

NVIDIA MELLANOX NEO DOCUMENTATION

Software version 2.7

Table of Contents

Release Notes	9
System Requirements	9
Mellanox NEO Server Requirements	9
Supported Platforms and Operating Systems	9
Mellanox NEO GUI Client Requirements	9
Recommended Screen Resolutions	10
Supported Mellanox Internally Managed Systems	10
Key Features	11
Changes and New Features	12
Bug Fixes in This Release	12
Known Issues	12
Introduction	21
Mellanox NEO Software Architecture	22
Mellanox NEO Graphical User Interface	22
Mellanox NEO Controller	23
Mellanox NEO Providers	23
Communication Protocols	23
Installation and Initial Configuration	24
Installation Requirements	
System Requirements	
Mellanox NEO Server Requirements	24
Ports Mellanox NEO Application Uses	24
Mellanox NEO GUI Client Requirements	25
Recommended Screen Resolutions	25
	25
Supported Mellanox Internally Managed Systems	
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems	25
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems Managed Hosts Supported by Mellanox NEO	25 25 25
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems Managed Hosts Supported by Mellanox NEO Downloading Mellanox NEO	25 25 25 25
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems Managed Hosts Supported by Mellanox NEO Downloading Mellanox NEO Using MyMellanox Account	25 25 25 25 25
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems Managed Hosts Supported by Mellanox NEO Downloading Mellanox NEO Using MyMellanox Account From the Mellanox Website	25 25 25 25 25 25
Supported Mellanox Internally Managed Systems Supported Platforms and Operating Systems Managed Hosts Supported by Mellanox NEO Downloading Mellanox NEO Using MyMellanox Account From the Mellanox Website Installing Mellanox NEO	25 25 25 25 25 25 26

Deploying NEO Virtual Appliances	. 29
Installing Mellanox NEO as Docker Container	. 51
Upgrading Mellanox NEO	. 52
Uninstalling Mellanox NEO	. 54
Uninstalling Mellanox NEO as Docker Container	. 54
Operating Mellanox NEO Services	55
NEO Health Monitoring	. 55
Mellanox Care	. 55
Launching Mellanox NEO GUI	56
User Authentication	. 56
Mellanox NEO GUI	57
Interface Frame	. 57
Profile Icons	. 57
Main Tabs/Categories/Navigator Buttons	. 57
Navigator Tabs	. 57
Monitoring Window	. 58
Network Map Window	. 60
Configuration Management Window	. 61
Telemetry Window	. 61
Tasks Window	. 61
Jobs Window	. 61
Events Window	. 62
Notifications Window	. 63
System Health Window	. 63
Settings Window	. 63
Mellanox NEO Monitoring	. 63
General Dashboard	. 63
What Just Happened® Dashboard	. 67
RoCE Dashboard Overview	. 70
Network Health Dashboard	. 73
Managed Elements	. 74
Devices	. 74
Inventory	110
Ports	110

Cables	115
Groups	116
Sites	121
Virtual Machines	124
Virtual Switches	124
Network Map	125
Map Components	125
Map Info and Settings	126
Running Operations	141
Views	142
Map Options	145
Services	146
Bring-up Wizard	147
Service Types	161
Service Elements	178
Configuration Management	182
Network Snapshots	182
Global Configuration	186
Provisioning Templates	188
Telemetry	192
Monitoring	192
Streaming	200
Snapshots	207
Tasks	210
Tasks Tab	210
Task Sequence Tab	214
Jobs	217
Events	218
Notifications	219
System Health	228
Providers	228
High Availability	235
Logs	236
Settings	237

System	241 245 247 248 249
Logs Users Device Access Email Events Policy Image Profile Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	245 247 248 249
Users	247 248 249
Device Access Email Events Policy Image Profile Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	248 249
Email Events Policy Image Profile Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	249
Events Policy Image Profile Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	2 ⊑4
 Image Profile Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery 	251
Image Management Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery.	253
Telemetry Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	255
Virtualization Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	257
Configuring Managed Network Components Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	258
Configuring SNMP on Mellanox Onyx Switch (for Port Counters Monitoring) Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	. 263
Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	263
Setting NEO SNMP Trap Protocol Registration Configuring Mellanox Onyx Switch for LLDP Discovery	263
Configuring Mellanox Onyx Switch for LLDP Discovery	264
	265
Configuring Host for LLDP Discovery	265
Configuring Windows Host for Basic Authentication	265
Appendix - Mellanox NEO/Nutanix Prism Plug-in	. 267
Definitions, Acronyms and Abbreviations	267
Key Features	268
General Prerequisites	268
Setup Prerequisites	269
Cluster Nodes Configuration	269
NEO Virtual Machine Configuration	271
Installing Nutanix Prism Plug-in	271
Nutanix Prism Plug-in Usage	271
Nutanix-NEO Debug Files	275
VXLAN Support	275
NEO VXLAN Templates	275
Examining the Connection	281
Appendix - Events	202
Application Events	. 202
Device Events	. 282

Appendix - Mellanox NEO GUI Fields Validations	286
Appendix - Activating Switch Telemetry Using Telemetry Agent	287
Appendix - What Just Happened® Reasons	289
Document Revision History	290
Release Notes Revision History	<mark>292</mark>
Release Notes Changes and Features History	292
Bug Fixes History	. 300

NVIDIA® Mellanox® NEO[®] is a powerful platform for managing scale-out computing networks. Mellanox NEO enables data center operators to efficiently provision, monitor and operate the modern data center fabric. Mellanox NEO serves as interface to the fabric, thus extending existing tools capabilities into monitoring and provisioning the data center network. Mellanox NEO uses an extensive set of REST APIs to allow access to fabric-related data and provisioning activities. Mellanox NEO eliminates the complexity of fabric management. It automates the configuration of devices, provides deep visibility into traffic and health, and provides early detection of errors and failures.

The documentation here relates to:

- Release Notes
- User Manual

Intended Audience

This manual is intended for cluster and data center administrators who are responsible for the deployment, configuration, and day-to-day maintenance of Mellanox devices.

Software Download

To download product software, please refer to the <u>NEO Software Download</u> product page.

Document Revision History

A list of the changes made to the user manual are provided in User Manual Revision History.

Typography

The following table describes typographical conventions in Mellanox documentation. All terms refer to isolated terms within body text or regular table text unless otherwise mentioned in the Notes column.

Term, Construct, Text Block	Example	Notes
File name, pathname	/opt/neo/controller/ conf/controller.conf	
Console session (code)	-> flashClear <cr></cr>	Complete sample line or block. Comprises both input and output. The code can also be shaded.
Linux shell prompt	#	The "#"character stands for the Linux shell prompt.
String	< > or []	Strings in < > or [] are descriptions of what will actually be shown on the screen, for example, the contents of <your ip=""> could be 192.168.1.1</your>

Related Documentation

For additional information, see the following documents and links:

- Mellanox NEO® REST API User Manual
- Mellanox NEO® SDK User Manual
- Telemetry Agent User Manual
- Free online training

Document Conventions

The following conventions might appear in this document.

A Note: Identifies important information that contains helpful suggestions

• Warning: Alerts you to the risk of personal injury, system damage, or loss of data.

Alert: Warns you that failure to take or avoid a specific action might result in personal injury or a malfunction of the hardware or software. Be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents before you work on any equipment.

Release Notes

These release notes pertain to the Mellanox NEO software.

System Requirements

Mellanox NEO Server Requirements

Platform	Type and Version (Up to 20 Nodes)	Type and Version (Above 20 Nodes)
OS	RedHat/CentOS 7.4, 7.5, 7.6, 7.7, 7.8	
CPU	8-core server and above	24-core server and above
RAM	16GB and above	32GB and above
Disk	10G* + 500MB per switch	

If NEO is managing more than 20 switches, you must use SSD disk for the machine running NEO.

• For IP Discovery to load, DNS should be configured properly on installed machine or hostname should be defined at /etc/hosts file.

Supported Platforms and Operating Systems

Platform	Operating System	
Bare metal server	RedHat/CentOS 7.x	
Virtualized Environment		
Linux virtualization	RedHat/CentOS 7.x	
Microsoft Hyper-V virtualization	Windows Server 2008 R2 Windows Server 2012 Windows Client 10 Windows Server 2016	
VMware virtualization	VMware Workstation 15.1.0 ESXi 6.7.0	
Oracle VirtualBox	6.08	

Mellanox NEO GUI Client Requirements

Supported Browser	Browser Version
Microsoft Edge	80.0.361 and above
Chrome	62 and above

Supported Browser	Browser Version
Firefox	72.0.2 and above
Safari	11.0 and above

Deprecated Safari versions on Windows are not supported by NEO.

Recommended Screen Resolutions

Screen Type	Screen Size	Recommended Resolution
Desktop	23"	1920 X 1080
Laptop	15"	1366 X 786
Tablet	9.7"	1024 X 768

Supported Mellanox Internally Managed Systems

Platform	Device	Software Version
Mellanox SN2000 Series	SN2010 SN2100 SN2100B SN2410 SN2410B SN2700 SN2700B SN2740	Mellanox Onyx v3.9.1014 or above Cumulus Linux 3.6.2 or above
Mellanox SN3000 Series	SN3420	
Mellanox SN4000 Series	SN4600C	
HPE M-Series	SN2100M SN2410M SN2410bM SN2700M	Mellanox Onyx v3.9.1014 or above
Edgecore	AS4610	Cumulus Linux 3.2 or above

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• The latest supported Mellanox Onyx version is: 3.9.1014

- The latest supported Cumulus version is: 3.7.9
- Support for Mellanox Onyx SwitchX family systems stopped starting from Mellanox NEO version v2.4

Key Features

Feature	Description
Telemetry	Enables the user to collect telemetry data from Spectrum based managed switches, and stream it to external data collectors.
Device Management	Enables chassis discovery, health monitoring and running operations (reboot, software-upgrade) on managed systems
Device Provisioning	Enables the user to run commands on selected systems
Port & Device Monitoring	Enables the user to collect all managed switches ports traffic and error counters via the SNMP protocol
Ethernet Discovery	Enables the user to discover the managed devices' connectivity via the LLDP protocol
Report Management	Enables the user to generate and save traffic counter graphs
Events	Enables the user to receive notifications on the managed systems and the Mellanox NEO application, and enables the use to define rules for events triggering
Task and Job Management	Enables the user to centralize task running on managed switches, and enables tracking running and completed jobs in the system
Task Sequence	Enables the user to create and manage sequences of tasks which can be executed at any time
Running and Tracking Configuration Info	Enables the user to view the current running configuration of every managed switch system, and notifies the user of network configuration changes, summarizing all systems configuration changes
Dashboard	Provides a summary of the managed site's traffic and events behavior
RoCE Dashboard	The RoCE Dashboard contains a snapshot of the RoCE related network state, including information on service state, traffic and events. RoCE services can also be added and managed from this dashboard.
What Just Happened (WJH)	A dashboard that contains information about packet drops in the fabric.
Network Mismatch Analysis	Notifying the user on a network configuration mismatch - for example: MTU mismatch, Mellanox Onyx mismatch
Topology Map	Enables the user to have a graphical view of managed network topology
Configuration Management	Enables the user to edit and apply running configuration files (Global Configuration), CLI files (Provisioning Templates) and to save/restore old running configurations (Network Snapshots).
Cable Information	Enables the user to present cable information of selected devices, ports and groups
NIC Capabilities	Enables the user to retrieve important information about managed Hosts Adapter Cards (HCAs)
Performance Monitoring	Enables the user to run performance checks between two hosts
Performance Health Check	Enables the user to run performance health tests between all managed hosts or for randomly selected hosts
Service View and Bring-up Wizard	Enables the user to apply selected network configurations and validate these configurations periodically
High Availability	Enables the user to use a cluster of nodes for high availability of network management
Cumulus Linux Support	Added support for Cumulus Linux network operating system operated over Mellanox switch systems

Changes and New Features

Feature	Description
	Rev 2.7
New system support	Added support for SN3420, SN3700, and SN4600C switch systems
What Just Happened®	WJH is now enabled on Mellanox NEO by default upon Telemetry Agent installation
	WJH now supports up to 5K WJH drops per second
	Added ability to enable/disable WJH events per severity
	Added the ability to filter out WJH events by category, severity or reason (Streaming Settings)
	Enhanced wording for WJH events
	Updated WJH dashboard
Connectivity check	Added ability to verify device connectivity across multiple communication protocols

This section lists the new features and changes in this Mellanox NEO® version.

Bug Fixes in This Release

Ref. #	Issue
2146982	Description: Reported aggregated traffic for the switch in the Network Map view is displayed incorrectly.
	Keywords: Switch, Network Map
	Discovered in version: 2.6
	Fixed in version: 2.7
2170410	Description: Upgrading from 2.3-2.6 with Event Policy configured causes NEO to fail to load.
	Keywords: Upgrade, fail, event policy
	Discovered in version: 2.6
	Fixed in version: 2.7

Known Issues

This section lists the known issues in this version of Mellanox NEO® with available workarounds.

Ref. #	Issue
23887 86	Description: Network map periodically refreshes. When that happens, selected items become unselected.
	Workaround: N/A
	Keywords: Network Map

Ref. #	Issue
	Detected in version: 2.7
24120	Description: The What Just Happened button "Export to CSV" is missing from UI.
55	Workaround: N/A
	Keywords: WJH, WebUI
	Detected in version: 2.7
21878 52	Description: Any change related to the "RoCE" sub-category under "Events Policy" on NEO 2.4 or below will be lost upon NEO upgrade. User is required to reconfigure it after the upgrade.
	Workaround: N/A
	Keywords: RoCE, upgrade
	Detected in version: 2.7
21076 70	Description: When working with NEO, any switch configuration done directly on the switch (via switch CLI) might be conflicted with NEO configuration and interfere with NEO switch management and configuration.
	Workaround: N/A
	Keywords: NEO, CLI, configuration, conflict, overwrite
	Detected in version: 2.7
22251 34	Description: In Streaming Settings, the events "TTL value is too small" and "Packet size is larger than MTU" (under Forwarding > L3) are always streamed even if configured otherwise.
	Workaround: N/A
	Keywords: Streaming, MTU, TTL
	Detected in version: 2.7
21470	Description: RoCE service does not display MLAG port-channel traffic.
08	Workaround: N/A
	Keywords: RoCE, MPo
	Detected in version: 2.7
22116 06	Description: The NEO dashboard, the WJH dashboard specifically, may at times become slow to respond.
	Workaround: N/A
	Keywords: WJH, dashboard, slow
	Detected in version: 2.7
22483 62	Description: Upgrading Mellanox NEO to software version 2.7 rebuilds the database and removes all Telemetry and WJH data.
	Workaround: N/A
	Keywords: WJH, database
	Detected in version: 2.7
22395 14	Description: Any task with a snapshot created on top of it in NEO 2.4 version (or older) is displayed under "Telemetry" \rightarrow "Snapshots", not under "Tasks".
	Workaround: N/A
	Keywords: Telemetry, task, snapshot
	Detected in version: 2.7
22396 62	Description: Any collector added to a telemetry session in NEO version 2.4 (or older) is detached from the session after Mellanox NEO upgrade.
	Workaround: Reattach collector after software upgrade.

Ref. #	Issue
	Keywords: Collector, session, upgrade
	Detected in version: 2.7
22453 29	Description: WJH buffer drop trap_probability is probability to extract the packet from stream of the packets that get exception. If the packet rate is low the extraction rate can deviate from configured value.
	Workaround: N/A
	Keywords: WJH
	Detected in version: 2.7
20989 05	Description: NEO OpenStack integration is supported only over HTTPS protocol (HTTP is not supported).
	Workaround: N/A
	Keywords: HTTPS, OpenStack
	Detected in version: 2.6
21194	Description: NEO supports up to to 10 MPOs in a single "apply MLAG" service.
41	Workaround: If more MPOs are required, the service must be updated and re-applied.
	Keywords: MLAG, MPO
	Detected in version: 2.6
-	Description: When interoperating with switch systems installed with Onyx 3.9.0300, they may reach high CPU utilization.
	Workaround: Run the command "ssh server login record-period 1" in order to avoid this.
	Keywords: Onyx, high CPU utilization
	Detected in version: 2.6
21260	Description: Mellanox Onyx® switches support up to 64 buffer histogram samplings.
93	Workaround: N/A
	Keywords: Histogram, buffer events, telemetry
	Detected in version: 2.6
21186 73	Description: The following 3rd party systems are not supported by Mellanox NEO®: Arista, Brocade, Cisco, Juniper and HP. It is not possible to add new systems from these vendors to NEO. However, if NEO is upgraded from an older version where these switch systems have been added, then they can be presented and managed without issue. NEO is still able to detect these 3rd party systems by IP range scanning or by LLDP.
	Workaround: N/A
	Keywords: 3rd party, switch systems
	Detected in version: 2.6
21076 70	Description: Switch configuration performed directly on the switches (via switch CLI) may conflict with Mellanox NEO configuration and interfere with NEO switch management and configuration.
	Workaround: Only use NEO for managing configuration over the managed switches (avoid manual configuration on the managed switches).
	Keywords: Configuration, CLI
	Detected in version: 2.6
19189	Description: In-band migration not supported.
27	Workaround: N/A
	Keywords: VLAN provisioning
	Detected in version: 2.6

Ref. #	Issue
19126 82	Description: Telemetry Agent does not provide telemetry information on split ports if they are configured while the agent is running.
	Workaround: Restart Telemetry Agent.
	Keywords: Telemetry Agent, split ports
	Detected in version: 2.6
19522 79	Description: Every new device added to NEO must have a unique management IPv4 address, otherwise the displayed devices data might be corrupted.
	Workaround: N/A
	Keywords: Management Elements
	Detected in version: 2.6
20824 27	Description: When configuring LLDP on the host interface, LLDP must be configured to publish the host management IPv4 address. Otherwise, the host is not presented correctly in Mellanox NEO.
	Workaround: N/A
	Keywords: LLDP
	Detected in version: 2.6
20617 26	Description: When adding a Cumulus switch to Mellanox NEO, the initial discovery results in SNMP failure. Once SNMP is configured on the switch, it returns to normal status (i.e. "OK").
	Workaround: N/A
	Keywords: Cumulus, SNMP
	Detected in version: 2.6
-	Description: NEO v2.5.1 supports up to 50 managed switches. If Mellanox NEO is managing more than 20 switches, it is recommended to use SSD disk otherwise NEO performance issues are expected.
	Workaround: N/A
	Keywords: Managed switches, performance
	Detected in version: 2.5.1
-	 Description: Running the Telemetry Agent configuration provisioning templates will attempt to restart the Agent, but it will fail to start it. Affected Telemetry Agent Provisioning Templates: Agent-Active-Ports-Update Agent-Interval-Factor-Change Agent-Port-Channel-Discovery
	<pre>Workaround: Edit the template in NEO: 1. Click the "Edit" option. 2. Replace the command docker exec neo-agent "/etc/init.d/telemetryd restart" with the command fae docker cmd "restart neo-agent" 3. Click the "Apply" button to save the changes.</pre>
	Keywords: Telemetry Agent Provisioning Templates
	Detected in version: 2.5.1
-	Description: Running WJH on a Cumulus switch is not supported. (Up to the release of NEO v2.5, no Cumulus version that supports WJH existed.)
	Workaround: N/A
	Keywords: WHJ, Support, Cumulus
	Detected in version: 2.5
-	Description: Running WJH and Threshold Events telemetry sessions on Onyx switches is supported only for Onyx version 3.8.2004 or newer.

Ref. #	Issue
	Workaround: N/A
	Keywords: WJH, Threshold events, Onyx Version
	Detected in version: 2.5
19226 07	Description: If a device (Linux host or switch) is removed from NEO while some Mellanox switches are running telemetry, then all the telemetry sessions running on these switches will be stopped.
	Workaround: Manually disable and enable telemetry sessions using NEO (Telemetry \rightarrow Streaming) in order to reactivate the required telemetry sessions.
	Keywords: Telemetry, Device, Remove, Switch, Session, Stop
	Detected in version: 2.5
19176 81	Description: NEO monitoring over SNMP is not supported for Cumulus switches (due to a known issue in Cumulus switch).
	Workaround: N/A
	Keywords: SNMP, Monitoring, Cumulus
	Detected in version: 2.5
19173 23	Description: If a switch is unresponsive, NEO will not display a continuous graph of the monitoring data.
	Workaround: N/A
	Keywords: Unresponsive, Switch, Continuous, Monitoring
	Detected in version: 2.5
19201 82	Description: General device information (Memory and CPU) might be displayed at a delay of 2-4 minutes after the device has been added to NEO.
	Workaround: N/A
	Keywords: General information, Memory, CPU, Delay
	Detected in version: 2.5
19205 20	Description: In Cumulus switch, in case of "non-ascii" characters used in the switch configuration files, creating configuration backup and network snapshots or restoring from them might fail.
	Workaround: N/A
	Keywords: Cumulus, "non-ascii", Characters, Configuration
	Detected in version: 2.5
19206 01	Description: When editing MLAG port channels via MLAG wizard, configuration changes might fail in case telemetry was configured prior to the change (e.g., via the Bring-Up Wizard).
	Workaround: N/A
	Keywords: MLAG, Editing, Configuration, Telemetry
	Detected in version: 2.5
18877 61	Description: Telemetry agent will not publish telemetry data for MLAG port channel in the following cases:
	 MLAG port channel of MLAG stave switch MLAG port channel was disabled and enabled on MLAG master switch In these cases, telemetry data is published for the physical ports (the MLAG port channel members).
	Workaround: N/A
	Keywords: MLAG, Telemetry, MLAG port channel, disabled, enabled
	Detected in version: 2.5
-	Description: When upgrading NEO v2.4 to NEO v2.5, due to the transition from Graphite to InfluxDB, historical counters data kept on Graphite will not be transferred to the InfluxDB.

Ref. #	Issue
	Workaround: N/A
	Keywords: Upgrade, Graphite, InfluxDB, counters
	Detected in version: 2.5
18488 70	Description: General information (CPU and Memory information) for Cumulus switches managed by NEO are not displayed in the NEO interface until it is exposed by the switch. For more information, please refer to Exposing CPU and Memory Information via SNMP.
	Workaround: N/A
	Keywords: CPU and Memory information, Cumulus switches
	Detected in version: 2.5
-	Description: RoCE Service configuration is not supported for Onyx versions prior to 3.6.5000.
	Workaround: Upgrade the switch to the latest Onyx version.
	Keywords: Services, RoCE, Onyx
	Detected in version: 2.5
-	Description: RoCE Service configuration cleanup is not supported for services upgraded from older NEO versions.
	Workaround: Remove the old service and recreate it with the latest NEO.
	Keywords: Services, Clean-up, RoCE, upgrade
	Detected in version: 2.5
-	Description: RoCE Service configuration cleanup is supported only for Onyx and Cumulus switches.
	Workaround: For other service types, remove the configuration manually using switch CLI.
	Keywords: Services, Clean-up, RoCE
	Detected in version: 2.5
-	Description: Service configuration clean-up is supported only for RoCE service.
	Workaround: For other service types, remove the configuration manually using switch CLI.
	Keywords: Services, Clean-up
	Detected in version: 2.5
13295 30	Description: Manual HA takeover or failover might take up to 60 seconds (depending on the machine NEO is running on). During that time, triggering additional failover or takeover operations might result in the original action failure.
	Workaround: Wait for at least 60 seconds between HA operations - failover or takeover.
	Keywords: HA, failover, takeover
	Detected in version: 2.4
16008	Description: Configuring RoCE on a host bond interface is currently not supported.
68	Workaround: Configure RoCE on the bond slaves.
	Keywords: Bond, RoCE
	Detected in version: 2.3
15828 00	Description: Running too many frequent live monitoring sessions for a specific switch may overload the switch's JSON API and result in timeouts.
	Workaround: Run fewer live monitoring sessions in parallel.
	Keywords: JSON, timeout, live monitoring
	Detected in version: 2.3
-	Description: When a WJH is enabled on the Telemetry Agent, WJH on the Onyx switch is disabled (the user is not able to view WJH details via Onyx switch CLI) and vice versa.

Ref. #	Issue
	Workaround: N/A
	Keywords: What Just Happened, WJH, Onyx, Telemetry Agent
	Detected in version: 2.3
20901	Description: WJH is supported by NEO only for Onyx Spectrum switches using v3.7.1134, or newer.
23	Workaround: N/A
	Keywords: What Just Happened, WJH, Dropped Packets
	Detected in version: 2.3
-	Description: NEO-Host installation is supported only for Linux hosts, using one of the following HCAs: ConnectX-4 / ConnectX-4 Lx / ConnectX-5.
	Workaround: N/A
	Keywords: NEO-Host
	Detected in Version: 2.3
15782 31	Description: NEO telemetry agent can stream Routing Table information up to 20K records, and MAC table information up to 800 records.
	Workaround: N/A
	Keywords: Telemetry Agent, Routing Table, MAC Table
	Detected in Version: 2.3
14172	Description: System icons are not shown for Edge and Safari systems.
/3	Workaround: N/A
	Keywords: Network Map, Edge, Safari
	Detected in Version: 2.2
15041 28	Description: The network path calculation requires that all switches along the path will have the same SSH credentials. Otherwise, the calculation will fail.
	Workaround: N/A
	Keywords: Network Path, SSH, Credentials
14842	Description: The telemetry agent cannot be stopped on switches running Onyx OS v3.6.8100.
91	Workaround: Do not deploy the telemetry agent on Onyx OS v3.6.8100.
	Keywords: Telemetry Agent, Onyx
14213 69	Description: The "In Packets rate" calculated counter shows an incorrect value for Cumulus switches only, due to an issue with the switch (the Unicast RX Packets counter always returns a value of zero).
	Workaround: N/A
	Keywords: In Packets Rate, Cumulus, Unicast RX Packets
14984 34	Description: The network path calculation will display the links transmitted bandwidth utilization according to the maximal value of the aggregated links (in case of a multiple links connection).
	Workaround: N/A
	Keywords: Network Path, Bandwidth, Utilization
13321 20	Description: Telemetry Agent does not support split ports.
	Workaround: N/A
	Keywords: Telemetry Agent, Split Port
13285	Description: In the MLAG service, the bond is configured with the default gateway.
	Workaround: Configure a different static route to the relevant ports.
	Keywords: MLAG, Bond

Ref. #	Issue
13164	Description: Port live monitoring only works from a certain Onyx version.
29	Workaround: N/A
	Keywords: Telemetry, Live Monitoring
13273 85	Description: Upgrade procedure (from an older version to 2.1.0) does not include Events Policy and RoCE Service.
	Workaround: N/A
	Keywords: Upgrade
13096	Description: Telemetry session interval cannot be changed
55	Workaround: N/A
	Keywords: Telemetry Agent
12981 37	Description: When loading images with a similar name (differed only by tag) the 1 st image name becomes empty due to an <u>issue in Red Hat Docker</u> .
	Workaround: N/A
	Keywords: Docker, Container
12724 97	Description: There is no validation for the maximum ECN value in RoCE Service. The max allowed ECN value is dynamic and depends on switch type, current memory state , etc.
	Workaround: N/A
	Keywords: RoCE Service
12770 47	Description: Configuring one of the IPL ports in MLAG service to 'switchport mode trunk' fails the service.
	Workaround: Reset switchport mode before adding the port to the IPL.
	Keywords: MLAG Service
13027	Description: Switch reboot stops a telemetry agent session (if running).
//	Workaround: After switch reboot, manually restart the telemetry session.
	Keywords: Telemetry
10716 52	Description: For optimized UI functionalities, LastPass browser add-on should either be disabled or not installed.
	Workaround: N/A
	Keywords: UI, LastPass
-	Description: A NEO-Host package installation is required for successful provisioning of RoCE through the new RoCE service.
	Workaround: Install NEO-HOST either on Linux-without-Neo-Host-installed predefined group or on a specific host.
	Keywords: RoCE Service
10649	Description: The MLAG service is supported in MLNX Onyx (MLNX_OS) starting from v3.6.4000.
/9	Workaround: Make sure to upgrade your Onyx version to v3.6.4000 or above.
	Keywords: MLAG Service
-	Description: When using SNMPv3 with sha authentication and priv=aes128 option, the switch will become unreachable due to timeout.
	Workaround: For Mellanox PPC switches, use md5 authentication with a priv=des option.
	Keywords: Authentication
-	Description: Mellanox NEO Client (browser) might fail to connect to the NEO server in case the iptables service is running.

Ref. #	Issue
	Workaround: Make sure to disable the iptables service before running NEO installation.
	Keywords: Installation
-	Description: VLANs and LAGs information may not be displayed as part of device information for non-Mellanox devices.
	Workaround: N/A
	Keywords: 3rd Party Systems Support
-	Description: Linux/Windows host provisioning via NEO is non-persistent.
	Workaround: N/A
	Keywords: Host Provisioning
-	Description: NEO start-up will fail in case the machines' local time zone is not configured.
	Workaround: Make sure the installed machines' local time zone is configured. (/etc/localtime file exists).
	Keywords: NEO Start-Up
-	Description: Apply Config operation is only available for switches with Onyx v3.6.2000 and above.
	Workaround: N/A
	Keywords: Configuration Management
-	Description: Cable information is only supported for Mellanox Onyx switch ports.
	Workaround: N/A
	Keywords: Cable Information
95178 9	Description: Performance tests are only supported for ConnectX-4 and ConnectX-5 family adapter cards.
	Workaround: N/A
	Keywords: Performance Check
-	Description: Performance check can be performed only on two Linux hosts, running MLNX_OFED_LINUX-3.3-1.0.4.0 version or higher.
	Workaround: N/A
	Keywords: Performance Check
-	Description: RoCE configuration on hosts is non-persistent.
	Workaround: N/A
	Keywords: RoCE Service

Introduction

Mellanox NEO® is a powerful platform for managing scale-out computing networks. Mellanox NEO enables data center operators to efficiently provision, monitor and operate the modern data center fabric.

Mellanox NEO serves as interface to the fabric, thereby extending existing tool capabilities into monitoring and provisioning the data center network. Mellanox NEO uses an extensive set of REST APIs to allow access to fabric-related data and provisioning activities.

Mellanox NEO eliminates the complexity of fabric management. It automates the configuration of devices, provides deep visibility into traffic and health, and provides early detection of errors and failures.

Mellanox NEO incorporates a monitoring mechanism that can be combined with Mellanox Care®, a support program that offers 24/7 fabric management services to monitor network health. This mechanism traps network events and issues regular notifications to Mellanox's Network Operations Center (Mellanox NOC). Special Mellanox personnel analyze the details of the reported events and take action according to the service level agreement (SLA).

Mellanox NEO presents the following benefits:

- Reduces complexity of fabric management
- · Provides in-depth visibility into traffic and health information
- Network API supports integration, automation, and SDN programmable fabrics
- Historical health and performance graphs
- Generates preventive maintenance and "soft degradation" alerts
- Quickly troubleshoots topology and connectivity issues
- Integrates and streamlines fabric information for your IT systems
- Combined with Mellanox Care, produces regular event notifications to Mellanox NOC for 24/7 health monitoring

Central Management Console	Mellanox NEO provides network and device management functions via one central console. Its centralized dashboard can be used to monitor, troubleshoot, configure and optimize the system via a single interface.
In-Depth Visibility and Control	Mellanox NEO includes an advanced granular monitoring engine that provides real- time access to switches, enabling cluster-wide health and performance monitoring, real-time identification of problems and failures, and quick problem resolution via granular threshold-based alerts and its utilization dashboard.
Quick Resolution of Problems	Mellanox NEO provides comprehensive information from switches, showing errors and traffic issues such as congestion. The information is presented concisely over a unified dashboard and configurable monitoring sessions. The monitored data can be correlated per job and customer, and threshold-based alarms can be set.
Open Architecture	Mellanox NEO provides an advanced REST interface and SDK package integrated with external management tools. This combination enables data center administrators to consolidate management dashboards while flawlessly sharing information among the various management applications, synchronizing overall resource scheduling, and simplifying provisioning and administration.

Mellanox NEO as Network API	Mellanox NEO serves as an interface to the fabric, thereby extending existing tool capabilities into monitoring and provisioning the data center network. Mellanox NEO uses an extensive set of REST APIs to allow access to fabric-related data and provisioning activities.
	The interface can provide external tools with the fabric topology, device health and performance status, alerts, and device and fabric management actions. This allows taking advantage of existing tools and enhancing them, as well as building new DevOps oriented management frameworks.
	For further information on Mellanox NEO API documentation, please refer to the <u>NEO</u> <u>SDK User Manual</u> .

