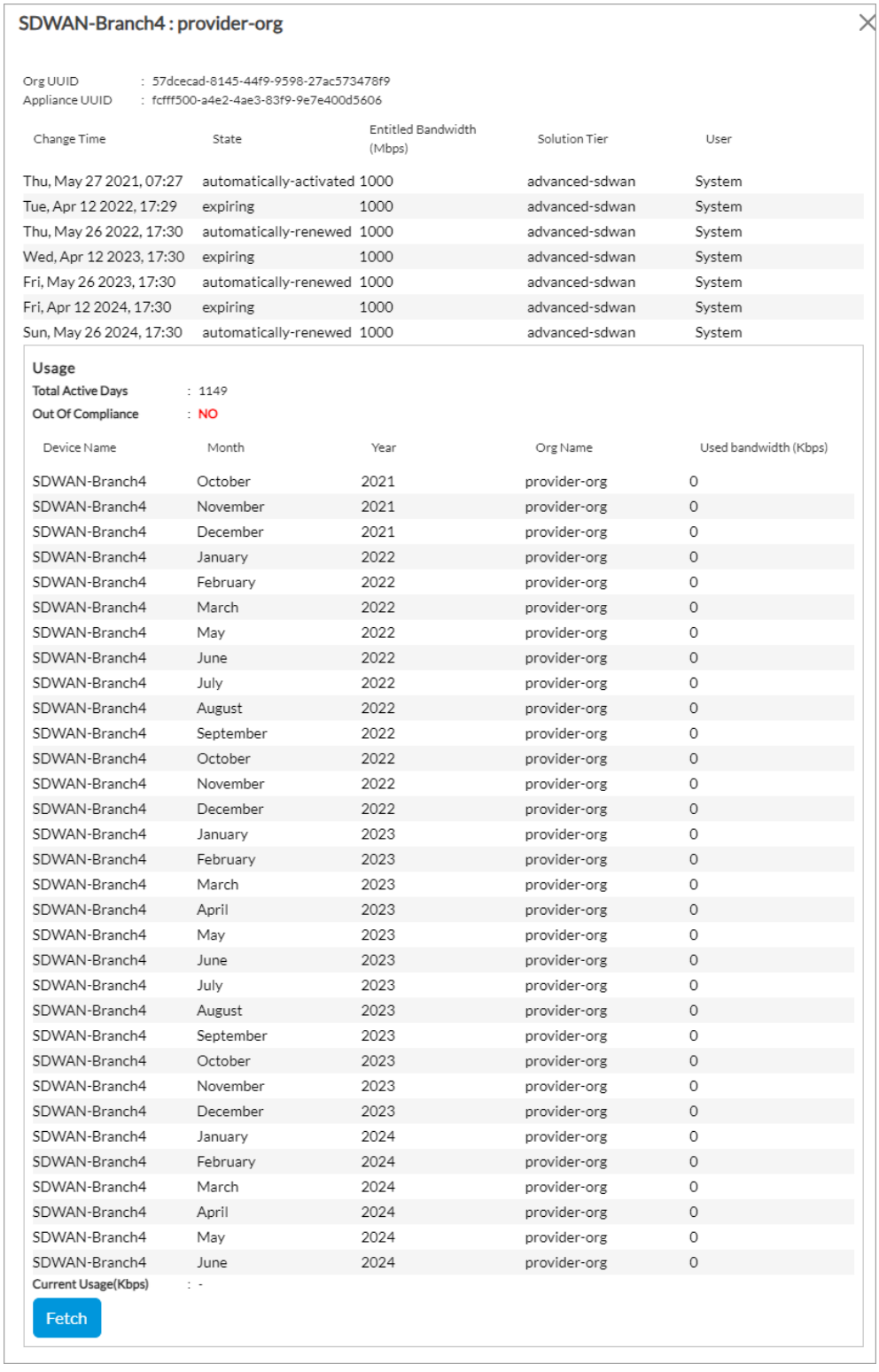
Measurements are taken every five minutes and the rate of transmitted and received date is calculated in Kbps and saved as a bin in VOS device's internal database. At the beginning of each month, the previous month's values are queried and the top 5^{th} percentile is eliminated. The 95th percentile value is reported as the reference value to Versa Director, and Versa Director displays that value as the amount of bandwidth used during the month.

The following figure shows a sample of the Director Subscription Management window. This sample shows the subscription bandwidth values (in the Provisioned Bandwidth column) and the actual amount of bandwidth used (in the Used Bandwidth column) based on the 95th percentile method, for a number of sites. Note that this figure displays only

a subset of the fields, those that are most relevant. The full subscription report includes more details, such as subscription state, subscription date, and number of active days.



