
Troubleshoot Link Bandwidth Issues

 For supported software information, click [here](#).

To troubleshoot WAN link bandwidth issues, you can run a speed test using a Versa Operating System™ (VOS™) device. Speed tests can be useful for LTE connections, where bandwidth consumption is a critical factor.

You can configure VOS devices to be a Versa speed-test client and a Versa speed-test server, and a single VOS device can function as both a Versa speed-test server and a Versa speed-test client simultaneously. Both the client and server can be a regular CPE device, or they can part of an SD-WAN topology.

After you configure a Versa server, the client can start the test by initiating a TCP-based connection toward the server, which listens on port 5201. The client generates a request ID for each request received from a user, and the user can fetch the test results from the VOS device based on the received request ID.

Note: If the VOS device is behind a firewall, port 5201 must be open.

For Releases 21.2.1 and later, you can also perform speed tests using an internet speed-test server. For more information, see [Run Internet Speed Tests](#).

For Releases 21.2 and earlier, the speed test is performed in two stages—an upload test and a download test.

For Releases 22.1.3 and later, the speed test factors in network latency to derive the results. The speed test is performed in three stages—a ping test, an upload test, and a download test. The ping test calculates the latency of the link, and then the speed test uses this data when performing the upload and download tests. The speed test can measure bandwidth speeds up to 1 Gbps. The actual measurement depends on several factors, including in-path shapers and latency. The test uses up to 45 MB of data per upload or download in the best case to measure the bandwidth. The speed test uses 90 MB of data for a complete test.

The default forwarding class for speed-test traffic is the best-effort forwarding class (FC 15). For Releases 22.1.3 and later, you can change the default forwarding class, as described in [Configure Speed-Test Common Options](#), below.

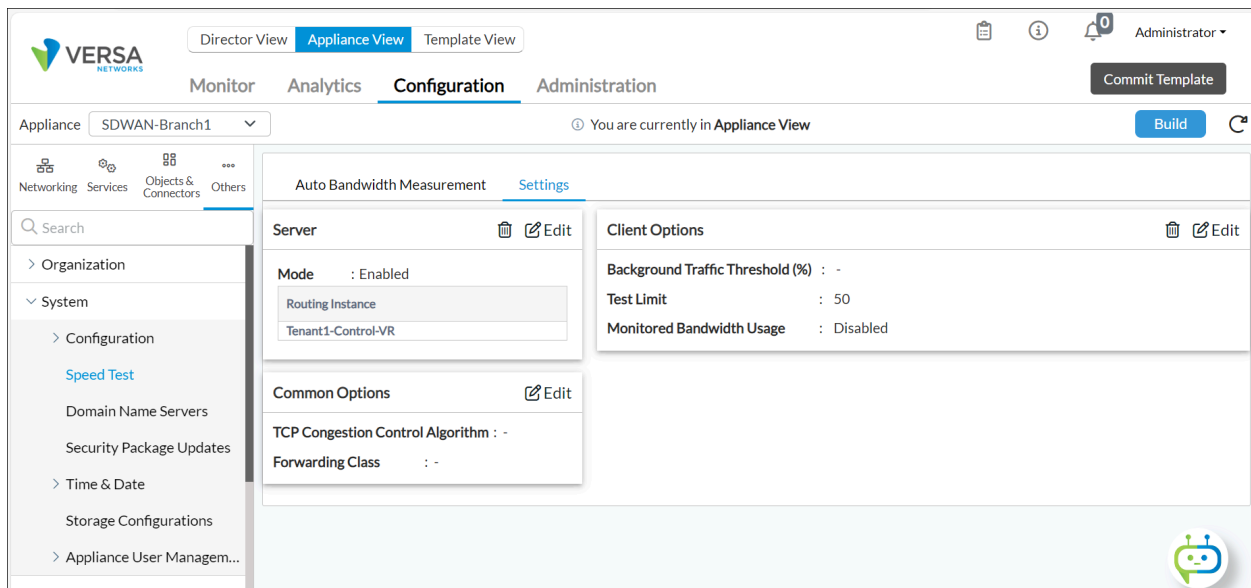
For the version of the speed test for Releases 22.1.3 and later, you can run this test when both the client and server are running Releases 22.1.3 or later. If the client is running Release 21.2 or earlier and the server is running Release 22.1.3 or later, the server runs the earlier version of the speed test, that is, the version without the ping test.


Configure a Versa Speed-Test Server

You can configure a Versa speed-test server using Versa Director or a REST API call.

