Network

Use the Network screen to display a list of Viptela devices in the overlay network and to display detailed information about individual devices.

Screen Elements

- Title bar.
- Device Groups drop-down with a list of all configured device groups in the network.
- Filter criteria—Sort options drop-down and Search box, for a Contains or Match string.
- Table of devices in the overlay network—To re-arrange the columns, drag the column title to the desired position.

View List of Devices

The Network screen lists the Viptela devices in the overlay network. When you first come to the Network screen, the device group "All" is selected, and the screen shows status information for all Viptela devices in the overlay network.

To see a list of devices in a particular group, select that device group.
To filter the devices by reachability, hostname, system IP address, site ID, and device model, select from the sort options in the drop-down or type a string in the Search box.

To display information about an individual device, click its system IP address.

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**View Information about a Device**

To view high-level information about a device, select it from the Monitor ► Network screen:

1. From the Device Groups drop-down list, select the device group to which the device belongs. The device table lists all the devices in the selected group.

2. Select the device by clicking its system IP address. The left pane lists the information categories about the device, and the right pane displays the information for that category.

   - If you selected a controller device—including the vBond orchestrator, vManage NMS, or vSmart controller—the Control Connection category is selected and displays all operational control connections between the device and other controller devices in the network.
   - If you selected a vEdge router, the System Status category is selected and displays status information about the device.

To select a different device, either click the Select Device drop-down located at the top of the left pane, or click Network in the title bar and then select a device by clicking its system IP address.

After you select a device by clicking its system IP address, the screen changes and displays the following elements:

- **Select Device bar**—A horizontal bar that includes these elements:
  - Select Device drop-down
  - Device name
  - Device IP address
  - Device site location
  - Device model
  - More Info drop-down

- **Left pane**—A vertical pane that lists the categories of information you can display about the device:
  - Application—DPI and cflowd flow information.
  - Interface—Interface status and statistics.
  - WAN—TLOC and tunnel status and statistics.
  - Control Connections—Status and statistics for control connections.
View Device Status Summary

To view summary status information about a device:

1. From the Monitor ➤ Network screen, select a device.
2. From the Select Device bar, click the More Info drop-down located to the right of the bar. vManage NMS opens a drop box with summary information about the device.

To close the device status summary, click More Info again or click anywhere on the screen outside the drop-down.
View DPI Flows

To view DPI flow information on a vEdge router:

1. From the Monitor ► Network screen, select a device.
2. Click Application–DPI in the left pane. The right pane displays DPI flow information for the device.

The upper part of the right pane contains:

- Filter bar—Located directly under the device name, this bar includes the Filter icon and time periods. Click the Filter icon to display a drop-down menu to select the desired VPN and TLOC. Click a predefined or custom time period for which to display data.
- DPI flow information in graphical format.
- DPI flow graph legend—Select an application family to display information for just that flow. Click the Total Network Traffic checkbox to display flow information as a proportion of total network traffic.

The lower part of the right pane contains:

- Filter criteria.
- DPI flow information table that lists all application families sorted by usage. By default, the top six application families are selected. The graphical display in the upper part of the right pane plots the flow and usage of the selected application families.
  - Click the checkbox to the left to select and deselect application families. You can select and display information for a maximum of six application families at one time.
  - Click an application family to display applications within the family.
  - Click an application to display the source IP addresses of the devices accessing the application. The Traffic per TLOC pie chart next to the graph displays traffic distribution per TLOC (color).
  - To re-arrange the columns, drag the column title to the desired position.
  - To return to the list of application families, click Applications–DPI in the title bar or click the Back button in the browser.

