Run Internet Speed Tests

For supported software information, click here.

From a Director node, you can run internet speed tests from Versa Operating System™ (VOS™) devices using predeployed internet speed-test servers. To run an internet speed test, the VOS device must have an internet connection over a WAN link. The internet speed test chooses the nearest predeployed speed-test server based on the location identified with the public IP address of the WAN interface. You do not need to deploy an independent speed-test server.

When you run an internet speed test from a Director node, it creates approximately 200 sessions. You can run a speed test with a single session from a device's CLI.

From a Director node, you can run multiple internet speed tests simultaneously using different browser windows, but the speed tests are executed serially, one at a time.

For data traffic, an internet speed test uses HTTP with port 8080. For DNS traffic, it uses port 53.

The data sessions are identified by the speed-test application type.

By default, an internet speed test uses the DNS address 8.8.8.8.

You can also perform speed test by deploying a Versa speed-test server. For more information, see Configure a Versa Speed-Test Server.

This article describes how to run an internet speed test.

Before You Begin

- Ensure that the Director node and VOS devices are running Release 21.2.1 or later.
- If you upgraded from an earlier release to Release 21.2.1 or later, you must redeploy on all branch devices the template from which you want to run an internet speed test. Doing so allows you to run an internet speed test without performing additional configurations. All configuration settings required to run an internet speed test are added by default when you redeploy the template or when you bring up devices running Release 21.2.1 or later.
- If your organization restricts you from using a public Domain Name System (DNS) server, you can change from the default DNS server, 8.8.8.8, to the preferred DNS server in the versa-speedtest routing instance. If your organization has no such restrictions, you can use the default DNS server that is configured in the new or redeployed template. To change the DNS server, see Configure DNS Servers.

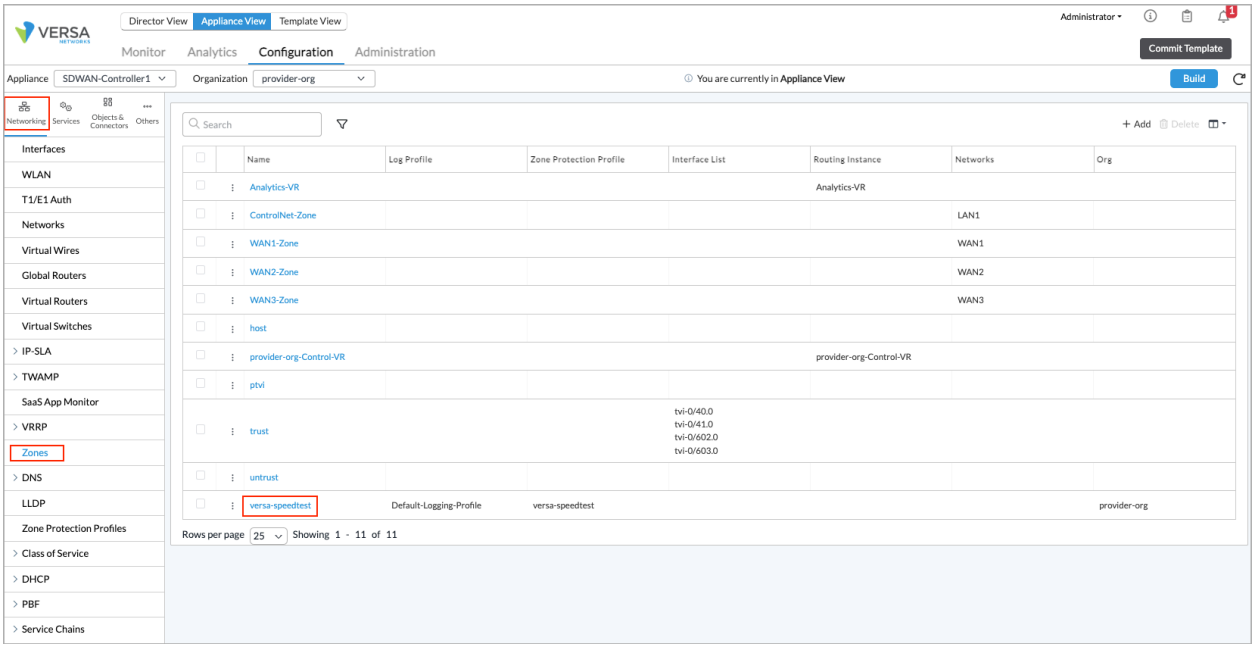
- Verify that the WAN link that you want to use to run the internet speed test has internet connectivity, and verify that the CGNAT service is configured on the provider organization.
- Verify that you can retrieve the list of predeployed internet speed-test servers. To do so, see Step 7 in Run an Internet Speed Test from a Director Node, below.
  - If you can see a list of servers when you perform this step, you can run the internet speed test.
  - If an error occurs, check the CGNAT and DNS configurations and then click Fetch Server List again.
- In some scenarios, to get accurate results, you need to know the geographical location of the VOS device you want to use to run the internet speed test.
- If a VOS device has multiple tenants or organizations, the default configuration for the internet speed test is added only for the provider organization.
- If branch devices on the Director node are running VOS releases prior to Release 21.2.1, redeploying the template pushes the configuration to the these devices, but the internet speed tests do not work with the older software releases.