Configure a Versa Speed-Test Server Using Versa Director

1. In Director view:
 - a. Select the Configuration tab in the top menu bar.
 - b. Select Templates > Device Templates in the horizontal menu bar.
 - c. Select an organization in the left menu bar.
 - d. Select a post-staging template in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Others > System > Speed Test in the left menu bar, then select the Settings tab. The main pane displays speed test-related panes (for Releases 21.2.1 and later).



4. In the Server pane, click the  Edit icon to specify the routing instances to use as the speed-test server. The Edit Server screen displays.

Edit Server

Routing Instance

---Please Select---


+

WAN1-Transport-VR

WAN2-Transport-VR

OK

Cancel

- Click the  Add icon and select a routing instance to be a speed-test server.
- Click OK. The Speed Test Server pane displays the routing instance. The example below shows that two routing instances are configured to be Versa speed-test servers.

Server

Mode

: Enabled

Routing Instance

WAN1-Transport-VR

WAN2-Transport-VR

Configure a Versa Speed-Test Server Using a REST API Call

Use this API call to enable bandwidth measurement on a remote Versa speed-test server.

https://docs.versa-networks.com/Secure_SD-WAN/03_Troubleshooting/Troubleshoot_Link_Bandwidth_Issues

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Versa REST API	API Type
https://ip-address:9182/versa/ncs-services/api/config/devices/device/BW-Test-Server/config/system/bw-measurement/server	PUT

The following examples shows the payload of this API call:

```
{
  "bw-measurement": {
    "server": {
      "routing-instances": {
        "WAN2-Transport-VR"
        "WAN1-Transport-VR"
      }
      "routing-instance": "WAN1-Transport-VR"
    }
  }
}
```

Configure a Versa Speed-Test Client Using Versa Director

After you have configured a Versa speed-test server, you can immediately begin running speed tests using the VOS default speed test parameters, as described in [Initiate a Versa Speed Test from a Versa Client](#), below. If needed, you can change the configured default values, as described below.

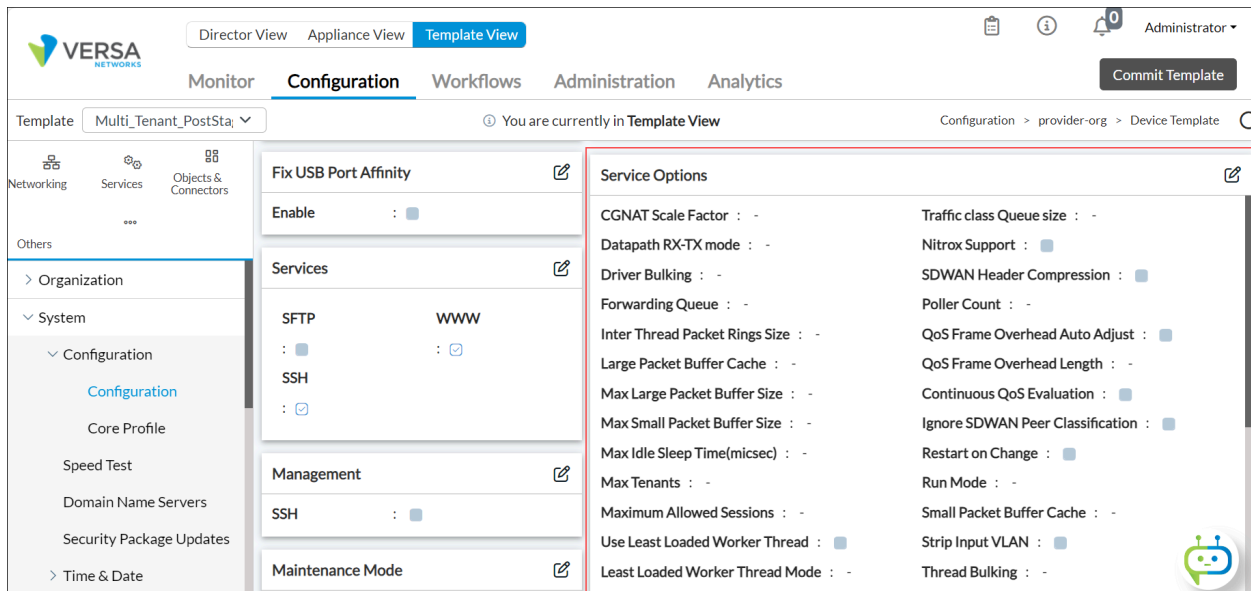
Change the Number of Packets To Queue for Transmission

By default, the transmit ring on a NIC queues 512 buffers for transmission. For a speed test, when you want to transmit a burst of packets to measure the network bandwidth, it is recommended that you increase the number of transmit buffer descriptors to 2048 if the expected bandwidth is greater than 500 Mbps.

