



Summary

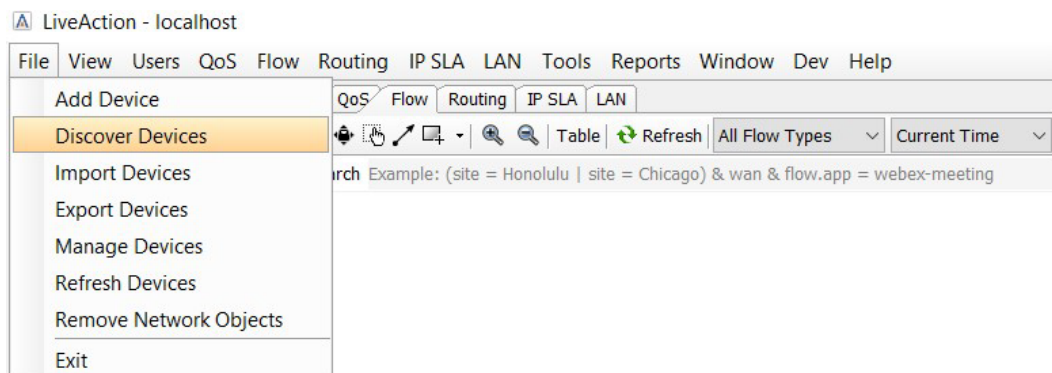
LiveNX is unable to configure sflow export for Cisco's ASR 9k platform. Fortunately, you can follow this guide and manually configure sflow export to LiveNX and still get the rich visibility that you would expect. This guide will explain the steps necessary to bring your ASR 9k into LiveNX and configure sflow export.

If you have any questions about this guide, or need any assistance in general please contact LiveAction support: support@liveaction.com.

Bring in your ASR 9k by using Discover Devices

Step 1

With your LiveNX client open, go to **File > Discovery Devices**.



Step 2

Enter your ASR 9k's IP address, enter your SNMP settings, specify the node and click **OK**.

Device Discovery

Step 1: Specify what to scan

Specify IP ranges (ex: 192.168.1.1-200) or one IP per line:

Specify seed device to scan

IP Address Hops

Step 2: Specify SNMP settings

Use the Default SNMP connection settings

Enter SNMP connection settings for this device

SNMP Version Target Port

Community String

Step 3: Specify node

Step 3

Select **Add Devices**.

Device Discovery on Local

Filter ...


Select	Device Name	IP Address	Hops	Vendor	Model
<input checked="" type="checkbox"/>	ASR 9k	10.10.20.5	0	Cisco	cisco ASR 9k

Selected: 1 Discovered: 1 Device Limit: 10,000,000 (0 active devices)

Step 4

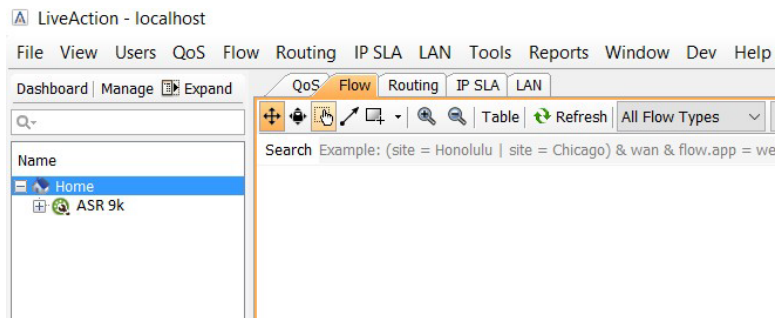
On the Configure Device window, please select **No**.

Configure Device

 1 configurable device added to the application.
Do you want to configure QoS, Flow, Routing, IP SLA, or LAN for the added devices?

Step 5

Now, you should be able to see you ASR 9k in LiveNX with a wrench across it. This means that LiveNX cannot configure your device, however, we will still poll SNMP and receive flow (when configured).



