Configure TWAMP Control Client and Server Sessions

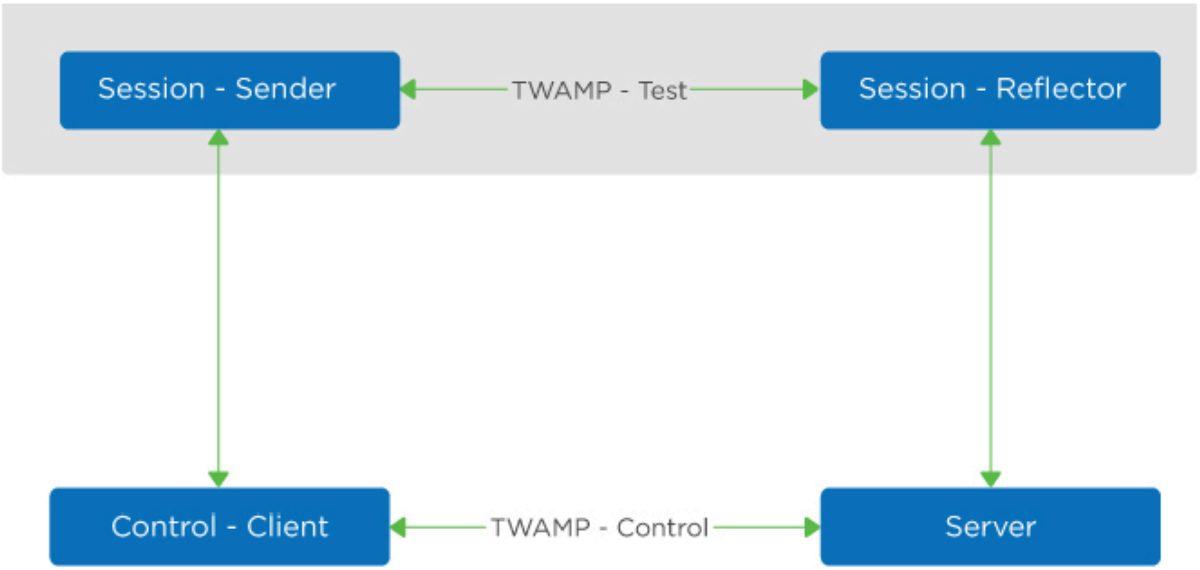
For supported software information, click here.

TWAMP Control, also called full Two-Way Active Measurement Protocol (TWAMP), allows negotiation of SLA parameters negotiation. TWAMP is a standard protocol, defined in RFC 5357, that is used to measure network performance for IP networks and can be used for SLA compliance checks. You can use TWAMP Control along with TWAMP Light for SLA compliance checks, periodic network monitoring, and on-demand network quality checks. Similar to TWAMP Light, TWAMP Control has two modes, on-demand and forever running performance tests. For both modes, you can use TWAMP Control to do the following:

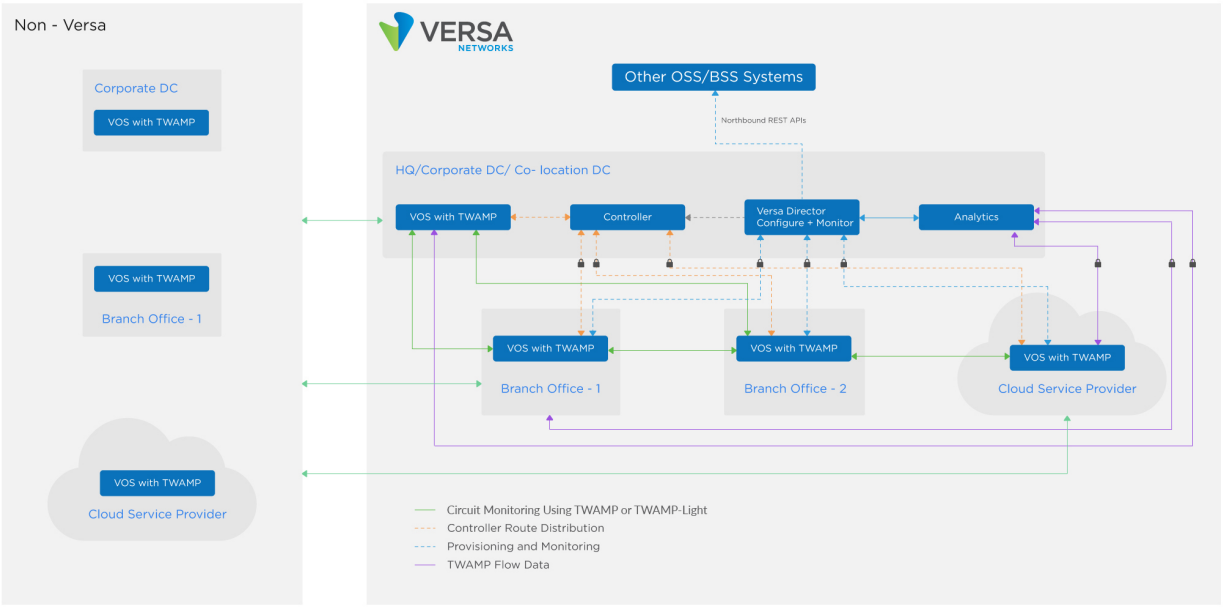
- Configure the TWAMP Control client and server.
- Manage (start, stop, or restart) the TWAMP client.
- Monitor negotiation results and related statistics.
- Collect periodic and on-demand reports of performance tests using Versa Analytics.

The Versa Operating System™ (VOS™) TWAMP software consists of the following components, all of which are compliant with RFC 5357:

- Control server—Interfaces with the control client and manages one or more TWAMP reflector sessions for each configured control connection.
- Control client—Negotiates TWAMP test parameters with the control server, and, based on the negotiated parameters, manages the lifecycle of TWAMP tests through TWAMP Light sessions while performing circuit quality measurements between configured endpoints.
- Session reflector—Reflects the TWAMP test measurement packets received from a preconfigured or any TWAMP test sender.
- Session sender—Sends TWAMP test packets to the peer test-session reflector, to measure circuit quality.



The following figure illustrates the TWAMP network performance measurement flow within a Versa network, and between a Versa Networks and a non-Versa network.