Note: If you change the default number of packets in the NIC's transmission queue, you must restart Versa services.

To change the number of packets in the NIC's transmission queue, change the TX descriptor value:

1. In Director view:
 - a. Select the Configuration tab in the top menu bar.
 - b. Select Templates > Device Templates in the horizontal menu bar.
 - c. Select an organization in the left menu bar.
 - d. Select a post-staging template in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Others > System > Configuration > Configuration in the left menu bar. The main pane displays configuration-related panes.



4. In the Service Options pane, click the Edit icon. The Edit Service Options popup window displays.

The screenshot shows the 'Edit Service Options' popup window. The 'General' tab is selected. The 'Number of TX Descriptors' field is highlighted with a red box. The window contains various configuration options, including 'Thread Bulking', 'Maximum Allowed Sessions', 'Driver Bulking', 'Poller Count', 'Number of RX Descriptors', 'Worker Count', 'Inter Thread Packet Rings Size', 'Run Mode', 'Max Idle Sleep Time(micsec)', 'Min Idle Sleep Time(micsec)', 'Datapath RX-TX mode', 'Forwarding Queue', 'CGNAT Scale Factor', 'Max Tenants', 'Least Loaded Worker Thread Mode', 'Strip Input VLAN', 'Minimal Core Support', 'Nitrox Support', 'VXLAN Entropy', 'Token Bucket', 'Restart on Change', 'Tag Native VLAN', 'Use Least Loaded Worker Thread', 'TPM Support', 'Crypto Accelerator Support', 'IPsec Cipher Key Check', 'SDWAN Header Compression', 'Host Huge Page Size', and 'Total Huge Page Size'. The 'Number of TX Descriptors' field is highlighted with a red box.

5. In the Number of TX Descriptors field, enter 2048.

6. Click OK.

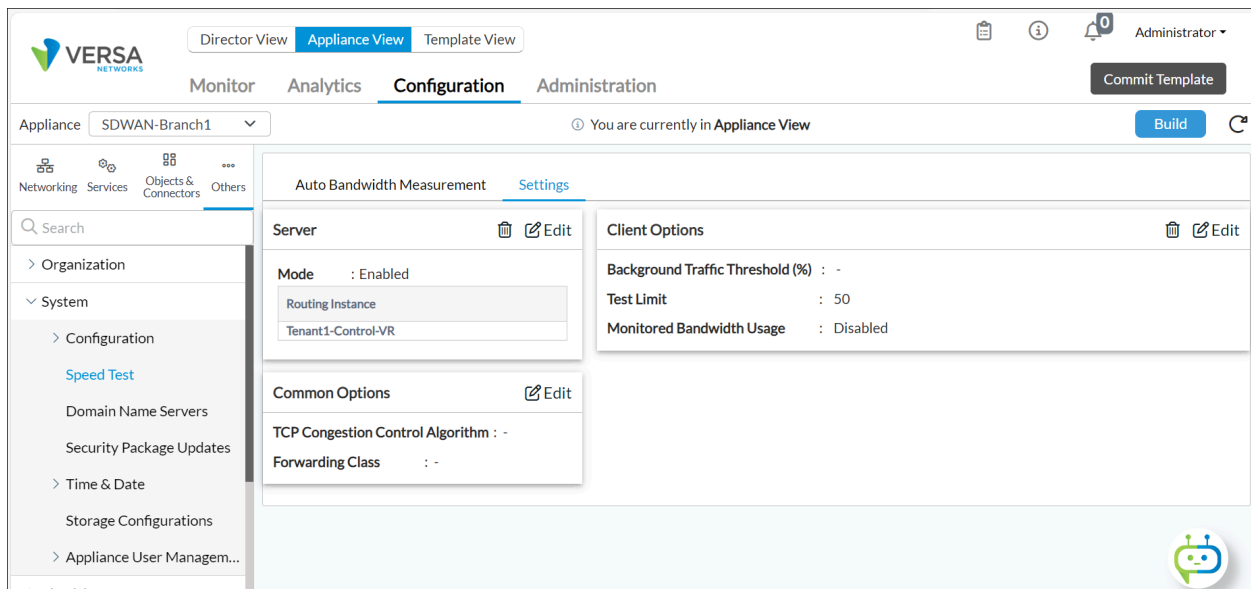
7. Restart Versa services.


Change the Speed-Test Limit Value and Background Traffic Threshold

The default speed-test limit value is 5. The default background traffic threshold value is 15.