View Cflowd Flows

To view cflowd flow information on a vEdge router:

1. From the Monitor ► Network screen, select a device.
2. Click Applications–Cflowd in the left pane. The right pane displays cflowd flow information for the device.
The upper part of the right pane contains:

- Filter bar—Located directly under the device name, this bar includes the Filter button and time periods. Click the Filter icon to display a drop-down menu to select the desired VPN and TLOC. Click a predefined or custom time period for which to display data.
- Cflowd flow information in graphical format.
- Cflowd flow graph legend—Select a flow destination to display information for just that flow. Click the Total Network Traffic checkbox to display flow information as a proportion of total network traffic.

The lower part of the right pane contains:

- Filter criteria.
- Flow destination information table that lists all flow destinations sorted by usage. By default, the top six flow destinations are selected. The graphical display in the upper part of the right pane plots the flow and usage of the selected flow destinations.
  - Click the checkbox to the left to select and deselect flow destinations. You can select and display information for a maximum of six flow destinations at one time.
  - Click a flow destination to display source IP addresses of the cflowd flows.
  - Click a flow source to display the size of the flow, in bytes.
  - To re-arrange the columns, drag the column title to the desired position.
  - To return to the list of flow destinations, click Applications–Cflowd in the title bar or click the Back button in the browser.

### View Interfaces

To view information about interfaces on a device:

1. From the Monitor ► Network screen, select a device.
2. Click Interface in the left pane. The right pane displays interface information for the device.

The upper part of the right pane contains:

- Chart Options bar—Located directly under the device name, this bar includes the Chart Options drop-down and time periods. Click Chart Options to select the type of data to display. Click a predefined or custom time period for which to display data.
- Interface information in graphical format.
• Interface graph legend—Select an interface to display information for just that interface.

The lower part of the right pane contains:

• Filter criteria.

• Interface table that lists information about all interfaces. By default, the first six interfaces are selected. The graphical display in the upper part of the right pane plots information for the selected interfaces.
  ◦ Click the checkbox to the left to select and deselect interfaces. You can select and display information for a maximum of six interfaces at one time.
  ◦ To re-arrange the columns, drag the column title to the desired position.
  ◦ For cellular interfaces, click the interface name to display a screen that shows detailed information about the cellular interface (in Releases 16.2.2 and later).

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View TLOC Loss, Latency, and Jitter Information

To view information about TLOC loss, latency, and jitter:

1. From the Monitor ► Network screen, select a device.
2. Click WAN–TLOC in the left pane. The right pane displays the aggregated average loss or latency/jitter information for all TLOCs (colors).

The upper part of the right pane contains the following elements:

• Chart Options bar—Located directly under the device name, this bar includes the Chart Options drop-down and time periods. Click Chart Options to select the type of data to display. Click a predefined or custom time period for which to display data.

• TLOC information in graphical format.

• TLOC graph legend—Select a TLOC to display information for just that TLOC.

The lower part of the right pane contains the following elements:

• Filter criteria.

• TLOC (color) table that lists average jitter, loss, and latency data about all TLOCs. By default, the first six colors are selected. The graphical display in the upper part of the right pane plots information for the selected interfaces.
  ◦ Click the checkbox to the left to select and deselect TLOCs. You can select and display information for a maximum of six TLOCs at one time.
View Tunnel Connections

To view all tunnel connections for a device:

1. From the Monitor ► Network screen, select a device.
2. Click WAN–Tunnel in the left pane. The right pane displays information about all tunnel connections.

The upper part of the right pane contains the following elements:

- Chart Options bar—Located directly under the device name, this bar includes the Chart Options drop-down and time periods. Click Chart Options to select the type of data to display. Click a predefined or custom time period for which to display data.
- Tunnel information in graphical format.
- Tunnel graph legend—Select a tunnel to display information for just that tunnel.

The lower part of the right pane contains the following elements:

- Filter criteria.
- Tunnel table that lists average latency, loss, and jitter data about all tunnel end points. By default, the first six tunnels are selected. The graphical display in the upper part of the right pane plots information for the selected tunnels.
  - Click the arrow to the left to view the tunnel end points for that TLOC color.
  - Click the checkbox to the left to select and deselect tunnels. You can select and display information for a maximum of six tunnels at one time.
  - Click Application Usage to the right to display DPI flow information for that TLOC.

