

LiveAction Training Lab Workbook Pt. 1

NXOF-1.LWA.2.0.1

LiveNX Foundations Workbook 1

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July 2022.

LiveNX Foundations Workbook 1

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NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 IMPORTANT INFORMATION – Please Read!

The step-by-step Labs in this Workbook have been written specifically for the LiveAction Training Student Pod, documented herein. All "Pods" have been pre-configured with the appropriate software and generated traffic to successfully perform these labs. Pay attention to any notes presented as:

Note: This is a note example which gives additional information to the specific context.

The Diagrams, or screen shots, throughout this Workbook are *examples* for demonstration purposes and may not reflect the appropriate parameters for the classroom and/or your specific subnet. Unless specifically directed to do so, do not attempt to match the settings displayed in the screen shots to your configuration.

Traffic collected by your assigned Pod may not be synchronized with other Student Pods, and in some cases... due to specific application traffic timing, may not display the exact result specified in the Labs. The main intent is to know HOW to access the information... not to attain specific lab results.

Throughout this document *italics*, **bold** fonts, and words in CAPS, are used to place emphasis on specific procedures or results.

Lab.0

Lab 0: Setup and Get Connected

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 0.1: Connect to the Lab Network

For this class, each attendee or Student will connect to and manage their own LiveNX installation hosted by Criterion Networks. In this lab you will login to the hosting portal and connect to the lab environment.

You have been assigned a dedicated environment or "Pod", and this document provides you with information to help you login and run the hands-on labs. Your **Username** and **Password** should have been sent to you ahead of the course.

To login, go to <u>https://portal.criterionnetworks.com/</u> and enter the username and password that the instructor has shared with you. (Make sure to click the Terms and Conditions Check Box).

Each Student will manage:

Local:

- 1 x PC Workstation to be used as a Management PC (Your Laptop)
- 1 x Installed LiveNX Client (installation performed in the class)
- 1 x Browser (Chrome or Firefox recommended)

Remote Student Pod

- 1 x LiveNX OVA Linux install
 - 1 LiveNX Server
 - 1 LiveNX Node (installed on LiveNX Server)
- 1 x Network topology (shown below)
- 1 x Windows Workstation (May be accessed via RDC but not required) and Browser
- 2 x Remote PC's located in Branches (may be accessed via RDC but not required)



DIAGRAM

Lab Steps:

- 1. Connect your computer to the Internet.
- 2. Verify connectivity to the Internet by opening a browser to www.liveaction.com.

Note: Make sure to consult the Infrastructure Diagram and worksheets, as well as specific classroom instructions for names, IP addresses, and other parameters. The screen shots in this Lab Workbook are *examples* which may not reflect the appropriate parameters for the classroom and/or your specific subnet.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 0.2: Connecting to Your Training Pod

Throughout this Lab Workbook, you will be directed to connect to your Pod resources... use the IP Address & Port information provided by the Access Devices page in the Training Lab Portal.

The instructor will have emailed credentials/login information to you prior to the start of the Training Session... like that below...



Figure 2

Lab Steps:

1. Click the URL provided in the email.

Note: If clicking-on the URL does not automatically launch your default browser you may need to copy the URL to your browser address bar.

- 2. Enter the Username & Password as provided in the email.
- 3. Tick the "Terms of Service" box.
- 4. Click Enter.

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5. You will be taken to the **Home Screen**, where you will see Learning Options. Your Labs will be found in the **Learning Center** tile on the right.

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NETWORKS	earning Center, Experience, Design Center			
Home	Design Center	Lear	- rning Center	<u>لهم</u>
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Esperience	Upgrade your subscription		Goto Active Learnings	50 - 9
Showcraes Sandbowes				
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	Not evelable in your plan		veileble in your plen.	
1 Statistics	Upgrade your subscription		Upgrade your subscription	
4				

Figure 3

6. To find your Labs, click on the Subscribed option in the Learning Center tile.

	Available Subscribed Active Scheduled	
Home	Q	All Others
Design	LIVENX FLOW FOUNDATION C	ori, environments
Showcases Sandouxes	Lab Run Time - 48 Hours Available Tiles - 1	Schedule Leunch.Nov
leam	LIVENX AND CISCO SOWAN INTEGRATION V9.3 C This bit would periode an owniew of Livent monitoring confinematics with Cisco bowns, though a mix of enrolees in this bit, we The transmission of the configuration of the con	e would run through the setup, integration and necessary steps to
Statistics	Lab Run Time : 4 Hours Anailable Tries : 1	Schedule Launch Now
*		

- 7. The Lab Pod may or may not be running already. You can check this status by looking to the right of the panel of the LiveNX Flow Foundations lab. If it says **Launch Now**, you should launch the lab by clicking **Launch Now**. If it says **Access Lab**, then it is already launched, and you can access it by clicking the **Access Lab** link.
- 8. Once in the lab menu click Access Devices.

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9. Here you have two tabs: Topology, which is a live **Topology** map (click devices to access them), and **Lab Details**, which lists the IP addresses and ports of the devices. You can Remote Desktop Connect to the workstation and PC's in the labs.

		0%		Queued	Spawning	Provisioning	Stabilizing	Ready
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		4	SP2_MPLS2	SP2_MPLS2	admin	C1sco12345	35.226.145.33	20155
Sandboxes		5	BRI	Branch1+LA	a dimin	C1sco12345	35 226 145.33	20160
		6	82-HQ	HQ-B2	admin	C1sco12345	35.226.145.33	20157
Learn		7	SP1_MFLS1	SP1_MPLS1	admin	C1sco12345	35.226.145.33	20158
		в	SP1_MPLS2	SP1_MPLS2	admin	C1sco12345	35.226.145.33	20150
		9	882	Branch2-NY	admin	C1sco12345	35 226 145.33	20161
		10	wkst1	Administrator	Administrator	C1sco12345	35.226.145.33	20201
Statistics		10	Activedirectory	Administrator	Administrator	C1sco12345	35.226.145.33	20202
		12	PC1	Administrator	Administrator	C1sco12345	35.226.145.33	20203
		13	PC2	Administrator	Administrator	C1sco12345	35 226 145.33	20204
	+ Add Hours							
	Terminate		_					

Lab 0.3: Install the LiveNX Client

A direct connection from the LiveNX Client installed on your workstation is the most efficient method to connect with the Engineering Console. You'll install the LiveNX Client now, so it is ready for use in future labs.

Note: The Instructor will provide version information prior to the training session (via facilitation email). Make sure to download & install the appropriate version of the LiveNX Client as directed.

To install the LiveNX Client:

- 10. Download the appropriate Client version from the LiveAction Web Pages, or from the Training Resources page.
 - https://cloudkeys.liveaction.com/downloads
 - http://www.liveaction.com/support/training-resources/

11. Launch the installer.

12. Accept all the defaults, as appropriate.

Note: At this point we will NOT login to the LiveNX Server... instructions for connecting & login are provided in a subsequent Lab.

Lab 1

Lab 1: The LiveNX Web UI

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 1.1: Explore the Web UI

These Labs uses the WebUI exclusively.

The LiveNX WebUI provides an easy, convenient way to view the data collected by LiveNX. You may create custom Dashboards to give visibility across your entire Enterprise, perform LiveNX configuration, view & troubleshoot topology & devices, as well as view/run/schedule reports. Dashboard settings are saved per-user login but may be initially based-upon the admin users' setup.

Note: The displays in these UI labs will vary, depending upon how long your Pod has been running, as well as the variety of traffic. These labs are meant to illustrate *how* to get at the information... results are not important. Diagrams are for illustration purposes and may not reflect the data you may view on your Training Pod.

In this, and all subsequent Labs, utilize the addressing <ipaddress> and TCP ports <port> provided on the Access Devices web page. In this Lab you will view the different features of the LiveNX WebUI.

Lab Steps:

13. Open your Browser and navigate to the LiveNX Server at https://<ipaddress>

14. Login to the WebUI using: Username: admin Password: Student

	Live <mark>NX</mark>	
Username		
Password		
	Login	
By clicking "Log	in", I agree to the terms of LiveAction's <u>EULA</u> First time user information	

Figure 6

The Overview screen will appear.

Note: The contents of this screen may change dependent upon the *version* of LiveNX being run.

15. Hover over and/or click the various icons at the Top-Right of the screen to see what they do!

erview Enter Filter Requ	est Here						🕁 Applyfilter 🛛 🕄
ites, Devices, Interfaces by Sta	tuses					Active Alerts	
						ALERTS E	TIME OPENED
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						Branch1-LA.doloud visco.com running application rtp had 200.00 ms of jitter for traffic with a DSCP value of 46 (EF)	22 Sep 2021, 05:52
						 Over 1% of Voice traffic for Branch/I-LA.dcloud.clsco.com running application statistical-p2p is not marked as DSCP EF. 	21 Sep 2021, 08:42
SITES 💕	0	DEVICES 0	0	INTERFACES 2	0	H0-82 deloud class communing application rtp had 200,00 ms of jitter for traffic with a DSCP value of 0 (0E)	21 Sep 2021, 06:12
• UA		Branch1-LA		GigabitEthernet2(Branch1-LA		HQ 82 deload.clsco.com running application rtp had 200.00 ms of (itter for traffic with a DSCP value of 0 (BE)	21 Sep 2021, 06:12/
 H0 		HOR2		GigsbitEthernet2E43-Et1		Branch1-LA deloud elsee.com running application rtp had 200.00 ms of jitter for traffic with a DSCP value of 0 (BE)	21 Sep 2021, 06:12/
		 HQ81 		GlobblEthernet2HO-B2		 Branch1-LA doloud class comrunning application rtp had 200.00 ms of jitter for traffic with a DSCP value of 0 (BE) 	21 Sep 2021, 05:127
				GigabitEthernet3(HQ-B1)		H0-82 deloud claco com running application rtp had 200,00 ms of) ther for traffic with a DSCP value of 46 (BF)	21 Sep 2021, 04:03
				 GigsbitEthernet3(-IQ-B2) 		A HQ-82 deloud.cisco.com running application rtp had 200.00 ms of j Her for traffic with a DSCP value of 34 (ΔF41)	21 Sep 2021, 04:03
				 GigsbitEthernet-Waranch I-LA 		 HQ-B2 doloud cisco com running application rtp had 200.00 ms of jtter for traffic with a DSCP value of 46 (EF) 	21 Sep 2021, 04:03
						 HQ 82.deloud.clsco.com running application rtp had volce/video traffic with 200.00 ms max jitter 	21 Sep 2021, 04:037
						 HQ-82.dcloud.cisco.com running application rtp had 200.00 ms of jtter for traffic with a DSCP value of 34 (AF41) 	21 Sep 2021, 04.03
						Over 1% of Voice traffic for HQ-B2.dcloud.claco.com running application openwebnet is not marked as DSCP EF.	21 Sep 2021, 04:03.
						Branch1-LA.doloud.clsco.com running apolication rtp had 200.00 ms of jitter for traffic with a DSCP value of 34 (AF41)	21 Sep 2021, 04:02/
						 Branch1-LA.doloud.cisco.com running application rtp had 200.00 ms of jitter for traffic with a DSCP value of 34 (AF41) 	21 Sep 2021, 04:02/

Figure 7

16. Click the **Menu** icon at the Top-Left and explore the menus.

Main Patri	lero.						<o applyfilter="" au<="" th="" ø=""></o>
Overview tuse	;					Active Alerts	
Deanboard						ALERTS 📴	TIME OPENED
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AND		H0-81		GigabitEthemat2IH0-82		Branch FLA, odoud, discollopming application its had 200.00 ms of jitter for traffic with a CSCP value of 0 (BE)	21 Sep 2021, 06:12 AM
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						Branch1-LA.ddoud.cisco.com running application itp had 200.00 ms of jitter for traffic with a CGCP value of 34 (AF41)	21 Sep 2021, 04:02 AM
						Branch1+LA.ddoud.cisco.com running application rtp had 200.00 ms of jitter for traffic with a DSCP value of 34 (AF41)	21 Sep 2021, 04.02 AM
Reports						Branch1-L3.ddoud.claco.com running application rtp had voice/video traffic with 200.00 ms max jitter	21 Sep 2021, 04:02 AM
à LiveNA							
P Configure							

Figure 8

17. Select Sites.

	_							
tes Enter Filter Request Here						Apply filter Mar 20, 2	022 07:40:00 → Mar 20, 2022 07:55:00 1	S Min 2 Auto Configure Site
							Q. Search.	
SITE NAME	♀ SITE STATUS	DEVICE REACHABILITY	٥	DEVICE OPU, M EMDRY		PEAK UTILIZATION OUT	CONCESTION DROPS	INTERFACE DRIVERS
Sile Name	All	✓ AII	~	All 👻	Peak Utilization In	Peak Utilization Out	AI v	Interface Errors
нq	•				52.77%	30.74%		
LA					28.12%	38.03%		

Figure 9

Note that the sites, and their associated statistics, are listed in columnar format.

Note: Detailed site information is discussed in the Device Semantics Lab.

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18. Note: Status, Utilization, Drops, Errors, etc....

- 19. Toggle the Auto Update to ON.
- 20. Click on the link to LA to see additional site info.

Anytime you wish to return to a prior level, or the WebUI home, you can click the Breadcrumbs (A) or Menu icon (B).

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520													
							=						
728													
0 07541 07542 07543 07544 (07.48 07.46	4547 0248	07:50	07:51 07:	7.62 07:53	a 07:64	07:55						
			Q	Search			0 A						
Legend O Service Provider O F	News C	Bytes C	Q. Packets 0			Packet Rate C							
SP1_MPLS	404	38.54 MB	Packets 0 111,4	Bit Rate C	342.60 Kbps	Packet Rate O	123.86 pps						
			Packets 0 111,4	Bit Rate C		Packet Rate C							
SP1,MPLS SP2.MPLS	404	38.54 MB	Packets 0 111,4	Bit Rate C	342.60 Kbps	Packet Rate O	123.86 pps 0.14 pps						
SP1,MPLS SP2.MPLS	404	38.54 MB	Packets 0 111,4	Bit Rate C	342.60 Kbps	Packet Rate O	123.86 pps						
SP1,MPLS SP2.MPLS	404	38.54 MB	Packets 0 111,4	Bit Rate C	342.60 Kbps	Packet Rate O	123.86 pps 0.14 pps				Ø		
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SP1.MPLS SP2.MPLS ence Provider Bandwith (Dutbound) 7/8	404	38.54 MB	Packets 0 111,4	Bit Rate C	342.60 Kbps	Packet Rate C	123.86 pps 0.14 pps		Braz	ch1-LA.deixe	ad eisco.com		
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Figure 10

21. Select Topology > Geo Topology

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Geo Topology						Avendo		Devices	FILCT NR.	(C) W	AN Applications	ACTIVE ACTO	jej jej
Logical Topology represe												×	•
	und)											~	SP1_MPLS SP2_MPLS
Stories													
Reports							-					=	
LiveNA													
Configure	07.43	07544	07:48	07548	02547	07.48	07:49	07:50	07:51	07.62	07:50 07:54	07:55	
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													121
	07.43	07.44	67.45	07-46	47,47	07.48	07:49	07:50	07.51	67.52	67:53 67:54	07.55	
/aff1501323-liveaction.pods								Q Sec				II 3	😑 Critical 😑 Warning 🛑 Good 🔘 Polling Disabled 🔘 N/

Figure 11

22. Click on a Site to see additional information & pivot points to other views/details. Lab 1.1: Explore the Web UI © Copyright LiveAction 2022

LiveAction	i NX		New Festures: ▲ 12 = 0 ● 0 ▲ 43 {-} = Ø = Ø = Å aomin
to Topology Enter Fi	liter Request Here		d> Apply filter Mar 20, 2022 07:45:00 → Mar 20, 2022 08:00:00 15 Min. ∀ 32 Auto
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		LUIC PAGE SUTTRECEBERAN LOS ANOCO A PARAMENTAL SAN ELEMANDAR	You can also jump to the Alerts and Historical Alerts pages using these PIVOT points
e Status Normal • Warnin	^	Long Polar Springs*	
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DSCP	 V Image: A start of the start o	TILENE.	
0 (BE) = 34 (AF4 46 (EF) = 48 (CS)			TUCSON

- 23. Click on the Menu button in the upper left, then select Configure at the bottom.
- 24. Select Device Management.

		My D	vices (3)					м	y Inter	faces (7)							Nacover	ed Devices	(0)								Autodisc	overy (0)			
Edit	Refresh L	ist Co	ifgure	Delete	Rediscover In	terfaci	8																		Q, Sea	ch.,					
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	Device	Δ1	¥	IP Address	All	~	Model	Node		Site					All	v	AI	~	AJ	~		A1	~	A1	×	All	×	Tags		AI	×
	HQ-81	Up		198.18.129.24	Cisco		ciscoProducts	Loca//Server		HQ			2			~		~		~										10 se	econds
	Branch1-LA	Up		198.19.1.1	Cisco		clocoProducts	Local/Server		LA			3			~		~	~									10 00	econde		
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1Dw18	1																														

Figure 13

See that you can add devices, and run Device Discovery, from the WebUI. We'll run Discover Devices in a subsequent Lab.

Lab 1.2: Dashboard Overview

Note: Diagrams are for illustration purposes and may not reflect the data you may view on the Training Pod.

In this Lab you will Create and Modify your own Custom Dashboard.

Lab Steps:

25. From the **Main** menu, click on **Dashboard** (1), then click on the **+** icon (2) to create a new tab in the dashboard space Dashboard. This will appear as "New Tab".



Figure 14

26. Click Custom Dashboard (marked in Red in the screenshot).



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27. Some options can be expanded to show more details, while others can be directly dragged to the dashboard. Drag-and-drop (A) or click + to add Widgets to your custom dashboard.

shboard	Ð						Jul 2	Add widget	
	Status	994.N		System	11	Alerts	12	Current dashboard: New Tab Added 0 out of 9 widgets	
								A Drag and Drop widgets from thi	<u> </u>
					Share			Alerts panel	
		Custom Dashboard				rve no shared dashboards on thi con for thet is no one shared ony das		Availatility	
								Availability = Top Devices With Least Availability	
							O: Top interk	acces With Least Availability Top Stevice Providers with Least Availability Top Stev with Least Availability Totals by Sites, Devices and Interfaces	
								Applications Top Application Performance Summary	
		x WAN	Drop widgets here	System				E Top Volce/Video Performance Summary	
								Source Address	
								Destination Address	
								Source or Destination Address	
								Site Traffic Source Site Traffic	
								Destination Site Traffic	
								E Bidirectional Source/ Destination Pair	
								Network One are a Michaertek	
								Create New Widget	

Figure 16

Note: For the purposes of this Lab, you may choose any combination of widgets to add to your custom dashboard. You can add up to 9 widgets on a single Dashboard.

- 28. Delete un-wanted Widgets by clicking the X at top right of the widget.
- 29. To give the dashboard tab a more appropriate name, simply select the **New Tab** text and rename your dashboard.
- 30. You can also change the order. Click the **6-Dots** and drag to the location you wish to move it too much like a browser tab.

ashboard [©]						Jul 22, 2021 22.5	800 - Jul 22, 2021 23:1000	Add Widget 🥜
Status	II WWN		System	8	Alerts	=	New Tabi 🚶	+
Enter Filter Request Here						6	5	 Apply filter
Current Active Alert Count Alert Count By Site		× 🗧 Current Active Alert Count Ale	ert Count By Category	4 ×	🗄 Availability Top Devices	With Least Availability		×
				-		100.0		

Figure 17

You may edit or add to your Dashboard by using the Add Widget icon at the Top-Right.

Note: Since LiveNX stores *breadcrumbs* it will retain a trail of the last page you've visited in the WebUI, based-upon your individual login credentials. Unless shared... Your custom Dashboard will not be visible to others.

Lab 1.3: Pre-Configured Stories

The LiveNX WebUI has several pre-configured *walk-thrus*, or Stories, built-in. These Stories may help you easily find specific workflows and statistical information regarding your monitored devices.

Lab Steps:

- 31. Click the Menu icon.
- 32. Select Stories, and Site-to-Site Analysis.



Note: Diagrams are for illustration purposes and may not reflect the data in your Training Pod. These labs are meant to illustrate *how* to get at the information.

33. Select Direction > Inbound.

LiveAction: Instantian	NonFactorer		• 0 🌲 1 Mar 20, 2022 153			
	incerte - discont				Diagnam	Table
VIEW FILTER Description Heliowed Curroning Mittele Tandastitis Uniteration		βı				

Figure 19

34. Hover-over for Utilization info or select an area of the chart to display a Sankey Flow Diagram.

To Site Analysis > LA - HQ		< Mar 20, 2022 15 20.00 → Mar 20, 2022 15	35.00 > 15 Min ~ 2 A
Hitch Direction Enter Filter Request Here		Appy Star MAN Centre Man Centre	of Filter Flow Deta
ication VIII VIII VIII VIII VIII VIII VIII VI	All 🗸	Sanico Provider All	Al
P 4x	0.(BE)		
nrvragen: perwebest	41 (EF)	SP1.MPLS	Norm
	34(4541)		
anip Idozenii			

Figure 20

View the other pre-configured Stories to discover how they may help you with Capacity Planning, Inventory, and Network Management.

You may access any of the default reports in the WebUI, as well as utilize as a *template* any Dynamic Reports created in the LiveNX Client.

Lab Steps:

35. Click the Menu icon.



- 36. Select Reports, and View Reports.
- 37. From the Top Reports section, select Application

View Reports			View Schedux	Create Re
Templates Reports History				
Q By Template Name				Table T
Default Templates	Favorite Reports			0
				0
Voice Analysis	-			
WAN C	Too Reports			0.0
Feverite Applicationa				
Apple Fastiane Applications	NAME C	DESCRIPTION Q		
Apple Fastiane Voice Analysis	Amplication	This Flow-based repo	t will high light the Top 10 applications' bendwidth, based on the selected filter criteria. It will also intup to 1000 applications.	
NAN Capacity Planning	Top Conversations		t will high light the Top 10 conversions, based on the selected filter offsets. It will also list up to 1000 conversations.	
Site Network Performance Audit	Interface Bandwidth	This Flow-based repo	t will highlight the Top 10 interfaces bandwidth, based on the selected Filter criteria. It will ist up to 1000 interfaces.	
/olce/Video Performance Vs. Network	DSCP	This Flow-based repo	t will helpfulph the Top 10 DSOP manings' bandwidth, based on the selected filler criteria. It will list up to GLOSOP values.	
Site-to-Site Traffic Utilization Audit	Top Interface Bandwidth	This SNMP-based rep	ort shows a table of all the interfaces benchridth utilization per the specified files.	
Service Provider DSCP Audit	Top Interface Errors	This SNMP based rep	ort shows a table of all interface errors (CRC/Runta/Overnuna, etc.) per the specified filter.	
Frack Single Site WAN Path Changes	Top Class Bandwidths	This SNMP-based rep	ort shows a table of all QoS class bandwidths for all interfaces per the specified filter.	
Application Vs. Network Performence	Top Class Drops	This SNMP based rep	ort shows a table of all GoS class chops on all interfaces per the exectined filter.	
Voice/Video Service Provider Performan	Interface Bandwidth	This SNMP-based rep	ort graphs bandwidth utilization of a specific interface.	
Application Service Provider Performan	Interface Utilization	This SNMP-based rep	ot graphs the interface bandwidth utilization (by percentage) of a specific interface.	
SDWAN Application Service Provider Pe	Interface Errors	This SNMP based rep	ort graphs the number of interface errors (DRC/ Runts/ Dvervuns/ etc.) of a specific interface.	
SDWAN Application Vs. Network Perfor	Post-Policy Drops	This SNMP-based rep	ort graphs the QoS drops of all classes on a specific interface.	
SDWAN Voice/Video Performance Vs. N 🔞	Application OSCP Audit	This Flow-besed repo	t will show the DSCP markings of applications organized by site, based on the selected fitter criteria.	
SDWAN Voice/Video Service Provider P	Interface Bandwidth Sur	mary This Flow-based repo	t will high light the ingress and egress interface bandwidth, based on the selected filter criteria. It will ligt up to 50 interfaces.	
WAN Application Vs. Network Performs				
WAN Application Service Provider Perfo 🔞	Default Templates			0
WAN Voice/Video Performance Vs. Net	NAME O		DESCRIPTION 🛆	
WAN Voice/Video Service Provider Perf			active care 2	
	Voice Analysis		This group of reports is useful for understanding enterprise-wide CoS performance for YoRP It includes DSCP maning validation per site, QoS performance internation, and Volce/Viceo performance data gitter	and pecket loss), b
	IWAN		This group of reports provides rapid understanding of Claco IWAN performance and utilization. It includes an understanding of which service provider a specific class of thatfic is utilizing deley/loss/jitter measure	rements by traffic o
	Favorite Applications		This group of reports provides an understanding of the applications seen at a specific site, their performance (based on the Cloco Performance Monitor), traffic class, and business relevance.	
	Apple Fastlane Applicati	ms	This group of reports provides an understanding of the Apple Fastiane applications seen at a specific site, their performance (based on the Cisco Performance Monitor), traffic class, and business relevance.	

GENERAL SETTINGS		REPORT LIST		REPORT DETAILS		
Name		Application (Flow)	Fast 🗈 🔳	Report Name	Flow Type	
MY Application		Add New Report	+	Application	Basic Flow	~ ~
Presentation Mode				Report Description	Execution Ty	ype
Standard	~			Enter report description	Time Serie	s v
Footnote				Devices	Sort Dy	
Enter report group description				All WAN Devices	Bit Rate	
Time Zone	DST			Interfaces	Business Ho	ours
(GMT-05.00) America/New York	~			All WAN Interfaces	 All Hours 	Cannot be used with All Devices
Time Range				Flex Search 😡	Bin Duration	
Last Hour	~			Ex : site=Honolulu & wan & flow app=http	× 1 Minute	D v
Flex Search 🔞				Display Filler		-
Ex.: site=Honolulu & wan & flow.app=http	×			No Display Filtering	Due to the	e options selected, this report will utilize the
Display Filter				Direction	Raw Flow	datastore (slower)
Select Display Filter	~		C	Inbound and Outbound Combined		
Sharing Settings						
Email 🔆						
Enter an email address or AD entity						
					0	ncel Save As Template Execute

Figure 23

38. Select Options.

- Name: My Application
- Time Range: Last Hour
- Direction: Inbound and Outbound Combined
- Bin Duration: 1 Minute

39. Click Execute.

Tempiates Reports History									
Q By Template Name	My Applica	ation					View Options ~	Share Download	Schedule Copy Clo
efault Templates	Application	(Flow)		Directio	n		Bin Time	Range Show	n (1hr) 🔹 🗸
bice Analysis	Devices All WA	N Dovices Interface: All WAN Inter	faces Display Filter: No Display Filt	pring Dissetles: inbound and Outb	ound Combined Flow Type: Easto Flo	w Execution Type: Time Series Sert By: Bit	Rote Bin Duration: 1 Dirute Start Time Jul 23, 22	21 22 42 28 601 (SMT 04.00) End Tax	w. Jul 22, 2021 21:12:28 EDT (SMT04:03)
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ple Fastiane Voice Analysis									fip laneragent
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ce/Video Performance Va. Network 🌘	20.43	20.49 20.50	20.50	21,00 21,05	21,00	21(75 21(20	2125 20130 213	19 21.40 21.42	Toral
Ho-Site Traffic Utilization Audit									
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ck Single Site WAN Path Changes	h hand o	Application O	Total Flows C	Total Bytes O	Total Packets O	Average Bit Rate O	Average Packet Rate O	Peak Bit Rate O	Peak Packet Rate O
plication Vs. Network Performance		rtp-audio	54	20.79 MB	103,936	46.19 Kbps	28.87 pps	109.14 Kbps	68 ;
ice/Video Service Provider Performan	_	ica	206	4.23 MB	63,542	9.40 Kbps	17.65 pps	23.52 Khps	43 (
plication Service Provider Performan.	_	ipfix	21	2.70 MB	2,884	6.00 Kbps	0.80 pps	53.94 Kbps	51
WAN Application Service Provider Pe.	_	anmp	215	1.83 MB	6,876		1.91 ppa	13.61 Kbps	41
WAN Application Vs. Network Perfor.	_	ftp	168		40,278		11.19 pps	5.46 Kbps	17 :
WAN Voice/Video Performance Vs. N		sip	65	1.33 MB 929.65 KB	7,169		3.29 pps	8.24 Kbpc 8.02 Kbpc	9
	_	sip	51		12.885		3.58 pcs	1.41 Kbps	4:
Naki Voine/Video Service Provider P		ospf	389	226.78 KB	2,835		0.79 pps	1.25 Kbps	1
							0.59 pps	13.62 Khps	16 :
WAN Voice/Video Service Provider P		sah	27	210.89 KB	2,120				
	. —	sah	27	210.89 KB	2,120	0.47 Kirps		To be haps	10)

This report displays all the applications transiting the network in the **past hour**, in table format, with color references for the top 10 items by Total Bytes. All reports display 10 metrics per display page.

