

# SD-WAN Administrator Guide

May 2018

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Permissions, Monitoring and Configuration for Windstream Enterprise SD-WAN  
Version 1.6

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# SD-WAN Permissions

## 1.1 Setting SD-WAN Permission Levels

The administrator grants permissions for SD-WAN to others in their company for the Windstream Enterprise SD-WAN Portal. There are four (4) Levels of permission access defined for SD-WAN:

Overview of permission levels:

- + View SD-WAN Monitor - Allows read-only viewing of the “Monitor” sections within SD-WAN.
- + View SD-WAN Configure - Allows read-only viewing of the “Configure” sections within SD-WAN.
- + Manage (Limited) SD-WAN Configure - Allows managing/editing capabilities of the “Business Policy” and “Firewall” areas only within SD-WAN.
- + Manage (All) SD-WAN Configure - Allows managing/editing capabilities for all areas within SD-WAN.

NOTE: These permission levels are not cumulative, so only those checked are applicable.

For more information on User Management, [download the WinAuth User Administration guide](#)

# SD-WAN Permissions

## 1.2 Permission Level Notifications

Users are informed if they do not have the level of permission to make changes for certain areas:

### Configure Edge

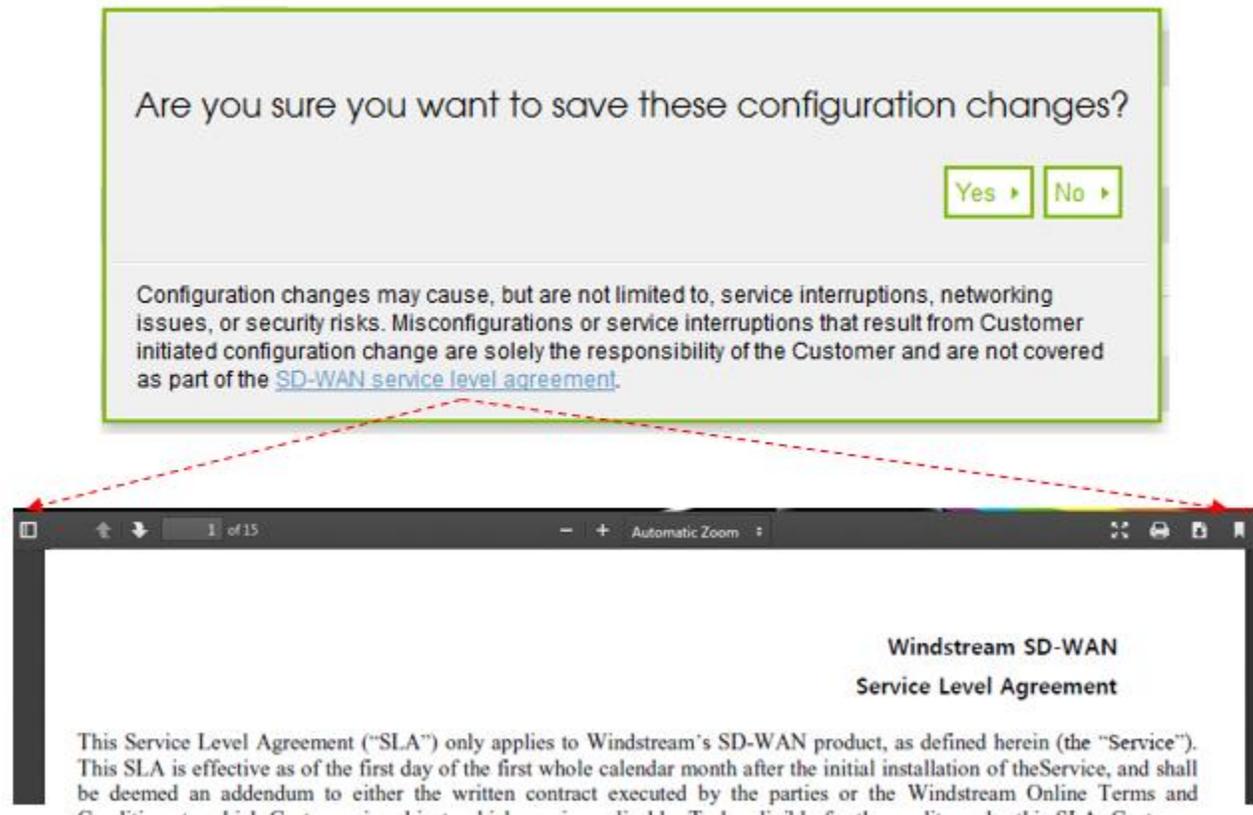
The screenshot displays the 'Configure Edge' interface for 'POL Demo Rochester'. The left sidebar contains 'Monitor', 'Configure', 'Edges Profiles Services', and 'Settings'. The main content area has a breadcrumb trail: 'Edge Overview' > 'Device' > 'Business Policy' > 'Firewall'. A prominent yellow warning message states: 'Note: You do not have permission to save any changes on this page. If you have questions regarding your access, please contact client services for more information.' Below the message, the configuration details for 'POL Demo Rochester' are shown in a read-only state:

Name:	POL Demo Rochester	Status:	Pending
Alias Name:		Activation Key:	QQKD-X5WE-58DR-NRFN
Description:	PSR6801349		

Read-Only permission message

# SD-WAN Permissions

## 1.3 Confirmation of Configuration Changes



Confirmation dialog box with link to SLA

Reminder: Administrators that are reluctant to make their own changes can always rely on your appropriate support teams:

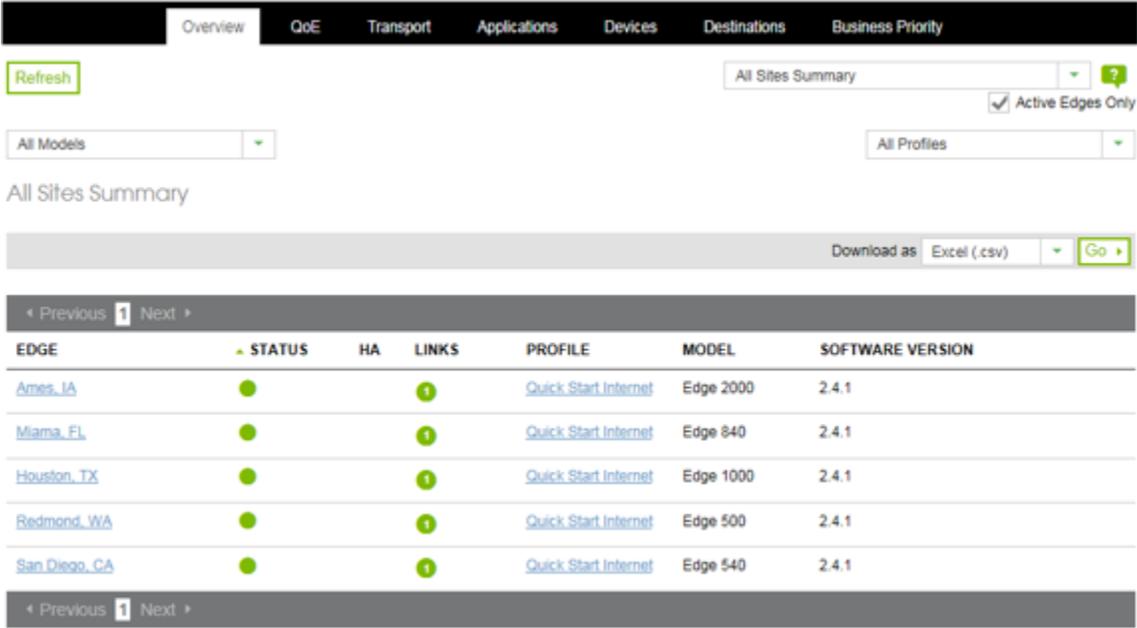
- + (Enterprise Customers) Concierge – 855-999-2244 or contact your Technical Service Manager (TSM) directly
- + (Enterprise Customers) Advanced - 800-600-5050
- + (SMB Customers) Advanced and Concierge – 877-599-3282

Note: It is recommended that a qualified network technician manage network configuration changes, as these updates may cause service interruptions, network issues, or security risks if not properly implemented.

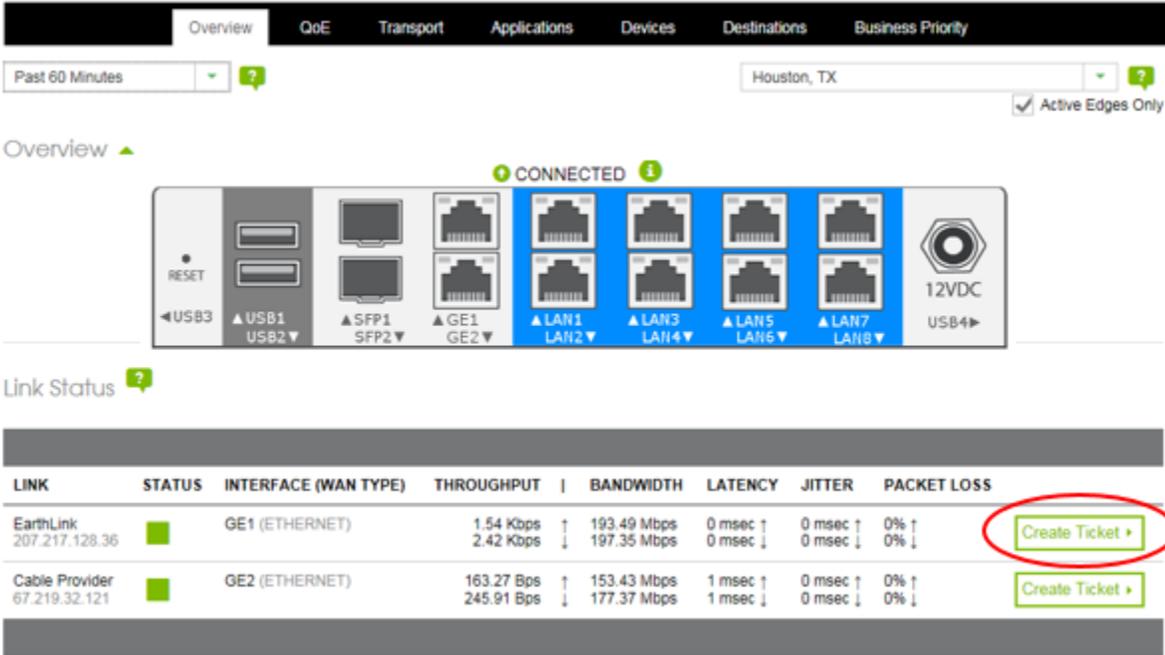
# SD-WAN Monitor

## 2.1 Monitoring Overview

The monitoring overview page lists all your Edge devices with sorting and filtering capabilities.



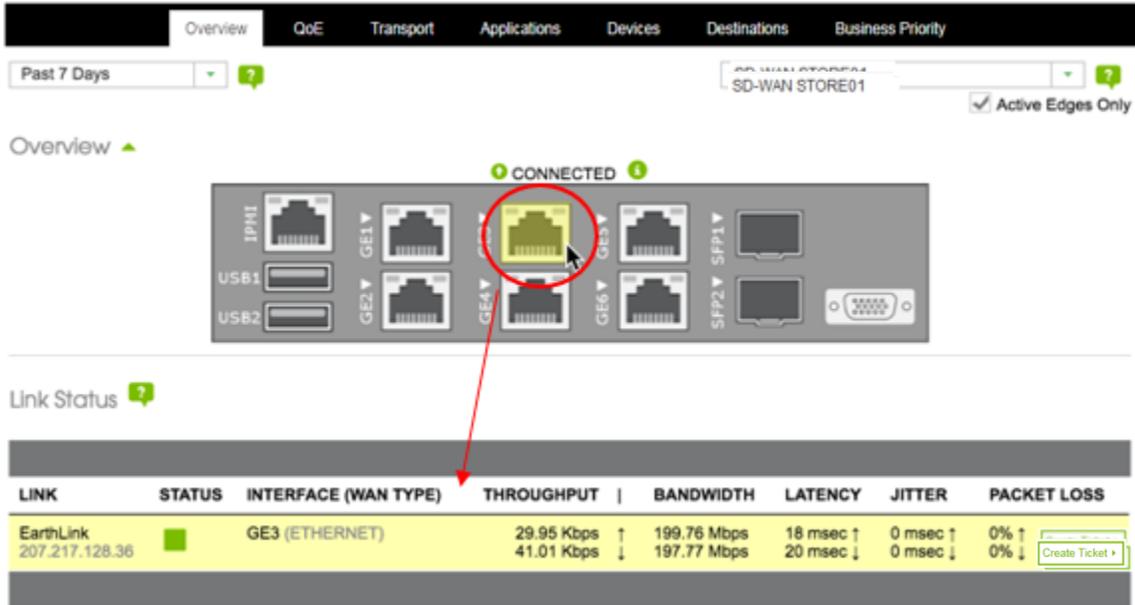
Overview summary provides high-level information for all your Edges



Ability to auto-populate a service ticket directly for each circuit if an issue arises

Mouse-over device hotspots to quickly indicate relationships as both ports and associated data rows highlight.

Function-sensitive help is available on all pages with Tool Tips.



Mouse-over ports and the associated data row highlights



Context-sensitive tool-tips throughout the portal provide insight

# SD-WAN - Monitoring - Overview

The screenshot shows the SD-WAN Monitoring Overview page. It includes a sidebar with 'Monitor', 'Configure', and 'Settings' sections. The main content area has tabs for 'Overview', 'QoE', 'Transport', 'Applications', 'Devices', 'Destinations', and 'Business Priority'. A dropdown menu is set to 'Past 30 Days' and the location is 'SD-WAN STORE01'. A 'CONNECTED' status indicator is shown above a hardware interface diagram. Below this is a 'Link Status' table with one entry for 'EarthLink'. Further down are four charts: 'Top Applications' (table), 'Top Categories' (pie chart), 'Top Operating Systems' (bar chart), and 'Top Sources' (bar chart). Red callout numbers 1 through 8 are placed over various elements in the interface.

**Link Status**

LINK	STATUS	INTERFACE (WAN TYPE)	THROUGHPUT	BANDWIDTH	LATENCY	JITTER	PACKET LOSS
EarthLink 207.217.128.36	CONNECTED	GE3 (ETHERNET)	28.15 Kbps 39.71 Kbps	199.66 Mbps 192.33 Mbps	18 msec 20 msec	0 msec 0 msec	0% 0%

**Top Applications**

NAME	VOLUME
SD-WAN Control	1.68 GB
SD-WAN Management	771.53 MB
IPsec	519.54 MB
SSL	92.11 MB
Microsoft Lync	34.46 MB

**Top Categories**

- SD-WAN
- Tunneling and VPN
- Business Collaboration
- Web
- Business Application

**Top Operating Systems**

OS	Volume
Edge	High
Windows	Low

**Top Sources**

Source	Volume
SD-WAN Edge	High
8308097-6530	Low

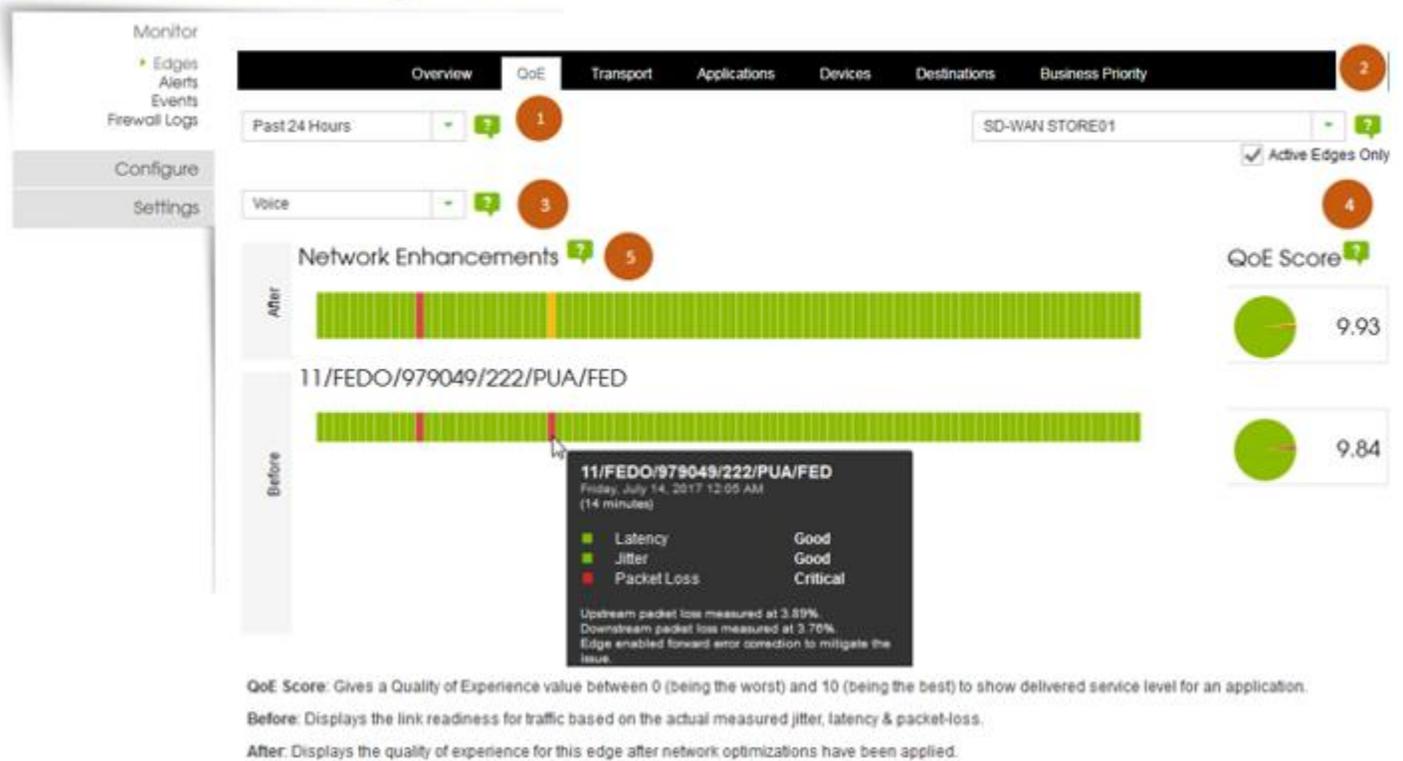
Monitor Overview screen

1. Overview displays information about your Edge WAN links, application bandwidth, and network usage for top operating systems, top categories, and the top devices. The Overview tab consists of two (2) areas: **Link Status** and **Bandwidth Usage**. All can be filtered by various timeframes.
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an “Active” or in a “Pending Activation” state. Only Edges in an “Active” state will have data to display in the “Monitor” section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the “Active Edges Only” radio button, only activated sites will appear in the drop-down list.
3. The **Link Status** area (WAN/LAN) is updated in real-time and displays a list of your links and their data (Cloud and VPN status, Interface, and Throughput Capacity). Cloud Status and VPN Status can display the following statuses: **Green**=Active, **Yellow**=Degraded, **Red**=Offline/Disconnected, **Grey**=Not Enabled. The Link Status area can also display the status of backup links depending upon the WAN settings.
4. The **Bandwidth Usage** area displays your top applications, categories, operating systems and devices along with their volume for a historical period of time. You can change the time frame by clicking the Time Duration drop-down menu. Clicking on one of the arrow icons will allow you to drill down further into the details for each usage category.
5. The **Top Applications** area displays historical usage data for top applications and is connected to the Applications tab. To access the Applications tab, click the View Details arrow (→) on the right side.
6. The **Top Categories** area displays categories as a color-coded Pie chart (with a corresponding Legend). The Top Categories area is also connected to the Applications tab. To access the Applications tab, click the View Details arrow (→) on the right side.
7. The **Top Operating Systems** area displays top operating systems as a bar graph. Hover over a bar in the graph to display usage data for that system. The Top Operating Systems area is connected to the Devices tab. To access the Devices tab, click the View Details arrow (→) on the right side.
8. The **Top Devices** section of the Bandwidth Usage area displays top devices as a bar graph. The Top Devices section is also connected to the Devices tab. You can access the Devices tab. To access the Devices tab, click the View Details arrow (→) on the right side.