View Control Connections

To view all control connections for a device:

1. From the Monitor ► Network screen, select a device.
   If you select a controller device—a vBond orchestrator, a vManage NMS, or a Smart controller—the Control Connections screen opens by default.
2. If you select a vEdge router, click Control Connections in the left pane. The right pane displays information about all control connections that the device has with other controller devices in the network.
The upper part of the right pane contains the following elements:

- Expected and actual number of connections.
- Control connection data in graphical format. If the device has multiple interfaces, vManage NMS displays a graphical topology of all control connections for each color.

The lower part of the right pane contains the following elements:

- Filter criteria.
- Control connections data in tabular format. By default, the first six control connections are selected. The graphical display in the upper part of the right pane plots information for the selected control connections.
  - Click the arrow to the left to view the control connections for that TLOC color.
  - Click the checkbox to the left to select and deselect control connections. You can select and display information for a maximum of six control connections at one time.

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**View System Status**

To view system status about a device:

1. From the Monitor ► Network screen, select a device.
   When you select a vEdge router, the System Status screen opens by default.
2. Click System Status in the left pane. The right pane displays information about the device.

The right pane contains the following elements:

- Reboot—Number of times the device has rebooted. For details about each reboot, click Reboot. The Reboot screen opens and contains the following elements:
  - Filter criteria.
  - Table listing all the reboots on the device along with the time and reason for the reboot. If the device is down for 90 seconds or longer, the reason shows as "Unknown". The Last Updated column displays the time when the vManage NMS retrieved the reboot data from the device.

- Crash—Number of times the device has crashed. For details about each crash, click Crash. The Crash screen opens and contains the following elements:
  - Filter criteria.
  - Table listing all the crashes on the device along with the time of crash and name of the core file created as a result of the crash.
• Status of hardware components, applicable only if the selected device is a hardware vEdge router:
  ◦ Module
  ◦ Temperature sensors
  ◦ USB
  ◦ Power supply
  ◦ Fans

The status of a hardware component is represented in one of the following ways:

• Green check mark—Component is operational.
• Red circle with an X—Component is down.
• Orange triangle with an exclamation point—Component has an error.
• N/A—Not applicable since the selected device is not a hardware vEdge router.

• CPU & Memory—To the right are the time periods. Click a predefined or custom time period for which to display data.
  ◦ CPU usage—Displays the CPU usage, as a percentage of available CPU, over the selected time range.
  ◦ Memory usage—Displays the memory usage, as a percentage of available memory, over the selected time period.

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**View Events**

To view the number of critical, major, or minor events on a device:

1. From the Monitor ► Network screen, select a device.
2. Click Events in the left pane. The right pane displays information about all events on the device.

The upper part of the right pane contains the following elements:

• Filter bar—Includes the Filter drop-down and time periods. Click the Filter icon to display a drop-down menu to add filters for searching events. Click a predefined or custom time period for which to display data.

• Events Histogram—Displays a graphical representation of all events. To hide the events histogram, click the Events Histogram title or the down angle bracket to the right of it.

• Events graph legend—Select a severity level to display events generated by Viptela devices in that classification.

The lower part of the right pane has the following elements:
• Filter criteria.
• Events table.
  ◦ To re-arrange the columns, drag the column title to the desired position.
  ◦ To change the sort order in a column, click the Up or Down arrow in the column title.

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Troubleshoot a Device

To troubleshoot a device in the network:

• Ping the device.
• Run a traceroute.
• Display traffic path information.