Mellanox NEO Software Architecture

Mellanox NEO architecture includes controller and service providers (Device Manager, Provisioning, Fabric Manager, Monitoring and Access Credentials Manager). The controller transfers information from the service providers to the user, as well as controls the service providers and verifies their status. It queries and fetches information from providers and performs operations such as:

- Storing a list of supported logs per each provider
- Pausing, resuming, resetting, and fetching a specific log
- · Maintaining a connection with a provider



Mellanox NEO Graphical User Interface

The Mellanox NEO Web GUI is the front-end of the application. It communicates with the Mellanox NEO REST API in order to retrieve and display the relevant information.

Mellanox NEO Controller

The Mellanox NEO controller is the central component enabling data collection from all the service providers. The collected data is maintained in a central repository. The controller exposes a Restful API that allows retrieving any type of information and running any type of supported actions.

Mellanox NEO Providers

The Mellanox NEO providers listed below are the data sources for the controller. Each provider is an independent process (service) which communicates with the controller.

- Device Management Provider
- Provisioning Provider
- Monitoring Provider
- Access Credentials Provider
- IP Discovery Provider
- Telemetry Provider
- Ethernet Connectivity (LLDP) Discovery Provider
- IB Provider
- Solution Provider
- Virtualization Provider
- Host Manager Provider
- Performance Provider

Communication Protocols

Mellanox NEO utilizes the following communication protocols.

Protocol	Purpose
HTTPS	Collecting chassis data regarding Mellanox devices and Windows servers
SNMP	Collecting connectivity data, monitoring data and general data from switches
SSH	Switch/Linux provisioning

Installation and Initial Configuration

Installation Requirements

Prior to the installation process, make sure:

- A supported version of Linux is installed on your machine as listed below
- To have HTTPS/HTTP access from your client machine (on which a browser is running) to the machine that you intend to run NVIDIA® Mellanox® NEO® on

▲ The default access protocol is HTTPS.

 The <u>ports listed below</u> are not being used by another application running on the same machine/VM as Mellanox NEO

System Requirements

Mellanox NEO Server Requirements

Please refer to "Mellanox NEO Server Requirements" in the Release Notes page.

Ports Mellanox NEO Application Uses

Ports	Protocol	Description			
Listening					
2022	ТСР	SSH protocol (relevant for HA mode only)			
2224	ТСР	Pacemaker PCS service (relevant for HA mode only)			
8086	ТСР	InfluxDB (relevant for HA mode only)			
8088	ТСР	InfluxDB			
8094	ТСР	Telegraf			
7658	ТСР	Mellanox NEO GRPC collector used for collection of buffer threshold events			
7654	ТСР	Used to communicate between NEO telemetry agent and Mellanox NEO			
162	UDP	SNMP traps receiver			
	Tr	ansmitting			
22	SSH	Access managed devices			
443	HTTPS	Access managed devices			
80	НТТР	Access managed devices			
161	SNMP	Access managed devices			

Mellanox NEO GUI Client Requirements

Please refer to "Mellanox NEO GUI Client Requirements" in the Release Notes page.

Recommended Screen Resolutions

Please refer to "Recommended Screen Resolutions" in the Release Notes page.

Supported Mellanox Internally Managed Systems

Please refer to "Supported Mellanox Internally Managed Systems" in the Release Notes page.

Supported Platforms and Operating Systems

Please refer to "Supported Platforms and Operating Systems" in the Release Notes page.

Managed Hosts Supported by Mellanox NEO

Please refer to "Managed Hosts Supported by Mellanox NEO" in the Release Notes page.

Downloading Mellanox NEO

Using MyMellanox Account

If you do not have an active support contract, skip these steps, and follow the next procedure instead.

To download Mellanox NEO software:

- 1. Log into MyMellanox.
- 2. Go to Software \rightarrow Management Software \rightarrow Mellanox NEO.
- 3. Click the "Downloads" tab and click the software image.
- 4. Click "Download".

From the Mellanox Website

• If you have a valid support contract, follow the previous procedure instead.

- 1. Go to the <u>Mellanox NEO product page</u> on the Mellanox website.
- 2. Click the "Download Software" button.

- 3. Fill the short form and click "Submit".
- 4. A direct link to the image download is sent to the email address you provided in the form.

Installing Mellanox NEO

The default Mellanox NEO installation directory is /opt/neo.

To install Mellanox NEO software:

- 1. Copy the Mellanox NEO installation package to a local temporary directory (e.g. /tmp).
- 2. Enter the temporary directory.

cd /tmp

3. Delete the previous installation folder (if any exist).

rm -rf /tmp/neo

4. Extract the Mellanox NEO installation package.

tar zxvf neo-2.7.0-5.el7.tar.gz

5. Enter the new created directory.

cd neo

6. Install Mellanox NEO.

./neo-installer.sh

7. If a previous Mellanox NEO installation is detected, you will be asked to confirm proceeding with the upgrade procedure. Type "y" to proceed. See <u>Upgrading Mellanox NEO</u> below for more information.



 [Optional] In order to use more provisioning templates of Mellanox NEO supported system types (Linux hosts, Windows hosts, Arista switches and Cisco switches), you may download and install Mellanox NEO external RPMs. For further details on how to download and install Mellanox NEO external RPMs, please refer to the community post <u>"HowTo Install NEO Plugins"</u>. You can download and install the external RPMs also after Mellanox NEO is up and running.

9. [Optional] Run Mellanox NEO manually after the installation is complete.

/opt/neo/neoservice start

During the installation process, a warning message will display when NTP is not configured. To resolve that, please install NTP and run the ntpd process.

Installing NEO for High Availability

Mellanox NEO High Availability (HA) deployment is composed of a three-node cluster (based on CentOS 7.x) installed with Mellanox NEO software. The HA mechanism for NEO is based on two standard Linux mechanisms:

- Pacemaker cluster resource manager responsible for detection and recovery of machine and application-level failures
- Rsync responsible for synchronizing all file systems between the three cluster nodes

Prerequisites

- CentOS v7.x installed on your machine, where HA is exclusively supported
- Configure SSH trust between the three nodes. Run the following on each of the three nodes:

```
ssh-keygen
ssh-copy-id -i /root/.ssh/id_rsa user@server
```

• In order to install Mellanox NEO as a docker container, SSH trust can be established by using the script "create_ha_trust_on_docker.sh" with the IP addresses of all the nodes as parameters. For example:

```
/opt/neo/common/utils/create_ha_trust_on_docker.sh 10.212.220.7 10.212.220.13 10.212.220.6
```

- The script opens port 2022 for SSH on all cluster nodes which is used for file synchronization
- For the script to run successfully, the names of the containers must be identical on all nodes
- Configure /etc/hosts and add all 3 server IPs and hostnames for each of the three nodes. For example:

```
# cat /etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4
:1 localhost localhost.localdomain localhost6 localhost6.localdomain6
10.250.24.3 neo-server-2
10.250.24.2 neo-server-3
```

Installing Mellanox NEO Cluster

Install NEO separately on each node. For further information, refer to <u>Installing Mellanox NEO</u> section above.

Configuring Mellanox NEO Cluster

The following steps are performed on one node only, but will automatically apply to the other two nodes once the cluster is started.

Choose one node and update the parameters in its yaml file, located at: /opt/neo/common/conf/ ha.yaml:

- 1. [Optional] Hacluster_password this parameter is set by default to use a pre-configured password. To change the password, please contact <u>Mellanox Support</u>.
- 2. [Optional] ha_file_sync the periodic time for syncing the persistent data. Default value is 300 seconds. Minimum value is 100 seconds.
- 3. ha_nodes the IP addresses of the three nodes on which NEO is installed, in addition to their priority:
 - local_ip the IP of the node that is part of the HA cluster
 - priority either 1, 2 or 3 according to their mode (active/stand-by). Node priority is only considered upon the first NEO startup.
- 4. virtual IP the virtual IP address for the GUI. This IP is the gateway for all nodes.
- 5. rsync_user the username used to authenticate all three nodes of the HA

The following is an example of an ha.yaml file:

```
Hacluster_password:
rsync_user: root
ha_file_sync:
ha_nodes:
- local_ip: 10.250.24.2
priority: 1
- local_ip: 10.250.24.3
priority: 2
- local_ip: 10.250.24.4
priority: 3
virtual_ip: 10.250.24.10
ssh_port: 22
```

Once configuration is completed successfully, make sure to start NEO and check its status as described in the section below.

Operating Mellanox NEO Cluster

Mellanox NEO user can start, stop, or restart Mellanox NEO cluster, or check its status at any time.

• To start Mellanox NEO cluster, run:

/opt/neo/neocluster start

• To check Mellanox NEO cluster status, run:

/opt/neo/neocluster status

• To stop Mellanox NEO cluster, run:

/opt/neo/neocluster stop

• To restart Mellanox NEO cluster, run:

/opt/neo/neocluster restart

• To return to the standalone mode from the HA mode, stop neocluster and then starting neoservice.

Connecting NEO Web UI to Mellanox NEO Cluster

When connecting NEO Web UI to Mellanox NEO HA cluster, make sure to connect via the virtual IP address of the cluster.

Deploying NEO Virtual Appliances

When working with NEO over VM, the VM name will be "neo-server-NEO-<version>-\${macsuffix}".

In order to override this name, comment, or remove, the line hostnamectl set-hostname "neo-server-NEO-2.6.0-9-\${mac-suffix}" from the file /usr/sbin/ifup-local.

Mellanox NEO supports several virtual appliances for selected hypervisors for easier deployment. Before deploying the NEO virtual machine (VM) on Windows 2016, make sure to disable the following security settings so you can access the UI from the host machine:

- Configuration is enabled currently enabled on your server. This configures a was Internet and intranet Web sites. The r to Web sites that might pose a security risk. For ation, see <u>Effects of Internet Explorer Enhanced</u> Most a D Σ 놂 L ectly in I ing Tool om displaying correctly in Internet Explorer and iversal Naming Convention (UNC) shares. If you or functionality that has been disabled, you can et or Trusted sites zones. For more information, iying i idows ierShell ISE -----..... Paint ŧ. eg. 21 Task Manage ver Mana ö Catting -8 File Explorer ows Accessories ws Administrative Tools Ease of Access ofhel 8 Windows System ۲ dows Server 2016 Standard Evaluation Windows License valid for 180 days Build 14393.rs1_release.160715-1616 ws Φ
- 1. Click the Start button and launch the "Server Manager":

- 2. Click "Local Server".
- 3. In the "Properties" window, make sure the "IE Enhanced Security Configuration" is set to "On".

🚡 Server Manager				- 0
Server Ma	nager • Local Se	rver	· 🗊	② ♥ Manage Tools View He
III Dashboard	PROPERTIES For WIN-1GJ9QV6881E			TASKS 💌
Local Server All Servers File and Storage Services.	Computer name Workgroup	WIN-1G/9QV6881E WORKGROUP	Last installed updates Windows Update Last checked for updates	Never Install updates automatically using Windows Update Never
	Windows Firewall Remote management Remote Desktop NIC Teaming Ethernet	Private: On Enabled Disabled Disabled IPv4 address assigned by DHCP, IPv6 enabled	Windows Defender Feedback & Diagnostics IE Enhanced Security Configuration Time zone Product ID	Real-Time Protection: On Settings On [(UTC-08.00) Pacific Time (US & Canada) 00378-00000-0000-AA739 (activated)
	Operating system version Hardware information	Microsoft Windows Server 2016 Standard Evaluation	Processors Installed memory (RAM) Total drik coace	Intel(R) Core(TM)2 Quad CPU 2 GB 50.65 GB

4. Turn off the "IE ESC for Administrators and/or for Users", and click OK:

豫 Internet Explorer Enhanced Security Configuration	×
Internet Explorer Enhanced Security Configuration (IE ESC) reduces the exposure of your server to potential attacks from Web-based content. Internet Explorer Enhanced Security Configuration is enabled by default for Administrators and Users groups.	
Administrators:	
On (Recommended)	
😵 💿 Off	
Users:	
On (Recommended)	
Image: Image	
More about Internet Explorer Enhanced Security Configuration	
OK Cancel	

5. Restart the browser, and attempt logging-in.

Deploying NEO Virtual Appliance on Linux KVM

1. Go to the VM host (hypervisor) storage directory:

	cd /images
2.	Copy your release image to the VM host:
	cp /release/vm/neo-1.4.9-10.qcow2
3.	Run:
	virt-manager &
4.	Create a new VM:

a. Choose to "Import existing disk image" for installing the OS:



b. Provide the storage path, and as OS select Linux Red Hat 7.3 or above:



c. Specify the memory usage and the number of CPUs:

🐜 🕞 New VM <@r-	cloudx4-	03>			\odot	\otimes
Create a Step 3 of 4	new vir	tual	mac	:hine		
Choose Memory a	nd CPU s	etting	js			
Memory (RAM):	8192	-	+	MiB		
	Up to 327	39 Mie	3 avail	able or	n the host	
CPUs:	4	-	+]		
	Up to 24 a	availat	le			
💥 Ca	incel	¢	Bac	<	∘≫Forv	vard

As the memory usage and the number of CPUs get higher, the performance improves. Memory usage should at least be 8192 MB.

d. Enter a name for the VM. If you wish to configure the NIC card, select "Customize configuration before install":

📾 💿 New V	M <@r-cloudx4-03>
Cre Step	ate a new virtual machine
Ready to be	gin the installation
Name:	NEO-2.3.0-9
OS: Install: Memory: CPUs: Storage:	Red Hat Enterprise Linux 7.3 Import existing OS image 8192 MiB 4 m/kvm/centos7-neo-2.3.0.92.qcow2 I Customize configuration before install
✓ Network	selection br0: Host device enp5s0f0 ▼
	Cancel & Back Finish

e. If you wish to set a fixed MAC address, do so in the NIC section of the VM configuration:

📾 💮 NEO-2.3.0-9 on QEMU/	KVM <@r-cloudx4-03>				\odot	×
🚽 Begin Installation 🛛 🎇	Cancel Installation					
CPUs	Virtual Network	Interface Bridge br0: Host devic	e enp5s0f0 ▼			
Boot Options	Device model: MAC address:	virtio 00:50:56:28:26:10	•			
NIC :28:26:10						
Sound: ich6						
Channel qemu-ga						
Controller USB						
🤁 USB Redirector 2						
💠 Add Hardware]		- Remove	💥 Cancel	Appl	y

Once the new VM is successfully complete, the following screen with the hostname and

login username will appear:

KEE (·	NEO-2.3.0-9 or	QEMU/KVM <@r-cloudx4-03>
File	Virtual Machine	View Send Key
	8 Þ	00 🔹 🖷
	CentOS Lin Kernel 3.1	ux 7 (Core) 0.0-957.1.3.el7.x86_64 on an x86_64
	neo-server	-2 login:

- 5. Log into the VM and using the following credentials:
 - Username root
 - Password 123456
- 6. Stop the NEO service. Run:

cd /opt/neo ./neoservice stop

7. Verify the date and timezone are configured properly:

date

If you need to update the timezone, follow the steps below:

a. Delete the current "localtime" file under /etc/ directory.

cd /etc

b. Remove the local time.

rm localtime

c. Select a time zone.

ln -s /usr/share/zoneinfo/US/Pacific localtime

8. Check the hostname resolution. Run:

hostname -i

- 9. Make sure you received your local IP.
- 10. Start NEO. Run:

cd /opt/neo ./neoservice start

11. Make sure you can access the VM through your browser.

Deploying NEO Virtual Appliance on VirtualBox

A NEO VM uses 64-bit architecture. If you have a 32-bit OS, virtualization might not be enabled on your machine, and an error message of unavailable hardware acceleration will appear. In this case, make sure to enable virtualization through BIOS.

In order to enable virtualization through BIOS, follow the steps below:

1. Click "File" and choose "Import Appliance".

File	Machine Help		
S	Preferences	Ctrl+G	
9	Import Appliance	Ctrl+I	
R	Export Appliance	Ctrl+E	
	Virtual Media Manager	Ctrl+D	
	Host Network Manager	Ctrl+H	
5	Cloud Profile Manager	Ctrl+P	
2	Network Operations Manager		
9	Check for Updates		
⚠	Reset All Warnings		
\bigtriangledown	Exit	Ctrl+Q	

🦉 Oracle VM VirtualBox Manager
2. Choose the path for the ova file in the VM files and click Next.



3. Click "Import" to import the VM into VirtualBox. After this step, the VM will be imported and ready to explore NEO on it.

		?	\times
←	Import Virtual Appliance		
	Appliance settings		
	These are the virtual machines conta You can change many of the propert below.	ined in the appliance and the suggested settings of the imported VirtualBox mach ies shown by double-clicking on the items and disable others using the check boxe	ines. Is
	Virtual System 1		^
	😽 Name	neo-server4f1ebc	
	🗮 Guest OS Type	🔁 Red Hat (64-bit)	
	CPU	4	
	RAM	8192 MB	
	 DVD 		
	Network Adapter	☑ Intel PRO/1000 MT Server (82545EM)	
	Storage Controller (IDE)	PIIX4	~
	You can modify the base folder which machine) modified.	will host all the virtual machines. Home folders can also be individually (per virtua	el
	C:\Users\Administrator\VirtualBo	x VMs	\sim
	MAC Address Policy: Include only N	T network adapter MAC addresses	-
	Additional Options: 🗹 Import hard	drives as VDI	
	Appliance is not signed		
		Restore Defaults Import Cano	cel

4. Choose "vm" and click start to run it.

Coacle VM VirtualEex Manager		- σ ×
BUS tank	O O O O O O O O O O O O O O O O O O O	
🔁 the accesses of the 🧱	Constant Constan	neo-server4f1ebc
	Consider Territory Consider TERRITOR CONSIDER TERRITO	
	Production and the contrast of the contra	
	Daubid © Searce Education Trus © Encargence Trus	

- 5. Once the VM starts, log in using the following credentials:
 - Username root
 - Password 123456
- Run ifconfig to display the interfaces. As can be seen below, eth0 has already acquired an IP on the network:



The MAC address assigned to the VM must be on DHCP records in order to get an IP address from the VM.

- 7. Log into NEO GUI using the IP found in the previous step (http://<NEO_server_IP>/neo) with the following credentials:
 - Username admin
 - Password 123456

Deploying NEO Virtual Appliance on VMware Workstation

1. Click "File" \rightarrow "Open" and open the ovf template.



2. Click "import" to start the NEO VM import process.

Import Virtual Machine	\times				
Store the new Virtual Machine Provide a name and local storage path for the new virtual machine.					
Name for the new virtual machine: centos7-neo-2.3.0.8					
Storage path for the new virtual machine: C:\Users\Administrator\Documents\Virtual Machir Browse					
Help Import Cancel					

The VM can then be seen imported:

- 3. Click "Power on this virtual machine" to start the VM. Use the following credentials:
 - Username root
 - Password 123456
- 4. Run ifconfig to display the interfaces. As can be seen below eth0 already acquired an IP.

The MAC address that is assigned to VM must be on DHCP records in order to get an IP address from the VM.

- 5. Log into NEO GUI using the IP found in the previous step (http://<NEO_server_IP>/neo) with the following credentials:
 - Username admin
 - Password 123456
 - ▲ If the VM does not succeed at gaining an IP, check the "Automatic Settings" under "Edit" → "Virtual Network Editor". Make sure to untick the checkbox of VirtualBox which is installed on your machine, and then reboot the VM so it can acquire an IP.

Deploying NEO Virtual Appliance on VMware ESXi Server

1. Connect to ESXi machine using vSphere Client.

Ø	1	VMware vSphere Client	x
vmwa VMwar Clier	are [.] e vSphere I t		
To dire vCente	l vSphere features vailable only throug Sphere Client will co ature set as vSphe ctly manage a singl age multiple hosts, r Server.	introduced in vSphere 5.5 and beyond are gh the vSphere Web Client. The traditional portinue to operate, supporting the same are 5.0. In the same same same same same same same sam	_
IP Us Pa	address / Name: er name: ssword:	r-cloudx4-03 root	
		Use Windows session credentials	e

2. Click "File" and choose "Deploy OVF Template...".

2							r-clou	dx4-03 -	vSphe	re Client						-		x
File	Edit View	Inventory	Admin	istration	Plug-ins	Help												
	New		•															
	Deploy O\	/F Template																
	Export		•															
	Report		•															
	Print Map	s	+															
	Exit																	
Adm	ninistration																	
	8																	
	Roles	System	Logs															
Rece	nt Tasks									N	lame,	Target or Status	contains	•			Clea	r ×
Name	5		Target		Stat	us	0	etails	Ir	nitiated by	/	Requested Star	t Ti ▽	Start Tim	e		Comp	leted T
	Taulus										_		E -1	e	CO 4			>
	asks		_	_	_	_	_	_	_	_	_		Evalu	ation Mode	: 60 days i	remain	iing ji	00t //

- 3. Choose the path for the OVF template and go through the pages by clicking "Next".
- 4. Click "Finish" to start deploying.

0	Deploy OV	F Template 📃 🗖 🗙
Ready to Complete Are these the options you	want to use?	
Source OVF Template Details Name and Location Disk Format Ready to Complete	When you dick Finish, the deployment settings: Dyf File: Download size: Size on disk: Name: Host/Cluster: Datastore: Disk provisioning: Network Mapping: Power on after deployment	nent task will be started. (\10.5.1.111\mti_ctx_poc\CTX_FR\ashnewer\Documents_ 723.7 MB 30.0 GB NEO_2.3.0-8 r-cloudx+03.mtr.labs.minx datastore1 Thick Provision Lazy Zeroed "VM Network" to "VM Network"
		< Back Finish Cancel

5. Right-click on the VM and choose "Open Console" and power on the machine.

2				r-cloudx4-03 - vSphere Client
File Edit View Inv	ventory Admini	stration Plug-ins Help		
🖬 🖾 🛕 H	iome 🕨 🛃 Inv	entory 🕨 🎁 Inventory		
🔳 UI 🕨 🤅	ه 🖸 🕼	12 💀 👳 🧇	₿º.	
r-doudx4-03		NEO_2.3.0-8	_	
	Power		Resource Allocation Performance Events	Console Permissions
	Guest			close tab &
(FR)	Snapshot Onen Console		· chine?	
₽	Edit Settings Upgrade Virtua Add Permissio Report Perform Rename Open in New V Remove from Di Delete from Di	I Hardware n Ctrl+P nance Window Ctrl+Alt+N Inventory sk	software computer that, like a is an operating system and ting system installed on a virtual test operating system. machine is an isolated computing use virtual machines as desktop or infs, as testing environments, or to pications. In hosts. The same host can run s	Virtual Machines
		Basic Tasks Power on the Bedit virtual n	e virtual machine aachine settings	vEphere Client

- 6. Use the following credentials to log into the machine:
 - Username root
 - Password 123456
- 7. Run if config to display interfaces. As can be seen below, the VM has already acquired an IP.

P neo-1.6.0-5 on ufm-host80.rdmz.labs.mlnx		
File View VM		
CentOS release 6.5 (F Kernel 2.6.32-431.el6	inal) .x86_64 on an x86_64	
localhost login: root		
[root@localhost ~]# i	fconfig	
eth0 Link encap: inet addr:1 inet6 addr UP BROADCAS RX packets: TX packets: collisions RX bytes:38	Ethernet HWaddr 00:0C:29:5F:B2:9B 8.224.15.234 Bcast:10.224.15.255 Mask:255.255.255.1 Fe80::20c:29fife5f:b29b/64 Scope:Link T RUNNING MULTICAST MTU:1500 Metric:1 30 errors:0 dropped:0 overruns:0 frame:0 20 errors:0 dropped:0 overruns:0 carrier:0 8 txqueuelen:1000 43 (3.7 KiB) TX bytes:2079 (2.0 KiB)	8
lo Link encap: inet addr:1 inet6 addr: UP LOOPBACK RX packets: TX packets: collisions: RX bytes:25	Local Loopback 27.0.0.1 Mask:255.0.0.0 ::1/128 Scope:Host RUNNING MTU:16436 Metric:1 1442 errors:0 dropped:0 overruns:0 frame:0 1442 errors:0 dropped:0 overruns:0 carrier:0 8 txqueuelen:0 3070 (286.2 KiB) TX bytes:293070 (286.2 KiB)	
[root@localhost ~]# _		

- The MAC address assigned to the VM must be on DHCP records in order to get an IP address from the VM.
- 8. Log into NEO GUI using the IP found in the previous step (http://<NEO_server_IP>/neo) with the following credentials:
 - Username admin
 - Password 123456

Installing NEO Virtual Appliance on Hyper-V

- 1. Launch the Hyper-V.
- 2. Click "Action" \rightarrow "Virtual Switch Manager".

3. Create a new external virtual switch:

🕌 Virtual Switch Manager for MTL-ARYE1	- 🗆 X
Virtual Switches New virtual network switch Global Network Settings MAC Address Range 00-15-5D-04-9E-00 to 00-15-5D-0	Create virtual switch What type of virtual switch do you want to create? External Internal Private
	Create Virtual Switch Creates a virtual switch that binds to the physical network adapter so that virtual machines can access a physical network.
	OK Cancel Apply

4. Provide a name and make sure you choose the right network adapter connected to the management network:

Virtual Switches New virtual network switch Label Anticology Content of the second	Name:
Global Network Settings MAC Address Range 00-15-5D-04-9E-00 to 00-15-5D-0	Notes:
	Connection type What do you want to connect this virtual switch to? External network: Intel(R) Dual Band Wireless-N 7265 Allow management operating system to share this network adapter Internal network Private network
	VLAN ID Enable virtual LAN identification for management operating system The VLAN identifier specifies the virtual LAN that the management operating system will use for all network communications through this network adapter. This setting does not affect virtual machine networking. 2
	Remove

5. Click "Action" \rightarrow "New" \rightarrow "Virtual Machine".



6. Click "Next" in the New Virtual Machine Wizard window.

🖳 New Virtual Machine Wizar	d	\times
🐸 🛛 Before You B	egin	
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager. To create a virtual machine, do one of the following: Click Finish to create a virtual machine that is configured with default values. Click Next to create a virtual machine with a custom configuration. Do not show this page again	
	< Previous Next > Finish Cancel	

7. Specify the neo-vm name in the "Specify Name and Location" menu.

New Virtual Machine Wiza Specify Name	rd ne and Location	×
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk	Choose a name and location for this virtual machine. The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload. Name: NEO_2.3.1-1 You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.	,
Installation Options Summary	☐ Store the virtual machine in a different location Location: Ct:\ProgramData\Microsoft\Windows\Hyper-V\ If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.	
	< Previous Next > Finish Cancel	

8. Click "Next".

9. Chose the desired generation in the "Specify Generation".

🖳 New Virtual Machine Wizar	d	Х
💴 Specify Gene	ration	
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	 Choose the generation of this virtual machine. Generation 1 This virtual machine generation supports 32-bit and 64-bit guest operating systems and provides virtual hardware which has been available in all previous versions of Hyper-V. Generation 2 This virtual machine generation provides support for newer virtualization features, has UEFI-base firmware, and requires a supported 64-bit guest operating system. Once a virtual machine has been created, you cannot change its generation. 	:d
	< Previous Next > Finish Cancel	

- 10. Click "Next".
- 11. Set the memory size to 8192MB minimum in the "Assign Memory" menu.

New Virtual Machine Wizar Assign Memory	d ×
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 12582912 MB. To improve performance, specify more than the minimum amount recommended for the operating system. Startup memory: 8193 MB Use Dynamic Memory for this virtual machine. Image: Note that the operating system that it will run. Image: When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.
	< Previous Next > Finish Cancel

- 12. Click "Next".
- 13. Use the virtual switch that appears in the "Connection" drop down menu in the "Configure Network" menu.

🖳 New Virtual Machine Wizar	d ×
🕮 Configure Ne	etworking
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Installation Options Summary	Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected. Connection: NEO_VIRTUAL_SWITCH Not Connected NEO_VIRTUAL_SWITCH
	< Previous Next > Finish Cancel

- 14. Click "Next".
- 15. Choose "Use an existing virtual hard disk" and browse to the neo-v vhd file in the "Connect Virtual Hard Disk" menu.

🖳 New Virtual Machine Wizar	d	×		
Connect Virt	ual Hard Disk			
Before You Begin Specify Name and Location Specify Generation Assian Memory	A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties. O Create a virtual hard disk Use this option to create a VHDX dynamically expanding virtual hard disk.			
Configure Networking Connect Virtual Hard Disk Summary	Name: NEO_2.3.1-1.vhdx Location: C: \Users\Public\Documents\Hyper-V\Virtual Hard Disks\ Size: 127 GB (Maximum: 64 TB)			
	Use this option to attach an existing virtual hard disk, either VHD or VHDX format. Location: strator\Documents\centos7-neo-2.3.1.1.vhdx\NEO_OUTPUT.vhdx Browse O Attach a virtual hard disk later Use this option to skip this step now and attach an existing virtual hard disk later.			
	< Previous Next > Finish Cancel			

💯 Open				×
🔶 -> -× 🛉 🚺 > Tł	his PC > Documents > centos7	-neo-2.3.0.8.vhdx	ٽ ~	Search centos7-neo-2.3.0.8.vh 🔎
Organize 🔻				BEE 🖛 🛄 (
A Quick accord	Name	Туре	Compressed size Passwi	ord Size Ratio
Desktop *	- NEO_OUTPUT	Hard Disk Image File	688,115 KB No	4,202,496 KB 84%
🕹 Downloads 🖈				
😫 Documents 🖈				
📰 Pictures 🛛 🖈				
centos7-neo-2.3				
🚋 Microsoft Manage				
🛄 This PC				
🏪 Win2016DCx64_10				
Logs				
PerfLogs				
Perl				
postinstall	<			>
File	ame: NEO_OUTPUT		~	Virtual hard disk files \checkmark
			,	<u>O</u> pen Cancel

- 16. Click "Next".
- 17. Click "Finish" in the "Summary" menu when displayed.

📃 New Virtual Machine Wiza	rd ×
Completing	the New Virtual Machine Wizard
Before You Begin Specify Name and Location Specify Generation Assign Memory Configure Networking Connect Virtual Hard Disk Summary	You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine. Description: Name: NEO_2.3.1-1 Generation: Generation 1 Memory: 8192 MB Network: Intel(R) 82574L Gigabit Network Connection - Virtual Switch Hard Disk: C:\Users\Administrator\Documents\centos7-neo-2.3.1.1.vhdx\VEO_OUTPUT.vhdx (VHE
	To create the virtual machine and close the wizard, click Finish. < Previous Next > Finish Cancel

18. Right click and choose Connect once you see the neo-vm on your Hyper-V

Virtual Machin	nes		
Name	State	2	CPU Usa
Name	State Connect Settings Start Checkpoint Move Export Rename Delete		CPU Usa
	Enable Replicati	on	

19. Select "Start" from the "Action" menu to start the VM.



- 20. Use the following credentials to log in to your VM:
 - Username root
 - Password 123456

Installing Mellanox NEO as Docker Container

1. Install Docker CE on CentOS 7.X:



▲ In order to upgrade Mellanox NEO docker, users must configure a location on the host to be shared with the docker. To do that please add the following to the docker run command:



2. Run the container:

```
cp <image path> /tmp
Service docker start
gzip -d <image name.tar.gz>
docker load -i /tmp/<image name.tar>
docker images (To get image id)
docker run -dit --network host -v /dev/log:/dev/log --privileged <image id> /usr/sbin/init
```

Alternatively you may pull the image from the docker hub:

```
docker pull mellanox/neo
docker run -dit --name 'neo' --restart unless-stopped --network host -v /dev/log:/dev/log --privileged
mellanox/neo:latest /usr/sbin/init
```

- The NEO web UI is reachable by default on port 3080 (SSL 3443) (e.g. https://<host_ip>: 3443/neo/). To access the web UI without mentioning the port, you may do so by following the steps below.
 - a. In the host (not inside the container) create the file etc/httpd/conf.d/neo.conf with the following content:

```
<Location /neo>
ProxyPass http://127.0.0.1:3080/neo
ProxyPassReverse http://127.0.0.1:3080/neo
</Location>
b. Run:
```

service httpd restart

4. Get/find the container ID by running in the host (not inside the container):

```
docker ps
```

Make sure NEO is not running on the Linux host machine before starting the NEO on the container.

5. Start NEO on the container:

```
docker exec -it <container id> /bin/bash
cd /opt/neo
./neoservice start
```

If the device was rebooted, the running instance will disappear and a new instance should be run.