Note the **Report Options** on the image.



- 40. Hide a metric by clicking on the Legend (in the table, or on right of chart).
- 41. Re-sort by clicking on the Sort Arrows.
- 42. **Zoom-in** by Left-click-drag a portion of the chart.
- 43. Reset Zoom to normal.

flew Reports												View Schedule	Create Report
Templates	Reports Histo	n											
Q, By Template Name		My Application View Options + Shale Downood S										Schedule Ca	Ciose Ciose
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le-to-Site Traffic Utiliza													
te-to-care treffic title 28	tion Audit	0									0		
noto eann Traithe Utiliza Invice Provider DSCP A		0	ii < Page 1]/a>>							Q, Search		
rvice Provider DSCP A	udit			/a >> Application ©	Tots Flows C	Total Bytes O	Total Packets 🗘	Average II it Rate O	Average Packet Rate C		Q, Search Peak Bit Rate C	Peak Packet Rate :	
rvice Provider DSCP A ick Single Site WAN P	udit ath Changes	0			Total Flows 0 54	Total Byles 0 20.79 MB	Total Packets © 103,936	Average Bit Rate C 46.19 Kops	Average Packet Rate O	28.67 pps			0
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nice Provider DSCP A ick Single Site WAN Pr plication Vs. Network Ica/Video Sarvice Pro- plication Service Prov	udit eth Changes Performance rider Performan	0 0 0	Legend 0	Application © rtp-oudio ica IoTX symp	54 206 71 215	20.79 MB 4.23 MB 2.70 MB 1.83 MB	103,936 63,542 2,084 6,075	46.19 Kbps 9.40 Kbps 6.00 Kbps 4.07 Kbps		28.87 pps 17.65 pps 0.80 pps 1.91 pps	Pesk Bit Rate C 109.14 Kap 23.52 Kap 53.54 Kap 13.61 Kap	5 5 8	0 68 pt 43 pt 5 pt 4 pt
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vice Provider DSCP A cic Single Side WAN Po dication Vs. Network cas/Video Service Pro- dication Service Pre- MAN Application Serv AWA Application Vs. 1	udit eth Changes Performance rider Performan ider Performan ider Provider Pe Natwork Perfor	6 6 6 6 6 6 6 6 6 6 6 6 6 6 7 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Legend 0	Application () rtp-odio ica bitx somp ftp iarrevapont	54 206 71 215	20.79 MB 4.23 MB 2.70 MB 1.81 MB 1.61 MB 1.33 MB	103,936 63,542 2,384 6,775 40,278 11,841	46.19 Knps 9.40 Knps 6.00 Knps 4.07 Knps 3.58 Knps 2.07 Knps		28.87 pps 17.65 pps 0.80 pps 1.91 pps 11.19 pps 3.29 pps	Peek B t Rate () 109,14 Kap 23,52 Kap 53,54 Kap 54,6 Kap 8,24 Kap 8,24 Kap	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0 68 pp 43 pp 8 pp 4 pp 17 pp 9 pp
vice Provider DSCP A cic Single Site WAN Pr plication Va. Network Clarvideo Service Prov plication Service Prov WAN Application Serv WAN Application Vs. 1 WAN Volce/Video Per	udit eth Changes Performance Kder Performan Ider Performan Ider Promider Pe Network Perfor formance Vis. N	6 6 6 6 6 6 6 6 6 6 6	Legend C	Application () rip outlin ica IbTX srmp Tip	54 206 71 215 108 65	20.79 MB 4.25 MB 2.70 MB 1.80 MB 1.61 MB	103,936 03,542 2,384 6,375 40,278	46,19 Kbps 9,40 Kbps 6,00 Kbps 4,07 Kbps 3,58 Kbps		28.87 pps 17.65 pps 0.80 pps 1.91 pps 11.19 pps	Peak Bit Rate () 109.14 Kinp 23.52 Kinp 53.54 Kinp 13.51 Kinp 5.46 Kinp	55 56 56 56 58	0 68 pp 43 pp 5 os 4 pp 17 op 9 pp 9 pp
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44. **Schedule** the Report to run Hourly.

Name		
MY Application		
Run Report		
Hourly		
Never	~	
		DST
Time Zone		
Time Zone (GMT-05:00) Ame	erica/New York	× .

Figure 27

45. Verify that the report is now scheduled by navigating to **View Schedule**.

View Reports		11 View School View
Templates Reports	History	
Q. By Template Name		My Application View Options - Share Download Schedure Copy Dow
efault Templates		Application (Flow)
loice Analysis	0	Device of Weinbacks Ender of Weinbacks Ender of Weinbacks Ender of Data and Online of Hearty Education (Section Section Sector S
MAN	0	Bolared 1 minus
avorite Applications	0	see
pple Fastiane Applications	0	
pple Fastiane Voice Analysis	0	90 av
	0	
VAN Capacity Planning		



Lets have a look at creating a Custom Report

- 47. Navigate back to reports by clicking **Reports > View Reports**.
- 48. Click Create Report (top right of screen)
- 49. Expand (A) Flow and then expand (B) QoS.

GENERAL SETTINGS	REPORT LIST	RI	PORT DETAILS	
Name	Please choose report type	<u> </u>	B Flow	
Enter report group name	Add New Report	+	Address	~
Presentation Mode			Analysis	~
Standard \sim			AnyConnect	~
Footnote			Application Performance (AVC)	~
Enter report group description			Applications	~
			Firewall	~
Sharing Settings			LiveAgent	~
Email %		- I.	Miscellaneous	×
Configure email settings to enable sharing			Network.	~
File Format Send PDF Send CSV			Network Users	~
PDF Row Limits			PfR	~
All Rows 🗸		в	QoS	^
Custom Logo ()		_	Application DSCP Audit	
No Custom Logo			DSCP	
			User Filter DSCP Audit	
			VMware SD-WAN (VeloCloud)	~
				Cancel Save As Template Execute

- 50. Select Application DSCP Audit.
- 51. Click Execute.
- 52. Verify the Application to DSCP values

Templates Reports Histo	9												
Q By Template Name		Application	DSCP Aud	it, Last Fifteen Minute	6					View Options ~ Sh	ine Download	Schedule Copy	Clos
y Templates		Application (SCP Audit (F	low)									1
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e Network Performance Audit	0	< Page 1	14.2.2							0	Search		0
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rvice Provider DSCP Audit	0		NY	rtp-audio	46 (EF)	14	5.40 MB	27,009	48.02 Kbps	30.01 p			32
ack Single Site WAN Path Changes	0		HQ	rtp-audio ica	46 (EF) 0 (BE)	14	5.37 MB 1.15 MD	25,835	47.71 Kbps 10.25 Kbps	29.82			33
plication Vs. Network Performance	0		HQ	ica	0 (86)	56	1.15 MB	17,213	10.20 Kbps	19.13			20
ice/Video Service Provider Performan.		_	HQ	lanrevapent	0 (BE)	26	547.74 KB	4.483	4.87 Kbps	4.98			5
polication Service Provider Performant.	-	-	HQ	ipfix.	0 (BE)	16	535.01 KB	667	4.76 Kbpc	0.74	DG 54.03 KB	00	5
WAN Application Service Provider Pe			NY	sip	0 (BE)	19	422.91 KB	3,032	3.76 Kbps	3.37	p8 5.57 Kb	p9	5
WAN Application Vs. Network Perfor	-	-	HQ	snmp	0 (BE)	52	413.23 KB	1,608	3.67 Kbps	1.79 (ps 4.44 Kb	ps	2
WAN Voice/Video Performance Vs. N	0	-	HQ	TO	0 (BE)	28	271.40 KB	6,785	2.41 Kbps	7.54			8
WAN Voice/Video Service Provider P			NY	lanrevagent	0 (BE)	9	166.08 KB	1,911	1.48 Kbps	2.12	ря 2.50 Кб	ps	3
	-												
WN Application Vs. Network Performa WN Application Service Provider Perfo WN Voice/Video Performance Va. Net	0												



NXOF-1.LWA.2.0.1LiveNX Foundations Workbook 1Lab 1.5:Enable / Customize Alerts

The LiveNX Alert System is able to visually, or via email, inform you if there is any anomolous behavior or issues with your monitored devices. A wide variety of issues may be brought to the attention of users with LiveNX Alerts.

Note: By default, no alerts are enabled during initial LiveNX installation. It is up to the administrator to turn on alerts & notifications.

In this Lab you'll enable and customize alerting for Voice or Video packet drops.

Lab Steps:

53. Click the Menu icon.

54. Select Configure, and Alert Management.

	QoS Class Drop	Device, Interface	 Warning 	Qos Class VOICE Drop Rate > 20 kbps for at	Web UI
	QoS Interface Drop	Device, Interface	Warning	Drop Rate > 2500 pps for at least > 0 minutes	Web UI
	Routing Adjacency State Change	Network	A Critical	for at least > 0 minutes	Web UI
	Routing Polling Error	Network	A Critical	for at least > 0 minutes	Web UI
	Site Reachability	Network	 Info 	for at least > 5 minutes	Web UI
	Spanning Tree Topology Change	Network	A Critical	for at least > 0 minutes	Web UI
~			 Definition 		

Figure 32

55. Click on QoS Class Drop.

Enable On	d				
🗸 Th	is alert may contri	bute to stat	us of an Interfa	ce, Device, and/	or Site.
Severi	ty				
V	/arning				~
status.	Severity for this ale When the severity holds				
	omatic Resolutior	Time * 🚯			
0					min
	Catch All Thresi All non-specifi Drop Rate * 0	ed QoS Cla	For at L	Least *	min
	Qos Class *				
	VOICE				
~	Drop Rate *		For at Least	*	
	20	kbps	> 0	min	
	Qos Class *				
	VIDEO				
~	Drop Rate *		For at Least	*	
	50	kbps	>1	min	
	Specific QoS Clas				

- 56. Select to Enable this alert.
- 57. Change the Severity if desired.
- 58. Enter QoS Class "VOICE".
- 59. Define a DROP RATE of 20.
- 60. Leave FOR AT LEAST of "0".

Note: The effect of 0 mins means ANY occurrence will trigger the alert.

- 61. Click Add More
- 62. Enter QoS Class "VIDEO".
- 63. Define a DROP RATE of "50".
- 64. Define the interval of "1" min.
- 65. Click Save.

NXOF-1.LWA.2.0.1

LiveNX Foundations Workbook 1

Although you may not see immediate alerts based-upon this customization... future QoS Labs will activate this alert... depending upon traffic reply on the Training Pod. Alerts notification is at the top of the WebUI.



Figure 34

66. Enable ALL alerts (This is for use in a later Lab).

M	nagement [©]										Maintenance M	ode View A	ilert
					U.	eNX Alar	ts						
		Clickthi	how to										
Enso	0 Disable	Click this	S DUX LU							Q Sear			
	ALERT TYPE	enable a	II Alerts		SEVERITY		ENABLED	~	The Figure Int	SHARINS			
				Ť		Ŷ		~					Ť
-	Anen Type		All	~	All	~	Al V		Thresholds	Sharing			
	IPSLA Voice/Jitter Test		Network		Critical		~		Total Test Errors > 3 Errors for at least > 0 minutes	Web UI			
	Line Card Operational State		Device, interface		Multiple				Multiple	Multiple			
	LiveNX CPU Utilization		System		Critical		~		Local/Server >= 40 % for at least > 0 minutes	Web UI			
2	LiveNX Disk Utilization		System		A Critical		~		Local/Server ~~ 60 % for at least ~ 0 minutes	Web UI			
	LiveNX Memory Utilization		System		A Critical		~		Local/Server >= 40 % for at least > 0 minutes	Web UI			
2	LiveNX Node Connectivity	0	System		Critical		~		for at least >0 minutes	Web UI			
	Low WAN Interface Ultization	0	Device, Interface		Multiple				Mattipre	Multiple			
	Power Supply Operational State		Device, Interface		Multiple				Multiple	Multiple			
	QFP Throughput Level		Device, Interface		Multiple				Multiple	Multiple			
	QoS Class Default Drop	0	Device, Interface		Critical		~		Drop Rate > 0 kbps for at least > 0 minutes	Web UI			
2	QoS Class Drop	0	Device, Interface		 Warning 		~		Multiple	Web UI			
	QoS Interface Drop	0	Device, interface		 Warning 		~		Drop Rate > 2500 pps for of least > 0 minutes	Web UI			
	Routing Adjacency State Change		Network:		Critical		~		for at least > 0 minutes	Web UI			
2	Routing Polling Error		Notwork.		A Critical		~		for at least >0 minutes	Wab UI			
	Site Reachability	0	Network		Multiple				Multiple	Multiple			
2	Spanning Tree Topology Change		Network		Critical		~		for at least >0 minutes	Web UI			
-	Voice Traffic Classification and Marking		Application		A Critical		~		for at least >0 minutes	Web UI			
	Voice, Video Applications Performance		Application		Critical		~		Multiple	Web UI			
2	Voice/Video Performance - Jitter Avg	0	Application		Critical		~		Jitter Avg >= 30 ms for at least > 0 minutes	Web UI			
	Voice/Vicioo Performance - Jitter Mex	0	Application		A Critical		~		Jitter Max >= 60 ms for st least > 0 minutes	Web UI			
	Voice/Video Performance - Packet Loss	0	Application		Critical		~		Packet Loss >= 1 % for at least > 0 minutes	Web UI			
	VRRP Operational State		Network		Multiple				Mattiple	Multiple			

One of the first things to do after installing LiveNX is to grant additional user access, as well as to ensure that if you lose the credentials for the initial admin account, you will be able to login with appropriate privileges with a backup account.

Lab Steps:

67. In the Browser interface, click on the gear icon to configure, select Users Management

	LiveAction 🔤							New Festured			-			_
ert M	fanagement [©]											Maintenano	e Sectors	
					LiveNX Ale	rta							System D	agnostics
Enal	tie Disable										Q. Search		Uper Mar	egement is
	ALERT TYPE	0	CATEGORY 0	SEVERITY	C	ENMALED	0	75865843.05	SHARIN	6			Uver	r Managament
	Alert Tgae		АІ	78		NI ~		Threaholda	Shori	ng				
	Application Performance - App Delay	Θ	Application	Multiple				Multiple	Multipl	e				
	Application Performance - Network Delay	0	Application	Multiple				Multiple	Multipl	e				

Figure 36

68. Click Add User.

69. For this exercise we will add a Local user.

ADD NEW USER			×
1 Auth	entication Type		Settings
	Authentication Type		
	Select Authentication Type	~	
	LDAP		
	RADIUS	Cancel	Next Step
	TACACS+		

Figure 37

- 70. Enter a username and a Display Name (something you'll remember).
- 71. Select the Admin role from the Group drop-down, and a Session Timeout value.
- 72. Enter a **password** (again, something you'll remember or write down). Re-enter the password for **confirmation**.

Note: On first login the user will be prompted to change the initial password.

Note: You now have a backup login in case you forget the administrator credentials. Throughout the remainder of this class, we will use the credentials associated with the *admin* login. NXOF-1.LWA.2.0.1

Lab 1.7: View and Navigate System Diagnostics

Within System Diagnostics, System health, Data store and report queue are viewable.

Lab Steps:

74. In the Browser interface, click on the gear icon to configure, select System Diagnostics.

75. Click anywhere in the Local/Server to expand the details of the server.

m Diagnostics > Node Information															Swolings Eystem Die	gnostice "
LOCAL/SERVER	Status Ck Cor	formance Ck	Current Deci	oyment: Custom IP: Local										Last Update T	User Mana	poment
9		OS RAM		JUN RAN		DISK		RTT		DEVICES					Live NK Ser	ver
del OEMU Virtual CPU version 2.2.0	OG UEL 1.3 %	Amount	15.64.08	Committed	8.00 C8	Total	499.75 GB	Server to Node	NIA	Total	5	Configurable	5	Loading	0	
rs 8	JVM UEL 1.3 %	Used	7.08.08	Used	1.69.08	Free	482.75 OB	Node to Server	NA	Active	5	Down	0	Last Days Flow Rate	0.216 fp	
	System		_		De	eta Store						Report 0	ueue			
OS CPU USAGE				JVM CPU USAGE					OS RAM USAGE							
				Source of California					Gammer Galler.							
wi		Danley UTDees	45	185				Daning LTD firm	150						Daning 270 Ave	
41				10					10							
24				39					29							
0.55 0.65 0.67 0.55 0.65 0.50 0.50	1 22.02 22.03 02.04 02.05 02.0 Abr	6 80.87 80.00 HD	20	0,55 0456 04.57 0	40 0H.09 CE.00 620H	00.00 00.00	said cane cane said	02.00 01.00	01.05 04.0	6 01 57 0 155	0.0 0	200 1201 0202	02.05 02.04	0.05 0.06	207 2208 2200	
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		Section (1) for		45.66.05 372.59.06 274.49.59 96.216.05 63.19.09				2005.(7) 20	NUMBER OF DOI 4 3 3 2							
10 41 41 41	1 2010 02:04 02:05 02:05			45.4.05 272.5.05 274.04 96.3.05 61.049 0799	11 10 10 10 10 10 10 10 10 10 10 10 10 1	1 9552 9553	tita sict tite of	(****)		IN DEVICES	0:39 42	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				-
	1 100 109 100 100 100		- 9	45.4.05 272.5.05 274.04 96.3.05 61.049 0799		1 20.62 30.63	10 Au 10:05 10:04 10:04	(****)		N DEVICES		1 0 0 200 8200 200 200				-
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Figure 38

Note: If you have additional nodes, there will be multiple entries for each additional node and the details for those nodes can be seen as well.

- 76. Within the expanded server information are three tabs.
- 77. **System** tab will show you CPU usage, RAM usage, Disk Space, Down Devices and Flow details.



78. Data Store tab will allow viewing the storage details applicable to the server.

m Diagnostics > Node Information																		
al/Server 🔍 🖂																		
LOCAL/SERVER	51	tanuz Ok Conform	nanca: Ok	Current De	eployment. Cue	atom IP. Local										Last Upda	ese Time: 7/	/22/2021 10:09:01 PM
			OS RAM			JUN RAN		DISK		RTT		DEVI	CES					
del OEMU Virtual CPU version 2.2.0	OG UHL	1.3 %	Amount	15.64 G8		Committed	8.00 G8	Total	409.75 GB	Server to Node	N/A	Tota	5	Configurable		5 Loadin		0
res 8	JVM UEL	13%	Used	7.08.08		Used	1.69.08	Free	482.75 DB	Node to Server	N/A	Activ	e 5	Down		o Last D Flow R	uyo kate	0.216 fps
	System						-	eta Store						Report	Queue			
LONG TERM STORE SIZE					FLOW STOR	RE SITE	_				LONG TERM STOR	RE GROWT	TH RATE					
427 MB					23.84 mill						10110							
101 MB 015 MB 015 MB 10 Jan 10 105 10 10 10 10 10 10 10 Jan 10 105 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		17 MA 14 DE 21 24		10,21,210 0,34,210 0,77,200 0,34,200					100 Jan 300 Jan	-0-98-48		7 28 24 N 01 Ja					20 11 11
101148 015148 Digitas Digitas					8.36108 6.77108 Distan	11 1 1 1 1 1 1	100 100 101 100 100 100 100	e of 56 50 10		a ta pa an fan fan dan	- 1819		0 00 44 86 00 46					2 F 11
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	G. 26 (0 (0 G) G) (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	0.0 4.0 0.0	Dening(*1) den		Source Control Distance Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source Source	H & K & K & D & K		e (* 16 jul 11			498-9	a a a a	34					Ad http://www.

79. Report Queue tab will allow viewing any reports currently running on the server.

D LOCA	L/SERVER	Status	::Ok Conform	ence: Ck	Current Deployment	E Custom	P. Local										Last Undate Te	ne: 7/22/2021 10:09:01 P
ru edel	QEMU Visual OPU version 2.2.6	OS UNI.	1.9%	os Ram Amount	15.64.08	Comm	LM.	8.00.08	D ISP Tota	491.76.08	RTT Server to Node	N/A	DE VI	5	Configurable	5	Loading Last Rays	0
ores	8	JVM OBL	1.3%	Used	7.08 68	Used		1.69.68	Free	482.75.68	Node to Server	N/A	Ath	• i	Down	0	Flow Rate	0.216 fpa
		System						Dv	rta Stora						Report Q	Locus -		
ceport C	veues C																	
Cancel	Cancel All																	
0	REPORT NAME	C REPORT ID			πe	0	USER NAME		0	PRIDRITY	O COEVE N	IMP	¢	OLIEVED TIME		0	FUNNEMD TIME	c
	Report name	Report id		AL		~	Username			AL	~							
								N	io Data									

NXOF-1.LWA.2.0.1LiveNX Foundations Workbook 1Lab 1.8:Support and Troubleshooting

If support is needed, logs will need to be generated and collected.

80. Navigate to the Settings menu.

	() ()																				
D LOCA	L/SERVER	5	atus: Ok Conform	sence: ck	Current Deployment	Cuetom	IP. Local												Lest Update Time		
CPU				OS RAM		.79M 8	AM		018	ы	817			DEVIC	E 68					LiveNX Server	
Medel	QEMU Virtual OPU version 2.2.0	OS UBI.	1.3%	Amount	15.64.08	Corre	bitted	8.00 GB	Tota	470.76 08	Serve	r to Node	N/A	Total	5	Configurable		5	Looding	0	
Cores	8	JVM UGL	1.7 %	Used	7.08.08	Used		2.01.08	Free	482.75.08	Note	to Server	N/A	Activ	• 5	Down		0	Last Days Flow Rate	0.216 fpa	
		System						Data	Store							Report	Quere	_			-
	-																				
	Cencel All																				
		C REPORT ID		C REPORTS	TATE		USER NAME			PRIDRUTY		QUEUE RAME		¢	QUEUED TIME			FUB	NEMS TIME		0
	Report name	Report Id		All		~	Username			All	~										
								Not	Data												
								No I	Data												
								No I	Data												

Figure 42

81. Navigate and expand Troubleshooting and then click Logs.

Q. Search													
onfiguration	- 1 ¹	LOGS											
ata Source Management		LiveNK Log Lex	d										
sta Store		INFO			 Set 								
evice Entity Page Reports	- 11												
mail Configuration		Manage Logs											
regrations	-	Bet LiveNKL	ogs Delete										
itensing		0											
License Configuration		O NOES	11.1215	C SDUR	5	Ó FILERICH	ć	COLLECTION STARTTING	0 state	0 s	25	ô	DOWNLOND
License Expiration Notification		No	de name	So	urce	File Path		Collection start time	State		Size		
weNA Configuration													
loumed Data													
ides													
operties	~							No Data					
tory													
eports	~												
ecurity	~												
ingle Sign On													
NMP Trop													
rolog													
roubleahoosing													
CPU Profiling													
Heep Dump													
Logs													
Packet Capture													
Upload History													
User Activity Tracking													
pdates	_												

Note: Most cases, will just require the default setting INFO Log Level. The support team will indicate if a different level is needed.

82. Click Get LiveNX Logs.

,	e to download logs of t nerated, you may down		
	s you want to downloa uploads only. All other		
	Select All	Select None	
Local/S	erver		

Figure 44

Note: If there are multiple nodes installed within the environment, there will be additional items selectable.

83. Once logs are generated, you can Download the zip file. Once downloaded locally, the logs can be shared with the LiveAction support team.

84. Navigate to Packet Capture under Troubleshooting.
LiveAction	NX							New Features] •• (0 • 0	🌲 2 🛛 {-} =	0- 0 -	·
tings													
Q Search													
	- 1	PACKET CAPTURE											
onfiguration	- 11	Capture Packets Delete											
ta Source Management	- 11												
to Store	- 11	O NOCE NAME	ĉ	FILE NAME	0	COLLECTION START TIME	C STAIL		0	\$125		0	DOWNLOW
ivice Entity Page Reports	- 11	Node Name		Fie Name		Collection Start Time	State			Size			
legrations	~												
tensing	-												
License Configuration													
License Expiration Notification						No Data							
eNA Configuration													
umed Data													
des													
operties	~												
cay													
ports	~												
ounity	~												
ngle Sign On													
MP Trop													
polo													
subledvoorling	<u>^</u>												
CPU Profiling								1	2				
Heep Dump													
Loga Pasket Capture	- 1												
Packet Capture Upload History	_												
User Activity Tracking													
idates													
inh Li Data Store													

85. Click Capture Packets.

PACKET CAPTURE		×
	kets into downloadable file? O d the file from the table on the	
-	re is 1200 seconds and minim will have your recent 5 upload atically.	
Interface*	Device	
eth0	Other	~
Node	Protocol	
Local/Server	 ✓ None 	~
Host	Duration*	
eg: x.x.x.x		Sec
Port		
2055		
	Cancel	pture Packets

Figure 46

86. This allows you to capture packets on a specific device, protocol, port, and a specific duration.

Note: If directed by support to capture packets, they will indicate the duration and other applicable details needed.

87. As in Logs, you can download the zip file. Once downloaded locally, the logs can be shared with the LiveAction support team.

Lab 2

Lab 2: The LiveNX Client

NXOF-1.LWA.2.0.1LiveNX Foundations Workbook 1Lab 2.1:Launch the LiveNX Client

These Labs uses the Engineering Console exclusively.

The LiveNX Client is a Java application which may be loaded and launched on your local workstation. In this class you may alternatively run the Client on the virtual workstation connected via Remote Desktop Connection. The Client may be downloaded at https://cloudkeys.liveaction.com/downloads, and installation is straight-forward

A Mac version is also available for install if needed.

Lab Steps:

88. Launch the LiveNX Client.

DIAGRAM

Client Lo	gin	×
Liv	veNX	
Username:		
Password:		
For first tim	e use:	
Userna	me and password are "admin"	
Click "	Configure" to setup server address	
Configu	re OK Ca	ncel

Figure 47

89. Click Configure to verify server settings.

Note: A single client installation may connect to multiple LiveNX Servers simply by modifying the Server IP and Port. In this class we will always connect to the LiveNX Server in our Training Pod. Use the <ipaddress> from your Lab Access Worksheet. The "For first time use" instructions only apply to an un-configured Server.

90. Enter the LiveNX information (IP address and Port) from your Lab Access worksheet

Clie	nt Login		\times
Server	Configuration		×
Server S	iettings		
Server:			\sim
Port:	7000		
		Save	Cancel
	Configure	ОК	Cancel

91. Click Save

92. Enter the Username & Password.

Username: admin Password: Student (note the capital S)



Figure 49 93. Click **OK**

The Client will launch...



... and will open showing the current configured Topology.



Figure 51

Note: Your topology may be different from the screenshot above. Some of the items may be stacked directly on top of each other, requiring you to click and drag to make them more visible

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 2.2: Explore the LiveNX Client

Although we've already pre-configured one or more devices... LiveNX *may not* be collecting any flow data. In a subsequent Lab we will verify & complete the configuration of our class network by adding more devices and enabling flow collection, as needed. For now, let's look at some of the menus and feature availability of the LiveNX Client.

Lab Steps:

94. Right-click on device **HQ-B2** and select **Zoom to Device** to zoom into the **HQ-B2** Device, and center it on the screen.



Figure 52

Note: Your topology may be different from the screenshot above.

- 95. Left click anywhere in the white area and move the mouse to re-position the device(s) in the window.
- 96. Use the mouse scroll-wheel to zoom in & out.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 97. Note the 5 Module Tabs to the top-left of the Topology Pane.



Figure 53

Note: Once we confirm the collection Flow and SNMP data these tabs will be a lot more useful!

98. Click on **Flow** tab and then on **Refresh**. This will bring up all the flows that LiveNX is seeing from the router.