To change these values:

1. In Director view:
 - a. Select the Configuration tab in the top menu bar.
 - b. Select Templates > Device Templates in the horizontal menu bar.
 - c. Select an organization in the left menu bar.
 - d. Select a post-staging template in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Others > System > Speed Test in the left menu bar, and then select the Settings tab. The main pane displays panes related to speed-test settings (for Releases 21.2.1 and later).



4. In the Client Options pane, click the  Edit icon. In the Edit Client Options popup window, enter information for the following fields.

Edit Client Options
✕

Background Traffic Threshold (%)

Test Limit

Monitored Bandwidth Usage

OK

Cancel

Field	Description
Background Traffic Threshold	<p>Enter the percentage of background traffic below which a speed test can be initiated. Use this option to restrict speed tests when a link is busy. For example, with the default background traffic threshold of 15%, a speed test can be initiated initiated when interface utilization falls below 85% (100 – 15). If interface utilization is above 85% and hence is considered to be busy, a speed test cannot initiated.</p> <p>If you configure an interface's uplink and downlink bandwidths, these values are used to derive the interface utilization percentage instead of the port speed. For information about configuring the interface bandwidth, see Configure Interfaces.</p> <p>Speed test results are marked as being either within or outside of the threshold. For example, with a default background traffic threshold of 15%, for a 1 Gbps port, any speed above 850 Mbps is considered to be within the bandwidth traffic threshold, and any</p>

Field	Description
	<p>speed below 850 Mbps is considered to be outside the bandwidth traffic threshold.</p> <p><i>Range:</i> 1 through 100%</p> <p><i>Default:</i> 15%</p>
Test Limit	<p>Enter the number of times per day to run a speed test when the speed test is successful, that is, when it is within the bandwidth traffic threshold. Use this option to control the test burden on the VOS device by limiting the number of tests a user can perform when troubleshooting an issue.</p> <p><i>Range:</i> 1 through 200</p> <p><i>Default:</i> 5</p>
Monitored Bandwidth Usage	<p>(For Releases 21.2.1 and later.) Select Enabled to use the monitored bandwidth for traffic-steering purposes. For more information, see Configure SD-WAN Traffic Steering.</p> <p><i>Default:</i> Disabled</p>

5. Click OK.

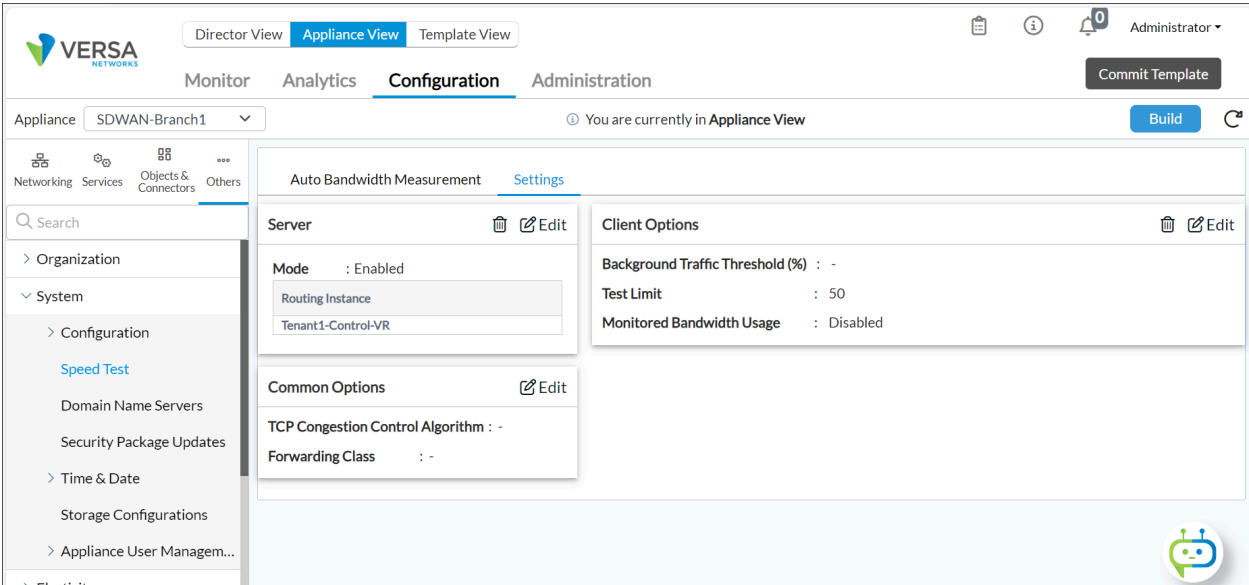
Configure Speed-Test Common Options


For Releases 22.1.3 and later.