Verify the Zone Configuration for Internet Speed Tests

Before running an internet speed test, verify that the versa-speedtest zone is present in the provider organization.

To verify the versa-speedtest zone configuration:

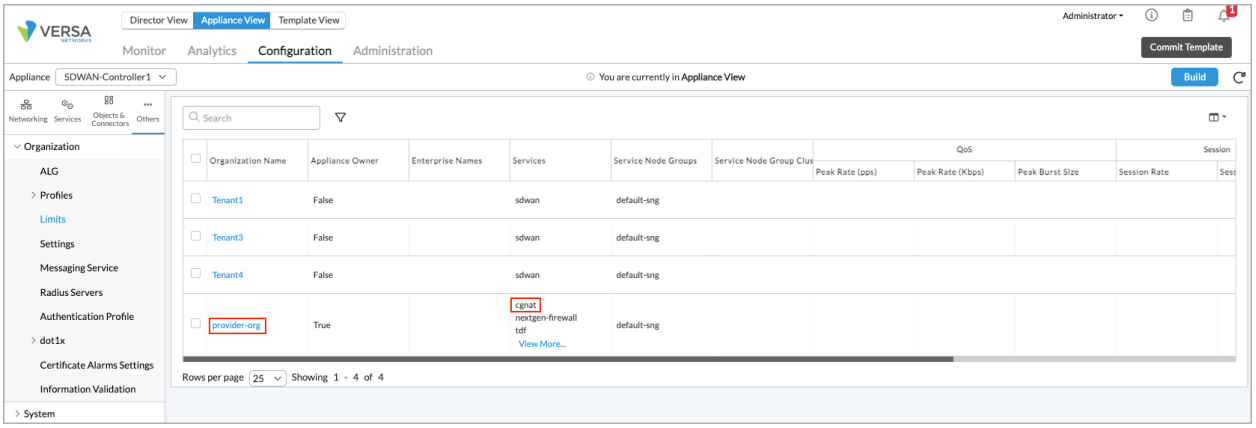
1. In Director view:
   a. Select the Configuration tab in the top menu bar.
   b. Select Devices > Devices in the horizontal menu bar.
   c. Select an organization in the left menu bar.
   d. Select a Controller in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > Zones in the left menu bar. The table in the main pane displays the zones that are already configured.
4. If the versa-speedtest zone is not listed, add a new zone to use for internet speed tests. Note that the name of the zone must be versa-speedtest. For more information, see Configure Zones.



Verify the CGNAT Service

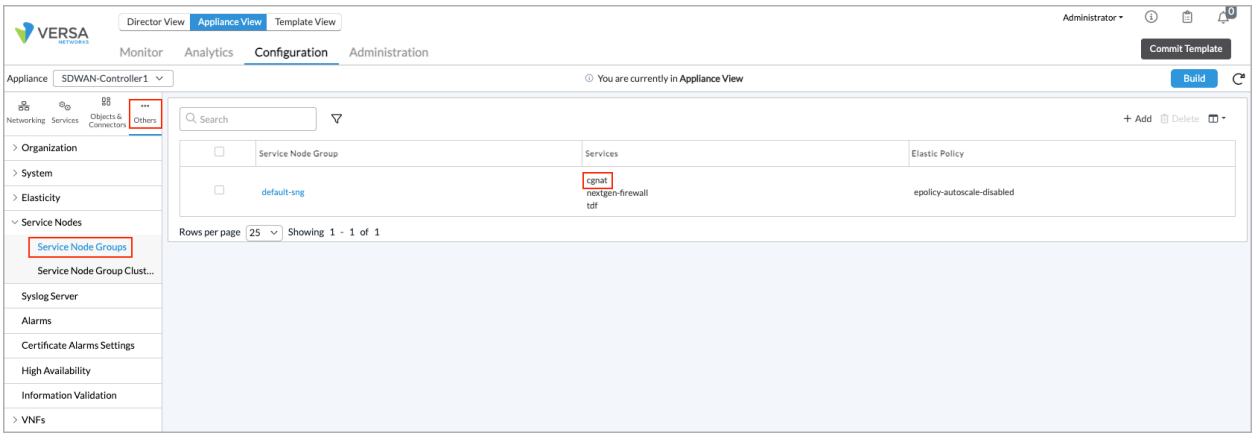
To verify that the CGNAT service is present in the provider organization:

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 a provider organization in left navigation panel.
   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 > Organization > Limits in the left menu bar.
4. Check that the Services column displayed the CGNAT service. For example:



You can also verify that the CGNAT service is present in the provider organization by displaying Service Node Groups screen:

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 a provider organization in left navigation panel.
   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 > Service Nodes > Service Node Groups in the left menu bar.
4. Check that the Services column for the service node group displays the CGNAT service. For example:

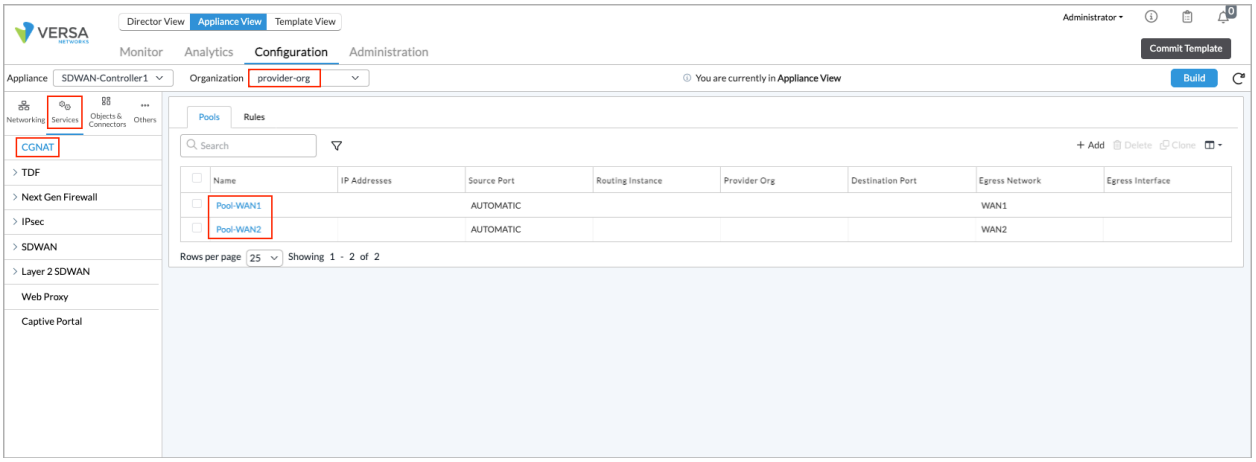


View the CGNAT Configuration

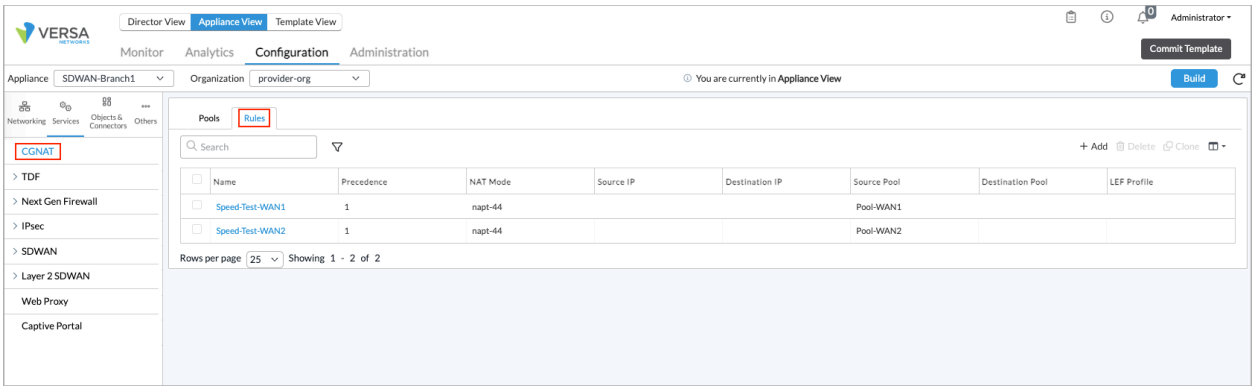
The default configuration creates CGNAT pools and rules for all available WAN interfaces and contains the CGNAT pools and rules settings needed to run internet speed tests.

To view the CGNAT pools and rules in the default configuration:

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 template in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Services > CGNAT in the left menu bar. The main pane displays the CGNAT pools that are already configured, including those that are configured by default.



4. To display the default CGNAT rules that are configured, select the Rules tab.



Run an Internet Speed Test

You can run an internet speed test either from a Director node or using a REST API call.

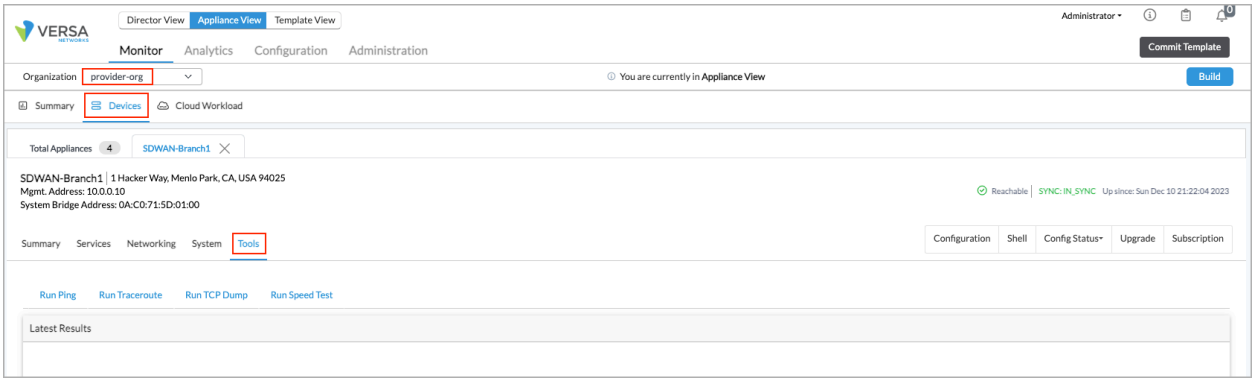
Run an Internet Speed Test from a Director Node