To see the details for each subscription, click the name of the site in the Versa Director window, as shown in the following figure. This detailed view shows the monthly 95th percentile bandwidth usage for each VOS instance on a per-organization basis, and it shows whether a VOS instance is out of compliance. Click the Fetch button to refresh the display with the latest values.



SDWAN-Branch4 : provider-org

Org UUID : 57dcecad-8145-44f9-9598-27ac573478f9
Appliance UUID : fcfff500-a4e2-4ae3-83f9-9e7e400d5606

Change Time	State	Entitled Bandwidth (Mbps)	Solution Tier	User
Thu, May 27 2021, 07:27	automatically-activated	1000	advanced-sdwan	System
Tue, Apr 12 2022, 17:29	expiring	1000	advanced-sdwan	System
Thu, May 26 2022, 17:30	automatically-renewed	1000	advanced-sdwan	System
Wed, Apr 12 2023, 17:30	expiring	1000	advanced-sdwan	System
Fri, May 26 2023, 17:30	automatically-renewed	1000	advanced-sdwan	System
Fri, Apr 12 2024, 17:30	expiring	1000	advanced-sdwan	System
Sun, May 26 2024, 17:30	automatically-renewed	1000	advanced-sdwan	System

Usage

Total Active Days : 1149
Out Of Compliance : NO

Device Name	Month	Year	Org Name	Used bandwidth (Kbps)
SDWAN-Branch4	October	2021	provider-org	0
SDWAN-Branch4	November	2021	provider-org	0
SDWAN-Branch4	December	2021	provider-org	0
SDWAN-Branch4	January	2022	provider-org	0
SDWAN-Branch4	February	2022	provider-org	0
SDWAN-Branch4	March	2022	provider-org	0
SDWAN-Branch4	May	2022	provider-org	0
SDWAN-Branch4	June	2022	provider-org	0
SDWAN-Branch4	July	2022	provider-org	0
SDWAN-Branch4	August	2022	provider-org	0
SDWAN-Branch4	September	2022	provider-org	0
SDWAN-Branch4	October	2022	provider-org	0
SDWAN-Branch4	November	2022	provider-org	0
SDWAN-Branch4	December	2022	provider-org	0
SDWAN-Branch4	January	2023	provider-org	0
SDWAN-Branch4	February	2023	provider-org	0
SDWAN-Branch4	March	2023	provider-org	0
SDWAN-Branch4	April	2023	provider-org	0
SDWAN-Branch4	May	2023	provider-org	0
SDWAN-Branch4	June	2023	provider-org	0
SDWAN-Branch4	July	2023	provider-org	0
SDWAN-Branch4	August	2023	provider-org	0
SDWAN-Branch4	September	2023	provider-org	0
SDWAN-Branch4	October	2023	provider-org	0
SDWAN-Branch4	November	2023	provider-org	0
SDWAN-Branch4	December	2023	provider-org	0
SDWAN-Branch4	January	2024	provider-org	0
SDWAN-Branch4	February	2024	provider-org	0
SDWAN-Branch4	March	2024	provider-org	0
SDWAN-Branch4	April	2024	provider-org	0
SDWAN-Branch4	May	2024	provider-org	0
SDWAN-Branch4	June	2024	provider-org	0

Current Usage(Kbps) : -

Fetch

What To Do If You Are Out of Compliance

Versa Networks uses the trust model in its licensing-compliance process and does not implement automatic enforcement methods.

To facilitate this compliance model, when you are provisioning a VOS device, you configure licensing and subscription options that correspond to the feature tier and maximum bandwidth that your license allows. After your subscription is activated, the VOS device collects information about actual bandwidth usage.

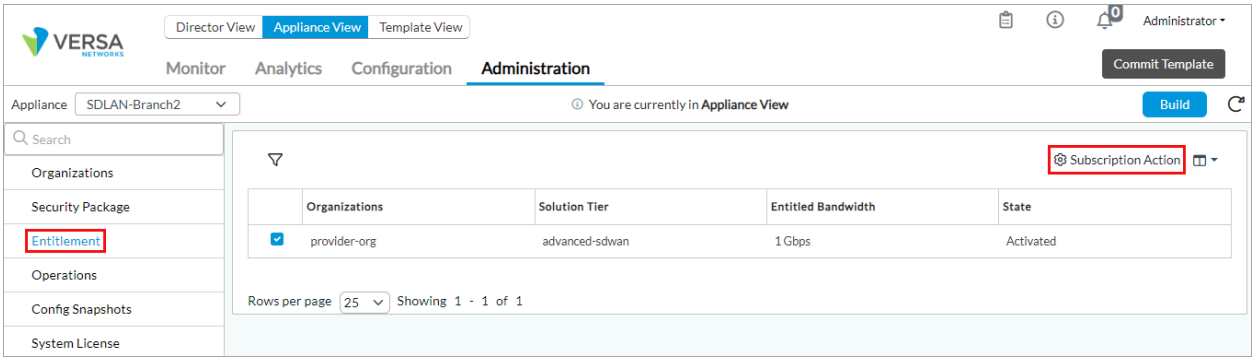
The Versa Director Entitlement Management window displays provisioning and bandwidth usage information so that you can compare what you purchased against what you are using. Versa Networks requires all customers to manually report this subscription information on a regular basis so that Versa Networks can invoice accordingly.