To configure the TCP congestion control algorithm and the forwarding class to use for speed tests:

1. In Director view:
 - a. Select the Configuration tab in the top menu bar.
 - b. Select Templates > Device Templates in the horizontal menu bar.
 - c. Select an organization in the left menu bar.
 - d. Select a post-staging template in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.

3. Select Others > System > Speed Test in the left menu bar, and then select the Settings tab. The main pane displays panes related to speed-test settings.



4. In the Common Options pane, click the  Edit icon. In the Edit Common Options popup window, enter information for the following fields.

Edit Common Options

TCP Congestion Control Algorithm

Hybla

Forwarding Class

Forwarding Class 12 (Best-Effort)

OK

Cancel

Field	Description
TCP Congestion Control Algorithm	<div>Select a TCP congestion control algorithm. By default, the TCP congestion control algorithm on the client and server nodes is CUBIC. If you want to change the default algorithm, you must change it on both client and server nodes.</div> <div><div>BBR—Bottleneck bandwidth and round-trip</div></div>

Field	Description
	<p>propagation time</p> <ul style="list-style-type: none"> ◦ CUBIC—This is the default. ◦ Hybla ◦ New Reno <p><i>Default:</i> CUBIC</p>
Forwarding Class	<p>Select the forwarding class for the speed-test traffic. The default forwarding class for speed-test traffic is the best-effort forwarding class (FC 15).</p>

5. Click OK.

Initiate a Versa Speed Test from a Versa Client

You can initiate a Versa speed test after completing the basic configuration of the Versa VOS device. Ensure that you connect the VOS device's interface or interfaces to the network. The interfaces must be in the same routing instance and they must be for a single tenant.

Initiate a Versa Speed Test from a Versa Client Using Versa Director

You can configure and deploy a Versa speed test-client in a non-SD-WAN (DIA) or an SD-WAN deployment. How you initiate the speed test depends on the deployment:

- For a DIA deployment, you initiate the speed test in Appliance view by selecting the Monitor > Speed Test tab and then specifying the IP address or fully qualified domain name (FQDN) of the speed-test server.
- For an SD-WAN VPN deployment, you can initiate the speed test as you would for a DIA deployment, or you can initiate it, also in Appliance view, by selecting a CPE WAN interface in the Monitor > Summary tab.

Note: To initiate a speed test from a Versa SD-WAN branch device, select only WAN interfaces. Do not select a LAN interface.

Initiate a Versa Speed Test from a Versa Client in a DIA or an SD-WAN VPN Deployment

1. In Director view:
 - a. Select the Administration tab in the top menu bar.
 - b. Select Appliances in the left menu bar.
 - c. Select the device in the main pane. The view changes to Appliance view.
2. Select the Monitor tab.
3. Select an organization in the left menu bar, and then select the Tools tab in the horizontal menu bar.

Director View | **Appliance View** | Template View

Monitor | Analytics | Configuration | Administration

Organization: Tenant1 | You are currently in Appliance View | Build | OUT OF SYNC

Summary | **Devices** | Cloud Workload

Total Appliances: 4 | SDWAN-Branch1

SDWAN-Branch1 | 6001 America Center Drive, 4th Flr, Suite 400, San Jose, CA, USA 95002
 Mgmt. Address: 172.16.0.8
 System Bridge Address: 0A:30:00:60:DE:00
 Redundant Pair: SDWAN-Branch2

Reachable | SYNC: OUT_OF_SYNC
 Up since: Mon Nov 6 12:19:40 2023

Summary | Services | Networking | System | **Tools**

Configuration | Shell | Config Status | Upgrade | Subscription

Run Ping | Run Traceroute | Run TCP Dump | **Run Speed Test**

Latest Results

- Click Speed Test. In the Speed Test pane, select the Versa tab, and then enter information for the following fields.

Director View | **Appliance View** | Template View

Monitor | Analytics | Configuration | Administration

Organization: Tenant1 | You are currently in Appliance View | Build | OUT OF SYNC

Summary | **Devices** | Cloud Workload

Total Appliances: 4 | SDWAN-Branch1

SDWAN-Branch1 | 6001 America Center Drive, 4th Flr, Suite 400, San Jose, CA, USA 95002
 Mgmt. Address: 172.16.0.8
 System Bridge Address: 0A:30:00:60:DE:00
 Redundant Pair: SDWAN-Branch2

Reachable | SYNC: OUT_OF_SYNC
 Up since: Mon Nov 6 12:19:40 2023

Summary | Services | Networking | System | **Tools**

Configuration | Shell | Config Status | Upgrade | Subscription

Run Ping | Run Traceroute | Run TCP Dump | **Run Speed Test**

Versa | Internet

Remote IP address/FQDN:
 Network:

Test Speed

Field	Description
Remote IP Address/FQDN	Enter the IP address or fully qualified domain name of the remote device.
Network	Select a network to use for the speed test from the drop-down list.