Figure 54

99. Expand the HQ-B2 device in the Home Tree View.

100. Click on one of the interfaces... note how the information displayed in the Topology Pane changes.



Note: You are welcome to poke around the LiveNX Client... don't worry, you won't break anything... but we will get some real usage, and see real data, in the coming labs!

Lab 3

Lab 3: Configuring Devices

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 3.1: Add Device

This Lab uses the WebUI.

Adding devices into LiveAction and managing them properly is very important to the overall usability of LiveAction itself.

In this Lab we'll go to the WebUI to Discover & Add a device to our LiveNX Server.

Lab Steps:

- 101. Login to the LiveNX WebUI
- 102. Select Configure > Device Management



Figure 56

103. Click Discover Devices.

1. What to scan	122. SNMP Settings	14 3. Node
SPECIFY IP RANGES		
11 198.19.2.1		Choose a site 🗸 🗸
Add More		
SPECIFY SEED DEVICE TO SCAN IP address		llana
192.168.1.1		Hops From 1 to 5
		Save & Next

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1

- 104. Enter **198.19.2.1**, in the IP Address field.
- 105. Select the SNMP Settings tab.
- 106. Click "Default SNMP connection settings".
- 107. Select the **Node** tab.
- 108. Select Local/Server.
- 109. Click **Discover**.

ce Management 🎱		CSV Import/Export	 Credenti 	al Store	View Devices	Add Non SNMP Devic	Discover Device
My Devices (3)	My interfaces (7)	Discovered Devices (0)		_		(i) Autodiscovery (0)	
COVERY LOGS: 0/1							
00VERY L002: 0/1						 Successfully starts 	d device discovery job
						© Successfully starts	d device discovery job
						 Successfully starts 	d device discovery job
50xEV14052 0/1						 Successfully starts 	d device discovery job

Figure 58

Note: Discovery may take a minute or two. If you've specified a large subnet to scan, and Discovery seems to take too long... click Stop.

/2 SELE	CT DEVICES									
Add A	Il Devices Edit							Q Search		
	DEVICE 0	SIRIAL O		VENDOR 0		NODE O	INTERFACES	0	HARDCODED SAMPLE RATED	0
	Device	Serial	IP Address	Vendor	Modal	Node	Interfaces			
	Branch2 NY	0000000021	198.19.2.1	Cisco	clscoProducts.3004	Local/Server	7			
Trova	a 🖤									

Figure 59

- 110. Tick the box next to Branch2-NY.
- 111. Click Select Interfaces.

2 SELECT INTERFACES Device	es: 1 Interfaces: 7													
	es: 1 Interfaces: 7													
Edit														
						Selec	1od. 3					Q S	Search	
NAME	D INTERFACE STATE	0 DEVICE	0 10	NE RATE (Kips)	IP ADDRESS C	LABIL	c	INPLIT CAPACITY (Klass) 0	DUTPUT CAPACITY (Klaps) 0	WANKSON 0	STRVICE PROVIDER	0	тада О	DESCRIPTION
name	Al v	AI	× 1	line rate	ip address	Label		Input Capacity	Output Capacity	AI ~	AI	¥	Taps	description
GigabilEthernel2	Up	Branch2-NY	10	000000	198.19.2.1	Branch2 LAN				WWN	Branch2 LAN			Branch2 LAN
GigabitEthernet3	Up	Branch2 NY	10	000000	100.64.2.2	WAN_SP2_MPLS	2			WAN	WAN_SP2_MPLS2			WAN_SP2_MPLS2
19 stitttemett	Up	Branch2-NY	10	00000	192.168.122.161									
 GigeOREthernet4 	Up	Branch2-NY	10	000000	10.255.2.2									WAN_SP1_MPLS2
Loopbeck0	Up	Branch2-NY	80	00000	10.0.2.1									
Null0	UD	Branch2-NY	10	000000										
VolP-NullO	Up	Branch2-NY	10	0000000										

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112. Select GigabitEthernet2, GigabitEthernet3 & GigabitEthernet4.

113. Click Add Selected.

LiveNX displays the available configured interface on the device(s) that were discovered. Notice that LiveNX also discovers additional device *semantic* information such as Line Rate, Capacities, Labels, etc....

Note: LiveNX's Rapid Device Discovery feature will automatically select the Top 4 interfaces based-upon interface utilization. It is important that you confirm, or select, the interfaces you wish to monitor. LiveNX may monitor up to 1000 interfaces on a single device.

vice	Management 🔍											CSV In	port/Export	~	Credential Store	Vie	w Devices	Add	Non Sh	IMP Device	Discover	Devices
		My Devices (d)				My inter	faces (10)				Disco	vered Devices						() Aut	odiscov	ery (0)		
sit	Refresh List	Configure	Delete	Rediscover Interfa	ces												Q Sean					
	DEVICE 0	DEVICE STATE 0	IP ADDRESS 0	VENDOR 0	MODEL Ó	NODE 0	sms 0	INTERFACES 0	HARDCODED S_ 0	POLL	0 qe	os ¢	FLOW	Ó	IPSLA Ö	ROUTING	٥	LAN	٥	1868	втани	u. 0
	Device	AI v	IP Address	AI ×	Model	Node	Site			AL	•	AI V	AL	×	All v	All	v	All	~	Tags	AI	×
	HQ-81	Up	198.18.129.24	Cisco	ciscoProducts	Local/Server	HQ	2		~		~	~								1(0 seconds
	Branch1-LA	Up	198.19.1.1	Cisco	discoProducts	Local/Server	LA	3		~		~	~								10) seconds
	HO-82	Up	198.18.129.25	Cisco	ciscoProducts	Local/Server	HQ	2		~		~	~								1() seconds
	Branch2-NY 🔆	Up	198.19.2.1	Cisco	ciscoProducts	Local/Server		3		~		~	~		~							1 minute

Figure 61

114. In the **Devices** Tab, click on the newly added **Branch2-NY** device. This will bring up the configuration page.

	AI 🗸		All 🗸	Model			AR ~	Al V	41		All v
HQ-B1	Up	196.18.129.24	Claco	ciscoProdu	EDIT BRANCH2-MKBCLOUD.CISCO.COM	×					10 seconds
Branch1-LA	Up	198.19.1.1	Cieco	cisco Produ	Site Group	Interval					10 seconds
	Up	198.18.129.25	Cieco	ciscoProdu	NH V No Group Exected V	1 Minute					10 seconds
	Up	198.19.2.1	Claco	ciscoProde	ABO NY		~				1 minute
					POLL PELA OS ROUTHG Accodule Patrice IP Address TopIP Address IV Tags East X Start Start X	2 R.OW LAN					

Figure 62

- 115. In the **Site** box, click and type **NY** assign the device to the site NY and do the same for **Group** (We will meet **Groups** in the Engineering Console).
- 116. Set the polling Interval to 10 seconds
- 117. Uncheck the **IPSLA** check box (this is not covered in this course)
- 118. Add **Tags** into the Tag box. Use something creative and descriptive for this site. We have used **East**, **Sales Office**, and **Branch**.

You now see we've added **Branch2-NY** for monitoring by LiveNX. Notice that there is a "notconfigured" symbol next to the link. This means we still have some configuration to complete.

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119. Next we must give the site some additional information to ensure our reporting and monitoring work correctly. We must define the **Site** geographically. To do this, go to **Site Management** from the **Main Menu**.



Figure 63

120. You will notice that NY does not have some of its **Site Semantic Info**. Here we can add what's missing.

Aan	agement [©]																			View Sites
	Dilt Deide															Q Seed	h			
	SITE	0 D	ATA ODITER O	DEVICES	0	CONTAINS DEVICES	NO. OF EMPLOYEES	¢	OUSINESS HOURS 0	IP RANGES	0	600 100	0	ADDRESS 0	REGION		0	DESCRIPTION	TACS	0
	Ste		All 🗸	Devices		Al 🗸	No. of Employees		Business Hours	IP Ranges		AL	~	Address	Reg)			Description	Tags	
	HO			HQ MC.doloud.clsco.c.	-	~			Mo - Fr 8:00 am - 6:00	198.18.128.0/18		1		San Francisco, CA	San Fr	inclisco, Califor.		Headquarters Data Co		
	LA			Branch1-LA doloud.cis		~			Mo - Fr 8:00 am - 5:00	198.19.1.0/24 10.0	ш.	1		Los Angeles, CA	Los Ar	geles, Californi		Branch 1	_	
	NY			Brench24N9 debud cis		~			None	198.19.2.0/24									1	

Figure 64

121. To open the **Site Configuration** pop-up, click on **NY** in the left column.

Details	Address	Business hours
Site Description	Site IP Range (CIDR Notation IP's)
Enter site description	198.19.2.0/24	4
Devices	0/1000 Tags	
Branch2-NY.dcloud.cisco.com ×		East x Sales x Research x
Number of Employees		
Number of Employees		
Data Center		

122. In the Tags box, enter **East**, **Branch**, and any others you want to add. We've added **Sales** and **Research**.

Details	Address	Business hours
Address	Latitude & Longitud	e
Address Line 1	Latitude	
Address Line 2	Longitude	
City	Phone Number	
New York	Phone Number	
State/Province/Region	Email	
New York	Email	
Zip Code	Region	
10006	Input valid address a populate region	and press "Geo Coordinate Lookup" to
Country		
United States	~	
Geo Coordinate Lookup Remove Region		
Lookup geocode using addre		
contap geocode asing addre		

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123. Enter some information in the City/State/Zip Code/Country fields (We have used zip code 10006 for central New York City). Then, click on the **Geo Coordinate Lookup**.

Details	Address Business hours	
Details	Malitas Illatitas Illati	
Address	Latitude & Longitude	
Address Line 1	40.709329	
Address Line 2	-74.013120	
City	Phone Number	
New York	Phone Number	
State/Province/Region	Email	
New York	Email	
Zip Code	Region	
10006	Continent: North America → Country: United States → State: New York → City: New York)
Country		
United States		
Geo Coordinate Lookup Remove Region		
	Cancel	Save

Figure 67

124. This calculates the position (as accurately as possible – if you put a street address too it improves the accuracy) and enters that information in the Longitude and Latitude cells. This is used to place the site on the Geo Topology Map.

		Detai	ils				Ada	iress			B	isiness hours	
ays of l	Neck	-	-	-	-	-		Time Zone					DST
Su	•	0		•	0	Sa		(GMT-05	00)	America/1	lew York		
Start tim								End time					
~		^						~		~			
08	:	00		лм				05		00	PM		
v		v						~	U	v			
08		00	l	лы				05	•	00	РМ		

- 125. Next, click on the **Business Hours** tab, and complete the days of the week, and typical start and end times of people's workday. This is used on the **WAN Capacity Planning** and **WAN Utilization** calculations.
- 126. Then Click Save.

	LiveAction:											
te Ma	agement ®											View Sites
Add	Edit Dalata									Q, Search.		
	SITE O	DATA CENTER O	DEVICES 0	CONTAINS DEVICES 0	NO. OF EMPLOYEES 0	BUSINESS HOURS 0	IP RANGES 0	GEG LOC C	ADDRESS 0	REGION 0	DESCRIPTION 0	TABS
	Ste	All V	Devices	AI v	No. of Employees	Business Hours	IP Ranges	AI	Address	Region	Description	Tags
	но		HQ-81.dcloud.cisco.co	~		Mo - Fr 8:00 sm - 5:00	196.18.128.0/18	+	San Francisco, CA	San Francisco, Califor	Headquarters Data Ce.	
	LA		Branch1-LA doloud cis	~		Mo - Fr 8:00 pm - 5:00	196.19.1.0/24 10.0.1.1	+	Los Angeles, CA	Los Angeles, Californi	Branch 1	
0	NY		Branch2-NY.doloud.cls	~		Mo - Fr 8:00 am - 5:00	198.19.2.0/24	+	New York, New York, 1	New York, New York, U		Sales, Branch, Researc.

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127. You'll see the table now completed with the new information for the Site New York. (Note, if you added information in the **Description** box, you would see that here too.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 3.2: Manage & Configure Devices

This Lab uses the Engineering Console.

You may perform many management tasks via the WebUI... but since we'll need to go to the LiveNX Client to configure Flow Collection in the next lab... let's complete our Device Configuration in the Console.

Note: You can find instructions for Adding Devices via the Client in the Appendix of this Lab Workbook.

Lab Steps:

- 128. Login to the LiveNX Client.
- 129. Right-click on Home and Expand All.
- 130. The **NY** site now appears as we configured it from the WebUI. In the Engineering Console this is referred to as a **Group**. To use **Sites** in the WebUI and **Groups** in the Engineering Console you must configure both.



Figure 70

Double click on the **NY** Group to expand it, then right click on white space to reveal the **View Options** dialog, hover over **View**, and select **Fit to View**.

Notice that the Topology Pane contains all the devices listed in the Home Tree view. Also note that the Branch2-NY device needs to be configured, indicated by the wrench image.

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- 131. Click Manage (Above the Home Tree). A Device Management dialogue will open.
- 132. Select only Branch2-NY

	by:					r ite	er	Clear						
Select	Device Name	IP Address	Vendor	Model	Node	Group	Poll	QoS	Flow	IP SLA	Routing	LAN*	Interval	Status
	Branch1-LA	198.19.1.1	Cisco	ciscoProducts. 3004	Local			\checkmark	\checkmark				10 seco	Configured
	Branch2-NY	198.19.2.1	Cisco	ciscoProducts. 3004	Local	NY	41 🗖						10 sec 4	2 Not Config
	HQ-B1	198.18.129.24	Cisco	ciscoProducts. 3004		40		\checkmark	\checkmark				10 seco	 Configured
	HQ-82	198.18.129.25	CISCO	ciscoProducts.3004	LUCAI		V		Ŋ				10 seco	Configured
	ling occurs every 15 m	inutes				Global De	vice Setting	15					N	lumber of Devic
		Configure QoS, Fl				Global De			MP Settin	gs			N	lumber of Devic
Device	Configurations	Configure QoS, Fl	able and did	IP SLA k the configure button.			lit D	efault SNI		-	a - Not Set		N	Number of Devic
Device	Configurations	Configure QoS, Fl Select devices in the ta	able and did		~	Ed	lit D	efault SNI efault CLI	I Monitorir	-			Ν	
	Configurations Configure Remove	Configure QoS, Flo Select devices in the ta Remove selected device	able and dick	k the configure button.	~	Ed	lit D	efault SNI efault CLI	I Monitorir	ng Settings			N	Clear

Figure 71

- 133. Here you will see the Group that we have already created for our new device.
- 134. Check ONLY Poll, QoS and Flow.
- 135. Verify the Interval on the device is **10 seconds**.
- 136. Click Apply.
- 137. Click Configure.

LiveNX starts the Add Device wizard... we will select to use whatever defaults are already configured...

- 138. Step1: Use the **Default SNMP**... Click Next
- 139. Step2: Use My Default Configuration CLI... Click Next

	Device Connection In	formation			
1. Device Connection Information	Enter the SNMP con	nection information.			
2. CLI Settings	Node	Local			
(Configuring)	IP Address	198.19.2.1			
 CLI Settings (Monitoring) 	O Non SNMP device	a such as NetFlow probes			
 Select Interfaces 	O LiveSensor				
5. Select VLANs	Use the Default 5	SNMP connection settings		Edit	
Select Features	O Enter SNMP conr	rection settings for this device			
7. Enable Polling	SNMP Version	Version 2c	~	Target Port	161
8. Review Configuration	Community Strin	a dcloud			
9. Device Updated		- L			

Steps	CLI Settings (Configuring)
I. Device Connection Information Information Configuring) Configuring) Configuring) Configuring) Configuration Select Therefores Select VLANs Select Freetures Review Configuration Device Updated	Specify the Claromection Information used for configuring these devices. Required fields are indicated with an asterisk (*). Configuration QLI Connection Settings Enter Command Line Interface (QLI) connection settings used to configure these devic Add as monitor only device for non Cisco and unsupported Cisco US (UDS, IDS-XE © Use my default Configuration CLI connection settings) Edit Connection Type SSH © Port* 22 User name on Device Password on Device Password on Device Also use these credentials for monitor mode.
	< Dack Next > Finish Cancel Help

Figure 73

140. Step 3: Check Use the **Previous Page Connection Settings** ... Click **Next**. You will be shown a list of configuration elements to verify. Click Continue.

Steps	CLI Settings (Monitoring)
Device Connection Information CLI Settings (Configuring) CLI Settings (Monitoring) Select Interfaces Select VLANs Select Features Renable Polling Review Configuration Device Updated	Specify the CLI connection information shared by all users. This information will only be used to monitor this device. Required fields are indicated with an asterisk (*). Monitor-only CLI Connection Settings Enter Command Line Interface (CLI) connection settings used to monitor this device. Use the default Monitor-only CLI connection settings Enter connection settings for this device Connection settings for this device Connection Type SSH v Port* 22 User name on Device Password Enable Password
	< Back Next > Finish Cancel Help

Test	Status	Description	
SNMP connection	•	Succeeded	~
SNMP access	•	Succeeded	
CLI configure connection	0	Skipped	
CLI configure login	0	Skipped	
CLI configure enable password	\odot	Skipped	
CLI monitor connection	\odot	Skipped	
CLI monitor login	0	Skipped	
CLI monitor enable password	0	Skipped	
Serial number validation	0	Skipped	
Model supported	•	Succeeded	
IOS supported		Succeeded	
NBAR capable	•	Succeeded	
NBAR2 capable	•	Succeeded	
NetFlow collector configure supported	٠	Succeeded	
Flexible NetFlow supported	•	Succeeded	
Unified Perfmon (AVC/Medianet) Supported	•	Succeeded	
Medianet Performance Monitoring supported	•	Succeeded	
MACE AVC Supported	0	Not supported	
MLS NetFlow configure supported	0	Not supported	
Mediatrace configure supported	•	Succeeded	
IP SLA Supported	•	Succeeded	
HQF Supported	•	Succeeded	
MAC Table Supported		Not cupported	~

Figure 75

Note: Any changes to the Select Features dialog will generate a CLI push to update the current configuration. Before sending a new configuration to the device, you can verify the configurations that LiveNX created.

- 141. Step 5: Ensure the correct interfaces are selected...GigabitEthernet2, Gigabit Ethernet3, and GigabitEthernet4. Click Next
 - You can include Loopback, but not necessary. The point is to understand you can choose both logical and physical interfaces.

ieps	Select Interfac	ces				
. Device Connection Information	Select the inte	rfaces you want to	monitor on t	nis device (maximum 10	000 interfaces).	
. CLI Settings (Configuring)		esses and subnet ma for more details.	asks are edit	able on the table for d	evices that do not p	rovide them. See
. CLI Settings (Monitoring)	ule user guide	for more details.				
I. Select Interfaces	Selected	Interface	Trunk	IP Address	Subnet Mask	Description
. Select VLANs		GigabitEthernet1		192.168.122.161	255.255.255.0	
. Select Features		GigabitEthernet2		198.19.2.1	255.255.255.0	
		GigabitEthernet3		100.64.2.2	255.255.255.0	
. Enable Polling		GigabitEthernet4		10.255.2.2	255.255.255.0	
. Review Configuration		Loopback0		10.0.2.1	255.255.255.255	
. Device Updated		Null0 VoIP-Null0				
	Selected inte	erface(s): 3				
	< Back	Next > Fi	nish		Cance	el Help

Figure 76

- 142. Step 5: Since there are no active VLANs configured on this exercise, skip past this option if one is shown. You may monitor up to 25 configured VLANs on each device. Click **Next.**
- 143. Step 6: The **Select Features** dialog allows you to turn-on specific Cisco technologies per device interface using the templates included in LiveNX. This dialog displays the current IOS configuration of the device you are currently viewing. Match the settings for **GigabitEthernet3** and **GigabitEthernet4 (WAN interfaces only)**. Click **Next**.

teps	Select Features			
	Select the features you want to enable section.	on each interface. Learn mor	re about each feature in the H	Help
 CLI Settings (Configuring) CLI Settings (Monitoring) Select Interfaces 	Features on device			
5. Select VLANs	Interface	NBAR	NetFlow	
6. Select Features	GigabitEthernet2			
7. Enable Polling	GigabitEthernet3	<u>~</u>		
8. Review Configuration	GigabitEthernet4			
	< Back Next > Finish		Cancel	Help

- 144. Step 7: Verify **Polling** is set for **10 Seconds** and ensure **Flows** and **QoS** are selected. These should be selected from our previous work for the NY Branch Router.
- 145. Click Continue



Steps	Review Configuration	
1. Device Connection Information	The following commands will be sent to the device. Or you can choose to manually configure the device yourself.	
CLI Settings (Configuring)		
3. CLI Settings (Monitoring)	collect timestamp sys-uptime last	٦
4. Select Interfaces	collect transport top flags	
5. Select VLANs	exit	
5. Select Features	flow monitor LIVEACTION-FLOWMONITOR description DO NOT MODIFY, USED BY LIVEACTION.	
	exporter LIVEACTION-FLOWEXPORTER-IPFIX	
7. Enable Polling	cache timeout inactive 10	
8. Review Configuration	cache timeout active 60	
 Device Updated 	record LIVEACTION-FLOWRECORD	
	exit	
	interface GigabitEthernet3	
	ip flow monitor LIVEACTION-FLOWMONITOR input	
	ip flow monitor LIVEACTION-FLOWMONITOR output exit	
	interface GigabitEthernet4	Ш
	ip flow monitor LIVEACTION-FLOWMONITOR input	Ш
	ip flow monitor LIVEACTION-FLOWMONITOR output	Ц
	Send the configuration commands to device.	_
	○ I will manually configure the device myself.	
	0	
	<back next=""> Enish Cancel Help</back>	
	Caller Guine Caller Lieb	

- 146. Step 8: Review the code of the changes that have been made. For this lab select "Send the configuration commands to device" radio button. You may not want to do this in your actual deployment it can depend on your configuration management processes. Just know, LiveNX can send the config instructions if you wish.
- 147. Click **Next**. Wait for the configuration process to finish.
- 148. Click Finish.

ps	Device Updated			
Device Connection Information	You have configured this devic configuration to the device's st			
 CLI Settings (Configuring) CLI Settings (Monitoring) 	Device Settings			
 Select Interfaces 	Setting		Description	
	Polling Rate		10 se	conds
i. Select VLANs	NetFlow Monitoring		NetFlow	collector
. Select Features	NetFlow Polling		Ena	
. Enable Polling	Mediatrace		N,	
-	Routing Poling		Disa	
Review Configuration	Qos Poling		Ena	
. Device Updated	IP SLA Poling CEF		Disa Enal	
			cha	DICO
	Interface Settings			
	Interface	NBAR	NetFlow	
	GgsbitEthernet2		•	•
	GgabitEthernet3		•	•
	GigabitEthernet4		•	•
	L			
	< Back Next >	Finish		Cancel Help

Figure 80

149. Step 9: You will see the summary of the changes made. Click **Finish**.

start"?	o save the current ru	inning configuration	n to the device's st	artup config, i.e., "copy	y run
Do not show	again (current confic	uration will not be	saved to startup o	onfiguration on further	use)
	again (carrent coring	and doin will not be		orngaradorr orr rararer	usej

150. You will be prompted to save the current config to the startup config. For our exercise click **Yes**.

The device will be added to the Topology Pane in LiveNX. You will notice it no longer shows the Wrench icon, meaning it has been configured in the LiveNX system.

151. Click **Close** to close the dialog box.

Note: Your new device may not be immediately visible. Use the View > Fit to View command to include all devices in the main view. Arrange as required.

NXOF-1.LWA.2.0.1LiveNX Foundations Workbook 1Lab 3.3:Configure Flow on Devices

This Lab uses the Engineering Console.

Before removing unwanted interfaces, you should remove any existing flow configurations those interfaces have been configured with... this will avoid any issues when writing new configuration data to the device. In this lab, we will turn on flow for **Branch2-NY**.

Lab Steps:

152. Select **Flow** from the Menu Bar, choose **Configure Flow**.



Figure 82

153. Select Branch2-NY, click Configure Selected.

Instruct Select	tions t devices to configure flow										
	onfiguration Table										
Q-	-										
Select	Device	Type		IP Address	Description	Tags	Traffic	Applic	Voice/Vid	Traditi	Custom
	Branch1-LA	Standard	\sim	198.19.1.1	Cisco IOS S	WAN,	•	۲	۲	۵	
~	Branch2-NY	Standard	\sim	198.19.2.1	Cisco IOS S	WAN,	•	0	0	0	•
	HQ-B1	Standard	\sim	198.18.129.24	Cisco IOS S	WAN,	•		٥	0	•
	HQ-B2	Standard	\sim	198.18.129.25	Cisco IOS S	WAN,	•	T	۲	•	•
	🛞 HQ-MC	Standard	\sim	198.18.129.23	Cisco IOS S	HQ	•		٢	•	•
				T	nese a	re	unco	onfig	gured	IJ	
				TĽ	iese a	reı	unco	onfig	jured	J	

Note: If the device is grayed-out you must return to the Home tree, right-click on the appropriate device, and select Refresh, before continuing.

Guidance: Best Practices dictate the following for deciding which interfaces to monitor for flow.

- **WAN interfaces** (rule of thumb, all WAN interfaces on a device, unless there is a reason to not monitor).
- Only Interface for Router-On-A-Stick.
- Data Center Devices that are running East-West traffic.

Note: Your settings may be different from the screenshot above. Diagrams are for illustration purposes and may not reflect the data you see in your Training Pod.

154. Select Traffic Statistics (FNF), Application Performance (AVC), and Voice/Video (Medianet) on Branch2-NY interfaces GigabitEthernet2, GigabitEthernet3 and GigabitEthernet4.

Note: Semantics are important. Note that we have a WAN interface tag on a LAN interface – GigabitEthernet2. This needs to be corrected later..

structions Configure the type of flow you v	wish to receive from the	interfaces							
ow Configuration Table									
λ-									
)evice	Туре	IP Address	Description	Tags	Traffic Sta	Application	Voice/Video P	Traditional	Custom
1 🛞 Branch 2-NY	Standard	✓ 198.19.2.1	Cisco ICS Softw	. WAN, NY,	۲	۲	۲	•	•
- 😌 GigabitEthernet2	-	198.19.2.1	Branch2 LAN	WAN, Bra					
😔 GigabitEthernet3	-	100.64.2.2	WAN_SP2_MPLS2				V		
😌 GgabitEthernet4	-	10.255.2.2	WAN_SP1_MPLS2			Sec.			
		Seman impo	ntics are ortant ⊫						
		Seman impo	ntics are ortant ⊾						
ow Export Destination		Seman impo	ntics are ortant ⊾						
	ton	Seman impo	ntics are ortant ଜ						
low Export Destination Configure Flow Export Destina UrveFIX node	ton	Seman impo	ntics are ortant ⊾						
Configure Flow Export Destina		Seman impo	ntics are ortant ⊳						
Configure Flow Export Destina	port 9991	Seman impo	ortant ⊳						

Click Preview CLI.

Nevice	Type	Branch2-NY
ranch2 NY	Standard	config t
		ip access-list extended LIVEACTION-ACL-AVC
		permit top any any
		exit
		policy-map type performance-monitor LIVEACTION-POLICY-UNIFIED
		exit
		class-map match-any LIVEACTION-CLASS-AVC
		exit
		class-map match-any LIVEACTION-CLASS-MEDIANET
		exit
		class-map LIVEACTION-CLASS-AWC
		match access-group name LIVEACTION-ACL-AVC
		exit
		class-map LIVEACTION-CLASS-MEDIANET
		match protocol telepresence-media
		match protocol rtp
		exit
		policy-map type performance-monitor LIVEACTION-POLICY-UNIFIED class LIVEACTION-CLASS-MEDIANET
		erit
		class LIVEACTION-CLASS-AVC
		exit
		exit
		interface GigabitEthernet4
		service-policy type performance-monitor input LIVEACTION-POLIC
		service-policy type performance-monitor output LIVEACTION-POLI
		exit
		interface GigabitEthernet3
		service-policy type performance-monitor output LIVEACTION-POLI
		service-policy type performance-monitor input LIVEACTION-FOLIC
		exit
		flow record type performance-monitor LIVEACTION-FLOWRECORD-AVC
		description DO NOT MODIFY. USED BY LIVEACTION.
		match application name account-on-resolution
		motab association alignet involutions

If you are working on more than one device, the configuration for each will be available to view here. Select a device in the list to view individual CLI file.