# SD-WAN Permissions

## 2.2 Monitoring Quality of Experience (QoE)

### SD-WAN - Monitoring - QoE



Monitor Quality of Experience screen

1. The SD-WAN **Quality of Experience (QoE)** tab shows the SD-WAN Quality Score (SQS) for different applications. The QS rates an application's quality of experience that a network can deliver for a period of time.
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an "Active" or in a "Pending Activation" state. Only Edges in an "Active" state will have data to display in the "Monitor" section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the "Active Edges Only" radio button, only activated sites will appear in the drop-down list.
3. There are three different traffic types that you can monitor (Voice, Video, and Transactional) in the QoE tab. You can hover over a WAN network link, or the aggregate link provided by the SD-WAN to display a summary of Latency, Jitter, and Packet Loss.

4. The SD-WAN Quality Score (SQS) rates an application's quality of experience that a network can deliver for a given time frame. Some examples of applications are: video, voice, and transactional. QoE rating options are shown in the table below.

Rating Color	Rating Option	Definition
Green	Good	All metrics are better than the objective thresholds. Application performance at or above SLA.
Yellow	Fair	Some or all metrics are between the objective and maximum values. Application performance may be impacted.
Red	Poor	Some or all metrics have reached or exceeded the maximum value. Application performance may be impacted.

5. **Link Steering and Remediation** enables dynamic, application aware per-packet link steering that is performed automatically based on the business priority of the application, embedded knowledge of network requirements of the application, and the real-time capacity and performance of each link. On-demand mitigation of individual link degradation through forward error correction, jitter buffering and negative acknowledgment proxy also protects the performance of priority and network sensitive applications. Both the dynamic per-packet link steering and on-demand mitigation combine to deliver robust, sub-second blackout and even brownout protection to improve application availability, performance and end user experience.

# SD-WAN Monitor

## 2.3 Monitoring Transport

### SD-WAN - Monitoring - Transport

Monitor

- Edges
- Alerts
- Events
- Firewall Logs

Configure

Settings

Overview
QoS
Transport
Applications
Devices
Destinations
Business Priority

Past 24 Hours

Average Throughput

Start Live Monitoring

SD-WAN STORE01

Active Edges Only

Links

Downstream

Upstream

Download as Excel (.csv) Go

← Previous 1 Next →

CLOUD STATUS	VPN STATUS	NAME	INTERFACE (WAN TYPE)	TOTAL BYTES	DOWNSTREAM (BPS)	UPSTREAM (BPS)
■	■	11/FEDO/979049/222/PUAFED 40.138.212.203	GE1 (Ethernet)	251.13 MB	12.40 Kbps	10.85 Kbps

← Previous 1 Next →

Monitor Transport screen

1. The Transport tab provides an overview of the bandwidth used across all of the WAN links. For any period of time including historical timeframes, you can view which Link or Transport Group was used for the traffic and how much data was sent. You can filter on the data by drilling down into various utilization types.
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an “Active” or in a “Pending Activation” state. Only Edges in an “Active” state will have data to display in the “Monitor” section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the “Active Edges Only” radio button, only activated sites will appear in the drop-down list.
3. Using the chart tools, you can easily zoom into any subset of data within the chart by clicking in the chart and holding down the mouse button while scrolling the area you wish to zoom into. Pin mode allows you to compare non-adjacent data sets. Just select the pin mode in the chart above, select a range and then drag it across the chart to compare it with the data anywhere else on the chart.
4. Using the interactive legend, you can selectively turn data plots individually on/off by clicking a data series to hide it and focus on the other series in the chart.
5. The Cloud Status represents the ability for the Edge device to communicate to the gateway over the Internet cloud. The status values for both Cloud and VPN are (green: connected, red: disabled, gray: unavailable)
6. Descriptions for the options of Links Stats listed in the Links Stats drop-down menu are shown in the table below.

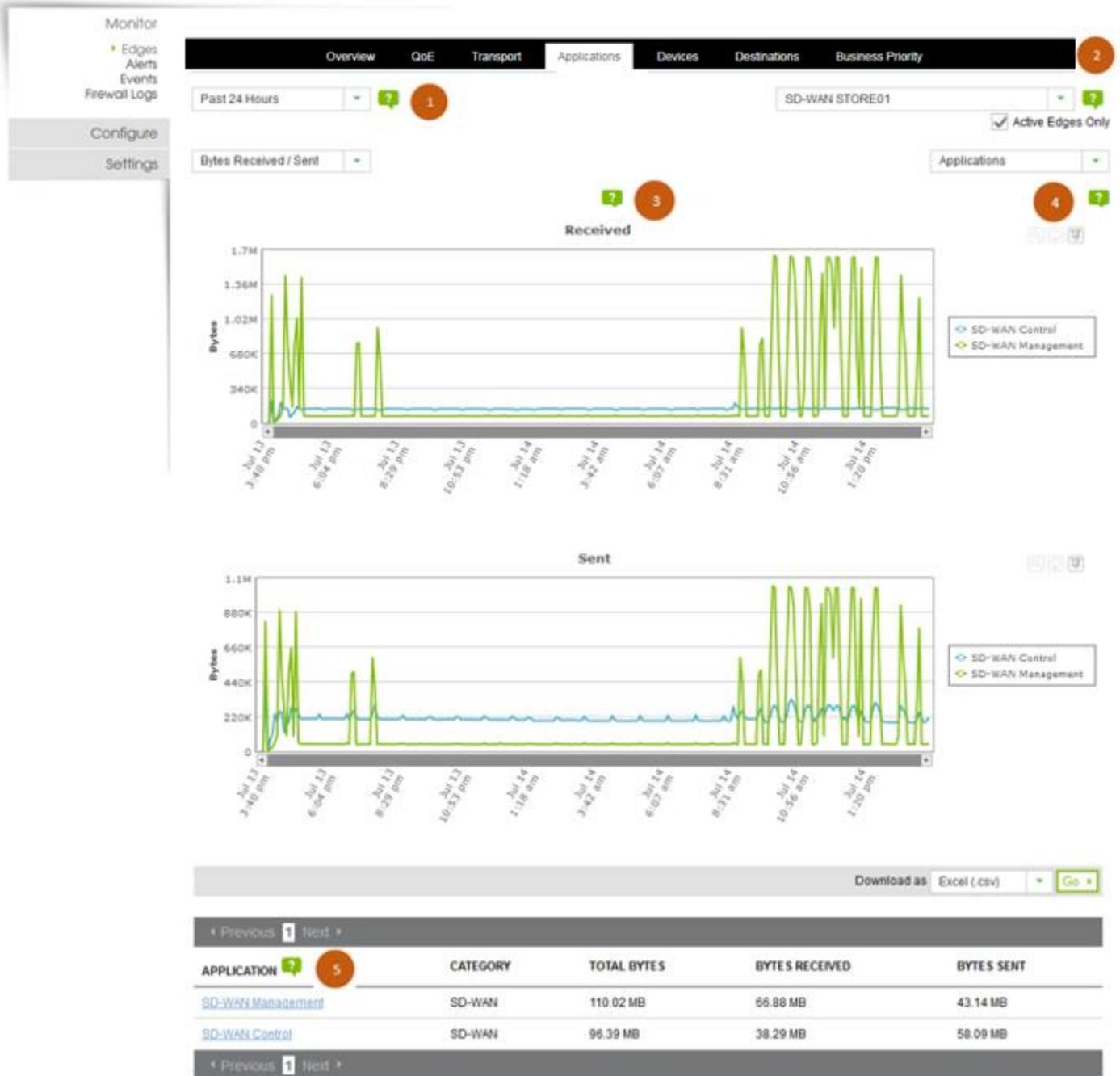
Link Stat Item	Definition
Bandwidth	This parameter denotes the desired bandwidth allocation in Mbps for each flow. Based on these parameters, the total capacity is allocated in proportion to the bandwidth values of various flows.
Jitter	Jitter is calculated using the RFC 3550 Formula for calculating jitter that is used by RTP. Jitter metrics are measured between the edged device and the SD-WAN core gateway. Application performance may be impacted.
Latency	For each packet, the latency is measured by subtracting the network send time (packet is time stamped immediately before being sent) from the network receive time (packet is time stamped immediately after being received).
Packet Loss	A lost packet is calculated when a path sequence number is missed and doesn't arrive within the re-sequencing window. A “very late” packet is counted as a lost packet in this regard.

7. Live monitoring is useful for conducting active testing and calculating Average Throughput. It is also beneficial for troubleshooting security compliance and for seeing how traffic policies are being leveraged in real time. To monitor live traffic for Links and Transport Groups, click the Start Live Monitoring button.

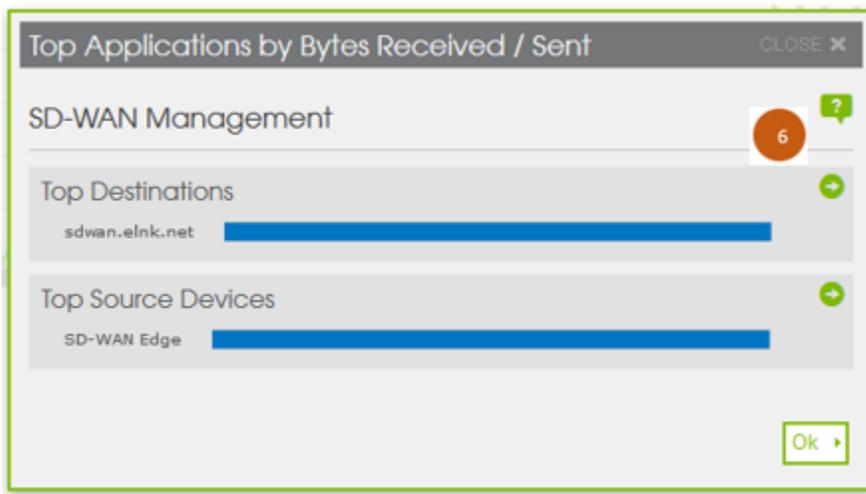
# SD-WAN Monitor

## 2.4 Monitoring Applications

### SD-WAN - Monitoring - Applications



Monitor Applications screen



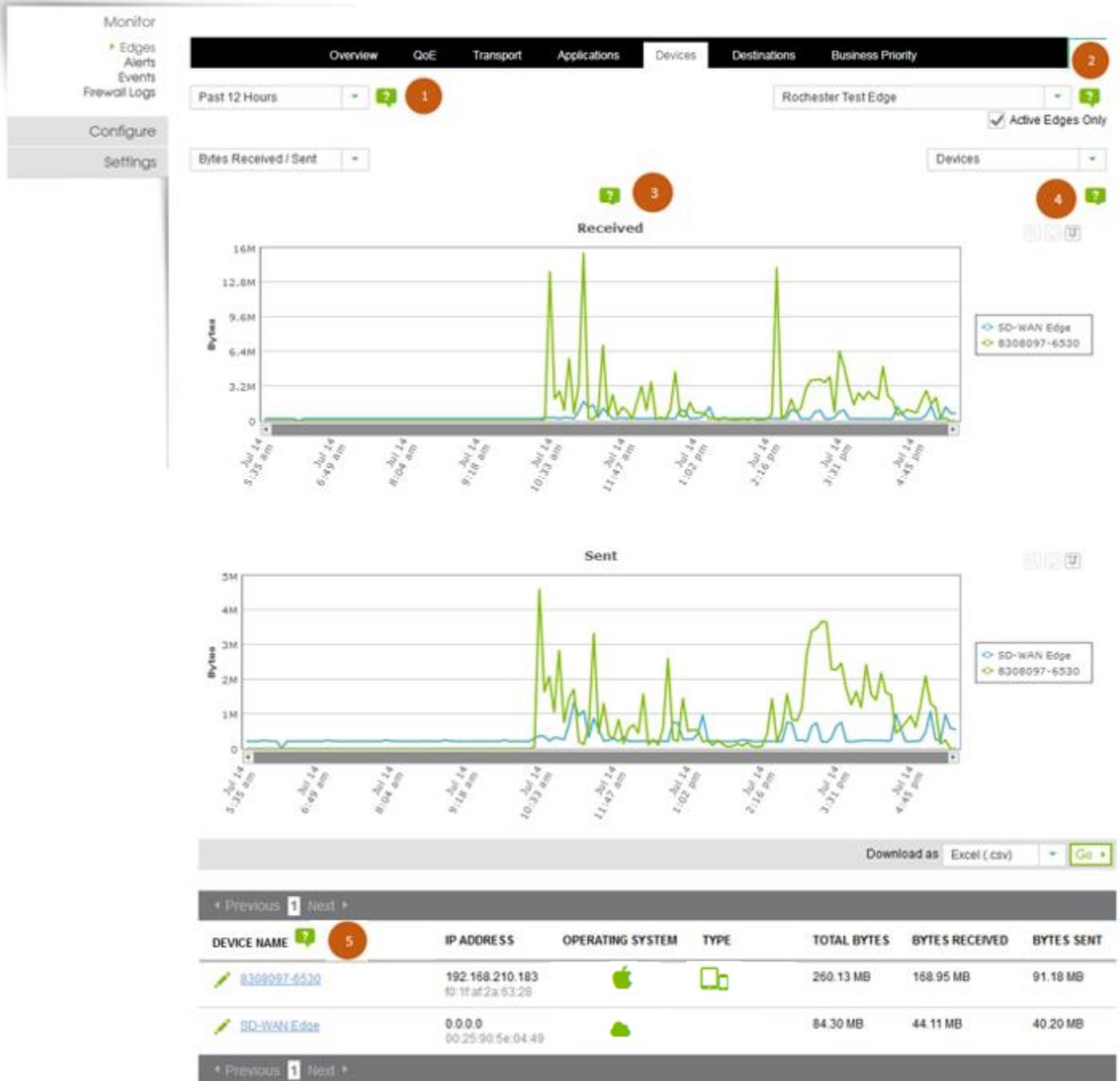
Top application dialog box

1. The Applications tab displays network usage information about your applications or your application categories. You can hover over a segment of the graph to display network usage data for that segment. You can also choose which type of data is displayed from the Data drop-down menu (Bytes Received/Sent, Total Bytes, Total Packets, or Packets Received/Sent).
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an "Active" or in a "Pending Activation" state. Only Edges in an "Active" state will have data to display in the "Monitor" section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the "Active Edges Only" radio button, only activated sites will appear in the drop-down list.
3. Chart tools: You can easily zoom into any subset of data within the chart by clicking in the chart and holding down the mouse button while scrolling the area you wish to zoom into. Pin mode allows you to compare non-adjacent data sets. Just select the pin mode in the chart above, select a range and then drag it across the chart to compare it with the data anywhere else on the chart.
4. Using the interactive legend, you can selectively turn data plots individually on/off by clicking a data series to hide it and focus on the other series in the chart.
5. You can also click an application in the Applications column to open a dialog box, which displays the Top Destinations and Top Device Devices for the application.
6. Clicking on the arrow icon will take you to the associated page allowing you to drill down further into the data.

# SD-WAN Monitor

## 2.5 Monitoring Devices

### SD-WAN - Monitoring - Devices



Monitor Devices screen

The Devices page uses icons for identifying both device OS and device type with mouse-over text that informs you what the icon represents as shown below.