TWAMP Control is a standards-compliant protocol and allows measuring of network performance in heterogeneous networks and supports interoperability between Versa and non-Versa network elements that support TWAMP Control. While TWAMP Control negotiates performance test parameters, TWAMP Test measures network quality metrics. A TWAMP Control connection negotiates parameters with standards-compliant peer to establish the least common

parameters that TWAMP Test can use to measure performance metrics, including the following:

- Round-trip delay (RTT) and RTT delay variance (jitter)
- One-way delay (OWD) and one-way delay variance (jitter)
- RTT packet loss and packet loss ratio
- Real data loss in the forward direction
- Real data loss in the reverse direction
- Duplicate and reordered packets
- Forward and reverse TTL values

A TWAMP Control connection can have one or more TWAMP Light sessions as child sessions. A TWAMP Light session is considered to be a child session if it is associated to a TWAMP Control connection. You can add a new TWAMP Light session as a child session to an existing TWAMP Control connection, or you can create a child session when you create a TWAMP Control connection. You cannot configure independent TWAMP Light sessions to be child sessions. If required, you can delete an independent TWAMP Light session, perform a commit, and then create a child session with a similar configuration. Note that if you update a child session configuration while the parent session is active, the parent session resets and terminates all the control connections and test sessions of the parent session. If parent session is TWAMP Control client and was active before the child configuration update, it is automatically stopped in the backend.

This article describes how to configure TWAMP Control client and server connections. You can create a TWAMP sender child session for a TWAMP client, and you can create a TWAMP reflector child session for a TWAMP server. For more information about TWAMP Light, see Configure TWAMP Light Test Sessions.

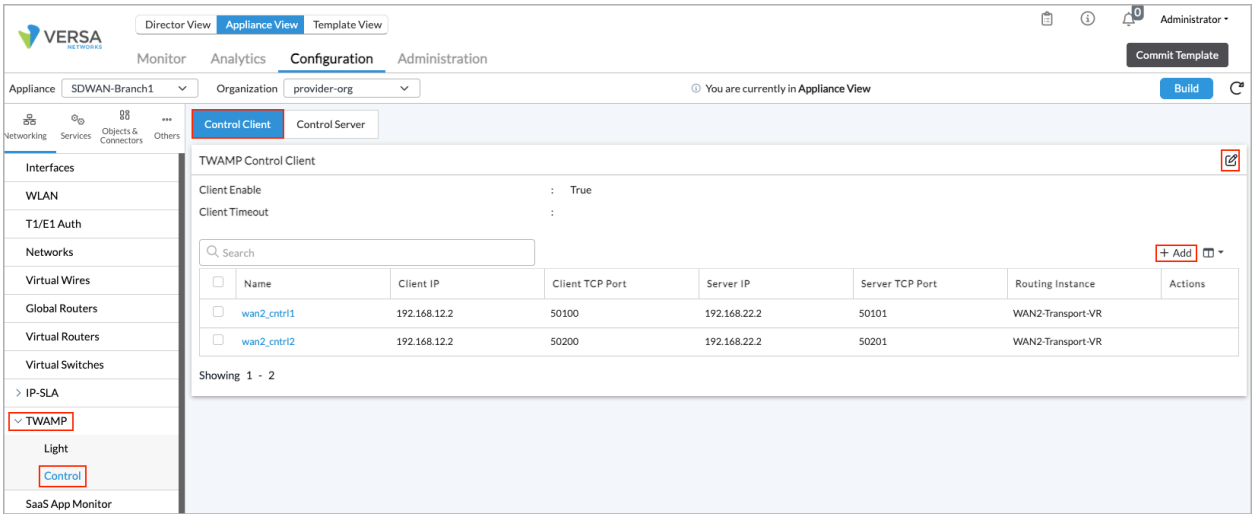
You can also monitor and analyze TWAMP control client and control server performance metrics.

Configure TWAMP Control Connections

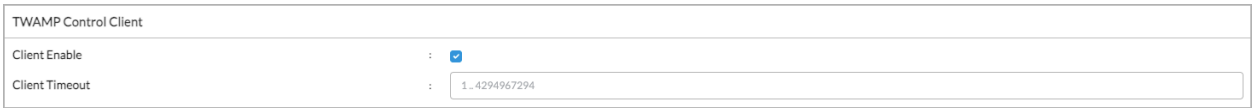
To configure TWAMP Control connections, you configure both a client connection and a server connection. You can also clone an existing client or server connection.

Configure a TWAMP Control Client Connection

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Click an appliance in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > TWAMP > Control in the left menu bar. For Releases 22.1.1 and earlier, select Networking > TWAMP.
4. Select the Control Client tab.

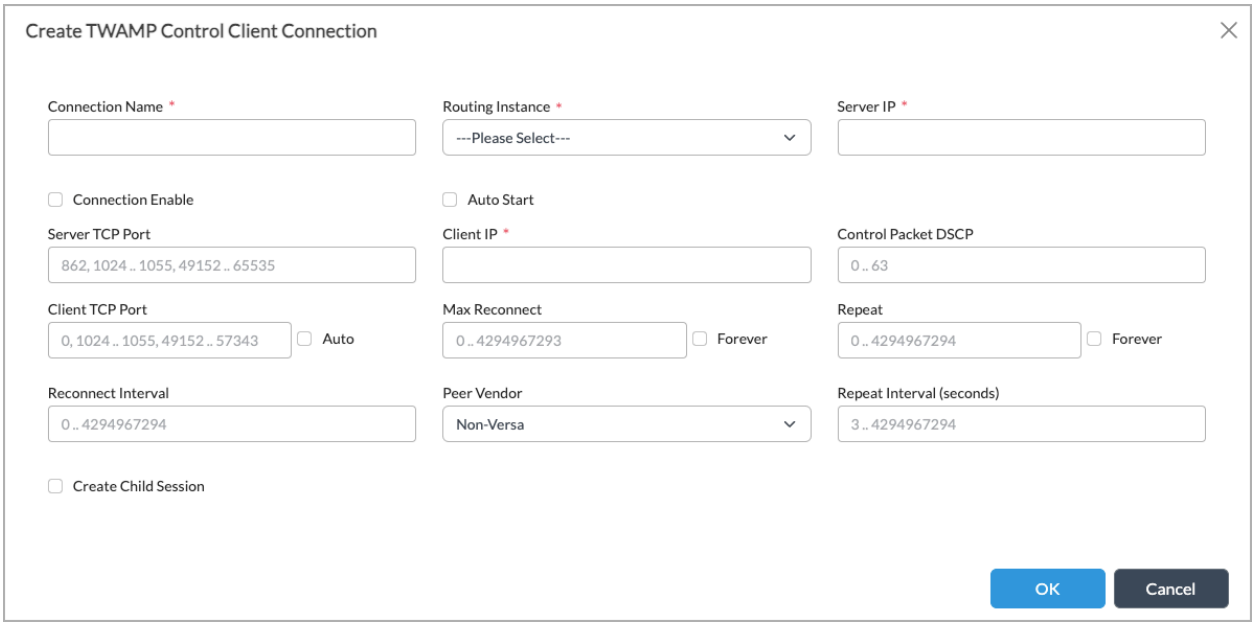


5. Click the Edit icon to enable the control client and to set the client timeout. Enter information for the following fields.