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Ping a Device

To verify that a network device is reachable on the network, by sending ICMP ECHO_REQUEST packets to it:

1. From the Monitor ► Network screen, select the device.
2. Click Troubleshooting in the left pane. When you first click Troubleshooting, the Connectivity Tools tab and the Ping button are selected in the right pane.
3. In the Destination IP field, enter the IP address of the device to ping.
4. In the VPN drop-down, select the VPN to use to reach the device.
5. In the Source/Interface drop-down, select the interface or IP address to use to send the ping packets.
6. Click Advanced Options to specify additional parameters:
   1. In the Count field, enter the number of ping requests to send. The range is 1 through 30. The default is 5.
   2. In the Size field, enter the size of the packet to send. The default is 64 bytes, which comprises 56 bytes of data and 8 bytes of ICMP header. The range for data is 56 through 65507 bytes.
   3. Click the Rapid checkbox to send 5 ping requests in rapid succession and to display statistics only for packets transmitted and received, and the percentage of packets lost.

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Run a Traceroute

To display the path that packets take to reach a host or IP address on the network:
1. From the Monitor ► Network screen, select the device.

2. Click Troubleshooting in the left pane. When you first click Troubleshooting, the Connectivity Tools tab and the Ping button are selected in the right pane.

3. Click the Traceroute button.

4. In the Destination IP field, enter the hostname or IP address of a device on the network.

5. In the VPN drop-down, select the VPN to use to reach the device.

6. In the Source/Interface field, select the interface to use to send traceroute probe packets.

7. Click Advanced Options:
   1. In the Size field, enter the size of the traceroute probe packets, in bytes.

8. Click Start to trigger a traceroute to the requested destination. The lower part of the right pane displays:
   - Output—Raw output of the path the traceroute probe packets take to reach the destination.
   - Graphical depiction of the path the traceroute probe packets take to reach the destination.

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**Analyze the Traffic Path for an IP Packet**

To display the next-hop information for an IP packet (available on vEdge routers only):

1. From the Monitor ► Network screen, select the vEdge router.

2. Click Troubleshooting in the left pane. When you first click Troubleshooting, the Connectivity Tools tab and the Ping button are selected in the right pane.

3. Click the Traffic Analysis tab.

4. To specify the data traffic path, select values or enter data in the required fields (marked with an asterisk [*]) and optional fields. The required fields are:
   - VPN—VPN in which the data tunnel is located.
   - Source Interface—Interface from which the cflowd flow originates.
   - Source IP—IP address from which the cflowd flow originates.
   - Destination—Destination IP address of the cflowd flow.
   - Protocol (under Advanced Options)—Number of the protocol being used to transmit the cflowd flow.

   The optional fields are:
   - Application—Application running on the router.
   - Source Port—Port from which the cflowd flow originates.
   - Destination Port—Destination port of the cflowd flow.
   - DSCP—DSCP value in the cflowd packets.

5. Click Advanced Options:
   1. In the Path toggle field, select whether the data traffic path information comes from the service side of the router.
or from the tunnel side.

2. Check the All Paths checkbox to display all possible paths for a packet.

6. Click Simulate to determine the next hop that a packet with the specified headers would take.

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**View Real-Time Data**

To view real-time data for a device:

1. From the Monitor ▶ Network screen, select a device.

2. Click Real Time. The right pane displays system information about the device.

The right pane contains the following elements:

- Command drop-down—Located directly under the device name, this drop-down allows you to select a feature-specific operational command to display real-time device information for the selected command. The commands available in the drop-down vary depending on the device selected. When you first select Real Time, the System Information command is selected, and real-time system information about the device is displayed in tabular format. For some commands, you can add filters to speed up the display of information. When you select these commands from the drop-down, the Select Filter pop-up is displayed prompting you to either Show Filters or Do Not Filter.
  - Show Filters—Displays the available filters. Fill in the desired fields and click Search to display real-time device information corresponding just to those fields. Clicking Search without filling any of the fields displays the entire information for the selected command.
  - Do Not Filter—Displays the entire real-time device information for the selected command.

- Filter criteria.

- Table with real-time information for the selected command.

  - To re-arrange the columns, drag the column title to the desired position.
  - To change the sort order in a column, click the Up or Down arrow in the column title.