Upgrading Mellanox NEO

In order to upgrade the Mellanox NEO software:

1. Stop the Mellanox NEO services.

```
/opt/neo/neoservice stop
```

- Copy the Mellanox NEO installation package to a local temporary directory (for example: / tmp).
- 3. Enter the temporary directory.

cd /tmp

4. Extract the Mellanox NEO installation package.

If a "neo" directory still exists in the current directory—left over from the previous version you had installed—please make sure to remove it before extracting the new NEO installation package.

tar zxvf neo-2.4.0-5.el6.tar.gz

5. Enter the new created directory.

cd neo

6. Install Mellanox NEO.

./neo-installer.sh

If a previous Mellanox NEO installation is detected, you will be asked to confirm proceeding with the upgrade. Type "y" to proceed.

If there is a conflict between the current installed RPMs and the new RPMs that NEO needs to install, you might be asked to confirm proceeding with the upgrade process twice:

A This will only occur when upgrading from NEO v1.5. Before clicking 'y', make sure the RPMs do not have any dependencies that are not related to NEO.

7. [Optional] Run Mellanox NEO manually after the installation is complete.

/opt/neo/neoservice start

 [Optional] In order to use more provisioning templates of Mellanox NEO supported system types (Linux hosts, Windows hosts, Arista switches and Cisco switches), you may download and install Mellanox NEO external RPMs. For further details on how to download and install external Mellanox NEO RPMs, please refer to the community post "<u>HowTo Install NEO Plugins</u>".

You can download and install the external RPMs also after Mellanox NEO is up and running.

Uninstalling Mellanox NEO

To uninstall the Mellanox NEO software, run:

/opt/neo/neo-uninstaller.sh

Uninstalling Mellanox NEO as Docker Container

To uninstall Mellanox NEO as a Docker Container, run:

docker stop <container-id> docker rm <container-id>

For Mellanox NEO running in High Availability mode, run the following:

```
docker exec -it <container-id> /opt/neo/neocluster stop
docker stop <container-id>
docker rm <container-id>
```

Operating Mellanox NEO Services

NVIDIA® Mellanox® NEO® users may start, stop, or restart Mellanox NEO services, or check their status at any time.

To start Mellanox NEO services, run:

/opt/neo/neoservice start

In order to stop Mellanox NEO services, run:

/opt/neo/neoservice stop

In order to restart Mellanox NEO services, run:

/opt/neo/neoservice restart

In order to check Mellanox NEO services status, run:

/opt/neo/neoservice status

NEO Health Monitoring

NEO uses <u>Monit</u> to monitor the status of NEO and dependent services (influxdb, telegraf, kapacitor). If one of these services is down, Monit detects it and restarts the service after a few seconds.

To see the exact monitoring configuration, please refer to /etc/monit.d/neo.monitrc.

Mellanox Care

Mellanox NEO incorporates a monitoring mechanism that can be combined with Mellanox Care[™], a support program that offers 24/7 fabric management services to monitor network health. This mechanism traps network events and issues regular notifications to Mellanox's Network Operations Center (Mellanox NOC). Special Mellanox personnel analyzes the details of the reported events and takes action according to the service level agreement (SLA).

Mellanox Care identifies, alerts and addresses hardware failures, non-optimal configuration, service degradation issues, performance issues and more.

To obtain a Mellanox Care license, please contact your Mellanox Support.

Launching Mellanox NEO GUI

To launch a Mellanox NEO GUI session:

- 1. Start the Mellanox NEO server.
- 2. Launch the GUI by entering the following URL in your browser: http://<NEO_server_IP>:3443/neo

© NVIDIA .	NEO
Username	
Password	
Login	

3. In the Login Window, enter your Username and your predefined user Password and click Submit.

User Authentication

Mellanox NEO user authentication is based on standard Apache user authentication. Each web service client application must authenticate against the Mellanox NEO server to gain access to the system. The Mellanox NEO software comes with one predefined user:

- Username: admin
- Password: 123456

It is recommended to change the default password to a new and personalized one in order to ensure that your NEO account is safe.

Mellanox NEO GUI

The Mellanox NEO software has several main GUI views. Before exploring the different options, it is recommended to perform the following steps:



- 1. Click on the "Settings" tab:
 - a. Select the "Users" view to add new Mellanox NEO users, and define users' roles and credentials.
 - b. Select the "Email" view to add recipient lists. Upon user's definition, these lists could be used to distribute specific event alerts to a group of recipients. For further instructions, see <u>"Settings"</u>.
- 2. Click on the "Events" tab to activate and deactivate events, and define the severity, condition-value, description and notification parameters for each event. For further instructions, see <u>"Events".</u>

Interface Frame

Profile Icons



When clicking the small profile icon on the top left corner of the left-hand menu, a drop down menu will appear, providing the user with the following:

- Username can either be a regular user or an admin
- The ability to change the account password

Main Tabs/Categories/Navigator Buttons

The following table describes the main Mellanox NEO® windows and categories:

Navigator Tabs

Tab Icon	Function	Description					
6	Dashboard	Provides single view highlighting information and network status					

Tab Icon	Function	Description				
	Managed Elements	Provides a list of devices, inventory, ports, groups, virtual machines, and virtual switches				
æ	Network Map	Provides a visual view of the physical connectivity between managed devices				
ac	Services	Provides automation tools for complex networking configurations				
٥	Configurations	Available for administrators only. Provides the ability to create/edit configuration files and provisioning templates and manage network snapshots.				
htt	Telemetry	Presents several reports of information collected by the management system, and allows to save and load them				
&	Tasks	Available for administrators only. Displays future scheduled Jobs.				
T	Jobs	Available for administrators only. Displays all the running and completed jobs in the system.				
\Diamond	Events	Provides notification events or critical device faults of the switch and server data events. The "Events Policy" view allows the user to activate and deactivate events, and define the severity, condition- value, description and notification parameters for each event.				
\geq	Notifications	Displays all network notifications				
	System Health	Provides information on Mellanox NEO building blocks				
	Settings	Available for administrators only. General system settings (default access credentials, user management).				

Monitoring Window

The Mellanox NEO dashboard enables an efficient network view from a single screen and serves as a starting point for event or metric exploration.

There are 4 dashboard views:

- General dashboard
- RoCE dashboard
- What Just Happened dashboard
- Network Health dashboard

General Dashboard

The fabric dashboard provides single view that is highlighting information and network status in the following smaller dashboard windows:

- Events
- Network Health
- WJH Category Distribution
- Services
- Configuration Changes

For more information, please refer to page <u>Mellanox NEO Fabric Interface Dashboard</u>.

What Just Happened®

The What Just Happened dashboard provides a view of the fabric packet drops information and statistical data of the drop reasons. The information is retrieved from the Telemetry Agent by a dedicated "What Just Happened" session.

RoCE Dashboard

The RoCE dashboard provides a single view that is highlighting information and network status related to RoCE traffic. The information is displayed in the following smaller dashboard windows:

- Last 24 Hours RoCE Related Events
- RoCE Services
- Recent RoCE Related Activity

Network Health Dashboard

This dashboard provides a graphic display for each device in the system representing its status and the severity of events reported on it.

Managed Elements Windows

The Managed Elements panel provides a list of devices, inventory, ports, groups, virtual machines, virtual switches, cables and sites.

- The Devices window displays a list of all devices on the machine, with the following related to each device: its IP address, name, system type, status, and MAC address.
 - A click on any device will display in a right panel a list of "Device Information" that includes: Stats, Ports, Inventory, OS, Events, Jobs, Credentials, Groups, Links, Config, Telemetry Snapshots, VLAN, LAG, Cables and Docker Containers.
 - A right click on a device or on multiple devices will allow performing any of the following actions, provided that the selected devices are capable of these actions: Provisioning, Connectivity Check, Install, Reboot, Remove, Acknowledge, Go To Map, History Monitoring, Live Monitoring, Create MLAG with, Add to Group, Add to Site and Generate Dump.
 - For more information on the Devices window, refer to "Devices"
- The Inventory window provides detailed information about each device part (such as CPU and FAN) its serial number (S/N), part number (P/N), model, vendor, state and health. For more information on the Inventory window, refer to "Inventory".

- The Ports window provides information about all ports in the fabric the device they are connected to, their name, protocol type, active speed, MTU, operational state and admin state. A click on one of the ports will display further information about that specific port: Counters, Errors, Cable, VLAN and LAG, when available. For more information on the Ports window, refer to <u>"Ports"</u>.
- The Cables window provides the following information about the cables connected to the switches: the ports to which the cable is connected, its serial number, cable type, part number, revision, length and speed.
- The Groups window provides information about existing groups, their members and group credentials (if defined), and allows the user to create new groups. For more information on the Groups window, refer to "Groups".
- The Sites window allows you to define physical locations of devices with information about the site's members. For more information on the Sites window, refer to "<u>Sites</u>".
- The Virtual Machines window lists all the Virtual Machines (VMs) that run on all KVMs in the network. For more information on the Virtual Machines window, refer to <u>"Virtual Machines"</u>.
- The Virtual Switches window lists all the Virtual Switches that run on all KVMs in the network. For more information on the Virtual Switches window, refer to <u>"Virtual Switches"</u>.
- The Telemetry Snapshots window provides a view of the system telemetry snapshots:

Device Infor	mation (10.2	09.36.162)					X86_64	3.7.1960-	19 2019-04-0
General Telemetry	Ports Snapshots	Inventory VLAN	Events Link Aggre	Jobs gation	Device A Cables	Access Docke	Groups er Containers	Links Sessie	Config ons
Select Task	:: Displa	ys the VLAN	I table.		•				
View	Compare								
Type to s	search snap	shot output							
show vla	n								
VLAN	Name		Ports						
1	default		Eth1/1, Eth1/6, Eth1/11 Eth1/10	Eth1/2 Eth1/7 L, Eth1/7	, Eth1/3, , Eth1/8, 12, Eth1/1	Eth1/4, Eth1/9, L3, Eth1	, Eth1/5, , Eth1/10, l/14, Eth1/1	5,	

Network Map Window

The Network Map window shows the fabric, its topology, elements and properties. NEO performs automatic fabric discovery and displays the fabric elements and the connectivity between the elements. In the Network Map window you can see how the fabric and its elements are organized (e.g. switches and servers).

For more information on the Network Map window, refer to "Network Map".

Configuration Management Window

A This panel is visible to administrators only.

The Configuration Management panel allows creating and editing configuration files and provisioning templates, as well as managing network snapshots. This panel is composed of three tabs: Network Snapshots, Global Configuration and Provisioning Templates.

For more information on the Configuration Management window, refer to "<u>Configuration</u> <u>Management</u>".

Telemetry Window

The Telemetry panel is composed of three windows:

- Monitoring allows creating live and history monitoring sessions
- Snapshots allows creating monitoring snapshots
- Streaming allows to view the current telemetry sessions (predefined and customized sessions), their status, and their members (switches)
 For more information on the Streaming window refer to "Streaming".

For more information on the Streaming window, refer to "Streaming".

Tasks Window

This panel is visible to administrators only.

The Tasks panel presents user's defined tasks (future scheduled Jobs). The following tasks are supported:

- Selecting a single or multiple devices and setting an action such as software upgrade or provisioning (CLI-command) and the action setting data
- Selecting a specific action on a device/a group of devices and creating a task from this action and its setting data
- Adding or deleting a task
- Dynamically selecting devices using filters (wildcards) tasks

For more information on the Tasks window, refer to "Tasks".

Jobs Window

A This panel is visible to administrators only.

The Jobs panel displays all of Mellanox NEO's running Jobs. A Job is a running task defined by a user and applied on one or more of the devices (provisioning, software upgraded, switch reboot etc.)

Mellanox NEO users can monitor the progress of a running job, as well as the time it was created, its last update description and its status. The status value can be "Running", during operation, "Pending", if another job is already running in the same device, "Completed with Errors" if an error has occurred, and "Completed". To cancel a pending job, right-click on the relevant job, and then choose "Abort".

Job States

Job State	Description
Created	Job was created and will shortly start running.
Pending	Job is pending by Mellanox NEO. This state appears in case another job that contains at least one common device is already running.
Running	The pending job was released and is now running.
Completed	All sub-jobs were completed successfully
Completed with Errors	All sub-jobs were completed, but on some of them, errors occurred.
Aborted	A pending job was canceled by the user.

Jobs

							0 2
10 🔻							
ID		Description	Created ↓	Last Update	Status	Summary	Progress
Filter	7	Filter V	Filter V	Filter V	Filter V		
105		Provisioning	2020-04-01 12	2020-04-01 12	Completed	View Summary	
72		Upgrade tele	2020-04-01 11	2020-04-01 11	Completed	View Summary	
66		Displays tele	2020-04-01 10	2020-04-01 10	Completed	View Summary	
65		Displays tele	2020-04-01 10	2020-04-01 10	Completed	View Summary	
63		Removing SN	2020-04-01 10	2020-04-01 10	Completed Wit	View Summary	
62		Removing sys	2020-04-01 10	2020-04-01 10	Completed	View Summary	
55		Adds a trap-re	2020-04-01 10	2020-04-01 10	Completed	View Summary	
54		Enables LLDP	2020-04-01 10	2020-04-01 10	Completed	View Summary	
53		Adding systems	2020-04-01 10	2020-04-01 10	Completed	View Summary	
50		Removing SN	2020-04-01 10	2020-04-01 10	Completed	View Summary	
						1 to	10 of 33 □ < < Page 1 of 4 > > >

Jobs can also be tasks scheduled by the system. In such cases, the users can monitor the progress of these jobs but cannot control them.

For further information on the Jobs window, refer to "Jobs".

Events Window

Mellanox NEO includes an advanced granular monitoring engine that provides real time access to switch and server data events. Network events can either be notification events or critical device faults. The events information includes severity, time.

For further information on the Events window, refer to "Events".

Show devices by: Name

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Notifications Window

The Notifications tab is Mellanox NEO's incoming messages box, providing the administrators network notifications.

For further information on the Notifications window, refer to "Notifications".

System Health Window

"High Availability" panel is visible to administrators only.

The System Health panel is composed of three windows:

- Providers the building blocks of Mellanox NEO
- High Availability a mechanism meant to serve as a backup if the active node on which NEO is installed should fail
- Logs presents detailed logs and alarms that are filtered and sorted by category, providing visibility into traffic and device events as well as into Mellanox NEO server activity history.

For further information on the System Health window, refer to "System Health".

Settings Window

A This panel is visible to administrators only.

For further information on the Settings window, refer to "<u>Settings</u>". The Settings panel allows administrators to edit users' profiles, define general system settings such as default access credentials, generate backups and restoration points and create and manage provisioning templates.

Mellanox NEO Monitoring

NEO's monitoring dashboards are central views enabling to oversee and analyze the network state. The available dashboards are:

- Fabric dashboard for overall network status
- What Just Happened® for information about packet drops in the fabric
- RoCE dashboard for RoCE related network status
- Network Health for a graphic display for each device in the system representing its status and the severity of events reported

General Dashboard

The general fabric dashboard displays several sub-panels, as shown in the following figure.



Events

The Events panel displays statistics pertaining to critical and error events that occurred over a specific period. A pie chart is available to visualize each event type. You may show critical and/or error events by clicking the Critical and/or Error buttons respectively. If only one severity is selected, you will see one big pie chart instead of two smaller ones.

The events are distributed over 4 categories: Application, Device, Port, and Priority.

Inside each one of the pie charts, you will have the total number of events. Hovering over a specific slice, shows the category and number of events belonging to that category.

You may utilize a time filter to view events for a specific time period. It has dropdown list with the following options:

- Last 5 minutes
- Last 1 hour
- Last 12 hours (default)
- Last 24 hours
- Last 1 week
- Last 1 month
- Last 6 months
- Last 1 year

The charts are updated according to the time filter settings and the settings of the general filters in the dashboard (Sites, Groups, Devices).

Clicking the "All Events" link at the bottom redirects to the events page.

Clicking on a specific category will open a preview model displaying the subcategory distribution for that category.

If both Critical and Error severities are selected, the area on the left displays "Critical" subcategories and the one on the right displays "Error" subcategories.

If more than 5 subcategories exist, the top 5 appear first, and the rest are collapsed under a bar called "Other" which can be expanded to reveal the statistics for the subcategories inside.

Clicking "Full Report" on the bottom right corner navigates to the Events page.

The pagination function allows us to navigate between categories—clicking the right arrow (>) to the right of the preview model takes you to the subcategory distribution of the next category.

Network Health

Network Health displays switches and servers as circular nodes in different colors according to the severity of their health state; it will show the switches in the left panel and the servers in the right panel.

The colors of circles will indicate the status of the device as follows:

- Green OK
- Yellow Error
- Red Critical
- Empty red circle Lost communication

For each device type (Servers, Switches) we will have the title (Switches or Servers) and next to it the number of devices under this type; and for each severity we will have the title (Critical, Errors, Healthy) and next to it we will have in brackets the number of devices under that severity.

Once a certain device is clicked, a preview model is displayed showing more information about the device (hostname, IP, site, system type, MAC address).

In the preview model, pagination is enabled and clicking on the "<" or ">" arrows navigates to other nodes of the same device type.

Clicking "Network Health" in the model or in the Network Health panel redirects to the "Network Health" dashboard.

If there are too many devices to show on the small panel, a + sign with a number appear indicating the number of remaining devices (e.g. +34). If clicked, a preview model appears showing all devices in same severity.

WJH Category Distribution

WJH Categories Distribution provides information regarding packet drops throughout the fabric and statistical data of the drop reasons. It consists of four main parts:

- A drop-down menu time filter to view statistics for a specific time period
- The total number of events in the selected time period
- Distribution of events per category displaying the number of drops per category and the name of that category under the number
- The "WJH Dashboard >" button which navigates to the What Just Happened dashboard

If more than three categories exist, then pagination is activated making it possible to navigate to the other categories.

Clicking any of the categories opens a preview model showing drop reasons that fall under that category.

Per drop reason distribution, you see:

- Reason name
- Number of drops associated with it
- Bar illustrating the proportion of drops belonging to it

If there are more than 5 reasons, the distribution for the top 5 is shown and a reason group called "Other" is displayed which combines all other reasons. If Other is expanded, distribution for all the remaining reasons is displayed.

Clicking < or > navigates to next/previous category. Clicking "WJH Dashboard" navigates to the What Just Happened dashboard.

Services

The Services panel provides a view of all services created in the system. In addition to global filters in the dashboard, this panel has two filters which affect what is displayed:

- All/Failed filter: "All" shows all the services created. Failed shows for showing the failed services only.
- Custom filter that displays specific services. by default, "All services" is selected.

Clicking on a specific service opens a service preview model displaying the following information for each member:

- Validation Status
- Configuration Status
- System Name
- IP
- Site

The validation and configuration status will be displays with a circle as follows:

- Red completed with errors
- Green completed
- Gray unknown

The title of the model will contain the name of the service and the number of members in that service in parentheses.

Hovering over specific status indicators shows a tooltip of the status (e.g. Completed).

You're able to navigate to the status of other services by clicking the "<" and ">" arrows.

Clicking "All Services" redirects to the "Services" page.

Configuration Changes

The Configuration Changes panel provides the user with some information about the latest configuration changes applied to devices. This panel contains the following information:

- Device hostname
- Device IP address
- Site to which the device is assigned

• Time of last change on the device

If desired, the three dots can be clicked in order to download configuration for a specific device. Clicking "All Configurations" redirects to the "Configurations" page.

What Just Happened® Dashboard

NEO gives the user an out-of-box, built-in WJH dashboard to view current and historical WJH data from managed Mellanox Spectrum® switches. In order to do so, NEO relies on InfluxDB and switch Telemetry Agents on the switches as part of the solution. Please see "<u>NEO Telemetry Agent</u>" for the Telemetry Agent installation procedure.

The telemetry data can be visualized and queried by using either NEO or any visualization software available. To get the telemetry data into the database of choice, a switch Telemetry Agent is used to pull, parse, and apply logic and stream out of the Mellanox Spectrum switch.

To enable WJH using NEO, the Telemetry Agent must be installed in a docker container on the switch.

WJH is only supported through CLI with Web UI or using NEO, but not in parallel.

Once installed and enabled, The WJH dashboard can be accessed to visualize WJH categories, events, and other details. For a list of possible packet drop reasons, please refer to <u>What Just</u> <u>Happened® Reasons</u>.

The upper main section of the page, contains the title, the number of dropped packets, and the filters button.

WJH Filtering

Under the title, users can find the WJH presets, where they are able to add/edit filters which affect the data presented in the WJH dashboard.

On the top-right of this area, users can save filters to the current preset, create a new preset, or reset the filters to the default preset. More about presets in the Manage Presets and History section.

Filter Editing Area

Users may access this area by clicking the filters icon on the top-right of the dashboard, or clicking the edit icon next to each item in the filters area, or clicking "+ Add Filters".

This screen allows users to modify currently selected filters, add new filters, or manage presets.

Time Filtering

In the Active Filters section, users are able to sort through WJH results by setting a time filter. Clicking the dropdown menu allows users to select from several preset time options. Alternatively, users may also select a custom time frame by clicking the Custom option.

This opens up a calendar from which users may select start and end time.

Severity Filtering

Users may select which severity (i.e. Error, Warning, Notice) they want to include (at least one should be selected) in their WJH results.

Add Filters

This area provides the ability to add new filters to your presets.

- The search box enables users to search for specific attributes and filter with them (e.g. search for specific drop reasons)
- The Metadata section provides the ability to filter for metadata (e.g. reason, switch, port, etc.)
- The Flow Details section features the following submenus for filters (L2, L3, L4, VXLAN) If expanded, users can filter attributes for these categories (e.g. filter specific MAC under L2, or filter for a specific L3 protocol).

Every category has the option to either include or exclude.

Categories Distribution

This panel provides statistics about the reported drops per category. Per category, this section shows the reason distribution in pie chart format.

Above each pie chart, users can see the name of the category it represents, and in the middle of each pie chart, users can see the total number of drops belonging to this category. Each slice in the pie represents the portion for specific reason drops.

Filtering for Specific Drop Category

Hovering in the middle of one pie chart (on the number), opens a tooltip showing the name of the category and the option to add it to filter by clicking "+ Add to Filters".

After filtering on a specific category is applied, it will affect the entire dashboard. All results for drops would belong to that category only. The name of this area is also changed from "Categories Distribution" to "Reasons Distribution". The filter is then added to the filters area (e.g. category is Forwarding).

The reason distributions will appear beside the pie chart in bars graphs. The first two bars will show the proportion of drops with the highest rate of occurrence. The remainder of the drops are lumped under an expandable "Other" bar.

The filter may be removed by clicking the Edit button at the top of the dashboard and removing it in the Edit Filters module.

Filtering for Specific Drop Reason

Clicking on a specific slice under Categories Distribution shows a tooltip containing the name of the drop reason, the number of drops belongs to that reason, and the option to add that reason to your filters by clicking "+ Add to Filters".

Once the filter is added, both category and reason are added to the filters, and only drops for the filtered reason will appear now.

Reordering Categories

By default, the categories are presented in descending order according to the number of drops, but the pie charts can be rearranged by clicking and dragging the 4 dots below each category.

Once the order is changed, a button appears to reset the order to default (descending).

Events Distribution Per Switch

This view displays the distribution of events per switch and features two options. One is to show all switches, and another to show the Top 3. If Top 3 is selected, then only 3 pie charts (if any) are visible. If All is selected, then we can see more than 3 pie charts (3 per screen).

By default, the pie charts are shown in descending order according to the number of drops. It is possible to reorder them by dragging and dropping them using the 4 dots below each switch.

In the following screen All is enabled. This enables pagination so more than 3 switches are visible. The order of the switch is changed so the button that reorders them (Order by Descending) is enabled.

Event Distribution Per Port - Multiple Mode (One Switch Filtered)

Hovering in the middle of the pie chart reveals a tooltip that contains the name of the switch and the option to add the switch to the filters.

If the switch is added to the filters, then the whole dashboard is affected as all panels will return data for that switch only.

The name of this panel will change from "Events Distribution Per Switch" to "Events Distribution Per port" as now it presents the distribution of events per port for the selected switch.

Event Distribution Per Port - Single Mode (One Port Filtered)

Hovering in the middle of the ports pie chart reveals a tooltip that shows the name of the port and the option to add it to the filters.

If the port is added to the filters, then the whole dashboard is affected as only drops for this port are displayed.

Events Distribution Per Port - Filtering for Specific Category

Hovering on a slice of the pie chart reveals a tooltip presenting the category name and the option to add it to the filters.

Once added, only drops for that port and that category are displayed.

Time-based Categories

This panel displays the WJH events received during in a specified period. This panel is affected with the filters applied to the dashboard.

Hovering over any point on the graph reveals a tooltip containing the name of the category, the date and time, and the number of drops that had occurred. It also has the option to add that category to the filters.

Detailed Flow Distribution

This panel allows users to select multiple properties and aggregate the events to display the combined number of WJH events.

Hovering over a specific bar displays the names of the properties selected, their value, and the combined number of WJH events for the selected properties.

The "i" icon indicates that L1 drops are not included in this distribution.

Detailed WJH Events

This table presents detailed information about each drop.

There is a collapse button at the top of each column in the table. Clicking it opens a filter module allowing users to narrow down the results they see in the table by deselecting certain values and clicking the apply button.

There are three vertical dots at the end of each WJH event (row). Clicking them opens up a context menu showing the two options:

- Details & Recommended Actions
- Streaming Settings

Details & Recommended Actions

Clicking "Details & Recommended Actions" opens a module showing the name of the switch, time of the WJH event, reason, and recommended actions to be taken.

Streaming Settings

Clicking "Steaming Settings" opens a module showing the streaming settings of the WJH event.

This model provides the ability to define some filters on the agent-side level. For example, to prevent the agent from streaming buffer drops, then they can be disabled using this module.

RoCE Dashboard Overview

The RoCE Dashboard contains a snapshot of the RoCE related network state, including information on service state, traffic and events. RoCE services can also be added and managed from this dashboard.

The RoCE related counters and events can be taken from the Telemetry Agent or retrieved by JSON API requests. This can be configured by the controller.cfg configuration file, in the Telemetry section. When using a Telemetry Agent, you must enable the NEO Counter Events session in the Telemetry streaming definitions page in order to get traffic events (see <u>"Enable/Disable Session"</u>).

This feature is only supported for Onyx Spectrum switches.

Last 24 Hours RoCE Events

Last 24 Hours Events displays the RoCE related events that occurred over the last 24 hours in a column graph, where each column accumulates events by severity, per hour. Clicking a column on the graph presents a detailed view of the events that compose it.

RoCE Services

The RoCE services section displays all the RoCE services and allows adding new ones and managing them.

Clicking the "+ Add" button opens the RoCE Service Creation wizard, which allows defining and configuring RoCE on the network devices. For more details, see <u>"RoCE"</u>. Clicking a RoCE service element will open a panel that shows details on this service.

List Tab

This tab displays all the devices managed by the service, their ports and their status. The Status column displays the device configuration and validation status, and the RoCE Telemetry column displays the RoCE traffic state for this device. High bandwidth, utilization, packet discard and other traffic related events are reflected in this column.

Clicking a device row opens another panel with the device ports' details.

Ports Sub-Tab

This sub-tab shows a list of ports with their utilization and congestion information. The definitions of utilization and congestion vary by the type of RoCE configuration defined by this service:

RoCE Configuration	Utilization Means	Congestion Means		
ECN Only	Total Port Utilization (%)	Total Port Packet Drops (%)		
ECN + QoS	RoCE Traffic Class Utilization (%)	RoCE Traffic Class Packet Drops (%)		
ECN + QoS + PFC	RoCE Traffic Class Utilization (%)	RoCE Traffic Class Congested Bandwidth (%)		

Clicking the graph icon () near the port name opens the Telemetry tab, that displays telemetry data for the selected port.

Clicking the bell icon () near the port name opens the Event tab, that displays events for the selected port.

Telemetry Sub-Tab

This sub-tab displays a graph with the last hour values of port counters relevant to the RoCE configuration defined by this device. The displayed counters are controlled by the checkboxes below the graph. The port can be changed by the drop down list above the graph.

The counters are displayed according to the selected configuration:

Displayed Counters per RoCE Configuration

ECN	ECN + QOS	ECN +QOS+PFC
Normalized bandwidth Normalized ECN Packets Normalized Discarded Packets	Normalized bandwidth Normalized ECN Packets Normalized Discarded Packets TC <priority> Normalized Bandwidth TC<priority> Discarded Packets</priority></priority>	Normalized bandwidth Normalized ECN Packets Normalized Discarded Packets TC <priority> Normalized Bandwidth TC<priority> Discarded Packets PFC<priority> Normalized Congested Bandwidth</priority></priority></priority>

The RoCE data is gathered by the Telemetry Agent if it is installed on the switch. Otherwise, NEO uses the switch JSON-API to retrieve the data.

You may change the number of allowed priorities in the SNMP Monitoring controller file, and then create a RoCE service that matches one of the selected priorities (via max_priorities=?).

Events Sub-Tab

This sub-tab displays all the RoCE related events for this device. This includes service lifecycle events (service configuration, validation etc.), and RoCE traffic events for ports and priorities on this device.

Map Tab

This tab displays a network map with all the devices managed by this service. The color of the elements is based on their RoCE traffic state.

Events Tab

This tab displays all the RoCE related events for this service. This includes service lifecycle events (service configuration, validation etc.), and RoCE traffic events for ports and priorities on devices managed by this service.
Recent RoCE Activity

The Recent Activity panel provides direct access to the most recent 20 RoCE related events, in a date descending order. Clicking an event shows its details in the events page.

Network Health Dashboard

This dashboard provides a graphic display for each device in the system representing its status and the severity of events reported on it.

Devices Heatmap

Devices Heatmap displays all the devices in different colors according to the severity of their health state. Once clicked on a certain device, you will be directed to the Devices tab under Managed Elements where you can access all information about that device.

The colors imply the following health states:

- Green OK
- Yellow error
- Red critical
- Empty red circle lost communication

Through the Devices Heatmap panel, you can apply filters by clicking the icon (see above). The following filter dialog will be displayed.

After customizing a certain filter for the devices, you can choose either the red or the green color to denote the devices that match your filter.

Example:

To filter for the devices whose CPU load is greater than 5, select the "CPU Load" as the Attribute, the ">" icon as the operator, and "5" as the threshold. To view the devices filtered in green, select the Matching Color to be green.

Once clicked on "Submit", the customized filter will be added to the bottom of the Devices Heatmap panel in the Dashboard (see below). The filters will be stored in the browser's local storage so on any user login or page reload, the heatmap panel will remain saved with all applied filters.

On the right side of the panel, there are:

- A brief text that describes the filtered criterion, and a square icon colored with the Matching Color (in this example, CPU Load > 5, green). If you click on the description, you will be able to edit your current customized filter.
- A recycle bin icon () that enables you to delete the filtered heatmap
- A help icon ("?") that displays your devices' criteria according to the defined colors

Managed Elements

The Managed Elements tab provides a list of devices, inventory, ports, cables, groups, sites virtual machines and virtual switches.

Devices

Devices information includes the IP address of each device, the device's name, system type, status, health and MAC address.

	Last Update: 06 Jul 2020 1	5:13			
Honitoring V	Devices + Add				
📑 Managed Elements 🤸					2
Devices	All 🗸	10 🗸			
Inventory	Name Filter	IP ↑	System Type	Status	MAC Filter
Ports	switch40	Interm I 10.0.0.1266	MSN2700	Lad.	AA:22:CC:44:DD:28
	switch40	☑ 10.0.0.1266	📥 MSN2700	[an]	AA:22:CC:44:DD:28
Cables	switch40	2 10.0.0.1266	📥 MSN2700	[.in]	AA:22:CC:44:DD:28
Cables	switch40	2 10.0.0.1266	📥 MSN2700	au	AA:22:CC:44:DD:28
Crowns	switch40	2 10.0.0.1266	📥 MSN2700	<u>lan</u>	AA:22:CC:44:DD:28
Groups	switch40	2 10.0.0.1266	📥 MSN2700	au	AA:22:CC:44:DD:28
C ¹	switch40	☑ 10.0.0.1266	📥 MSN2700	au	AA:22:CC:44:DD:28
Sites	switch40	2 10.0.0.1266	📥 MSN2700	au	AA:22:CC:44:DD:28
	switch40	☑ 10.0.0.1266	📥 MSN2700	au	AA:22:CC:44:DD:28
Virtual Machines	switch40	2 10.0.0.1266	📥 MSN2700	latt	AA:22:CC:44:DD:28
Virtual Switches				1 to 10 of 403 🔣	< Page 1 of 41 > >1
🛔 Network Map					

Device Information List

Device Information	Description
IP	The switch's IP address. Note: For Mellanox Switches, when clicking on the IP address, you will be redirected to the switch's web page, in which you will be able to configure the switch as desired.
Name	The switch's name.
System Type	Mellanox switch (🚢) - displayed with its type. For example: MSN2100.
	Non-Mellanox switch (Content of the second
	Host (I) - displayed with its type. For example: Windows/Linux/Nutanix/Other Hosts. The switch icon will also appear in case of a host with a bridge interface.