Field	Description
Client Enable	Click to enable all TWAMP Control clients for the tenant.
Client Timeout	Enter the timeout value for client sessions, in seconds. *Range*: 1 through 4294967294 seconds *Default*: 10 seconds

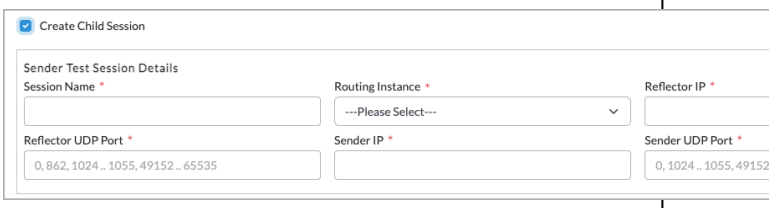
6. Click the Add icon to add a client session connection. In the Create TWAMP Control Client Connection popup window, enter information for the following fields. Note that if you change the configuration for an active session, the session resets when you click OK.



Field	Description
Connection Name (Required)	Enter a name for the TWAMP Control server connection. This name identifies a TWAMP Control connection on the control client device. *Range*: 1 through 63 characters
Routing Instance (Required)	Select the VRF routing instance on which to run the tests for the node.
Server IP (Required)	Enter the IP address of the peer node that reflects the probes initiated by this node.
Connection Enable	Click to enable the control client.
Auto Start	Click to automatically start the control client without waiting for manual start or stop requests. Select this option to have the client run in forever mode.
Server TCP Port	Enter the Transmission Control Protocol (TCP) port number to use for the TWAMP Control connection. The TWAMP Control server listens on this port number for incoming TWAMP Control connections. Typically, the TCP port number is 862, which is the well-known TWAMP Control port number and is defined in RFC 5357. For security hardening, you can configure a non-default port number in the supported range. *Values*: 862, 1024 through 1055, 49152 through 65535 *Default*: 862
Client IP (Required)	Enter the IP address the local control client device to use in the source IP address field of the IP header in the TCP packets for the control connection.
Control Packet DSCP	Enter the DSCP value for control client or server packets. This value is placed in the IP header of TCP

	packets generated by the control client or control server. *Range*: 1 through 63 *Default*: 0
Client TCP Port	Enter the TCP port number to use for the control connection on the node. *Range*: 1024 through 1055, 49152 through 57343
◦ Auto	Click to have the control client automatically allocate the TCP port number from a dynamic port range.
Max Reconnect	Enter the maximum number of times the client attempts to reconnect to the server. *Range*: 0 through 4294967293 *Default*: 3
◦ Forever	Click to attempt to reconnect to the server continuously.
Repeat	Enter the number of times to repeat the control session. When a control session completes, it repeats for the number of times specified in this value. When the value is 0, the control session does not repeat. If the value is greater than 0, the control session is repeated at the interval configured in the Repeat Interval field. *Range*: 0 through 4294967293 *Default*: None
◦ Forever	Click to repeat continuously.
Reconnect Interval	Enter the interval, in seconds, between subsequent client reconnection attempts to the server. Note that if you set this interval below 2 seconds, the reconnection time can increase because the server

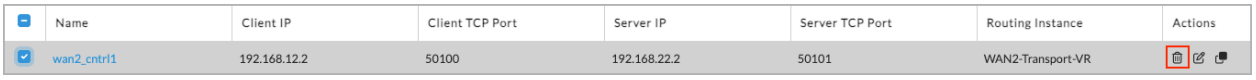
	may reject the reconnect request when the cleanup of an old TCP connection is occurring. *Range*: 1 through 4294967294 seconds *Default*: 2
Peer Vendor	Select the peer vendor device type for the control session: ◦ Non-Versa—Select this option for other scenarios. This is the default. ◦ RAC Client—Remote Access Client device. Select this option when you are configuring auto-SLA for Versa SASE clients. ◦ Versa—Select this option when you are connecting SLA over a site-to-site IPsec VPN. For more information, see Configure Site-to-Site Tunnels. *Default*: Non-Versa
Repeat Interval (seconds)	Enter the time interval when a test session is repeated, that is, when the value in the Repeat field is greater than 0. *Range*: 0 through 4294967293. *Default*: None
Create Child Session	Click to automatically create a TWAMP Light sender child session. Note that the relevant fields for the control client connection are automatically populated for the child session, and you can update the values if required. For more information, see Configure a Session Sender Test Session. In the Sender Test Session Details section that displays, enter information for the following fields.



- Session Name (Required)—Enter a name for the TWAMP Light sender child test session. *Range*: 1 through 63 characters
- Routing Instance (Required)—Select the VRF routing instance on which to run tests for the child session.
- Reflector IP (Required)—Enter the IP address of the peer node that reflects the probes initiated by this node. The address must be an IPv4 address.
- Reflector UDP Port (Required)—Enter the UDP port number to have the session reflector use for the TWAMP Test session. The default number is a value within the dynamic port range, and this value populates the Receiver Port field in the Request-TW-Session message. You can also configure the well-known port number 862. *Values*: 862, 49152 through 65535
- Sender IP (Required)—Enter the IP address of the remote session reflector device to which the TWAMP Test session initiates. This value populates the Receiver Address field in the Request-TW-Session message.
- Sender UDP Port (Required)—Enter the UDP port number that the session ssender uses for the TWAMP Test session. The port number must be in the dynamic port range. By default, the control client automatically allocates a UDP port number. *Range*: 49152 through 57343

7. Click OK.

To delete a session, hover over the session and click the Delete icon.