When you run a speed test from a VOS device, the speed test uses the default internet speed-test server, which is usually the server that is closest to the VOS device. If desired, you can select a different server when you set up the speed test.

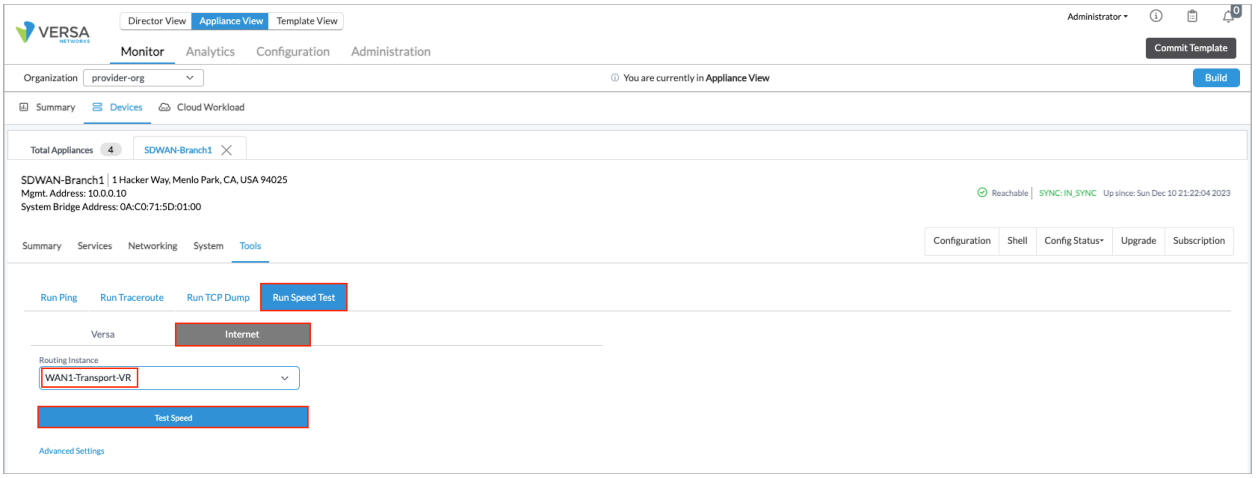
To run an Internet speed test from a Director node:

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.