Instructions Configure the type of flow you	wish to receive fro	on the in	iter faces							
Row Configuration Table										
Q										
Device	Туре	1	IF Address	Description	Tags	Traffic	Applica	Voice/Vide	Tradito	Custom
- 🛞 Branch 2-NY	Standard	~ 1	98.19.2.1	Cece IOS So	WAN,	۲	۲	۲	0	0
GigabitEthernet2		1	98.19.2.1	Branch 2 LAN	WAN,					
GgabitEthernet3		1	00.64.2.2	WAN_SP2_M	WAN		M			
GgabitEthernet4	-	1	0.255.2.2	WAN_SP1_M	-					
			Send	ing flow configurat	ons					
			Send	Cancel	ons					
few Datast Destination			Send		ors					
	nation		Send	Cancel	ons					
Configure Flow Export Destr	nation		Send	Cancel	ons					
fow Deport Destruction Configure Row Expert Destr @ UnetKt node DiseNE code flow replicator			Send	Cancel	ons					
Configure Flow Export Destin		and p		Cancel	ors					

- 155. Click Close.
- 156. Click Save to Devices.
- 157. Again, save the current running config to the startup config.
- 158. Click Close.

Note: Now that we've configured Flow Collection on Branch2-NY... we'll be able to view flows on all devices in the Topology Pane!

159. Don't forget to click Refresh in the Filter Bar.



This Lab uses the Engineering Console. Results can also be achieved in the WebUI.

You can add or remove any interfaces as your network evolves. This action removes the interface from LiveNX, not from the router configuration.

Note: Your Instructor may have already performed this process when they configured your Training Pod.

Lab Steps:

160. Right-click on the Branch1-LA device and select Add or Remove Interfaces.



Figure 86

161. Deselect GigabitEthernet3.

teps	Select Interfa	tes				
Select Interfaces Select VLANs Select Features Enable Polling	Note: IP addre			nis device (maximum 10 able on the table for de		rovide them. See
-	Selected	Interface	Trunk	IP Address	Subnet Mask	Description
 Review Configuration Device Updated 		GigabitEthernet1 GigabitEthernet2		192.168.122.160 198.19.1.1	255.255.255.0	Branch 1 LAN
		GigabitEthernet3		100.64.1.2	255, 255, 255, 0	WAN SP2 MPLS2
		GigabitEthernet4 Loopback0 Null0 VoIP-Null0		10.255.1.2 10.0.1.1	255.255.255.255	WAN_SP1_MPLS2
	Selected into		nish		Cano	el Help

- 162. Select **Next** until the **Device Updated** window is displayed. Save the config to the device and save to startup config.
- 163. Select **Finish** to update the device.

Notice that the device now has 2 active interfaces, represented by **GigabitEthernet2** and **GigabtEthernet4**



164. Repeat from Lab Step 1 above to perform interface addition/removal on **Branch2-NY** (as needed).

Note: You may also remove multiple interfaces at a time from multiple devices. See the Appendix for instructions to Export/Import Devices.

Lab 4

Lab 4: Making the Topology Work

This Labs uses the Web UI.

Note: Semantics may have already been configured on most of the devices in this Lab. You need to ensure that all the devices have their semantics entered.

Device semantics are very useful for getting the most out of your LiveNX deployment. Whether it's grouping devices according to region, or identifying high priority links, setting semantics will help you in your day-to-day operations.

Your task in this Lab will be to identify WAN links and tag them to populate dashboard data, set bandwidth rates for these links, group devices, and merge clouds.

Lab Steps:

165. Device Semantic Settings can be viewed in the WebUI using the Story **Device Inventory**. You can also verify that all devices have their semantic information configured.

evice Inventory	Enter Filler	Request Here																			40 Ap	ply 1
erioes.																						
																	Q Sc	a an b				
																	UL OC					
1FVICE	0	DEVICE SERVIL	0	IP ADDRESS	0	sms		0 M014	16	0 TASE	a	0 GROUP		0	NODR.		OS VS	FREIDN	0	DESCRIPTIO	N	
Device		Device Berial		IP Address		Site		No	iode	Т	.gs	Group			Model		05	Version		Descript	on	
q-81		2		198.18.129.24		HQ		Loca	:al						cisco Products 500	4	17.4	18		Ciaco IOS 3	aftware (Beng	,elu
anch1 LA		101		198.19.1.1		LA		Loca	al la						ciscoProducts.300	4	17.4	.1a		Cisco IOS 8	Software (Beng	jalu
10-82		3		198.18.129.25		HO		Loca	sel						ciscoProducts.300	4	17.4	.1a		Cisco IOS 8	Software (Beng	,alu
teen / 4		0200020021		198.19.2.1		ΝV		Los	al						raana Prochard is 3003	a	124	18		Cinco KISS	ialtwire (Heng	pal
inen / 4		INCONCISCUE?1		198.19.2.1		N7		Inc	ai			•			ciscan Prochactise 2000	4	174 Q, Sc			Elsen KKS	Software (Heng	
erfaces			BFVICF		0 ame		WW IYPE				OUTPUT CANVE- 0		IF BIEFS		nisenerum 0	299990	Q, Sc		0 144		Software (Heng	pelu
erfaces	IP ADDRESS	0 REIRRY MADE 0				0		0 яния	NACE PROVIL C	INPUT CAPACITY C		ARREVATED _ 0			пенсинтан 0	20-9-9-11	Q, Sc	ross		e1 0	TARE	
tions / 4 etfaces			Devic		0 ami St	0	WWN TYPE AT	0 яния	NACE PROVIL C		алтрыг саниаФ Олфад Сар		IF BEEFS				Q, Sc	arch				
erfaces	IP ARENGER IP Address 1911 15 129 24	Image: second of the	Devic HKHIN		I SI	0		с яни У Бо	antice Previo	INPUT CAPACITY C		ляженчаты – 0 Abbreviaba .		0	Description 0 Description	хэчээн Spood	Q, Sc	ross		e1 0	TARE	
naven ∠ etfaces merevic> ex	IP ABERRIER IP Address 1911 11:129-24 100.64.0.2	0 эниннэт валяк 0 5 Sk0ret Mask 0 7 256 255 0 255 255 0	Devic IKHIN HQ-81	9	HQ	0	AI	0 зни v So SP2,	INICH PHON C IB Anvice Pro	ничит слимату С Іприї Сара	Output Cap 1 Gitps 4 Mbps	Asservated - 0 Abbrovate. G2 G3	If index 7 3	0	Description	arrent Speed	Q, Sc O	type	L 10	es O abel	Tags	
name / 4 thooses memory MA_ () Interface N_ () spatial literant? gabitEthomet3 gabitEthomet2	IP ADDRESS IP Address 19011112924 100.64.0.2 198.15.1.1	2 3669997 MAGRE Q Stationet Magre 2 2 2 2 2 5 0 2 2 5 0 2 5 0 2 5 2 5 0 2 5 0	Devic IK(HIT) HQ-81 Branch	o 114	IIQ HQ LA	0	AI WAN	C ases ✓ So SP2 Ban	ance Previ C III envice Pro. C 2_MPLS Inch1LAN	Input Cape	Output Cap 1 Gtus 4 Mbps 1 Gbps	AMMENIATED - 0 Abbreviate. G27 03 02	If index 7 8 2	•	Description 0 Description HQLAN WAN_SP2_MP Branchi LAN	зенна Speed	Q, Sc O 1 Gbps 1 Gbps	arch Type Hitemet_com ethernet_com ethernet_com	140 L 141 HQ 161 HQ 161 HQ	es C abol I ANN ISP2_MPLS1 Inch1 LA LAN	Track Tags	
Internet A. C Interface N. C Interface N. C Interface N. Interface N. Interface N. Interface N. Interface IgabitEthermet3 IgabitEthermet3 IgabitEthermet3	IP ADDRESS IP Address 19411112924 100.64.0.2 199.19.1.1 108.64.1.2	3869991 States C Stativet Mask C 256 255 192 II 256 255 0 255 255 55 0 255 255 0 255 255 255 0 255 255 0	Devic HQ-81 Branch Urencti	е 1L4 Н А	HQ HQ LA LA	0	AI WAN	C seev ✓ So SP2 Bran SP2	INTER PROVIL C III envice Pro 2.MPLS	Input Cape 1 Ottos 1 Ottos 1 Obps 1 Obps 2 Miss	Output Cap 1 Gbps 4 Mbps 1 Gbps 2 Mbps	Asservated - 0 Abbroviate. G27 G3 G2 G3	If index 7 3 2 3		Description 0 Description 1 HQLAN WAN_SP2_MP Branch1 LAN WAN_SP2_MP.	seea Speed	Q, Sc C 1 Chips 1 Gbps 1 Gbps 1 Gbps	arch Type Hiternel.joan ethernel.joan ethernel.joan	10. 100 10. 100 10. 100 10. 100 10. 100	ex 0 abol 11 AN 15 P2_MPLS1 inch1 LA LAN SP2 MPLS	Tags - - -	
Innerd (2-347 Inner 1-4 Inner 1-4 Interface AL. 0 Interface AL. 0 Int	IP ADDRESSE IP Address 190 110 129 24 100 64.0.2 109 15.1.1 108 64.1.2 10 255.1.2	2 3669997 MAGRE Q Stationet Magre 2 2 2 2 2 5 0 2 2 5 0 2 5 0 2 5 2 5 0 2 5 0	Devic IK(HIT) HQ-81 Branch	e 1L4 14 A	IIQ HQ LA	0	AI WAN	C asers V Sec SP2 Bran SP2 SP4 SP4	ance Previ C III envice Pro. C 2_MPLS Inch1LAN	Input Cape	Output Cap 1 Gtus 4 Mbps 1 Gbps	Assessanted _ Q Abbreviate . G2 G3 G2 G3 G4	If index 7 8 2		Description 0 Description HQLAN WAN_SP2_MP Branchi LAN	seea Speed	Q, Sc O 1 Gbps 1 Gbps	arch Type Hitemet_com ethernet_com ethernet_com	10. 100 10. 100 10. 100 10. 100 10. 100 10. 100	et 0 abel I NN ISP2_MPLS1 Inch1 LA LAN ISP2 MPLS	Track Tags	

Figure 89

166. To configure semantics for Sites, Devices, and Interfaces you will need to visit the relevant **Configuration** pages. **Configuration** pages can be found under the **Main Menu**.



167. Let's start with Site semantics. Which will be in Site Management.

te Ma	inagement						Semantic	Informa	tion											View Sites
Add	Edit Delete						Gemanue	IIIIOIIIIE	lioi	5						Q , Se	irch			
	3019	0 BALA D	нтик 0	пемпен О	спитии	O REVIEW	NO. OF EMPLOYIES	HIDDAR SCHOLDO	¢	IF RAMIES C	,	00F0108	0	ADDRESS 0	REAL	ION	0	DESCRIPTION 0	TAR	0
	Ste	All	~	Devices	AI	~	No. of Employees	Business Hours		IP Ranges		AL	×	Address	R	əgian		Description	Tags	
	10		/	DQ01.dcload.cisco.co.		~	200	Mo+1r 8.00 am	5.00	198.10.120.0/18	1	4		Set Lonciaca, CA	Ser	Francisco, Calif	н	Headquarters Data Ce	West, LK	Admin
	LA			Branch1-LA doloud.cls		~	75	Mo - Fr 8:00 am	5:00	198.19.1.0/24	1	1		Los Angelas, CA	Los	Angales, Califor	ni	Los Angeles Branch	Sales, Br	anch, West
	NY			Branch2 NY.dcloud.cls		~		Mo · Fr 8:00 am	5.00	198.19.2.0/24		1		New York, NY, 10006,	New	Vork, New York	U		Branch, N	lanufacturing

Figure 91

Within the **Site Semantics** page, you will begin to see the importance of **Semantic Data**. Each of the blocks of information highlighted in the boxes above are examples of **Semantic Data**. Semantic data allows you to view, or create views, of your network and its activity to help you understand, monitor, and troubleshoot more effectively.

8d	Edit Delete				Selected. 1			Q I		
SIT	r 0	DATA DENTER G	DEVICES	A	0			REGION	C DESCRIPTION C	TAGS
		All V	Devices	EDIT 1 SITE	с рн	×	15			
н		~	HQ-81.dcloud cis		2	3	icisco, CA	San Francisco, Ca	ifor Headquarters Data Ce	West, HQ, Admin
LA			Branch1-L4 delos	Details	Address	Businesencurs	eles, CA	Los Angeles, Calif	omi Los Angeles Brench	Sales, Branch, West
			Branch2-NY dolos	Site Description	Site IP Range (CIDR Notation IP's		K, NY, 10006,	New York, New Yo	n, U	Branch, Manufacturin
				Devices HG-85 dobud doon com × HG-85 dobud doon com × Namber of Engloyees 200	2 West x HO x Admin x	³				
				Data Center		Cancel Save				

To edit the semantic data for a site, click on the site name, or select the check box and click **Edit**. The **Edit Site** pop-up window will appear and offers three tabs for editing the semantic information. These are **Details**, **Address**, and **Business Hours**. You can move between sites by clicking the arrows wither side of the site name in the middle top of the window.

Make sure you configure the **NY** site added earlier to complete the semantic data entries. You might even want to give it some tags that you can use later for creating a report, or in the Geo-Topology view.

Check the Site Semantics against this table, especially the NY branch settings:

				Data	#	Hrs		
Sites	Tags	Site IP Range	Description	Center	Employees	Operation	City	State
	West, Admin,		Headquarters			8am -	San	
HQ	HQ,	198.18.128.0/18	Data Center	Yes	200	5pm	Francisco	CA
	West, Sales,		Los Angeles			8am -	Los	
LA	Branch	198.19.1.0/24	Branch	No	75	5pm	Angeles	CA
	East,							
	Manufacturing,		New York			3am –	New	
NY	Branch	198.19.2.0/24	Branch	No	125	10pm	York	NY

Let's now look at Device Semantics, found under **Device Management** in the Configure menu.



Figure 93

Adding semantic information to an interface allows you to more easily filter information to see exactly what you are looking for. Clicking an interface or a device will bring up the Semantic config panel on the right of the screen.
ice i	Aanagement											CSV in	port/Export		Credential Sto	re	View Devic	es	Add Non :	INMP Device	Discover Dev	045
		My Devices (4)			My Inte	faces (10)				Discovered	Devices	0)						Autodisc	overy (3)		
dt	Refresh List	Configure	Delete	Rediscover Interfa	035												Q, So	arch				
	DEVICE 0	DEVICE STATE	IP ADDRESS 🗘	VENDOR 0	MOBEL 0	NODE 0	SITE		0 HARDCODED S., 0	POLL C	QOS	¢	FLOW	0	IP SLA	¢ ROU	nna ¢	LAN		TAGS (INTERNAL	
	Device	Al v	IP Address	AI ~	Model	Node	Situ			Al ×	AL	~	Al	*	AI N	A	v	Al	~	Tags	AI	×
	HQ-81	Up	198.18.129.24	Cisco	ciscoProducts	Local/Server	HQ		2	~		~	~							Router, SP2 M	10 sec	iond
	Branch1-LA	Up	198.19.1.1	Cisco	ciscoProducts	Local/Server	LA		3	~		~	~							Router, SP2 M	10 sec	:ond
	HQ-82	Up	198.18.129.25	Cisco	ciscoProducts_	Local/Server	HQ		2	~		~	~							Primary, Route	10 sec	/ond
	BIBNS12-NY	Up	198.19.2.1	Cisco	ciscoProducts	Local/Server	NY .		3	~		~	~								10.965	.ond
								_														

This screen shows the devices that LiveNX is monitoring, along with important semantic data. You can edit this information by clicking on the device name or selecting it with the check box and clicking **Edit**.

As discussed previously, these devices inherit semantic information from above (Site level), and will cascade their accumulated semantic information down to the interfaces.

Device	IP Address	Tags	Site	Group
HQ-B1	198.18.129.24	Router, SP2 MPLS, Secondary, DeviceTypeA	НQ	HQ
HQ-B2	198.18.129.25	Router, SP1 MPLS, Primary, DeviceTypeB	НQ	HQ
Branch1-LA	198.19.1.1	Router, SP1 MPLS, SP2 MPLS, DeviceTypeB	LA	LA
Branch2-NY	198.19.2.1	Router, SP1 MPLS, SP2 MPLS, DeviceTypeB	NY	NY

Check the **Device Semantics** against this table, especially the NY branch settings:

Finally, let's check the Interface Semantics that will make using LiveNX more accurate, and seamless.

			Service			
Interface	Device	Site	Provider	Label	WAN/X-Con	Tags
GigabitEthernet2	HQ-B1	HQ	HQ LAN	HQ LAN	None	GE
GigabitEthernet3	HQ-B1	НQ	SP2_MPLS	SP2_MPLS	WAN	ATT, MPLS
GigabitEthernet2	HQ-B2	HQ	HQ LAN	HQ LAN	None	GE
GigabitEthernet3	HQ-B2	НQ	SP1_MPLS	SP1_MPLS	WAN	Verizon, MPLS
GigabitEthernet2	Branch1-LA	LA	Branch1 LAN	Branch1 LAN	None	GE
GigabitEthernet3	Branch1-LA	LA	SP2_MPLS	SP2_MPLS	WAN	ATT, MPLS
GigabitEthernet4	Branch1-LA	LA	SP1_MPLS	SP1_MPLS	WAN	Verizon, MPLS
GigabitEthernet2	Branch2-NY	NY	Branch2 LAN	Branch2 LAN	None	GE
GigabitEthernet3	Branch2-NY	NY	SP2_MPLS	SP2_MPLS	WAN	ATT, MPLS
GigabitEthernet4	Branch2-NY	NY	SP1_MPLS	SP1_MPLS	WAN	Verizon, MPLS

Note: Tags such as WAN and Labels can be used in conjunction with the search string for the topology and in reports.

Now, when you look at the **Device Inventory Story** you should see a full complement of semantic data for the devices (including the Sites they belong to) as well as the interfaces.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 4.2: Adding Devices to Groups

This Labs uses the Engineering Console.

Within the Engineering Console, having devices in groups makes it easier to manage the topology. You can also use group tags in reports and topology searches.

As you have created the groups in the WebUI lab earlier, this is a review of how the same result can be achieved in the **Engineering Console**. In this Lab you will create three groups, one called **LA**, one called **NY**, one called **HQ**.

Lab Steps:

168. Open the Device Management window by selecting Manage.



Figure 95

On the **Device Management** window note that you can modify many settings for the device, such as polling technologies, polling intervals, manage CLI configuration settings, etc.

169. Select "Edit Groups"

elect	Device Name	IP Address	Vendor	Model	Node	Group	Poll	QoS	Flow	IP SLA	Routing	LAN*	Interval	Status
	Branch 1-LA	198.19.1.1	Cisco	ciscoProducts.3004	Local		\checkmark	\checkmark					10 seco $ \lor$	Configured
	Branch2-NY	198.19.2.1	Cisco	ciscoProducts.3004		NY	\checkmark	\checkmark	\checkmark				10 seco 🗸	-
	HQ-B1	198.18.129.24		ciscoProducts.3004			\checkmark	\checkmark	\checkmark				10 seco 🗸	1 -
	HQ-B2	198.18.129.25	Cisco	ciscoProducts.3004	Local		\checkmark						10 seco 🗸	Configured
AN poll	ling occurs every 15 mil	nutes											Numi	ber of Devices
	ling occurs every 15 min					Global D	evice Setting	75					Num	ber of Devices
	Configurations Configure	Configure QoS, Fle Select devices in the ta	able and click	P SLA c the configure button.				gs	MP Setting	25			Num	ber of Devices
	Configurations	Configure QoS, Flo	able and click			E	dit D	efault SNI		-	: - Not Set		Num	ber of Devices
	Configurations Configure	Configure QoS, Fle Select devices in the ta	able and click			E	dit D	efault SNI efault CLI	Monitorir	-			Num	
)evice (Configurations Configure Remove	Configure QoS, Flo Select devices in the ta Remove selected device	able and click	k the configure button.		E	dit D	efault SNI efault CLI	Monitorir	ng Setting:			Num	Clear

As we have only configured NY to be a group, we need to create **Groups** for the other sites in the Engineering Console (This can be achieved in the WebUI, but we've already seen how that's done)

170. Click Add to create a new group.



- 171. Enter LA in the Name field.
- 172. Select Branch1-LA from the All Other Devices list
- 173. click the green **Right** arrow (or double click the device)
- 174. Click Add.
- 175. Repeat the steps above to create the **HQ** group.

Add Group			>
lame (*) LA 4			
escription Los Angeles Group			
5	6		
Uther Devices	- 0	Current Group of Devices	
Q-	\bigcirc	Q	
(NY) Branch2-NY	G	Branch1-LA	
HQ-B1			
HQ-B2			
sterisks (*) indicate required fields.			
		•	
		Add Done	Cancel
		Add Done	Cancel

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176. Once all groups have been created and devices correctly added, select **Done**.

Once completed your groups should look like the one below.

177. Click OK and return to the topology pane to see the changes.

		Add
Name	^ S	Add
HQ	2	Edit
LA	1	
NY	1	Remove

- 178. You may need to exit out of the previous windows to return to the **Device Management** window.
- 179. Double-click on the group to expand.



NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 4.3: Merge Clouds in Topology

This Lab uses the Engineering Console.

Now that the LiveNX topology has discovered devices, and you've defined the correct interfaces and NetFlow configurations, you may Refresh your Flow Tab to view any network flows collected in the Current Polling Interval.



Figure 101

Notice on your topology that the *network clouds* are not connecting between devices. Since these clouds are across a service provider it is necessary to merge the clouds so that NetFlow can be properly visualized across the topology.

Note: You must be in the Topology Pane to perform these steps. Click Home to ensure.

Lab Steps:

180. Right-click on the HQ-B2 Device's **GigabitEthernet2** 10.255.0.0/24 network cloud and select Merge Clouds.



- 181. On the Create Network Object dialog and configure the **Network Name** (This could be your Service Provider, or Transport ID) We have used **MPLS1**.
- 182. Select the **Object/Shape** as appropriate and useful for simple visual recognition.

Note: You may also give the tooltip a name of WAN Cloud.

183. Select "Find" to add more networks.

Name *	MPL S1	Create Network Object	
Type *	Merged clouds		()
		he member clouds in the topology with a single object. When used wit bridge between different clouds where the same flows traversing those cloud network object.	
[Clouds *	Click on clouds in the topology	-
	10.255.1.0/24		
			Find
	Click on clouds in the top using CIDR notation (e.g.,	pology, or use the "Find" button, or type in space separated subnets ., 192.168.0.0/24).	
Object/Shape	Network Cloud	O	
Size			\bigcirc
Tooltip	WAN Cloud		

184. Select the following networks and then select ok: 10.255.0.0/24 10.255.1.0/24 10.255.2.0/24

	10.0.0.102/32	
	10.0.1.1/32	
	10 0 2 1/32	
	10.255.0.0/24	
	10.255.1.0/24	
	10.255.2.0/24	
	100.64.0.0/24	
	100.64.1.0/24	
	100.64.2.0/24	
Ō	192.168.122.0/24	
Ö	198.18.128.0/18	
Ö	198.19.1.0/24	
- A	198.19.2.0/24	

Figure 104

- 185. Click OK.
- 186. Click **OK** to finish.



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Now all three devices should have a link to the WAN Merged cloud. Try moving the devices around to create a topology view which makes sense for you.

187. Click the Refresh button in the Flow tab to query flows from the devices and draw them on the topology.



Figure 106

188. Now complete this for the second cloud, using IP addresses **100.64.0.1**, **100.64.1.0**, and **100.64.2.0**.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Lab 4.4: Creating Network Objects

Network objects can be used to better visualize and understand how traffic traverses the topology. LiveNX allows you to assign various icons to flow endpoints, such as laptop or server icons for those host-types, as well as phone set or camera icons, to denote appropriate infrastructure.

In this Lab we'll identify several specific flows and assign appropriate end-point objects.

Lab Steps:

- 189. Make sure that there is no filter being applied (**No Display Filtering**)
- 190. In the Flow tab, Enter the flex-search string: flow.dstip=198.19.1.101
- 191. Click on the **Flow line** that appears to select it.... And note the IP endpoints.
- 192. Right click on the IP Address endpoint 198.19.1.101 and select Create Network Object



- 193. Select an Object/Shape as "PC".
- 194. Click OK.

Name *	LA PC								
Type *	IP address end point								
	Represents an IP end point in the topology. The IP end point must be connected to/associated with an interface, subnet, or merged cloud in order for flows to be drawn to the network object.								
	IP Address *								
	198.19.1.101								
	Type in an IP address, or select a device interface or IP address end point in the topology.								
ject/Shape	PC V								
ject/Shape Size	IP Phone								
Size	IP Phone								
	IP Phone Laptop Network Cloud								
Size Tooltip	IP Phone Laptop Network Cloud Network Cloud (blue) PC 5								
Size	IP Phone Laptop Network Cloud Network Cloud (blue)								

195. Click Refresh.

You will now see the flows to your new network object.



Note: Assigning representative icons to the flow endpoints makes it easier to locate potential trouble spots!

- 196. Enter the search string: flow.srcip=198.19.2.102
- 197. Select the flow (it will be near the NY router), right click on the IP Address endpoint.
- 198. Select Create Network Object

🔺 Create Ne	twork Object	×
Name *	NY Server	
Type *	IP address end point	\sim
	Represents an IP end point in the topology. The IP end point must be connected to/associated with an interface, subnet, or merged cloud in order for flows to be drawn to the network object.	
	IP Address *	
	198,19,2,102	
	Type in an IP address, or select a device interface or IP address end point in the topology.	
Object/Shape		
Size	File Server	
Tooltip	Generic Square IP Phone	
* Required Fie	Laptop Network Cloud Network Cloud (blue)	
_	PC v	

- 199. Select an Object/Shape as "File Server".
- 200. Click OK. This will add the device to the diagram
- 201. Next, add a Laptop in HQ.
- 202. Enter the search string: flow.srcip=198.18.133.36
- 203. Select the flow (it will be near the HQ-B1 and HQ-B2 routers), right click on the IP Address endpoint.
- 204. Select Create Network Object.
- 205. Select an Object/Shape as "Laptop".
- 206. Click OK.
- 207. Click Refresh.

You will now see the flows to your new network objects.



Note: It is always good practice to save your best laid out topology as Master Layout (if you are an administrator) so that if you accidentally move devices on your topology, or would like to share your layout with others, you may then Sync to Master Layout.

208. To save the current layout as the master layout, right click anywhere on the white background, click **View**, and **Save as Master Layout**.

Flow	>		
Create Network Object			
View	>		Save Image
Group Management	>		Fit To View
			Reset View
			Reset Layout
			Sync to Master Layout
			Save as Master Layout
		~	Show Bandwidths
		~	Show ACLs
		~	Show Legends
		~	Scale Names
			Force Subnet Display for All Interfaces

Lab 5

Lab 5: Dashboards & Reports

This Lab uses the WebUI.

The LiveNX Dashboard is your first stop to view overall network health. There are some Default Templates already available, and you have the option to add more dashboards, delete any you don't want, or change them too.

In this Lab you'll examine the data provided within the Dashboard views and learn how to create your intelligence center for key views and information that LiveNX provides.