Download as Excel (.csv) Go

DEVICE NAME	IP ADDRESS	OS	TYPE	TOTAL BYTES	BYTES RECEIVED	BYTES SENT
<a href="#">SD-WAN Edge</a>	0.0.0.0 10.8e:db.03:13:08			5.23 GB	2.85 GB	2.38 GB
<a href="#">Scots-iPhone</a>	10.128.0.207 e8:80:2e:96:9f:ce			1.57 GB	1.46 GB	109.59 MB
<a href="#">Ricks-iPhone</a>	10.128.0.114 a0:3b:e3:bb:74:11			635.39 MB	32.98 MB	
<a href="#">android</a>	10.128.0.123 64:bc:0c:65:d1:3c			309.97 MB	262.82 MB	47.15 MB
<a href="#">Ramis-iPhone</a>	10.128.0.211 64:b0:a6:a1:d4:b0			202.18 MB	185.79 MB	16.39 MB
<a href="#">Robs-iPhone</a>	10.128.0.194 2c:33:61:4d:4c:75			1.29 GB	125.15 MB	1.17 GB
<a href="#">8308097-6530</a>	10.128.0.197 3c:a9:f4:44:0c:54			7.33 MB	5.33 MB	2.00 MB
<a href="#">0000208-T450</a>	10.128.0.135 dc:53:60:1b:75:92			1.02 MB	236.38 KB	779.25 KB

Icons represent Operating System (OS) and device type

**Top Devices by Bytes Received / Sent** CLOSE X

8308097-6530 6 ?

**Top Applications** +

- IPsec
- SSL
- Microsoft Lync
- Microsoft
- Microsoft Office 365

**Top Destinations** +

- 207.217.131.7
- 209.178.68.30
- 209.178.68.25
- 209.178.68.29
- 209.178.68.62

Ok

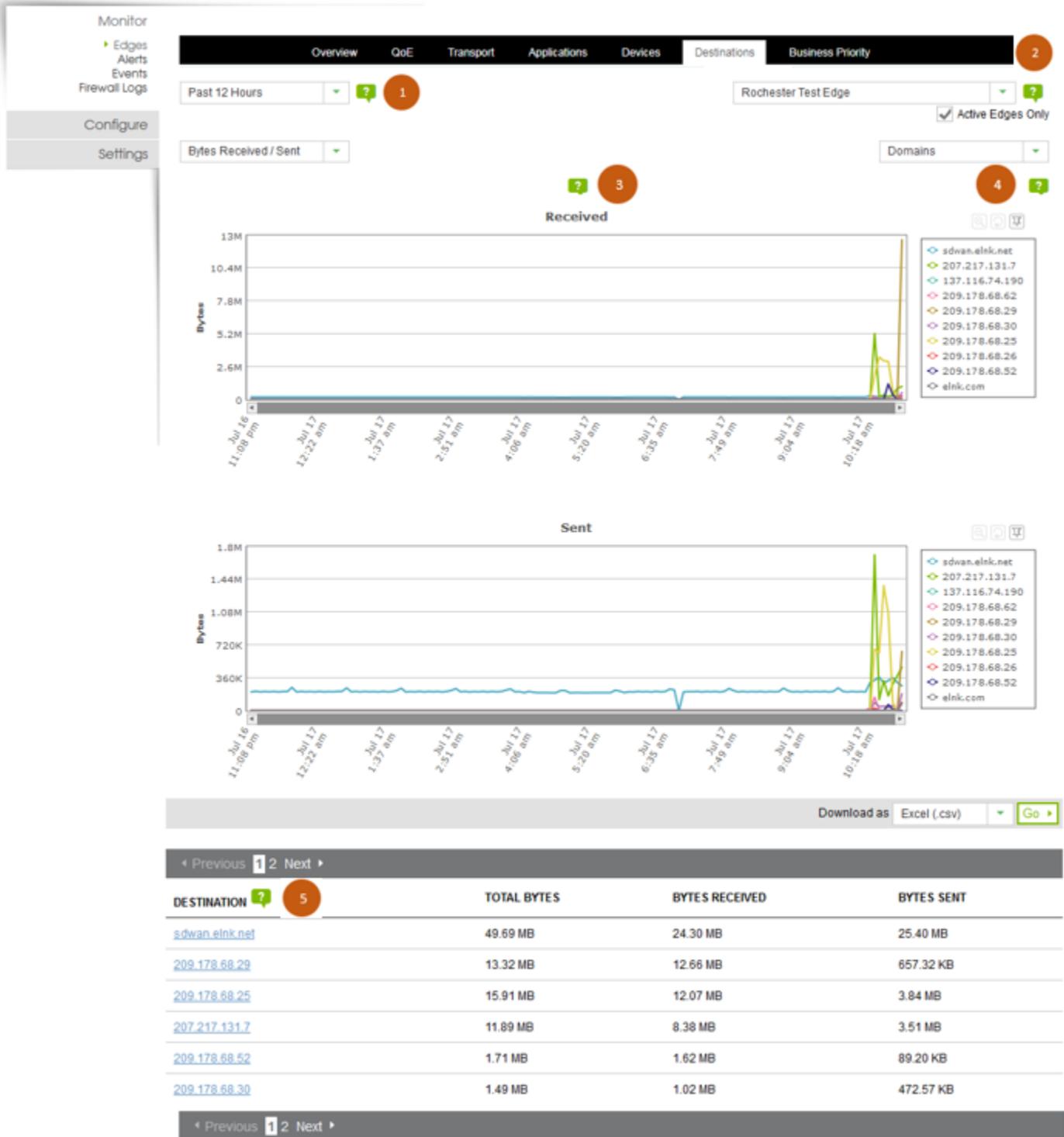
Top device dialog box

1. The Devices tab screen displays network usage data (operating system, device type) over a historical period of time. The data is displayed as two line graphs. You can change the data that is displayed in the graphs from the Data drop-down menu (Bytes Received/Sent, Total Bytes, Total Packets, or Packets Received/Sent). You can also hover over a segment of the graph to display the device and its associated network usage.
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an “Active” or in a “Pending Activation” state. Only Edges in an “Active” state will have data to display in the “Monitor” section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the “Active Edges Only” radio button, only activated sites will appear in the drop-down list.
3. Chart tools: You can easily zoom into any subset of data within the chart by clicking in the chart and holding down the mouse button while scrolling the area you wish to zoom into. Pin mode allows you to compare non-adjacent data sets. Just select the pin mode in the chart above, select a range and then drag it across the chart to compare it with the data anywhere else on the chart.
4. Using the interactive legend, you can selectively turn data plots individually on/off by clicking a data series to hide it and focus on the other series in the chart.
1. You can also click a device in the Device Name column to open a dialog box, which displays the Top Destinations and Top Applications. Enable the Friendly Name capability for Devices by clicking the pencil icon next to the device name in the grid view, this allows you to rename a device for in portal reporting.
5. Clicking on the arrow icon will take you to the associated page allowing you to drill down further into the data.

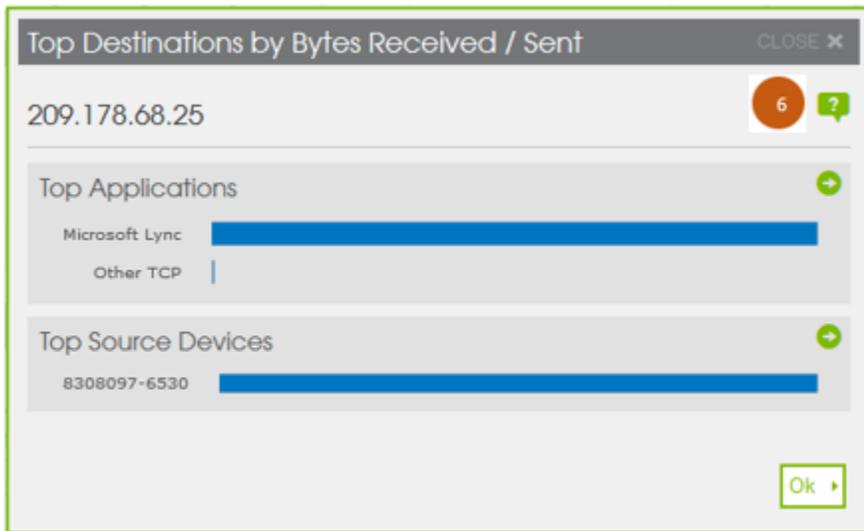
# SD-WAN Monitor

## 2.6 Monitoring Destinations

### SD-WAN - Monitoring - Destinations



Monitor Destinations screen



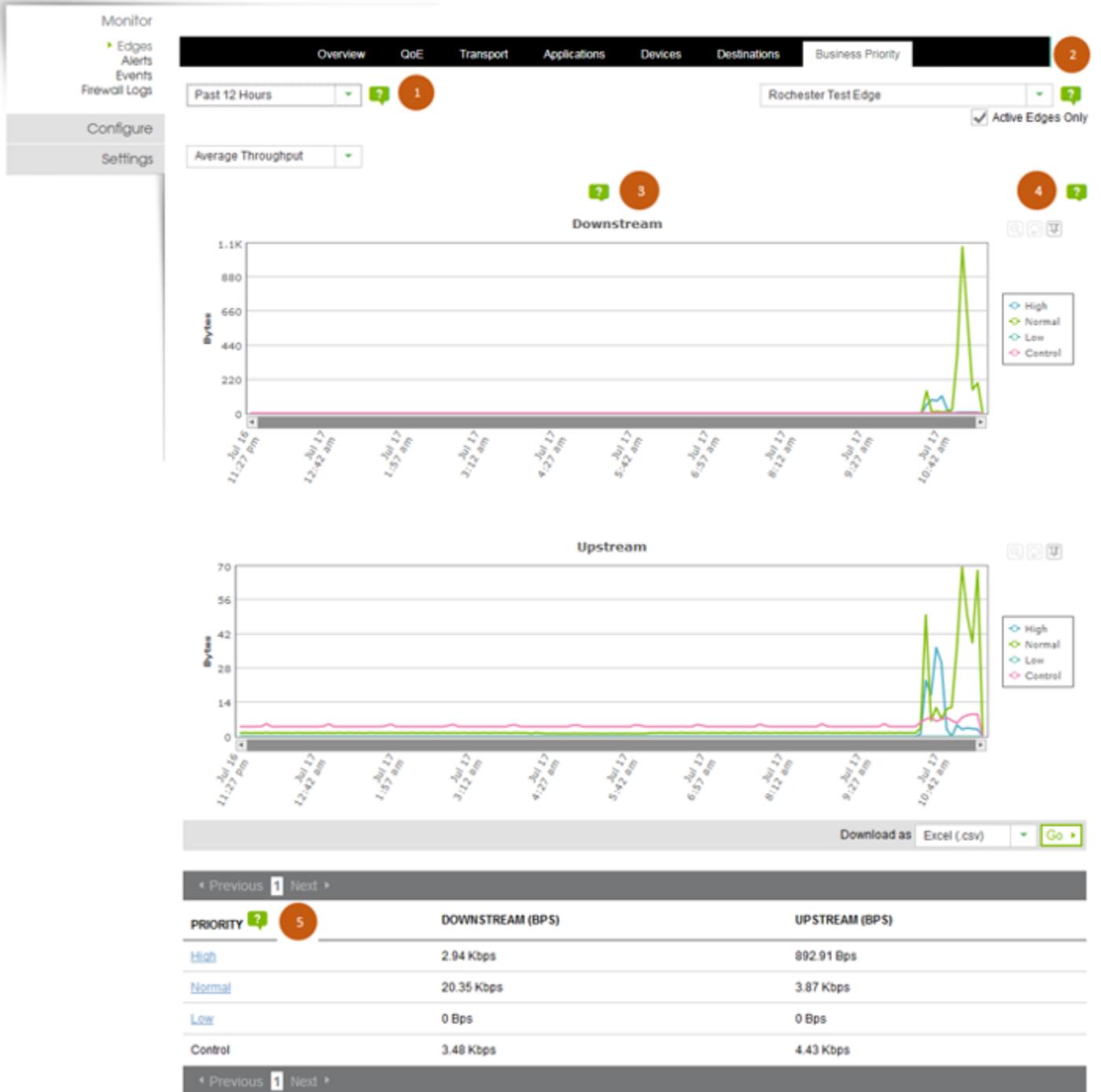
Top Destination dialog box

2. Edge Destinations tab screen displays network usage data (operating system, device type) over a historical period of time by the destination of the network traffic. If you hover over a segment of the graph, the destination and its associated network usage displays. There are three destination types (Domain, FQDN, IP) located on the right side of the screen.
3. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an “Active” or in a “Pending Activation” state. Only Edges in an “Active” state will have data to display in the “Monitor” section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the “Active Edges Only” radio button, only activated sites will appear in the drop-down list.
4. Chart tools: You can easily zoom into any subset of data within the chart by clicking in the chart and holding down the mouse button while scrolling the area you wish to zoom into. Pin mode allows you to compare non-adjacent data sets. Just select the pin mode in the chart above, select a range and then drag it across the chart to compare it with the data anywhere else on the chart.
5. Using the interactive legend, you can selectively turn data plots individually on/off by clicking a data series to hide it and focus on the other series in the chart.
6. You can also click a destination in the destination column to open a dialog box, which displays the Top Destinations and Top Applications. Enable the Friendly Name capability for Devices by clicking the pencil icon next to the device name in the grid view, this allows you to rename a device for in portal reporting.
7. Clicking on the arrow icon will take you to the associated page allowing you to drill down further into the data.

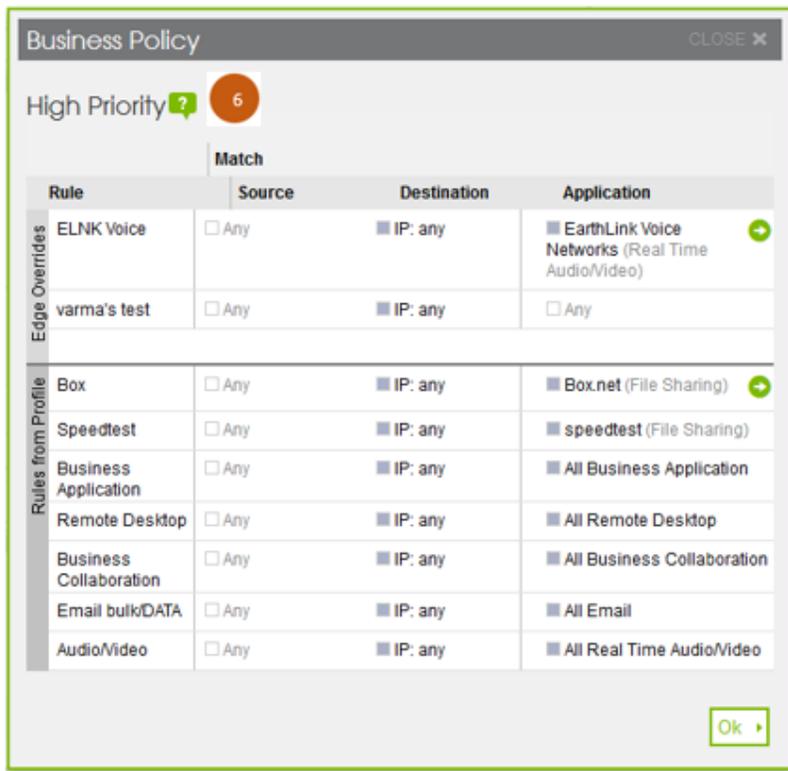
# SD-WAN Monitor

## 2.7 Monitoring Business Priority

### SD-WAN - Monitoring - Business Priority



Monitor Business Priority screen



High Priority dialog box

1. The Business Priority tab page displays the priority (High, Normal, and Low) of the network traffic over a historical period of time. If you mouse over a segment of the graph, the Business Policy characteristics and its associated Network usage displays.
2. Select the Edge Device you wish to view the monitoring details for. As you begin entering the name or location, the type-ahead function will quickly retrieve it. Edge devices may be in an “Active” or in a “Pending Activation” state. Only Edges in an “Active” state will have data to display in the “Monitor” section pages. All others will inform you that no data is available – this is normal until the Edge becomes Active. If you select the “Active Edges Only” radio button, only activated sites will appear in the drop-down list.
3. Chart tools: You can easily zoom into any subset of data within the chart by clicking in the chart and holding down the mouse button while scrolling the area you wish to zoom into. Pin mode allows you to compare non-adjacent data sets. Just select the pin mode in the chart above, select a range and then drag it across the chart to compare it with the data anywhere else on the chart.
4. Using the interactive legend, you can selectively turn data plots individually on/off by clicking a data series to hide it and focus on the other series in the chart.
5. Quality of Experience (QoE), resource allocations, link/path steering, and error correction are automatically applied based on business policies and application priorities. Orchestrate traffic based on transport groups defined by private and public links, policy definition, and link characteristics.
6. The rules associated with this priority govern the application behavior driving the queuing, bandwidth utilization, link steering and mitigation of network errors. Clicking on the arrow icon in the list will take you directly to the business policy page.

# SD-WAN Configuration

## 3.1 Configure Edges Overview

### Configure Edges

Get real-time visibility into performance and bandwidth use by app, location and user. All with easy to read graphs, charts, and reports. Download the [ADMINISTRATOR GUIDE](#) to learn all that the SD-WAN Monitoring tools can provide you.