- Click Test Speed to initiate the speed test.

Initiate a Versa Speed Test from a Versa Client in an SD-WAN VPN-Only Deployment

1. In Director view:
 - a. Select the Administration tab in the top menu bar.
 - b. Select Appliances in the left menu bar.
 - c. Select a server in the main pane. The view changes to Appliance view.
2. Select the Monitor tab in the top menu bar, and then select an organization in the left menu bar. The main pane displays monitor-related information for the organization.
3. Select the Summary tab.

The screenshot shows the Versa Networks SD-WAN interface. At the top, there are tabs for Director View, Appliance View (selected), and Template View. Below this is a navigation bar with Monitor, Analytics, Configuration, and Administration. The main content area shows the Summary tab for an appliance named SDWAN-Branch1. The appliance details include its location, management address, system bridge address, and redundant pair. A status bar indicates it is Reachable and SYNC: OUT_OF_SYNC. Below the details is a table of interfaces. The table has columns for Interface, Network Name, Service Provider, Status (Operational, Admin), Live Data, and Bandwidth (Configured, Measured). Three interfaces are listed: ae0.804, vni-0/0.0, and vni-0/1.2. The vni-0/0.0 and vni-0/1.2 interfaces have a 'Measure' button next to their bandwidth measurements. Below the table is a section for SDWAN Application Traffic with filters for Remote Branch, Application Rule, and various metrics like L2 SDWAN, Latency, Jitter, Packet Loss, and MOS.

Interface	Network Name	Service Provider	Status		Live Data	Bandwidth (Mbps)	
			Operational	Admin		Configured	Measured
> ae0.804	LAN-Network-T1	-	↑	↑	<input type="checkbox"/>		
> vni-0/0.0	WAN1	-	↑	↑	<input type="checkbox"/>	↑ 19.00 ↓ 19.00	Measure
> vni-0/1.2	WAN2	-	↑	↑	<input type="checkbox"/>	↑ 0.00 ↓ 0.00	Measure

4. In the CPE Interfaces table, click Measure for the interface to use for the speed test. The Bandwidth Measurement popup window displays.

Bandwidth Measurement

Local WAN Interface

vni-0/0.0

Remote Destination *

SDWAN-Branch3

Remote Circuit Name

WAN1

Remote Circuit Media

All

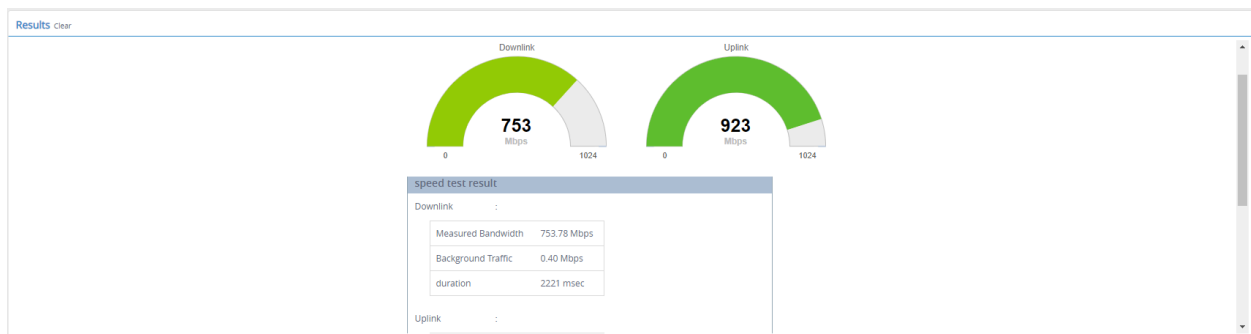
Remote Circuit Type

All

OK

Cancel

- In the Remote Destination field, select the remote destination.
- Click Request to initiate the speed test. The following screenshot shows part of the Results pane from a completed speed test.



Note: The measurement test that runs when you click Measure can measure and report bandwidths up to 990 Mbps. If an interface's bandwidth is 1 Gbps or more, the bandwidth value shown is 990 Mbps.