Lab Steps:

209. Click the Main Menu hamburger, and then click on Dashboard



Figure 113

NXOF-1.LWA.2.0.1

LiveNX Foundations Workbook 1

The Dashboard display is laid out with Tabs (2), and "Widgets", also called Display panels (3).

shboard				Mar 21, 2022 83/45	00 -> Mar 21, 2022 04:00:00 Add Wicget
Status (2) II	WAN	:	System		Meria ····
Enter Filter Request Here					 Apply filter
Top Sites by WAN Utilization Feek Incound WAN Interface Utilization	X 🗄 Top WAN Applications by Bandwi	dth Inbound/Outbound Bandwidth	×	E Top Interfaces % Changed - Interface Burstable Rate	×
386(8)-+(2-+C 9F)(MFR) 91.0 2816(8)-+(2-+C)-F(2-2)(4FR) 11.0 281(2-4)-(2-+C)-(2-+(2-+C))(4FR) 282-1(2-+0)(2-+(2-+C))(4FR) 282-1(2-+C)-(2-+(2-+C))(4FR) 282-1(2-+C)-(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2-+C))(4FR) 282-1(2-+(2	10auto Viso 10 auto-unitroni error amproprio 0131.136-unitroni 021.136-unitroni 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.430-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021.4300-autocom 021	5013 2714 315 323 220 1925 144 1320 144 1320 19 144 1320 19 144	ln Otal	HORE-HIGH-HIDDISH-HIGH (HP VHS) Brach (L-H)(EH-ADDISH-LH-PF VHS) Brach (L-H)(EH-ADDISH-LH-PF VHS) Brach (L-H)(EH-ADDISH-HIV- Brach (L-H)(EH-ADDISH-HIV- Brach (L-H)(EH-ADDISH-HIV- Brach (L-H)(H)(EH-ADDISH-HIV- Brach (L-H)(EH-ADDISH-HIV- Brach (L-H)(EH-ADDISH-HIV- Brach (L-H)(EH-ADDISH-HIV- HIV) Brach (L-H)(EH-ADDISH-HIV- HIV) HIV (L-H)(L-H)(H)(H)	
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Availability Top Devices With Least Availability	X 🗄 Availability Top Interfaces With L	east Availability	×		
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Figure 114

- 210. You can click any Widget heading, or orange text in the widgets for further drilldowns. Many of the charts and graphs will reveal more insight when you mouse-over them.
- 211. When you click these items, a new browser tab will open.

HQ-B2→GigE3→HQ→HQ SP1_MPLS1 HQ-B1→GigE3→HQ→HQ SP2_MPLS1 Branch1-LA→GigE3→LA→LA SP2 MPLS Branch1-LA→GigE4→LA→LA SP1_MPLS Branch2-NY→GigE3→NY→SP2_MPLS Branch2-NY→GigE4→NY→SP1 MPLS	47.0 11.0	HQ-B2→GigE3→HQ→HQ SP1_MPLS1 ● Input Peak: 47.00 %	
	%		

Figure 115

Note: Your results may not look the same as the images in this Lab. These images are for example purposes only.

212. Click on the WAN tab.

	Status	🗄 🚺	WAN	=	System
Enter Filter Reques	st Here				
Site Utilization Ap	pp Group (DSCP) - Outbound	×	# App Group (DSCP) Bandwidth Site	- Outbound	×
LA HQ NY	9.3 0.2 <0.1	MULTIMEDIA-C VOICE BEST-EFFORT	MULTIMEDIA-CONFERENCING VOICE BEST-EFFORT	237.2 143.8 100.9	 LA NY HQ
		NETWORK-CON	NETWORK-CONTROL	0.1	4

- 213. We are going to use this dashboard that shows all data in each of its widgets, and change it to only **rtp** data.In the **Search Bar** (5), click and select **Application** (6) from the dropdown options.
- 214. This will bring the **Application Pick** list (7), where you can specify which application you want to filter. Type **rtp**, and click on **rtp** from the list that appears.
- 215. Finally, click Apply to enact the filter.

Dashboard					
	Status	::	WAN	::	Syste
Application:	rtp Enter Filter Request Here				
: Site Utilization	App Group (DSCP) - Outbound	×	Hop Group (DSCP) Bandwidth Site	- Outbound	
LA	6.3	MULTIMEDIA-C	MULTIMEDIA-CONFERENCING	252.5	• LA
	A MARTIN	a		lane and the second sec	
	VVIdg	ets now only show F	Counts/num	bers	

- 216. Next, we will create a new Dashboard, and populate it with specific reports.
- 217. Click on the *sign* on the right side of the Dashboard Tab Bar.

					Mar 21, 2022 04:20:0	0 → Mar 21, 2022 04:35:00	Add Widget 🥜
ч	1	System		🗄		Alerts	
							Apply filter
up (DSCP) Bandwidth	Site - Outbound		× .:: Service Provider	Bandwidth Ap	p Group (DSCP) - Outbour	nd	×
IA-CONFERENCING	244.9	0.14	SP1 MPLS	244.9			MULTIMEDIA-C

218. This will bring up a New Tab, which can be renamed by clicking in the text in the tab. We called our **TRAINING TAB**. Use any name you wish for your tab.

		New Features!	▲ 1 7 🗖	0 •	0 🐥 45				💄 admin 🚽
				Mar	21, 2022 04:45:0)0 → Mar 21, 2	022 05:00:00	Add V	Vidget 💡
System	:	Alerts				TRA	INING TAB		
									_
ou're about to create a new dash									

Figure 119

219. In the main body of the page, you'll find options of standard Dashboard layouts that can be modified, or the choice to build a custom dashboard. Click on **Custom Dashboard**.

efault templates		Shared dashboards
Custom Dashboard Custom widgets LiveNX provides insights into multiple dimensions to help users understand and monitor network behavior. Using custom dashboards, LiveNX users can create their own network views that provide them with the most value	Status Default widget group Number of widgets: 8 This dashboard reveals the overall status of the network, monitored by LiveNX	You have no shared dashboards on this list yet The reason for that is no one shared any dashboards yet. You can hide this Shared dashboards' list until shared dashboard will be added. Hide 'Shared dashboards' area for now
WAN Default widget group Number of widgets: 12 This dashboard, focused on WAN, indicates which sites, service providers, and application groups are the most utilized and how they consume the most WAN bandwidth	System Default widget group Number of widgets. 6 This dashboard provides visibility into the overall health of the LivekX deployment, visualizing whether the LivekX system is normal or needs immediate attention	D
No WMIC or Cisco ISE Configuration Found.	CISCO SD-WAN Performance No Cisco SD-WAN Configuration Found.	

220. This will open a panel on the right where you can select standard reports to use as a standard widget or create your own widget from a custom report.

Alerts	Mar 21	Add widget Current dashboard: TRAINING TAB Added 0 out of 9 widgets	×
Create V	Vidaets	Search	Q
from Sta deshboards Repo	andard	Alerts Current Active Alert Count	~
o one shared a oards' list until shared dasi	board will be	Availability Availability	~
		Applications II Top Application Performance Summary	
		I Top Voice/Video Performance Summary	
		Address	
		Source Address	~
		Destination Address	~
G		Source or Destination Address	~
		Site Traffic	~
		Source Site Traffic	~
		Destination Site Traffic	~
		Bidirectional Source/ Destination Pair	
		Network Source Network	
		Destination Network	~
		Source or Destination Network	, v
			, i
Create Cu		Status Top Sites by WAN Utilization	~
Widge	t —	🔁 🖙 Create New Widget	

Figure 121

221. To add standard widgets to the Dashboard, either drag and drop items with the Drag

Handle er open the category stacks to reveal options

	Source Address	~
Open Category	Average Inbound	
Open Category Stack	Average Outbound	
Oldon	Average Inbound & Outbound Separated	
	Destination Address	~
	Source or Destination Address	\sim
	Site Traffic	\sim
	Source Site Traffic	\sim
	Destination Site Traffic	\sim

Figure 122

222. Drag any combination (up to 9 in total) onto a Custom Dashboard.

	Stelus	11	WAN		System	8	Alerts	11	DRAINING DAD	
Enter Filter Re	quest Here									 Apply filter
Top Interface	s Average Inbound Bandwid	th	×	E Top Interfaces, Average Outbound	Bandwidth	×				
H0 B2-+GIDE3-	-InboundH0	513.2		HO B2-+GIGE2-+Cuttoound-+m	680.0					
		373.4		Branch1-LA-JGigE4-JOutbound-JLA	392.4					
	gE2Intound/NY	15.6		Branch/2-NY GigE4 Outbound NY						
HO B2-+GIgE2-	Inbound-+H0	24.1		HO B1GigE2OutboundHO	27.3					
HQ-81-GigE3-	Inbound_/HQ	10.7		HQ482GigE2OutboundHQ	15.0					
Branch2-NYGI	gE4-Inbound-INY	9.4		Branch2-NY	5.4		6	Click Title to I	Drill Down to F	Conort
	pF4-Jabound-J-A	6.8		Rendrife A - Gigl 2 - Outbrand - LA			6			<i>Tebour</i>
HQ B1→GlgE2-		4.1		HO-B1→GigE3→Outbound→HO	<0.1					~
	gE3-Jinbound-JLA	0.8		Branch2-NYGigE3OutboundNY						
Boartch/2-KY/Gi	gE1InboundNY	0.3		Branch1-LACigE3OutboundLA						
		Rips			Кіцэк					
Sile Utilizatio	n App Group (DSCP) - Intiou	nd	×	E Received in the American States	futbourd	×				
HQ	8.2		MULTIMEDIA-C.	LA 95		MUTINEDUAC.	D	rag to Move	Widget	
LA	0.1		VOICE	HQ 0.2		VOICE	_			
NY	<0.1		BESTEFFORT	NY <0.1		BESTEFFORT				
			NETWORK CON			NETWORK CON				

223. Congratulations. You've created a Custom Dashboard, and learned how to filter data within the view, as well as drilldown to detailed information.

This Lab uses the WebUI.

We'll run 3 of the most used reports, based-upon available data in our Training Pods. Reports work the same with any installation... only the data is changed (... to protect the innocent? ;-).

Lab Steps: Run an Applications Report

- 224. You will be using the **WebUI** for this part of the lab.
- 225. Select View Reports from the menu on the left.

🕷 Main 🔤	ee				io Applefiller 😂 Ado
				Active Alerta	
ala Topology				ALSTE C	TIME OPENED
	DEVICES 4	INTERNACIES: 9		 Repart H & A down close com anning application rip had 200.00 ms of jtter for huffic with a DROP value of 46 (FF) 	22 Sep 2021, 05:52 AM
E Stories				 Breach HLA dolout cleax.com running application rtp hed 290.00 ms of littler for traffic with a 000P value of 46 (EF) 	22 Sep 2021, 03:52 AM
				Wern Huldt Verbeitraffe fer Eranon LLAudebud einen kom ranning applikation statistikeligige in net market as DECP EF.	21 84p 2021, 0842 PM
AL Reports	D DEVICES 2	O INTERFACES C	0	 HQ-82 connect cisco com running application righted 200.00 ms of jitter for Fathe with a D90P value of 8 (89) 	21 Sep 2021, 08.12 AM
Vev Reports La	 BARDALA 	 Noante herretz Brakchi 4.A 		 HQ 62.0cloud cises com running application righted 200.00 ms of jitter for hollic with a 200P value of 0 (85) 	21 Bep 2021, 05:12 AM
Wew Heperts	 H0.62 	 Signability for the Colling and G NV 		 Brown1 EA-block close com running application rtp had 290,00 ms of jitter for traffic with a DSCP value of 0 (DE) 	21 Sep 2021, 06:12 AM
Quation Reports	 Drevera Wy 	 Gioso/Ethemet28(0.81) 		 Brench14LA double lack communing application rip had 290.00 ms of jitter for traffic with a 050P value of 0 (9E) 	21 Sep 2021, 05.12 AM
View Schedule	 H0-81 	 OlgabilEtherne(2)+0-83. 		 HQ-82 delaad class com running application rtp had 358.80 ms of jitter for hattic with a 0002" value of 45 (87) 	21 Sep 2221, 0403 AM
verucaecue		ClipabilThwmrDilline.ch0.407		 HQ-22.00 bad class com running application righted 208.00 ms of (itter for I taffic with a DGOP value of 34 (AF41) 	21 Sep 2221, 64.03 AM
		 Gigsb/B/heme/G/HQ-81 		 HQ-52.00 read class core running application righted 200.00 million of jitter for Laffic with a DSCP value of 45 (07) 	21 Sep 2021, 04.03 AM
.B; LiveNA		 GigsbilD herreiD(HQ-02. 		 HO-52 doised class com running application rtp had voice/video traffic with 200.00 ms max [ther 	21 Sep 2221, 0400 AM
		 OlgabitDhemeti(Dreach14.A) 		 HQ 40, doilaud close core running application rtp had 300.00 ms of jitter for Forths with a D60P value of 34 (AP-R) 	21 Sep 2221, 0408 AM
1		 GlobbitPhomeMiRistach2 NV 		 Over 1% of Visice traffic for HQ-92.4 double isos com surving application operandent is not marked as D9DP RF. 	21 Sep 2021, 04.03 AM
✗ Configure				 Brench HLA dolout clean com running application rtp had 200,00 me of littler for traffic with a 090P value of 04 (4F41) 	21 Sep 2021, 04/02 AM
				 Browshi LA scioue close com running application rtp has 290,00 ms of jitter for traffic with a DSCP value of 34 (VF41) 	21 8to 2021, 0402 AM
				 Brand HLA dood cisco com reming application rtp had voice/video traffic with 200.00 ms man jitter 	21 Sep 2021, 04.02 AM
				 Over 1% of Visice traffic for Branch2 MV.dcload cises com ranning application sip is not marked as DBCP EF. 	23 Jul 2023, 02 37 AM

- 226. Select the Application report from Top Reports.
- 227. Enter a meaningful name for your report and select other options that are relevant to your task. Here I have chosen 1hour for the **Time Range**. You may want to view just a site, or a device. Be aware of what is needed.
- 228. Select the Inbound and Outbound Combined filter.

	REPORT DETAILS	
REPORT LIST		
		Flow Type
Add New Report	Your reference information for this report	Basic Flow V
	Report Description	Execution Type
	Enter report description	Time Series V
	Devices	Sort By
	All WAN Devices	Bit Rate V
	Interfaces	Business Hours
	All WAN Interfaces	All Hours 🗸
	Flar Search O	Cannot be used with All Devices Bin Duration
	-	× Aito ~
		5 minutes
		Long Term Store
	No Display Filtering	Due to the report options selected, this report will utilize the Long Term datastore (faster). To over-ride
	Direction	this behavior and use the Raw Flow datastore, set the
	Select Direction	Bin Duration option to 1 Minute (slower).
		Cancel Save As Template Execute
	Voor reference information for this report Application (Flow) Normal C Add New Report	Add New Report Add Ne

229. Click **Execute**.

/iew Reports													Ver Sched	ule Da	entir Report
Templates Reports History															
Q, application	Applicat	lion								View Options ~	Share	Download	Schedule	Сору	Close
Default Templates	Your refe	rance information for this	report Application	(Flow)											1
avorite Applications 0	Denice Al	ANN Devices - Interface: All	WM brockers Disala	Filter Na Disalas Elterino - Direction	Output Harbar RainFau	Execution Type Time Series Bort B	Sit Sate - No Decation A	Are - Bart Ener JJ 23 2321 13 2	R 12 ETT (DATOLOD) End Texes J	1 21 2021 S4 2043 ED	1047-5400 Be	Interval: Societas			
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WAN Application Service Provider Perio 0	< < Page	 Application () rtprovide ice 			57 21.7 216 4.4	5MB 7MB	108,737 66,917	48.33 Kops 9.92 Kops	Average Packat Rate 🔿	18.69 pps		0 51.98 Kbps 11.16 Kbps		#1# ()	32 p 20 p
WM Application Service Provider Perio 0	<< page	Application () Hproudic ice sip			57 21.7 216 4.4 71 1.6	5MB 7MB 0MB	108,737 66,917 10,987	48.33 Kbps 9.92 Kbps 8.56 Kbps	Average Packet Rate 🔿	18.69 pps 3.05 pps		0 51.98 Kbps 11.16 Kbps 4.14 Kbps		at# ()	32 p 20 p 4 p
WA Application Service Provider Perio. 0	< < Page	Application () rtproudic ico ibi fip fip			57 21.7 216 4.4 71 1.86 110 1.05	5 MB 7 MB 0 MB 7 MB	103,737 66,917 10,987 26,737	48.33 Khps 9.92 Khps 8.56 Khps 2.38 Khps	Average Packet Rate 🔿	18.69 pps 3.05 pps 7.43 pps		0 51.98 Kbps 11.16 Kbps 4.14 Kbps 2.63 Kbps		*** ()	32 p 20 p 4 p 8 p
WA Application Service Provider Perio. 0	< < Page	Application () Application () reproved ice ice po flp confisencing			57 21.7 216 4.4 71 1.80 110 1.00 43 7788.0	5 MB 7 MB 0 MB 7 MB	103,737 66,917 10,987 26,717 9,079	48.33 Khps 9.92 Khps 8.96 Khps 2.98 Khps 1.76 Khps	Average Packet Rate 🔿	18.69 ppo 3.05 ppo 7.43 pps 2.62 ppo		0 51.98 Khos 11.16 Khos 4.14 Khos 2.63 Khos 2.61 Khos		ate ()	32 p 20 p 4 p 8 p 8 p
WAX Application Service Provider Partia. 🧿	< < Page	Application () Application () the audio ico ap hp confisencing bittorext		1	57 21.7 216 4.4 71 1.8 10 1.0 43 788.0 74 163.2	5 MB 7 MB 0 MB 7 MB 14 KB 15 KB	108,737 66,917 10,087 26,737 9,079 2,131	48.33 Khps 9.92 Khps 3.96 Khps 2.98 Khps 1.76 Khps 0.36 Khps	Average Packet Rate 🔿	18.59 ppo 3.05 ppo 7.43 pps 2.52 ppo 0.55 pps		0 51.38 Kbps 11.16 Kbps 4.14 Kbps 2.63 Kbps 2.61 Kbps 364 bps		ate ()	32 p 20 p 4 p 8 p 8 p
WA Application Service Provider Perfus. 🧿	< < Page	Application () If proudic ico ico ico provide ico provide ico provide ico provide ico provide ico provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide provide		1	57 221.7 216 4.4 71 1.66 110 1.07 48 7788.0 744 1.632 206 1.50.5	5 MB 7 MB 0 MB 7 MB 4 KB 5 KB	108,737 66,917 10,987 26,737 9,079 2,131 1,612	48.33 Kops 9.92 Kops 3.56 Kops 2.98 Kops 1.75 Kops 0.36 Kops 0.29 Kops	Jourage Packet Race 🔿	18.55 ppo 3.05 ppo 7.43 pps 2.52 ppo 0.55 pps 0.45 pps		0 51.98 Kbps 11.16 Kbps 4.14 Kbps 2.69 Kbps 2.69 Kbps 364 bps 364 bps 328 bps		ate ()	32 pi 20 pi 4 pi 8 pi 8 pi 0 pi 0 pi
NAN Application Service Provider Perfus. 🛛	< < Page	Application () rtp sudio los bits bits confurencing bits confurencing ospf otrus	ha	17	57 23.7 216 4.4 71 1.6 40 7788.0 48 7788.0 744 1652.2 506 1190.5 4 580.0	5 MB 7 MB 0 MB 7 MB 14 KB 15 KB	108,737 66,917 10,087 26,737 9,079 2,131	48.33 Khps 9.92 Khps 3.96 Khps 2.98 Khps 1.76 Khps 0.36 Khps	Average Racket Rate 🕤	18.59 ppo 3.05 ppo 7.43 pps 2.52 ppo 0.55 pps		0 51.38 Kbps 11.16 Kbps 4.14 Kbps 2.63 Kbps 2.61 Kbps 364 bps		ate ()	32 p 20 p 4 p 8 p 8 p

Figure 126

Note: Your results may not look the same as the images in this Lab. These images are for example purposes only.

The default **Application** report is displayed when you select Reports, and after you clicked Execute Report the system filled-in the report template with current 15-minute data. Notice the report parameters (**A**), the various applications (**B**), view options (**C**), export options (**D**) and the actual data in the report (**E**).

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When you run a report... try to do filtering and searching so the system only needs to pull appropriate data to answer your question. LEAVE THE REPORT OPEN!

Run a Top Talkers Report

230. Click on the Pen icon near the top-right side of the report to load the current report parameters.

						View Schedul	e C	Create Report
		View Options V	Sha	re Dow	nload	Schedule	Сору	Close
23, 2021 13:2	8-13 EDT (GMT-04:00) End Time:	Jul 23, 2021 14:28:13 ED	F (GMT-04:00)	Bin Interval: 5	minutes	rtp-audio ica sip	L	oad Parameters
						ftp conferencing bittorrent ospf citrix bittorrent-ne	tworking	
						netbios-dgm Total		
14:10	14:15	14:20		14:25	14:20	Total		
14:10	14:15	1420	Q	14:25 Search	14:21	Total		() ¹
14:10	14:15 Average Packet Rate ◊	14:20	Q Peak Bit R	Search	14:20	Total		[] <u></u>
		14.20 30.20 pps		, Search ate ⇔	14:21 98 Kbps	Total		1 ±
8.33 Kbps				, Search ate ¢ 51.		Total		
8.33 Kbps 9.92 Kbps		30.20 pps		, Search ate ¢ 51. 11.	98 Kbps	Total		32 pps
14:10 8.33 Kbps 9.92 Kbps 3.56 Kbps 2.38 Kbps		30.20 pps 18.59 pps		search ate ¢ 51. 11.	98 Kbps 16 Kbps	Total		32 pps 20 pps

- 231. Click Add New Report, and then select Top Conversations.
- 232. You will be able to configure parameters that will affect both reports, and certain parameters specifically for the **Top Conversations** report. These parameters are independent of the original **Applications** report.

Templates Reports History	RUN OR EDIT REPORT(S)			×		
Q, application	GENERAL SETTINGS	REPORTUST	REPORT DETAILS		Schedule Copy	Close
efault Templates	Namo	🗄 Your reference information for this report Application (Flow) 👘 Normal 👝 🖀	Report Name	How Type		10
varite Applications 🛛 😆	Application	Top Conversations (Flow) Normal 👝 🗃	Tap Conversations	Basic Flow V		
pie Fastane Applications 0	Presentation Mode	Add New Report +	Report Description	Execution Type	ris suito	=
Stostion Ve. Network Performance	Standard ~		Enter report description	Time Series		=
Reation Service Provider Performan					the conferencing to the second	
WUN Application Service Provider Per.	Common to all		Devices All WAN Devices	Sert By	and along	
NVAN Application Vs. Network Perfor			Al Wan Devices	V Bit water V	errer Brezonweis naturzchling werheins-digen Total	
AN Application Va. Network Performa	Reports in View st		Interfaces	Beainess Hours	21	
AN Application Service Provider Perfs.	(GMT-05/07) America/New York		AI WAN Interfaces	V AllHours v		
	Time Range		Flex Search @	Connectibe used with All Devices Bin Duration		
	Lest Day		Ex: site-Horolulu & was & flow app-http	* 6.00	Peak Packet Rate O	
	N			i minites		32,030
	Plex Search 🔞		Display Pilter	Long Term Store		20 p.ps
	Ex. site-Honolulu & wan & flow.apprtitip x		No Display Filtering	Due to the report options selected, this report will		4 p.ss
	Display Filter		Direction	utilize the Long Term datastore (faster). To over ride this behavior and use the Raw Flow datastore, set the		8 0.36
	Select Display Filter		Orboard	Bin Duration option to 1 Minute (alower).		3 p.ps
	Older Bright Frank					U (p.25
	Sharing Settings		Should Wait For DNS Resolution			0 p.36
	Enal X		False	v		2 pps 0 pps
	Enter en email address or AD entity					0 p.34
			Specific to th	e Report Selected		
	His Pernat					
	Send FDF Send DSV					
	POF Row Limits					
	Al Rous 🗸					
				Cancel Save As Template Execute		

Note: Your results may not look the same as the images in this Lab. These images are for example purposes only.



Figure 129

This **Top Conversations** report has been appended to the **Applications** report. in the selected time-range including Source address, Destination address, total flows, etc.... a good way to see who is using the bandwidth, and what for... All that BitTorrent may not be good for business! Right-clicking to open a New Report leaves the prior reports open, in a tabbed manner, for comparison purposes. Bin Duration has been singled out as different.

Flow Identification

- 234. Close the report view. Next, we will look at QoS information by DSCP value.
- 235. On the report menu, click DSCP.

View Reports											
Templateo Reports History											
Q, application											
Default Templates	Favorite Reports	Sworte Reports									
Tavorthe Applications 0	Add Report										
Apple Festiene Applications 0											
Application Va. Network Performance 0	Top Reports										
Application Service Provider Performan	HAMP C	INSCRIPTING									
EDWAN Application Service Provider Pe 🕚	Application	The Flow-based report will high bit the Top 10 applications bandwidth, based on the selected filter criteria. It will also bit up to 1000 applications.									
SDWAN Application Va. Network Perfor 0		and in a revealed by the highlight first top to approximate devices first exercise from events from a top to approximate top to approximate devices the events from events from the first event of the events from events from the first event of the events from									
WWN Application Vo. Network Performa 8	Interface Dandwidth	In a transmission spectra in registry to the product of the sector has been and the sector has a first sector by the sector has been as a sector has a sector has been as a sector has been as a secto									
WAN Application Service Provider Perfor. 0	DBCP	The Pero based east of high birth the Too 10 BSP markings bandwidth based on the solucies (if the initiation, I will list up to 44 DSP marking).									
	Top Interface Bandwidthe	The SHMH-based report shows a table of all the interfaces bandwidt obligation per the specified ifter.									
	Top Interface Errors	This BHMP based report shows a table of all interface entry (DRO/Partra/Duerrum, etc.) per the opeoined fitter.									
	Top Class Bandwidths	This GRUP-based opport shows a table of all GoS cleas bandwidths for all interfaces per the specified fiber									
	Top Class Drops	This SNUP based report shows a table of all QoS alone drops on all invertises per the specified filter									
	Interface Dandwidth	This SNAVP-based report graphs handwidth utilization of a specific interface.									
	Insertace Utilization	This SNAP-based report graphs the interface bandwidth unit reston (b) percentage) of a specific interface									
	Interface Errora	The SNMP-based report graphs the number of interface errors (CINC/ Hunta) Oversmark etc.) of a specific interface.									
	Post Policy Drope	This SIMP based report graphs the DaS drops of all observe on a specific interface.									
	Application DBCP Audit	The Plow-based separt will alread the DSCP markings of applications organized by site, based on the selected filter exterior.									
	Interface Bandwidth Summary	This Plaw based report will highlight the ingress and ogress interface bandwidth based on the selected filter ariteria. It will fait up to 50 interfaces.									
	Default Templates										
	HAME C	Isosennok 0									

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LiveNX Foundations Workbook 1

236. For this exercise, do not alter any default parameters, but review the options available.

GENERAL SETTINGS	REPORT LIST		REPORT DETAILS	
Name	E DSCP (Flow)	Normal 🕤 🗃	Report Name	Flow Type
DSCP	Add New Report	+	DSCP	Basic Flow
Presentation Mode			Report Description	Execution Type
Standard \sim			Enter report description	Time Series 🗸
Footnote			Devices	Sort By
Enter report group description			All WAN Devices	V Bit Rate V
Time Zone 🕑 DST			Interfaces	Business Hours
(GMT-05:00) America/New York			All WAN Interfaces	V Al Hours V
Time Range			Flex Search	Connot be used with All Devices Bin Duration
Last Day 🗸			Ex.: site=Honolulu & wan & flow.app=http	× Auto ~
Flex Search			Display Filter	1 hour
Ex: site=Honolulu & wan & flow.app=http ×			No Display Filtering	Long Term Store Due to the report options selected, this report will
Display Filter			Direction	utilize the Long Term datastore (faster). To over-ride this behavior and use the Raw Flow datastore, set the
Select Display Filter			Cutbound	Bin Duration option to 1 Minute (slower).
Sharing Settings				
Email ½				
File Format Send PDF Send CSV				
PDF Row Limits				
All Rows 🗸				
Custom Logo				
No Custom Logo V				
				Cancel Save As Template Execute

Figure 131

237. Click Execute.

View Reports										View Schedule	Create Report
Templates Reports Hist											
Q By Template Name		DSCP						View Options ~	Share Print	Schedula Copy	Ciose
Default Templates		DSCP (Flow)									10
foice Analysis	0	Davies: All MAN	And a second second wa	H Interfaces Display Filter: No Disp	lay Filtering Direction: Outbound	Hew Type: Rosis How - Excention Type	c Time Sories Sort By: 8 t Rate - Min Duration	e Auto - Reart Times Mar 20, 2022 14:50:07 607 (GMT 00	00) Bull Yawa Mar 21, 2022 18,58,87 B	art (INVECTOR) Bin Interval:	1 hour
WAN	0	1000								- 34 (AF41)	=
evorite Applications	0									45 (DT) 6 (BT)	-
pple Fastiane Applications	0	ŝ.,								45 (C58) Tutel	
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ite Network Performance Audit	0	12.54	18.00	20.02	22.00 Mar 21	02.00	G4.00 06.00	02.00 10.00 12	00 14.90 14.54		
olce/Video Performance Va. Network	0										-
Sile-to-Sile Traffic Utilization Audit	0								Q Search		11
iervice Provider DSCP Audit	0	Legend ©	DSOP ©	Total Flows 🗘	Total Bytes 0	Total Packets 🗘	Average Bit Rate 🗘	Average Packet Rate 0	Peak Bit Rate 🗘	Peak Packet Rate 🗘	
Track Single Site WAN Path Changes	0	-	34 (AF41)	6,325	5.34 GB	6,610,510	494.50 Kbps	76.51 pps	497.55 Kbps		76 pp3
pplication Vs. Network Performance	0	-	46 (EF)	21,130	2.00 GB	11,905,177	185.35 Kbps	137.79 pps	186.47 Kbps		138 pps
olce, Video Service Provider Performan.	0	-	0 (BE)	84,778		6,073,226	78.30 Kbpc	70.29 pps	84.71 Kbps		73 pps
	0		48 (CS6)	9,936	646.60 KB	12,739	0.05 Kbps	0.15 pps	80 bp s		O pps

Figure 132

Look at the distribution of discovered traffic across the DSCP values. What does the amount of traffic marked 0 (BE) tell you?