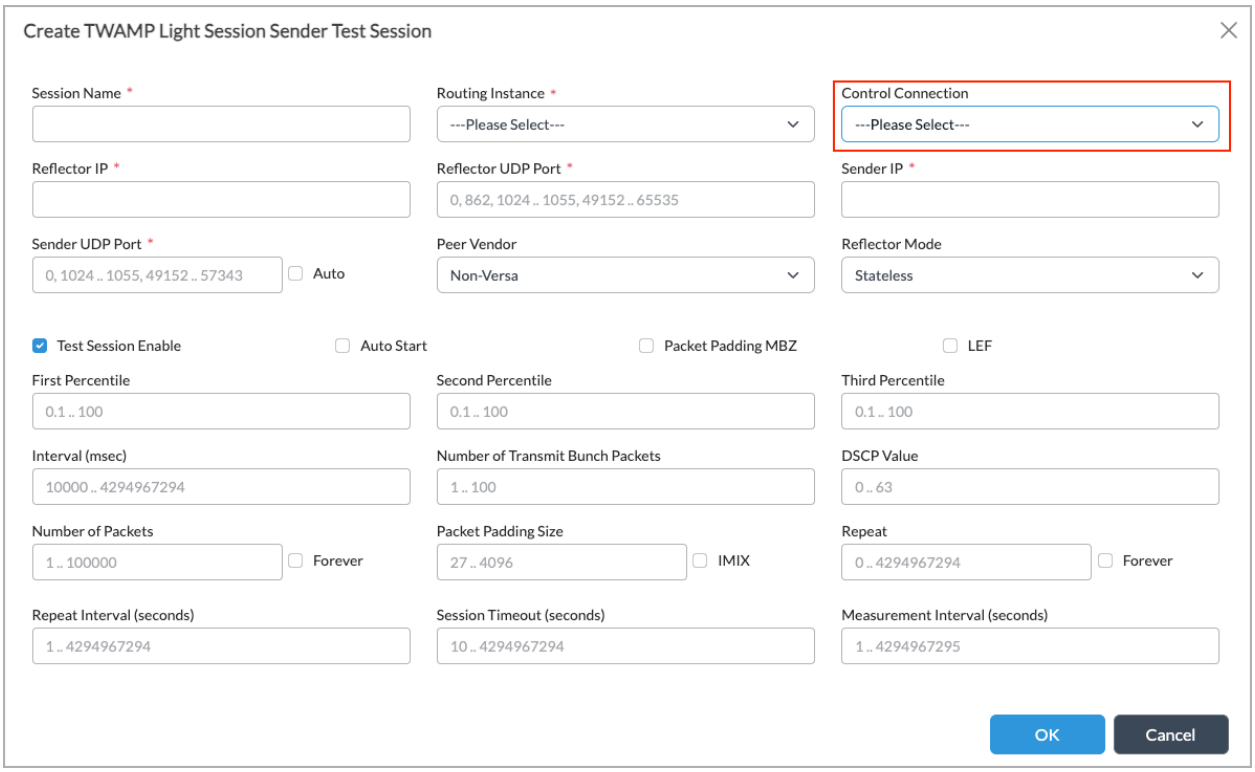


If you do not create a child session when you configure the TWAMP Control client connection, you can select the server connection as the control connection when you configure a TWAMP Light session sender test session:

1. In Director view:

a. Select the Administration tab in the top menu bar.
b. Select Appliances in the left menu bar.
c. Click the appliance in the main pane. The view changes to Appliance view.

2. Select the Configuration tab in the top menu bar.
3. Select Networking > TWAMP > Light in the left menu bar. For Releases 22.1.1 and earlier, select Networking > TWAMP.
4. Select the Session Sender tab.
5. Click the + Add icon to add a session. The Create TWAMP Light Session Sender Test Session popup window displays.

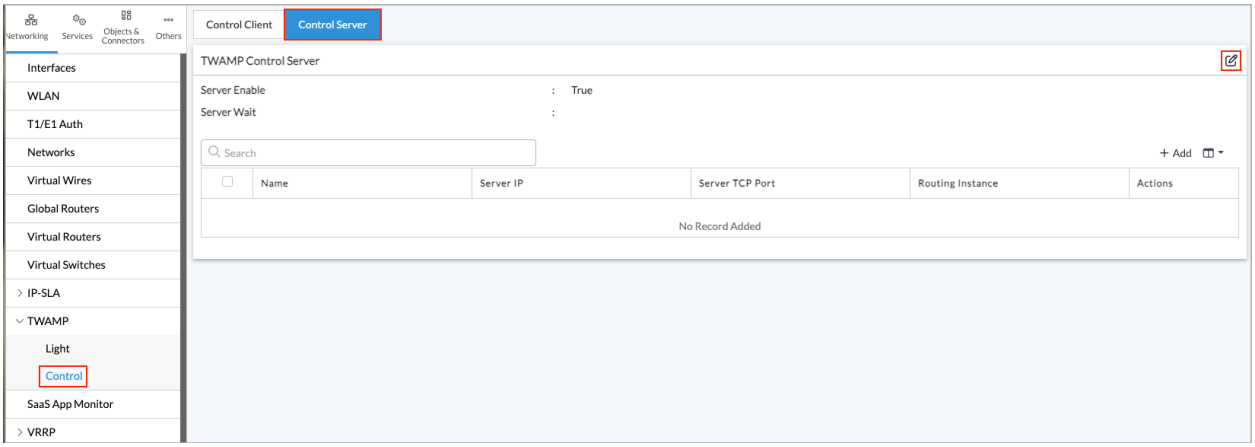


6. In the Control Connection field, select the TWAMP Control server.
7. For information about the other fields, see Configure a Session Sender Test Session.
8. Click OK.

Configure a TWAMP Control Server Connection

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Click the appliance in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.