Configure sFlow to be exported from the Cisco ASR 9k

Create a LiveNX Flow Exporter

```
conf t
flow exporter-map LIVENX-FLOWEXPORTER
version v9
options interface-table
options sampler-table
template data timeout 10
template options timeout 10

transport udp 2055
source MgmtEth0/RSP0/CPU0/0
destination 10.20.1.119
commit
exit
```

Create your LiveNX Flow Monitor

```
flow monitor-map FLOWMONITOR-IPv4
record ipv4
exporter LIVENX-FLOWEXPORTER
commit
exit
```

Create your LiveNX Flow Sampler

```
sampler-map FLOWSAMPLER
random 1 out-of 10 (You can increase this rate to improve performance)
commit exit
```

Apply your LiveNX Monitor and Sampler to an interface of interest

```
conf t
interface gigabitEthernet 0/0/0/0
flow ipv4 monitor FLOWMONITOR-IPv4 sampler FLOWSAMPLER ingress
flow ipv4 monitor FLOWMONITOR-IPv4 sampler FLOWSAMPLER egress
commit
exit
```

What is sFlow

sFlow, short for “sampled flow,” is an industry standard for packet export at Layer 2 of the *OSI model*. It provides a means for exporting truncated packets, together with interface counters. Maintenance of the protocol is performed by the sFlow.org

Packet sampling basics

Packet-based sampling schemes are widely used to characterize network traffic. Packet sampling uses randomness in the sampling process to prevent synchronization with any periodic patterns in the traffic. On average, 1 in every N packets is captured and analyzed.

While this type of packet sampling does not provide a 100% accurate result, it does provide a result with quantifiable accuracy.

Benefits of sFlow

- Flow Sampling on a network device is beneficial to save CPU processing due to the high volume that the device is handling.

Limitations of sFlow

- sFlow does not provide the packet level details required for complete analysis of the network as they don't have the access to every packet in the conversation to perform application expert analysis (like application response time analysis etc).
- The accuracy of sFlow analysis depends a lot on the sample rate selected. The higher the sample rate, the more accurate the analysis. The type of sampling (uni-directional or bi-directional sampling) also plays an important factor in the accuracy of sFlow results. The supported sample rates are dependant on (or limited to) the network infrastructure vendors.

References:

<http://www.sflow.org>

LiveNX Flow Sampling

LiveNX Flow Sampling is an automatic mechanism to apply the sample rate to data that is aggregated in LiveNX to achieve the estimated bandwidth on the device.

LiveNX Reporting

The **Flow Reports**, **Flow Path Analysis**, **Dashboard**, and **Flow Interface views** will utilize the flow sampler multiplier provided by the sampler-options and the flow records. It multiplies the received flow bytes and packets by the multiplier to give a more accurate bandwidth. This is all done dynamically based on the configuration and flow records and options. Only the **Flow Device view** shows the raw Flow records received by LiveNX. We do not use the sampler multiplier in this view.

Device views

LiveNX - 10.20.1.98

File View Users QoS Flow Routing IP SLA LAN Tools Reports Help

Dashboard Manage Expand

QoS Flow Routing IP SLA LAN

Search: Example: (site = Honolulu) (site = Chicago) & wan & flow.app = webex-meeting

Protocol	Src IP Addr	Src Port	Dest IP Addr	Dest Port	Application	Bit Rate	In Bytes	Packet Rate	Src Country	Src Site	Dest Country
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.10 Mbps	4MB	2042.46 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.10 Mbps	4MB	2042.58 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.08 Mbps	4MB	2014.67 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.05 Mbps	4MB	2014.46 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.10 Mbps	4MB	2041.94 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	3.09 Mbps	4MB	2041.94 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	2.76 Mbps	3MB	1815.62 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	2.76 Mbps	3MB	1815.62 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	2.95 Mbps	3MB	1917.87 pps	Unknown	Unknown	-
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rip**	2.95 Mbps	3MB	1917.87 pps	Unknown	Unknown	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	2.16 Mbps	3MB	1468.13 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	2.15 Mbps	3MB	1457.86 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	2.12 Mbps	3MB	1437.85 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	2.12 Mbps	3MB	1437.95 pps	Los_Angeles	Los_Angeles	-