0 (BE) traffic has not been recognized as a certain type by the router and it will use BEST EFFORT to route it. This **may** be a candidate for marking so that QoS may use priority routing.

Bandwidth by Flow Type

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- 238. Let's add some more information to our page.
- 239. Click the **Load Parameters** pen icon and add **Interface Bandwidth Summary** from the Top Reports section.

GENERAL SETTINGS	REPORT LIST		REPORT DETAILS
Name	E DSCP (Flow)	Normal 🔁 🗃	Q. Search
DSCP	Please choose report type		*Only Time Range report types displayed
Presentation Mode	Add New Report	+	Top Reports
Standard \lor			Application (Flow)
Footnete			Top Conversations (Flow)
Enter report group description			Interface Bandwidth (Flow)
Time Zone			DSCP (Flow)
(GNT-05:00) America/New York			Top Interface Bendwidths (SNMP)
Time Range			Top Interface Executivities (SNMP)
Custom V			Top Class Bendwidths (SNMP)
Start Date Start Time End Date End Time			Top Class Drops (SN/P)
07/22/2021 15:10 07/23/2021 15:10			Interface Bendwidth (SNMP)
Flex Search 🔞			Interface Utilization (SNMP)
Ex.: site=Honolulu & wan & flow.app=http 🛛 🗙			Interface Errora (SNMP)
Display Filter			Post-Policy Drops (SNMP)
Select Display Filter			Application DSCP Audt (Flow)
			Interface Bandwidth Summary (Flow)
Sharing Settings			LiveNA
Email 🔆 Enter an email address or AD entity			Flow
			SNMP
File Format Send PDF Send CSV			🔁 Cisco SD-WAN
PDF Row Limits			🕀 Alerts
All Rows			
Custom Logo			
No Outron Lass			

- 240. Enter a Search String: wan & flow.dscp=EF (note upper-case).
- 241. Select All devices.
- 242. Click Execute.

liew Reports													View Sch	edule Create Rapo
Templateo Reporta Histor	9	Interface B	andwidth !	Summary (Flow	à									
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						de Rhaine - Mar Tarretta	the Render Dec	The Party Rest Room	the the first sector of	a fan de ser an an an an	and the state Name I and The	222 14 54 00 50T (0MT 04 00) Evel		
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opte Fastlane Voice Analysis	0	-												
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te Network Performance Audit	0											0 (1997)		
Ice/Video Performence Ve. Network	0											Q Search		
te-to-Sile Traffic Utilization Audit	0	Legend O	Site 🗘	Device C	Interface Name 🗘	Service Provider Ö	Direction ©	Total Flows O	Total Bytes 🛈	Total Packets C	Average Bit Rate 🗘	Average Packet Rate 🗘	Peak Bit Rate 🛇	Peak Packet Rate 🗘
rvice Provider DISCP Audit	0	-	HQ	HQ-82	GigabitEthamet3	SP1_MPLS	Ingress	12,102	1.54 GB	8,674,402	143.05 Kbps	100.40 pps	158.54 Kbps	111 ps
ack Single Site WAN Path Changes	0	-	HQ	HQ-82	GigabitEthernet3	SP1_MPLS	Egress	10,505	999.35 MB	5,943,928	92.53 Kbps	68.79 pps	102.72 Kbps	76 p;
plication Vs. Network Performance	0			.com - GigabitEtt										
sice/Video Service Provider Performen	0													
pplication Service Provider Performan	0	Elevice: All WAX Bin Interval: 5 n		renta esc All UUAN Leta	Factor Display Hiter No. Dis	play Filtering Plose Type: Basi	e Ploy - Execution Type	Clima Saries Sort By: 84	Kata Has Search vian	E flow damp 107 Bin Durata	en: Callo - Shart Tena: Mar 20, 2	222 1 4 5 4 03 60 T (0 M L 0 4 02) 6 w	Terrec IV ar 21, 2022 14 54 00 8	or (avr.ac.ec)
WAN Application Service Provider Pe	0	150											- Burch	1.1/0gil00 harvat/by.
WAN Application Vs. Network Perfor	0	~											Branch	LA/SigabitDhamatt/ingr.
WAN Voice/Video Partermance Vs. N	0	§ ™ ₩	Alexandra	Martin Comme	And the second	non an	etteret warner	societ where the	and the second	server marine	AN NONPORTON	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	100/1000	
WAN Voice/Video Service Provider P.,	0													
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WN Voice/Video Performance Vs. NeL.	0													
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		Legend O	Site 0	Device C	Interface Name O	Service Provider O	Direction ()	Total Flows O	Total Bytes O	Total Packets O	Average Bit Rate O	Average Packet Rate C	Peak Bit Rate O	Peak Packet Rate O
		-	LA	Branch1-LA	GigabitEthemet4	SP1_MPLS	Egress	10,683	1.00 GB	5,964,018	92.85 Khps	69.03 ppr	100.11 Kbps	74 p;
		-	LA	Branch1-LA	GigaotEtheinet4	SP1_MPLS	Ingless	10,661	999.25 MB	5,942,630	92.52 KDp5	68.76 pps	99.81 K5p5	74 p;

This report shows the INGRESS & EGRESS flows for each relevant interface, for all marked EF traffic flows. This is a Quick way to see how much traffic "stays inside" and how much transits the device.

Note: Your results may not look the same as the images in this Lab. These images are for example purposes only.

This Lab uses the WebUI.

In this Lab you'll create a Custom Report to display the last of the most popular reports. Although the IPs and Ports are now an included report, due to its popularity, we'll create a similar Custom report to visualize the process.

Lab Steps:

- 243. In the View Reports page, click on Create Report at the top-right of the screen.
- 244. Click on Flow, then Analysis, and select IPs and Ports.
 - Name your report. (Do not use "&")
- 245. Select HQ-B2 device.
- 246. Enter wan & flow.dscp=EF in the Flex Search field.
- 247. Set the **Direction** as **Inbound and Outbound Combined**. the Fields as indicated in the diagram, below.
- 248. Click Execute Report.

GENERAL SETT	INGS			REPORT LIST		REPORT DETAILS		
Name				: IPs and Ports (Flow)	Fast 🖸 🗐	Report Name	Flow Type	
IPs and Ports	Last Fifteen M	finuted		Add New Report	+	IPs and Ports	Basic Flow	
Presentation M	ode					Report Description	Execution Type	
Standard						Enter report description	Time Series	
Footnote						Devices	Sort By	
Enter report g	roup descripti	on				HQ-82	✓ Bit Rate	
Time Zone			DST			Interfaces	Business Hours	
(GMT-05:00) /	America/New 1	rork				All Interfaces	 All Hours 	
Time Range						Flex Search 🔘	Bin Duration	
Custom						wen & flow.dscp=BE	× Auto	
Start Date	Start Time	End Date	End Time			Display Filter		1 minute
07/23/2021	15:29	07/23/2021	15:44			No Display Filtering	Raw Flow Data Due to the options selected, this	concert will written the
						Direction	Raw Flow datastore (slower).	report will dulize the
Flex Search 🔞						Inbound and Outbound Combined	~	
Ex.: site=Hon	olulu & wan &	flow.app=http	ж			Should Wait For DNS Resolution		
Display Filter						False		
Select Display	/ Filter							
Sharing Setti	0.05							
Email 🌾								
Enter an emai	l address or A	D entity						
File Format								
Send PDF	Send CS	SV.						
PDF Row Limits								
All Rows								
Custom Logo	9							
No Custom L			~					
							Cancel Save As T	emplate Execute

																	View	Schedule Grea	ata Report
Templatas Reports Histo																			
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Capacity Planning	0	ā 10 🗧															- 10	6.18.123.26/168.18.1.121/ 9.18.2.20/108.18.131.921/	VICE.
National Parformance cudit	0																-	0.100.100.100.10100.007	ALL.
e/Video Performance Va. Network	0	10.80	13.31		10.80	12.88	1334	12.85		3.80	13.27	12.38	1.29	1240	541 1542	12.48	12.44		
to-Ste Tariko Universito - Analit	0	< nor 1	74.5.8													Q Dearth	-		T a
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i Single Site Wilds Path Changes	0	Legend C	Bre IP Addr C	Bro Brie C	Bro Pert C	Det IP Addr C	Det Bite 🗘	Det Pert C	Protocol C	DECP C	Application C	Tetal Hows C	Total Bytes C	Total Packets C	Average Bit Rate C	Average Packet Rate C	Peak Bit Rete C		- 8
ioptien Vo. Network Porformance	0	-	158.19.2.102	NY NY	4210	128.10.133.38	HQ HQ	1494	10P	0(30)	ica .	12	527.05 KD 220.21 KD	4,930	4.63 Kbps	8.40 pps	6,7910	StolP Addr	t
ervideo Service Provider Performan	-	- 2-	168.19.2.102	NY NY	1093	128.10.120.02	R	2670	TCP	0(25)	eip ica	14	220.51 KB	8249	2.05 Kbps	2.19 pps 3.01 pps			1
oot en Kovice Provider Performan.			158.18.135.36	HQ	1285	198 19 2 102	N	4218	109	0 (BE)	ion .	13	197 20 KB	4930	1.75 Kips	5.48 cpm		Dec Site	- E
Wi Appliestion Service Provider Per-			158.19.2.82	NY	3570	138.10.128.82	HQ	80.60	TOP	0(86)	conferencing	10	103.07 KB	2111	1.63 Kbps	2.35 pp =	2.67 8.0	-	- 1
Wi Application Via Network Perfor-			198.18.133.36	HQ	1137	128.19.1.101	LA	21	10P	0 (86)	fra .	14	141.60 KB	3.640	1.25 Kbps	3.93 pp e	14110	Det IP Addr	-
un versaturiler Parfermance VI. N		-	198.10.133.36	HQ	4210	198.19.2.102	NY.	1484	TOP	0(80)	ica .	14	101.76 KB	3,294	1.17 Mps	3.00 pps	1.54.0	Dist Site	_
AN Velles Video Service Provider P.,	-	-	198.10.100.06	HQ	21	198.19.1.101	LA	1137	702	0(30)	fa	54	129.00 KB	3.945	1.15 lbps	3.61 pp.a	1,29 (2)	pa .	4 pp
		_	158.19.2.82	NY	9670	198.19.128.82	HQ	5660	10P	0(86)	aip.	4	72.65 KB	833	0.65 Kbps	C.93 pp+	2,47 Kh	28	3 pp
Application Vs. Network Performe		_	168.19.2.102	87	3888	128.18.138.85	HQ	2710	108	0 (##)	bittoment-networking	24	9,7088	24	o oa shpe	0.03 (64	104 h	16	0 pp
	0																		
l'Application Bandos Pionidar Parfo I Volos, Video Parformance Vo. Net																			

You now have a report which, at-a-glance, shows all the flows that are using **Best Effort**. You can select which columns to show or hide simply by selecting and deselecting them in the **Filter Columns dropdown**.

Lab 6

Lab 6: Traffic Flows

These Labs uses the WebUI exclusively.

One of the strongest features of LiveNX is its ability to differentiate traffic flows by collecting NetFlow & SNMP from devices and mapping the flows visually in the LiveNX Logical Topology and Geo-Topology Pane.

In this Lab we need to find the address pair which has been generating **FTP** traffic over the past few hours. We can make it easy to find with the application of just a few Filter Bar selections!

Lap Steps:

249. Select Logical Topology from the Main Menu.



Figure 137

- 250. You should see all sites in the view, but if NY is missing add it to the view.
- 251. On the left side of the screen, if you see just HQ and LA listed, click the **Edit** button at the top of the panel.
- 252. Select NY so all three sites are checked.
- 253. Click Save.
- 254. To arrange the entities as you'd like to see them, unlock the view using the **View Lock** button on the right.



Figure 138

255. Click in the Filter Bar.

LiveAction	
gical Topology PRENEW	
inter Filter Request Here	Click in Filter Bar
Application	
Application Group	
DSCP	
Site	Filter Options
Destination Site	
Source Site	
Service Provider	
Custom	
	SP2_MPLS
	HQ LAN

- 256. For this exercise, we are going to look for **FTP**, which is an application. Click on Application. This will bring up the applications to choose from.
- 257. You can select the application by scrolling down the list (only the top 50 are shown), or type in the application name. As **FTP** is far down the list, type the letters slowly to see the list change. Click **FTP** when you see it in the list.
- 258. Click Apply Filter.

pplication: Add value	••• IA
Inet	
50plus	
220	Begin Typing Application Name
0050net	or
0086cn	Select From the List
04com	
111tw	
14la	
15com	
	HO LAN

NXOF-1.LWA.2.0.1

You'll see all FTP traffic flowing across the network, but even referring to the legend at the bottom-left corner may not help identify the **specific** flows!



Figure 141

- 259. To get into the specific flows, down to the IP addresses of source and destination, click on one of the flow lines now visible. This brings up an information window that details the Application Name, the segment and direction of the flows, as well as bytes and bandwidth stats. There is also a **Pivot Point** (^{II}) that will take you to a Report of the flow lines you have selected.
- 260. Click the **Pivot Point**.

[DC] HQ	∷ Application: ftp 📌 🗙	
[Do] Ho	Selected segment: HQ → SP1_MPLS Bytes: 92.00 KB Bandwidth: 2.45 Kbps Reports 2 Application: ftp	
NXOF-1.LWA.2.0.1

261. You will be taken to the report page where details of the application, including source and destination IP addresses and DSCP Mapping are available.

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rface Dandric	ian (Tev)																	1
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	HU	5965	Sig abrit 1	without o	0.124100			11							2.43 Kogs			2
		280+	Sigue 23	*****	0.000										2.43 %igs			_
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erversation	n Javi					elon Son By Dr. Nee	FoxSandt (Attr'10) &				011 50 1 50 1 00 ⁻ (0.4 ⁻ 0430) Def T	ine Mar 21, 3132 22/2010 007 (SA1	768.00)		2.43 Kipi			/
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erversation Al Devices	er (Filme) Interface: All Inte				In Filew Execution Type: Approp			nen 8. (for ange 16 g) 6. (ger 187 1. 54 f)	57 Bin Dumfore 5 Vinues - Binnie W	in Fair One Resolution: Non- Gear Three Inter 21.2	622 501 506 507 (0-47 3-480) Ewi T	ine:Hw21.3032332886.0071/347	16400)		2.43 Kops			/
n erandioe. U Derices	er (Filme) Interface: All Inte		o Xopiny Filtering Off	entine Outbourd - Filee Type: Dec	In Trave Departion Type: Approp			nen 8. (for ange 16 g) 6. (ger 187 1. 54 f)	¹⁷ de Duelor 5 Marco - Deelo M Informati	n for the Restuter that dem Three Her 21.3	622.50+504.00*70+70+00; Det 10	ine Mar 21, 3032 222838 007 (SM						/
nversation U Derices	er (Filme) Interface: All Inte	rhoos Naping Rivert Ar		enier Outourd – Fiew Type: In:	In Filew Execution Type: Approp			nen 8. (for ange 16 g) 6. (ger 187 1. 54 f)	57 Bin Dumfore 5 Vinues - Binnie W	n for the Restuter that dem Three Her 21.3					23	24	2.0	-
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rversation U Dorizo (1993), 799, (1993), 799	es (Tano) Incriso: Allina Incriso: Allina D D D D D D D D D D D D D D D D D D D	thes Nation Phatics	Ditrip filering De	colec Outward Ree Type De Data Data Data Data Data Data Data Data	E Rev Decution Type: Appro 2 2 2 2 2 2 2	Source		ne Lineagents (Spentrickin Destination Tex Ryles 0 12	5) Se Duratine Statures - Senakt VA Information unwers Their Prachator 92:10	nferbeikossdertisc denffechler2L2	18 17 660 0 2.43 Mag	1.2 1.8 Jonago Pactat Kara () 19		Q. 811 Dat	21 21 Shean			-
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Figure 143

262. You can further drill down into detailed reports by right clicking on various cells. A popup box of detailed search filters and drill-downs will appear.



Figure 144

263. In this exercise, right click the SRC IP Address and select **Drill Down on 198.18.133.36 as IPs and Ports**. NXOF-1.LWA.2.0.1

264. This will bring up a report of the IP's and Ports being used. This can be further used to drill down to troubleshoot further if needed.

Reports																								Vev Schedule	De	oste Haport
fewn on 198.10.133.36 :	e IPs and Ports	from Top Conve	notices																	Vie	v Optional —	Dan	Pre	Schedule	Cogy	Cos
(Ports (Real)																										
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												B 54	is (Gps)													
						_		-				_										Q Seeth.				Ш
end O Stollser Name O	Ort	User Name C	9	c IP Addr C	Sec Sta	0 1	ins Port ()	Det IP Actin C	Cer Sta	0	Est Port O	Protocol ()	COOP O	Application ()		Total Flows C	T	ral Dyas C	Tes	Factors C	A	verage Eit Rase 🔿		Average Packe	Res C	
			1	6 18 188.95	HQ.		187	106-10-1-101	LA		21	TEP	0(66)	Ep.			5		28.48		1,200		158Kbpt			49
-			1	R 18 18 38	HQ	1	1	1010110	84		1147	108	0(69)	Dp.			5		24.68		1,100		1128bps			862

Figure 145 See how easy that was?

Using the **Logical Topology**, what other applications can you identify across our network? Hint: By selecting **FTP** you are looking at ONLY **FTP**. What do you see if you remove that filter?

Application	Port#	IP Pairs

Lab 6.2: Discover Specific Flows

Note: This exercise will use the Flow Path Analysis story.

265. From the Main Menu, click on Stories, and then Flow Path Analysis.

11	Stories
	Device Inventory
•	Flow Path Analysis
	IP SLA
	Security Flow Analysis
	Site to Site Analysis
	Calls by Number
	WAN Availability
	WAN Capacity Planning
	WAN Utilization

Figure 146

266. In the Flow Path Analysis home page, you are offered three Tabs: **Basic** (A), **Voice/Video Performance** (B), and **Application Performance** (C). Voice/Video Performance provides specific information on RTP/streaming media, such as packet loss and jitter. **Application Performance** provides information on bandwidth use, response time and latency for TCP data flows. For this exercise we will use the basic tab.

		New factures: 4 17 = 0 • 0	▲45 {-}+ @+ @+ ≛stro
Flow Path Analys		 Apply filter 	Mar 21 D 3.30.00 - Mar 22, 2022 00.30.00 Hour N
несс А	Waiter/Victor Performance	٨μ	plastion Performance
	Please select a filter and time range to run specific report		

- 267. Note also that you can look back in time by adjusting the date/time (D) and duration of view in the upper right corner. The display (E) remains clear until you provide filter parameters in the **Page Filter** (F).
- 268. Click in the **Page Filter** and from the drop down, scroll and find **Src IP**, and click it. Note the other options here as there are many and can be used according to your need at any time. In the **Src IP** field type the IP address of the PC in Los Angeles **198.19.1.101**.
- 269. In the screen that populates you will see all traffic that originated at the Los Angeles PC (198.19.1.101), regardless of protocol, application, DSCP marking, or destination. You can add elements to the filter bar to refine your search.

270.

w Path A	vnatysis	Std IP: 198.19.1.101	Enter Filter Requ	est Here										ob Apply filter	Mar 21, 2022 23:45	00 - Mar 22, 2022 00	145.00 Hour
		1	lee c					Voice/Video Perk	NUMBER OF BRIDE					Λριτά	cation Performance		
RRK Q	FLOW P., Q	TBME 0	PROTOGOL C	SRC IP ADDR 0	SRC SITE 0	SRC PORT C	DRTIP ADDR 0	DET SATE Q	DET PORT 0	DECP	Q APPLIC	CTION Q	TOTAL R.OWS 0	TOTAL RYTES C	TOTAL PACKETS Q	AMERAGE BIT R., 0	ANERAGE PACK.
		Time	Protocol	Src IP Addr	Src Site	Src Port	Dst IP Addr	Dst Site	Dst Port	DSCP	Appl	cation	Total Flows	Total Bytes	Total Packets	Average BH	Average Pa.
	C?	22 Mar 2022, 12 20AM	TOP	198.19.1.181	LA	21	198.16 133.36	HQ	1132	0 (BE)	fip.		6	109-94 KB	1,345	0.24 Kbps	0.371
=	Left (22 Mar 2022, 12:254M	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1137	0 (BE)	fto		6	109.87 KB	1,344	0.24 Kbps	0.37
	ß	22 Mar 2022, 12:30AM	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1187	0 (BE)	ftp		6	109.87 KB	1,344	0.24 Kbps	0.37
-	C ²	21 Mar 2022, 11 55PM	102	190.19.1.101	LA	21	198.18.103.06	10	1137	0 (0)	Tp.		6	109-38 KB	1,308	0.24 Khps	0.37
	đ	22 Mar 2022, 12:10AM	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1137	0 (BE)	ftp.		6	100.31 KB	1,337	0.24 Kbps	0.37
=	C.	22 Mar 2022, 12:404M	TOP	198.19.1.101	LA	21	198.18.133.86	HO	1137	0 (BE)	ftp		6	105.93 KB	1,308	0.24 Kbps	0.35
	đ	21 Mar 2022, 11:50PM	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1137	0 (BE)	ftp.		5	91.16 KB	1,115	0.20 Kbps	0.31
	C ²	22 Mar 2022, 12 BDAM	TOP	198.19.1.101	LA	21	198.18 133.36	HQ	1132	0 (BE)	Tip .		5	90.82 KB	1,111	0.20 Khps	0.31
=	Ľ۲	22 Mar 2022, 12:054M	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1137	0 (BE)	fφ		5	90.67 KB	1,109	0.20 Kbps	0.31
	ß	22 Mar 2022, 12:454M	TOP	198.19.1.101	LA	21	198.18.133.30	HQ	1137	0 (BE)	ftp:		5	90.25 KB	1,104	0.20 Kbps	0.31
	đ	22 Mar 2022, 12 156M	101	190.19.1.101	LA.	21	198.18.100.06	10	1137	0(0.)	Tip .		5	US.27.KB	1,090	0.20 Khps	0.30
	ď	22 Mar 2022, 12:354M	TOP	198.19.1.101	LA	21	198.18.133.36	HQ	1137	0 (BE)	ftp		5	89.27 KB	1,092	0.20 Kbps	0.90
	L2	22 Mar 2022, 12:00AM	TOP	198.19.1.101	LA	1187	198.18.133.36	HO	21	0 (BE)	ftp		6	62.79 KB	1,229	0.14 Kbps	0.34
	đ	22 Mar 2022, 12:10AM	TCP	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (IE)	10			62.74 KB	1,228	0.14 Kbps	0.34
	C?	22 Mar 2022, 12 25AM	TCP	198.19.1.181	LA	1137	198.18.133.36	HQ	21	0 (BE)	fip		6	62:34 KB	1,220	0.14 Khps	0.34
Ξ.	ഷ	22 Mar 2022, 12:30AM	TOP	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (BE)	fto		6	62.18 KB	1,217	0.14 Kbps	0.34
	ß	22 Mar 2022, 12:40AM	TOP	198.19.1.101	LA	1137	198.18.133.30	HQ	21	0 (BE)	ftp		6	61.82 KB	1,210	0.14 Kbps	0.34
-	ď	22 Mar 2022, 12 20 M	10 ¹	190.19.1.101	LA.	1137	198.18.103.06	10	21	0(0.)	Tp.		5	52.80 KB	1.004	0.12 Kbps	0.29
	ď	21 Mar 2022, 11:55PM	TOP	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (BE)	ftp		5	52.16 KB	1,021	0.12 Kbps	0.28
Ξ.	ß	22 Mar 2022, 12:054M	TOP	198.19.1.101	LA	1137	198.18.133.86	HO	21	0 (BE)	fto		5	G1.86 KB	1,015	0.12 Kbps	0.28
	đ	21 Mar 2022, 11:50PM	102	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (BE)	tp.		5	51.81 KB	1,014	0.12 Kbps	0.28
	C [®]	22 Mar 2522, 12 45AM	TOP	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (BE)	fip.		5	51.70 KB	1,012	0.11 Kbps	0.28
=	LCT 1	22 Mar 2022, 12:35AM	TOP	198.19.1.101	LA	1137	198.18.133.36	HQ	21	0 (BE)	ftp		5	G1.39 KB	1,006	0.11 Kbps	0.28

Figure 147

271. You can use column filters to further clarify/find the flow you are interested in. In our exercise the flows are very consistent, so click the **Flow Path Analysis** pivot point of the first flow on the list

w Path /	vnatysis	Src IP: 198.19.1.101	Enter Filter Rec	uest Here											ob Apply fit	er Mar 21, 2022 23:4	5:00 - Mar 22, 2022 0	8:45:00 Hour
			Jasic						Voice/Video I	Performance						Application Performance		
ни о	FLOW P. 0	тыя О	PROTODOL	O RECIPACIE O	SHC STE	SHI: FORT	0 88	прави 0	DRI MIS	0 DRT PORT	0 0809	0	APPLICATION	O TOTAL HOWR	O TOTAL BYTER	C TOTAL PARKETS C	ллеване вит н	ANDRAGE PACE.
		Time	Protocol	Sirc IP Addr	Src Site	Sic Port	0	ist IP Addr	Dat Site	Dst Port	0.9CP		Application	Total Flows	Total Byte	Total Packets	Average Bit	Average Pa
-	6	22 Mar 2022, 12 20AM	TOP	198.19.1.101	LA	21	19	C	olumn	Filters	0 (RE)		fip.		6 109.5	4 KB 1,345	0.24 Kbps	0.37 p
	et i	22 Mar 2022, 12 25AM	TOP	198.19.1.101	LA	21	19	8.16.133.36	- Marinin		0 (BE)		fip.		6 109.8	7 KB 1,344	0.24 Kbps	0.37 (
=	ď	22 May 2022, 12:304M	TOP	198.19.1.101	LA	21	198	8.18.133.95	HQ	1137	0 (BE)		fo		6 109.8	7 KB 1,344	0.24 Kbps	0.37
	ß	21 Mar 2005, 11:05PM	TOP	198.19.1.101	LA	21	199	8.18.133.96	HQ	1137	0 (BE)		fp		6 109.3	8 KB 1,338	0.24 Kbps	0.37
	C ²	22 Mar 2022, 12 1 FL	ow Path	n Analysis	s Pivot P	oint	19	110.100.06	HQ	1137	0 (IE)		Tp		6 109.3	1.68 1,307	0.24 Kbps	0.371
	đ	22 Mai 2522, 12:45AM	TOP	108.10.11401	LA	21	19	8.18.133.36	HQ	1137	0 (BE)		πp		6 105.9	3 KB 1,308	0.24 Kbps	0.36
Ξ.	12	21 Mar 2022, 11:90PM	TOP	198.19.1.101	LA	21	198	8.18.133.36	HQ	1137	0 (BE)		fp		5 91.1	6 KB 1,115	0.20 Kbps	0.31
	ß	22 Mar 2022, 12:00AM	TOP	198.19.1.101	LA	21	198	8.18.133.96	HQ	1187	0 (BE)		fo		5 90.8	2 KB 1,111	0.20 Kbps	0.31 ;
	C ²	22 Mar 2022, 12 05AM	102	190.19.1.101	LA	21	19	1.10.100.06	HQ	1137	0 (RE)		Tp.		5 90.8	/ KB 1,109	0.20 Kbps	0.31

Figure 148

In this exercise you have located many flows relevant to a specific parameter – Source IP Address, 198.19.1.101. You can use this method to find flows relevant to other parameters even combining different parameters to

Let's look at how to find a specific flow amongst the data on the network. Let's see how the **Voice Signaling (SIP)** traffic is performing in our NY Branch.