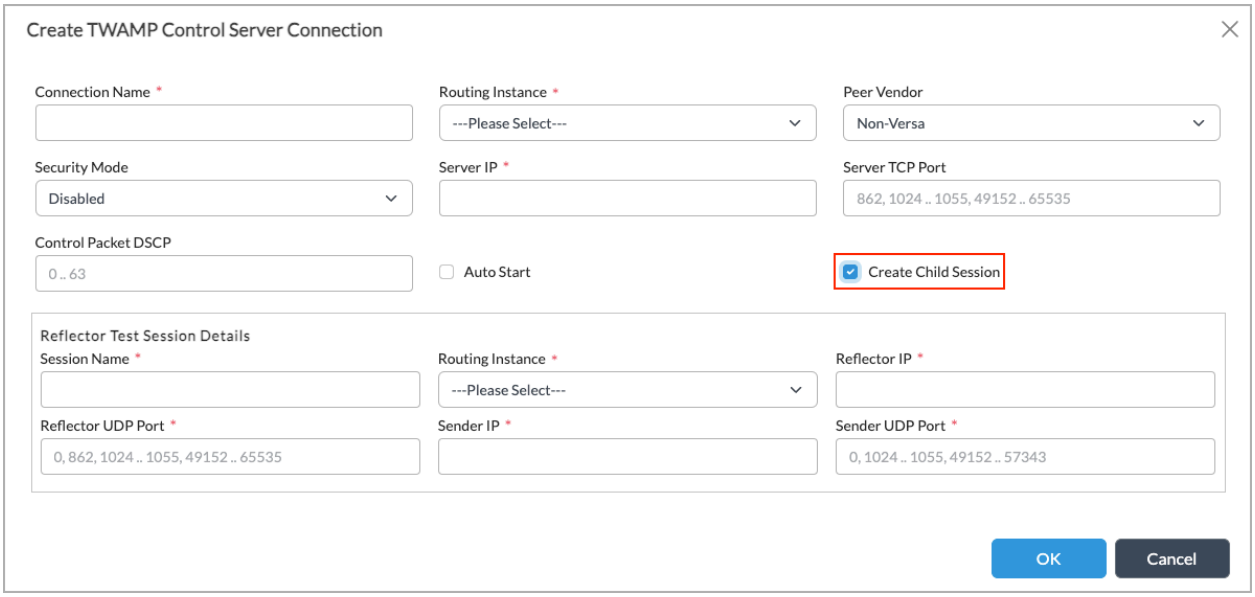
3. Select Networking > TWAMP > Control in the left menu bar. For Releases 22.1.1 and earlier, select Networking > TWAMP.
4. Select the Control Server tab.



5. Click the Edit icon to enable a control server for the tenant and set the server wait time. Enter information for the following fields.

Field	Description
Server Enable	Click to enable all TWAMP Control servers.
Server Wait	Enter the timeout value for server sessions, in seconds. *Range*: 1 through 604800 seconds *Default*: None

6. Click the Add icon to add a server. In the Create TWAMP Server Client Connection popup window, enter information for the following fields. Note that if you change the configuration for an active session, the session resets when you click OK.



Field	Description
Connection Name (Required)	Enter a name for the TWAMP control server connection.
Routing Instance (Required)	Select the VRF routing instance on which to run the test session.
Peer Vendor	Select the peer vendor device type for the server session: ◦ Non-Versa—Select this option for other scenarios. This is the default. ◦ RAC Client—Remote Access Client device. Select this option when you are configuring auto-SLA for Versa SASE clients. ◦ Versa—Select this option when you are connecting SLA over a site-to-site IPsec VPN. For more information, see Configure Site-to-Site Tunnels. *Default*: Non-Versa
Security Mode	Select the TWAMP Control server security mode for the control connection: ◦ Disabled. This is the default ◦ Remote Access Client *Default*: Disabled
Server IP (Required)	Enter the IP address of the remote server device from which to initiate the TWAMP Control server session.
Server TCP Port	Enter the TCP port number to use for the TWAMP Control server connection. The TWAMP Control server listens on this port number for incoming TWAMP Control connections. Typically, the TCP port number is 862, which is a well-known TWAMP Control port number and is defined in RFC 5357. For security hardening, you can configure a non-default port number in the supported range.

	Values: 862, 49152 through 65535 *Default*: 862
Control Packet DSCP	Enter the DSCP value for control client or server packets. This value is placed in the IP header of TCP packets generated by the control client or control server. *Range*: 1 through 63 *Default*: None
Auto Start	Click to automatically start the control server without waiting for manual start or stop requests. Select this option to have the server run in forever mode.
Create Child Session	Click to create a TWAMP Light session reflector child test session for the server connection. Note that the relevant fields for the control server connection are automatically populated for the child session and you can update the values, if required. For more information, see Configure a Session Reflector Test Session. The Sender Test Session Details section displays the following fields.  ◦ Session Name (Required)—Enter a name for the TWAMP Light sender test session. ◦ Routing Instance (Required)—Select the VRF routing instance to use for this test session. ◦ Reflector IP (Required)—Enter the IP address of the peer node that reflects the probes initiated by this node. Supports only IPv4. ◦ Reflector UDP Port (Required)—Enter the UDP port number for the session reflector to use for this TWAMP Test session. The default number is within the dynamic port range, and this value

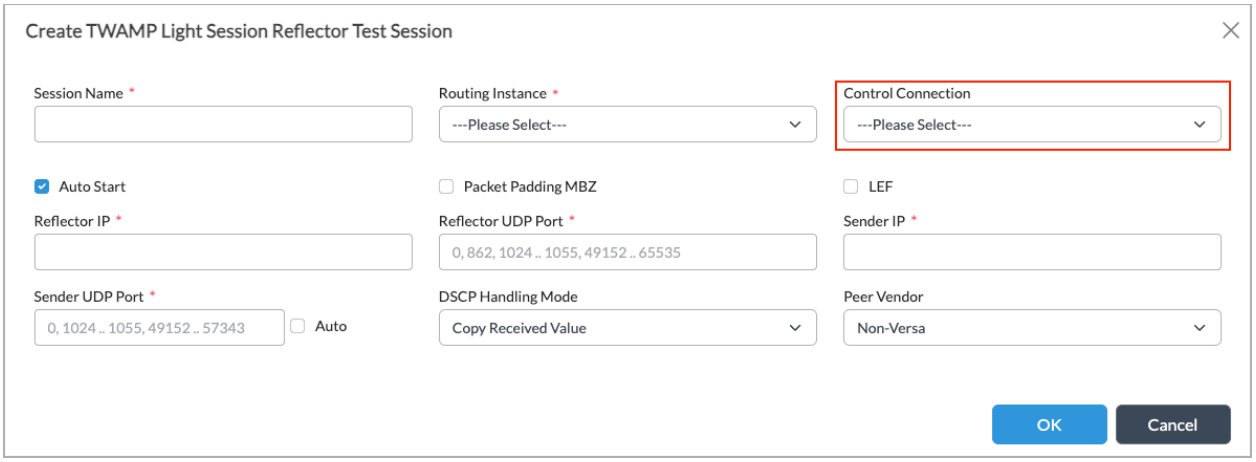
	populates the Receiver Port field in the Request-TW-Session message. You can also configure the well-known port number 862. *Values*: 0, 862, 49152 through 65535 *Default*: None ◦ Sender IP (Required)—Enter the IP address of the remote session reflector device to which the TWAMP Test session initiates. This value populates the Receiver Address field in the Request-TW-Session message. ◦ Sender UDP Port (Required)—Enter the UDP port number that the session sender uses for the TWAMP Test session. The port number must be within the dynamic port range. By default, the control client automatically allocates a UDP port number. *Values*: 0, 49152 through 57343 *Default*: None

7. Click OK.

To delete a session, over the session and click the Delete icon.