If you determine that a site uses more bandwidth (or features) than allowed by its Versa Networks license, that site is considered to be out of compliance. In this case, Versa Networks expects you to either upgrade your license tier or limit your usage to the amount specified by the license.

If you decide to upgrade your subscription in bandwidth or in feature tiers, or both, in the Versa Director Subscription Management window, choose the Modify option for the specific VOS device, selecting a subscription level that reflects the actual bandwidth usage.

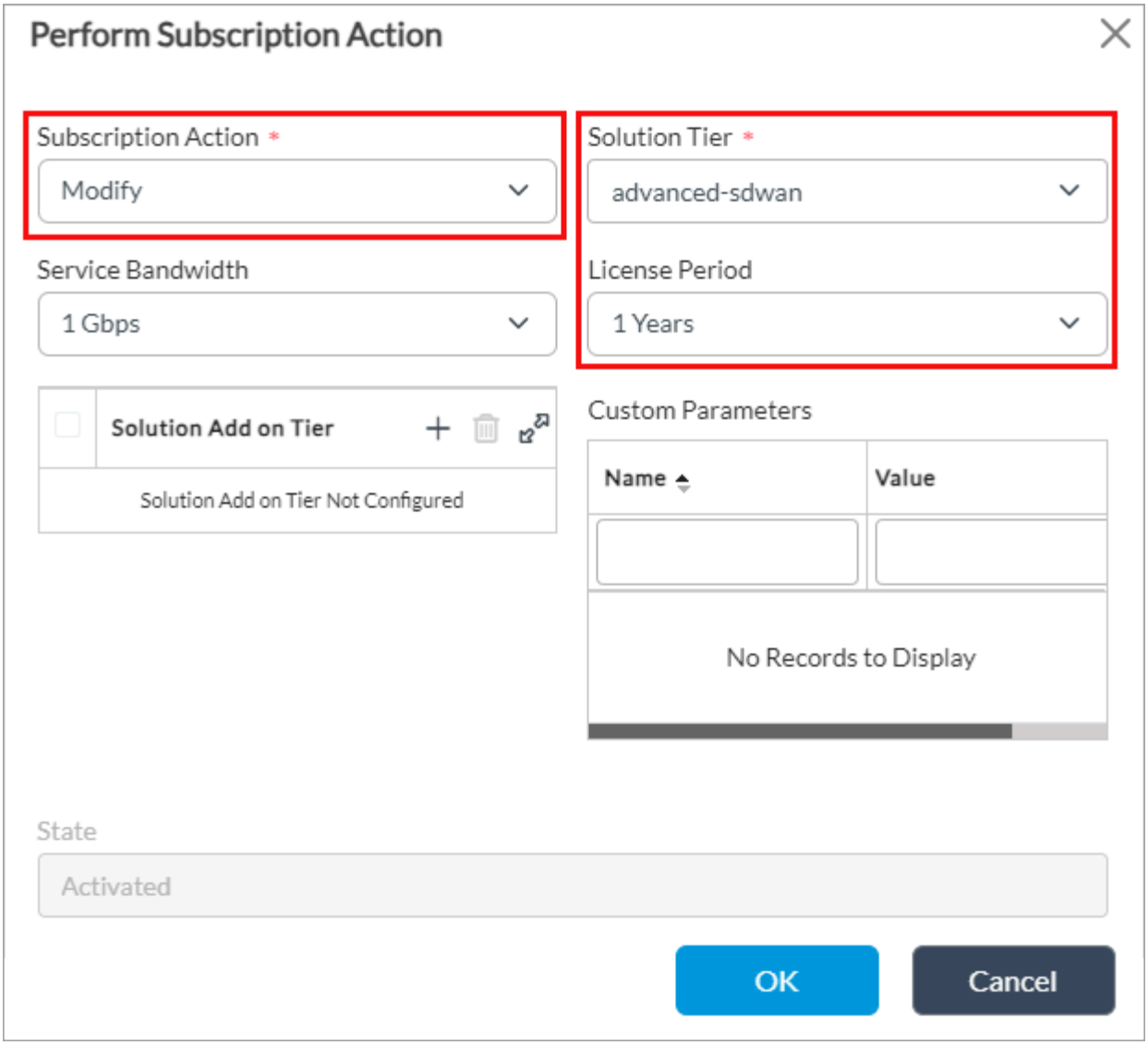
To change an organization's subscription state:

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Select an appliance in the main pane. The view changes to Appliance view.
2. Select a provider organization in the main pane, and then select Subscription Action.