Initiate a Speed Test from a Versa Client Using a REST API Call

To request a speed test from a Versa client in a DIA or an SD-WAN VPN deployment, use the following API call:

REST API Call	API Type
<code>https://ip-address:9182/versa/ncs-services/bw-measurement/_operations/client?appName=Desk-Branch1</code>	POST

This API call has the following payload:

https://docs.versa-networks.com/Secure_SD-WAN/03_Troubleshooting/Troubleshoot_Link_Bandwidth_Issues

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```
{
  "client": {
    "interface": "vni-0/0.0",
    "remote-destination": "10.10.10.01",
    "routing-instance": "WAN_1-Transport-VR",
    "executed-by": "Administrator",
    "executed-from": "10.10.10.01",
    "executed-at": "2018-04-06T09:44:58.016Z",
    "mechanism": "customer-initiated"
  }
}
```

The following output shows the responses you might receive when you run a speed test from a Versa client:

Note: The request-id in the payload can be any nonzero value.

```
{
  "output": {
    "request-status": "test-invalid",
    "request-id": 0
  }
  "output": {
    "request-status": "test-already-running",
    "request-id": 2
  }
  "output": {
    "request-status": "test-failed",
    "request-id": 3
  }
  "output": {
    "request-status": "device-busy",
    "request-id": 4
  }
  "output": {
    "request-status": "downlink-busy",
    "request-id": 5
  }
  "output": {
    "request-status": "uplink-busy",
    "request-id": 6
  }
  "output": {
    "request-status": "test-initiated",
    "request-id": 7
  }
  "output": {
    "request-status": "cap-limit-reached",
    "request-id": 8
  }
}
```

To poll the Versa client for a status request, use the following API call:

https://docs.versa-networks.com/Secure_SD-WAN/03_Troubleshooting/Troubleshoot_Link_Bandwidth_Issues

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REST API Call	API Type
https://ip-address:9182/versa/ncs-services/api/operational/devices/device/Controller1/live-status/system/bw-measurement/status/14	GET

This API call returns the following response:

```
{
  "system:status":{
    "request-id":"1",
    "server":"10.10.11.11",
    "uplink":{
      "measured-bandwidth":"956.98 Mbps",
      "background-traffic":"0.41 Mbps",
      "duration":"2142 msec"
    },
    "downlink":{
      "measured-bandwidth":"941.47 Mbps",
      "background-traffic":"0.42 Mbps",
      "duration":"2139 msec"
    },
    "test-latency":"1.00 msec",
    "bytes-sent":"13622028",
    "bytes-received":"13622001",
    "interface":"vni-0/2.0",
    "device-serial":"XXXX17090XXXX",
    "executed-at":"2020-02-05T22:00:48.695+00:00",
    "executed-by":"Administrator",
    "executed-from":"10.10.10.10",
    "mechanism":"customer-initiated",
    "result":"completed-within-threshold"
  }
}
```

The following table describes the result codes reported in the speed test status.

Value	Result Code
1	"result": "uplink-in-progress"
2	"result": "downlink-in-progress"
3	"result": "completed-within-threshold"
4	"result": "completed-outside-threshold"

Value	Result Code
9	"result": "failed-internal-error"
10	"result": "failed-server-busy"
11	"result": "failed-timeout"
12	"result": "failed-background-traffic-exceeded"

Initiate a Versa Speed Test from an SD-WAN Branch Using a REST API Call

To request a speed test on a Versa client from an SD-WAN branch, use the following API call:

REST API Call	API Type
<code>https://ip-address:9182/api/config/devices/device/sd-wan-branch-name/config/orgs/org/organization-name/bw-measurement</code>	POST

This API has the following payload:

```
{
  "bw-measurement": {
    "local-wan-interface": "vni-0/0.0",
    "remote-destination": "SPEED-TEST-SERVER",
    "remote-circuit-name": "WAN3"
  }
}
```

To poll the Versa client for a status request, use the following API call:

```
https://ip-address:9182/vnms/dashboard/appliance/sd-wan-branch-name/live?uuid=
3f90c42b-368d-4798-9320-80318aa41fed&command=orgs/org/Provider/sd-wan/bw-measurement/status?deep
```

This API call returns the following response:

```
{
  "collection": {
    "sdwan:status": [
      {
        "site-name": "SPEED-TEST-SERVER",
        "path-bw-status": [
          {
```