Device Information	Description
Status	 The switch's status, which can be any of the following: Unknown Communication OK Lost Communication Rebooting Pending Reboot
Health	 The switch's health status, represented by the following icon colors: Red - Major Green - OK Orange - Unknown
MAC Address	The switch's MAC address.

Additional Device Information

When clicking a single device, a list with the following information will appear on the right side of the screen:



are detected via the ETH Discovery provider.

General Tab

Provides information about the device's CPU and memory usage in a gauge view. The colors are changed according to the utilization percentage as follows:

- 0-50%: Green
- [> 50]-70%: Orange
- [> 70]%: Red

	Devices + Add				c	Device Information (172.20.203.50)	3.8.2004
🚳 Dashboards 🔷 👌		10				General Ports Inventory Events Jobs Device Access Groups Links Config	
Managed Elements ~	Name		System Type	Status	MAC	Telemetry Snapshots VLAN Link Aggregation Cables Docker Containers Sessions	
Devices	Filter 🛛	Filter 🔊	Filter	Filter	Filter 🔊	Memory	
Inventory	N/A	₿ 1.1.1.1	📇 Mellanox Switch	0	N/A		
Ports	lab4	172.20.203.4	E Linux Host	0	98:03:9B:8D:1E:19	30.48%	
Cablas	switch-058d0c	C 172.20.203.50	₼ MSN2100	© lat	B8:59:9F:62:3D:00		
-	switch-9f2c62	C 172.20.203.51	MSN2100	0	98:03:9B:FC:36:80	CPU1 CPU2 CPU3 CPU4	
Groups	N/A	172.20.203.52	Mellanox Switch	0	N/A	$\square \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$	
Sites	switch-c/te/0	172.20.203.53	MSN2100	0	B8:59:9F:7A:A1:40	$\begin{pmatrix} 4\% \\ 4\% \end{pmatrix} \begin{pmatrix} 4\% \\ 4\% \end{pmatrix} \begin{pmatrix} 4\% \\ 4\% \end{pmatrix} \begin{pmatrix} 3\% \\ 3\% \end{pmatrix}$	
Virtual Machines	switch-c/ff58	2 1/2.20.203.54	MSN2100	0	B8:59:9F:7A:75:C0		
Virtual Switches				10/01/	< Hage Lot 1 > >1		
						Last Update: Thu 5 Mar 2020 12:06:32	
A Network Map							
& Services							

For hosts on which NEO-Host is installed, a table with information about the Linux server will be displayed:

evice Information (172	2.20.203.6)			3.10.0-957.12.2.el7.x86_64
General Ports Telemetry Snapshots	Inventory	Events Jobs	Device Access	Groups Links Config
10 v	Total Memory	CPU Cores	CPU Architec	cture Operating System NIC Driver
Filter V	Filter	∇ Filter	V Filter	∇ Filter ∇ Filter ∇
3.10.0-957.12	2.80 GB	4	x86_64	CentOS Linux N/A
				1 to 1 of 1 I < < Page 1 of 1 > >I

Ports Tab

Provides details on each port of the device.

Device Information (172.20.203.6)			3.1	0.0-957.12.2.el7.x86_64 🕑
General Port	s Inventory nots	Events Jobs	Device Access	Groups Links	Config
10 • Name ↑	Protocol	Active Speed	MTU	Operational Sta	te Admin State
Filter V	Filter V	Filter	V Filter	∇ Filter	♡ Filter ♡
ens3	Ethernet	1 Gbps	1500	UP	Enabled
ens9	Ethernet	56 Gbps	1500	UP	Enabled
				1 to 2 of 2	< Page 1 of 1 > >

A right click on one port or more will enable performing live/history monitoring and provisioning on those ports. For information on these actions, refer to <u>"Ports Actions"</u>.

Inventory Tab

Provides details on switch parts, such as FAN and CPU.

Device Information	(172.20.203.53)					3.7.1134
General Por Telemetry Snaps	ts Inventory hots VLAN	Events Jobs Link Aggregation	Device Acce Cables D	ss Groups Jocker Containers	Links	Config
10 •						
Name 1 个	S/N 2 1	P/N 3 ↑	Model	Vendor	State	Health
Filter V	Filter V	Filter V	Filter V	Filter V	Filter	ア Filter ア
CHASSIS	MT1936T0	MSN2100	MSN2100	Mellanox	0	0
F1	N/A	N/A	FAN	Mellanox	0	0
F1	N/A	N/A	FAN	Mellanox	0	0
F1	N/A	N/A	FAN	Mellanox	0	0
F1	N/A	N/A	FAN	Mellanox	0	0
MGMT	MT1936T0	MSN2100	MGMT	Mellanox	0	0
PS1	N/A	N/A	PS	Mellanox	0	0
PS2	N/A	N/A	PS	Mellanox	0	0
				1 to	8 of 8 🛛 🖂	< Page 1 of 1 > >

For Linux hosts on which NEO-Host is installed, a table with information about the Mellanox adapter cards will be displayed:

ID	Model	S/N	P/N	PSID	FW Version	Orig. Base MAC	State	Health
0000:82:00.0	ConnectX4	N/A	MCX456A- ECA_Ax	MT_2190110032		e4:1d:2d:5c:eb:68	ОК	OK
0000:08:00.0	ConnectX5	N/A	MCX556A- EDA_Ax	MT_000000009		24:8a:07:9c:13:8e	OK	OK

Events Tab

Lists specific switch related events.

Device Informa	ation (172.20.203.51)				3.8.2004
General Telemetry S	Ports Inventory E inapshots VLAN Li	Events Jobs D nk Aggregation Cal	evice Access Grou bles	ups Links Cor	nfig
10 • Severity	Timestamp ↓	Source	Name	Description	Reason
Filter, V	mm/dd/yyyy	Filter V	Filter V	Filter V	Filter V
0	2020-03-03 15:53:25	task.10	Task Snapshot	Task Snapshot	Task 'show cloc
0	2020-03-03 15:44:55	System Job	Job Failed	Job failed	Job for 'Device
0	2020-03-03 12:09:48	Eth1/9	Port State Event	Port Status Down	Port Status Down
0	2020-03-03 11:39:48	Eth1/9	Port State Event	Port Status Up	Port Status Up
0	2020-03-03 09:14:28	User Job	Job Completed	Job completed	Job for 'Setting
0	2020-03-03 06:59:11	Task Execution	Job Completed	Job completed	Job for 'Provisi
0	2020-03-02 15:55:59	Telemetry Keep	Telemetry Agen	Telemetry Agen	Agent communi
0	2020-03-02 15:55:34	IP Discovery	Device Added	Device added	A new device o
				1 to 8 of 8	Page 1 of 1 \rightarrow \rightarrow

Jobs Tab

Lists switch jobs and their status.

Device Information (172.2	20.203.51)				3.8.2004
General Ports Telemetry Snapshots	Inventory Events VLAN Link Agg	Jobs De regation Cabl	vice Access Groups es	Links	Config
Description	Created \downarrow	Status	Summary	Prog	ress
Filter V	mm/dd/yyyy	Filter	∇		
Creating Network	2020-03-03 12:2	Completed	View Summary		
Creating Network	2020-03-03 12:2	Completed	View Summary		
Creating Network	2020-03-03 12:2	Completed	View Summary		
Creating Network	2020-03-03 12:1	Completed	View Summary		
Setting SNMP Au	2020-03-03 09:1	Completed	View Summary		
Provisioning	2020-03-03 06:5	Completed	View Summary		
			1 t	o 6 of 6	< Page 1 of 1 > >

Device Access Tab

Displays access credentials for the specific device in the applicable protocols - HTTP, SSH, SNMP, SNMP v3.

Device Informa	tion (172.2	20.203.51)							3.8.2004
General Telemetry Sr	Ports napshots	Inventory VLAN	Events Link Aggre	Jobs gation	Device Access Cables	Groups	Links	Config	
O HTTP									>
SSH									>
O SNMP									>
SNMP v	3								>

Groups Tab

Lists the groups of which the specific device is a member.

Device Information (172.20.203.51)		3.8.2004
General Ports Inventory Telemetry Snapshots VLAN	Events Jobs Device Access Groups L Link Aggregation Cables Docker Containers	inks Config Sessions
10 V Name	Description	Credentials
Filter	Filter	
test		0
Telemetry-Active	Mellanox Spectrum Switches With Tel	emetry Co O
Mellanox-Spectrum-Switches	Mellanox Spectrum Switches Group	0
Telemetry-Enabled	Mellanox Spectrum Switches With Tel	emetry Ima O
Mellanox-Switches	Mellanox Switches Group	0
Telemetry-Supported	Mellanox Spectrum Switches With Do	cker Capa O
	1 to 6 of	f6 K C Page 1 of 1 D D

Links Tab

Details the active links of the specific device. The "Peer Name" and "Peer IP" columns specify the management peer and name, and the "Peer Port" column refers to the port to which the interface is connected. If the "Peer Port" is "Unknown", the interface is up, but no ETH discovery (LLDP) connection information is available.

Device Information (172.)	20.203.51)			3.8.2004
General Ports Telemetry Snapshots	Inventory VLAN	Events Jobs Link Aggregation	Device Access Groups Cables Docker Containers	Links Config s Sessions
Port ↑	Pe	er System Name	Peer System IP	Peer Port
Filter	▼ F	lter	Filter	Filter V
Eth1/1	lat	54	172.20.203.4	ens10
Eth1/13	SW	vitch-c7ff58	172.20.203.54	Eth1/1
Eth1/14	SW	/itch-c7fe70	172.20.203.53	Eth1/14
Eth1/15	SW	/itch-058d0c	172.20.203.50	Eth1/15
Eth1/16	SW	/itch-058d0c	172.20.203.50	Eth1/16
			1 tr	o 5 of 5 IC C Page 1 of 1 > >I

Config Tab

Enables users to perform the following:

- Take snapshots of running configuration files of a specific system in NEO. Configuration files provide general information about hosts.
- Manage existing snapshots and device specific configuration files.

Configuration Management can be accessed from two main windows in NEO; this Config tab, and the Configuration Management window from the left pane. For information on the latter window, please refer to <u>"Configuration Management"</u>.

In the Config tab under Devices, there are multiple buttons with different functionalities and purposes, explained in the tables below.

evice Information (10.2	09.24.5)							
General Ports Telemetry Snapshots	Inventory VLAN	Events Link Aggre	Jobs gation	Device Cables	Access Dock	Gro er Cont	oups tainers	Links
View Compare								
Selected Config:	2020-0)3-02 01:59:	11 👻	± 1	. 2	ď	Ø	
- Variables								
ΜΤυ	MTU	J Value					D	
Interface Type	Inter	face Type					Ŵ	
Interface Name	Inter	face name					Đ	
net add < <interface_t [\$? -eq 0] exit \$?; # net commit [\$? -eq 0] { rc=\$?;n sudo ifdown <<interface_< td=""><td>ype>> <<inte exit for none- et abort;exit \$ ce_name>> _name>></inte </td><td>rface_name: zero return c rc;}; # exit for</td><td>>> mtu <n ode • none-zer</n </td><td>1TU> o return cod</td><td>de</td><td></td><td></td><td></td></interface_<></interface_t 	ype>> < <inte exit for none- et abort;exit \$ ce_name>> _name>></inte 	rface_name: zero return c rc;}; # exit for	>> mtu <n ode • none-zer</n 	1TU> o return cod	de			

Config Tab Components

Icon	Name	Description
₽	Compare Config Data	Allows comparing two configuration files or snapshots and tracks the changes between them (added information will be colored in green, and removed information will be colored in red and crossed out). See related Figure 4 below.
Ē	Show Config Data	Displays configuration files content. See related Figures 3 and 4 below.
*	Download	Downloads the chosen configuration file or snapshot to the user's computer.
1	Upload	Uploads a device specific configuration file to NEO's repository. Note that snapshots cannot be uploaded.
	Fetch Config Data	Fetches information about the selected system's running configuration file. This icon is used for the first information retrieval request, and will be replaced with the next icon below.

lcon	Name	Description
đ	Refresh Config Data	Retrieves the content of the current running configuration on the system. If the content retrieved is different from the latest snapshot for that system, it will create a new snapshot. Otherwise, it will only update the "Last Verified" date to the time when the last snapshot was taken. These snapshots are also taken by NEO as it refreshes the configuration files of all devices every 24 hours. By default, NEO saves up to 7 snapshots for each device. Note: Hosts do not have running configuration files like switches. Therefore, "refreshing" a host will return general information about it.
C	Apply Config	[Applicable to Mellanox and Cumulus Switches only] Applies the chosen configuration file or snapshot on the switch. The apply operation replaces the current running configuration. The operation might take a few minutes.
Ø	Edit Config	Enables editing an existing configuration file of a specific system in NEO, and saving it for future use. The new configuration file can be saved as a new file using the "Save Config As" icon, or can overwrite the existing one, using the "Save Config" icon.
Ŵ	Delete	Removes selected configuration files. This icon is only available for device specific configuration files (edited snapshots).

Related Figures:

Figure 1- Selected Config Drop Down Menu	Figure 2 - Configuration File Variables				
Test1 -	- Variables				
☐ Test1	МТU	MTU Value	Û		
2017-06-04 14:07:33	Interface Type	Interface Type	Ê		
© config-10.224.14.238-2017-01-2319_04_04	Interface Name	Interface name	۱.		
The Config drop down menu displays a log archive menu of all device specific configuration files (, snapshots (), snapshots () of the chosen device, and global configuration files (In order to apply t drop-down menu, previously defined	the configuration file selected fro values should be provided for th d variables (if applicable).	om the e		
Figure 3 - Configuration Content Example	Figure 4	- Compare Config Data Outpu	t		

Last Verified : 2016-09-27 21:01:00	Device Information (172.20.203.53) 3.7.1134
## Running database "initial" ## Generated at 2016/09/27 23:59:04 +0300 ## Hostname: switch-ec4034 ## ## ## ## ##	General Ports Inventory Events Jobs Device Access Groups Links Config Telemetry Snapshots VLAN Link Aggregation Cables Docker Containers
<pre>womming terms temporary prick mode fitting in oil default prefix-modes enable items install anything if items install anything if interface thermet 1/30 module-type offo-split.4 force interface ethermet 1/30 module-type offo-split.4 force interface ethermet 1/30 flowcontrol receive on force interface ethermet 1/30 description was-connection interface ethermet 1/36 description was-connection inter</pre>	Selected Config: 2020-03-03 06:59:11 • Compare With: Global_config • show running-config ## ## Running database "initial" ## Generated at 20 81/04/14 20105132 20/02/21 04:59:12 +0000 ## Hostname: switch-c2462009800c ## Hostname: switch-c2462009800c ## ## Running-config temporary prefix mode setting ## ## Chassis configuration ##
Figure	5 - Last Verified
Last Verified : 2016-09-28 11:57:38	
The "Last Verified" marks the last time the snapsh device. The snapshot can be updated by clicking the snapshot can be updated	ot was known to be the current configuration on the he "refresh" button, or when an auto-refresh takes place.

A Snapshots cannot be deleted, but when removing a system, all its snapshots, including the edited snapshots (device specific configuration files) will be permanently removed as well.

VLAN Tab

Lists all VLANs of which a certain device is a member.

Device Information (10.0.	0.25)	X86_64 3.8.1989-24 2019-09-11
General Ports Telemetry Snapshots	Inventory Events Jobs VLAN Link Aggregation	Device Access Groups Links Config Cables Docker Containers Sessions
10 v	Name	Ports
Filter	Filter	ア Filter ア
1	default	
		1 to 1 of 1 🔣 🤇 Page 1 of 1 🗦 🔿

Link Aggregation Tab

The top table lists all LAG information of the selected device. The bottom table lists MLAG ports for the selected device and their corresponding ports in the peer device.

General	Ports	Inventory	Events	Jobs	Device A	ccess	Groups	Links	Config	
Telemetry	Snapshots	VLAN	Link Aggre	gation	Cables	Docke	r Containers			
Port Char	nnel									
Port Chann	el ↑	Members	Admin S	tate	Operationa	l State	Switchp	ort Mode	MTU	Access VLAN
Filter	7	Filter V	Filter	7	Filter	7	Filter	v	Fil V	
			No	Port Char	nnel info foun	d for this (levice			
4										Þ
							0 t	o 0 of 0	IC C Page	0 of 0 > >1
MLAG Po	ort Chani	nel								

Local						Peer				
MLAG Port ↑	Members	MTU	Operational Stat	e Admir	n State	Members		мти	Ор	eratior
Filter V	Filter V	Fil 🔽	Filter	♥	▼		7	v		
		No ML	LAG Port Channel in	fo found for this	s device					
•										÷
					0	to 0 of 0		Page 0 o	f0 ⊃	

Cables Tab

Lists the cables connected to a Mellanox/Cumulus switch of communication status "OK", and provides the following information about each cable: the port to which it is connected, its serial number, cable type, part number, revision, length, and speed.

Device Information	(172.20.203.51)					3.8.2004
General Por Telemetry Snaps	ts Inventory hots VLAN	Events Jobs Link Aggregation	Device Access Cables Do	s Groups ocker Containers	Links Session	Config s
10 ▼ Port ↑	Serial Number	Cable Type	Part Number	Revision	Length	Speed
Filter V Eth1/1	Filter ♥ MT1904VS	Filter ♥ Passive co	Filter V	Filter V	Filter	∇ Filter ∇ 100GBASE
Eth1/9	MT1135VS	Passive co	MC220713	A2	2m	56Gbps
Eth1/13 Eth1/14	MT1152VS MT1150VS	Passive co Passive co	MC220713 MC220713	A2 A2	1m 1m	56Gbps 56Gbps
Eth1/15	MT1352VS	Passive co	MC220713	A3	1m	56Gbps
Eth1/16	MT1352VS	Passive co	MC220713	A3	1m	56Gbps
				1 to	6 of 6 🛛 🖂	< Page 1 of 1 > >

Virtual Machines Tab

This tab is available only for Linux KVM/Nutanix/ESXi hypervisors. When clicking a hypervisor machine, a list of all VMs that run on that machine will appear, and the following VM information will be provided: the VM name, its state, the image the VM runs, the number of cores the VM has, and the VM memory size.

Device Information (172.2	20.203.2)			3.10.0-957.el7.x86_64
General Ports Telemetry Snapshots	Inventory Events Virtual Machines	Jobs Device Acces Virtual Switches Virtu	ss Groups Li al Networking	inks Config
10 ▼ Name ↓	State	Image	Cores	Memory
Filter ∇	Filter V	Filter Var/lib/libvirt/imag	Filter	7 GB
cumulus-30	Down	/var/lib/libvirt/imag	4	1 GB
172.20.203.6	Up	/var/lib/libvirt/imag	4	3.0234375 GB
172.20.203.5	Up	/var/lib/libvirt/imag	4	4 GB
172.20.203.4	Up	/var/lib/libvirt/imag	4	3.0234375 GB
172.20.203.3	Up	/var/lib/libvirt/imag	4	4 GB
172.20.203.13	Up	/var/lib/libvirt/imag	4	4 GB
172.20.203.12	Up	/var/lib/libvirt/imag	4	4 GB
			1 to 8 of 8	< < Page 1 of 1 → →

When clicking a VM, a list of its virtual interfaces will be displayed with information about its name, type (Normal/SR-IOV), physical ports and VLAN ID.

					c	Device Information (172.20	.203.2)			3.10.0-957.el7.xl
LI	v 10 v					General Ports	Inventory Events	Jobs Device Access	Groups Links	Config
lame	IP ↑	System Type	Status	MAC		Telemetry Snapshots	Virtual Machines Vi	rtual Switches Virtual N	letworking	
Filter 🗸	Filter	Filter V	Filter 🗸	Filter	∇	10 •				
localhost	172.20.203.2	IBM System	0	N/A		Name 4	State	Image	Cores	Memory
localhost.l	172.20.203.3	Red Hat KVM	0	00:02:C9:E9:C1:C2		Filter	Filter	Filter	Filter	Filter
lab4	172.20.203.4	Red Hat KVM	0	EC:0D:9A:7D:7D:D3		vm2-clone1	Down	/var/lib/libvirt/image	4	4 GB
lab6	172.20.203.6	Red Hat KVM	•	E4:1D:2D:61:F5:D3		cumulus 20	Bown	/var/lib/libuirt/imago	4	1 GB
switch-058	172.20.203.50	📇 MSN2100	0	B8:59:9F:62:3D:00		473 20 202 6	Down	Avanib/ib/iib/iir/image	+	2 4024275 CP
switch-9f2	172.20.203.51	💒 MSN2100	014	98:03:9B:FC:36:80		172.20.203.6	Up	/var/lib/lib/lib/linage	4	3.0234575 GB
switch-c7f	172.20.203.53	📇 MSN2100	•	B8:59:9F:7A:A1:40		172.20.203.5	Up	/var/lib/libvirt/image	4	4 GB
switch-c7ff58	2 172.20.203.54	KSN2100	0	B8:59:9F:7A:75:C0		172.20.203.4	Up	/var/lib/libvirt/image	4	3.0234375 GB
		_	1 to 8 c	f8 C Page 1 of 1 C		172.20.203.3	Up	/var/lib/libvirt/image	4	4 GB
						172.20.203.13	Up	/var/lib/libvirt/image	4	4 GB
						172.20.203.12	Up	/var/lib/libvirt/image	4	4 GB

Virtual Interfaces			
10 *			Filter
Name	Туре	Physical Interface	VLANs
vnet13	Normal	enp1s0	
Showing 1 to 1 of 1 entries			(K) 2

Virtual Switches Tab

This tab is available only for Linux KVM/ESXi hypervisors. When clicking on a hypervisor machine, a list of all Virtual Switches that run on that machine will appear, and the following Virtual Switches information will be provided: the virtual switch name, VLAN ID and physical interface.

evice Information (17)	2.20.203.2)	3.10.0-957.el7.x86
General Ports Telemetry Snapshots	Inventory Events Jot s Virtual Machines Virtua	es Device Access Groups Links Config Switches Virtual Networking
Name	VLANs	Physical Interface
Filter	V Filter	V Filter
or0	NA	eno3

Virtual Networking Tab

This tab is available only for Linux KVM/Nutanix/ESXi hypervisors. When clicking on a hypervisor machine, a simplified host visualization network map will appear, and the following visualization information will be provided:

• The virtual machines in the selected hypervisor

- The physical ports that are connected to these VMs through virtual interfaces. These ports are blue colored, and when clicking them, you will be redirected to the Ports page, where port information will be provided in a table
- The switch ports that are connected to the physical ports available only for Linux KVM hosts



Docker Containers Tab

Enables the user to manage, deploy, remove, start and stop the docker images and instances, and to discover current images and instances. This tab is available only for Spectrum Mellanox switch systems that possess docker capability, using Onyx OS or Cumulus OS (for the OS versions, please refer to the latest Release Notes document).

• When clicking on this tab, a table that contains the docker instances is displayed. The table includes the following attributes: Instance Name, Image Name, Version and Uptime, as well as multiple buttons for multiple functionalities, as described in the following table.

lcon	Name	Description
+	Create Instance	Starts a new instance from a loaded docker image.

	Stop Instance	Stops a running instance from the switch.
Images	Images	 Shows a list of loaded images with the following attributes: Image Name, version, creation date Adds a button that allows to load a new docker image. A right click on an image record offers the capability to remove the image.

When clicking on the "Image" button, a list of loaded images is displayed.

Images			×
10 • Add		Filter	
Image Name	Version	Creation Date	9
telemetry-agent	2.6.0-5	3 weeks ago	
Showing 1 to 1 of 1 entries			< >

When clicking on the "Add" button, a new popup will allow to load a new docker image.

Profiles	H R C ×	
No Profile Selected		
Description		
Action Description		
Protocol		
SCP	¥	
Server		
Hostname or IP Address		
Path		
Absolute path		
Container Image		
Image File		
Username		
Username		
Password		
Password		

Sessions Tab

Lists all telemetry related sessions of the selected device, including default telemetry sessions (highlighted in orange) and user defined telemetry session (shown in gray).

Device Information (172	.20.203.51)				3.8.2004
General Ports Telemetry Snapshots	Inventory VLAN L	Events Jobs .ink Aggregation	Device Access Grou Cables Docker Contai	ps Links Cor iners <mark>Sessions</mark>	ifig
Name ↓	Collectors	Profile	Interval	Status	State
WJH	NEO DB	Default	5	1	O
Interface Co	🖋 NEO DB	Default	5	0	0
Buffer Events	NEO GRPC	Coll∉ Default	5	0	0
				1 to 3 of 3	Page 1 of 1 $>$ $>$

Possible Device Actions

Right clicking on a device will show the actions that can be done on it, depending on the device type and capabilities:

Acknowledge

Acknowledges all events related to the selected device(s). This action will gray out the selected device events.

Reboot

Reboots the device. When choosing "Reboot", a dialog box appears, requiring the users to confirm their choice or create a reboot task.

Confirmation	×
Are you sure you want to reboot ?	
	No Yes Create Task

When reboot is started, the device's status will turn into "Rebooting", and an event named "Reboot Started" will be created. If the operation is completed successfully, a "Reboot Completed" event will be created. If the operation fails, a "Reboot Failed" event will be created.

Onyx Software Upgrade

Enables the user to upgrade the device's software. When choosing "Onyx Software Upgrade", a dialog box appears, requiring the users to fill in the relevant details in order to perform the upgrade.

O	NYX Software Upgrade	×
۲	Image Management	
	Add Delete	
•	Profile	
	Close Create Task Subm	it

- "Create Task" directs the user to the Tasks page
- "Submit" directs the user to the Jobs page and starts the upgrade process immediately

After the Onyx Software Upgrade is completed successfully, the device's status will turn into "Pending Reboot", meaning that SW upgrade will only take place after rebooting the device.

Load Docker Image

Enables the user to load new docker image on the device's. When choosing "Docker Container", a dialog box appears, requiring the users to fill in the relevant details in order to load a docker image.

10 🗸	ALL							I
IP	Name	Profiles	P	I Pl	C	×		VL
		No Profile Selected						
10.10.10.10		Description						l.
		Action Description						ne
10.10.10.11		Protocol						
10 10 10 10		SCP				~		ontric
10.10.10.12		Server						
	r-ufm-sw76	Hostname or IP Address						
		Path						
10.209.36.143	NTNX-0c3/a8dt	Absolute path						
10 209 37 44	NTNX-e0a67448	Container Image						
		Image File						
10.209.39.207	NTNX-c696726f	Username						
		Username						
10.215.52.1		Password						
		Password						

• "Submit" directs the user to the Jobs page, and starts the loading process immediately.

Compare Configuration

This enables users to compare the configuration of several switch systems through Mellanox NEO.

1. Mark at least two systems.

2. Right-click the selected systems and click Compare Configuration. Devices

Add				
All	10 •			
Name	IP ↑	System Type	Status	MAC
Filter V	Filter V	Filter V	Filter	Filter
localhost	172.20.203.2	IBM System x365…	0	N/A
🔲 lab5	172.20.203.5	🔜 Red Hat KVM	0	N/A
Iocalhost.localdo	172.20.203.12	🔜 Red Hat KVM	0	N/A
Iocalhost.localdo	172.2(<mark>.2</mark>			N/A
localhost	172.20.2		0	N/A
switch-058d0c	☑ 172.20.2	tall	0	B8:59:9F:62:3D:00
switch-9f2c62	C Re	boot	0	98:03:9B:FC:36:80
	Ē Re	emove	1 to 7 of 7	<pre>Page 1 of 1 > ></pre>
	🖉 Ac	knowledge		
	j弡i Ad	d To Group		
	Ad	d To Site		

It is also possible to do this from the Network Map screen. Network Map



- 3. Select a master system.
- 4. Select a system to compare the master with.

5. The differences in configuration are displayed in color.

Compare Configu	ration				Show devices by: IP	¥ ×
Master 172.20.203.1	3 🔻	Compare With	172.20.203.5 172.20.203.13 172.20.203.5	v		
Linux version 3.10 # dmidecode 3.1 Getting SMBIOS dat SMBIOS 2.8 present	.0-957. <mark>21</mark> a from sy:	. <mark>312.2</mark> .el7.x86_64	172.20.203.12	bsys.centos.org)	(gcc version 4.8.5 2015	50623 (Red Hat
Handle 0x0000, DMI BIOS Information Vendor: Se	type 0, : aBIOS	24 bytes				
Version: 1 Release Da Address: 0	.11.0-2.e te: 04/01, xE8000	17 /2014				
Runtime Si ROM Size: Characteri BI	ze: 96 kB 64 kB stics: 05 charact	teristics not su	oported			
Ta BIOS Revis	rgeted com ion: 0.0	ntent distributi	on is supported			
OFED Version: MLNX	_OFED_LINU	JX-4.6-1.0.1.1:				
4						

Provisioning

Provisioning enables the user to perform actions via the CLI player. The actions can be sent to one or more devices. Mellanox NEO provides provisioning templates with common CLI commands. Clicking on "Provisioning" opens a dialog box where the user is required to fill in the desired CLI commands and job description or select a predefined template.

Provisioning			
E Templates			
Insert Command	?	Global Variab	les
Description			
Type sequence of commands here			
	Reset Apply		
Selected Devices			
IP	Name		Profile
172.20.203.50	switch-058d0c		Ethernet
Update Device Information			
Take Running Config Snapshot Configuration Write			
Start Create Task			

• "Templates" will open a dialog with a list of the available provisioning templates.

Typing string into the Filter box (at the top right corner) will filter the list.

The templates table contains two columns: the left column for a template name and the right column for a matching validation template.

Select Template

Template Name 个	Matching Validation Template	
Filter	7 Filter	V
	N/A	
Add-Port-To-LAG	N/A	
Add-VLAN	N/A	
Add-VLAN-To-OSPF-Area	N/A	
Add-VLANs	N/A	
Add-VXLAN	N/A	
Agent-Active-Ports-Update	N/A	
Agent-Interval-Factor-Change	N/A	
Agent-Port-Channel-Discovery	N/A	
Config-Congestion-Control-Method	N/A	

1 to 10 of 113 \square \square Page 1 of 12 \rightarrow \square

Close Lo

Template Type	Icon	Description
Provisioning	No Icon	Applies configuration or commands to the selected devices
Validation	\odot	Checks that a specific configuration still exists on the selected devices

If you wish to edit an existing template, click "Edit command" and edit it as desired.

Provisioning				
Templates				
Edit Command	?	Global Variable	s	
Adding VLAN to switch		VLAN ID	Number of VLAN to create	•
(System Type : minxos_switch) (Profile : Ethernet		VLAN Name	Textual name for the VLAN	۵
Selected Devices				
IP	Name		Profile	
172.20.203.50	switch-058d0c		Ethernet	
Update Device Information Take Running Config Snapshot Configuration Write Start Crosts: Task				

When adding invalid variables, a validation mechanism will notify you in case the variable's value is invalid, and will instruct on the correct options in order to avoid the occurrence of a failed job (see image below). This mechanism also provides description of the variable used. For example:

- VLAN ID number of VLANs to create
- VLAN Name textual name of the VLAN

Collapse Command ?	Global Va	ariables	
Adding VLAN to switch	VLAN ID	Insert value	Ê
<pre>cli session prefix-modes enable vlan <vlan_id> exit vlan <vlan_id> name "<vlan_name>"</vlan_name></vlan_id></vlan_id></pre>	VLAN Name	Insert value	Î
Reset Apply System Type : minxos_switch Profile : Ethernet			

- "Create Task" directs the user to the Tasks page.
- "Start" directs the user to the Jobs page and starts the provisioning process immediately.

The three boxes on the bottom-left corner can be checked when loading a template that involves changes in the system configuration or when creating/editing a template.

- Update Device Information
- Take Running Config Snapshot
- Configuration Write
 - Update Device Information This box is checked by default. When checked, it refreshes NEO's device information after the provisioning execution. Otherwise, the devices are refreshed every 15 minutes by the Device Manager. The refresh operation might take up to one minute.
 - Take Running Config Snapshot When checked, a snapshot of each device's configuration will be taken before the provisioning execution.