If you do not create a child session when you configure a TWAMP Control server connection, you can select the server connection as the control connection when you configure a TWAMP Light sender reflector session:

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Click the appliance in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > TWAMP > Light in the left menu bar. For Releases 22.1.1 and earlier, select Networking > TWAMP.
4. Select the Session Sender tab.
5. Click the + Add icon to add a session. The Create TWAMP Light Session Sender Reflector Test Session popup window displays.



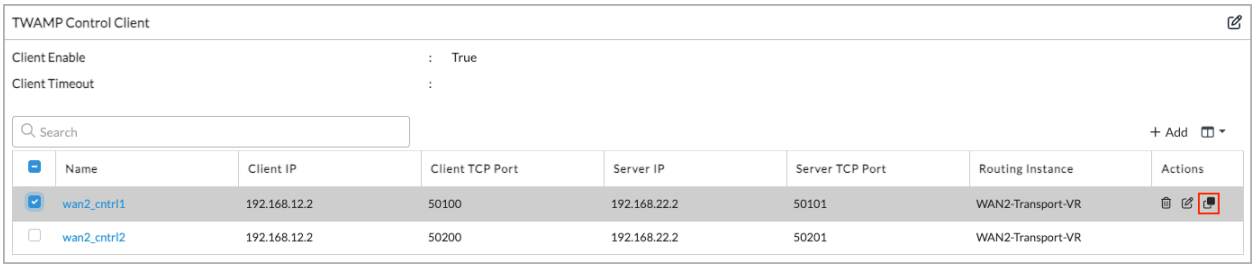
6. In the Control Connection field, select the TWAMP Control server.
7. For information about the other fields, see Configure a Session Reflector Test Session.
8. Click OK.

Clone a TWAMP Control Connection

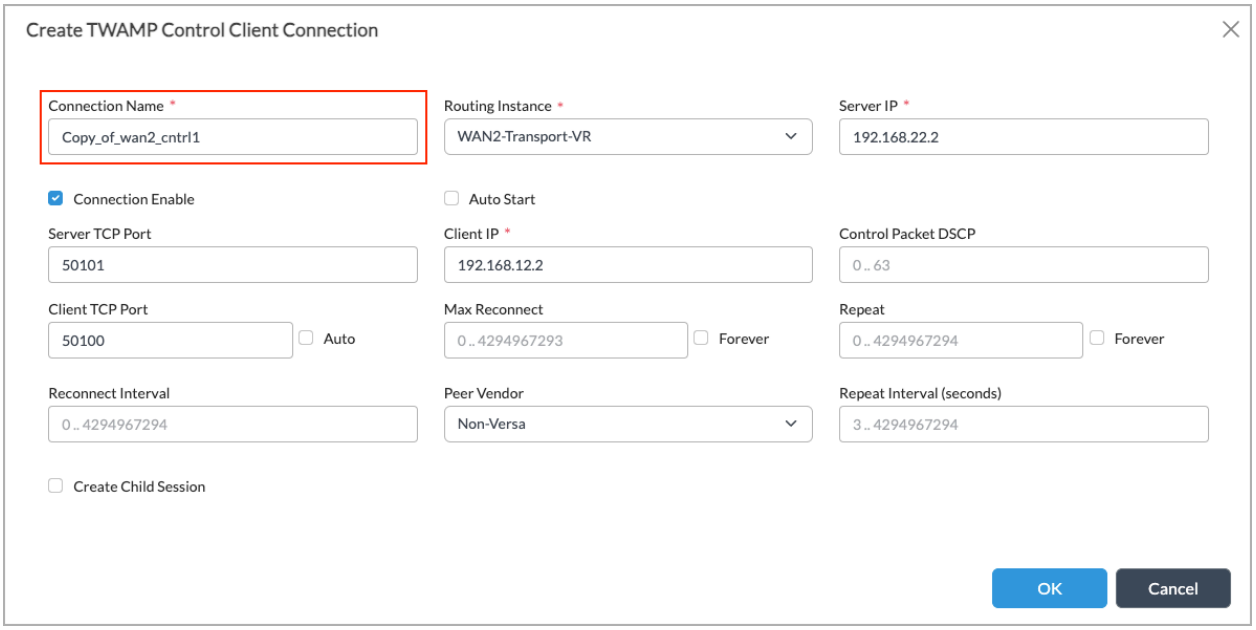
You can clone an existing control client or control server connection to create a copy of the connection.

To clone an existing connection:

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Click the appliance in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > TWAMP > Control in the left menu bar. For Releases 22.1.1 and earlier, select Networking > TWAMP.
4. Select the Control Client or Control Server tab.
5. In the Control Connection table, select a session.



6. Click the Clone icon. The Create TWAMP Control Client/Server Connection popup window displays, and the existing connection name is prefixed with the string "copy of."



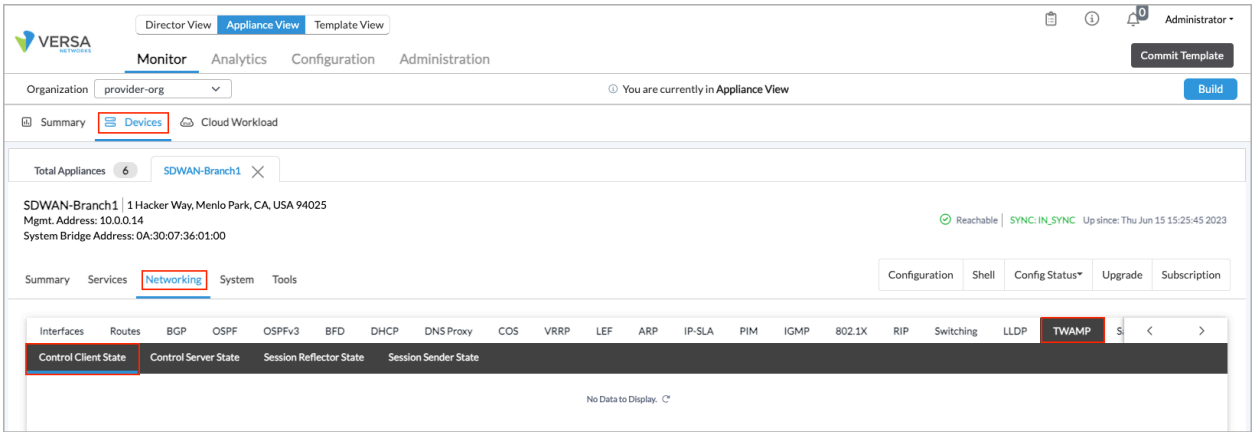
7. In the Connection Name field, enter a name for the session.
8. Click OK.