NAME	PROFILE	HA	DEVICE	BIZ. POL	FIREWALL	STATUS	MODEL	SERIAL NUMBER
<input type="checkbox"/> <a href="#">Rochester Test Site</a>	Quick Start Profile					Activated	edge840	VCE08400000085

Configure Edge Main screen

### Configure Edge

<b>Name:</b>	SD WAN Single Extra 04	<b>Status:</b>	Activated
<b>Alias Name:</b>	Rochester Test Site	<b>Updated:</b>	07/10/2017 13:59:50
<b>Description:</b>		<b>Version:</b>	3.0.0

Configure Edges Overview screen

1. The listing shows activated Edge devices – pending activations will not appear. The Edge device settings are inherited from the Profile selected for the Edge and can be simple if the network configuration defined in the profile is used without modification. Overrides can be made to Network and Network Service configuration as part of Edge configuration but should be used sparingly and for scenarios that are temporary. Care should be taken when considering modifications as some changes (i.e. static routing) can impact other locations.
2. The color-coded icons will link you directly to the configuration areas for Device, Business Policy and Firewall. An icon color of “Gray” in one of the configuration columns, indicates all the rules in place are based on the “Default Profile” settings, any other color means at least one rule override is in place.

# SD-WAN Configuration

## 3.2 Configure Edges Device

### Configure Edge

**Rochester Test Edge**

Edge Overview | Device | Business Policy | Firewall

**High Availability** ? **1**

Enabled  
This option is not available when the LAN1 interface is set to "Routed".

**Device Settings:** **2**

**VLAN Settings** ? Add Vlan ▲ **3**

Management IP:   Enable Edge Override ?

VLAN OVERRIDE	VLAN	NETWORK	IP ADDRESS	INTERFACES	SEGMENT	DHCP	ACTIONS
	1 - Corporate	192.168.210.0/24	192.168.210.1	GE1 GE2	L3VPN	Enabled (242)	

**Interface Settings** ▲

INTERFACE OVERRIDE	INTERFACE	SWITCH PORT SETTINGS		ROUTED INTERFACE SETTINGS		ACTIONS
		MODE	VLAN	ADDRESSING	WAN OVERLAY	
Active	GE1	Access	1 - Corporate			
Active	GE2	Access	1 - Corporate			
Active	GE3			DHCP	Auto Detect	
Active	GE4			DHCP	Auto Detect	
Active	GE5			DHCP	Auto Detect	
Active	GE6			DHCP	Auto Detect	
Active	SFP1			DHCP	Auto Detect	
Active	SFP2			DHCP	Auto Detect	

**WAN Settings** ▲

NAME	TYPE	INTERFACES	LINK TYPE	PUBLIC IP	LEC CIRCUIT ID	ACTIONS
EarthLink	Auto Detect	GE3	Public Wired	207.217.128.36		

Configure Edges – Device Screen

The image shows two configuration screens from a network management interface. The top screen is titled "Static Route Settings" and has a callout '5' next to its title. It contains two columns: "SETTINGS" and "DESCRIPTION". Under "SETTINGS", there are fields for Subnet (Ex. 10.0.2.5/8), Source IP (N/A), Next Hop (Ex. 10.3.3.1), Interface (None), VLAN (checkbox), Cost (Ex. 0), Preferred (checkbox), and Advertise (checkbox). Under "DESCRIPTION", there is a field for "Optional" and "ACTIONS" with plus, minus, and refresh icons. The bottom screen is titled "DNS Settings" and has a callout '7' next to its title. It has fields for Private DNS ([none]) and Public DNS (Google). On the right side of the "DNS Settings" screen, there is a checkbox for "Enable Edge Override" with a callout '3' and a help icon. A "Save Changes" button is located at the bottom right of the entire configuration area.

Configure Edges – Device Screen cont.

The image shows a dialog box titled "VLAN: Corporate" with a "CLOSE X" button in the top right. The dialog is divided into several sections. The top section is labeled "VLAN" with a callout '2' and contains a checked "Enable Edge Override" checkbox with a callout '3'. Below this are fields for "VLAN Name" (Corporate), "VLAN ID" (1), "Edge LAN IP Address" (192.168.210.1), "Cidr Prefix" (24), "Network" (192.168.210.0/24), and "LAN Interfaces" (GE1, GE2). The next section is labeled "DHCP" with a callout '8' and contains fields for "Type" (Enabled), "DHCP Start" (192.168.210.13), "Num. Addresses" (242), and "Lease Time" (1 day). At the bottom, there is a table for "DHCP Options" with columns for "Option", "Code", "Data Type", and "Value". The "Option" column has a "Select" dropdown. At the bottom of the dialog are "Cancel" and "OK" buttons.

Add VLAN dialog box

1. Edges can be installed as a single standalone device or paired with another Edge to provide High Availability (HA) support. The HA configuration can be achieved with using L2 switches only or using a combination of L2 and L3 switches. The HA configuration is only for wired WAN connections and cannot be modified by the customer.
2. A VLAN is a way to group ports, potentially across multiple switches, within a LAN that can communicate with each other as though they were on a single, isolated LAN. Dividing the network into VLANs reduces the congestion on the larger LAN. VLAN Settings can be chosen for your LAN interfaces - the Edge LAN IP address, the Edge Management IP address, and CIDR Prefix. You can also specify Fixed IP addresses tied to specific MAC Addresses. The list of LAN interfaces and the SSID of any Wi-Fi interfaces that are configured for this VLAN are listed. Finally, a block for configuring DHCP is shown. DHCP can be enabled (where a start address, the number of addresses, the lease time, and optional parameters are entered), the address of one or more relay agents can be enabled, or DHCP can be disabled. (This tool-tip is also inside the VLAN modal mockup above).
3. This option enables Edge specific edits to the displayed settings, and discontinues further automatic updates from the configuration profile for this module. For ongoing consistency and ease of updates it is recommended to set configurations at the Profile rather than the Edge exception level.
4. The list of Switch Ports with a summary of some of their settings (such as Access or Trunk mode and the VLANs for the interface). Switch Ports are highlighted with a light yellow background.
5. Static Route Settings are useful for special cases where statics routes are needed for existing network attached devices (such as printers). The '+' icon on the right of the dialog box can be used to add additional Static Route Settings. Perform these steps to specify the Static Route settings:
  - + Enter the subnet for the route.
  - + Enter the IP address for the route.
  - + Select the WAN interface where the Static Route will be bound.
  - + Select the Broadcast checkbox to advertise this route over VPN and allow other Edges in the network to have access to this resource.
  - + Optionally, add a description for the route.
6. Choose an interface when the next hop is not within the LAN network.
7. DNS is an optional service that allows you to create a configuration for DNS. The DNS Service can be for a public DNS service or a private DNS service provided by your company. A Primary and Backup server can be specified. The service is preconfigured to use Google and Open DNS servers.
8. Dynamic Host Configuration Protocol (DHCP) dynamically assigns unique IP addresses to network devices. As a network device joins or leaves an IP-based network, DHCP automatically renews or releases an IP address. DHCP allows network administrators to centrally manage and automate the assignment of the IP addresses making network administration a lot easier to manage.

# SD-WAN Configuration

## 3.3 Configure Edges Business Policy

### Configure Edge

**Rochester Test Edge**

Edge Overview | Device | **Business Policy** | Firewall

1

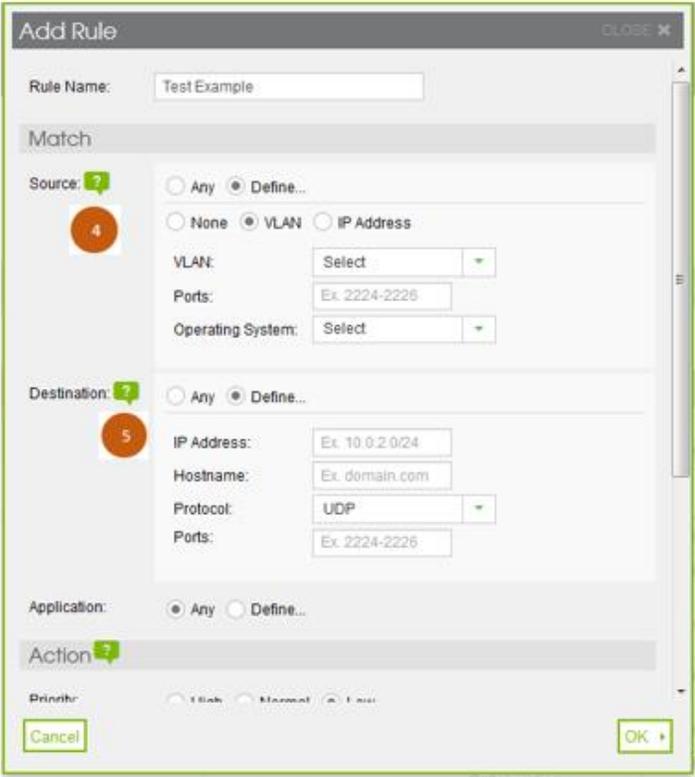
Add Rule Import Delete Rule

		Match	Action			
Rule	Source	Destination	Application	Net. Service	Link	Priority
1 High Collaboration	Any	IP: any	All Business Collaboration	Multi-Path	Auto	High
2 Low Gaming	Any	IP: any	All Gaming	Multi-Path	Auto	Low
<b>Rules from Profile</b>						
1 Box	Any	IP: any	Box.net (File Sharing)	Multi-Path	Auto	High
2 Speedtest	Any	IP: any	speedtest (File Sharing)	Multi-Path	Auto	High
3 Skype	Any	IP: any	Skype (Real Time Audio/Video)	Direct	Auto	Low
4 Business Application	Any	IP: any	All Business Application	Multi-Path	Auto	High
5 Remote Desktop	Any	IP: any	All Remote Desktop	Multi-Path	Auto	High
6 Business Collaboration	Any	IP: any	All Business Collaboration	Multi-Path	Auto	High
7 Email bulk/DATA	Any	IP: any	All Email	Multi-Path	Auto	High
8 Infrastructure	Any	IP: any	All Infrastructure	Multi-Path	Auto	Normal
9 Web	Any	IP: any	All Web	Multi-Path	Auto	Normal
10 Authentication	Any	IP: any	All Authentication	Multi-Path	Auto	Normal
11 Management	Any	IP: any	All Management	Multi-Path	Auto	Normal
12 Network Service	Any	IP: any	All Network Service	Multi-Path	Auto	Normal
13 Tunneling and VPN	Any	IP: any	All Tunneling and VPN	Multi-Path	Auto	Normal
14 Audio/Video	Any	IP: any	All Real Time Audio/Video	Multi-Path	Auto	High
15 File Sharing	Any	IP: any	All File Sharing	Multi-Path	Auto	Normal
16 Internet Instant Messaging	Any	IP: any	All Internet Instant Messaging	Direct	Auto	Low
17 Anonymizers And Proxies	Any	IP: any	All Anonymizers and Proxies	Direct	Auto	Low
18 Gaming	Any	IP: any	All Gaming	Direct	Auto	Low
19 Media	Any	IP: any	All Media	Direct	Auto	Low
20 Social Networking	Any	IP: any	All Social Networking	Direct	Auto	Low
21 Peer to Peer	Any	IP: any	All Peer to Peer	Direct	Auto	Low
22 Storage and Backup	Any	IP: any	All Storage and Backup	Direct	Auto	Low

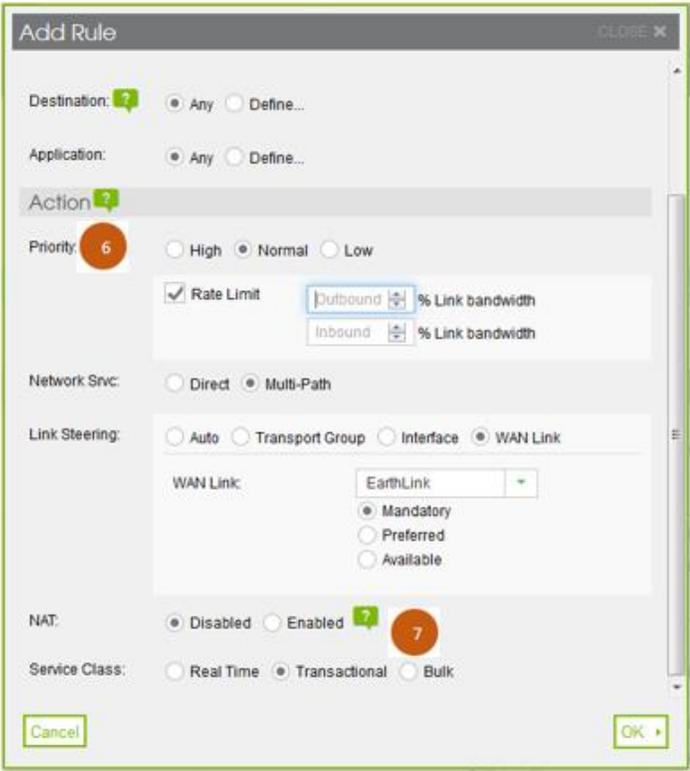
\* Business policy rules applied from the assigned Profile of this Edge.

Save Changes

Configure Edges – Business Policy screen



Add Business Policy rule dialog box



Add Business Policy rule dialog box cont.

1. Business Policy rules allow you to have control over which resources (bandwidth, equipment, wide-area facilities, etc.) that are being used. For example, you can limit the bandwidth consumed over a backbone link by FTP transfers or give priority to an important database access. This ensures that you are servicing the most important traffic to your business and that the WAN is used efficiently by mission-critical applications that are important to your business. This ensures that bandwidth and minimum delays required by time-sensitive multimedia and voice applications are available, and that other applications using the link get their service without impeding mission-critical traffic. A number of rules are predefined and you can add your own rules to customize your network operation. Rules are listed in order of highest precedence. Network traffic is managed by identifying its characteristics then matching the characteristics to the rule with the highest precedence.
2. You can move your configured rules up or down in the list of rules to establish precedence by hovering over the numeric value at the left side of the rule and moving the rule up or down. If you hover over the right side of a rule, click the x (cross) sign next to the rule to remove it from the list or the + (plus) sign to add a new rule.
3. Based on the business policy configuration, SD-WAN examines the traffic being used, identifies the Application behavior, the business service objective required for a given app (High, Med, or Low), and the Edge WAN Link conditions. Based on this, the Business Policy optimizes Application behavior driving queuing, bandwidth utilization, link steering, and the mitigation of network errors.
4. If the Match Source Define option is chosen, the source traffic can be narrowed to a specific VLAN, an IP Address, a Port, an Operating System or any combination of the selections.
5. If the Match Destination Define option is chosen, the destination can be first narrowed to a type (Any, Internet, Edge, or Non-SD-WAN Site). The destination can then be further defined by specifying an IP Address, Hostname, Protocol (GRE, ICMP, TCP, or UDP), and a port.
6. The Action section allows traffic to categorize Priority as High, Normal, or Low. Percentage (%) Rate Limits (0 – 100) can also be applied in both the Outbound and Inbound direction. Link Steering provides for
  - a. Mandatory where traffic will be sent over the WAN link or link Service-group specified. If the link specified (or all links within the chosen service group) is inactive or if a multi-path gateway route is unavailable, the corresponding packet will be dropped.
  - b. Preferred indicates the traffic should preferably be sent over the WAN link or link Service-group specified. If the link specified (or all links within the chosen service group) is inactive or if the multi-path gateway route chosen is unstable or if the link Service Level Objective (SLO) is not being met, the corresponding packet will be steered on the next best available link. If the preferred link becomes available again, traffic will be steered back to the preferred link.
  - c. Available indicates the traffic should preferably be sent over the WAN link or link Service-group specified as long as it is available (irrespective of link SLO). If the link specified (or all links within chosen service group) are not available or if multi-path gateway route chosen is unavailable, the corresponding packet will be steered to the next best available link. If the preferred link becomes available again, traffic will be steered back to the available link.
7. NATing is allowed for rules to a Non-VeloCloud site. It is also allowed for internet rules using Multi-path.