Color Mapping By Display Filter Colors
■ (Remaining)

Flow Path Analysis view

LiveNX - 10.20.1.98

File View Users QoS Flow Routing IP SLA LAN Tools Reports Help

Dashboard Manage Expand

QoS Flow Routing IP SLA LAN

Search: Example: (site = Honolulu) (site = Chicago) & wan & flow.app = webex-meeting

Protocol	Src IP Addr	Src Port	Dest IP Addr	Dest Port	Application	Bit Rate	In Bytes	Packet Rate	Src Country	Src Site	Dest Country
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	100.59 Kbps	123 KB	67.29 pps	Unknown	Unknown	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.92 Kbps	90 KB	46.20 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.54 Kbps	89 KB	46.37 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.49 Kbps	89 KB	46.08 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.46 Kbps	89 KB	46.39 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.22 Kbps	89 KB	46.16 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.20 Kbps	89 KB	46.20 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.06 Kbps	89 KB	47.95 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	70.96 Kbps	89 KB	46.23 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.11 Kbps	89 KB	46.20 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	71.03 Kbps	88 KB	46.25 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rip**	70.82 Kbps	88 KB	46.25 pps	Los_Angeles	Los_Angeles	-
UDP	10.20.40.1	2,670	10.20.1.119	2,055	unknown	248.39 pps	-	-	Unknown	Unknown	-

Color Mapping By Display Filter Colors
■ (Remaining)

Context Menu:

- Drill Down on Specific Flow
- Generate Web Report
- Export Flow Data
- Define Custom Application Based on Flow...
- Show Flow Path Analysis
- Execute Mediatrace
- Create Display Filter
- Add to Current Display Filter
- No Display Filter
- Create ACL based on Flow...

Search Example: (site = Honolulu) & (site = Chicago) & wan & flow.app = webex-meeting

Protocol	Src IP Addr	Src Port	Dst IP Addr	Dst Port	Application	Bit Rate	In Bytes	Packet Rate	Src Country	Src Site	Dst Country
UDP	10.20.41.10	23,030	10.20.25.10	55,542	rtp**	101.29 Kbps	126 KB	67.44 pps	-	Unknown	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	72.31 Kbps	90 KB	48.26 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	72.12 Kbps	90 KB	48.17 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	72.04 Kbps	90 KB	48.28 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	71.74 Kbps	90 KB	48.19 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	71.39 Kbps	89 KB	48.16 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	71.29 Kbps	89 KB	48.20 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	70.65 Kbps	88 KB	48.14 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	70.56 Kbps	88 KB	48.21 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	70.44 Kbps	88 KB	48.29 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	70.27 Kbps	88 KB	48.16 pps	-	Los_Angeles	-
UDP	10.20.25.10	55,542	10.20.41.10	23,030	rtp**	69.85 Kbps	87 KB	48.15 pps	-	Los_Angeles	-
UDP	10.20.1.98	58,466	10.20.41.5	161	snmp**	1.96 Kbps	182 B	0.00 pps	-	New_York	-

Flow Path Analysis

Flow: UDP 10.20.25.10:55542 -> 10.20.41.10:23030 3/27/17 7:44:00 PM - 7:49:00 PM Refresh Show Path

Device Name	LN-3925	PA-ASR9K
Application	rtp**	rtp**
CPU Usage +	15 - 22 %	3 %
In IF	GigabitEthernet0/2	GigabitEthernet0/0/0/1
Out IF	GigabitEthernet0/1	GigabitEthernet0/0/0/0
In QoS Policy +	DSCP/BE (0)	EF (46)
Out QoS Policy +	BE (0)	EF (46)
DSCP	BE (0)	EF (46)
Bit Rate	697 Kbps - 711 Kbps	633 Kbps - 723 Kbps

+ QoS Alert Enabled + Threshold Crossing Alert (TCA) + Interface/QoS Policy Drops

Color Mapping By Display Filter Colors

Reports view

Flow Reports

Q: Type here to filter reports.