• Configuration Write - This checkbox is enabled only when applying pre-defined templates. When checked, it sends the 'configuration write' command after the provisioning execution. This command makes all changes persistent, which means that they will still be valid after switch reboot.

For further information on the provisioning of devices, please refer to <u>"Providers"</u>.

Connectivity Check

Connectivity Check allows the user to verify their device's connectivity across multiple communication protocols (i.e. ICMP, SSH, HTTP, and SNMP).

		Ø	Device
All 🗸 10	~		Gene
Name IP ↑	System Type Sta	🖋 Provisioning	Grou
Filter V Filter V	Filter V F	< Connectivity Check	50
■ N/A C ⁷ 10.209.3	📇 Mellan 🔞	🛓 Install	
		LIII Telemetry Agent	• Na
		C Reboot	Filt
		💼 Remove	
	1 to 1 of 1	🛱 Acknowledge	
		🚠 Go To Map	
		🖿 History Monitoring	•
		📶 Live Buffers Utilizatio	n
		🔄 Add To Group	•
		📕 Add To Site	•
		🛓 Generate Dump	

Clicking "Connectivity Check" opens up a window showing the connectivity status of your device over the supported protocols.

-							onnectivity Check
SNMP	HTT	SSH	ICMP		System Type	IP ↑	Name
				7	Filter	♥ Filter ♥	Filter
۲	0	•	0		📥 MSN2700	☑ 10.0.0.1266	witch40
Chec							

Hovering over the status icons provides a description of the status indicated by that icon.

This can also be done from the Network Map view and the Managed Elements > Groups window.



Install

Mellanox Driver

Allows users to perform MLNX_OFED/MLNX_EN driver installation or upgrade on hosts. Follow the steps below to perform a driver install/upgrade.

1. Right-click one or more hosts, and choose "Install" \rightarrow "MLNX-OFED"

Name	IP ↑	System Type	Status	MAC	
Filter V	Filter	Filter V	Filter. 🗸	Filter) 🛛
localhost	172.20.203.2	IBM System x	0	N/A	
localhost.l	172.20.203.3	■ Red Hat KVM	0	00:02:C9:E9:C1:C2	
🔳 lab4	172.20.203.4	Red Hat KVM	0	EC:0D:9A:7D:7D:D3	
lab6	172.20.203.6	Provisioning	•	E4:1D:2D:61:F5:D3	
switch-05	172.20.203.50	L Install ►	MLNX-OFE	D 52:3D:00	
switch-9f2	172.20.203.51	C Reboot	NEO-Host	C:36:80	
switch-c7f	172.20.203.53		0	B8:59:9F:7A:A1:40	
switch-c7f	172.20.203.54	Acknowledge	•	B8:59:9F:7A:75:C0	
		Add To Group Add To Site	1 to 8 of	8 🛛 🤇 🤇 Page 1 of 1 🔿	

- 2. Fill out the required data. There are two ways to do so:
 - a. Choose a pre-defined profile, in which case all data will automatically be filled out. If a profile is selected, it can be edited in the same dialog window. Choosing one of these

icons will enable saving the changes and overwriting the profile selected, saving and creating a new profile, or reloading and reverting to the initial data. For more information on the profiles, see <u>"Image Profiles Settings"</u>.

b. Skip "Profiles" and manually fill in the required fields. If no profile is selected, provide description, then choose the desired protocol in the dialog window:

Driver Install

Profiles		 Ŭ	
No Profile Selected			
Description			
Action Description			
Protocol			
Shared Folder			
Shared Folder			
SFTP			
Absolute path			
Image			
Image File			

i. For the Shared Folder protocol - provide the path and image name. The image should be located in a shared folder that can be accessed by the hosts.

Driver Install	×
Profiles	
No Profile Selected	
Description	
Action Description	
Protocol	
Shared Folder	Ŧ
Path	
Absolute path	
Image	
Image File	
Close	e Create Task Submit

 ii. For the SFTP server protocol - provide the credentials, path and image name. The image should be located in an SFTP server that can be accessed by the NEO machine.

Profiles	H H C ×	
No Profile Selected		
Description		
Action Description		
Protocol		
SFTP	•	
Server		
Hostname or IP Address		
Path		
Absolute path		
Image		
Image File		
Username		
Username		
Password		
Password		

iii. Clicking "Create Task" will generate a driver install task that can be executed at any time. Clicking "Submit" will perform an immediate driver installation. Note that the procedure might last for several minutes.

In order to view the current driver version of the hosts, choose the host or any of the hosts for which you installed the driver under "Devices", and refresh the Config tab. You will be able to see the driver version as part of the configuration content.

VICW	Compare						
Selected Config:		2019-05-02 16:24:59 💌	*	<u>1</u>	C	C	Ø
last Vorifi	ed · 2019.05.0	2 16:25:00					

st Verified : 2019-05-02 16:25:00

5.5 //20 kb hoppy services are supported (int 15h)
3.5"/2.88 MB floppy services are supported (int 13h)
Print screen service is supported (int 5h)
8042 keyboard services are supported (int 9h)
Serial services are supported (int 14h)
Printer services are supported (int 17h)
ACPI is supported
USB legacy is supported
BIOS boot specification is supported
Function key-initiated network boot is supported
Targeted content distribution is supported
UEFI is supported
BIOS Revision: 3.10
Invalid entry length (16). Fixed up to 11.
OFED Version: MLNX_OFED_LINUX-4.4-2.0.7.0:

NEO Host

Allows users to install/uninstall NEO-Host on a Linux machine.

Follow the steps below to perform a NEO-Host install/uninstall/upgrade.

1. Right-click one or more hosts, and choose "Install--> NEO Host --> Install/Upgrade/Uninstall".

All • 10 •							General Ports Inventory Events Jobs Device Access Group
Name	IP ↑	System Type	Status	MAC			Telemetry Snapshots
Filter V	Filter 🗸	Filter V	Filte 🗸	Filter	V		View Compare
r-neo-sw33	10.209.24.3	📥 MSN2700	0	98:03:9B:FA:58:4	0		
r-roce-sw05	10.209.24.5	🚢 MSN2740	0	EC:0D:9A:50:4E:	40		Selected Config: running_config 🗸 📩 🕨 🗭 🐼
r-neo-sw38	2 10.209.24.38	📥 MSN2100	🔿 🕛	24:8A:07:F5:48:0	0		
N/A	2 10.209.24.46	📥 Mellanox S	0	N/A			show running-config
r-neo-sw55	2 10.209.24.55	📥 MSN2010	0	98:03:9B:FC:78:8	30		##
r-hpc-sw23	2 10.209.24.61	📥 MSN2700	0	98:03:9B:FA:58:0	0		## Running database "9d33de5c-c3a9-4d6b-a529-ecd8d34e88ed" ## Concepted at 2020/03/04_09/25/44_r0000
r-neo-sw27	2 10.209.24.102	📥 MSN2010	0	98:03:9B:F1:AF:8	30		## Hostname: r-neo-sw10
III N/A	10.209.24.112	🔜 Linux Host	0	98:03:9B:FC:36	✤ Provisioning		## Product release: 3.9.0230-71
spine	2 10.209.24.135	📥 Mellanox S	0	B8:59:9F:A6:59	C Reboot		##
r-roce-sw07	2 10.209.24.147	🚢 MSN2100	🗢 🖬	7C:FE:90:FA:D	🛓 Install	Þ	MLNX-OFED orary prefix mode setting
			1 to 10 of 14	4 K Page	Remove		NEO-Host NEO-Host Install
					Acknowledge		## Uninstall
					📥 Go To Map		## Interface Split configuration
					🔄 Add To Group	•	##

2. Confirm the install/upgrade/uninstall by clicking "Ok".

Are you sure want to install NE	st on System 10.224.40.70 ?	×
	Cance	el OK
A job will be created: Jobs		Show devices by: Name
10 •		
ID Description Creat Filter ▽ Filter ▽ Filter	Last Update Status Summary ♥ Filter ♥ Filter ♥	y Progress

2020-03-05 11:31:23

2020-03-05 11:29:20

NEO Telemetry Agent

57

56

NEO-Host Install

Removing systems

Allows users to install NEO Telemetry Agent on switches that supports Docker capability.

2020-03-05 11:31:23

2020-03-05 11:29:20

₽ Before deploying the Telemetry Agent on a Cumulus switch, make sure to install docker on the switch and that it is running.

A The switch's clock must be synchronized with NEO's clock. A lack of synchronization may prevent certain telemetry features from working properly.

To perform a NEO Telemetry Agent installation, right-click one or more switches and navigate to "NEO Telemetry Agent \rightarrow Install".

Devices + Add

				C	Device Information (172.20.203.51) 3.8.1986-47_M
All	• 10 •				General Ports Inventory Events Jobs Device Access Groups
Name ↓	IP	System Type	Status	MAC	Docker Containers
Filter V	Filter V	Filter V	Filter	V Filter V	
🔳 switch-9f	🖸 172.20.203.51	🖀 MSN2100	0	00/02/08/50/26	Memory
switch-05	2 172.20.203.50	📥 MSN2100	🗢 🕛 🔝	Provisioning	
localhost	172.20.203.13	🗮 Red Hat K…	•	M NEO Telemetry Agent)	
localhost	172.20.203.12	🔳 Red Hat K…	•	C Reboot	
localhost	172.20.203.20	HP ProLia…	•	Remove	CPU1 CPU2 CPU3 CPU4
localhost	172.20.203.2	🖼 IBM Syste…	•	🖉 Acknowledge	
lab5	172.20.203.5	🔳 Red Hat K…	0	📥 Go To Map	
		1	to 7 of 7	🖿 History Monitoring	
				Live Monitoring	
				🚟 Create MLAG with 🛛 🕨	Last Update: Sun 16 Feb 2020 10:31:08
				🔁 Add To Group	>
				🛓 Generate Dump	

00

Load Telemetry Agent & Start Telemetry Agent	- *
Overall	
Current Process: Load Telemetry Agent	
Status: Running	
Status: Running	

The agent will be installed on the switch, and the session will be started.

For further information, please refer to <u>"Activating Switch Telemetry Using the NEO Telemetry Agent"</u>.

History Monitoring

Provides a report of the device attributes values history. For further information on the history monitoring of devices, please refer to <u>"Providers"</u>.

Live Monitoring

Provides a live report of the device attributes values.

Create MLAG

Allows users to configure an MLAG with devices that have at least two links to this device. This action is applicable for Mellanox Ethernet switches only.

Generate Dump

Allows the user to generate a debug dump file for the device and upload it to a remote folder. Available for Onyx switch systems. When choosing "Generate Dump", a dialog box appears, requiring the users to fill in the relevant details in order to perform the dump generation.

Profiles	
No Profile Selected	
Description	
Action Description	
Protocol	
SCP 🔻	
Server	
Hostname or IP Address	
Path	
Absolute path	
Username	
Username	
Password	
Password	

- "Create Task" directs the user to the Tasks page
- "Submit" directs the user to the Jobs page and starts the dump generation and upload process immediately.

Adding Devices

To add a device click the button above the Devices Information list. You can add a device either by manually typing its IP address, or by scanning a range or a subnet of IP addresses.

Discover by IP

Discover By							
IP	Range	Subnet					
Device							
System Typ	е						
Mellanox	ONYX	•					
+ Add	+ Add						
Devices							
IP							
Filter							
Noi	tems were for	und					
Auto Provisi	ioning						
SNMP T	raps						
LLDP							
	Save	Cancel					

+ Add

button to add the device.

- 1. Insert the Device IP address, select its type, and click the Repeat the action for all devices you wish to add.
- 2. Once all devices are added, click Submit.

A window with the devices that have been added will be displayed. Clicking one of the devices will show the system addition status.

Adding systems	
1.2.3.4	Description: Adding systems Output: System has been added.

▲ Each newly added device under this window will automatically appear in the Allowed list under Settings → Discovery, in a grayed-out row.

Discover By Discover By Subnet IP Range Subnet IP Range From Subnet То System Type > . . . Auto Provisioning 3 > System Type > Discovery Method > Auto Provisioning 3 > Tier Assignment () Discovery Method > None ۳ Tier Assignment () None Ŧ Cancel Cancel

Discover by Range/Subnet

Insert the IP range or subnet to scan for devices, and select the device types to discover, and the discovery methods to use.

Discovery method options:

- LLDP when checked, NEO discovers all devices found within the range specified and on which LLDP is enabled
- Multicast when checked, NEO discovers all Mellanox Onyx switches found within the range specified using multicast

You can optionally specify a tier for the devices discovered by the scan. This tier is used to present the network map in a hierarchical structure.
Auto-Provisioning



Whether you added the devices by specifying IP or by scanning, the following provisioning actions are enabled by default on all added devices:

• SNMP - configure the device to listen and respond to SNMP requests (SNMP version 2c)

Supported for Cumulus switches.

• SNMP Traps - configure device to send SNMP traps to NEO. The SNMP trap version (2c/3) is decided by the Onyx global SNMP credentials used.



- LLDP configure device to enable LLDP protocol
 - A Supported for Onyx and Cumulus switches.

Removing Devices

To remove a device, right-click it, and click "Remove". A job will be created automatically.



A NEO removes itself as an SNMP trap listener from Onyx switches when they are removed.

Inventory

Mellanox Inventory page provides a detailed presentation of each device part (such as CPU and FAN), part number, SKU and serial number.

In	iventory								
									ø
	10 🗸								
	Device Name 1 1	Device IP 2 1	Name 3 1	S/N 4 ↑	P/N 5 1	Model	Vendor	State	Health
	Filter V	Filter V	Filter V	Filter V	Filter V	Filter	Filter V	Filter V	Filter V
	CL1-AHV-NTNX-1	10.0.0.123	CHASSIS			NX-W00-1NL3-G5	Nutanix	0	0
	CL1-AHV-NTNX-2	10.0.0.124	CHASSIS			NX-W00-1NL3-G5	Nutanix	0	0
	gen-r-vrt-058.mtr.lab	10.0.0.158	CHASSIS			X9DRFF-i/7(T)+	Supermicro	0	0
	r-cloudx4-03.mtr.labs	10.0.0.138	CHASSIS			X9DRFR	Supermicro	0	•
	switch1	10.0.0.25	CHASSIS	MT1452X00858	MSX1700-BS2F2	MSN2700	Mellanox	0	0
	switch1	10.0.0.25	FANI	MT1505X03441	MSX62-FF	FAN	Mellanox	0	0
	switch1	10.0.0.25	FAN2	MT1505X03443	MSX62-FF	FAN	Mellanox	0	0
	switch1	10.0.0.25	MGMT	MT1452X00858	MSX1700-BS2F2	MGMT	Mellanox	•	•
	switch1	10.0.0.25	PS1	MT1505X03440	MSX64-PF	PS	Mellanox	0	0
	switch1	10.0.0.25	PS2	MT1505X03438	MSX64-PF	PS	Mellanox	0	0
								1 to 10 of 40) I⊂ < Page1of4 > >I

Ports

Ports

50 🗸							
Device Name 1 1	Device IP	Name 2 1	Protocol	Active Speed	MTU	Operational	Admin State
Filter V	Filter V	Filter V	Filter V	Filter V	Filter V	Filter V	Filter V
CL1-AHV-NT	10.0.0.123	bond0	Ethernet	N/A	1500	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br0	Ethernet	N/A	1500	UNKNOWN	Enabled
CL1-AHV-NT	10.0.0.123	br1	Ethernet	N/A	1500	UNKNOWN	Enabled
CL1-AHV-NT	10.0.0.123	br.dmx	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br0.local	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br1.local	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br.microseg	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br.mx	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	br.nf	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	eth0	Ethernet	10 Gbps	1500	UP	Enabled
CL1-AHV-NT	10.0.0.123	eth1	Ethernet	10 Gbps	1500	UP	Enabled
CL1-AHV-NT	10.0.0.123	eth2	Ethernet	1 Gbps	1500	UP	Enabled
CL1-AHV-NT	10.0.0.123	eth3	Ethernet	N/A	1500	DOWN	Enabled
CL1-AHV-NT	10.0.0.123	ovs-system	Ethernet	N/A	1500	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	sviran	Ethernet	N/A	1500	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	sviran.local	Ethernet	N/A	65000	DOWN	Disabled
CL1-AHV-NT	10.0.0.123	tap0	Ethernet	N/A	65000	UP	Enabled
CL1-AHV-NT	10.0.0.123	tapl	Ethernet	N/A	65000	UP	Enabled

C

Ports Information

The Ports page provides the following details on each device port..

Device Port Details

Details	Description
Device	The device name
Name	The port name
Protocol	Shows the port's used protocol. It can be either Ethernet or InfiniBand
Active speed (Mbps)	The actual speed in which the port operates
MTU (Maximum Trans- mission Unit)	The standard MTU is 576, however ISPs often suggest using 1500
Operational State	Up/Down
Admin State	Enabled/ Disabled

Once a port is selected, a window with the available Port Information will be displayed:

- Counters: The user can choose to view the following counters:
- In Octets Rate Received Data Rate in MBps
- Out Octets Rate -Transmit Data Rate in MBps
- In Packet Rate
- Out Packet Rate
- Normalized Bandwidth Percentage of Bandwidth utilization in %



- Errors: The "Errors" tab includes the following counters:
- In Discards
- In Errors
- Out Discards
- Out Errors
- Symbol Errors

Counters	Errors	Cabl	e VLAN	
Link Aggreg	ation			
Errors			Value	
Filter		∇	Filter	7
In Discards	Rate		0	
In Errors Ra	te		0	
Out Discard	s Rate		0	
Out Errors R	Rate		0	
Symbol Erro	or Rate		0	
Last Update: T	hu Mar 5th 2	2020 00	:22:28	

• VLAN: Provides VLAN information of the selected device, if available.

Counters	Errors	Cable	VLAN	
Link Aggreg	ation			
10 🔻				
VLAN ↑		N	lame	
Filter) v (Filter	V
1		d	efault	

1 to 1 of 1 🛛 🕓 Page 1 of 1 之 🖂

• LAG: Provides LAG information of the selected device, if available.

Counters	Errors	Cable	VLAN	
Link Aggreg	ation			
10 •				
LAG Membe	rship 个			
Filter				7
	No	o items were	e found	
	0 t	to 0 of 0	C Page 0 of	0 > >1

• Cable: Provides information about the cable connected to the selected port, if available.

Counters Errors Cabl	e VLAN
Link Aggregation	
10 🔻	
Property ↑	Value
Filter V	Filter V
Cable And Module Type	Passive copper cable
Identifier	QSFP+
Length	2m
Part Number	MCP10PT-E002
Revision	A3
Serial Number	MT1904VS07584
Supported Speeds And T	100GBASE-CR4
Vendor	Mellanox

1 to 8 of 8 □ < < Page 1 of 1 > >□

Ports Actions

A right-click on a port will enable performing the following actions:

1. History/Live Monitoring:

Ports

evice Name 1 ↑	Device IP	Name 2	↑ Protocol	Active Speed	MTU	Operational	Admin State
Filter 🗸 🗸	Filter V	Filter	∇ Filter ∇	Filter V	Filter V	Filter V	Filter
lab4	172.20.203.4	ens9	Ethernet	N/A	N/A	UP	Enabled
lab4	172.20.203.4	ens10	Ethernet	N/A	N/A	UP	Enabled
switch-058d0c	172 20 203	Fth1/1	Fthernet	56 Gbps	1500	UP	Enabled
switch-058d0c	Monitoring		📥 History	56 Gbps	1500	UP	Enabled
switch-058d0c	🖋 Provisionii	ng 🕨	🛃 Live	56 Gbps	1500	UP	Enabled
switch-058d0c	현 Add To Gr	oup 🕨	Ethernet	N/A	1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/5	Ethernet	N/A	1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/6	Ethernet	N/A	1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/7	Ethernet	100 Gbps	1500	UP	Enabled
switch-058d0c	172.20.203	Eth1/8	Ethernet	N/A	1500	DOWN	Enabled



For information on Live/History Monitoring, refer to sections <u>"History Monitoring"</u> and <u>"Live Monitoring</u>".

2. Provisioning: NEO allows performing port provisioning on ports of Mellanox switches. This can be performed on one or more ports of the same Mellanox Switch.

Ports

Device Name 1 1	Device IP	Name 2	↑ Protocol	Acti	ve Speed	мти	Operational	Admin State
Filter	Filter V	Filter	▼ Filter ▼	Filte	er 7	Filter V	Filter V	Filter
lab4	172.20.203.4	ens9	Ethernet	N/A		N/A	UP	Enabled
lab4	172.20.203.4	ens10	Ethernet	N/A		N/A	UP	Enabled
switch-058d0c	172 20 203	Eth1/1	Ethernet	56 0	Sbps	1500	UP	Enabled
switch-058d0c	<u>ես</u> Monitoring	g ▶	Ethernet	56.0	abps	1500	UP	Enabled
switch-058d0c	🎤 Provisioni	ng 🕨	Disable Ports		bps	1500	UP	Enabled
switch-058d0c	টো Add To Gr	oup 🕨	Remove Hybrid Vlan P	ort		1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/5	Remove Vlan Port			1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/6	Set Access VLAN Port			1500	DOWN	Enabled
switch-058d0c	172.20.203	Eth1/7	Set Hybrid Vian Port		Gbps	1500	UP	Enabled
switch_058d0c	172 20 203	Eth1/8	SecMIU			1500	DOWN	Enabled

Some templates might require additional details to be completed (see example below).

S	Set MTU		×
	View command		
	Description	Setting MTU on interfaces	
	Interface Type	ethernet 🔻	
	MTU Size	MTU size (1500-9216)	
			Start

Clicking Start launches a port provisioning job.

After the port provisioning job is completed, it might take up to a minute for NEO tables to be updated with the new data.

Cables

The Cables window provides information on the cables and modules connected to devices in the network.

Cables

													0
10 🗸													
Device Name 1 1	Device IP	Po	rt2. ↑		Serial Number	Cable Type	Part Number	Revision		Length		Speed	
Filter V	Filter	7 F	ilter	7	Filter 🎔	Filter 🗸	Filter V	Filter	7	Filter	7	Filter	v
switch1	10.0.0.25	Et	h1/1		MT1538VS03045	Passive copper cable	MCP1600-C002	A2		2m		100GBASE-CR4	
switch1	10.0.0.25	Et	h1/2		MT1538VS03046	Passive copper cable	MCP1600+C002	A2		2m		100GBASE-CR4	
switch1	10.0.0.25	Et	h1/3		MT1723VS03439	Passive copper cable	MCP1600-E001	A3		1m		100GBASE-CR4	
switch1	10.0.0.25	Et	h1/5		MT1723VS03440	Passive copper cable	MCP1600-E001	A3		1m		100GBASE-CR4	
switch1	10.0.0.25	Et	h1/6		MT1723VS03441	Passive copper cable	MCP1600-E001	A3		1m		100GBASE-CR4	
switch1	10.0.0.25	Et	h1/7		MT1723VS03442	Passive copper cable	MCP1600-E001	A3		1m		100GBASE-CR4	
switch2	10.0.0.26	Et	h1/1		MT1538VS03047	Passive copper cable	MCP1600-C002	A2		2m		100GBASE-CR4	
switch2	10.0.0.26	Et	h1/2		MT1538VS03048	Passive copper cable	MCP1600+C002	A2		2m		100GBASE-CR4	
switch2	10.0.0.26	Et	h1/3		MT1723VS03443	Passive copper cable	MCP1600-E001	A3		lm		100GBASE-CR4	
switch2	10.0.0.26	Et	h1/5		MT1723VS03444	Passive copper cable	MCP1600-E001	A3		1m		100GBASE-CR4	

Groups

Groups

The Groups window includes 17 predefined groups for hosts/switches/ports with information about the groups members and credentials (if defined). The Members column indicates the group type: Device/Port.

New									
					Group Infe	ormation			
10 •					Devices	Device Access			
Name		Description	Members	Credentials	10 •				
Filter	_ ⊽	Filter 🗸	Filter	♥	Name	1	IP		System Type
test			Devices	0 *	Filter	⊽	Filter	7	Filter
Telemetry-Active		Mellanox Spectrum Switches With Telemetry	Devices	0	N/A		172.20.203.52		Mellanox Switch
ConnectX-4-Hosts		Mellanox ConnectX-4 Hosts Group	Devices	0	switch-0	058d0c	172.20.203.50		Mellanox Switch
ESXi-Hosts		ESXi Hosts Group	Devices	0	switch-9	912c62	172.20.203.51		Mellanox Switch
Cumulus-Switches		Cumulus Linux Switches Group	Devices	0	switch-o	:7fe70	172.20.203.53		Mellanox Switch
Nutanix-Hosts		Nutanix Hosts Group	Devices	0	switch-o	:7ff58	172.20.203.54		Mellanox Switch
Other-Switches		Third Party Switches Group	Devices	0				1 to 5	5 of 5 K Page 1 of
Windows-Hosts		Windows Hosts Group	Devices	0					
Mellanox-Spectrum-Switches		Mellanox Spectrum Switches Group	Devices	0					
		1	1 to 10 of 18	< Page 1 of 2 → →I					

This window also allows creating new groups.

To create a group of a number of devices/ports:

1. Click the "New" button under "Groups".

New				
10 -				
Name		Description	Mambarr	Cradantials
(maine			memoers	credentials
Filter	Y	Filter	Filter V	_
port-group			Ports	-
ConnectX-4-Hosts		Mellanox ConnectX-4 Hosts Group	Devices	0
Windows-Hosts		Windows Hosts Group	Devices	0
Telemetry-Enabled		Mellanox Spectrum Switches With Telemetry	Devices	0
Mellanox-Spectrum-Switches		Mellanox Spectrum Switches Group	Devices	0
Cumulus-Switches		Cumulus Linux Switches Group	Devices	0
Telemetry-Supported		Mellanox Spectrum Switches With Docker C	Devices	0
Mellanox-Switches		Mellanox Switches Group	Devices	0
ConnectX-5-Hosts		Mellanox ConnectX-5 Hosts Group	Devices	0
NEO Heat Supported		Hosts Without NEO-Host Installed Group	Devices	0

Devices Device Acc	135		
10 🔻			
Name 🕆	IP	System Type	
Filter	∇ Filter	▼ Filter	5
switch-058d0c	172.20.203.50	Mellanox Switch	
switch-9f2c62	172.20.203.51	Mellanox Switch	
switch-c7fe70	172.20.203.53	Mellanox Switch	
switch-c7ff58	172.20.203.54	Mellanox Switch	

2. Select the Group Members (Devices/Ports), fill in the Group Name and Group Description in the Group wizard, then click "Next".

(Group Wizard	Ä	
	Information Member	5	
	Group Name	Enter group name	
	Group Description	Enter group description	
	Group Members	Devices Ports	
	Create unique credent	tials for this group	

The "Create Unique Credentials For This Group" checkbox is only available for devices groups. If checked, you will be able to create new credentials for the group members which will overwrite the global default credentials (set under Settings > Device Access), and the device credentials (set under Devices > Device Access). Any of the three credential levels (global, group, and device) can overwrite each other.

- Choose the members of the group under "Members" by moving the devices from Available Devices to Selected Devices/Ports, and click "Next".
 Ports group - example:
 - ▲ Grouping ports is supported for Mellanox/Cumulus ports. Note that when creating a port group, you can group the ports of one device or more, provided that the ports are of the same type (for example: Eth type). Select one device, then its ports, and move them under "Selected Ports", then repeat the action for all devices you wish to add to the same group.

Group Wizard		х
Information Members		
Available Devices 10 Na ↑ IP System Type Filter ♡ Filter ♡ Filter ♡ Switch-05 172.20.203 ▲ MSN2100 switch-c7 172.20.203 ▲ MSN2100 switch-c7 172.20.203 ▲ MSN2100 1to 4 of 4 IC < Page 1 of 1 > >IC	Device Ports 10 Port ↑ Filter Filter Eth1/1 Eth1/2 Eth1/3 Eth1/4 Eth1/5 Eth1/6 Eth1/7 Eth1/8 Eth1/9 Eth1/10	Selected Ports 10 N. 1 ↑ IP Port 2 ↑ Fitter ▽ No Ports Selected > > 0 to 0 of 0 0 to 0 of 0
Previous		Finish

Devices group - example:

ailable Devices			Selected De	avices			
ALL	▼ 10 ▼		10 🔻				
Name ↑	IP	System Type	Name ↑	IP		System Type	
Filter V	Filter 🗸	Filter V	Filter	∇ Filt	ier 🗸	Filter) 7
N/A	1.2.3.4	💒 Mellanox Switch	N/A	1.3	2.1.4	💒 Mellanox Switch	
N/A	172.20.203.52	💒 Mellanox Switch	Move Selected	localdo 172	.20.203.3	Red Hat KVM	
lab4	172.20.203.4	Red Hat KVM					
switch-058d0c	172.20.203.50	📥 MSN2100	>		1 to 2 c	12 V / Daga 1 of 1	
switch-9f2c62	172.20.203.51	📥 MSN2100	<		1 to 2 t	JIZ REAGE FAGE FOIL	
switch-c7fe70	172.20.203.53	📥 MSN2100	«				
switch-c7ff58	172.20.203.54	💒 MSN2100					
	1 to 7 (of7 IC CPage 1 of 1 > >I					

4. If you checked the Credentials button for the devices group, you will be asked to provide the new credentials as a final step.

5. Once you click "Finish", the group will be displayed on the left pane, and the Group Information will be displayed on the right pane.

Groups				
+ New				
				Group Information
10 •				Devices Device Access
Name	Description	Members	Cred	10 •
Filter 🗸	Filter	Filter 🗸		Name IP System Type
ConnectX-5-Hosts	Mellanox ConnectX-5 Ho	Devices	0	
NEO-Host-Active	Hosts With NEO-Host Ins	Devices	0	Filter V Filter V Filter V
Linux-Switches	Linux Switches Group	Devices	0	switch-058d0c 172.20.203.50 Mellanox Switch
NEO-Host-Supported	Hosts Without NEO-Host	Devices	0	switch-9f2c62 172.20.203.51 Mellanox Switch
Tolomotor Supported	Mollanov Spoctrum Swite	Dovicos	0	switch-c7fe70 172.20.203.53 Mellanox Switch
Telemeny-Supported	Weilanox Spectrum Switc	Devices		switch-c7ff58 172.20.203.54 Mellanox Switch
Linux-Hosts	Linux Hosts Group	Devices	0	1 to 4 of 4
Mellanox-Switches	Mellanox Switches Group	Devices	0	
	11 to 17 of 17 K	< Page 2 of	2 > >	

Note that you can view the device information of a device in a group by clicking the device under Group Information in the "Groups" window.