# SD-WAN Configure

## 3.4 Configure Edges Firewall

### Configure Edge

**Monitor**

**Configure**

- Edges
- Profiles
- Networks
- Services

**Settings**

Rochester Test Edge

Edge Overview | Device | Business Policy | **Firewall**

Firewall Enabled

Outbound Firewall Rules 1 2 3 4 5 6 7 8 9 10 11 12 13

[Add Rule](#) [Import](#) [Delete Rule](#)

Rule	Match	Action		
	Source	Destination	Application	Action
<input type="checkbox"/> 1 <a href="#">RuleTest</a>	<input checked="" type="checkbox"/> VLAN: 1 - Corporate	<input checked="" type="checkbox"/> VLAN: 1 - Corporate	<input checked="" type="checkbox"/> MSN Video (Real Time Audio/Video)	<input checked="" type="checkbox"/> Deny and log
<input type="checkbox"/> 2 AllowAny	<input type="checkbox"/> Any	<input type="checkbox"/> Any	<input type="checkbox"/> Any	<input checked="" type="checkbox"/> Allow

Edge Overrides

Rules from Profile

Inbound Port Forwarding 5 6 7 8 9 10 11 12 13

Port Forward Rule						Allowed Traffic Source	
Name	Protocol	Interface	WAN Port(s)	LAN IP	LAN Port	Remote IP/Subnet	Log
(optional)	Select	Select	Ex: 27011 <span>6</span>	Ex: 10.0.2.5 <span>7</span>	Ex: 27031	Ex: 45.2.142.0/2 <span>8</span>	<input type="checkbox"/>

Inbound NAT Rules 9 10 11 12 13

1:1 NAT Rule					Allowed Traffic Source			
Name	Outside IP	Interface	Inside IP	Out	Protocol	Port(s)	Remote IP	Log
(optional)	Ex: 54.87.9.35	Select	Ex: 10.0.2.5 <span>10</span>	<span>11</span>	Select	Ex <span>11</span>	x.45.2.8 <span>12</span>	<input type="checkbox"/> <span>13</span>

[Save Changes](#)

Configure Edges – Firewall screen

Add Firewall rule dialog box

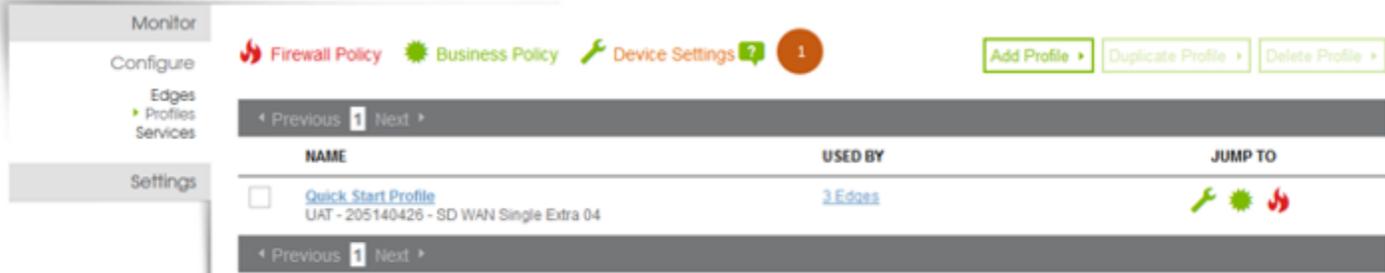
1. Firewall rules are used to configure Allow or Deny Access Control List (ACL) rules. The rules are used to determine what traffic is allowed between VLANs or out from the LAN to the Internet. The rules can be based on applications, application categories, source IP address/port, destination IP address/port, DSCP tags or protocol. Network traffic is managed by identifying its characteristics then matching the characteristics to the rule with the highest precedence.
2. Adding a new Firewall rule using the dialog, you can select Source, Destination, and Application characteristics to match. Given a match, the Firewall action defined in the rule will be applied.
3. You can move your configured rules up or down in the list of rules to establish precedence by hovering over the numeric value at the left side of the rule and moving the rule up or down. If you hover over the right side of a rule, you click the – (minus) sign next to the rule to remove it from the list or the + (plus) sign to add a new rule.
4. When a Deny action is detected by the firewall, an Event is generated. The event can be seen in the list of events using Monitor -> Events. When a Deny and Log action is detected, the Firewall logs the event locally.
5. The Inbound Firewall Rules section provides Port Forwarding and 1:1 NAT rules that define how Internet traffic is filtered or routed to an Edge via the Gateway. Configure rules to redirect traffic from a specific WAN port to a device (LAN IP/ LAN Port) within the local subnet. Optionally restrict the inbound traffic by IP or subnet. Port Forwarding Rules are used to forward requests made on specific TCP or UDP ports to specific LAN IP addresses and ports on an Edge. The '+' icon on the right can be used to add additional Port Forwarding Rules.

6. To configure a range of ports, separate the start port and the end port with a dash, e.g. 20-25.
7. Leave blank to allow all traffic.
8. Enable logging for this rule.
9. 1:1 NAT Settings are used to map a public IP address to an Inside (LAN) IP address. A 1:1 NAT mapping can only be configured with IP addresses that do not belong to the Edge. It can also translate outside IP addresses in different subnets than the WAN interface address if the ISP routes traffic for the subnet towards the Edge. Each mapping is between one IP address outside the firewall and one LAN IP address inside the firewall. Within each mapping, you can specify which ports will be forwarded to the inside IP address. The '+' icon on the right can be used to add additional 1:1 NAT settings.
10. Traffic Out – Also NAT outbound traffic.
11. To configure a range of ports, separate the start port and the end port with a dash, e.g. 20-25.
12. Leave blank to allow all traffic.
13. Enable logging for this rule.
14. Mac Address Filtering is another Source option available in the Match area of the dialog box shown below. You can use the Mac Address feature when you want a filtering rule to apply to a specific client no matter what subnet the client is associated with. (The filtering rule is independent of the client's subnet).

# SD-WAN Configure

## 3.5 Configure Profile Overview

### Configure Profiles



(Configure Profiles main screen)

### Configure Profile



Configure Profiles – Profile Overview screen

1. The color-coded icons will link you directly to the configuration areas for Device, Business Policy and Firewall. An icon color of “Gray” in one of the configuration columns indicates all the rules in place are based on the “Default Profile” settings, any other color means at least one rule override is in place.

# SD-WAN Configure

## 3.6 Configure Profile Device

### Configure Profile

**Quick Start Profile**

Profile Overview | **Device** | Business Policy | Firewall

**Device Settings**

VLAN Settings Add Vlan ? 1

Management IP:

VLAN	NETWORK	IP ADDRESS	SEGMENT	DHCP	ACTIONS
1 - Corporate			L3VPN	Enabled (242)	<span>?</span> <span>✎</span>

**Interface Settings** ? 2

Edge2000  Edge1000  Edge840  Edge500  Edge5X0

Edge5X0 ▲

**Interface Settings**

Actions <span>?</span> <span>3</span>	Interface <span>?</span> <span>4</span>	Switch Port Settings <span>?</span> <span>5</span>		Routed Interface Settings <span>?</span> <span>6</span>	
		Mode	VLANs	Addressing	
<span>✎</span>	LAN1	Access	1 - Corporate		
<span>✎</span>	LAN2	Access	1 - Corporate		
<span>✎</span>	LAN3	Access	1 - Corporate		
<span>✎</span>	LAN4	Access	1 - Corporate		
<span>✎</span>	LAN5	Access	1 - Corporate		
<span>✎</span>	LAN6	Access	1 - Corporate		
<span>✎</span>	LAN7	Access	1 - Corporate		
<span>✎</span>	LAN8	Access	1 - Corporate		
<span>✎</span>	GE1				DHCP
<span>✎</span>	GE2				DHCP
<span>✎</span>	SFP1				DHCP
<span>✎</span>	SFP2				DHCP
<span>✎</span>	USB1 (disabled)				DHCP
<span>✎</span>	USB2 (disabled)				DHCP
<span>✎</span>	USB3 (disabled)				DHCP
<span>✎</span>	USB4 (disabled)				DHCP
<span>✎</span>	WLAN1 (disabled)	Wifi	1 - Corporate		
<span>✎</span>	WLAN2 (disabled)	Wifi	1 - Corporate		

Configure Profiles – Device screen

Wi-Fi Radio Settings ? 7

Radio Enabled:

Country: auto

DNS Settings ? 8

Public DNS: Google

Configure Profiles – Device screen cont.

Add VLAN ? CLOSE X

VLAN ? 1

VLAN Name:

VLAN ID:

Edge LAN IP Address:

Cidr Prefix:

Network: 0.0.0.0

LAN Interfaces:

DHCP ? 9

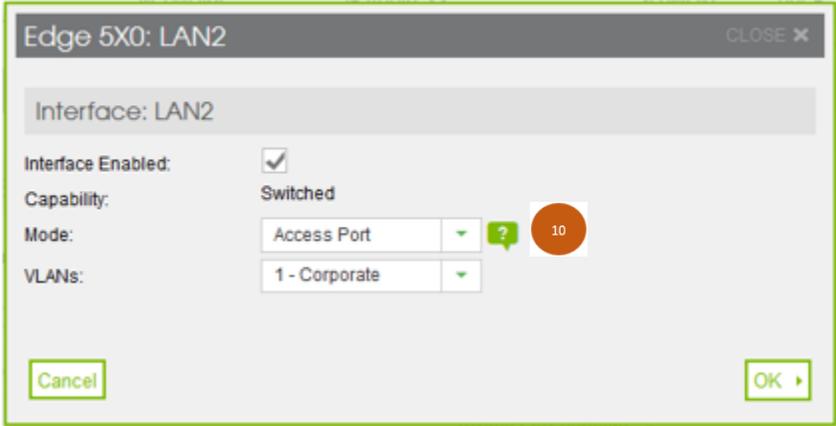
Type: Select

Cancel OK

“Add VLAN” dialog box



Edit VLAN dialog box



Edit interface dialog box

1. VLAN Settings can be chosen for your LAN interfaces. The Edge LAN IP address, the Edge Management IP address, and CIDR Prefix. You can also specify Fixed IP addresses tied to specific MAC Addresses. The list of LAN interfaces and the SSID of any Wi-Fi interfaces that are configured for this VLAN are listed. Finally, a block for configuring DHCP is shown. DHCP can be enabled (where a start address, the number of addresses, the lease time, and optional parameters are entered), the address of one or more relay agents can be enabled, or DHCP can be disabled.
2. Device Settings allows you to configure the Interface Settings for one or more Edge models in a profile. Depending on the Edge Model, each interface can be a Switch Port (LAN) interface or a Routed (WAN) Interface. Depending on the Branch Model, a connection port is a dedicated LAN or WAN port, or ports can be configured to be either a LAN or WAN port. Branch ports can be Ethernet or SFP ports. Some Edge models may also support wireless LAN interfaces. It is assumed that a single public WAN link is attached to a single interface that only serves WAN traffic. If no WAN link is configured for a routed interface that is WAN capable, it is assumed that a single public WAN link should be automatically discovered. If one is discovered, it will be reported back and this auto-discovered WAN link can then be modified and the new configuration pushed back to the branch.
3. Actions you can perform on the network interface, such as Edit or Delete.
4. The interface name- this name matches the Edge port label on the Edge device or is predetermined for wireless LANs
5. The list of Switch Ports with a summary of some of their settings (such as Access or Trunk mode and the VLANs for the interface). Switch Ports are highlighted with a light yellow background.
6. The list of Routed Interfaces with a summary of their settings (such as the addressing type and if the interface was auto-detected or has an Auto Detected or User Defined WAN overlay). Routed Interfaces are highlighted with a light blue background.
7. The Wi-Fi radio settings determine if the Wi-Fi radio is enabled, it selects the country where the Edge is located, selects the band of the Wi-Fi radio, and the channel used by the Wi-Fi network. If a specific country is selected, a specific Wi-Fi channel can be selected. Note: Wi-Fi is an optional service, to add Wi-Fi to your existing service(s), please contact your Technical Service Manager (TSM).
  - + (Enterprise Customers) Concierge – 855-999-2244 or Contact your Technical Service Manager (TSM) directly.
  - + (Enterprise Customers) Advanced - 800-600-5050
  - + (SMB Customers) Advanced and Concierge – 877-599-3282
8. The Device DNS Settings allow you to specify which Network Services DNS Service will be used.
9. Dynamic Host Configuration Protocol (DHCP) dynamically assigns unique IP addresses to network devices. As a network device joins or leaves an IP-based network, DHCP automatically renews or releases an IP address. DHCP allows network administrators to centrally manage and automate the assignment of the IP addresses making network administration a lot easier to manage.
10. You can configure Edge device LAN interfaces as Access Ports where you can choose a VLAN for the port and select L2 Settings for Autonegotiate (selected by default), Speed, Duplex type, and MTU size (default 1500). You can also configure Edge device LAN interfaces as Trunk Ports where you can choose VLANs for the port, how Untagged VLAN data is handled (routed to a specific VLAN or Dropped) and select L2 Settings for Autonegotiate (selected by default), Speed, Duplex type, and MTU

size (default 1500).

# SD-WAN Configure

## 3.7 Configure Profile Business Policy

### Configure Profile

Quick Start Profile

Profile Overview Device Business Policy Firewall

Add Rule Import Delete Rule

Rule	Match	Action					
	Source	Destination	Application	Net	Service	Link	Priority
1 Box	Any	Any	Box.net (File Sharing)	Multi-Path	Auto	High	
2 Speedtest	Any	Any	speedtest (File Sharing)	Multi-Path	Auto	High	
3 Skype	Any	Any	Skype (Real Time Audio/Video)	Direct	Auto	Low	
4 Business Application	Any	Any	All Business Application	Multi-Path	Auto	High	
5 Remote Desktop	Any	Any	All Remote Desktop	Multi-Path	Auto	High	
6 Business Collaboration	Any	Any	All Business Collaboration	Multi-Path	Auto	High	
7 Email bulk/DATA	Any	Any	All Email	Multi-Path	Auto	High	
8 Infrastructure	Any	Any	All Infrastructure	Multi-Path	Auto	Normal	
9 Web	Any	Any	All Web	Multi-Path	Auto	Normal	
10 Authentication	Any	Any	All Authentication	Multi-Path	Auto	Normal	
11 Management	Any	Any	All Management	Multi-Path	Auto	Normal	
12 Network Service	Any	Any	All Network Service	Multi-Path	Auto	Normal	
13 Tunneling and VPN	Any	Any	All Tunneling and VPN	Multi-Path	Auto	Normal	
14 Audio/Video	Any	Any	All Real Time Audio/Video	Multi-Path	Auto	High	
15 File Sharing	Any	Any	All File Sharing	Multi-Path	Auto	Normal	
16 Internet Instant Messaging	Any	Any	All Internet Instant Messaging	Direct	Auto	Low	
17 Anonymizers And Proxies	Any	Any	All Anonymizers and Proxies	Direct	Auto	Low	
18 Gaming	Any	Any	All Gaming	Direct	Auto	Low	
19 Media	Any	Any	All Media	Direct	Auto	Low	
20 Social Networking	Any	Any	All Social Networking	Direct	Auto	Low	
21 Peer to Peer	Any	Any	All Peer to Peer	Direct	Auto	Low	
22 Storage and Backup	Any	Any	All Storage and Backup	Direct	Auto	Low	

Configure Profiles – Business Policy screen

Add Business Policy rule dialog box

1. Based on the business policy configuration, SD-WAN examines the traffic being used, identifies the Application behavior, the business service objective required for a given app (High, Med, or Low), and the Edge WAN Link conditions. Based on this, the Business Policy optimizes Application behavior driving queuing, bandwidth utilization, link steering, and the mitigation of network errors.
2. A number of rules are predefined and you can add your own rules to customize your network operation. Rules are listed in order of highest precedence. Network traffic is managed by identifying its characteristics then matching the characteristics to the rule with the highest precedence. You can move your configured rules up or down in the list of rules to establish precedence by hovering over the numeric value at the left side of the rule and moving the rule up or down. If you hover over the right side of a rule, click the - (minus) sign next to the rule to remove it from the list or the + (plus) sign to add a new rule.
3. You can select Match choices for network traffic based on the Source of the traffic, the Destination of the traffic, and or the type of application that generated the traffic. Given a Match, the actions defined in the lower part of the dialog for the rule will be applied. For each of the Match selections, the option “Any” is used to designate any traffic from a Source, Destination, or Application. If the Match Source “Define” option is chosen, the source traffic can be narrowed to a specific VLAN, an IP Address, a Port, an Operating System or any combination of the selections.

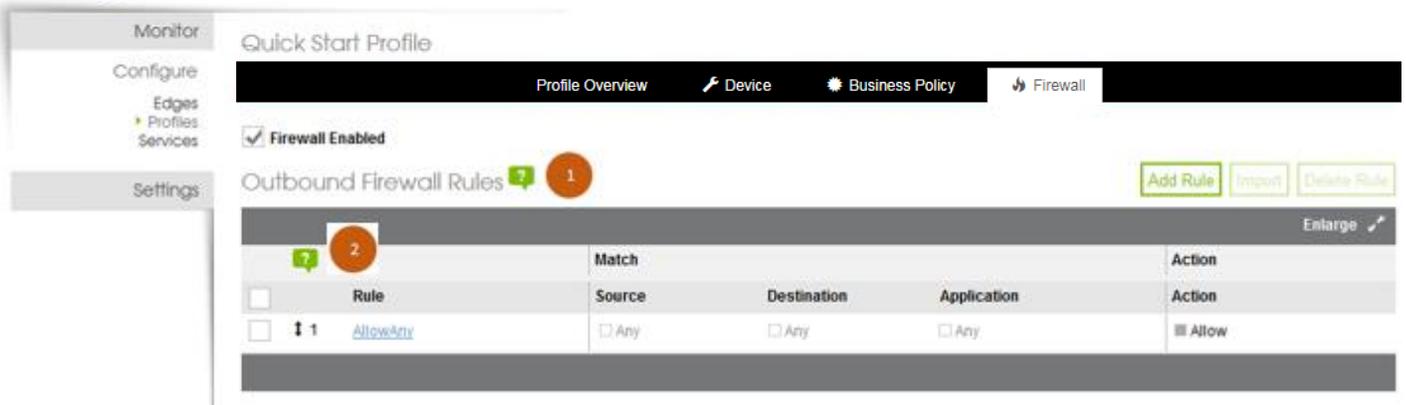
4. If the Match Destination Define option is chosen, additional parameters can be specified to identify traffic destination (see the following screen capture). The destination can be first narrowed to a type (Any, Internet, Edge, or Non-VeloCloud Site). The destination can then be furthered defined by specifying an IP Address, Hostname, Protocol (GRE, ICMP, TCP, or UDP), and a port. Match Destination options are particularly useful if the same traffic match pattern needs to be assigned different QoS values depending on the route taken. As an example, you may want to assign a higher priority to traffic destined to a SD-WAN site versus regular cloud-based internet traffic. This can be easily achieved using the Destination configuration value.
5. If the Match Application Define option is chosen, applications can be chosen first by category then by specific application. In addition, a DSCP value can be specified to match traffic coming in with a preset DSCP/TOS tag. Depending on your Match choices, some Actions may not be available. For example, if All Applications is chosen, Network Service and Link Actions are grayed out and are not available for selection.
6. The Action “Priority” parameter allows traffic to categorize as High, Normal, or Low. Percentage Rate Limits can also be applied in both the Outbound and Inbound direction.
7. The Action “Network Service” parameter can be set to Direct or Internet Multi-path. The Direct option explicitly sets the traffic to be sent to the destination directly, bypassing the SD-WAN Gateway - this option is only applicable for Destination = Internet. The Internet Multi-path option explicitly marks the traffic to be sent over the SD-WAN Gateway utilizing the benefits of per packet link steering, multi-path redundancy, and error-correction.
8. The Action “Link Steering” parameter can be set to by Service Group, by Interface, or by WAN Link. A Transport Group represents WAN links bundled together based on similar characteristics and functionality. Defining a Transport Group allows business abstraction so that similar policy can apply across different Hardware types. For the “Transport Group” option, you select the Transport Group type of All, Public Wired, Public Wireless, or Private Wired. This option is allowed at both the Edge override level and Profile level.
  - + “Mandatory” indicates that traffic will be sent over the WAN link or link Service-group specified. If the link specified (or all links within the chosen service group) is inactive or if a multi-path gateway route is unavailable, the corresponding packet will be dropped.
  - + “Preferred” indicates the traffic should preferably be sent over the WAN link or link Service group specified. If the link specified (or all links within the chosen Service group) is inactive, or if the multi-path gateway route chosen is unstable, or if the link Service Level Objective (SLO) is not being met, the corresponding packet will be steered on the next best available link. If the preferred link becomes available again, traffic will be steered back to the preferred link.
  - + “Available” indicates the traffic should preferably be sent over the WAN link or link Transport group specified as long as it is available (irrespective of link SLO). If the link specified (or all links within chosen service group) are not available, or if multi-path gateway route chosen is unavailable, the corresponding packet will be steered to the next best available link. If the preferred link becomes available again, traffic will be steered back to the available link.
9. Rules on the Profile level can only use Transport Groups for Link Steering: Interface steering is only available for Virtual Edge profiles. Rules steered by Interface or WAN Link must be created at the Edge level.
10. You can configure Policy Based NAT for both Source and Destination. The NAT can be applied to either Non-SD-WAN Site traffic or Internet traffic using Multi-Path. When configuring NAT, you must define which traffic to NAT and the action you want to perform. There are two types of NAT configuration: Many to One and One-to-One.