Monitor TWAMP Control Connections

You can monitor TWAMP Control client and server connections to view the current state and statistics of the connection.

To monitor a session:

1. In Director view, select the Monitor tab in the top menu bar.
2. Select a provider organization.
3. Select Devices.
4. Select a device from the main pane.
5. Select the Networking tab in the horizontal menu bar.
6. Select TWAMP.
7. To view information about the control client state, select the Control Client State tab.

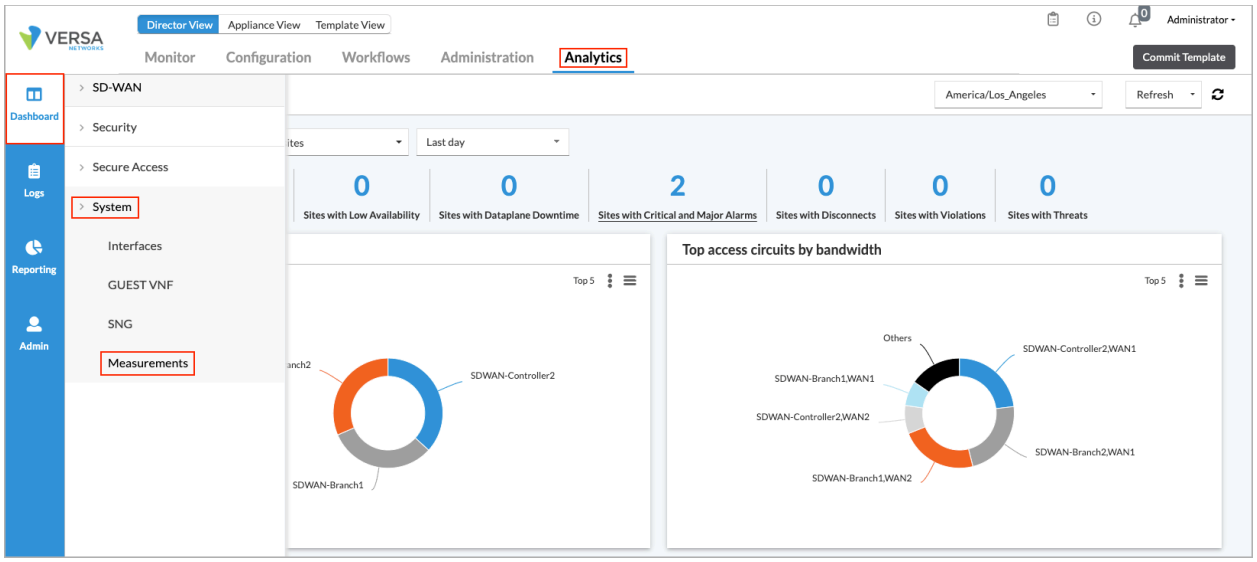


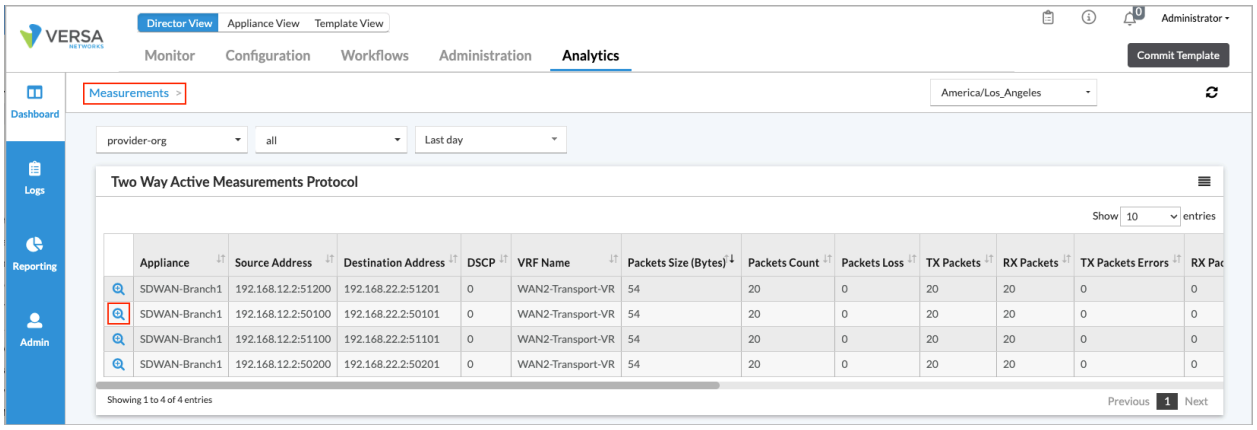
8. To stop monitoring the control client connection, click Stop.
9. Clear the current monitoring statistics, click Clear Statistics.
10. To view information about the control server state, select the Control Server State tab.

11. To clear the current monitoring statistics, click Clear Statistics.

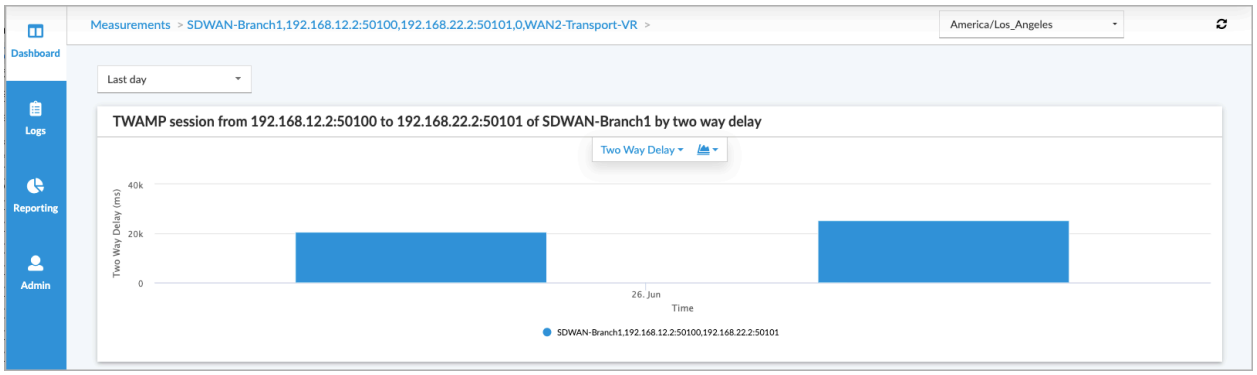
View TWAMP Control Statistics

1. In Director view, select the Analytics tab from the top menu bar. The view changes to Analytics view.
2. Select Dashboard > System > Measurements in the left menu bar to view the entries for TWAMP measurements.