3. In the Perform Subscription Action popup window, select Modify in the Subscription Action field, and enter information for the other field. For more information, see Change the Subscription State.

Updated: Wed, 23 Oct 2024 07:33:38 GMT



4. Click OK.

If you decide not to purchase higher bandwidth or feature tiers for your site, Versa Networks expects you to rate-limit your traffic to comply with the purchased bandwidth capacity for that site. Versa Networks provides traffic-policing and traffic-shaping options to implement rate limiting. After you apply a traffic rate-limiting method, the VOS device ensures that traffic remains within the configured, rate-limited boundaries. If you do not use traffic rate limiting, the VOS device continues to forward traffic at the rate at which it is received.

Note: You can rate-limit traffic on a per-organization or per-interface basis. However, for the best user experience, it is recommended that you use traffic-shaping options.

Example Bandwidth Measurement in an SD-WAN Topology

The example in this section shows how the bandwidth-measurement method works in an SD-WAN topology:

- It uses the 95th percentile calculation method.
- Only traffic flowing through WAN interfaces is used for calculating the bandwidth.

Note: The VOS device tracks the 95th percentile for both receive (RX) and transmit (TX) traffic on the WAN interfaces, and it uses the higher of the two values to calculate the amount of bandwidth used by each WAN interface.

- Control traffic is excluded from the calculation.
- Traffic over an interchassis link is excluded from the calculation.
- If a single bin contains counts of data from multiple WAN interfaces, the values for all WAN interfaces are added together, and the 95th percentile is calculated from this sum.

Note: While the bandwidth used by each WAN interface in a bin is added together, the percentile calculation itself is *not* additive.

The following table shows the bin distribution for two WAN interfaces, WAN1 and WAN2. Each bin contains the amount of bandwidth used by each interface over a 5-minute interval, and the data is sorted on the values in the Total column. For simplicity, the 90th percentile is used in this example to calculate the overall bandwidth usage. Here, the 90th percentile is 14 Mb. This means that bandwidth usage in excess of the 90th percentile is ignored.

Bin	WAN1	WAN2	Total (WAN1 + WAN2)	
1	1 Mb	3 Mb	4 Mb	
2	2 Mb	4 Mb	6 Mb	
3	6 Mb	3 Mb	9 Mb	
4	5 Mb	5 Mb	10 Mb	
5	9 Mb	1 Mb	10 Mb	
6	2 Mb	9 Mb	11 Mb	
7	4 Mb	7 Mb	11 Mb	
8	2 Mb	10 Mb	12 Mb	
9	8 Mb	6 Mb	14 Mb	← 90th Percentile
10	15 Mb	25 Mb	40 Mb	

Example Bandwidth Measurement in a Non–SD-WAN Topology

The example in this section shows how the bandwidth-measurement method works when SD-WAN is not configured on the device, that is, no WAN interfaces are configured on the device, as would be the case with pure vCPE, UTM, and uCPE devices:

- Traffic on all physical interfaces is used to calculate the bandwidth usage.
- If traffic is measured on multiple physical interfaces, the calculation uses the value for the interface with the highest bandwidth. For example, if one interface in a bin uses 90 Mb and a second interface uses 100 Mb, the calculation uses 100 Mb as the usage value for that bin.

The following table shows the bandwidth usage on two interfaces, vni-0/1 and vni-0/2. Each bin records the amount of bandwidth used by each interface over a 5-minute interval, and the higher of the two values is used as the maximum for each bin. For simplicity, the 90th percentile is used for calculate the overall bandwidth usage in this example, and the data is sorted on the values in the Maximum column. In this example, the 90th percentile is 100 Mb.

Bin	vni-0/1	vni-0/2	Maximum	
1	40 Mb	50 Mb	50 Mb	
2	50 Mb	40 Mb	50 Mb	
3	30 Mb	60 Mb	60 Mb	
4	60 Mb	30 Mb	60 Mb	
5	20 Mb	70 Mb	70 Mb	
6	70 Mb	30 Mb	70 Mb	
7	10 Mb	80 Mb	80 Mb	
8	80 Mb	55 Mb	80 Mb	
9	100 Mb	90 Mb	100 Mb	← 90th Percentile
10	90 Mb	100 Mb	100 Mb	

For more details about bandwidth and usage reporting, see your EULA or Master Agreement.

Supported Software Information

Releases 20.2 and later support all content described in this article.

Additional Information

View VOS Subscription Information