- 11. NATing is allowed for rules to a Non-VeloCloud site. It is also allowed for internet rules using Multi-path.
- 12. The Service Class parameter can be set to Real-time (time sensitive traffic), Transactional, or Bulk. This option is only for custom applications. SD-WAN Apps/Categories fall in one of these categories.

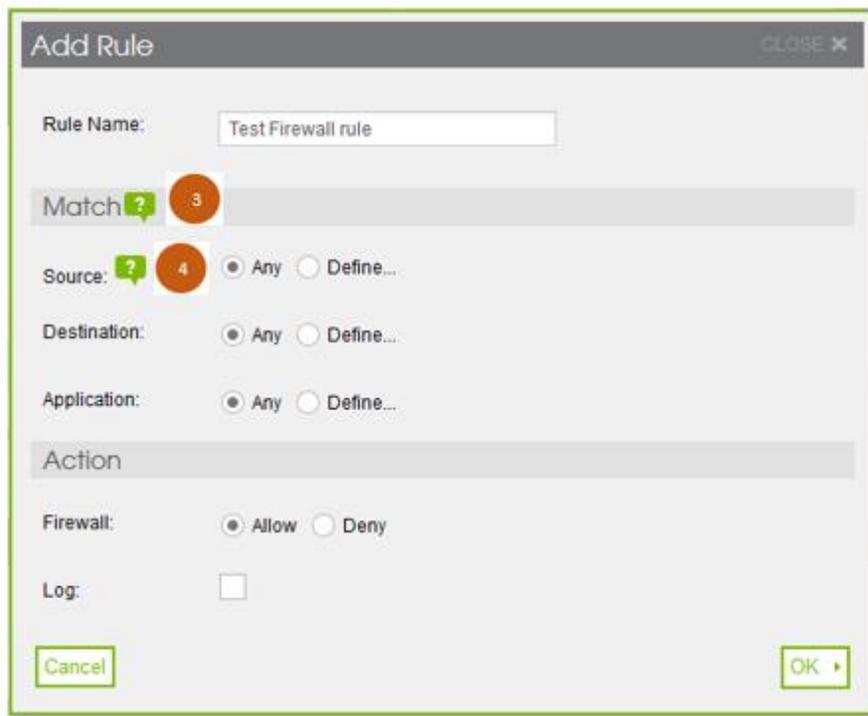
# SD-WAN Configure

## 3.8 Configure Profile Firewall

### Configure Profile



(Configure Profiles – Firewall screen)



Add Firewall rule dialog box

1. Firewall rules are used to configure Allow or Deny Access Control List (ACL) rules. The rules are used to determine what traffic is allowed between VLANs or out from the LAN to the Internet. The rules can be based on applications, application categories, source IP address/port, destination IP address/port, DSCP tags or protocol. Network traffic is managed by identifying its characteristics then matching the characteristics to the rule with the highest precedence. Note that the Firewall function can be disabled using the Firewall Enabled switch. This page allows you to define Outbound Firewall Rules and Edge Access. Inbound rules must be defined at each Edge.
2. You can move your configured rules up or down in the list of rules to establish precedence by hovering over the numeric value at the left side of the rule and moving the rule up or down. If you hover over the right side of a rule, you click the – (minus) sign next to the rule to remove it from the list or the + (plus) sign to add a new rule.
3. Using the dialog, you can select Source, Destination, and Application characteristics to match. You can use the parameters to finely select where you want the Firewall rule to be applied. Given a match, the Firewall action defined in the rule will be applied. Note: When a Deny action is detected by the firewall, an Event is generated. The event can be seen in the list of events using Monitor Events. When a Deny and Log action is detected, the Firewall logs the event locally.
4. Mac Address Filtering is a Source option available in the Match area of the dialog box shown below. You can use the Mac Address feature when you want a filtering rule to apply to a specific client no matter what subnet the client is associated with. (The filtering rule is independent of the client's subnet). To enable this filter, choose the Mac Address radio button, type in the Mac address, and click the OK button.

# SD-WAN Configure

## 3.9 Configure Services

### Configure Services

NAME	TYPE	SERVERS	USED BY
<input checked="" type="checkbox"/> <a href="#">Google</a>	Public	Primary: 8.8.8.8 Backup: 8.8.4.4	1 Profiles 0 Devices
<input type="checkbox"/> <a href="#">OpenDNS</a>	Public	Primary: 208.67.222.222 Backup: 208.67.220.220	0 Profiles 0 Devices

(Configure Services screen)

New Service dialog box

1. Domain Name Server (DNS) translates domain names into IP addresses. With the DNS service, we can access websites by only typing their alpha-numeric names (domain names) in the browser instead of their IP addresses. The DNS services is an optional service that allows you to create a configuration for DNS. The DNS Service can be for a public DNS service or a private DNS service provided by your company. A Primary and Backup server can be specified. The recommended practice is to configure the primary and secondary DNS servers on separate machines, on separate Internet connections, and in separate geographic locations (for the purpose of redundancy). The service is preconfigured to use Google and Open DNS servers. For a private service, you can also specify one or more Private Domains.
2. Network Services for SD-WAN allows you to define your Enterprise Network Services. These definitions can be used across all Profiles. This includes services for DNS. The possible services are defined in Network Services but are not used unless they are assigned in a Profile.

# SD-WAN Settings

## 4.1 Customize Edge Names

In this area, you can assign “aliases” to your Edge site names so they appear as you would like to see them.

### SD-WAN - Settings - Customize Edge Names

**CUSTOMIZE EDGE NAMES**  
Allows you to adjust how your Edge locations are viewable within myLink.

- Filter your results by name** - narrow the results displayed below by filtering on an Edge location name.
- Assign an alias name** - enter a name that is more identifiable to you and your business (ie. Shipping Department, Distribution Center, etc) in the text box on the right of each Edge location. This alias will not change how your Edge locations are identified in billing or other interactions with Windstream. It is only for your assistance in managing Edge locations through the portal.
- Download the listing** - CSV file of the listing is available for interaction with your other applications. A PDF file of the listing is available as well.
- Bulk upload updates** - download a CSV file of the Edge location listing, update the Alias column with updated alias names for locations, and upload it to set multiple entries at one time.

Filter Your Results

Download as:

NAME	ADDRESS	ALIAS
<a href="#">Rochester Test Site</a>	20 FIELD ST ROCHESTER, NY 146201528	<input type="text" value="Rochester Test Site"/>

Settings – Customize Edge Names screen

In the example below, a new alias “Rochester Test Warehouse” is being assigned:

NAME	ADDRESS	ALIAS
<a href="#">Rochester Test Site</a>	20 FIELD ST ROCHESTER, NY 146201528	<input type="text" value="Rochester Test Warehouse"/>

Assigning a new alias

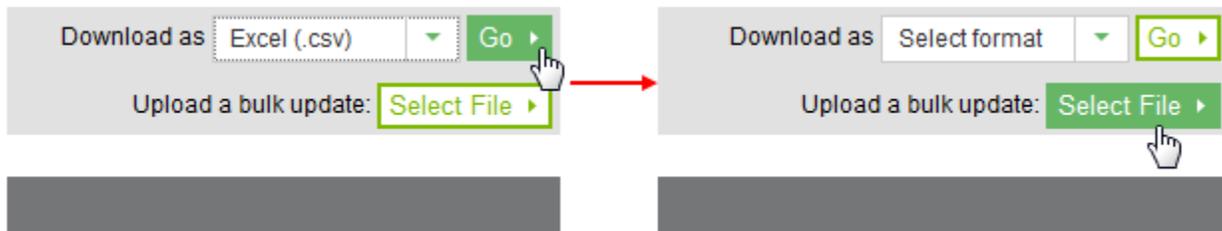
The new name (alias) immediately appears in the listing and if you “mouse-over” the name value, the original name of the Edge is displayed in a bubble:

NAME	ADDRESS	ALIAS
<a href="#">Rochester Test Warehouse</a>	20 FIELD ST ROCHESTER, NY 146201528	<input type="text" value="Rochester Test Warehouse"/>

SD WAN Single Extra 04

New name with original name being shown

You can also update multiple site aliases at one time by using the “bulk update” feature. Simply download a template file, fill in your values and upload the completed .csv file.



Download the bulk update file template, fill out and then upload the completed file

	A	B	C	D
1	ID	Name	Address	Alias
2	1234567890-0987654321	SD WAN Single Extra 04	20 FIELD ST, ROCHESTER, NY 146201528	Rochester Test Site
3				
4				

Example of bulk update template file

## 4.2 Tagging

In our SD-WAN offering, a tag is a keyword or term assigned to a piece of information (such as an SD-WAN Edge CPE, location, or a user’s device). This kind of metadata helps describe an item and allows it to be categorized for filtering or searching using simple keywords that make sense to the tag creator. Tags can be created using words, acronyms or numbers.

Currently, our SD-WAN tags are specific to a company so all users associated with your company in the portal will see the same tags. So if you assign tags within the SD-WAN area of the portal, all your co-workers will be able to utilize your tags as well.

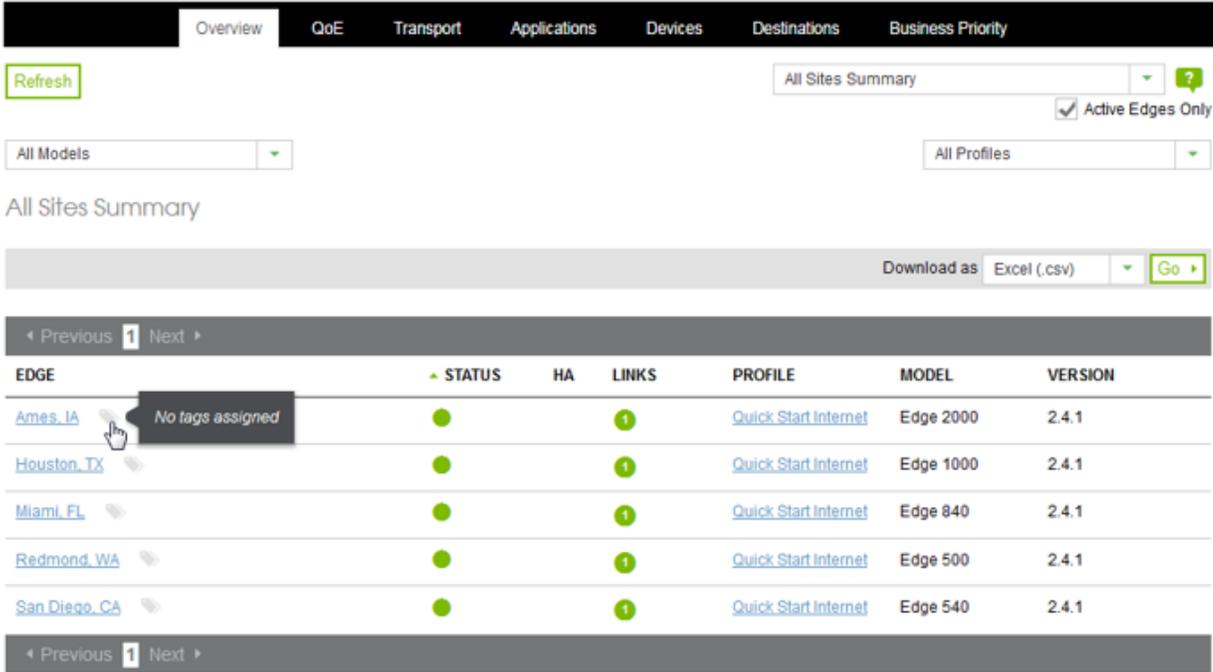
Benefits of Customized Naming and Tagging for SD-WAN include:

- + A Windstream Enterprise exclusive – a differentiator not offered by other technology vendors or service/managed service providers.
- + Customized naming – select logical names for locations and devices.
- + Customized tagging - create filters for location edge devices and end user devices.
- + Renders real-time visibility on an easy to interpret basis.
- + Simplifies report creation on customer created filters.

SD-WAN tags are currently implemented in SD-WAN Edge Overview, Devices and Destinations areas. Because tagging offers many benefits and opportunities, look for our future SD-WAN releases to continuously add-on and improve our tag offerings!

In SD-WAN our tagging option is identified by tag icons: Gray  = No tags) and Green  = tagged) with mouse-over text that indicates whether tags have been assigned or not.

Below is an example of the Edge Overview page when currently there are no tags assigned indicated by the mouse-over text.

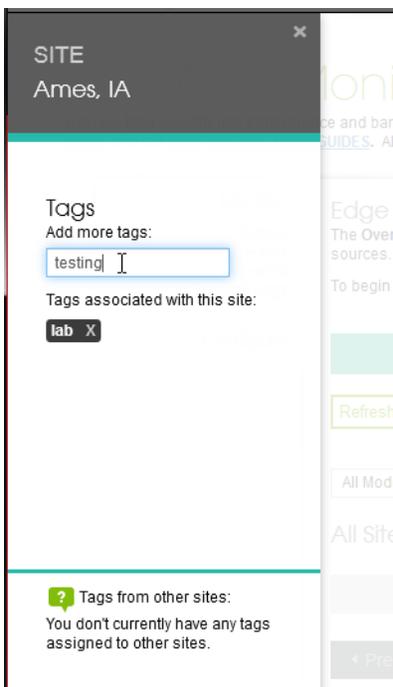


The screenshot shows the 'Edge Overview' page with a navigation bar (Overview, QoE, Transport, Applications, Devices, Destinations, Business Priority) and a 'Refresh' button. Below are filters for 'All Models' and 'All Profiles'. The main section is 'All Sites Summary' with a 'Download as Excel (.csv)' button. A table lists sites with columns: EDGE, STATUS, HA, LINKS, PROFILE, MODEL, and VERSION. The 'Ames, IA' site is highlighted with a tooltip that says 'No tags assigned'.

EDGE	STATUS	HA	LINKS	PROFILE	MODEL	VERSION
<a href="#">Ames, IA</a>				<a href="#">Quick Start Internet</a>	Edge 2000	2.4.1
<a href="#">Houston, TX</a>				<a href="#">Quick Start Internet</a>	Edge 1000	2.4.1
<a href="#">Miami, FL</a>				<a href="#">Quick Start Internet</a>	Edge 840	2.4.1
<a href="#">Redmond, WA</a>				<a href="#">Quick Start Internet</a>	Edge 500	2.4.1
<a href="#">San Diego, CA</a>				<a href="#">Quick Start Internet</a>	Edge 540	2.4.1

Tagging – Overview page with no tags assigned

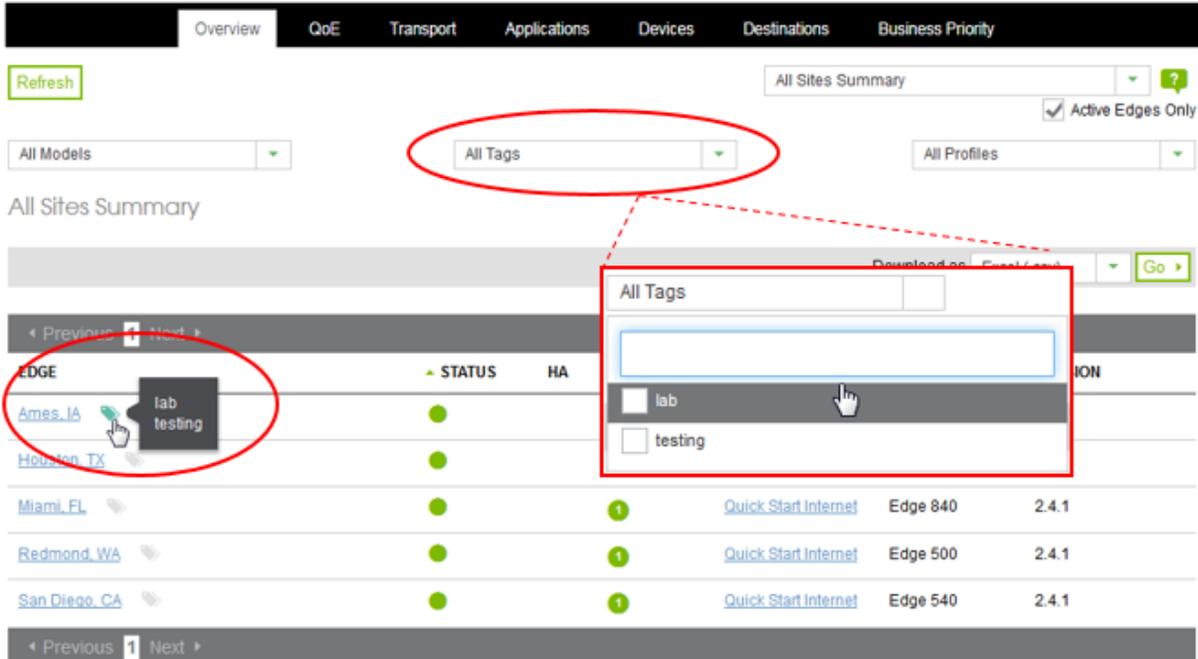
Clicking on a tag opens the “Tag Manager” section where tags can be added or deleted. Simply enter your tags in the text box you wish to associate with the site.