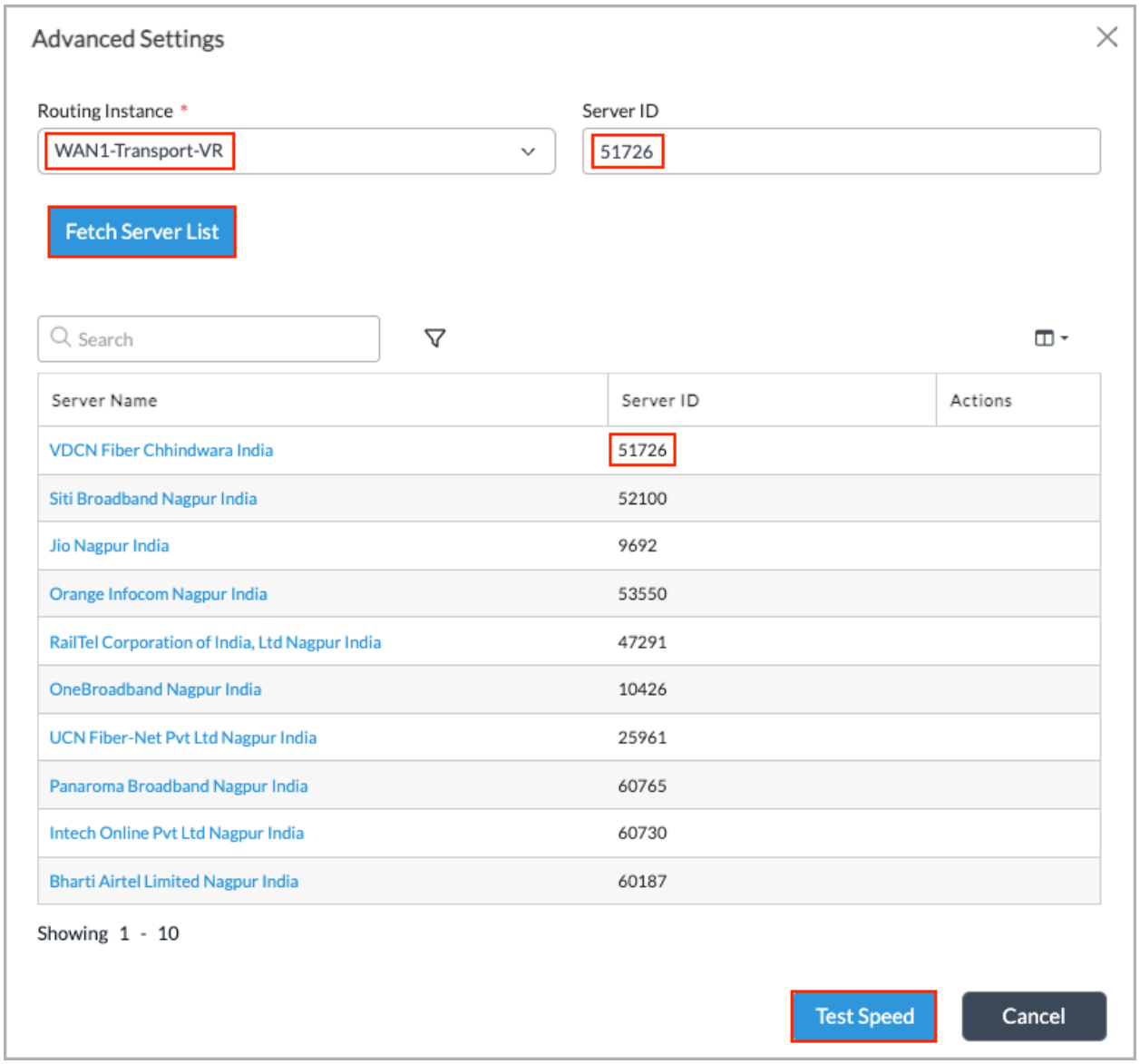
2. Select the Monitor tab in the top menu bar.
3. Select an organization in the left menu bar.
4. Select the Tools tab in the horizontal menu bar. The following screen displays.



5. Click Run Speed Test. In the Speed Test pane, select the Internet tab and, in the Routing Instance field, select the routing instance to use to run the speed test.

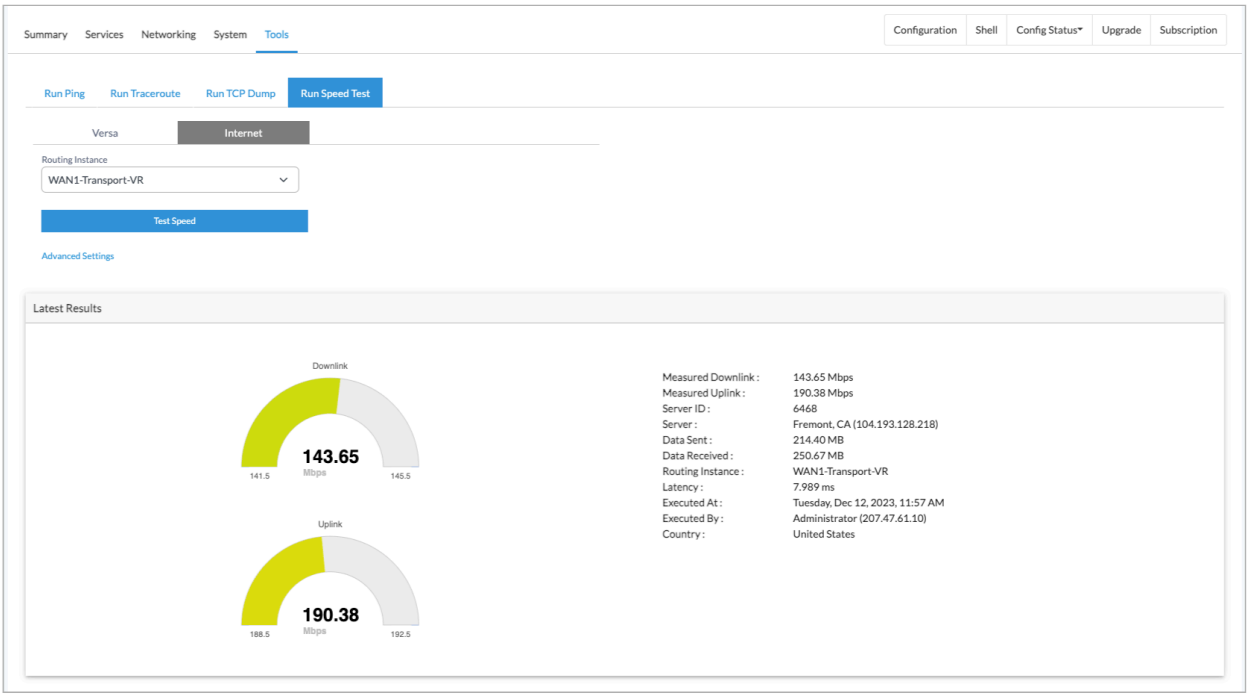


6. To run the speed test using the default internet speed-test server, click Test Speed.
7. To select the internet server to use for the speed test, click Advanced Settings. In the Advanced Settings popup window, enter information for the following fields, and then click Test Speed to run the speed test.