119

					Group Information			
10 🔻		Filter			Devices Device	Access		
Name	Description	Members	Device Access		IP	Name	System Type	
est		Devices	0		10.209.24.105	r-neo-sw08	MSN2100B	
onnectX-4-Hosts	Mellanox ConnectX-4 Hosts Group	Devices	0		10.209.26.59	r-neo-sw04	SwitchDev Linux	
onnectX-5-Hosts	Mellanox ConnectX-5 Hosts Group	Devices	0		10.209.36.129	r-ufm-sw73	📇 MSN2100	
umulus-Switches	Cumulus Linux Switches Group	Devices	0		10.209.36.161	r-ufm-sw74	44 MSN2100	
inux-Hosts	Linux Hosts Group	Devices	0		10.209.36.162	r-ufm-sw75	📇 MSN2100	
ellanox-Spectrum- witches	Mellanox Spectrum Switches Grou	Devices	0		10.209.37.182	r-ufm-sw82	Cumulus Linux	
lellanox-Switches	Mellanox Switches Group	Devices	0		Showing 1 to o or o dev	loes		<
ellanox-SwitchX-2- witches	Mellanox SwitchX-2 Switches Grou	p Devices	0					
EO-Host-Active	Hosts With NEO-Host Installed Gro	up Devices	0					
EO-Host-Supported	Hosts Without NEO-Host Installed Group	Devices	0 < :	>				
EO-Host-Supported owing 1 to 10 of 17 gro 209.38.162 - Device In	Hosts Without NEO-Host Installed Group ups	Devices		>				
EO-Host-Supported owing 1 to 10 of 17 gro 209.38, 162 - Device (r General Ports	Hosts Without NEO-Host Installed Group ups formation Inventory OS Events Ja	Devices bs Groups	C Conf	ig VLAN	Link Aggregation	MLAG Cables Do	oker Containers Sessions	
EO-Host-Supported owing 1 to 10 of 17 grc 209.30.162 - Device in General Ports 10 v	Hosts Without NEO-Host Installed Group ups formation Inventory OS Events Ja	Devices bs Groups	C S S S S S S S S S S S S S S S S S S S	ig VLAN	Link Aggregation	MLAG Cables Do	cker Containers Sessions Filter	Cop
EO-Host-Supported owing 1 to 10 of 17 grc 209.38.162 - Device In General Ports 10 V Name	Hosts Without NEO-Host Installed Group ups formation Inventory OS Events Ja Protocol	Devices Devices	C :	ig VLAN	Link Aggregation	MLAG Cables Dor Operational State	cker Containers Sessions Filter Admin State	Сор
EO-Host-Supported owing 1 to 10 of 17 gro 209.36.162 - Device in General Ports 10 V Name Eth1/1	Hosts Without NEO-Host Installed Group formation Inventory OS Events Ja Protocol Ethernet 100	Devices bs Groups Active Spe Gbps	O Unics Conf eed	ig VLAN MTU 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN	cker Containers Sessions Filter Admin State Enabled	Cop
EO-Host-Supported owing 1 to 10 of 17 grd 209.38, 162 - Device In General Ports 10 V Name Eth 1/1 Eth 1/2	Hosts Without NEO-Host Installed Group formation Inventory OS Events Ja Ethernet 100 Ethernet 100	Devices Device	C :	ig VLAN MTU 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN UP	cker Containers Sessions Filter Admin State Enabled Enabled	Сор
EG-Host-Supported owing 1 to 10 of 17 gro 209.38.162 - Device (n General Ports 10 V Name Eth 1/1 Eth 1/2 Eth 1/3	Hosts Without NEO-Host Installed Group ups formation Inventory OS Events Ja Ethernet 100 Ethernet 100	Devices Device	C :	ig VLAN 1500 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN UP DOWN	cker Containers Sessions Filter Admin State Enabled Enabled Enabled	Cop
EC-Host-Supported awing 1 to 10 of 17 gra 200-38.182 - Device in General Ports 10 ▼ Eth1/1 Eth1/2 Eth1/3 Eth1/4	Hosts Without NEO-Host Installed Group formation Inventory OS Events Ja Ethernet 100 Ethernet 100 Ethernet 100	Devices Device	C :	e VLAN 1500 1500 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN UP DOWN DOWN	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled	Сор
209-30.102 - Device In 209-30.102 - Device In 209-30	Hosts Without NEO-Host Installed Group ups formation formation QS Events Ju Ethernet 100 Etherne	Devices Device	C Conf	ig VLAN 1500 1500 1500 1500	Link Aggregation	MLAG Cables Down	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled Enabled Enabled	Cop
209.36.162 - Device In 209.36.162 - Device In 209.36	Hosts Without NEO-Host Installed Group formation formation Inventory OS Events Inventory OS Events I00 Ethernet I00 Ethernet I00 Ethernet I00 Ethernet I00 Ethernet I00 Ethernet I00 I00 Ethernet I00 I00 I00 I00 I00 I00 I00 I00 I00 I0	Devices Device	C Conf	9 VLAN 1500 1500 1500 1500 1500 1500	Link Aggregation	MLAG Cables Dor Operational State Dor DOWN UP DOWN 0 DOWN 0 UP	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled Enabled Enabled	Cop
209-38, 162 - Device In 209-38, 162 - Device In General Ports 10 V Name Eth1/1 Eth1/2 Eth1/3 Eth1/6 Eth1/6 Eth1/7	Hosts Without NEO-Host Installed Group formation Inventory OS Events Jup Ethernet 100 Ethernet 1	Devices Device	O Links Conf eed	g VLAN 1500 1500 1500 1500 1500 1500	Link Aggregation	MLAG Cables Dor Operational State Down UP UP DOWN UP DOWN UP UP	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled	Сор
209.36.162 - Device in 209.36.162 - Device in General Ports 10 V Name Eth 1/1 Eth 1/2 Eth 1/3 Eth 1/3 Eth 1/4 Eth 1/5 Eth 1/7 Eth 1/8 Eth 1/7 Eth 1/8	Hosts Without NEO-Host Installed Group formation Inventory OS Events Jac Ethernet 100	Devices Device	Conf	y VLAN 1500 1500 1500 1500 1500 1500 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN UP DOWN DOWN UP DOWN UP DOWN	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled	Сор
209-38.162 - Device in General Ports 10 V Name Eth 1/1 Eth 1/2 Eth 1/3 Eth 1/3 Eth 1/4 Eth 1/3 Eth 1/4 Eth 1/5 Eth 1/6 Eth 1/8 Eth 1/7 Eth 1/8 Eth 1/7 Eth 1/8 Eth 1/9 Eth 1/9	Hosts Without NEO-Host Installed Group ups formation Inventory OS Events Jac Ethernet 100 Ethernet 100 Ethernet 100 Ethernet 100 Ethernet 100 Ethernet 100	Devices Device	C :	9 VLAN 1500 1500 1500 1500 1500 1500 1500 1500 1500	Link Aggregation	MLAG Cables Dor Operational State DOWN UP DOWN DOWN UP UP DOWN UP DOWN DOWN	cker Containers Sessions Filter Admin State Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled Enabled	Сор

In addition, a right click on a specific group will offer the following selection of actions:

 Modify Members: Opens the Group Wizard in which members can be removed and added to the group. Groups

New		
10 🔻		
Name	Description	Members Cred
Filter V	Filter V	Filter 🗸
test1		Devices O
test		Devices 🗸
Telemetry-Active	Mellanox Spectrum Switc	Devices O
ConnectX-4-Hosts	Mellanox ConnectX-4 Ho	Devices O
ESXi-Hosts	ESXi Hosts Group	Devices O
Cumulus-Switches	Cumulus Linux Switches	Devices O
Nutanix-Hosts	Nutanix Hosts Group	Devices O
Other-Switches	Third Party Switches Group	Devices O
Windows-Hosts	Windows Hosts Group	Devices O
Mellanox-Spectrum-S	Mellanox Spectrum Switc	Devices O
	1 to 10 of 18	Page 1 of 2 > >

Devices Devic	e Access	
10 🔻		
Name ↑	IP	System Type
Filter V	Filter	7 Filter V
N/A	172.20.203.52	Mellanox Switch
switch-058d0c	172.20.203.50	Mellanox Switch
switch-9f2c62	172.20.203.51	Mellanox Switch
switch-c7fe70	172.20.203.53	Mellanox Switch
switch-c7ff58	172.20.203.54	Mellanox Switch
	1 to 5 of 5	< Page 1 of 1 > >

120

- Delete: Clicking the OK button in the dialog box removes the group from NEO.
- Provisioning: allows applying a command or a sequence of commands on all group members at once, or on specific group members, per user selection. For further information on Provisioning, refer to <u>"Provisioning"</u>.
 - While the user may create a task for the entire group, the changes will apply to members included in the group at the time of the task's execution. Provisioning templates of specific arguments cannot be applied on groups.

4	Provisioning templates of	specific arguments canno	ot be applied on groups.
---	---------------------------	--------------------------	--------------------------

Provisioning		
Templates		
Insert Command	?	Global Variables
Description		
show <u>strap</u>		
	Reset Apply	
Selected Devices		
IP	Name	Profile
172.20.203.50	switch-058d0c	Ethernet
172.20.203.51	switch-9f2c62	Ethernet
172.20.203.52		
Update Device Information Take Running Config Snapshot Configuration Wite		

• Reboot: upon clicking on the "OK" button in the dialog box, all the devices in the group will be rebooted.

Note: This action can be performed on groups that contain Mellanox switches.

- Onyx Software Upgrade: when selecting this option, a dialog box will appear, requiring the user to fill in the relevant details in order to perform the upgrade on all devices in the group. For further information on SW Upgrade, refer to <u>"Onyx Software Upgrade"</u>. Note: This action can be performed on groups that contain only Mellanox switches.
- Generate Dump: When selecting this option, a dialog box will appear, requiring the user to fill in the relevant details in order to perform the dump generation for all devices in the group. For further information on Generate Dump, refer to <u>Generate Dump</u>. Note: This action can be performed on groups that contain only Mellanox switches.
- Driver Install: When selecting this option, a dialog box will appear, requiring the user to fill in the relevant details to perform the installation/upgrade on all hosts in the group.Note: This action can be performed on groups that contain only Linux hosts.
- Acknowledge: acknowledges all events related to the devices in the selected group.
- History Monitoring: Provides a report of the devices' attributes values history. Note: This action can be performed on groups that contain only Mellanox switches.

Sites

The Sites window allows you to define physical locations of devices with information about the site's members. This window also allows creating new sites.

To create a site of a number of devices:

1. Click the "New" button under "Sites".

Sites	
+ New	
10 •	
Name	Description
Filter	V Filter
	No items were found
	0 to 0 of 0

2. Select the Site Members. Fill in the Site Name and Site Description in the Site wizard, then click "Next".

Site Wizard		×
Information Mem	bers	
Site Name	Enter site name	
Site Description	Enter site description	
		Next

3. Choose the members of the site under "Members" by moving the devices from Available Devices to Selected Devices/Ports, and click "Next".

vailable Devices				Selected Devices		
ALL	▼ 10 ▼			10 •		
Name ↑	IP	System Type		Name ↑	IP	System Type
Filter V	Filter V	Filter 🗸		Filter V	Filter 🗸	Filter V
N/A	1.2.3.4	🚵 Mellanox Switch		N/A	1.32.1.4	🚢 Mellanox Switch
N/A	172.20.203.52	🚵 Mellanox Switch	Move Selected	lab4	172.20.203.4	📰 Red Hat KVM
localhost.loc	172.20.203.3	🗮 Red Hat KVM				
switch-058d0c	172.20.203.50	📥 MSN2100	>		1 to 2 of 2	Page 1 of 1
switch-9f2c62	172.20.203.51	📥 MSN2100	<		102012	chage for the second
switch-c7fe70	172.20.203.53	🚵 MSN2100	«			
switch-c7ff58	172.20.203.54	📥 MSN2100				
	1 to 7 of 7	\leq Page 1 of 1 $>$ $>$				

4. Once you click Finish, the site will be displayed on the left pane, and the Site Information will be displayed on the right pane.

Sites		
+ New		
		Site Devices
10 •		10 •
Name	Description	Name
Filter	▼ Filter ▼	Filter V Filter V
III Site1	site	switch-058d0c 172.20.203.50 Mellanox Switch
	Modify Members	switch-9f2c62 172.20.203.51 Mellanox Switch
		1 to 2 of 2 C Page 1 of 1 C C

Note that you can view the Device Information of a device in the site by clicking the device under Site Information in the "Sites" window.

In addition, a right-click on a specific site will offer the following actions:

- Modify Members opens the Site Wizard in which members can be removed and added to the site
- Remove upon clicking on the "OK" button in the dialog box, the site will be removed from NEO

Virtual Machines

The Virtual Machines window lists all the Virtual Machines (VMs) that run on all KVMs in the network, and provides the following details of each VM.

VM Info	Description
Host	Name of the KVM
Name	Name of the VM
State	State of the VM
VLANs	VLAN IDs
Image	The image run by the VM
Cores	VM number of cores
Memory	VM memory size

Virtual Machines

												c
10 •												
Host ↓	IP	Na	lame		State		VLANs		Image	Cores	Memory	
Filter	∇ Filter	▼ F	Filter	7	Filter	7	Filter	7	Filter V	Filter V	Filter	v
localhost	172.20.203.2	17	72.20.203.5		Up				/var/lib/libvirt/images/vm3.q	4	4 GB	
localhost	172.20.203.2	17	72.20.203.6		Up				/var/lib/libvirt/images/vm4.q	4	3.0234375 GB	
localhost	172.20.203.2	17	72.20.203.13		Up				/var/lib/libvirt/images/haitha	4	4 GB	
localhost	172.20.203.2	17	72.20.203.4		Up				/var/lib/libvirt/images/vm2.q	4	3.0234375 GB	
localhost	172.20.203.2	cu	umulus-30		Down				/var/lib/libvirt/images/cumul	4	1 GB	
localhost	172.20.203.2	17	72.20.203.12		Down				/var/lib/libvirt/images/haitha	4	4 GB	
localhost	172.20.203.2	17	72.20.203.3		Up				/var/lib/libvirt/images/vm1.q	4	4 GB	
localhost	172.20.203.2	vn	m2-clone1		Down				/var/lib/libvirt/images/vm2-c	4	4 GB	
										1 to 8 o	f8 K < Page 1 of 1	

Virtual Switches

The Virtual Switches window lists all the Virtual Switches that run on all KVMs in the network, and provides the following details of each virtual switch:

VM Info	Description
Host	Name of the KVM
Name	Name of the virtual switch
VLANs	VLAN ID
Physical Interface	Physical port

Virtual Switches

				c
10 •				
Host	Name	VLANs	Physical Interface	
Filter	Filter	∇ Filter	∇ Filter	
localhost	br0	NA	eno3	
			1 to 1 of 1	1 of 1 ⊃ ⊃

Network Map

The Network Map screen shows the fabric, its topology, elements and properties. NEO performs automatic fabric discovery and displays the fabric elements and the connectivity between the elements. In the Network Map screen, you can see how the fabric and its elements are organized (e.g., switches and servers). In addition, it helps to utilize resources and traffic by performing telemetry and monitoring actions on the fabric in a colorful, user-friendly interface.



The zoom slider enables zooming in and out on the map, while the compass icon serves as a reset button.

"Search By Property" allows users to search for keywords using free text.

Map Components

Component	Description
Mellanox Onyx Switches [*]	Represents Mellanox-OS switches discovered/ managed by Mellanox NEO.

Component	Description
Non-Mellanox OS Switches*	Represents third party switches discovered/ managed by Mellanox NEO.
Servers	Represents the computer (host) connected to the discovered/ managed switches.
Links	In the Network Map view, you may also see the connections (represented by a line) between each of the devices and between switches and servers.
Network icon	Represents a group of unknown discovered devices.
Unknown connection	Represents an unknown physical connection (while one of the peers is unknown).

The color of the device varies according to its severity level. For further information, refer to <u>Devices' Severity Levels</u>.

Map Info and Settings

The Network Map window includes physical hierarchies of the fabric. Hovering over one element in the map will highlight its connections and blur the other elements.

The View tab in the right pane enables filtering for certain elements to be viewed in the Network Map (see below).

A The views created are saved per user, thus cannot be accessed using a different username.

Network Map

Hetholic map					
Display By: IP	MLAG: Please Select	Views: All Elements			
Search By Property					
			View Network Filter VLAN Filter by VLAN Filter by VLAN Type Linux Host & Melanos Swite Network Severity E Info & Varning & Error E Critical & Unknown	: Analysis Properties	Show Ghow Hds Show Show Show Show Show Show

In the example above, only Mellanox Switches that have three levels of severity will be viewed in the map; those in Warning level, Error level, and Critical level. This customized filter can be saved by clicking the "Save As" button above (

Save As	×
Please enter a view name	
	Cancel Save

After clicking "Save", the view will be saved and can be accessed from the drop down menu next to "Views:". It can be deleted by clicking the "x" icon.

All Elements	•	H H ± ± C
Views		
All Elements		
Sites		
All Sites		
test		
	All Elements Views All Elements Sites All Sites test	All Elements Views All Elements Sites All Sites test

Note that the view can be edited by selecting it, modifying the filters, and saving it using the Save button (\bigcirc). The refresh button (\bigcirc) is used for reset. Network map layouts can be exported and saved to text files by clicking on the Export icon (\triangleq). In addition, they can be imported from text files by clicking on the Import icon (\triangleq). This allows the sharing of a layouts between different users.

You can also filter for the devices allocated to one or more VLANs by selecting the VLAN number/



numbers in the right pane (see below).

that when filtering for the members that belong to a certain VLAN number, the option to hover over any device in the map will be disabled.

Properties Tab

- The Properties tab in the same pane provides the following:
 - When selecting an element in the network map, its name, vendor, profile, status, IP, system type, and health information will be displayed.
 - When selecting a link connecting between two devices, various types of information will be displayed in the following order:

a. A list of all ports' links.

View Network Analysis	Properties
10 •	
Property ↑	Value
Health State	ОК
IP	172.20.203.53
MAC	B8:59:9F:7A:A1:40
Name	switch-c7fe70
Profile	Ethernet
Status	Communication OK
System Type	Mellanox Switch
Vendor	Mellanox

1 to 8 of 8 🛛 🔇 🤇 Page 1 of 1 🗦 🖂

b. Port cable information is available when at least one of the devices connected in the link is a Mellanox switch of communication status "OK". Cable info can be exposed by clicking "+". When this information is called for the first time, it will take a few minutes for the server to request and upload it.

Cable Info	~
Property	Value
Cable & Module Type	Passive copper, unequalized
Identifier	QSFP+
Length	1m
Part Number	MC2207130-001
Revision	A2
Serial Number	MT1135VS00625
Supported Speeds & Type	56Gbps
Vendor	Mellanox

Device Info

When selecting a system in the network map, its name, vendor, profile, status, IP, system type, and health information will be displayed in a table under the properties tab.

Network Map

Display By: IP MLAG: Please Select	Views: All Elements		
Search By Property			
	172 00 000 4 172 0000 4 172 00	View Network Analysis 10 Property Health State IP MAC Name Profile Status System Type Vendor	Value OK 172_20_203_50 B8_59_9F_62_3D_00 switch-08580c Ethernet Communication OK Mellanox Switch Mellanox
	(*) •	1 to 8	of 8 IC C Page 1 of 1 > >I

Links Info

When selecting a link on the map connecting two devices, the following information will be displayed:

- 1. A list of links between the two devices, recognized by the corresponding ports of each device.
- 2. A table of basic port information.

Cable Info

The cable info can be viewed by clicking the [+] icon. It may be available when at least one of the devices of the link edges is a Mellanox switch of communication status "OK".

Cable Info	~
Property	Value
Cable & Module Type	Passive copper, unequalized
Identifier	QSFP+
Length	1m
Part Number	MC2207130-001
Revision	A2
Serial Number	MT1135VS00625
Supported Speeds & Type	56Gbps
Vendor	Mellanox

View Tab

The View tab in the right pane enables filtering for certain elements to be viewed in the Network Map, and allows performing monitoring and telemetry actions for network analysis (see below).

Network Map



Type and Severity Filters

In the example above, there are three available system types; Mellanox Switch, Linux Host and Cumulus Linux, listed under the Type section. It is possible to filter the displayed systems in the map by toggling the buttons next to each system type. It is also possible to filter according to the severity of the system status - Info, Warning, Error, Critical or Unknown.

Network Analysis

The Network Analysis pane provides several network monitoring and analysis options. One option may be enabled at a given time.

- 1. Link Analysis: Performs monitoring on the links based on specific counters and conditions.
- 2. RoCE Congestion: Performs monitoring on the links based on the ECN Normalized Packets counter.
- 3. Network Path: Finds a path composed of links between a switch & an In-Band IP and performs monitoring on these links based on Out Bandwidth Rate counter.
- 4. Buffers Utilization: Indicates the status of the buffers utilization for the switches, if a threshold event occurs. In addition, provides an option to view the switch buffers histograms in a bar chart.

▲ To enable histograms, run the following template: NEO GUI → Managed Elements → SwitchXXX → Provisioning → template → enable histogram 5. Link Monitoring: Retrieves telemetry data on switches and ports and presents it in line or bar charts.

Display By: IP	MLAG: Please Select	Views: MLNX_SWITCHES	- H H ± ± C	
Search By Property				
		172 202034 172 202034	T2 22 25 34	View Network Analysis Properties Filter VLAN Falter by VLAN
In Bandwidth Rate 0.9	• 10 00 07 06 05 05 05 05 05 05 05 05 05 05		• 172 20 20354 • 772 20 20354 • 772 20 20353 • 772 20 20354	Implie Moning Show Implie Show Show Implie Entret Show Implie Chical Show Implie Unknown Show

Link Analysis

Link analysis allows you to display the link analytics according to a selected static counter, and define the conditions on which the analysis is based. The links will be colored according to the specified conditions. You may define up to five conditions.





To define a condition, select the desired counter, and click on the [+] button.

View	Network Analysis	Properties
🚯 Link A	nalysis	Show
C RoCE Congestion		Hide
🔁 Netwo	ork Path	Hide
III Buffer	s Utilization	Hide
📐 Link N	Nonitoring	Hide
Counter:		
In Errors	s Rate	* +
In Error Out Erro In Disca Out Disc Symbol In Band	s Rate ors Rate Irds Rate cards Rate Error Rate width Rate	
Out Bar In Pack Out Pac	idwidth Rate ets Rate :kets Rate	

Network Map

A form will pop up. Choose the appropriate operator, and define the desired threshold and color. This color will be applied on the link, if the link monitoring value matches the respective condition.

New Visualization Condition ×	
Packets/Sec Matching Color	View Network Analysis Properties
In Errors Rate >	C RoCE Congestion
Close Submit	Link Monitoring
	Counter:

The added conditions are listed in the Network Analysis section, if Link Analysis is enabled. The links are colored and labeled accordingly.

Display By: IP	MLAG: Please Select	Views: All Elements	- H H ± ± C		
Search By Property					
				View Network Analysis Properties	Show Hide
	10.224 15.127	6 cape 10 224 15 97 5.5 cape		Vetwork Path Buffers Utilization Link Monitoring	Hide Hide Hide
	10 224 40 04 10 224 40 70	10 224 40.78		Counter: Out Errors Rate	1 1 1 1

A Instead of aggregating all values, the displayed value represents the worst-case scenario:

- If: (Condition) > X, the highest value will be shown
- If: (Condition) < X, the lowest value will be shown

• The data samples are retrieved using the Telemetry Agent, if it is installed on the switch. Otherwise, NEO uses the SNMP requests to retrieve the data. Sampling using the Telemetry Agent is done in higher resolution.

RoCE Congestion

Network Man

The RoCE Congestion sub-pane provides monitoring based on ECN Normalized packets, given that there are 4 predefined conditions.

· · · · · · · · · · · · · · · · · · ·				
Display By: IP	MLAG: Please Select	Views: All Elements		
Search By Property				
	10.224 15 127 4 Packets Sec 12 Packets Sec 10.224 40.04 10.224 40.04	6 PadatuSec 10.224.15.97 5.5 PadatuSec 10.224.40.78	View Network Analysis Properties @} Link Analysis	Chow Hide Hide Hide Hide

Network Path

The Network Path sub-pane allows you to display the paths between a selected source switch and a specific target host (In-Band IP). The display includes the Out-Bandwidth Rate values on top of these paths.

Network Map					
Display By: IP	MLAG: Please Select	Views: All Elements			
Search By Property					
	10.221 × 10.201	N.2211429 N.2214429	19 22 (15 2) 19 22 (15 2) 19 22 (14 5	Vew Retwork Analysis Properties Ibit Analysis X Roce Congestion Ibit Notion Path Ibit Notions Ibit Notions Ibit Notions Ibit Notions Ibit Notions Secure Switch In-Band IP 10.209.26.68 • Trace Ibit Notions Ibit Notions	Hide Hide Show Hide Hide
	19 224 113 49	19.224 14.246 19.224 14.244 19.224 14.243	10.22443.56	>	

A The Network Path capability is supported by both Onyx and Cumulus operating systems. For the OS versions, please refer to the latest Release Notes document.

A The displayed out bandwidth rate value is the highest value of the interfaces. Thus, if two switch systems are connected by several links, only the highest value will be displayed. You may click on the link on the map for a table with all the values.

To do so, select the source switch from the drop-down menu, type the In-Band IP in the IP Field, and click the Trace button. The optional detected paths (can be more than one path) will be colored, and the Out-Bandwidth Rate value will be displayed on the map.



When entering a Loopback interface as the destination in NEO, one path is displayed.

Buffers Utilization

The Buffers Utilization feature samples and summarizes the capacity of admitted packets stored and queued in the buffer. This sub-pane allows a view on the switches' buffers utilization status, and provides an option to view the buffers histograms for each switch in a bar chart per interface.

The buffer icon beside each switch indicates the Buffer Utilization status. Each color corresponds to a specific status:

- 1. Grey: Unknown
- 2. Green: OK
- 3. Orange: Degraded
- 4. Red: Major or Critical

Show Show
Hide
~
_
Show
Show
Show
Show

To view the histograms data for a switch if a threshold event occurs, select a switch in the map, and the interface for which you wish to see the histograms. The histograms are viewed in a bar chart. The X-axis represents the bin number, and the Y-axis represents the buffer size distribution.

Network Map							
Display By: IP	MLAG: Please Select	- Views:	All Elements -	- R 1 4 C			
Search By Property							
		10 224 14234 (224 14234 10 224	N 221 KTW N 221 KTW N 221 KTW N 221 KTW N 221 KTW	N221021 N221123 N221148	View View Link A C RoCE S Netwi	Network Analysis Properties nalysis Competition NR Path Is Ultication Administry The The The The The The The The The The	Hide Hide Hide Hide

For a live view of the current buffer utilization histogram, right-click on a device, and select "Live Buffers Utilization":

Network Map



In order to configure Live Buffer Utilization follow this procedure:

1. Right-click the desired switch under Managed Elements \rightarrow Devices and install/run telemetry on it.

2. Right-click the switch under Devices and click on Provisioning and choose the "Enable Histogram" template.

▲ By default, the priority configured with NEO is 3 (i.e. TC=3 on the switch side). The

Provisioning				
Templates	Select Template			
Insert Command	10 V Showing 4 out of, 109 Click to reset all	filters.		
	Template Name ▽ ↑	Matching Validation Template		
	hist	Filter		
Type sequence of commands here	Disable-Histogram	N/A		
	III Enable-Histogram	N/A		
	Enable-Histogram-MLAG-Port-Channel	N/A		
	Enable-Histogram-Port-Channel	N/A		
Selected Devices		1 to 4 of 4 IK K Page 1 of 1 3 5		
Update Device Information		Close		
Take Running Config Snapshot				

3. Fill out the following global variables for this template.

Global Variables		
Traffic Mode	ucast	圃
Interface Range	1/1-1/32	۱
TC ID	3	圃
Event Threshold	100	圃

4. Click on Live Buffer Utilization to show histogram samples based on switch histogram configuration.



Link Monitoring

Link Monitoring displays telemetry data in the form of line charts and bar charts. There are 3 cases of monitoring:

- 1. No selection: All the switches that support monitoring are monitored.
- 2. A switch is selected: The ports of the selected switch are monitored.
- 3. A link is selected: The ports of the two devices making that link are monitored.

Monitoring All Switches

If nothing is selected, we perform telemetry of all the supported switches.

Network Map



Switch Monitoring

When a switch is selected, all its running ports are monitored.

Network Map



If you select the Last 5 Minutes mode, telemetry is streamed from the Telemetry Agent, and more counters are available.



Link Monitoring

If a link selected, the ports of the two devices taking part in this link are monitored.

Network	Man
Network	map

olay By: IP 🔻	MLAG: Please Select	Views: MLNX_SWITCHES		
			<u>.</u>	
1209.26.80:Eth1/28 - 10.209.24.149:Eth1/9/2 ~	MTU: 1500	Active Speed 5Gbps) - (MTU: 1600) (Active Speed 30Gbps)	Last 1	Hour Last 5 Minutes
0.6				10.209.24.149:Eth1 10.209.26.80:Eth1/28
		0.9		
0.5		0.8		
0.5		0.8 0.7 § 0.6		
0.5		0.8 0.7 0.6 0.6		
05 04 03 02		0.8 0.7 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6		
0.5		0.8 0.8 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7		

Running Operations

To run operations on more than one element in the map, hold the ctrl key down and select the elements, right-click on one of them and choose the action.



The level of severity of the devices' health state varies from OK to Critical, and is indicated by the device's icon color.

Devices' Severity Levels

Icon	Heath State
	Info/OK
	Error/Major
	Warning/Unknown/Degraded
MLNX-OS	Critical

Views

A view is a combination of a topology of nodes with (x, y) positions, filters state and Network Analysis state. By default, NEO offers a view (called "All Elements") which provides a multi-layer topology, based on either Spine-Leaf topology or user-defined tiers.

It is possible to save custom views with their own topology. The following parameters can be customized, saved in a view, and accessed later, on another machine or browser:

- 1. Systems positions in the map
- 2. VLANs filter selection
- 3. Type filters state
- 4. Severity filters state
- 5. Network Analysis state

Saving Customized Views

To save a customized view, click the "Save As" button a	ubove (
Save As	×
Please enter view name (Up to 50 characters)	
	Cancel Save

After clicking "Save", the view will be saved and can be accessed from the drop-down menu next to "Views". It can be deleted by clicking the "x" icon.

Views:	All Elements	-	H	H\$	1	*	C
	Views						
	All Elements						
	MLNX_SWITCHES X						
	Sites						
	All Sites						
	Site1				==		
	172.20.203.53	_	/	172.2	0.203.	54	

Note that the view can be edited by selecting it, modifying the filters, and saving it using the

"Save" button (\mathbb{C}). The refresh button (\mathbb{C}) is used for reset.

Network map layouts can be exported and saved to text files by clicking on the Export icon ($\stackrel{2}{=}$). In addition, they can be exported from text files by clicking on the Import icon ($\stackrel{2}{=}$). This allows the sharing of a layouts between different users.

All Elements View

In the All Elements View display type, the devices are shown in layers (tiers), for better understanding of the network. To select the All Elements view, click on the "Views" drop-down menu, and select "All Elements".

Default All Elements View

This view follows the concept of Spine-Leaf topology, where the hosts are in the bottom line of a topology, the leaves are switches directly connected to those hosts, and the spines are switches connected to the leaves.



Sites View

Sites, once <u>configured under Managed Elements</u>, can be viewed from the Network Map screen. The color for each site indicates the worst status for a device in that site.
Network Map



Map Options

At the top of the Network Map panel, there are several View options:

• You can choose to display a device by its name or its IP address and search for it accordingly.

Network Map

	Display By:	IP v	MLAG:	Please Select -	Vie
		IP			
		MAC			
2	earch By Prop	Name			

The device will be highlighted in the network map.

• MLAG visualization drop down menu: will only appear if there is one/more instances of MLAG service in NEO. MLAG members of the instance selected will be highlighted in the Network Map.

MLAG:	Please Select	,
	All auto-mlag-1	

• Any change in the devices view using the filtering options can be saved using the "Save As" icon.

Views:	All Elements		•	Ħ	R	1	*	С
	Views							
	All Elements							
	MLNX_SWITCHES	×						
	Sites							
	All Sites							
	Site1		_					
	172.20.203.53		-	\sim	172.2	0.203.	54	

These new views can be saved and later accessed from the Views drop down menu.

Services

The Services window enables simple configuration and continuous validation of services in the fabric. For each type of service, service instances can be created providing a clear visualization for the state of the services and their underlying components. A bring-up wizard can further simplify the configuration of the network by allowing the user to provide in a few minimal steps all the input required for bringing up the network from scratch.

Serv	ices	
The "Serv For each state of t	ice" feature enables simple configuration and continuous validation of services in the fabric. type of service, service instances can be created, which provide a clear visualization for te services and of their underlying components.	✗ BringUp Wizard
•	MLAG (I)	Ŷ
Ŧ	אדט (ז) איז איז איז איז איז איז איז איז איז איז	v
•	RoCE (I) ROCE Servi	Ť
+	Virtual Modular Switch (0)	<

The five available service types are:

- Bring Up
- Virtual Modular Switch
 - VMS
 - L3 Network Provisioning
- MLAG

- MTU
- RoCE

The service types and configurations are divided in the Service view as seen in the figure above, and an Add button, as well as a help button, are available for each one of them.

A The configuration and cleanup commands generated for the services assume that the switches have no prior configuration. Prior configuration may cause some of the commands to fail and lead to inconsistent configuration on the switches.

Bring-up Wizard

NEO enables a quick network bring-up that includes all the required configurations in one easy process. The user should only provide minimal input for the type of configurations needed in the bring-up wizard. All configuration steps are optional. Clicking "BringUp Wizard" will open the wizard for user input.



The wizard works on Onyx switch systems.

A configuration snapshot is taken for the devices participating in the bring-up before any configuration is done. This snapshot can be used to revert all the bring-up configuration changes.

Device Access

In this tab, the user can fill out the Device Access information for the device types participating in the bring-up.

A This updates the global credentials for the selected system type.