```

"path-handle": 6820096,
"local-site-name": "ST-SD-WAN-Branch1",
"remote-site-name": "SPEED-TEST-SERVER",
"local-wan-intf": "vni-0/0.0",
"local-wan-ckt": "WAN1",
"remote-wan-ckt": "WAN1",
"uplink-bw": "524.96 Mbps",
"downlink-bw": "563.38 Mbps",
"uplink-background-rate": "400 Mbps",
"downlink-background-rate": "400 Mbps",
"latency-msec": "1.42",
"jitter": "1.57",
"test-status": "failed-background-traffic-exceeded"
},
{
"path-handle": 6820608,
"local-site-name": "ST-SD-WAN-Branch1",
"remote-site-name": "SPEED-TEST-SERVER",
"local-wan-intf": "vni-0/0.0",
"local-wan-ckt": "WAN1",
"remote-wan-ckt": "WAN3",
"uplink-bw": "0.00 Mbps",
"downlink-bw": "0.00 Mbps",
"uplink-background-rate": "400 Mbps",
"downlink-background-rate": "400 Mbps",
"latency-msec": "0.0",
"jitter": "0.0",
"test-status": "uplink-in-progress"
},
{
"path-handle": 6824448,
"local-site-name": "ST-SD-WAN-Branch1",
"remote-site-name": "SPEED-TEST-SERVER",
"local-wan-intf": "vni-0/1.0",
"local-wan-ckt": "WAN2",
"remote-wan-ckt": "WAN2",
"uplink-bw": "0.00 Mbps",
"downlink-bw": "0.00 Mbps",
"uplink-background-rate": "400 Mbps",
"downlink-background-rate": "400 Mbps",
"latency-msec": "0.0",
"jitter": "0.0",
"test-status": "not-started"
},
{
"path-handle": 6828288,
"local-site-name": "ST-SD-WAN-Branch1",
"remote-site-name": "SPEED-TEST-SERVER",
"local-wan-intf": "vni-0/3.0",
"local-wan-ckt": "WAN3",
"remote-wan-ckt": "WAN1",
"uplink-bw": "0.00 Mbps",
"downlink-bw": "0.00 Mbps",
"uplink-background-rate": "400 Mbps",

```

```

    "downlink-background-rate": "400 Mbps",
    "latency-msec": "0.0",
    "jitter": "0.0",
    "test-status": "not-started"
  },
  {
    "path-handle": 6828800,
    "local-site-name": "ST-SD-WAN-Branch1",
    "remote-site-name": "SPEED-TEST-SERVER",
    "local-wan-intf": "vni-0/3.0",
    "local-wan-ckt": "WAN3",
    "remote-wan-ckt": "WAN3",
    "uplink-bw": "0.00 Mbps",
    "downlink-bw": "0.00 Mbps",
    "uplink-background-rate": "400 Mbps",
    "downlink-background-rate": "400 Mbps",
    "latency-msec": "0.0",
    "jitter": "0.0",
    "test-status": "not-started"
  },
  {
    "path-handle": 6837504,
    "local-site-name": "ST-SD-WAN-Branch1",
    "remote-site-name": "SPEED-TEST-SERVER",
    "local-wan-intf": "vni-0/0.0",
    "local-wan-ckt": "WAN1-v6",
    "remote-wan-ckt": "WAN1-v6",
    "uplink-bw": "0.00 Mbps",
    "downlink-bw": "0.00 Mbps",
    "uplink-background-rate": "400 Mbps",
    "downlink-background-rate": "400 Mbps",
    "latency-msec": "0.0",
    "jitter": "0.0",
    "test-status": "not-started"
  },
  {
    "path-handle": 6841856,
    "local-site-name": "ST-SD-WAN-Branch1",
    "remote-site-name": "SPEED-TEST-SERVER",
    "local-wan-intf": "vni-0/1.0",
    "local-wan-ckt": "WAN2-v6",
    "remote-wan-ckt": "WAN2-v6",
    "uplink-bw": "0.00 Mbps",
    "downlink-bw": "0.00 Mbps",
    "uplink-background-rate": "400 Mbps",
    "downlink-background-rate": "400 Mbps",
    "latency-msec": "0.0",
    "jitter": "0.0",
    "test-status": "not-started"
  }
]
},
}

```

Supported Software Information

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

- In Release 21.2.1, you can configure internet speed tests over DIA links; you can monitor internet speed tests; adds the Speed Test screen.
- In Release 22.1.3, ping test is also performed in the speed test process; adds support for configuring internet speed test Common Options.

Additional Information

[Configure Automatic Bandwidth Monitoring](#)

[Configure Interfaces](#)

[Configure SD-WAN Traffic Steering](#)

[Configure SLA-Driven Monitoring](#)

[Run Internet Speed Tests](#)