3. Click the  Zoom icon to view the details in a time-based graph.

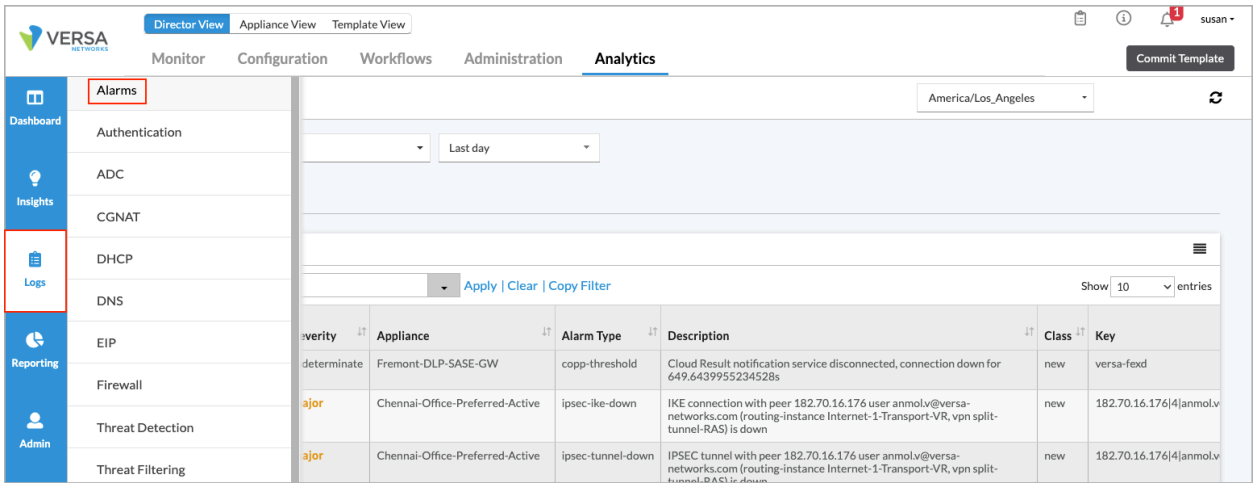


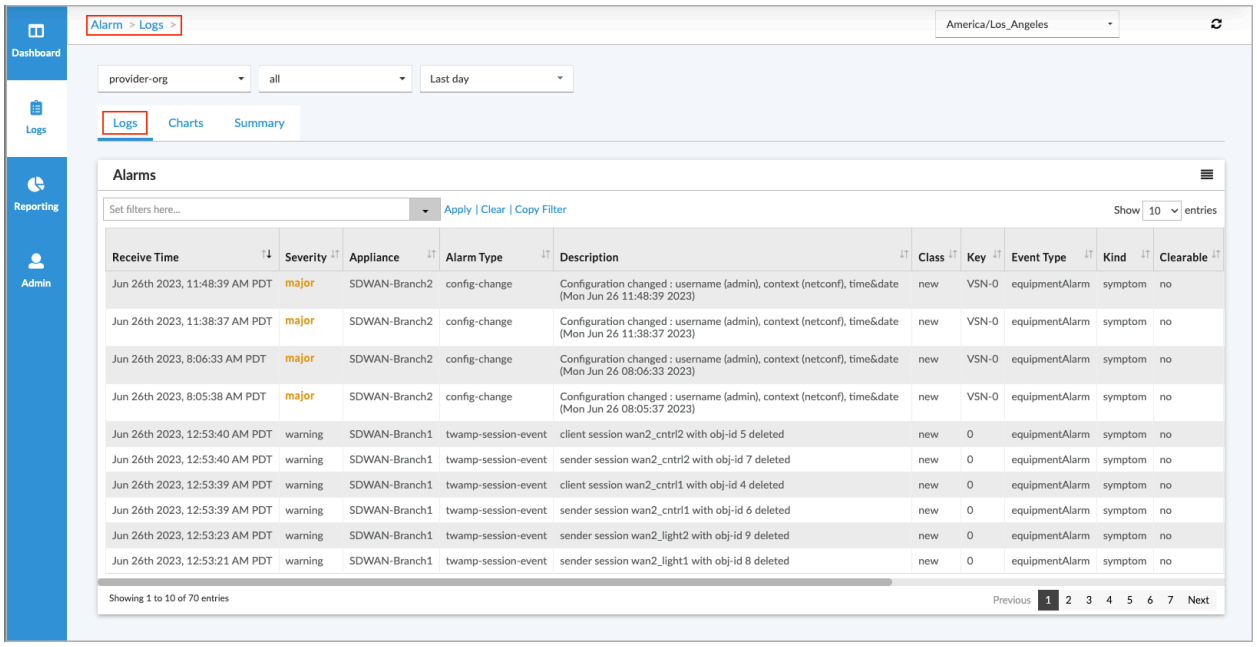
View Test Session Alarms

Alarms are generated for TWAMP Control client and server connections when you create or delete sessions.

To view the alarms for session sender and reflector test sessions:

1. In Director view, select the Analytics tab from the top menu bar. The view changes to Analytics view.
2. Select Logs> Alarms in the left menu bar and select Logs to view the alarms. You can use the filter to view TWAMP alarms.





To view the alarms from the CLI, issue the **show alarms last-n** *number* **| grep twamp** CLI command. For example:

```
admin@SDWAN-Branch1-cli> show alarms last-n 30 | grep twamp
```

```
twamp     twampSessionEvent     2021-02-17T07:33:21-0800 Tenant1: rflctr session ref_auto_start with obj-id 1 created
twamp     twampSessionEvent     2021-02-17T07:33:21-0800 Tenant1: rflctr session tst2 with obj-id 2 created
twamp     twampSessionEvent     2021-02-17T07:33:48-0800 Tenant1: sender session tst2 with obj-id 2 created
twamp     twampSessionEvent     2021-02-17T07:33:50-0800 Tenant1: sender session tst2 with obj-id 2 deleted
twamp     twampSessionEvent     2021-02-17T07:33:56-0800 Tenant1: sender session tst4 with obj-id 4 created
twamp     twampSessionEvent     2021-02-17T07:34:07-0800 Tenant1: sender session tst4 with obj-id 4 deleted
```

Supported Software Information

Releases 22.1.2 and later support all content described in this article.

Additional Information

Configure TWAMP Light Test Sessions
Configure Site-to-Site Tunnels
Monitor Device Services
TWAMP Logs