- 272. Navigate to the **Flow Path Analysis** page and clear out any page filters that may be left there. Make sure you are looking at the **Basic** tab too.
- 273. Let's now add site NY, and the Voice Signaling application, SIP.

low Path	Analysis	Sile: NY Applica	stion: sip Enter	Filter Request Here									Apply ther	Mar 22, 2022 02:40	00 - Mar 22, 2022 03	.00.00 Hour 1
		-	leen					Voice/Video Perfor	TTADD4				Appli	cal on Performance		
						1										
PEDK 0	FLOW P., 0	TIME 0	PROTOCOL 0	SRO IP ADDR 0	SROSITE Ó	SRC PORT 0	DIST IP ADDIT	DST SITE 0	DST PORT O	DSCP 0	APPLICATION 0	TOTAL FLOWS	TOTAL BYTES O	TOTAL PACKETS	AVERAGE DIT R	AVERAGE PACK
		Time	Protocol	Src IP Addr	Src Site	Src Port	Dst IP Addr	Dst Site	Dst Port	DSCP	Application	Total Flows	Total Bytes	Total Packets	Average Bit	Average Paul
	12	22 Mar 2022, 08:554M	TOP	198.19.2.82	NY	5060	198.18.128.82	но	8970	0 (BE)	sip	6	129.31 KB	772	0.29 Kops	0.21 p
=			TOP	198.19.2.82	NY	5060	198.18.128.82	HQ	3970	0 (BE)	sip	0	129.23 KB	770	0.29 Kisps	0.21 p
-	ß	22 Mar 2022, 03:15AM	Twee .													
	8	22 Mar 2022, 03:15AM 22 Mar 2022, 03:15AM	TOP	198.19.2.82	NY	5050	198-18-126-62	HQ	3970	0.010)	sip	h	128 61 KB	759	II 29 Kope	0.21 p

Figure 149

- 274. You'll see that for each identified flow the information provided relates to basic information source/destination information, as well as DSCP/Application, network utilization. But we want to see more to understand the performance.
- 275. Now click on the Application Performance tab.

Li	∕e∧ctik	OU. wx												1.00	en Festurest	• 17 • •	• 0 🔔 45	1-1*	0 · .	
w Path A	natysis	Site: NY	Application: slp	Enter Filter Reques	t Here											(b) Ap	ply filter Mar	22, 2022 02:40:00	- Mar 22, 2022 03	40.00 Hour
			Hapir:						W	sioyVideo Perlon	NTD9						Application	Performance		
											_	_								
xtus 🗘	PEEK 0	FLOW PATH 0	TIME 0	CLIDIT IP 0	sec smc 0	SERVERIP 0	DST SITE 0	PORT	0	APPLICATION 0	AD ANG	0	AD NAX 0	CND AVG 0	CND MAX 0	SND AVG 0	SND MAK 0	ND ANG 0	HD MAX 0	RETRANSMI.
a v			Time	Client IP	Src Site	Server IP	Dot Site	Port		Applicati.	AdAv		Ad Max	Ond Avg	Crid Max	Snd Avg	Snd Max	Nd Avg	Nd Max	Retrans
	=	đ	22 Mar 2022, 03:30AM	198.19.2.82	NY	198.18.128.62	HQ	3970		sip		0 ms	0 ma	0 ms	0.ms	0 ms	0 ma	0 ma	0 ms	507
	=	0	22 Mar 2022, 03:30AM	198.19.2.82	NY	198.18.128.82	но	5060		slo		0 ms	0 ms	0 ms	U oms	0 ms	0 ms	0 ms	0 ms	0
	-	đ	22 Mar 2022, 03 35AM	198.19.2.82	NY	198.18.128.82	HQ	3970		80		0 ms	0 ma	0 ms	0 == 8	0 ms	0 ma	0 ma	0 ms	505
	=	ø	22 Mar 2022, 83 40AM	19E.19.2.82	NY	198-18-12E-E2	HQ	3970		sip		0 ms	0 ma	0 ms	0 ms	0 ms	0 ma	0 ma	0 ms	503
	=	10	22 Mar 2022, 03:45AM	198.19.2.82	NY	198.18.128.82	HQ	3970		slo		0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	907
		đ	22 Mar 2022, 03:50AM	198.19.2.82	NY	198.18.128.82	HQ	3970		sip		0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	507
	=	đ	22 Mer 2022, ICI 55AM	198.19.2.82	NY	198.18.126.62	HQ	19970		яp		0 ms	0 ma	0 ma	0 ms	0 ms	0 ma	E ma	0 ms	505
	=	17	22 Mar 2022, 04:00AM	198.19.2.82	NY	198.18.128.82	HQ	3970		slo		0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	0 ms	D ms	508

Figure 150

- 276. In this view you will see more detailed information related to TCP performance including **Application Delay** (AD), **Network Delay** (ND), as well as retransmissions.
- 277. You can sort the results by clicking on a column heading. Each subsequent click on the same column heading reveres the sort order of the sort (smallest to largest vs largest to smallest)
- 278. You can also filter the table further by entering values in the column filters underneath the headings. This can be faster and more easily reversible than adding to the page filter at the top.
- 279. While we now have details on many flows that fit the parameters we searched for, and can single out subsets, we still want to drill-down on a specific flow to identify potential areas of trouble.
- 280. Click on the Flow Path Analysis pivot point on one of the flows.

LiveAction: NX N Applications > Application: ur	efined > PATH TCP 198.19.2.82 - 198.18.128.82	Mar 22, 2022 06:40:00 → Mar 22, 2022 06:4
THE IN A RE	ES detaul data com ES det	
th Flow NY - HQ Device Name	+O 82.cotud circo com	Brancia Mindonsi Seco Jon
Site Name	на	10
Application	xip	хір
CPU Usage	33.00 %	34.00 N
Memory Lisage	12.00 %	12.00 %
in Interface	GipsbiEtherrw2	GigabilEthemel4
	Gipab/Ethernet3	GigabitEthemet2
Out Interface		
n QoS Policy	B	
In QoS Policy Out OoS Policy	No Policy	No Policy
In QoS Policy Out OoS Policy Network Delay	ho Poloy	No Policy
in QoS Policy Out QoS Policy Network Delay Application Delay	No Paler	No Patro
In GoS Policy Out DoS Policy Network Delay Application Delay Retransmission	No Patry 	No Polcy -
IN (205 Policy Out OoS Policy Network Dulay Application Delay Retransmission Connection Lost	No Patry	No Policy
In GoS Policy Out DoS Policy Network Delay Application Delay Retransmission	No Patry 	No Policy
In (Job Policy Duk OoS Policy Network: GV Jay Application Delay Remaining Solid Connection Lost Connection Refused	No Patry No Patry	No Policy

Figure 151

- 281. In the table that appears you will see the path through the network that this flow takes (A). You will see ingress and egress ports on each device through which it traverses, along with any applied In or Out Policies that are applied (B). The CPU and memory usage of the devices is shown for reference to aid in troubleshooting (C).
- 282. As we arrived at this page from the Application Performance overview, you will also see the TCP statistics that were seen at each device in the flow (D). This can be very valuable information when troubleshooting.

Almost too easy, wasn't it? What other information can you gather on other applications through the network? Try gathering the following information on other applications.

Bittorrent-Networking

Src Site	Src IP	Dst Site	Dst IP	Port

Bittorrent

Src Site	_ Src IP	_Dst Site	_Dst IP	_Port
Src Site	_ Src IP	_Dst Site	_Dst IP	_Port
Src Site	_ Src IP	_Dst Site	_ Dst IP	_ Port
Src Site	_ Src IP	_Dst Site	_Dst IP	_ Port
Src Site	Src IP	Dst Site	Dst IP	Port
Src Site	Src IP	Dst Site	Dst IP	Port
Src Site	Src IP	Dst Site	Dst IP	Port
Src Site	_Src IP	_Dst Site	_ Dst IP	_ Port

There is some other traffic, such as rtp, sip, and Citrix... but there are 2 IPs that are generating Bittorrent traffic. Make sure there isn't a ghost server in your network serving movies and such!

Lab 6.4: Troubleshooting Issues

Scenario: Users in the Marketing Department at our New York site have been complaining that their workstations seem to be "slowing down" numerous times a day. This only happens when they are connected to the intranet. A pattern is developing where this happens approximately every 5 minutes. We need to investigate.

The user is on 198.19.2.128, which is in the New York Office. First, let's see what traffic is hitting our user. We will use the Analysis report that shows IP and Applications.

283. Go to Reports and create a new report.

= LiveAction 🔤			New 1	/ Feetures/	1 7	• • •	204	(-) -	w-	₩- I	atnin v
View Reports									View Schedul	e Deal	te Report
Templates Reports Histo	φ.										
Q, By Template Name										Table	Tilo
Default Templates		Favorite Reports									0
Volce Analysia	0	Add Report	Create a new Report								
WAN	0	Top Reports	Cicate a liew hopeir							~	0
Favorite Applications	0	Top Reports								v	0
Apple Eastlane Applications	0	NAME Q	DEROCHPTION 0								
Apple Eastbane Voice Analysis	0	Application	This Flow based report will high light the Top 10 applications' bandwidth, based on the selected filter criteria, it will also list up to 1000 applications.								
WAN Capacity Planning	0	Top Conversations	This Fox-based report will highlight the Top 10 conversions, based on the selected filter oriteria. It will also list up to 1000 conversations.								
Site Network Performance Audit	0	Interface Bandwidth	This Forw-based report will highlight the Top 10 interfaces' bandwidth, based on the selected filter orders. If will fail up to 1000 interfaces.								
/olce/Video Performance Vs. Network	0	DBCP	This Flow based report will high light the Top 10 DBOP markings' bandwidth, based on the selected fifter oritoria. It will list up to 64 DBOP values.								
She to Site Traffic Utilization Audit	0	Top Interface Bandwidths	This SNMP-based report shows a table of all the interfaces' bandwidth utilization per the specified filter.								
Service Provider DSEP Audit	0	Top Interface Linux	This SEMI-Spaced report above a table of all interface errors (CBC/BunkyDwinuts, etc.) per the specified filter								
Tack Single Site WAN Path Changes	0	Top Class Bandwidths	This SMMP based report shows a table of all QoS class bandwidths for all interfaces per the specified filter.								
Application Vs. Network Performance	0	Top Class Drops	This SNMP-based report shows a table of all QoS class drops on all interfaces per the specified filter.								
/olce/Video Scrvice Provider Performan	0	Interlace Bandwidth	This SMM stassed report graphs bendwidth utilization of a specific interface								
Application Service Provider Performan .	0	Interface Utilization	This SkMP based report graphs the interface bandwidth utilization (by percentage) of a specific interface.								

Figure 152

284. In the **Report Details** section (A), type **IP**, and click the **IP and Application** report in the **Analysis** section (B).

view Reports				e Create Report
Templates	CREATE REPORT			×
Q. By Template Name	GENERAL SETTINGS	REPORT LIST	REPORT DETAILS	Table Tile
Default Templates	Name	Please choose report type		o
loice Analysis	Enter report group name	Add New Report +	-	
WAN	Presentation Mode		A Flow	
evorte Applications	Standard V		Analysis A	o o
opte Fastlane Application			Es and Application	
gipte Castlane Voice Analy	Fastnate		IPs and Ports	
NAN Capacity Planning	Enter report group description		SNMP	
ite Network Performance	Sharing Settings			
olce/Video Performance)				
ite-to-Site Traffic Utilizatio	Email 🔅		Overall Health	
ervice Provider (1983) Aut	Enter an errori address or AD entity . Configure errori address to enable observa		Overall System Health	
rack Single Site WAN Path	File Format		Single Test Time Series	
application Vs. Network Ps	Send PDF Send CSV		Single Type Health	
Volce/Video Scrvice Provid	PDF Row Limits		Test Status	

Figure 153

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285. There are three key parameters that we want to review to give us the best view of the problem. These are characterized by:

- When are we looking? (Recently, and for 1 hour) (1)
- What are we looking for? (IP addresses and Applications) (2)
- Where are we looking? (NY site) (3)

286. The problem occurs approximately every 5 minutes. As we want to view all the traffic hitting 198.19.2.128, we will use Flex Search to focus on that destination IP address.

• flow.ip.dst=198.19.2.128 (4)

Flex Search can be entered in the Report Details section, or in the General Settings section. When used in General Settings for with a Report Template (multiple reports in one) the Flex Search affects ALL reports equally.

- 287. The traffic we are looking for happens every 5 minutes (approx.). It helps if you have the **No Display Filtering (5)** and **Flow Filter** set to **Basic Flow (6)**.
- 288. To see as much resolution on this time frame as possible we will force the **Bin Duration** (granularity of data) to 1 minute (7).

Beware: Forcing the Bin Duration to 1 minute for large time ranges can cause report slowness. We should be OK in this case as our search is quite simple.

289. Click Execute.

GENERAL SETTINGS		REPORT LIST		REPORT DETAILS		
Name	2	IPs and Application (Flow)	Fast 🖱 🖥	Report Name	-	Flow Type
Enter report group name	_	Add New Report	+	IPs and Application	6	Basic Flow
Presentation Mode				Report Description	_	Execution Type
Standard	~			Enter report description		Time Series 🗸
Footnote				Devices		Sort By
Enter report group description			3	Branch2-NY		Bit Rate 🗸
Time Zone	DST		-	Interfaces		Business Hours
(GMT-05:00) America/New York	~			All Interfaces		All Hours 🗸
Time Range				Flex Search @		Bin Duration
Last Hour	~		4	flow.ip.dst=198.19.2.128	- 7	1 Minute v
Flex Search @				Display Filter	_	
Ex.: site-Honolulu & wan & flow.app-http	ж		5	No Display Filtering		Raw Flow Data Due to the options selected, this report will utilize the
Display Filter			-	Direction		Raw Flow datastore (slower).
Select Display Filter	~			Inbound and Outbound Combined		
Sharing Settings				Should Wait For DNS Resolution		
Email X				False		
Enter an email address or AD entity						
Configure email settings to	enable sharing					
File Format						

Figure 154

- 290. The report will provide a view of traffic with a destination IP address of 198.19.2.128. As you should see, there are clear peaks of data coming in, with TWO bursts separated by 2 minutes, followed by a 5-minute pause (8).
- 291. If you look in the table below you will see all the traffic is coming from 198.18.133.36 (9) and that it is sending a variety of applications (10).

view Reports														View Sched	de Creat	le Report
Templates Reports Hist	ny .															
Q. By Template Name		IPs and App	plication, Last Hou	r								View Option	ns - Share Pri	nt Schedule	Copy	Close
Default Templates		Ps and Appl	cation (How)													
Voice Analysis	0	Device: Branch2	and another of the	foore physics in	teet No Display Filtering	Direction: Inbour	d and Outbours	Combined How Type Space H	w Energies Type: 1	me Series Sort By St	Fizze Flow Seconds flow of	der-198.18.2.128 Min Durse	ien: 1 Minute Should Wait For Dra	Receivator: falce		
NAN	0	Otart Time: May	12. 2022 10:00:00 EDT K	0477-04-00) End T	Tenel May 12 2022 14:00	80 EDT (2MT-04.0	() Sin Interv	it Timinate								
evorite Applications	0	0.4													1.36/198.15.2.128/1 1.36/198.15.2.128/1	
opie Festiane Applications	0	3		1	4 4	A	A			4	A A			190.10.13	106120.192.128/	10 Page 1
opie Fastiane Voice Analysis	0	B 12	- A I	K	A A	A				A.	<u> </u>	A A	A A	198.18.12	2.26/108.16.2.128/1 1.30/108.16.2.128/1	10R.
VAN Capacity Hanning	0	2 8		A.										Total		
te Network Performance Audit	0			1												
olce/Video Performance Vs. Network	0	ి	12.65	12:10	10:15		3:20	12.25 1	1 09	12.98	19.40 12	45 12:50	12:55	14:00		
In-to-Site Traffic Utilization Audit	0												Q. Scarch			m a
ervice Provider DSCP Audit	0	-														
rack Single Sile WAN Path Changes	0	Let 9	Eic IP Addr 🗘	Brc Site 🗘	Dist IP Addr 0	Dist Site 🗘	DSC 10		Total Flows 0	Total Bytes 🗘	Total Packets 🗘	Average Bit Rate 0	Average Packet Rate 🗘	Poak Bit Rafe 🗘	Peak Packet F	
plication Vs. Network Performance	0		198.18.133.36 198.38.133.36	HQ HQ	198.19.2.128	NY	0 (BE) 0 (BE)	esh	32		150	0.02 Kbps	0.04 pps	56 bps		0 pp
ice/Video Service Provider Performan.	0		190.18.133.36	HQ	190.19.2.128	NY	0 (BE)	epmap http://www.www-http	32				0.04 pps	56 bps		0 por
plication Service Provider Performan	Θ		198.18.133.36	HQ	196.19.2.128	NY	0 (BE)	netbico-san	32		150		0.04 pps	56 bps		0 pm
OWAN Application Service Provider Pe	0	-	198.18.133.36	но	198.19.2.128	NY	U (BE)	imap	32		160		0.04 pps	56 099		0 000
WAN Application Vs. Network Perfor-	0	-	198.18.133.56	но	198.19.2.128	NY	0 (BE)	teinet	32	7.04 KB	150	0.02 Kbps	0.04 pps	56 bps		6 pps
WAN Voice/Video Performance Vs. N.	0															
OWAN Voice/video Service Provider P.,	0															
AN Application Vs. Network Performa.	0															
AN Application Service Provider Perfo.	0															
WW Volce/Video Performance Vs. Net	0															
NAN Voice/Video Service Provider Port	0															

Figure 155

292. It would be recommended to check out the 198.18.133.36 device (the Workstation on HQ) and determine if it is infected with a virus looking for vulnerabilities.

Lab 7

Lab 7: Custom Filters

This Lab uses the Engineering Console.

Customizing LiveNX makes it more relevant. Creating and using **Custom Display Filters** will help you in your day-to-day use of LiveNX. Custom Display Filters allow you to quickly see a specific view of your network traffic as defined by the filter which includes Application (or group), IP Addresses (src, dst, either, or both), DSCP settings, Site (src, dst, either, or both), or Service Provider. Custom applications can also be used to define a Display Filter.

It is recommended that you create custom filters for common or frequently used views of your network to help monitor or troubleshoot.

In this lab you'll create a custom filter based-upon SIP and RTP traffic and verify their markings. Ports being used for the filters in this lab are:

- SIP Ports: 5060 5061 5062
- RTP Ports: 16384–32767

Lab Steps:

293. Select **HQ-B2**, and then click the **Filter** icon (looks like a funnel) to Open the Flow Display Filters Set-Up.



Figure 156

294. Click Create Filter on the top right of the Flow Display Filters Set-Up.



Figure 157

295. Enter a Name label: Use something that you will easily recognize. We have used **TRG-VoIP**.

Create Flow Display Fil	ter	×
Type in the name of the	e new flow displa	y filter:
TRG-VoIP		
	ОК	Cancel

Figure 158

- 296. Give the label color a meaningful name in this case SIP.
- 297. With the filter selected, look at the left of the window, and in the **Basic** Tab, check **Match Protocol/Ports** and select the **SIP** Protocol.



Figure 159

298. Click Edit to the right of the SIP selection.



Figure 160

299. Edit both entries, for TCP and UDP, to match the ports provided.

300. Select to "Match Ports Regardless of Source and Destination" for both TCP and UDP.



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301. Click OK.

Figure 161

- 302. Then click **Apply**.
- 303. Create a new filter entry by clicking Add Entry under Filter Entries.



Figure 162

304. Select the "rtp" Protocol and Edit the ports.

Select from a pre-defined list of protocols/applications or create new definitions to Create Create Create Create Copy to Create Create Create Create Copy to Create C	 Match Protoco 	l/Ports	
rtp Create Create Copy		fined list of protocols/applications or create new	
		🗸 🔶 Create 🥖 Edit 🗅 Cop	у
		=UDP) AND ((Src=16384-32767) AND (Dst=16384-3276)	7))

Figure 163

- 305. Name the color label again, this time **RTP**.
- 306. Edit the UDP Entry to "Match Source and Destination Ports" to 16384-32767 for both source and destination.

Protocols/Applications Setup	×
🕂 Create Definition 🗅 Copy 💥 Delete 🕎 Rename	
Defined Protocols/Applications: rtp	¥
Entries	
🕒 Add Entry 🏹 Add Defined Prot/App 🔓 Delete	
Trp	67)
	<u>.</u>
4	>
Note: Defined protocols/applications added as entries are not editable here	,
but can be edited by selecting them in the drop-down box above.	
Entry Details Layer 4 Protocol: UDP (17)	
Layer 4 Protocol: UDP (17) v	
Layer 4 Protocol: UDP (17) v Ports	
Layer 4 Protocol: UDP (17) Ports Match Source and Destination Ports Source: 16384-32767 Destination: 16384-32767	
Layer 4 Protocol: UDP (17) Ports Match Source and Destination Ports Source: 16384-32767	
Layer 4 Protocol: UDP (17) Ports Match Source and Destination Ports Source: 16384-32767 Destination: 16384-32767	
Layer 4 Protocol: UDP (17) Ports Match Source and Destination Ports Source: 16384-32767 Destination: 16384-32767	

Figure 164

- 307. Click OK.
- 308. Click Apply to save the custom filter, then Click OK.



Figure 165

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309. Select your **new filter**, select "**DSCP**" and select "**Refresh**" to verify the DSCP markings for your SIP and RTP traffic.



Figure 166

All the traffic should be Voice Traffic. Do you notice any traffic that is being treated incorrectly? Look for traffic marked with DSCP 0 (BE).

This Lab uses the WebUI.

Many times, either the network devices are not able to provide application recognition, or the application definitions provided by NetFlow don't always match the needs of your monitoring and troubleshooting. For this reason, LiveNX allows you to define **Custom Applications** and **Custom Application Groups**. Being able to create customized applications and groups provides for much clearer segmentation of traffic flows, and more powerful insights without manually filtering. **Custom Applications** and **Application Groups** can be applied in many places in LiveNX and are useful to provide flexibility and precision when monitoring and troubleshooting. Let's look at **Custom Applications** and **Custom Application Groups** and how to create them. This is a way of giving "unknown" applications a name.

310. To create a Custom Application, go to Main Menu > Configure > Application Management.



Figure 167

The Application management screen has three major areas. **Custom Applications** (1) where you can configure custom applications, **Application Groups** (2) where you configure multiple applications into a group, and the option to **View WAN Applications** (3).

EiveAction ™			New Technici 🔥 17 📕 0 🔹 0 🔺 3 (-)	• Q • Q • 🛓 admin •
Application Management	•			3 New WAN Applications
	Custom Applications		2 Application Groups	
		You have not added any custom applications yet		
		Add Oustom Application		

Figure 168

311. Click on **View WAN Applications** to list the applications that LiveNX is seeing in the network.

					Q. Search	
APPLICETION MAME	© APPLICATION BROUP	© APPLICATION STATUS ©	AMERIAGE INPUT BIT RATE	AMERAGE OUTPUT BIT RATE	VOICE MIDEO PERFORMANCE	APPLICATION PERFORMANCE
Application Name	Application Group	AI v	Average Input Bit Rate	Average Output Bit Rate	All ~	All v
10.21.1.154	unknown		16.61 Khps	16.64 Kbps	•	•
bgp	routing		56 bps	57 bps		•
bittoment	bittoment-group	•	266 bps	94 bps		
b Borrent-networking	bittoment-group	•	169 bps	17 bps		
citrix .	gotomeeting-group		3.54 Khps	3.27 Kbps		
dns	network-service		39 bps	Dibps		
ftp	file-transfer	•	6.73 Kbps	6.62 Kbps	•	•
http	web	•	0 hps	Dibps		
ica -	unknown		6.71 Kbps	6.44 Kbps		
lafo:	unknown	•	22.87 Kbps	6.16 Kbps	•	•
lannevagent	unknown	•	7.64 Khps	6.SB Kbps		•
mgep	audio-Video		8 bps	3 bps		
openwebnet	unknown		12.85 Kbps	12.85 Kbps		
usof	routing	•	324 bps	O bps	•	•
dp	audio-video	•	530.84 Khps	580.77 Kbps	•	•
rtp-audio	unknown		184.55 Kbps	85.21 Kbps		
slo	audio-video	•	6.19 Kbps	8.92 Kbps	•	•
ытр	wwwp-group	•	29.50 Khps	19.25 Kbps		
statistical-p2p	network-service		2.25 Kbps	2.24 Kbps		
trim	LINGOAD		0 bos	0 bos		
unknown	network-service	•	4.49 Khps	4.50 Kbps		•

Figure 169

Here we reveal an application called **Unknown** running on our network. Let's give it a real name; but to do that, we must know exactly what we are naming so we don't accidentally name anything else.

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312. Let's run a report to find out more about it. Go to **View Reports** and find **IPs and Ports** in the search bar.

RUN OR E	DIT REPORT	r(s)							×	0
GENERAL SET	TINGS			REPORT LIST		REPORT DETAILS				
Name				E IPs and Ports (Row)	Fast 🕤 🗃	Report Name	Flo	и Туре		- 1
IPs and App	lication, Last Fi	fteen Minutes		Add New Report	+	IPs and Ports	E	Basic Flow		- 1
Presentation	Mode					Report Description	Ex	ecution Type		- 1
Standard						Enter report description	1	Time Series		- 1
Footnote						Devices	So	rt By		- 1
Enter report	group descript	ion				All WAN Devices		lit Rate		- 1
Time Zone			DST			Interfaces	Bu	siness Hours		- 1
	America/New	York	~			All WAN Interfacts		VI Hours		- 1
Time Range						Flex Search @		n Duration	Cannot be used with All Devices	
Custom						flow.app=unknown		Vuto		
						-			1 minute	- 1
Start Date 06/17/2022	Start Time	End Date 05/17/2022	End Time 16:45			Display Filter No Display Filtering		Raw Flow Data		- 1
00/17/2022	10:39	00/17/2022	10.40			No Display Filtering		Due to the options selected, Raw Flow datastore (slower)		- 1
Flex Search	2					Direction				- 1
	nolulu & wan &	flow.app+http	×			Outbound				- 1
						Should Wait For DNS Resolution				- 1
Display Filter	F.1.					False				- 1
Select Displ	ly Finer									
Sharing Set	tings									- 1
										- 1
								Cancel Save /	a Templote Execute	- 1
										- 1

Figure 170

313. In the Flex Search field lets specify the application unknown using the flex search term:

- flow.app=unknown
- Click Execute.



Figure 171

In the resulting report, you should see information regarding the application **unknown** listed.

314. We can see that this application has specific attributes that help define it

The information regarding application **unknown** is: Protocol: UDP Port: 20201

Now we know how to define **unknown**, we can ask LiveNX to give it a more useful name.

- 315. Jump back to the **Application Management** page in **Configure**.
- 316. In Custom Application, click Add Custom Application.
- 317. A pop-up window will appear asking for the parameters that are needed to define the custom application.