- Reports
 - Interface Bandwidth
 - Top Analysis
 - IPs and Ports
 - IPs and Application
 - All Unique Flows
 - Address
 - Applications
 - Protocol
 - Protocol Port
 - Application Group
 - Application
 - Application Flow Duration
 - Top WAN Applications
 - Site Traffic Application
 - Site to Site Application
 - Site to Site Performance
 - DSCP vs Application
 - Business Relevance
 - Traffic Class
 - QoS
 - Network
 - Medianet
 - Applications (AVC)
 - Firewall
 - PKT
 - Wireless
 - AnyConnect
 - Ziften
 - Miscellaneous
 - Custom Reports
 - App1

Application 15m 1h 6h 1d 1w 30d Custom

03/27/17, 07:53:00 PM to 03/27/17, 07:58:00 PM Data bin: 1 minute Execute Report

Source: PA-ASR9K All Interfaces Number of flows: 60 Utilize Long Term Cache

Filter: No Display Filtering Inbound and Outbound Graph: Basic Flow Time Series Bit Rate

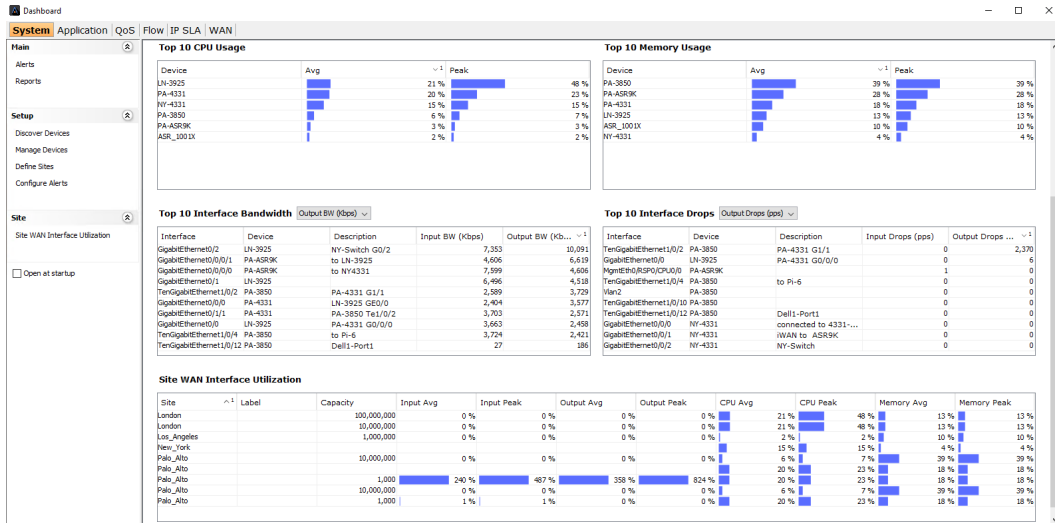
Search: flow.ip.src=10.20.25.10 & flow.ip.dst=10.20.41.10 & flow.protocol=UDP & flow.port.src=55542 & flow.port.dst=23030

Show Total Bit Rate

Number of datasets: 1

Application	Total Flows	Total Bytes	Total Packets	Average Bit Rate	Average Packet Rate	Peak Bit Rate	Peak Packet Rate
rtp	60	53 MB	287,310	1.41 Mbps	957.70 pps	1.43 Mbps	961 pps

Dashboard view



Flow Interface view