Field	Description
Routing Instance (Required)	Select the routing instance to use for the speed test.
Server ID	Enter the ID of the speed-test server.
Fetch Server List	Click to display a list of all available speed-test servers, and select the server to use.

The following is an example of the results of an internet speed test.



Run an Internet Speed Test Using a REST API Call

To run an internet speed test with the default settings, use the following API call:

REST API Call	API Type
https://*ip-address*:9182/vnms/dashboard/appliance/*device-name*/live?command=diagnostics/_operations/internet-speedtest	POST

This API call has the following request payload:

```
{
   "input":
   {
      "suppress-verbose":true,
      "routing-instance":"WAN1-Transport-VR"
   }
}
```

The following output shows an example of the payload response to this API call:

```
"diagnostics:output": {
   "status": "success",
      "result": "{
         \"download\": 165371180.18803573,
```

```
            \"upload\": 166668157.4374189,
            \"ping\": 28.001,
            \"server\": {
               \"lat\": \"36.1760\",
               \"lon\": \"-115.1370\",
               \"name\": \"Las Vegas, NV\",
               \"country\": \"United States\",
               \"cc\": \"US\",
               \"sponsor\": \"Cox - Las Vegas\",
               \"id\": \"16622\",
               \"host\": \"speedtest.rd.lv.cox.net:8080\",
               \"d\": 1546.0747852863926,
               \"latency\": 28.001},
               \"timestamp\": \"2021-03-05T20:08:25.608894Z\",
               \"bytes_sent\":  151519232,
               \"bytes_received\": 207248236,
               \"share\": null,
               \"client\": {
                  \"ip\": \"207.47.61.9\",
                  \"lat\": \"37.751\",
                  \"lon\": \"-97.822\",
                  \"isp\": \"Nextweb-r1\",
                  \"isprating\": \"3.7\",
                  \"rating\": \"0\",
                  \"ispdlavg\": \"0\",
                  \"ispulavg\": \"0\",
                  \"loggedin\": \"0\",
                  \"country\": \"US\"
               }
            }
         }
      }
   }
```


To fetch the list of predeployed internet servers, use the following API call:

REST API Call	**API Type**
https://*director-ip-address*:*port*/vnms/dashboard/appliance/*device-name*/live?command=diagnostics/_operations/internet-speedtest	POST

This API call has the following request payload:


```
{
   "input":
   {
      "routing-instance":"WAN1-Transport-VR",
      "list-servers":true
   }
```

```
}
```

The following output shows an example of the payload response to this API call:

```
{
   "diagnostics:output": {
      "status": "success",
      "result": "Retrieving speedtest.net configuration...\n
      16622) Cox - Las Vegas (Las Vegas, NV, United States) [1546.07 km]\n
      9056) LV.Net (Las Vegas, NV, United States) [1546.07 km]\n
      13529) Switch (Las Vegas, NV, United States) [1546.07 km]\n
      22320) ServerPoint (Las Vegas, NV, United States) [1546.07 km]\n
      19003) Valley Communications Association (Pahrump, NV, United States) [1619.80 km]\n
      11603) Ultimate Internet Access (Ontario, CA, United States) [1828.56 km]\n
      16620) Cox - Orange County (Orange County, CA, United States) [1839.96 km]\n
      37875) City of Hope (Duarte, CA, United States) [1854.38 km]\n
      39720) Giggle Fiber, LLC (Monrovia, CA, United States) [1856.36 km]\n
      13654) Sprint (Anaheim, CA, United States) [1859.74 km]\n
      14236) Frontier (Los Angeles, CA, United States) [1881.35 km]\n
      5031) AT&T (Los Angeles, CA, United States) [1881.35 km]\n
      17249) Wiline Networks (Los Angeles, CA, United States) [1881.35 km]\n
      16974) Spectrum (Los Angeles, CA, United States) [1881.35 km]\n
      18401) Windstream (Los Angeles, CA, United States) [1881.35 km]\n
      21541) i3D.net (Los Angeles, CA, United States) [1881.35 km]\n
      24286) System Solutions, Inc (Los Angeles, CA, United States) [1881.35 km]\n
      30819) Xiber LLC (Los Angeles, CA, United States) [1881.35 km]\n
      22471) Aerioconnect Inc. (Los Angeles, CA, United States) [1881.35 km]\n
      18857) Bel Air Internet LLC (Los Angeles, CA, United States) [1881.35 km]\n
      21001) 5x5 Telecom (Los Angeles, CA, United States) [1881.35 km]\n
      22736) Inyo Networks Inc (Los Angeles, CA, United States) [1881.35 km]\n
      3864) GeoLinks (Los Angeles, CA, United States) [1881.35 km]\n
      19230) Hivelocity (Los Angeles, CA, United States) [1881.35 km]\n
      7190) Sharktech Inc. (Los Angeles, CA, United States) [1881.35 km]\n
      9916) fdcservers.net (Los Angeles, CA, United States) [1881.35 km]\n
      18114) Atlantic Metro (Los Angeles, CA, United States) [1881.35 km]\n
      21363) Enzu Inc. (Los Angeles, CA, United States) [1881.35 km]\n
      18229) Starry, Inc. (Los Angeles, CA, United States) [1881.35 km]\n
      18393) 2degrees (Los Angeles, CA, United States) [1881.35 km]\n
      13516) Xfernet (Los Angeles, CA, United States) [1881.35 km]\n
      31490) CreeperHost LTD (Los Angeles, CA, United States) [1881.35 km]\n
      5303) Host Duplex (Los Angeles, CA, United States) [1881.35 km]\n
      29150) Genesis Adaptive Hosting, INC. (Los Angeles, CA, United States) [1881.35 km]\n
      34840) ReliableSite Hosting (Los Angeles, CA, United States) [1881.35 km]\n
      35056) Clouvider Ltd (Los Angeles, CA, United States) [1881.35 km]\n
      5905) GigeNET (Los Angeles, CA, United States) [1881.35 km]\n
      22775) DediPath (Los Angeles, CA, United States) [1881.35 km]\n
      37498) Netprotect (Los Angeles, CA, United States) [1881.35 km]\n
      38022) Light Source 1, Inc (Los Angeles, CA, United States) [1881.35 km]\n
      38726) Servers Galore (Los Angeles, CA, United States) [1881.35 km]\n
      15782) Sprint (Burbank, CA, United States) [1881.94 km]\n
      2402) Spectrum (Monterey Park, CA, United States) [1882.27 km]\n
      26187) Whitesky Communications LLC (Los Angeles, CA, United States) [1896.95 km]\n
      2408) Spectrum (Reno, NV, United States) [1914.74 km]\n
```