Bring Up Wizard						×
1 Device Access 2 Integration	3 Device Discovery	MLAG	Network Services	6 Monitoring	🕜 Summary	
System Type NVIDIA Mellano> 🗸						
• HTTP						>
SSH SSH						>
SNMP						>
SNMP v3						>
Previous					Next	

Integration

In this tab, the user can define integration with various hypervisors. This new capability helps NEO acquire information about the VMs running on them and handle VM lifecycle events to properly configure VLAN on the switches.

- Host Bond Configuration the user can select the type of bonds that are being used on the hosts. If LACP bond configuration is used, NEO will suggest to create MPOs (see <u>MLAG Port</u> <u>Channels</u>) according to the links it detected on the switches.
- VLAN Provisioning Port Mode the user can select which port mode to assign to the switch ports or MPOs (according what the user selected in the Host Bond Configuration section mentioned above). The options are hybrid, trunk, or default (which is to let NEO use the current switch port mode configuration). This is used when using NEO to handle VM lifecycle events and change switch VLAN configuration accordingly.

Bring Up Wizard						×
1 Device Access (2) Integratio	on 3 Device Discovery	MLAG	S Network Services	Monitoring	🕜 Summary	
Host Bond Configuration	CP v					
VLAN Provisioning Port Mode Defa	ault 🗸					
□ vCenter DVS Configuration					>	
Prism AHV Configuration					>	
Previous					Next	

VMware vCenter DVS Configuration

In this section the user can define VMware vCenter connectivity information. NEO uses it to get information from the vCenter regarding VM information and lifecycle events.

The VLAN Provisioning drop down contains the following options:

- Disabled VM lifecycle events will not be handled. NEO will only retrieve VM information from vCenter.
- Global VLAN provisioning NEO will listen to network events. In case of a network change event (e.g. adding or removing a network), NEO will add or remove VLANs to/from all switch ports. VLANs will be removed from the ports but will not be removed from the switch.
 - ▲ This is the recommended VLAN provisioning mode when working with Live Migration. In this mode, the VLANs' auto-provisioning is performed upon network creation (before the VM migration event) therefore, it prevents traffic lose.
- Per port VLAN provisioning NEO will listen to VM lifecycle events. In case of a VM change (e.g. VM added, removed or migrated) which required changes in VLANs, NEO will add or remove the VLAN accordingly from the relevant switch ports.

Upon filling the vCenter IP address, port, username and password, the user should click the Connect button to make sure the details are correct and NEO can connect the vCenter. If the connection is successful, a list of clusters managed by the vCenter will be shown in the Clusters table. The user should check the clusters he/she wants NEO to manage.

• The Connect button should be clicked after every change so the new information will be processed by NEO.

✓ vCenter DVS Configuration	~
VLAN Provisioning Per port VLAN provisioning	The VMware VCenter integration enables NEO to provide visibility into virtual environments which operate with a Distributed Virtual Switch. The integration enables VLAN and VXLAN tunnels auto-provisioning according to the VCenter admin configuration, these enabling an
vCenter Address Port	automatic VM migration capability across nodes and clouds.
10.215.58.12 443	
	Global VLAN provisioning Auto VLAN provisioning on all Switches and Ports once VLAN is created
Username	
administrator@vsphere.local	Decement V// AN exercision in a
	Auto VLAN provisioning Auto VLAN provisioning on destination Switch Port after VM has migrated, some packet loss
Password	may be experienced until provisioning is completed
Connect >	
Clusters	
Clusters Names	
No Clusters Available	

Nutanix Prism AHV Configuration

In this section the user can define the Nutanix Prism Central and the Prism Element connectivity information. NEO uses it to get information from Prism regarding devices, VM information and lifecycle events. For further information, refer to <u>Mellanox NEO/Nutanix Prism Plug-in</u>.

VLAN Provisioning	
IDE NUTANY VVISM Integration enables NE() to prov	vide visibility into the virtual
Disabled	ation enables VLAN and VXLAN
tunnels auto-provisioning according to the PRISM a Prism Central IP Port an automatic VM migration capability across nodes	admin configuration, these enabling and clouds.
0.0.0.0 9440 Global VLAN provisioning Auto VLAN provisioning on all Switches and Ports	once VLAN is created
Per port VLAN provisioning Auto VLAN provisioning on destination Switch Por loss may be experienced until provisioning is comp	t after VM has migrated, some packet pleted
Prism Elements Credentials	
+ New Element	

• The VLAN Provisioning drop down contains the following options:

- Disabled VM lifecycle events will not be handled. NEO will only retrieve VM information from vCenter.
- Global VLAN provisioning NEO will listen to network events. In case of a network change event (e.g. adding or removing a network), NEO will add or remove VLANs to/ from all switch ports. VLANs will be removed from the ports but will not be removed from the switch.
 - A This is the recommended VLAN provisioning mode when working with Live Migration.

In this mode, the VLANs' auto-provisioning is performed upon network creation (before the VM migration event) therefore, it prevents traffic lose.

- Per port VLAN provisioning NEO will listen to VM lifecycle events. In case of a VM change (e.g. VM added, removed or migrated) which required changes in VLANs, NEO will add or remove the VLAN accordingly from the relevant switch ports.
- Prism Central IP, port, username and password are used to connect to the Prism Central. In case of working without Prism Central, put the Prism Element details instead.

Prism Element Cred	dentials	
Element IP		
1.2.3.4		
Username		
username		
Password		
••••••		
	Cancel	Add

• Prism Elements Credentials - in this table the user should fill the username and passwords of each Prism Element in the network. Use "default" to fill the same credentials to all Prism Elements or specify credentials per Prism Element IP.

Upon filling the Prism Central IP address, port, username and password, and the Prism Element credentials, the user should click the Connect button to make sure the details are correct and NEO can connect the Prism. If the connection is successful, the switches and Nutanix hosts known to Prism will be added to NEO. This might take a couple of minutes.

The Connect button should be clicked after every change so the new information will be processed by NEO.

When enabling VLAN provisioning, the user can also set some advanced properties that affect the communication with Prism:

	Connection Settings	
Device Access 2 Integration 3 D	Timeout 10	6 Monitoring 7 Summary
Prism AHV Configuration	Session Timeout 86400	~
Global VI AN provisioning	Paguasta Patrias	ride visibility into the virtual
Siebal (E) at providenting	A0	on enables VLAN and VXLAN
Prism Central IP Port	40	s nodes and clouds.
10.209.39.39 9440	Events Port	
Driver Oceanal Hannessee	8080	once VLAN is created
admin		
Prism Central Password	Cancel	after VM has migrated, some is completed
Driem Elemente Credentiele		
default		
A m 1234		
New Element		
Connect >		
Previous		Neut

Device Discovery

In this tab, the user can fill out the switches needed to be configured. The switches are organized in pairs, so MLAG can be created from each pair. Mellanox NEO® can automatically detect MLAG switch pairs that fulfill the connectivity prerequisites and move them to the "Selected" table.

A MLAG configuration may be skipped by using the "Proceed without MLAG configuration" checkbox, and selected devices can be configured with MTU and ROCE in the Network Services step.

Device Access	2 Integration	3 Device Discovery	4 MLAG	5 Network Services	6 Monitoring	O Summary
Please add the devices	s that are part of the ne	etwork (switches and ho	osts).			
f they do not appear in	the table, please add	them manually or by LL	DP based discovery			
Once all the devices an	e populated, please se	elect the two top of rack	switches that will be	used for MLAG.		
+ Add Device						
Available				Selected		
10 🔻				10 •		
Name	IP			Name	IP	Pair 1
	♥	7	»	▼	▼	V
N/A	0 🚵 222.22	22.222.222	>	switch-9f2c62	🛇 📥 172.20.203.51	1
N/A	0 📇 1.1.1.1	1	<	switch-058d0c	🛛 🔛 172.20.203.50	1
N/A	0 🔛 222.22	22.222.221	*			
switch-c7fe70	🛛 🔛 172.20	0.203.53				
switch-c7ff58	🛛 📥 172.20	0.203.54				
	1 to 5 of 5 💷 🤄 Pa	age 1 of 1 > >			1 to 2 of 2 🖂 🤇 Pag	ge 1 of 1 🔿 🖂

If the switches are not listed, the user can click "Add Device" and add them.

Device Access	Integration Integration Integration	IP Device	Range	Subnet	twork Services	6 Monitoring	O Summary
Please add the devices If they do not appear in	that are part of the network (switche the table, please add them manually	System Type Mellanox Ol	NYX	٣			
Add Device	e populated, please select the two to	+ Add Devices			G.		
Available		Filter		7	ed.		
10 •		1.2.3	.4				
Name						IP	Pair †
N/A	0 📇 10.209.39.21	Auto Provisio	ning		sw12	0 🔠 10.209.39.29	2
r-neo-sw07 r-nutanix-sw05	 10.209.26.81 10.209.39.20 	 SNMP SNMP Tra LLDP 	ps			© 📇 10.209.39.22	2
	1 to 3 of 3 ≤ ≤ Page 1 of 1 ⇒ ⇒		Save	Cancel		1 to 2 of 2 💠 🖉 Pa	e1of1 > >⊨
Proceed without MLAG	6 configuration						
Braviaus							Maut

Devices can be added by their management IP address (click the ^o button to add them to the list). When done, click the "Add Devices" button. In case only one switch is known by NEO, NEO will try to discover switches linked to this switch using LLDP. If you want to use this ability, please make sure that LLDP protocol is enabled on your switches. once LLDP results are retrieved, relevant switch IP will be automatically populated.

Discover By		
IP	Range	Subnet
Device		
Overteen: True		
Mellanox (e DNYX	Ŧ
+ Add		
Devices		
IP		
Filter		7
No i	tems were for	Ind
Auto Provisi	ioning 🚯	
SNMP TI	raps	
🖉 LLDP		
	Save	Cancel

Alternatively, the user can specify a range of IPs or subnet IP to scan (see also <u>Discovery Settings</u>) and click the "Save and Scan" button to start scanning.

Discover By	Discover By
IP Range Subnet	IP Range Subnet
From	Subnet
То	System Type
System Type	Auto Provisioning ()
Auto Provisioning ()	Discovery Method
Discovery Method > d	Tier Assignment 🚯
Tier Assignment 🚯	None
None	
-	
Save And Scan Cancel	Save And Scan Cancel

After adding the devices in any of the above methods, they will undergo a short discovery cycle to get the required data and then will be available for the bring-up.

MLAG

The MLAG tab defines the necessary information for MLAG configuration in the selected switch pair.

- The MPO VLAN field allows the user to add VLANs (networks) to all switch pairs in one click.
- The MPO switchport mode field sets the default switchport mode that will be used for MPOs defined in each MLAG pair. The user can change specific MPOs to other values if necessary.

Switch 172.20.203.50

1 2

3

9 10 11 12 13 14

4 5 6

ø

8

Previous

For each pair, the user can select the ports that will be part of the MLAG IPL. The ports that NEO identified as linking the two switches are automatically selected. Clicking the 🖉 button will allow the user to set other MLAG related attributes.

Setup

Hybrid

Pair #1

1

Switch 172.20.203.51

9 10 11 12 13

¥

2 3 4 5 6 7 8

14

This section defines MLAG attributes:

×

7 Summary

Cluster #1 (10.209.36.162 - 10.209.36.161)

- Setup	
VIP Name	
10-209-36	-162x10-209-36-161
Virtual Syster	n MAC
00:00:5E:0	00:01:00
Port Channel	VLAN ID
3	4094

IPL Configuration

This section defines MLAG IPL attributes:

- IPL Configuration

10.209.36.162 IPL IP		
10.10.10.1	1	24
10.209.36.161 IPL IP		
10.10.10.2	/	24
Virtual IP		
192.168.1.1	1	24

MLAG Port Channels

This section defines MPOs to configure on the switch. If you are using LACP bond mode configuration, Mellanox NEO will auto-populate the table with any host linked to both switches in the pair.

- MLAG	Port Channels							
	Add							
	Port Channel	Hostname	switch-9f2c62(172.20.203.51) Ports	switch-058d0c(172.20.203.50) Ports	Switch Port Mode	Access VLAN	Allowed VLANs	
	6		1/4	1/4	Hybrid	Default	2,4-7	e 🖉
	7		1/5	1/5	Trunk		all	e 🖉
	8		1/6	1/6	Access	Default		N 🛍

The user can add or change MPOs according to the required network configuration.

Add MLAG Port Channel

S	Switch	n 10.2	09.30	6.162						Switcl	n 10.2	09.36	6.161					
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	16		9	10	11	12	13	14	15	16	
MLA	AG P	ort Ch	anne	1														
4																		
Swit	tch P	ort M	ode															
H	Hybr	id					•											
Nati	ive V	LAN																
[Defa	ult					•											
Allo	wed	VLAN	s															
								AIIN	/LANs	\$								
																	Can	cel

Networks

MLAG Members

This section defines layer 2 networks (VLANs) to configure on the switch. A default network with VLAN 1 is automatically added and is the default for MLAG port channel native VLAN definition.

- Networks

Add	
Default	
Network100	Ø 🗓
Network101	e 🖉
Network102	e 🖉

Add a network by clicking the "Add" button and setting its name and VLAN ID:

Add Network

Network103	}	
/lan ID		
103		

Network Services

In this tab, the user can specify RoCE and MTU definitions. If RoCE is required, the user can define in the advanced section ECN thresholds and the priority to use for RoCE traffic.

 \times

ig op wizaid						
Device Access	2 Integration	3 Device Discovery	4 MLAG	5 Network Services	6 Monitoring	7 Summary
CE Configuration						
No	Lossless Fabric	Lossy Fabric				
TU Configuration						
No	Default (1500)	Jumbo (9216)				
Advanced						
ECN Thresholds R	ange - 1500	КВ				
RDMA DSCP						
RDMA Priority						

-		
- P		

Next

Monitoring

In this tab, the user can define the telemetry means for monitoring the network configuration and traffic behavior. In the top section, the user can decide whether or not to deploy the telemetry agent on the switches (top checkbox), and if so, which telemetry sessions to use.

For more information on Telemetry Agent and Sessions see <u>Telemetry Streaming</u>.

Device Access	Integration	3 Device Discovery	(4) MLAG	5 Network Services	6 Monitorir	ng 🕜 Summary
Telemetry Session	n					
Note: Switches m	ust be time synchronized	I with NEO in order to start	telemetry agent			
Session Name						
Interface Counter	rs					
Buffer Events						
What Just Happe	ened					
Telemetry Snapsi	nots					
Name	Command Line			Interval		
VLAN	show vlan			5	Minutes	•
Switch Port	show interfaces	switchport		5	Minutes	Ŧ
MAC	show mac-addre	ess-table		5	Minutes	•
MLAG	show mlag			5	Minutes	¥
MLAG interfaces	s show interfaces	mlag-port-channel summa	ry	5	Minutes	•
MLAG VIP	show mlag-vip			5	Minutes	¥
						+ Add Telemetry Snapst

In the bottom section, the user can select which telemetry snapshots to enable. These will run a show command periodically and the user will be notified when the output will change. Clicking "Add Telemetry Snapshot" allows the user to add his own show command:

Insert Command	×
Please type a "show" command, NEO will periodically run the command and notify about changes in its output:	
Command	
example: 'show interfaces switchport'	
Interval 5 Minutes	
Close Subr	nit

Summary

In this tab, the user can see a summary of all the definitions that are going to be configured on each switch pair.

Device Ac	cess 🛛 🕘 Integratio	on 🗿 De	evice Discovery	4 MLAG	5 Net	work Services	6 Monito	ring 🛛 🚺	Summan
The following MLAG	settings summarize al	l previous ste	ps:					🕹 Ехро	rt Settings
10	209.36.162	10.2	209.36.161			Advance	ed		
IPL IP	IPL Port Range	IPL IP	IPL Port Range	e Virtua	IP	Virtual System	MAC Po	ort Channel	VLAN
10.10.10.1	1/1,1/2	10.10.10.2	1/1,1/2	192.168.1	.1/24	00:00:5E:00:01	1:00	3	4094
Networks		Name				V			
		Default				v	1		
		Vetwork100					100		
		Vetwork101					101		
	I	Network102					102		
MLAG Ports	Channels								
Hostname	MLAG Port Channel	10.209.36	162 Members	10.209.36.161	Members	Switch Port Mo	ode Netwo	rk Allowed	I VLANs
	4		1/4	1/4		Hybrid	Defau	lit 2,4	4- <i>1</i>
	6		1/6	1/5		Access	Defau	ilt	111
Telemetry Se	ssions								
			S	ession Name					
			NIC	O Monitoring					

Clicking "Apply configuration" will start the configuration process, which can take a couple of minutes. You can track the progress in the bring-up progress dialog and in the jobs page. For MLAG, RoCE and MTU configurations, service objects will be created and used to apply the required configuration on the switch pairs (see section <u>Service Elements</u> for more information). Telemetry actions (agent deployment and session configuration) will be done after the services are configured.

In case the MLAG configuration failed, the bring-up will not continue to the next phases. After failures in other phases NEO will try to continue with the bring-up process.

Service Types

Virtual Modular Switch

A drop-down menu will appear, allowing the user to select two types of services when clicking the "+" button:

+	Virtual Modular Switch (0)
VN	лs
L3	Network

VMS

▲ Before setting up VMS using the NEO VMS service, it is highly recommend to review the information and prerequisites found in <u>Mellanox Virtual Modular Switch™</u> <u>Reference Guide</u>.

Mellanox Virtual Modular Switch® (VMS) solution, comprised of Mellanox 10GbE, 40GbE, and 56GbE fixed switches, provides an ideal and optimized approach for a fixed switch aggregation. VMS is energy efficient and scales up to 28.8Tb/s of non-blocking bandwidth and up to 720 nodes of 40GbE and operates at ultra-low latencies. The VMS can be set up in Layer 3 mode (L3-VMS) based on OSPF. VMS configuration and bring-up can be fully automated, from the early planning stages until it is operational, by leveraging the VMS Wizard. The VMS Wizard provides an automation environment to provision the fabric with a centralized application, an application that learns the way the switches interconnect and how they ought to operate in the data center. Once the fabric size is defined and the types of switches in the fabric are selected, the VMS Wizard specifies how to configuration to the switches.

In order to configure the VMS solution:

1. Click the "Add" button on the right side of the VMS row.

+	MLAG (0)	VMS Wizard				×
		1 Settings (2) Spines	③ Leafs	(4) TORs	5 Network	
•	MTU (1)	Name VMS2				
	MTU1	Description VMS_Service				
		VMS Levels				
÷	RoCE (1)	Link Width From Top Of Rack please insert number between 1 and 5				
	RoCE1 ≁ Ø					
♥	Virtual Modu					
	VMS1				(Next

2. Type the service name and description under "General".

Select the number of tiers (VMS Levels - 2 or 3).

For 2 levels only (Spines and TORs), select 2. For 3 levels (TORs, Leafs and Spines), select 3.

Unlike the 2 levels choice, if you select 3 levels, you will be given more options, as can be seen in the figure below. You will also be requested to fill out the Leafs tab.

- a. Link width from top of rack The number of cables from each TOR to Leaf
- b. Uplink from top of rack The number of Leafs connected to each TOR
- c. Link width from Leafs The number of cables from each Leaf to Spine

For further information on the VMS topology, you may refer to the VMS Reference Guide at <u>www.mellanox.com</u>, under Products -> Ethernet Switch Systems -> VMS.

 Select the switch members of Spines after choosing the number of ports. The available options for this tier are 12 and 36 ports. For further information on these options, please refer to <u>"Supported Switches per Tier"</u>.

ettings	2 Spines	3 Leafs	(4) TORs	5 Network
Available			Selected	
12-port 40/56Gb	ÞΕ	v	Filter	
Filter			IP	Name
IP	Name		No	selected devices
١	No Avaliable Devices		10 •	
		> < «		

Supported Switches per Tier

Number of Ports	Switch Family	Supported Tier/s
12 ports	MSN2100	TOR/Leaf/Spine
32 ports	MSN2700, MSN3700	TOR/Leaf/Spine
48+8 ports	MSN2410	TOR

4. Select the switch members of Leafs after choosing the number of ports. The available options for this tier are 12 and 32 ports. For further information on these options, please refer to <u>Supported Switches per Tier</u>.

VMS Wizard					×
1 Settings	2 Spines	3 Leafs	(4) TORs	5 Network	
Available			Selected		
12-port 40/56Gb	DE T		Filter		
Filter			IP	Name	
IP	Name		No	selected devices	
N	No Avaliable Devices		10 •		
		» < < «			
Previous					Next

5. Select the switch members for TORs after choosing the number of ports. The available options for this tier are 12, 32, and 48+12 ports. For further information on these options, please refer to <u>"Supported Switches per Tier"</u>.

Settings	2 Spines	Leafs	4 TORs	5 Network
Available			Selected	
12-port 40/560	GbE	¥	Filter	
Filter			IP	Name
IP	Name		No	selected devices
	No Avaliable Devices		10 🔻	
		> < «		
evions				

6. Fill in the "Network" and "Subnet Mask" fields, then click "Finish".

Sottings	O Spinos			6 Notwork	
Jeungs	2 opines	Ledis	- TORS	3 Network	
Subnet					
0.0.0.0					
Subnet Mask					
255.255.255.255					

Once clicked "Finish", a service instance will be created and a service element will appear on the Services main page. A right click on a service element will enable performing different operations. For information on the operations and the service instances in general, please refer to <u>"Service Elements"</u>. A task for the VMS configuration will also be created when clicking "Finish", as described in the step below.

7. A task that contains all the VMS configurations to all switches will be created. Right-click the task and select "Run" to configure all the switches that are part of the VMS.

Tasks

	isks Sequence		
+ Add			
10 🔻			
Action		Description	
Filter		Filter	V
Prov	sioning	P Cloud VMS	
Prov	sioning	Displays cable information of a given inter	fa
Prov	isioning	☺ Setting MTU on interfaces	
O Prov	sioning	💬 Displays the VLAN table.	
Prov	sioning	💬 Enable Docker for Mellanox switches. Red	: o
Prov	isioning	💬 Enable Link Layer Discovery. Recommend	le

In order to delete a configured VMS service:

÷

1. Right-click your configured VMS icon and click "Delete".



2. Click OK when prompted by the following message.



L3 Network Provisioning

The L3 network provisioning service provides a simple provisioning capability for configuring the layer 3 network connectivity. This can be done by selecting the Mellanox switches and defining their IP subnet for inter-switch connectivity. The service will then discover all links between these switches and will allocate a subnet of the length of 30 for each link pair from the subnet provided by the user.

In order to configure the L3 network provisioning service, follow the steps below:

- 1. Click the "Add" button on the right side of the Virtual Modular Switch row.
- 2. Fill in the required information and check the desired checkboxes under the General dialog box:
 - a. Provide a name and description of the service.
 - b. Then in the OSPF Subnet Reservation field, type the subnet used for allocating IP addresses to OSPF areas.
 - c. [Optional] When the "Add Auto-Discovered Switches" checkbox is checked, a notification will be generated, notifying the user of a topology change in the newly created topology/service. For further information, refer to <u>"Notifications"</u>.
 - d. [Optional] Check the "Release Unused Resources" checkbox for unused links to be deallocated within the timeout interval chosen in minutes (the minimum is 15 minutes).
 - e. [Optional] Check the "Auto Configure Switches When Topology Changed" checkbox for auto configuration of devices upon topology changes. When this checkbox is checked, no notification will be generated. Rather, an event will appear under "Events".

Ð	MLAG (0)	L3 Network Provisioning	×
		1 General 2 Members	
Ð	MTU (1)	Name L3Network1	
	MTU1	Description L3_Network_Service OSPF Subnet Reservation 10.0.0 / 16-30	
÷	RoCE (1)	Auto-Discovered Switch Released Unused Resources Auto Configure Switches When Topology changed	
4			
	Virtual Modu		Next

3. Choose the devices to configure the L3 network provisioning service for, and click "Finish".

IP Name switch5 switch3 switch1 switch2	Filter IP Name No items were found
IP Name switch5 switch3 switch1 switch2 switch4	IP Name No items were found
switch5 switch3 switch1 switch2	No items were found
switch3 switch1 switch2	
switch1	
switch2	
switch4	
N	
switch6	
↓ < > 1 to 6 of 6	

Once clicked "Finish", a service instance will be created and a service element will appear on the Services main page. A right click on a service element will enable performing different

operations. For information on the operations and the service instances in general, please refer to <u>"Service Elements"</u>.

MLAG

The MLAG service allows configuring a pair of Mellanox Onyx or Cumulus switches with the following to support multi-chassis LAGs and periodically validates their configuration:

- 1. Switch cluster
- 2. MAGP router and network
- 3. MLAG port channel
- 4. Host bond

In order to configure the MLAG service:

- 1. Click the "Add" button on the right side of the MLAG row.
- 2. In the Cluster tab, select the switch type and IP of the first switch in the cluster. The rest of the fields (including the collapsible Advanced section) will be filled out automatically, with the option to be edited. Note that some fields might not be filled in case there is no appropriate peer switch.
 - ▲ The information in the Cluster tab is mandatory for the creation of the MLAG service, and cannot be changed once the service is created.

Services				_
The "Service" feature e For each type of servic	MLAG Wizard			×
state of the services an	1 Cluster	2 Networks	3 Servers	
	Name			
+ MLAG (MLAG1			
Bring	Description MLAG_Service			
Fe	Switch Type Mellanox ONYX			
+ MTU (1	Switch 1	IPL Ports		
	10.0.0.29	1/1,1/2		
MTU F G	Switch 2	IPL Ports 1/1,1/2		
_	Virtual IP			
+ RoCE (192.168.1.1	/ 24		
DOCE S	Advanced			>
	Apply Configuration			
				Next

3. Under Networks tab, you can manage MAGP networks on the MLAG cluster. Click "Add" to add a new network and fill in the required information, or edit/delete a network using the icons in the rightmost column of the network row.

A Networks are not mandatory for the MLAG service creation. They can be added, edited or removed after the service has been created.

Cluster	2 Networks	Servers	
Add Network			
Network Name			
Enter Network Name			
Subnet Address			
0.0.0.0 / 24			
VLAN ID			
101			
DHCD Delay			
DHCP Relay			
DHCP Static IP			
DHCP Server IP			
0.0.0.0			
Advanced			
			Save

- 4. Under Servers tab, you can manage the connectivity between the MLAG switches and the Linux hosts the MLAG switches are connected to. This includes both switch side configuration and (optionally) the host side bond creation. When first accessing this tab, it will be initialized with connected servers that NEO has already identified. Click "Add" to add a new server and fill in the required information, or edit/delete a server using the icons in the rightmost column of the server row.
 - A Servers are not mandatory for the MLAG service creation. They can be added, edited or removed after the service has been created. However, if you define a server, you also need to define the network it belongs to in the Networks tab.

Cluster	2 Networks	(3) Servers	
Add Server			
172.20.203.51 Members			
Select Ports	ø		
172.20.203.50 Members			
Select Ports	ø		
Network			
•			
MI AG Port Channel			
 Host Configuration 			
			A

Once clicked "Finish", a service instance will be created and a service element will appear on the Services main page. A right click on a service element will enable performing different operations. For information on the operations and the service instances in general, please refer to <u>"Service Elements"</u>.

When NEO discovers an MLAG configured on the switches, it will automatically create a service for it.

MTU

The MTU service allows configuring an interface MTU on specified Mellanox Onyx switches to a desirable value and periodically validates their configuration.

In order to configure the MLAG service:

1. Click the "Add" button on the right side of the MTU row.

2. Fill in the name, description, and MTU fields.

Services			
The "Service" feature e For each type of service	MTU Wizard		×
state of the services an	1 General	(2) Devices	
_	Name		
+ MLAG (MTU2		
л	Description		
	MTU_Service		
+ MTU (1)	MTU Size		
	Please insert a number		
мти <i>У</i> С			
+ RoCE (2			
_			
RoCE			
0 عر			
+ Virtuel N			
Virtuari			
MAS	 Apply Configuration 		
VMS			
			Next

3. Choose the device to configure the MTU service for, and click "Finish".

Available	c	alacted
	3	
10 •	1	0 •
Name ↑ IP	1	Name ↑ IP
Σ Γ		Σ Γ
switch-058d0c 172.20.203.50		
switch-9f2c62 172.20.203.51	>	
switch-c7fe70 172.20.203.53		No items were found
switch-c7ff58 172.20.203.54	>	
	<	
1 to 4 of 4 🛛 < 🕓 Page 1 of 1 🔶 🖂	~	0 to 0 of 0 🛛 < Seq Page 0 of 0 🔅 😒

Once clicked "Finish", a service instance will be created and a service element will appear on the Services main page. A right click on a service element will enable performing different

operations. For information on the operations and the service instances in general, please refer to <u>"Service Elements"</u>.

RoCE

RDMA over Converged Ethernet (RoCE) is a network protocol that allows remote direct memory access (RDMA) over an Ethernet network. It is mainly useful for network-intensive applications like networked storage or cluster computing, which require a network infrastructure with high bandwidth and low latency.

RoCE can be configured in the following configuration types: ECN only, ECN with QoS, and ECN with QoS and PFC.

To allow the network to use RoCE, both switches and hosts should be configured appropriately. The service allows one of the following modes to specify the devices to configure:

- 1. All host ports configures all network starting from the hosts' ports, through their directly linked switch ports, and including ports interconnecting switches.
- 2. All switch ports configures all ports and LAGs on all network switches applicable for RoCE. Does not include host ports.
- 3. Custom selection allows the user to specifically define which devices will be configured. If this option is selected, the wizard will include another step to define the devices. Each device can be defined as:
 - a. Host In this mode you select the specific host interfaces that you wish to configure. These interfaces must be linked to a supported switch. The switch interfaces that are directly connected to the host interfaces will also be configured.
 - b. Switch In this mode you select the specific switch interfaces that you wish to configure. These can also be LAGs or MLAGs.

In both modes you can select the "Configure inter-switch links" option to configure all the switch interfaces that are connected to the selected devices. For example, if you specify the leaf switches and select this option, the interfaces that connect the leaf switches to the spine switches or between different spine switches will also be configured.

For Windows hosts, the interface connectivity is not automatically detected. Therefore, the switch interfaces that are directly connected to the host interfaces will not be implicitly configured, and the "Configure inter-switch links" option is not relevant. You must explicitly create another RoCE service for the switch ports you wish to configure. This is relevant in case you select the "all host ports" option, or define hosts in the "Custom selection" option.

Editing RoCE Service

In case you have specified the configured devices explicitly, using the "Custom selection" option, you can edit the RoCE service to add or remove devices and interfaces to/from your configuration. However, you will not be able to change the network configuration type, the configuration parameter values or the device type to be configured (host/switch).

Removing a switch interface does not remove the RoCE configuration that is already assigned to it until the user applies the changes.

Requirements

Before configuring RoCE using NEO, make sure your network fulfills the following requirements:

- Host
 - The host should have a ConnectX-4 or ConnectX-5 NIC installed.
 - The host should have NEO-Host v1.3 and above installed.
 - Linux host should have a MLNX_OFED version compatible with NEOHost installed.
 - For Linux host, the configuration will only run on ports that NEO identifies as links to an applicable switch.
 - Linux host should have Link Layer Discovery Protocol Agent Daemon (LLDPAD) package installed.
 - Windows host should have a Windows Server 2016 operating system and WinOF2 v2.0 and above installed.
- Switch
 - The switch should be either a Mellanox Spectrum, a Cumulus or a 3232C/3231Q Cisco switch.
 - Mellanox switch should have Mellanox Onyx OS of v3.6.5000 and above installed.
 - Cumulus switch should have operating system v3.5 and above installed.
 - The cables should support 100G rate.
 - The ports speed should be configured to 100G.

Limitations

• Host: The configuration is non-persistent. Rebooting a host requires reconfiguring it.

RoCE Configuration

In order to configure RoCE,:

- 1. Click the "Add" button on the right side of the RoCE row.
- 2. Name your service and check/uncheck the QoS and PFC checkboxes, as desired. Select which devices will be configured by this service. In the Advanced section you can also alter the configured value for certain parameters, depending on the RoCE configuration you choose. The "Apply Configuration" checkbox defines whether configuring the devices will start immediately upon clicking the "Finish" button.