The screenshot shows a 'SITE' dialog for 'Ames, IA'. It has a 'Tags' section with 'Add more tags:' and a text input field containing 'testing'. Below that, 'Tags associated with this site:' shows a 'tag' button with an 'X' to delete it. At the bottom, a message says: 'Tags from other sites: You don't currently have any tags assigned to other sites.'

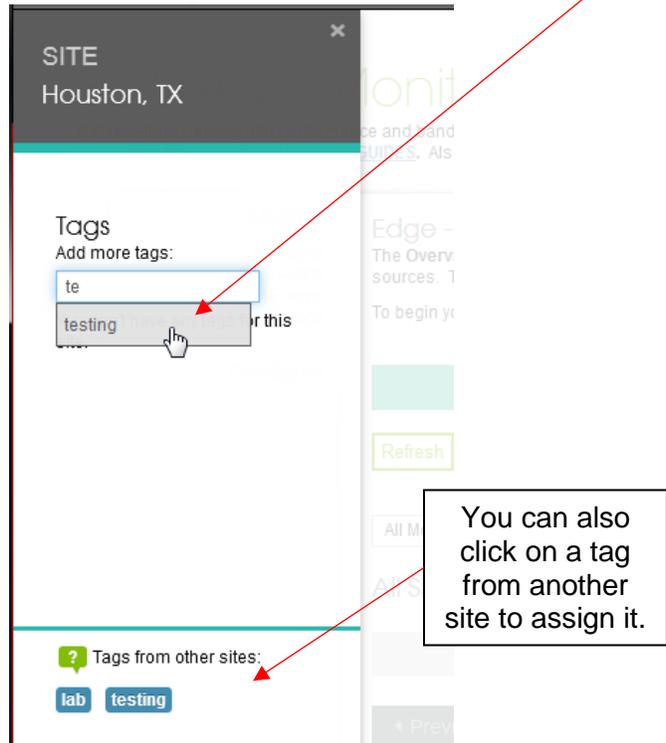
The Tag Manager provides for adding and deleting of tags

Once you close the tag manger, the tag icon in the list now turns from gray to green indicating there are one or more tags associated with the site. A mouse-over the tag icon now shows the tags for the site. A new filter drop-down option for tags also appears in the top section which allows you to filter on assigned tags.



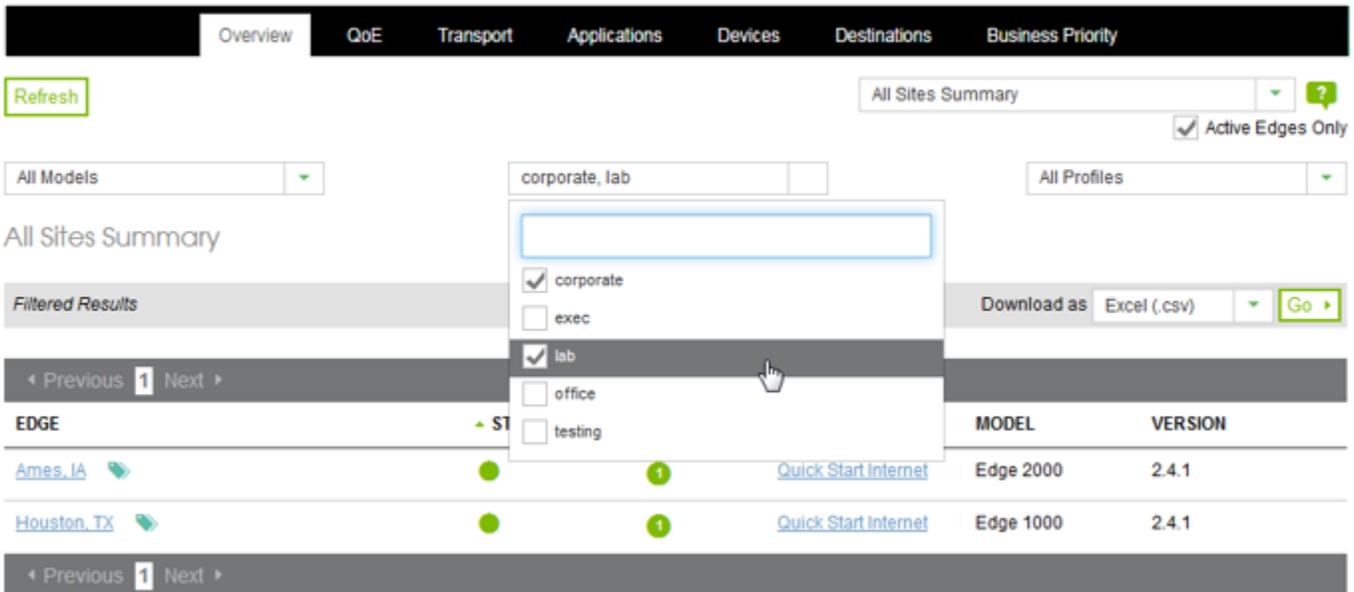
The Overview listing now showing the site “Ames, IA” with assigned tags

Clicking on another site's gray tag icon opens the tag manager for that site with all tags from other sites appearing in the section below. Here, you can simply click on an existing tag to add it to this site. The input also supports a "Type-ahead" function which filters tags and will narrow matching results as your type.



Tag Manager supports type-ahead and offers other tags

Now that tags are assigned we can filter by tags in the drop-down and get immediate results. The tags in the drop-down list appear in alphabetical order.



Tags in alphabetical order can be combined to filter results

Once a tag filter is set, mouse-over “Filtered Results” indicator and see the tags that the results are filtering by.

All Sites Summary

Filtered Results corporate, lab Download as Excel (.csv) Go

Previous 1 Next

EDGE	STATUS	HA	LINKS	PROFILE	MODEL	VERSION
<a href="#">Ames, IA</a>	●		1	<a href="#">Quick Start Internet</a>	Edge 2000	2.4.1
<a href="#">Houston, TX</a>	●		1	<a href="#">Quick Start Internet</a>	Edge 1000	2.4.1

Previous 1 Next

Result listing filtered by tags

If we remove a tag (corporate) from the site and the result list will be immediately updated to reflect the change.

Overview QoS Transport Applications Devices Destinations Business Priority

Refresh All Sites Summary Active Edges Only

All Models corporate, lab All Profiles

All Sites Summary

Filtered Results Download as Excel (.csv) Go

Previous 1 Next

EDGE	STATUS	HA	LINKS	PROFILE	MODEL	VERSION
<a href="#">Ames, IA</a>	●		1	<a href="#">Quick Start Internet</a>	Edge 2000	2.4.1
<a href="#">Houston, TX</a>	●		1	<a href="#">Quick Start Internet</a>	Edge 1000	2.4.1

Previous 1 Next

SITE Ames, IA

Tags

Add more tags:

Tags associated with this site:

corporate office exec

Tags from other sites:

lab testing

All Sites Summary

Filtered Results Download as Excel (.csv) Go

Previous 1 Next

EDGE	STATUS	HA	LINKS	PROFILE	MODEL	VERSION
<a href="#">Houston, TX</a>	●		1	<a href="#">Quick Start Internet</a>	Edge 1000	2.4.1

Previous 1 Next

Real-time updating of results based on changes in the Tag Manager

If there are more than four (4) tags assigned to a site, the mouse-over will indicate additional tags with a “+” (plus) sign as shown below.

All Sites Summary

Download as

EDGE	STATUS	HA	LINKS	PROFILE	MODEL	VERSION
<a href="#">Ames, IA</a>	<span style="color: green;">●</span>		<span style="border: 1px solid green; border-radius: 50%; padding: 2px;">1</span>	<a href="#">Quick Start Internet</a>	Edge 2000	2.4.1
<a href="#">Houston, TX</a>	<span style="color: green;">●</span>		<span style="border: 1px solid green; border-radius: 50%; padding: 2px;">1</span>	<a href="#">Quick Start Internet</a>	Edge 1000	2.4.1
<a href="#">Miami, FL</a>	<span style="color: green;">●</span>		<span style="border: 1px solid green; border-radius: 50%; padding: 2px;">1</span>	<a href="#">Quick Start Internet</a>	Edge 840	2.4.1
<a href="#">Redmond, WA</a>	<span style="color: green;">●</span>		<span style="border: 1px solid green; border-radius: 50%; padding: 2px;">1</span>	<a href="#">Quick Start Internet</a>	Edge 500	2.4.1
<a href="#">San Diego, CA</a>	<span style="color: green;">●</span>		<span style="border: 1px solid green; border-radius: 50%; padding: 2px;">1</span>	<a href="#">Quick Start Internet</a>	Edge 540	2.4.1

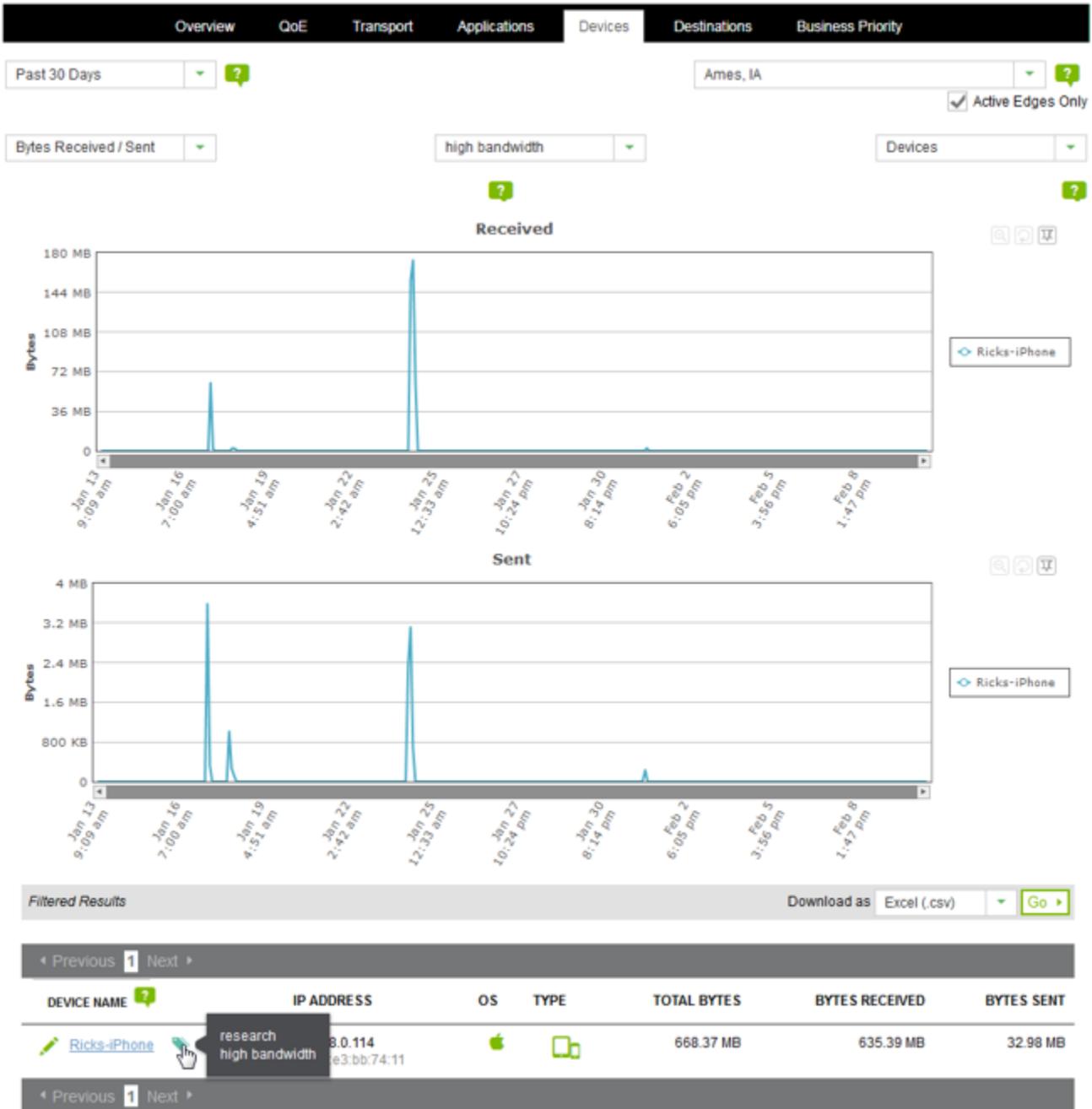
Mouse-over dialog indicating multiple tags assigned

Currently the other SD-WAN areas supporting tags are the Devices and Destinations pages where real-time, interactive graphs are integrated with the tagging capability.



The Devices page also supports tagging

Once you have filtered by tags, the data usage graphs immediately update based on the tag filter set.



The data graphs are immediately updated to reflect the tag filters.

# SD-WAN Report Center

## 5.1 Report Builder

Report Builder allows you to define SD-WAN reports. These reports aggregate data from all of your SD-WAN sites and can present the output in one cohesive report. This provides you the ability to view and manipulate data across any or all of your locations

There are five (5) pre-defined report templates and each template is made up of selected column fields applicable to the purpose of the report. These include Quality of Experience (QoE), Applications, Client Devices and Destinations in one cohesive report.

Using the pre-defined report templates, you can selectively add or remove column fields to tailor more specifically to your needs. You can also drag-n-drop columns to change the order. You also have the option to save any reports you define for future scheduling.

The Report Builder also offers filters that sift the data in your data source to bring back the information that answers exactly what you require.

To create a report simply click on “Report Center - Report builder as shown below.

### SD-WAN - Report Center

The screenshot shows the 'SD-WAN - Report Center' interface. On the left, a navigation sidebar contains 'Monitor', 'Configure', 'Settings', and 'Report Center' (circled in red). Under 'Report Center', there are sub-items: 'Report Builder', 'My SD-WAN Reports', 'Report Output', and 'Report History'. The main content area is titled 'Report Builder' and contains the following text: 'Report Builder allows you to define SD-WAN reports. There are five (5) pre-defined report templates and each template is made up of selected column fields germane to the purpose of the report. In addition to the pre-defined report templates, you can selectively add or remove column fields to tailor more specifically to your needs. You can also drag-n-drop columns to change the order. Once your report has been defined and saved you will be notified when it's ready for you. You also have the option to save any reports you define for future scheduling.'

Below the text is the 'Build Report' section with the following fields:

- Report Name: Enter a name for the report
- Report Type: Sites Report
- Time Frame: Past 7 Days

Below these fields are three sections:

- Available Fields:** A list of fields with plus signs next to them: Build Number, Bytes Received(#), Bytes Sent(#), Edge Alias, Edge Location, Edge Name, Edge Status, Edge Tags, HA (type).
- Selected Fields:** An empty box for selecting fields from the available list.
- Filter Criteria:** An empty box for defining filter criteria.

At the bottom right, there is a checkbox labeled 'Save this report to My SD-WAN Reports area?' and two buttons: 'Submit Report' and 'Cancel'.

The Report Center area offers advanced SD-WAN reporting and report management sections

There are five (5) pre-defined report types, simply select the appropriate report type to use and the “Available Fields” will contain fields unique to each template to make up your report.

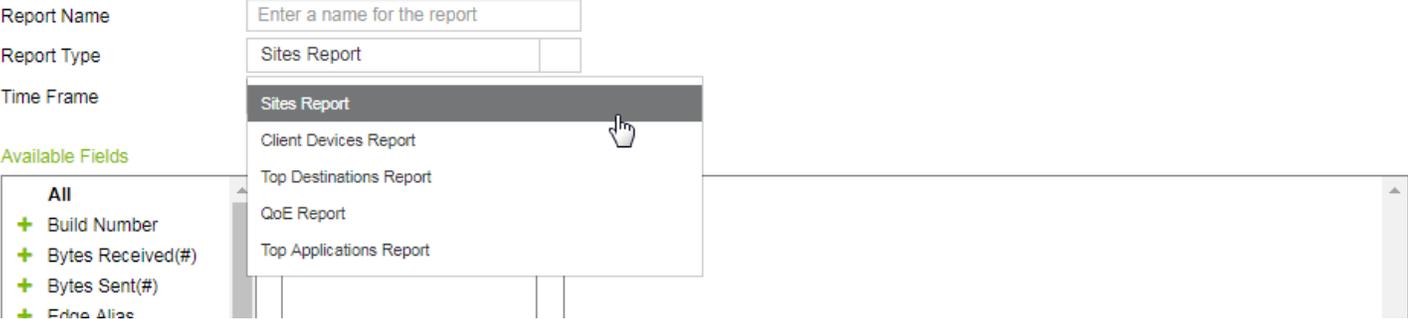
### Report Builder

Report Builder allows you to define SD-WAN reports.