13528) Switch (Reno, NV, United States) [1914.74 km]\n
39729) Roller Network (Reno, NV, United States) [1914.74 km]\n
38727) Vyve Broadband (Oakhurst, CA, United States) [1920.72 km]\n
14361) unWired Broadband Inc. (Fresno, CA, United States) [1941.66 km]\n
30512) Geolinks (Camarillo, CA, United States) [1944.47 km]\n
11521) Volcano Communications (Pine Grove, CA, United States) [1995.05 km]\n
5410) DigitalPath, Inc (Quincy, CA, United States) [2011.82 km]\n
37462) Volt Broadband (Turlock, CA, United States) [2022.82 km]\n
1938) Smarterbroadband, Inc (Auburn, CA, United States) [2026.90 km]\n
11671) Ayera Technologies, Inc. (Modesto, CA, United States) [2033.32 km]\n
24526) Advanced Wireless (Santa Maria, CA, United States) [2043.81 km]\n
14648) Ayera Technologies, Inc. (Manteca, CA, United States) [2050.75 km]\n
3801) Softcom Internet Communications (Galt, CA, United States) [2052.27 km]\n
2403) Spectrum (San Luis Obispo, CA, United States) [2054.60 km]\n
15789) Sprint (Stockton, CA, United States) [2055.13 km]\n
9436) Comcast (Sacramento, CA, United States) [2063.90 km]\n
7760) Succeed.Net (Sacramento, CA, United States) [2063.90 km]\n
5411) DigitalPath, Inc (Chico, CA, United States) [2087.98 km]\n
1446) FireServe, LLC (Klamath Falls, OR, United States) [2093.05 km]\n
33694) South Valley Internet (San Martin, CA, United States) [2096.47 km]\n
1663) Cal-Ore Communications (Dorris, CA, United States) [2102.01 km]\n
17846) Sonic.net, Inc. (San Jose, CA, United States) [2115.63 km]\n
15786) Sprint (San Jose, CA, United States) [2115.63 km]\n
35980) 3BB (San Jose, CA, United States) [2115.63 km]\n
24934) Razzolink Inc (San Jose, CA, United States) [2116.24 km]\n
6468) Tekify Fiber & Wireless (Fremont, CA, United States) [2121.79 km]\n
27781) Converse in Code Networks (Fremont, CA, United States) [2121.79 km]\n
30742) Xiber LLX (Fremont, CA, United States) [2121.79 km]\n
34384) XenSpec (Fremont, CA, United States) [2121.79 km]\n
38617) BayNIC (Fremont, CA, United States) [2121.79 km]\n
11613) KamaTera INC (Santa Clara, CA, United States) [2122.00 km]\n
32408) EGI Hosting (Santa Clara, CA, United States) [2122.00 km]\n
25606) Next Level Networks (Santa Clara, CA, United States) [2122.00 km]\n
12818) Ridge Wireless (Cupertino, CA, United States) [2129.25 km]\n
38363) Vyve Broadband (Mount Shasta, CA, United States) [2129.74 km]\n
19133) Shasta County Office of Education (Redding, CA, United States) [2132.22 km]\n
6349) Cruzio (Santa Cruz, CA, United States) [2134.99 km]\n
14204) Frontier (Palo Alto, CA, United States) [2136.97 km]\n
35596) Open5G Inc. (Atherton, CA, United States) [2141.43 km]\n
31420) Open10G (Oakland, CA, United States) [2142.60 km]\n
27103) Open10G (Emeryville, CA, United States) [2143.68 km]\n
5026) AT&T (San Francisco, CA, United States) [2155.95 km]\n
603) Unwired (San Francisco, CA, United States) [2155.95 km]\n
5754) Fastmetrics Inc. (San Francisco, CA, United States) [2155.95 km]\n
17587) Wiline Networks (San Francisco, CA, United States) [2155.95 km]\n
1783) Comcast (San Francisco, CA, United States) [2155.95 km]\n
18531) Wave (San Francisco, CA, United States) [2155.95 km]\n
8228) Race Communications (San Francisco, CA, United States) [2155.95 km]\n
5800) Siskiyou Telephone (Fort Jones, CA, United States) [2175.61 km]\n
2407) Spectrum (Medford, OR, United States) [2183.97 km]\n
33528) Uppercase Computer Solutions (Medford, OR, United States) [2183.97 km]\n
10964) Hunter \Communications (Central Point, OR, United States) [2187.90 km]\n
8406) Douglas Fast Net (Roseburg, OR, United States) [2233.57 km]\n
5427) Suddenlink Communications LLC (Eureka, CA, United States) [2283.81 km]\n

```
        8854) 600Amps Internet Services, Inc. (Brookings, OR, United States) [2298.03 km]"
    }
}
```