Cus	tom Applications					Application Group	5		
		ADD CUSTOM APPLICATION			×				
	•	Name *		Description					
		TRG Identified Traffid		Previously unknown traffic					
		 Network attributes 							
		IP Ranges		2 clude Application	Added: 1				
		Specify IPs or IP ranges (ex: 192.168.1.1-192	168.1.200)	unknown × Start typing for more results	×				
	9	Layer 4 Protocol	Added: 1	Port Ranges					
	•	UDP × Select protocol	×	20101					
		DSCP							
		Specify DSCP classes							
	6	URLS							
		HTTP heat or SSL common name		URI					
			doardia în host names		Vou can use wildcards in URI Cancel Save				
					Garcal 6				

Figure 172

- 318. Give the application a new name and description (1) usually something meaningful but you can get creative here.
- 319. Complete fields as necessary. The only mandatory field is the Name field. In our example you should focus on Include Application (2), Layer 4 Protocol (3), and Port Ranges (4).
- 320. Note that you can define a custom application by URL or URI strings (5).
- 321. Click Save (6) when you have completed the above steps.

lication Mana	agement										
		Custom	Applications				Application Groups				
dd Bill	t Belete Move-Up	Move Down						0	Q. Search		
RANK	APPLICATION NAVE	IP RANGES	PORT RANGES	LAYER 4 PROTOCOL	DSCP	NEAR APPLICATIONS	NTTP HQST	URI		DESCRIPTION	
Bank	Application Name	IP Ranges	For Ranges	Layer 4 Finiscol	DSCP	NISAR Applications	HITPhest	UR		Description	
1	TRG Identified Traffic		20101	UDP		unknown				Previously unknown	n traffic



322. Looking at the **Geo-Topology** to verify the custom application will allow you to see the previously **unknown** traffic as the name you selected for it.





Appendices

Adding devices into LiveAction and managing them properly is very important to the overall usability of LiveAction itself.

Lab Steps:

1. Select File, Add Device



- 2. Enter 198.19.1.1 in the IP Address field.
- 3. Select "Use the Default SNMP connection settings".

Steps	Device Connection In	nformation		
1. Device Connection Information	Enter the SNMP conn	ection information.		
2. CLI Settings (Configuring)	Node	Local	\sim	
 CLI Settings (Monitoring) Select Interfaces 	IP Address	198. 19. 1. 1		
5. Select VLANs	O Non SNMP device	e such as NetFlow probes		
6. Select Features	LiveSensor			
7. Enable Polling	Use the Default	SNMP connection settings	Edit	
8. Review Configuration	O Enter SNMP conr	nection settings for this device		
9. Device Updated	SNMP Version	Version 2c	 Target Port 16 	51
	Community String	9		
	< Back Next	> Finish	Cancel	Help

- 4. Click Next.
- 5. Select "Use my default Configuration CLI connection settings".

teps	CLI Settings (Configuring)
1. Device Connection Information	Specify the CLI connection information used for configuring these devices. Required fields are indicated with an asterisk (*).
 CLI Settings (Configuring) 	Configuration CLI Connection Settings
3. CLI Settings (Monitoring)	Enter Command Line Interface (CLI) connection settings used to configure these devices.
 Select Interfaces 	C Add as monitor only device for non Cisco and unsupported Cisco OS (IOS, IOS-XE and NX-OS supp
5. Select VLANs	Use my default Configuration CLI connection settings Edit
Select Features	
7. Enable Polling	C Enter connection settings for this device
8. Review Configuration	Connection Type SSH v Port* 22
9. Device Updated	User name on Device
	Password on Device*
	Enable Password
	Also use these credentials for monitor mode,
	<back next=""> Finish Cancel Help</back>

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6. Click Next.

teps	CLI Settings (Monitoring)
 Device Connection Information CLI Settings (Configuring) CLI Settings (Monitoring) Select Interfaces Select VLANs Select Features Review Configuration Device Updated 	Specify the CLI connection information shared by all users. This information will only be used to monitor this device. Required fields are indicated with an asterisk (*). Monitor-only CLI Connection Settings Enter Command Line Interface (CLI) connection settings used to monitor this device. Dise the default Monitor-only CLI connection settings Futer connection settings for this device Connection Type SSH Port* 22 User name on Device Password on Device* Enable Password
	< Back Next > Finish Cancel Help

- 7. Select "Use the previous page connection settings".
- 8. Click Next.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 You can verify what capabilities LiveAction is able to interact with the device.

9. Click Continue.

Test	Status	Description	
SNMP connection	•	Succeeded	
SNMP access		Succeeded	
CLI configure connection	0	Skipped	
CLI configure login	0	Skipped	
CLI configure enable password	\odot	Skipped	
CLI monitor connection	0	Skipped	
CLI monitor login	0	Skipped	
CLI monitor enable password	0	Skipped	
Serial number validation	•	Succeeded	
Model supported	•	Succeeded	
IOS supported	•	Succeeded	
NBAR capable	•	Succeeded	
NBAR2 capable	•	Succeeded	
NetFlow collector configure supported	•	Succeeded	
Flexible NetFlow supported	•	Succeeded	
Unified Perfmon supported	•	Succeeded	
Medianet Performance Monitoring supported	•	Succeeded	
AVC supported	•	Succeeded	
MLS NetFlow configure supported	\odot	Not supported	
Mediatrace configure supported	•	Succeeded	
IP SLA Supported	•	Succeeded	
HQF Supported	•	Succeeded	
MAC Table Supported	\odot	Not supported	-

A 5

On the select interfaces window you may notice 3 interfaces are already selected. LiveAction automatically selects the interfaces based on the highest bit rate.

teps	Se	elect Interface	es			
 Device Connection Information 	Se	elect the inter	faces you want to	o monitor on this d	evice (maximum 10	00 interfaces).
2. CLI Settings (Configuring)		Selected	Interface	Trunk	IP Address	Description
3. CLI Settings (Monitoring)		V	Ethernet0/0		198.18.129.25	
4. Select Interfaces		<u>د</u>	Ethernet0/1 Loopback0		10.255.0.2 10.0.0.102	
5. Select VLANs			NullO		10.0.0.102	
. Select Features			Tunnel0			PFR auto-tunnel for VRF default
. Enable Polling			VoIP-NullO			
Review Configuration						
). Device Updated						
		Selected inter	fred in 2			
		selected intel	nace(s): 5			
	4	Back	Next >	Finish		Cancel Help

A 6

10. Click Next.

Note: Since there are no VLANs configured on this device, none will be displayed. You may monitor up to 25 configured VLANs on each device.

teps	Select VLANs
. Device Connection Information	Select the VLANs you want to monitor on this device (maximum 25 VLANs).
2. CLI Settings (Configuring)	No VLANs were found on the device. No VLANs will be managed.
. CLI Settings (Monitoring)	A 12
. Select Interfaces	
. Select VLANs	
. Select Features	
. Enable Polling	
. Review Configuration	
	<back cancel="" finish="" help<="" td=""></back>

A 7

11. Click Next.

The **Select Features** dialog allows you to turn-on specific Cisco technologies using the templates included in LiveNX. This dialog displays the current IOS configuration of the device you are currently viewing. Leave this screen **AS-IS**.

teps	Select Features		
1. Device Connection Information	Select the features you want to enabl section.	e on each interface. Learn more a	about each feature in the Help
2. CLI Settings (Configuring) 3. CLI Settings (Monitoring) 4. Select Interfaces 5. Select VLANs	Features on device Enable Mediatrace Associate Probe at IP Address:		
6. Select Features	Interface	NBAR	NetFlow
 7. Enable Polling 8. Review Configuration 9. Device Updated 	Ethernet0/1 Ethernet0/0 Loopback0	য য	
			k
	<pre>Gack Next > Finish</pre>	·	Cancel Help

- 12. Click Next.
- 13. Change the polling rate to 30 seconds.
- 14. Verify that ONLY the Flow & QoS boxes remain checked.

teps	Enable Polling	
 Device Connection Information 	Select the features you want to actively monitor and the polling rate for all the features on this de Learn more about polling in the Help section.	evice.
2. CLI Settings (Configuring)		
CLI Settings (Monitoring)		
 Select Interfaces 		
5. Select VLANs	Polling Rate 30 seconds	
5. Select Features	Pall the Callentian Casterna	
7. Enable Polling	Poll the following features	
. Review Configuration		
. Device Updated	✓ QoS	
	IP SLA	
	✓ Routing	
	LAN*	
	* LAN polling occurs every 15 minutes * For SNMP v3, please see the User Guide on configuring LAN polling.	
	k	
	< Back Next > Finish Cancel	Help

Note: Any changes to the Select Features dialog will generate a CLI push to update the current configuration. Before sending the NetFlow configurations to the device, you can verify the configurations that LiveAction created.

iteps	Review Configuration	
1. Device Connection Information	The following commands will be sent to the device. Or you can choose to manually configure the c yourself.	levice
2. CLI Settings (Configuring)		
3. CLI Settings (Monitoring)	description DO NOT MODIFY. USED BY LIVEACTION.	
 Select Interfaces 	exporter LIVEACTION-FLOWEXPORTER	
5. Select VLANs	cache timeout inactive 10	
5. Select Features	cache timeout active 60	
7. Enable Polling	record LIVEACTION-FLOWRECORD	
3. Review Configuration	interface Ethernet0/1	
-	ip flow monitor LIVEACTION-FLOWMONITOR input	
). Device Updated	ip flow monitor LIVEACTION-FLOWMONITOR output	
	exit	
	interface Ethernet0/0	
	ip flow monitor LIVEACTION-FLOWMONITOR input ip flow monitor LIVEACTION-FLOWMONITOR output	
	exit	
	interface Loopback0	
	ip flow monitor LIVEACTION-FLOWMONITOR input	
	ip flow monitor LIVEACTION-FLOWMONITOR output	-
	 Send the configuration commands to device. 	
	C I will manually configure the device myself.	
	<back next=""> Finish Cancel</back>	Help

- 15. Select "Send the configuration..." radio button, if available.
- 16. Click Next.
- 17. Click Finish.

iteps	Device Updated		
1. Device Connection Information			ettings (You may want to save the current not be lost when the device is restarted):
2. CLI Settings (Configuring)	Device Settings		
CLI Settings (Monitoring)	Setting		Description
 Select Interfaces 	Polling Rate		30 seconds
5. Select VLANs	NetFlow Monitoring		NetFlow collector
6. Select Features	NetFlow Polling		Enabled
7. Enable Polling	Mediatrace		Disabled
5	Adjacency Polling		Enabled Enabled
8. Review Configuration	Qos Polling IP SLA Polling		Enabled
9. Device Updated	CEF		Enabled
	, Interface Settings		
	Interface	NBAR	NetFlow
	Ethernet0/1	•	•
	Ethernet0/0	•	•
	Loopback0	•	•
	<back next=""> Finit</back>	sh 🔓	Cancel Help

A 11

The device will be added to the Topology Pane in LiveNX. Note that LiveNX will not automatically position a new device with reference to any existing devices... you may need to scroll-about in the Topology Pane to locate your new device(s).

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Appendix 2: Client Device Discovery

As we discovered in a prior Lab, the LiveNX Server in your topology has had device(s) preinstalled. In the following Lab you may add additional devices to your Topology, configure those devices to send flow and SNMP data to the LiveNX Server, and discover what data your LiveNX solution is gathering.

Lab Steps:

Adding several devices at once is as easy as adding a single device at a time. To do this:

1. Select File and Discover Devices.



- 2. Specify the following IP addresses: 198.19.1.1 198.19.2.1
- 3. Select Use the default SNMP connection settings.



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Note: In the Lab infrastructure we are utilizing the Local LiveNX Node included with the Server installation. If you require access to a Remote Node to access the subnets or addressing in "Step 1: Specify what to scan" you would use the Specify node drop-down at the bottom of this dialog box.

ОК	Cancel
	ОК

A 14

- 4. Click OK.
- 5. Verify that both devices were found, and then select Add Devices.

Note: LiveNX may only discover a single router in the above steps. Your Student Pod may already be pre-configured with multiple devices. Your instructor may direct you to add one or more devices in this lab.



		Filte	r Clear			
Select	Device Name	IP Address	Hops	Vendor	Model	
•	Branch2-NV.dcloud.cisco.com	198.19.2.1	0	Cisco	ciscoGatewayServer	
•	Branch1-LA.dcloud.cisco.com	198.19.1.1	0	Cisco	ciscoGatewayServer	
elected: 2	Discovered: 2 Device	Limit: 10,000,000 (1 active devices)			stop	

A 16

6. Select Yes on the configure devices dialog.

?	2 configurable devices added to the application. Do you want to configure QoS, Flow, Routing, IP SLA, or LAN for the added devices?
	Yes No

A 17

7. Use the default SNMP connection settings and then select Next

Note: You must be logged-in as the original admin user so that the LiveNX Wizard will inherit the appropriate credentials. Ask your instructor for clarification on this, if desired.

teps	SNMP Settings	
SNMP Settings CLI Settings (Configuring) CLI Settings (Monitoring) Validating Devices Select Features Enable Polling Update Device Devices Configured	Enter the SNMP connection information used for monito C Use the Default SNMP connection settings C Enter SNMP connection settings for this device SNMP Version Version Community String	Edt Target Port 161
	<back next=""> Finish</back>	Cancel Help

A 18

- 8. Select Use my default Configuration CLI connection settings.
- 9. Click next.

iteps	CLI Settings (Configuring)
 SNMP Settings CLI Settings (Configuring) CLI Settings (Monitoring) Validating Devices Select Features Enable Polling Update Device Devices Configured 	Specify the CLI connection information used for configuring these devices. Required fields are indicated with an asterisk (*). Configuration CLI Connection Settings Enter Command Line Interface (CLI) connection settings used to configure these devices. Add as monitor only device for non Cisco and unsupported Cisco OS (IOS, IOS-XE and NX-OS supp) Use my default Configuration CLI connection settings Edit Connection settings for this device Connection Type SSH y Port* 22 User name on Device Password on Device* Enable Password Also use these credentials for monitor mode. Connection settings for this device
	νî
	<back next=""> Finish Cancel Help</back>

NXOF-1.LWA.2.0.1LiveNX Foundations Workbook 110. Select Use the previous page connection settings.

iteps	CLI Settings (Monitoring)
SNMP Settings CLI Settings (Configuring) CLI Settings (Monitoring) Validating Devices Select Features Enable Polling Update Device Devices Configured	Specify the CLI connection information shared by all users. This information will only be used to monitor this device. Required fields are indicated with an asterisk (*). Monitor-only CLI Connection Settings Enter Command Line Interface (CLI) connection settings used to monitor this device. Use the default Monitor-only CLI connection settings Enter connection settings for this device Connection Type SSH y Port* 22 User name on Device* Enable Password
	< Back Next > Firsh Cancel Help

- 11. Click Next
- 12. After verifying that the device validation is successful, Click Next.
| eps | Validating Devices | | |
|----------------------------------------|----------------------------------------------|---------------------------|---------------------------------------------|
| L. SNMP Settings | The following devices are being validated | | |
| 2. CLI Settings (Configuring) | validation issue occurs, click on the descri | ption field to view addil | tional details. |
| 3. CLI Settings (Monitoring) | | | |
| 4. Validating Devices | Device
Branch1-LA.dcloud.cisco.com | Status | Description
Succeeded: click for details |
| 5. Select Features | Branch2-NY.dcloud.cisco.com | | Succeeded: click for details |
| 5. Enable Polling | | | |
| 7. Update Device | | | |
| Devices Configured | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | , | | |
| | | | |
| | | | |
| | Export Validation Details | | |
| | | | |
| | < Back Next > Finish | 1 N | Cancel Help |
| | | | |

13. Select NBAR and NetFlow for both devices, Click Next.

teps	Select Features			
1. SNMP Settings	Select the features you want to	o use on the devices. Learn more	e about each feature i	n the Help section.
 CLI Settings (Configuring) CLI Settings (Monitoring) Validating Devices Select Features Enable Polling Update Device Devices Configured 	Device Branch1-LA.dcloud.cisco.com Branch2-NY.dcloud.cisco.com	NBAR	NetFlow	Mediatrace
	< Back Next >	Finish		ncel Help

- 14. Select all technologies excepting LAN.
- 15. Set the interval to 30 seconds for each device, Click Next.

teps	Enable Po	lling								
1. SNMP Settings		features you want to a	ctively ma	onitor, ar	nd the po	olling rate I	for the dev	ices. Lea	arn more about	
2. CLI Settings (Configuring)	each feat	ure in the Help section.								
3. CLI Settings (Monitoring)										
4. Validating Devices		Device	Poll	QoS	Flow	IP SLA	Routing	LAN* Interval		
5. Select Features		1-LA.dcloud.cisco.com							30 seconds 👱	
5. Enable Polling	Branch.	2-NY.dcloud.cisco.com							30 seconds 🗵	
7. Update Device										
8. Devices Configured										
or borrees coningaroa										
									2	
									, i	
	*10N p	olling occurs every 15 m	inuter							
		VMP v3, please see the I		e on coni	figuring l	AN polling	1.			
									1	
	< Back	Next > F	inish					Cancel	Help	

Note: For our class Labs we are gathering data every 30 seconds to reduce wait time when we make changes. In a production environment this may generate more network traffic than desired.

16. Select Send Updates to Devices and click Send.

teps	Update Device		
1. SNMP Settings	The selected devices will be updated bas		changes if necessary.
2. CLI Settings (Configuring)	You may choose to manually configure t	he devices.	
3. CLI Settings (Monitoring)			t be able to return to earlier screens. Learn
 Validating Devices 	more about each feature in the Help sec	don.	
5. Select Features	Device	Status	Description
6. Enable Polling	Branch1-LA,dcloud.cisco.com		Update Required: click to view
7. Update Device	Branch2-NY.dcloud.cisco.com	•	Update Required: click to view
 Devices Configured 			
	 Send Updates to Devices 	5end	
	C Manually Configure Devices	;	
	Export Update Commands		
	<back next=""> Finish</back>	1	Cancel Help

17. Once the updates are pushed successfully, click next.

teps	Update Device			
1. SNMP Settings	The selected devices will be updated based You may choose to manually configure the		changes if necessary.	
CLI Settings (Configuring)				
CLI Settings (Monitoring)	Warning: once update processes have been more about each feature in the Help section		t be able to return to earlier screens	;. Learn
 Validating Devices 				
5. Select Features	Device	Status	Description	
. Enable Polling	Branch1-LA.dcloud.cisco.com	•	Update Successful	
. Update Device	Branch2-NY.dcloud.cisco.com	•	Update Successful	
	Send Updates to Devices Sen	d		
	C Manually Configure Devices			
	Export Update Commands			
	< Back Next > Finish		Cancel	Help

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18. Click finish to add the devices into the topology.

teps	Devices Configured	
1. SNMP Settings	The following devices have been configured. Le	arn more about each feature in the Help section.
 CLI Settings (Configuring) CLI Settings (Monitoring) Validating Devices Select Features Enable Polling Update Device Devices Configured 	Device Branch1-LA.dcloud.cisco.com Branch2-NY.dcloud.cisco.com	Summary CEF, NBAR, QOS, IP SLA, Flows, COLLECTOR, 30 CEF, NBAR, QOS, IP SLA, Flows, COLLECTOR, 30
	< Back Next > Finish	Cancel Help

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Now that you have added three devices to the topology, they should look familiar to the image below. What is important to remember is that you should only bring in interfaces that will have interesting traffic, to you, traversing them. We will not need all the interfaces that have been included, so in one of the next Labs we'll remove the unneeded interfaces.

Appendix 3: Export/Import Device Configuration

Lab Steps:

1. From the File Menu select Export Devices.



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2. Deselect GigabitEthernet2 and Loopback0 from the 198.19.1.1 and 198.19.2.1 devices.

											Q 1	ype here to filter result	
d/Up	Name	Туре	Device Serial	IP Address	Vendor	Model	IOS Version	Description	Line Rate (Kb	Node	Sile	Site CIDR	Data Cen
\checkmark	Branch1-LA.dcloud.cisco.c	Router	101	198.19.1.1	Cisco	ciscoCSR1000v	16.3.2	Cisco IOS Software [Denal],		Local	LA	10.0.1.1, 198.19.1	
	GigabitEthernet1	Interface		198.19.1.1				Branch1 LAN	1,000,000				
	GigabitEthernet2	Interface		100.64.1.2				Internet	2,000				
\checkmark	GigabitEthernet3	Interface		10.255.1.2				MPLS	1,000				
	Loopback0	Interface		10.0.1.1					8,000,000				
	NullO	Interface							10,000,000				
	- VoIP-NulD	Interface							10,000,000				
\checkmark	HQ-B1.dcloud.cisco.com	Router	2	198.18.129.24	Cisco	ciscoCSR1000v	16.3.2	Cisco IOS Software [Denali],		Local	HQ		
\checkmark	- GigabitEthernet1	Interface		198.18.129.24				HQ-LAN	1,000,000				
\checkmark	GigabitEthernet2	Interface		100.64.0.2				Internet	1,000,000				
	·· Loopback0	Interface							8,000,000				
	- NullO	Interface							10,000,000				
	- VoIP-NulD	Interface							10,000,000				
\checkmark	HQ-B2.dcloud.cisco.com	Router	3	198.18.129.25	Cisco	ciscoCSR1000v	16.3.2	Cisco IOS Software [Denal],		Local	нQ		
\checkmark	GigabitEthernet1	Interface		198.18.129.25					1,000,000				
\checkmark	GigabitEthernet2	Interface		10.255.0.2					1,000,000				
	Loopback0	Interface		10.0.0.102					8,000,000				
	NuliO	Interface							10,000,000				
	VoIP-Null0	Interface							10,000,000				
\checkmark	HQ-MC.dcloud.cisco.com	Router	1	198.18.129.23	Cisco	ciscoC5R1000v	16.3.2	Cisco IOS Software [Denal],		Local	HQ		
\checkmark	GigabitEthernet1	Interface		198.18.129.23					1,000,000				
	- Loopback0	Interface		10.0.0.103					8,000,000				
	NullO	Interface							10,000,000				
	VoIP-NullO	Interface							10,000,000				
					<								>

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- 3. Select Export to csv.
- 4. On the Export window give the file a name.
- 5. Export the csv to the desktop, or appropriate directory.



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- 6. Close the export devices window.
- 7. Select File and Import Devices.



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8. Select the file you previously exported.

Look in:	🧮 Desktop		• 2	1 📂 🛄 •	
-	🥃 Libraries				
3	🔒 Administra				
Recent Items	Computer				
	🙀 Network				
	LiveAction				
Desktop	updateint	erface.csv			
Desktop					
My Documents					
Computer					
	File name:	updateinterface.csv		[Import N
		apadeoneen destav			
Network	Files of type:	CSV files (*.csv)		-	Cancel

9. Click Add/Update Devices.

	Update Devices is selected for Add/Update will b	e added or u	pdated								Q			
dd/Upd	Name	Туре	Device Serial	IP Address	Vendor	Model	105 Version	Description	Line Rate (K	Node	Site	Site CIDR	Data Ce	Ŀ
1	Branch1-LA.dcloud.cisco	Router	101	198.19.1.1	Cisco	ciscoCSR1000v	16.3.2	Cisco IOS Software [Denali],		Local	LA	10.0.1.1, 198.1		
1	GigabitEthernet1	Interface		198.19.1.1				Branch1 LAN	1,000,00	0				
	GigabitEthernet2	Interface		100.64.1.2				Internet	2,00	0				
1	GigabitEthernet3	Interface		10.255.1.2				MPLS	1,00	0				
	- Loopback0	Interface		10.0.1.1					8,000,00	0				
	NullO	Interface							10,000,00	0				
	VoIP-NullO	Interface							10,000,00	0				
~	HQ-B1.dcloud.cisco.com	Router	2	198.18.129.24	Cisco	ciscoCSR1000v	16.3.2	Cisco IOS Software [Denali],		Local	HQ			
1	GigabitEthernet1	Interface		198.18.129.24				HQ-LAN	1,000,00	0				
1	GigabitEthernet2	Interface		100.64.0.2				Internet	1,000,00	0				
	- Loopback0	Interface							8,000,00	0				
	- Null0	Interface							10,000,00	0				
	VoIP-NullO	Interface							10,000,00	0				
1	HQ-B2.dcloud.clsco.com	Router	3	198.18.129.25	Cisco	clscoCSR1000v	16.3.2	Cisco 105 Software [Denali],		Local	HQ			
~	GigabitEthernet1	Interface		198.18.129.25					1,000,00	0				
1	GigabitEthernet2	Interface		10.255.0.2					1,000,00	0				
	Loopback0	Interface		10.0.0.102					8,000,00	0				
	NullO	Interface							10,000,00	0				
	- VolP-Null0	Interface							10,000,00	0				
2	HQ-MC.dcloud.cisco.com	Router	1	198.18.129.23	Cisco	ciscoCSR1000v	16.3.2	Cisco 105 Software [Denali],		Local	HQ			
1	GigabitEthernet1	Interface		198.18.129.23					1,000,00	0			_	
H	- Loopback0	Interface		10.0.0.103					8,000,00	0				
Π	Nullo	Interface							10,000,00	0				
п	VoIP-NullO	Interface							10,000,00	0				
										-				
					٢									
								Add/Update Devices	Import from CSV		Export to C		lose	

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10. Click OK to use the Default SNMP settings.

Δ		×
Node	Local	•
O Use the Default SNN	1P connection settings	Edit
C Enter SNMP connect	ion settings for this device	
SNMP Version	Version 2c	Target Port 161
Community String		
		Ok Cancel
		0

Your Topology Pane will now show the appropriate devices/configurations.

NXOF-1.LWA.2.0.1 LiveNX Foundations Workbook 1 Appendix 4: Saving Server Configurations

Prior to upgrading the LiveAction Software, or to retain existing Server configuration for use in the case of a hardware failure or misconfiguration, the current configuration file may be Exported to a local or network drive.

Lab Steps:

1. Open the LiveNX WebUI, select Settings.

Enter Filter Reg	iest Here						(c) Settin	
ites, Devices, Interfaces by Str	fuses					Active Alerts	Syste	m Diagnostics
SITES: 2		DEVICES: 4		INTERFACES: 8		ALERTS	User	Vanagement
31163: 2		DEVICES: 4		INTERFACES: 8			LiveN	K Server
SITES 🗹	0	DEVICES 1	0	INTERFACES 🗹	0			
• H0		Branch1-LA		 GigabitEthemet1(Branch1-LA 				
• LA		 HQ81 		 GigabitEthernet1(HQ-B1 				
		HQ-82		 GigsbitEthernet1(HQ-B2) 				
		 HOMC 		 GigsbitEthernet1840-MC 				
				 GigabitEthernet2jBranch1-LA GigabitEthernet2jHQ-B1 				
				 GigebitEthemet2jH0-82 				
				 GigabitEthernet3(Branch1+LA 		No Active Alerts		

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2. Select Configuration.



- 3. Click Export.
- 4. Enter encryption password if preferred.



5. Select an appropriate place to save the file, give the file a name, then click Save.

Appendix 5: Connect via Remote Desktop Connection

A direct connection from the LiveNX Client installed on your workstation is the most efficient method to connect, but you may use RDC as an *alternate* way to connect to your Student Pod. SKIP this Lab if directly connecting with the LiveNX Client on your local workstation.

To connect using Microsoft Remote Desktop on Windows, or a compatible Remote Desktop client on Linux and Macintosh, follow the steps below. On Windows you can typically find Remote Desktop in START > ALL PROGRAMS > ACCESSORIES.

Note: Use the information from the Lab Details table to connect to the desired device.

Lab Steps:

Connect to the virtual Windows Workstation Desktop using the IP Address, username, and password pre-printed on the Class Worksheet, unless otherwise instructed.

- 6. Launch a Remote Desktop Connection.
- 7. BEFORE selecting Connect, click the General tab. (On Macintosh this will be the Preferences menu and Login tab.)

DIAGRAM



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Enter the following fields:

 Computer: <ipaddress> :20201
 (From your Lab Access worksheet)
 Username: administrator (or otherwise defined by instructor)

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8. Set the RDC session properties on the Display tab so that your video is a minimum of 1200x800 resolution... this may NOT be changed once the connection is active. See next page for example.

√

DIAGRAM

둸 Remote De	esktop Connection		-		×
	Remote Deskto Connection				
General Disp	lay Local Resources E	xperience	Advanced		
Display config	guration				
Choose the size of your remote desktop. Drag the slider all the way to the right to use the full screen.					
Sr	Full Screen	Larg	je		
	Use all my monitors for th	e remote se	ession		
	noose the color depth of th lighest Quality (32 bit)	e remote se	ession.		
Display the	connection bar when I use	the full scr	een		
Hide Option	15	(Connect	He	lp

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9. Select Connect.

10. Enter the workstation password: C1sco12345 (or otherwise defined by instructor).

DIAGRAM



11. Click OK.

Once successfully connected to your Pod you will see the Windows Desktop, and be able to access the LiveNX Server, Client, and other pod resources.

Note: Occasionally Remote Desktop may freeze its connection to the Pod workstation. If this happens, close the Remote Desktop window, and start again at Step 1 above. This will continue your lab session and will not lose any work.