There are five (5) pre-defined report templates and each template is made up of selected column fields germane to the purpose of the report.

In addition to the pre-defined report templates, you can selectively add or remove column fields to tailor more specifically to your needs. You can also drag-n-drop columns to change the order. Once your report has been defined and saved you will be notified when it's ready for you. You also have the option to save any reports you define for future scheduling.

### Build Report



Select a predefined report type

From the “Available Fields” column, you add fields to your report by clicking the “+” sign so they appear in the “Selected Fields” column. You may add ALL fields at once if you want.

You may also save the report you are creating for future reference in the “My Saved Reports” area by clicking the checkbox above the submit report button. This allows you to rerun the report or use it as a basis for creating another report.



Adding fields to build your report from the available section to the selected section

Select the appropriate time frame you are interested in for building your report.

### Build Report

Report Name:

Report Type:

Time Frame:

Available Fields:

- All
- + Build Number
- + Bytes Received(#)
- + Bytes Sent(#)
- + Edge Alias
- + Edge Location
- + Edge Name
- + Edge Status
- + Edge Tags
- + HA (type)

Time Frame Selection:

- Past 60 Minutes
- Past 8 Hours
- Past 24 Hours
- Past 7 Days
- Past 30 Days
- Past 6 Months
- Yesterday
- Last Month
- Custom

Select the time frame for your report

The Filter criteria column allows you to screen data in your data source to determine whether the data should be included or excluded from the calculations of the report results. You may filter on any/all of the selected fields in your report.

For example; you may want to know which of your edge locations is generating the most traffic to/from specific locations. OR how many locations are having quality of signal issues.

Filters allow you to “slice-n-dice” your data however you want to.

## SD-WAN - Report Center

Monitor | Configure | Settings

Report Center

- Report Builder
- My SD-WAN Reports
- Report Output
- Report History

### Report Builder

Report Builder allows you to define SD-WAN reports.

There are five (5) pre-defined report templates and each template is made up of selected column fields germane to the purpose of the report.

In addition to the pre-defined report templates, you can selectively add or remove column fields to tailor more specifically to your needs. You can also drag-n-drop columns to change the order. Once your report has been defined and saved you will be notified when it's ready for you. You also have the option to save any reports you define for future scheduling.

#### Build Report

Report Name:

Report Type:

Time Frame:

Available Fields:

- All
- + Build Number
- + Edge Alias
- + Edge Tags
- + HA (type)
- + Model
- + Profile
- + Software Version

Selected Fields:

- Edge Location
- Edge Name
- Edge Status
- Interface Name(#)
- Interface Status(#)
- Interface Type(#)
- Bytes Sent(#)
- Bytes Received(#)
- Total Bytes(#)

Filter Criteria ?

Add Filter

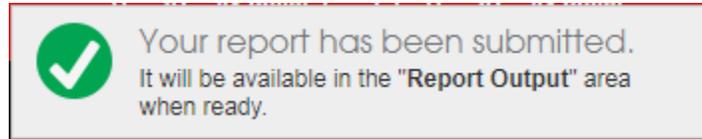
Total Bytes(  >  Gbps

- Edge Location
- Edge Name
- Edge Status
- Interface Name(#)
- Interface Status(#)
- Interface Type(#)
- Bytes Sent(#)
- Bytes Received(#)
- Total Bytes(#)

Save this report to My SD-WAN Reports area?

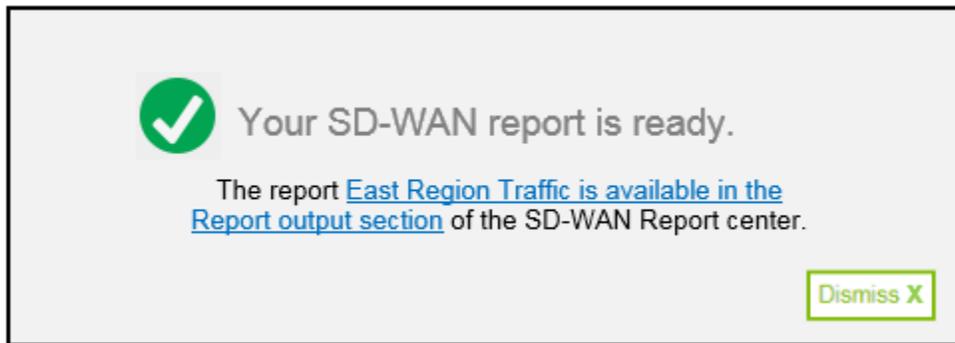
Example of setting a filter for sites that have total bytes within certain criteria

Once you click the submit report button, you will see the message below display informing you that once the report has completed, it will be available in the “report Output” section for you to download. Depending on the size of the report, it may take several minutes to complete.



Successful report submission message

Once the report becomes available, if you are anywhere in the portal, a message will display and you may click on the link to go directly to the Report Output page to retrieve your report.



Report ready message

## 5.2 Report Output

This area contains a listing of the scheduled reports that were created for your account. For each report listed you see the details associated including the report name, creator, create date, etc. Select the report name to download the report in a .CSV format. Reports will be available for seven (7) days from last run date.

### SD-WAN - Report Output

- Monitor
- Configure
- Settings
- Report Center
  - Report Builder
  - My SD-WAN Reports
    - Report Output
    - Report History

#### SD-WAN Scheduled Report Output

This area contains a listing of the scheduled reports that were created for your account. For each report listed you see the details associated including the report name, creator, create date, etc.

Select the report name to download the report. Reports will be available for seven (7) days from last run date.

◀ Previous 1 Next ▶

REPORT NAME	CREATED BY	CREATED DATE	LAST UPDATE	LAST RUN	FILE SIZE	SCHEDULE	REPORT DATA
<a href="#">Testing Sites Filter TotalBytes</a>	Rick Reynolds	07/27/2018 08:50 AM	07/27/2018 08:50 AM	07/27/2018 08:53 AM	2,316	N/A	<a href="#">View</a> ▼
<a href="#">Site Report - 60 mins</a>	Robert Magnanti	07/27/2018 07:18 AM	07/27/2018 07:18 AM	07/27/2018 07:20 AM	33,520	N/A	<a href="#">View</a> ▼

◀ Previous 1 Next ▶

Completed Reports are available for seven (7) days

Clicking on the report name will download the .CSV file to your computer.

REPORT NAME	CREATED BY	CREATED DATE	LAST UPDATE	LAST RUN	FILE SIZE	SCHEDULE	REPORT DATA
<a href="#">Testing Sites Filter</a> <a href="#">TotalBytes</a>	Rick Reynolds	07/27/2018 08:50 AM	07/27/2018 08:50 AM	07/27/2018 08:53 AM	2,316	N/A	<a href="#">View</a>
<a href="#">Site Report - 60 mins</a>	Robert Magnanti	07/27/2018 07:18 AM	07/27/2018 07:18 AM	07/27/2018 07:20 AM	33,520	N/A	<a href="#">View</a>

Download a completed report by clicking the name

Location	EdgeName	Status	InterfaceName	InterfaceStatus	InterfaceType	BytesSent	BytesReceived	TotalBytes
20 CLINTON AVE, ROCHESTER, NY, USA, 14604710	edge-000000000000 (Pending)	CONNECTED	Time Warner Cable	STABLE	ETHERNET	12.20 GB	141.48 GB	153.68 GB
3 Huntington Quadrangle, Melville, NY, USA, 11767	edge-000000000000 (Pending)	CONNECTED	Optimum Online	STABLE	ETHERNET	7.25 GB	46.47 GB	53.72 GB
130 Santa Ave, Pacific, CA, US, 94044	edge-000000000000 (Pending)	CONNECTED	Comcast Cable	STABLE	ETHERNET	3.79 GB	46.33 GB	50.12 GB
1014 TACOMA ST, BROOKLYN BROOK, OH, USA, 76121408	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE	ETHERNET	14.91 GB	19.33 GB	34.24 GB
1014 TACOMA ST, BROOKLYN BROOK, OH, USA, 76121408	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE	ETHERNET	14.57 GB	18.35 GB	32.92 GB
20 WACKER DR, CHICAGO, IL, USA, 606060000	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE	ETHERNET	28.77 GB	94.50 MB	28.87 GB
201 Roosevelt Blvd, Long Beach, NY, USA, 11560	edge-000000000000 (Pending)	CONNECTED	AT&T Wireless	STABLE	WIRELESS	24.20 GB	240.73 MB	24.44 GB
1802 Hight Ave., Everett, WA, USA, 98203	edge-000000000000 (Pending)	CONNECTED	Frontier Communications	STABLE	ETHERNET	4.02 GB	15.70 GB	19.72 GB
1010 LINCOLN PARK BLVD, MEMPHIS, TN, USA, 381040000	edge-000000000000 (Pending)	CONNECTED	Windstream Business	STABLE	ETHERNET	3.28 GB	11.04 GB	14.32 GB
1000 W LANTON ST, Cherry Hill, NJ, US, 08004	edge-000000000000 (Pending)	CONNECTED	Comcast Cable	STABLE	ETHERNET	1.55 GB	10.16 GB	11.71 GB
109 37th St, SPRINGFIELD, IL, USA, 627020000	edge-000000000000 (Pending)	CONNECTED	Comcast Cable	STABLE	ETHERNET	3.75 GB	7.53 GB	11.28 GB
20 CLINTON AVE, ROCHESTER, NY, USA, 14604710	edge-000000000000 (Pending)	CONNECTED	Windstream Communications	STABLE	ETHERNET	1.60 GB	9.33 GB	10.93 GB
1 GALATIHA BLVD, METairie, LA, USA, 70002	edge-000000000000 (Pending)	CONNECTED	Spectrum	STABLE	ETHERNET	3.01 GB	7.79 GB	10.79 GB

Example of a downloaded .CSV report

The report listing also offers the ability to “view” the contents of your report in an expandable view directly within the listing itself.

REPORT NAME	CREATED BY	CREATED DATE	LAST UPDATE	LAST RUN	FILE SIZE	SCHEDULE	REPORT DATA
<a href="#">Testing Sites Filter</a> <a href="#">TotalBytes</a>	Rick Reynolds	07/27/2018 08:50 AM	07/27/2018 08:50 AM	07/27/2018 08:53 AM	2,316	N/A	<a href="#">Hide</a>

LOCATION	EDGENAME	STATUS	INTERFACENAME	INTERFACES
20 CLINTON AVE, ROCHESTER, NY, USA, 14604710	edge-000000000000 (Pending)	CONNECTED	Time Warner Cable	STABLE
3 Huntington Quadrangle, Melville, NY, USA, 11767	edge-000000000000 (Pending)	CONNECTED	Optimum Online	STABLE
130 Santa Ave, Pacific, CA, US, 94044	edge-000000000000 (Pending)	CONNECTED	Comcast Cable	STABLE
1014 TACOMA ST, BROOKLYN BROOK, OH, USA, 76121408	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE
1014 TACOMA ST, BROOKLYN BROOK, OH, USA, 76121408	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE
20 WACKER DR, CHICAGO, IL, USA, 606060000	edge-000000000000 (Pending)	CONNECTED	Verizon Wireless	STABLE
201 Roosevelt Blvd, Long Beach, NY, USA, 11560	edge-000000000000 (Pending)	CONNECTED	AT&T Wireless	STABLE

REPORT NAME	CREATED BY	CREATED DATE	LAST UPDATE	LAST RUN	FILE SIZE	SCHEDULE	REPORT DATA
<a href="#">Site Report - 60 mins</a>	Robert Magnanti	07/27/2018 07:18 AM	07/27/2018 07:18 AM	07/27/2018 07:20 AM	33,520	N/A	<a href="#">View</a>

On screen view of the report

You may also download the report from within the expanded data view by clicking on the link located on the top right-hand side of the expanded view. We strongly recommend downloading your completed report as it will only be available for seven (7) days from the date it was last run.

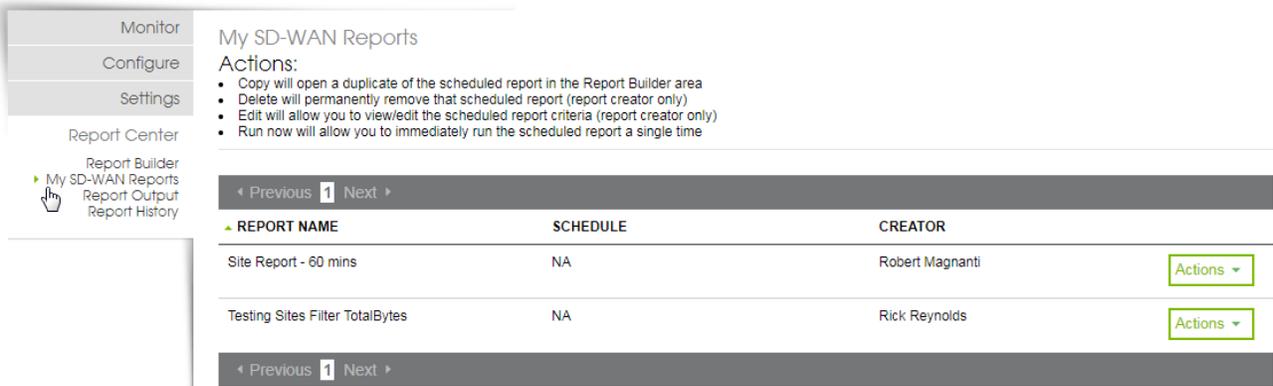


You can also download the report from within the expanded view window

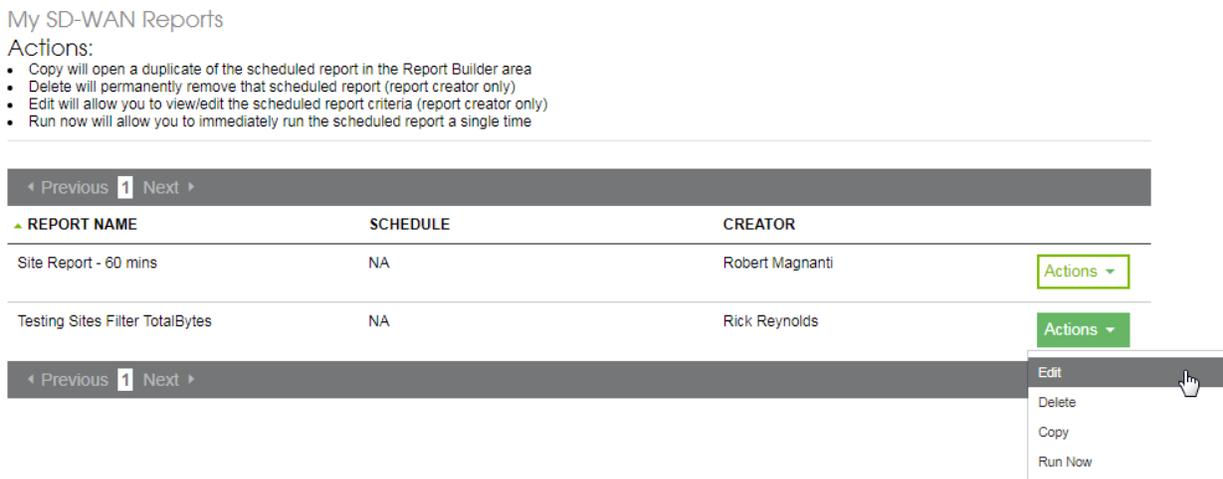
### 5.3 My SD-WAN Reports

This area is where your saved report definitions can be found. From here you can Copy, Delete, Edit or Run reports you and others created and saved based on the criteria that was previously defined. Because this section contains all the report definitions for a customer, you can only edit and delete the reports that you had created, all other reports you may copy or run only.

#### SD-WAN - Report Center



The saved reports area



Initiate actions directly from the saved reports area

My SD-WAN Reports

Actions:

- Copy will open a duplicate of the scheduled report in the Report Builder area
- Delete will permanently remove that scheduled report (report creator only)
- Edit will allow you to view/edit the scheduled report criteria (report creator only)
- Run now will allow you to immediately run the scheduled report a single time

◀ Previous 1 Next ▶

REPORT NAME	SCHEDULE	CREATOR	Actions
Site Report - 60 mins	NA	Robert Magnanti	Actions ▼ Copy Run Now
Testing Sites Filter TotalBytes	NA	Rick Reynolds	

◀ Previous 1 Next ▶

If you did not create the report, you cannot edit or delete it

### 5.4 Report History

This is a log activity area that lists all of user reports for your account including creation, updates and deletes of reports.

#### SD-WAN - Report History

Monitor

Configure

Settings

Report Center

- Report Builder
- My SD-WAN Reports
- Report Output
- ▶ Report History

SD-WAN Report History

This is an administrative console that lists a log of users reports management including creation updates and deletes of reports

◀ Previous 1 Next ▶

REPORT NAME	REPORT CREATED	REPORT DELETED	REPORT RUN	REPORT MODIFIED
Testing Sites Filter TotalBytes	7/27/2018 12:50:39 PM	-	7/27/2018 12:53:17 PM	7/27/2018 12:50:39 PM
Site Report - 60 mins	7/27/2018 11:18:25 AM	-	7/27/2018 11:20:47 AM	7/27/2018 11:18:25 AM

◀ Previous 1 Next ▶

An example of report history

# Packet Fusion

**Ellen Pensky**

*ellen@bumblebeemarketing.net*



Connecting the Dots to the Cloud