To specify a server ID when running an internet speed test, use the following API call:

REST API Call	API Type
https://*director-ip-address*:*port*/vnms/dashboard/appliance/*device-name*/live?command=diagnostics/_operations/internet-speedtest	POST

This API call has the following request payload:

```
{
    "input":
    {
        "suppress-verbose":true,
        "routing-instance":"WAN1-Transport-VR",
        "server-id":"16622"
    }
}
```

The following output shows an example of the payload response to this API call:

```
"diagnostics:output": {
    "status": "success",
    "result": "{
        \"download\": 192465129.88048345,
        \"upload\": 280610553.2917568,
        \"ping\": 23.759,
        \"server\": {
            \"lat\": \"36.1760\",
            \"lon\": \"-115.1370\",
            \"name\": \"Las Vegas, NV\",
            \"country\": \"United States\",
            \"cc\": \"US\",
            \"sponsor\": \"Cox - Las Vegas\",
            \"id\": \"16622\",
            \"host\": \"speedtest.rd.lv.cox.net:8080\",
            \"d\": 1546.0747852863926,
            \"latency\": 23.759
        }
        \"timestamp\": \"2021-03-05T21:08:18.044363Z\",
        \"bytes_sent\": 151519232,
        \"bytes_received\": 241227379,
        \"share\": null,
        \"client\": {
            \"ip\": \"207.47.61.9\",
            \"lat\": \"37.751\",
            \"lon\": \"-97.822\",
            \"isp\": \"Nextweb-r1\",
```

```
            \"isprating\": \"3.7\",
            \"rating\": \"0\",
            \"ispdlavg\": \"0\",
            \"ispulavg\": \"0\",
            \"loggedin\": \"0\",
            \"country\": \"US\"
        }
    }
}
```


Run an Internet Speed Test from the CLI

By default, an internet speed test that you run from a Director node uses multiple sessions. You can run a speed test with a single session from a device's CLI. Running a speed test with a single session is useful for simulating file transfer rates when using SCP or FTP.

To run an internet speed test from the CLI, issue the following command:

```
vos-cli> request diagnostics internet-speedtest routing-instance instance single-session true

status success
result Retrieving speedtest.net configuration...
Testing from web-r1 (XXX.XX.XX.X)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Cox - Las Vegas (Las Vegas, NV) [1546.07 km]: 29.225 ms
Testing download speed.....................................................................................
Download: 126.03 Mbit/s
Testing upload speed.....................................................................................
Upload: 79.98 Mbit/s
```

Troubleshoot an Internet Speed Test

If you run an internet speed test run with the default speed-test server and the results are low, do the following:

- Check the latency in the speed test report. If the latency is high, the default server might be too far from the device that is initiating the speed test. Choose the server that is nearest to the device's geographical location, and then rerun the test. To choose a different server, select an available speed-test server in the Advanced Settings popup window.
- Check the public IP address assigned to the WAN interface. This address might be registered in different a region or location than the physical location from which the device is reachable over the internet.
- Run the internet speed test when the network is quiet or idle.

Supported Software Information

Releases 21.2.1 and later support support all content described in this article.

Additional Information

Configure DNS Servers
Configure SD-WAN Traffic Steering
Troubleshoot Link Bandwidth Issues