Services		
RoCE	×	
For each type of service, serv state of the services and of the		
(1) General	(2) Members	
Name		
RoCE2		
+ MLAG (0)		
Please Enter RoCE Service Description	חנ	
+ MTU (1) Notwork Configuration		
FCN Oos	PEC	
Members:		
All links All switch ports	Custom selection	
Advanced	>	
Û		
+ RoCE (1)		
RoCE1 ⊁ ⊙		
Apply Configuration		
	Finish	
+ Virtual Modular Switch (1)		

3. If you choose to explicitly define the devices to be configured with the "Custom selection" option, use the Members tab to define the devices and the interfaces that will be configured by the service. You can select either hosts or switches.

OCE Ceneral Members type: Host Switch	2 Members	
Configure inter-switch links Available Hosts	Available	Selected
Filter	Name 🔺	IP Port
IP Name No Hosts Found	10 -voliable Ports	10 velected Ports
Apply Configuration Previous		Finis

nbers type:	Host Switch			
Available Sw	itches	Available		Selected
Mellanox	Specturm 🔻	Filter		Filter
Filtor		Name		ID Port
IP .	Nama	No Available Ports		No Selected Ports
10 0 0 25	nume	40		10
10.0.0.25	switch?	10 •		10 +
10 0 0 27	switch3		>>	
10.0.0.28	switch4		>	
10.0.0.29	switch5			
10.0.0.30	switch6		<	
10.0.0.123	CL1-AHV-NTNX-1		~	
10.0.0.124	CL1-AHV-NTNX-2			
10.0.0.138	r-cloudx4-03.mtr.labs.mlnx			
10.0.0.158	gen-r-vrt-058.mtr.labs.mlnx			
10 •	< > 1 to 10 of 10			

Once clicked "Submit", a service instance will be created and a service element will appear on the Services main page. A right click on a service element will enable performing different operations. For information on the operations and the service instances in general, please refer to <u>"Service Elements"</u>.

In order to delete a configured RoCE service:

1. Right-click your configured RoCE icon and click "Clea-n Up".



2. Click OK when prompted by the following message.

You are about to remove configuration from the switch/switches. Do you	want to cor	tinue?
	Cancel	ОК

Service Elements

The service elements are colored squares that stand for service instances and appear in the Services main page once a service type is created.



1. Elements Colors: The color of a service element varies mainly according to the service instance's last configuration status. However, when the service's status is "Monitoring", the color will be determined according to the service instance's last validation status.

lastConfigurationStatus	Color
Initializing	Blue
Idle	Grey
InitializingFailure	Red

Colors According to the Last Validation Status

lastConfigurationStatus	lastValidationStatus	Color
Monitoring	Unknown	Grey
	Completed	Green
	Completed With Errors	Red

- 2. Colors According to the Last Configuration Status
- Element Operations: A right-click on a service element will enable configuring the service by selecting "Apply Configuration". Other operations may also be available for a service element depending on its status, see details in the table below.



Available Service Element Operations

Status	Operations Available	Operations Description		
Initializing	None	N/A		
Idle Apply Configuration		Configures the service. Once the configuration is applied, the service status will automatically change to "Monitoring", and start periodic validation. Only once the configuration is applied, the "Validate" and operation will become available.		
	Apply Changes	Available if the service has been edited since applying the configuration. Applies only the configuration changes.		
Clean-up		Cleans-up the configuration done by the service. Once the configuration is cleaned, the service status will automatically change to "Idle", and stop periodic validation. Previous configuration and validation status will be reset.		
		Clean-up is currently supported for RoCE and MLAG service types on Onyx and Cumulus switches.		
		MLAG clean-up is only supported for MLAG services created in NEO 2.6 and above.		
		After MLAG clean-up is performed, MPO VLAN, IP routing, IP DHCP relay instance, LACP, and protocol MAGP configuration will remain on Mellanox Onyx switches. For Cumulus switches, only the MPO's VLAN configuration remains.		
	Validate	Validates the configuration of the service.		
	Start	Starts a periodic validation of the service (default interval is 30 minutes). This will change the status to "Monitoring".		
	Delete	Deletes the service.		
	Show Properties/ Edit Service	Shows the information filled when the service was created. Some service types can be edited.		

Status	Operations Available	Operations Description
Initializing	Delete	Deletes the service.
Failure	Show Properties	Shows the information filled when the service was created.
Monitoring	Stop	Stops a periodic validation of the services. This will change the status to "Idle".
	Show Properties/ Edit Service	Shows the information filled when the service was created. Some service types can be edited.

- Device configuration backup: Before configuration changing operations (Apply Configuration, Apply Changes, Clean-up: see table above), a network snapshot will be created for all the devices that are about to be configured. This snapshot can be used to revert to the original device state if the configuration fails, or if it has unwanted implications. If the snapshot creation fails the operation will not run.
- Element Icons: Each service element contains the following (example:



- The name of the service
- The wrench icon if the last configuration status of the service was "Unknown"
- The clock icon if the service state is Monitoring
- The spinner icon if the service is going under a validation or configuration process at the moment
- Element Information: When hovering over an element, the following information will be displayed:
 - The service's "state"
 - The service's "last configuration status"
 - The service's "last validation status"
- Service Details Modal: When clicking a service element, a modal with more details about the service will appear. The modal consists of three tabs:
 - "Service Details" tab lists the service type, the time it was created, the time it was last updated, the last validation status and time, and the last configuration status and time.
MTU1

Service Details	Validation Heatmap	Configuration Heatmap	
Type: Created: Last update: Last validation st Last validation tir Last configuration	MTU 2020-03 2020-03 atus: Comple ne: 2020-03 n status: Comple n time: 2020-03	-03 15:18:23 -03 15:19:04 ted -03 15:19:50 ted -03 15:19:04	

If the service initialization fails, an error message will be added to the bottom of Service Details list.

• "Validation Heatmap" tab - provides a validation heatmap of the service devices, colored according to their validation job status (Completed - Green, Completed with Errors - Red, Unknown - Grey). When clicked on a device, more details about its IP and name (and the relevant errors if there are any) will be displayed.

rvice Details	Validation H	leatmap Config	uration Heatmap	
Total	: 5	Error :2	N/A :0]
Sys	stem:10.224.15 me:ufm-switch1	.89 9		
Sys Nar Err	stem:10.224.15 me:ufm-switch1 ors:	.89 9		
Sys Nai Errr sho rou	stem: 10.224.15 me:ufm-switch 1 ors: ww.protocols in ting priority-flow	.89 9 clude '(lacp mlag spa -control)'	inning-tree IP	
Sys Nar Err sho rou spa	stem: 10.224.15 me:ufm-switch1 ors: ww protocols in ting priority-flow unning-tree disa	.89 9 clude '(lacp mlag spa -control)' bled	nning-tree IP	

• "Configuration Heatmap" tab - provides a configuration heatmap of the service devices, colored according to their configuration job status (Completed - Green, Completed with Errors - Red, Unknown - Grey). When clicked on a device, more details

MLAG	6_Service_	_1		х
Service	Details Valida	tion Heatmap	Configuration Heatmap	
	Total : 5	Error :0	N/A : 0	
	System: 10.22	24.14.86		
	Name:switch-	ec4034		

about its IP and name (and the relevant errors if there are any) will be displayed.

Configuration Management

Configuration Management manages network configurations and provisioning templates.

Network Snapshots

Network Snapshots manages configuration snapshots of the switches, by creating and restoring snapshots when needed. NEO takes an automatic snapshot once a day (system snapshots), and maintains the last seven snapshots (taken over the last seven days). Users can also create snapshots (user snapshots), and manage them by performing a number of actions detailed below.

Network snapshots are saved configuration files captured at a certain point of time. These snapshots can be later used to restore a previous state of the network.



Tab Components

Using this tab, users can manage network snapshots by viewing, editing, creating, importing, deleting, copying, and restoring them.

Configurations								
Network Snapshots Glob	al Configuration Provision	ning Templates						
1 + New 2 ± Upload	File							
3 2 1 13 Dec, 2020 13 Dec, 2020 0220 0302	,					4 5 ^{13 Dec,} 185	1 1 2020 4 Dec, 202014 Dec, 08:43 08	2 202014 Dec, 2020 47 18:59
7 Snapshots				87	8Devices			
10 🗸					10 🗸			12 O Restore
Name	Created 4	Description	No. of Devices			Name	IP	Configuration
Filter V	Filter V	Filter V	Filter	∇		Filter	7 Filter	V
🔳 🛗 system_config_20	2020-12-14 18:59:01	-	2			r-dmz-ufm-sw60	10.209.38.155	10 🖃 🛓
RoCE1_2020-12-14	2020-12-14 08:47:33	⊜Snapshot taken befo	1		9	ufm-switch26	10.209.38.131	e 🛓
RoCE1_2020-12-14	2020-12-14 08:43:05	⊜Snapshot taken befo	1					11
🛗 system_config_20	2020-12-13 18:59:00		2					
network_snap	2020-12-13 03:02:50		1					ito z or z in incleage i or i i z i zi
MLAG1_2020-12-13	2020-12-13 02:20:13	⊜Snapshot taken befo	2					
		1 to (6 of 6 K ≤ CPage 1 of 1 ⊃	· >				

Network Snapshots Tab Components

ħ	t Name	Description
1	New Button	Enables users to create new user snapshots.
2	Upload File Button	Enables users to upload local tar (compressed) snapshot files.

#	Name	Description
3	Snapshots Timeline	Displays snapshots in a chronological order in the form of a bar chart. This timeline is linked to the snapshots table, as when a snapshot is selected from the table, it will be highlighted in the timeline, and vice versa.
4	Devices Count	The number of devices that are included within a snapshot. It is also used to represent the height of the bar.
5	Snapshot Date	The date on which the snapshot was taken. Appears below the snapshot.
6	Snapshots Colors	System snapshots are green-colored, while user snapshots are blue-colored.
7	Snapshots Table	Lists all system (^m) and user (^o) snapshots. The format of a system snapshot is: "system_config_yyyy-mm-dd_hh-mm-ss".
8	Devices Table	Lists all devices of which configurations have been saved in the selected snapshot from the Snapshots table.
9	Disabled Row	A switch that was once part of the system and was included in the snapshot, but no longer exists. This switch's configuration cannot be restored, but users can view or download its saved configurations.
1 0	View Icon	Displays configuration output of the corresponding switch.
1 1	Download Icon	Downloads the saved configuration of the switch to the user's computer.
1 2	Restore Button	Enables restoring the configurations of the selected switches.

To take a new snapshot of specific systems:

- 1. Click the "New" button.
- 2. Provide a name and description of the snapshot, and move the systems you want to be part of the snapshot to the rightmost table:

Name	Network snapshot name		
Description	Snapshot Description		
] In case of	failure, save anyway		
Available D	Devices		Selected Devices
All	~		10 🗸
10 🗸			Name ↑ IP
Name 🕆	IP		Filter
Filter	▼ Filter		No Devices Found
r-dmz-u	fm-sw60 10.209.38.155	>	
ufm-swi	tch26 10.209.38.131	>	
	1to2of2 K ⊂ Page1of1 > ⊃C	< «	0 to 0 of 0 👘 🤇 Page 0 of 0 🔿 🗩

Note the following:

- The snapshot name must be a unique non-whitespace name
- Snapshot description is optional
- When the failure checkbox is checked, snapshots will be created even if not all of the switch's configurations were taken successfully. When it is unchecked, the snapshot will only be created if all of the switches' configurations were taken successfully.
- 3. Click "Create". A new bar will be added to the right side of the timeline.

Restoring Snapshots

The main goal of taking network snapshots is to help retrieve certain switches' configurations in case errors/misconfigurations take place. Previously saved snapshots of switches' running configurations can be restored and applied on these switches.

To restore a snapshot:

- 1. Select the desired snapshot from the Snapshots table.
- 2. Select the switches that you would like to store their configurations from the Devices table.
- 3. Click "Restore". A pop-up will bring to attention the seriousness of the restoration process, and will prompt choosing either to backup and restore, or to restore only:



- 4. Backup snapshots are taken right before restoration and capture the currently running configurations. The name format of these backup snapshots is: system_config_yyyy-mm-dd_hh-mm- ss_Auto_Snapshot. The backup snapshot will immediately be added to the Snapshots table. Once the backup process is successfully completed, the restoration process will take place.
- 5. Click "Backup & Restore" or "Restore". The restoration process will start.

Snapshots Actions

A right-click on a snapshot from the Snapshots table will enable performing the following actions:

- Remove : Deletes the selected snapshot. Only user snapshots can be deleted by users. System snapshots are deleted automatically seven days after their creation.
- Download : Downloads the selected snapshot to the user's computer as a tar/compressed file.
- Save Copy: Copies the selected snapshot and prompts the user to add a new different name:

New Snapshot Name:

Network snapshot name			
		Cancel	Save

Global Configuration

Global Configuration manages global configuration files. These global files are not necessarily associated with a specific system in NEO, and are editable text files to which variables can be added, and contain a list of configurations that can later be applied on specific systems.

X

Configuration Management

Network Snapshots	Global Configuration	n Provisioning Templates			
🕹 Upload File					
10 •		Insert Command	?	Global Variables	?
Name 1		Conveh			
Filter	♥	Search	Q		
		Description		Specific Variables	?
No Rows To	o Show	Type sequence of configurations here			
0 to 0 of 0	Page 0 of 0 → →	Reset S	ave As Save Validate		

Tab Components

Using this tab, users can manage configuration files by viewing, editing, creating, validating, and deleting them and their variables (if applicable).

Configuration Management		
Global Configuration Provisioning Templates	Network Snapshots	
± Upload File 1		
10 🔻	Insert Command	? Global Variables 9
Name ↑	Search 7	α MTU Value 🔒
	Sets interface MTU force 6	
2 ≥ Download 3	net add < <interface_type>> <<interface_name>> mtu <mtu> [\$? -eq 0]][exit\$?; # exit for none-zero return code</mtu></interface_name></interface_type>	Specific Variables 10
	net commit [\$7 -eq 0] { rc=\$?;net abort;exit \$rc;}; # exit for none-zero return code evido indexe face name>>>	Interface Type
	sudo ifup < <interface_name>></interface_name>	Interface Name Interface name
	5	
1 to 1 of 1	8 Reset Save As Save Va	Validate

Global Configurations Tab Components

#	Name	Description
1	Upload File Button	Enables users to upload local .txt configuration files.
2	Configuration Files Menu	Displays all available global configuration files (files can be filtered for using the Filter field).
3	Download Icon	Enables users to download configuration files to the File System in .txt format.
4	Delete Template Icon	Enables users to delete configuration files from NEO.
5	Configuration Text Box	An editor that enables users to type in a list of configurations in separate lines and add global/specific variables.

#	Name	Description
6	Description Field	An editable field that describes the configuration file.
7	Search Field	Enables users to search for specific data that will be highlighted in the configuration text box below if any match is found.
8	Editor Buttons	Reset: Clears the text box, description and variables forms.
		Save As: Enables saving a newly created configuration file.
		Save: Keeps the edits on the currently selected file.
		Validate : Inserting any changes to the text box, description field or variables forms needs to be validated before continuing.
9	Global Variables Menu	A global variable is a single value given to all switches in the system. This field is comprised of all global variables defined in the configuration file. These variables appear in the configuration text box in bold , and are enclosed between angle brackets (for example: <variable1>).</variable1>
1 0	Specific Variables Menu	A specific variable is a single value given to a single switch in the system. This field is comprised of all specific variables defined in the configuration file. These variables appear in the configuration text box in bold , and are enclosed between two angle brackets (for example: < <variable1>>).</variable1>
1 1	Variable Name Field	A label before the field denoting the name of the variable.
1 2	Variable Description Field	An editable field that describes the variable.
1 3	Delete Variable Icon	Removes the variable from the configuration file.

To edit an existing configuration file:

- 1. Choose the configuration file from the list available on the left pane. It will be loaded into the middle pane, and variables, if found, will be loaded into the right pane.
- 2. Make the necessary edits.
- 3. Click "Validate".
- 4. Click "Save"/"Save As".

To create a new configuration file:

- 1. Make sure the editor is cleared by clicking "Reset".
- 2. Start typing a list of configurations in separate lines, and provide a description to the new file.
- 3. Click "Validate".
- 4. [Optional] Add a description to the variables (if applicable), then validate the changes again.
- 5. Click "Save As". You will be prompted to add a name and choose a system type. If the system type is "Mellanox", you may choose a system profile as well.

Provisioning Templates

The "Provisioning Templates" view enables you to edit existing commands or create new ones.

Configuration Management						
Network Snapshots Global Configuration	Provisioning Templat	tes				
Template Name 🗅	=		Insert Command ?	Global Variables		?
Filter	7		((
			Adding VLAN to switch	VLAN ID	Number of VLAN to create	İ
			cli session prefix-modes enable	VI AN Name	Textual name for the VLAN	m
Add-Port-To-LAG			vlan <vlan_id></vlan_id>			
I Add-VLAN			vlan <vlan id=""> name "<vlan name="">"</vlan></vlan>			
Add-VLAN-To-OSPF-Area				Specific Variables		2
Add-VLANs				Specific variables		· · · ·
Add-VXLAN						
Agent-Active-Ports-Update						
Agent-Interval-Factor-Change						
Agent-Port-Channel-Discovery						
1 to 10 of 201	Page 1 of 21 > >I		System Type : minxos_switch (Profile : Ethernet)			
			Reset Save as template Validate			

Tab Components

Using this tab, users can manage provisioning templates by viewing, editing, and creating them.

Configuration Management						
Network Snapshots Global Configuration	Provisioning Templates					
Template Name 1	=	Insert Command	?	Global Variables 5		?
Filter	7	2	1			
Check-Lossless-Fabric		Adding VLAN to switch		VLAN ID	Number of VLAN to create	<u> </u>
 Linux-Check-Lossless-Fabric 		cli session prefix-modes enable	3	VI AN Name	Textual name for the VLAN	
Add-Port-To-LAG		vian <vlan_id></vlan_id>	-	VLAN Name		
I Add-VLAN		exit				
		Vian svean TD> hame "svean hame>"		Contraction of the second s		
Add-VLAN-To-OSPF-Area		Vian <vlain_id> hame <<vlain_hame></vlain_hame></vlain_id>		Saurifa Variables 7	,	
Add-VLAN-To-OSPF-Area Add-VLANs		vian «vian_iD» name «vitan_name».		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VXLAN		viai «VLAV_ID» name «VLAV_name».		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VXLAN Agent-Active-Ports-Update		viai «vLAN_US name «vLAN_names»		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VXLAN Agent-Active-Ports-Update Agent-Interval-Factor-Change		van «vLav_Us name «vLav_Tames»		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VXLAN Agent-Active-Ports-Update Agent-Interval-Factor-Change Agent-Port-Channel-Discovery		van «vLav_lu» name «vLav_name».		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VXLAN Agent-Active-Ports-Update Agent-Interval-Factor-Change Agent-Port-Channel-Discovery 1 to 10 of 201	2age 1 of 21 → →1	van «vLaw_lu» name «vLaw_name».		Specific Variables 7	,	?
Add-VLAN-To-OSPF-Area Add-VLANs Add-VLANs Add-VXLAN Agent-Active-Ports-Update Agent-Interval-Factor-Change Agent-Port-Channet-Discovery 1 to 10 of 201 IC F	Page 1 of 21 > >1	Vian < VLAN_U2> name < VLAN_name>> (System Type : minxos_switch) (Profile : Ethernet)		Specific Variables 7	,	?

Provisioning Templates Tab Components

#	Name	Description
1	Provisioning Templates Menu	Displays all available provisioning templates (templates can be filtered for using the Filter field).
2	Description Field	An editable field that describes the provisioning template.
3	Templates Text Box	An editor that enables users to type in a sequence of commands and add global/specific variables.
4	Editor Buttons	Reset : Clears the text box, description and variables forms.
		Save as template : Enables saving a newly created provisioning template.
		Validate: Inserting any changes to the text box, description field or variables forms needs to be validated before continuing.
5	Global Variables Menu	A global variable is a single value given to all switches in the system. This field is comprised of all global variables defined in the provisioning template. These variables are enclosed between angle brackets (for example: <variable1>).</variable1>
6	Delete Variable Icon	Removes the variable from the template.

#	Name	Description
7	Specific Variables Menu	A specific variable is a single value given to a single switch in the system. This field is comprised of all specific variables defined in the provisioning template. These variables are enclosed between two angle brackets (for example: < <variable1>>).</variable1>

In order to edit existing templates:

1. Choose the Template Name you wish to edit from the list on the left pane of the window, and edit it in the middle pane.

Configuration Management					
Global Configuration Provisioning Templates Netwo	ork Snapshots				
10 •	Insert Command	?	Global Variables		
Template Name 1	Adding part to LAC			Number of LAC to create or add to	
Filter V	Adding pointo EXG		LAG ID	Number of EAG to create of add to	
	cli session prefix-modes enable		Interface ID	Number of interface to add to LAG	8
❷ Linux-Check-Lossless-Fabric	exit				
⊖ Linux-Check-VPI-Port	interface ethernet <interface_id> channel-group <lag_id> mode active</lag_id></interface_id>				
Add-Port-To-LAG			Specific Variables		
Add-VLAN					
Add-VLAN-To-OSPF-Area					
Add-VLANs					
Add-VXLAN					
Agent-Active-Ports-Update	System Type : minxos_switch (Profile : Ethernet)				
Agent-Interval-Factor-Change	Reset Save as template Valid	ate			

2. Click "Validate", then "Save as template". You will then be requested to insert a Template Name and System Type.

Template Name	
System Type	
Mellanox Switch	¥
System Profile	
No Profile	T

If your system type is "Mellanox Switch", you will be asked to select the "System Profile".

To add a new template:

1. Make sure the editor is cleared by clicking "Reset".

2. Insert a new command and its description:

Configuration Management			
Global Configuration Provisioning Templates	Network Snapshots		
10 🔻	Insert Command	?	Global Variables
Template Name 1			
Filter 🗸 🗸	Description		
	show snmp		Specific Variables
⊘ Linux-Check-Lossless-Fabric			
❷ Linux-Check-VPI-Port			
Add-Port-To-LAG			
Add-VLAN			
Add-VLAN-To-OSPF-Area			
Add-VLANs			
Add-VXLAN			
Agent-Active-Ports-Update			
Agent-Interval-Factor-Change	Reset	Save as template Validate	

3. Click "Validate", then "Save as template".

To run a set of commands with certain values on multiple devices in parallel, and/or with different values per device:

 Choose the devices you wish to run these commands on from "Devices" under "Managed Elements", right-click on them and click "Provisioning".
 Devices

Add			
			2
All	v 10 v		
Name	IP	System T ↓	Status MAC
Filter V	Filter V	Filter V	Filter V Filter V
🔳 switch-05	🖸 172.20.203.50	🖀 MSN2100	B8:50:0E:62:3 D:
🔲 switch-9f	🖸 172.20.203.51	🖀 MSN2100	
localhost	172.20.203.13	🗮 Red Hat K…	
localhost	172.20.203.20	📑 HP ProLia…	
lab5	172.20.203.5	🗮 Red Hat K…	
localhost	172.20.203.12	📑 Red Hat K…	Remove
localhost	172.20.203.2	🔳 IBM Syste…	Acknowledge
			History Monitoring
			🛃 Live Monitoring
			টো Add To Group
			Add To Site
			🛓 Generate Dump

2. Choose your template:

set Command Description Type sequence of commands here		2	Global Variables
serCommand Description Type sequence of commands here		7	Global Variables
Description Type sequence of commands here			
Type sequence of commands here			
		Reset Apply	
elected Devices			
IP	Name		Profile
直 10.0.0.26	switch2	E	themet
ā 10.0.0.27	switch3	E	themet
10.0.28	switch4	E	themet
Jpdate Device Information			
ake Running Config Snapshot			
Configuration Write			

3. Set the global and local variables, then click "Start" or "Create Task":

Provisioning									
Templates									
Edit Command					?	Global Variables 🧲	$\langle \neg \rangle$		
Configure general MLAC	G settings and IPL (run o	n both switches)				IPL IP Prefix	Subnet prefix for IPL interfaces (0-32)	Û	
System Type : minxos	_switch Profile : Ethe	ernet				MLAG VIP	Virtual IP address for MLAG	ŵ	
						MLAG VIP Prefix	Subnet prefix for MLAG Virtual IP (0-32	畲	
						MLAG System	Virtual System MAC	â	
						MAC			
						VLAN ID	VLAN Interface ID for IPL (1-4094)	Û	
Selected Devices									
IP	Name	Profile	IPL LAG ID 📋	IPL Port Range	IPL IP Addre	ss 🗊	IPL Peer IP Address	Û	
10.0.26	switch2	Ethernet	Insert Data	Port range to use for IPL	IP Address of IPL Interface		IP Address of peer IPL Interface		
10.0.0.27	switch3	Ethernet	Insert Data	Port range to use for IPL	IP Address of IPL Interface		IP Address of peer IPL Interface		
10.0.0.28	switch4	Ethernet	Insert Data	Port range to use for IPL	IP Address of IPL Interface		IP Address of peer IPL Interface		
 Update Device Informa Take Running Config S 	tion inapshot								
Configuration Write									
Start Create Task									

Telemetry

Monitoring

Telemetry may be used to monitor the success and faults of the network and its operations. The initial view lists the saved reports. Administrators can view all saved reports, while standard users can only view the reports they create. A right-click on a specific report opens a menu with the options to load the report or delete it from the list. Multiple reports can be selected and deleted at

There are four types of reports that users can generate:

- History Monitoring
- Live Monitoring
- Performance
- Snapshot

The monitoring actions can be performed from multiple windows:

- Managed Elements --> Devices --> Right-click on one or more devices
- Managed Elements --> Ports --> Right-click on one or more ports
- Managed Elements --> Groups --> Right-click on a group (available only for History Monitoring)
- Telemetry streaming refer to <u>History Monitoring</u> and <u>Live Monitoring</u> sections below.

History Monitoring

Provides a report of the device attributes values history.

To create a history monitoring report:

1. Click the History button.

2. Choose the devices or ports you wish to generate a report for under "Members" (available objects: device, port).

lembers Attribute	S				
Select Members	Type: Device Port				
Available Devices			Selected Devices		
IP T	Filter		IP v	Filter	
IP	Туре		IP	1	уре
172.20.203.50	📥 MSN2100		N	Device Selected	
172.20.203.51	💒 MSN2100		Showing 0 to 0 of 0 de	evices	< >
172.20.203.52	🚵 Mellanox Switch				
172.20.203.53	📥 MSN2100	>			
172.20.203.54	🚵 MSN2100	>			
Showing 1 to 5 of 5 de	evices < >	<			

3. Check the checkboxes of the attributes you wish to monitor their values (available attributes are listed in the table_below), and define the time frame of the report (over the last hour,

day, week or month).

eate History Monitoring Session
lembers Attributes
Last: Hour Traffic Errors Memory Metrics CPU Metrics
 In Bandwidth Rate Out Bandwidth Rate
 In Packets Rate Out Packets Rate
revious Finish

History Monitoring Available Attributes

Available Objects	Available Attributes
Devices	Counters
	Errors
	Memory Metrics
	CPU Metrics
Ports	Counters
	Errors

4. Once clicked "Finish", the report will be generated.

mory Free				
7000				
6000				
5000				
₽ 4000				
3000				
2000				
1000				
0	20:06:00	20:06:20	20:06:40	20:07:00
		Time		
10 209 24 39				

For saving the generated reports, see <u>"Saving Reports"</u>.

Live Monitoring

Provides a live report of the device attributes values.

To create a live monitoring session:

- 1. Click the button.
- 2. Choose the devices or ports you wish to generate a report for under "Members" (available objects: device, port).

Select Members Type: Available Devices	Device Port		Selected Devices		
	Filter		IP V	Filter	
IP Type 172.20.203.50 ▲ MSN2100			IP N	o Device Selected	ybe
172.20.203.53 172.20.203.54 Showing 1 to 4 of 4 devices	Image: Mission 100 Image: Mission 100	> > <	Showing 0 to 0 of 0 d	evices	< 2

- 3. Check the checkboxes of the attributes you wish to monitor their values (available attributes are listed in the table_below), and define the interval of the monitoring (the minimal monitoring interval can be as low as 2 seconds).
 - ▲ The minimal interval of 2 seconds applies to Spectrum and SwitchX switches, while for other devices, the minimal interval is 20 seconds for ports, and 5 seconds for devices.

Create Live Monito	ring Session	×
Members Attributes	8	
	Interval: 5 Seconds Memory Metrics CPU Metrics	
	Memory Total Memory Used	
Previous		Finish

Live Monitoring Available Attributes

Available Objects	Available Attributes
Devices	Memory Metrics
	CPU Metrics
Ports	Counters
	Errors

4. Clicking Finish starts the monitoring session.

For saving the monitoring session, see "Saving Reports" section.

Live Monitoring is not supported for third party switches (non-Mellanox switches), but is supported for the ports of those switches.

Saving Reports

The generated reports can be saved or printed by clicking on the designated buttons.

Last Hour Report



x Export to CSV

- A Report Title can be composed of 4-20 alphanumeric characters, as well as "_" (underscore) and "-" (dash). See <u>"Appendix - Mellanox NEO GUI Fields Validations"</u>.
- The Report Description field is optional, and can contain an unlimited number of characters.

S	ave Report	×
	Report Title	
	Daily_Report Report Description	
	description (optional)	
	Close Save	

- Users can save a report within 30 minutes from its creation time.
- Once a report is generated, it can be exported to a CSV file.
 - If the report was generated for multiple devices the CSV file can only be created if each graph contains a single device ("Group by Counter" checkbox on the left side of the graph is unchecked).
 - If the report was generated for a single device the option of creating a CSV file will automatically become available.

Last Hour Report

A Print Save	10.209.24.82 Out Octe	ets Rate						
☑ All								
₩ 10.209.24.02	0.8							
	8. 0.6 99 0.4							
	0.2							
	0.0	10:41:40	10:50:00	10:58:20	11:06:40 Time	11:15:00	11:23:20	11:31:40
	Export to CSV							

- Removing temporary reports is done by a garbage collector mechanism that is activated every 5 minutes.
- By default, the maximum number of reports that can be saved is 200, while each user can save up to 20 reports (the administrator can keep saving reports even after reaching the 20 report limit, but once the system's 200 report limit is met, no additional reports could be saved, unless reconfiguration is performed).

To configure the maximum number of reports to save:

- 1. Open the /opt/neo/controller/conf /controller.cfg file.
- 2. Find the Report section.
- Set the maximum allowed number of saved reports in the system by changing the max_reports_per_system value (the default is 200).
- 4. Set the maximum allowed number of saved reports per user by changing the max_reports_per_user value (the default is 20).
- 5. Restart Mellanox NEO-controller.

To configure the report's garbage collector cycle interval:

- 1. Open the /opt/neo/controller/conf /controller.cfg file.
- 2. Find the Report section.
- 3. Set the garbage_collector_interval value to the desired number (the default is 5 minutes).
- 4. Restart Mellanox NEO-controller.

Streaming

Streaming is supported on Spectrum systems with either Onyx or Cumulus operating systems.

Predefined Sessions

For every Telemetry Agent controlled by Mellanox NEO, the sessions below are defined by default:

- WJH
- Interface Counters
- Buffer Events

By default (when Telemetry Agent is started on the switch) only "Interface Counters" session is enabled (activated).

These sessions retrieve information for various NEO views. They cannot be edited or deleted, and devices will be automatically added to/removed from them according to their telemetry capability. Some of them can be enabled or disabled by need.

To perform an action on an added session, right-click on it, and select "Disable/Enable", "Modify Members" or "Delete".

The default streaming sessions are:

)	Streaming					
≜		Sessions					C
Dashboards	>	10 🔻					
Managed Elements	>	Name ↓	Collectors	Profile	Interval	Status	State
📥 Network Map		Filter V	Filter V	Filter V	Filter V	Filter 7	Filt V
🗲 Services		WJH	🖋 NEO DB	Default	5	0	0
Configuration Management		Interface Counters	🖋 NEO DB	Default	5	0	0
Lat Telemetry	~	Buffer Events		Default	5		0
Monitoring	0				1 10 3 01 3	Fage	
Snapshots							
Streaming							

- WJH samples the dropped packets buffer, and streams the data to Mellanox NEO.
- Interface Counters samples interface counters. Please refer to the "Supported Telemetry Data Streaming" page of the Telemetry Agent User Manual for more information on the supported profiles and the available counters per profile.
- Buffer Events samples the buffer histogram and creates an event every time the defined threshold is crossed. To view the buffer histogram when an event is created, go to Network Map, and click on "Buffers Utilization" under Network Analysis. For more information, see <u>"Network Analysis"</u>.

To perform a change of collectors to an existing session, go over the pencil mark under Collectors and mark the relevant collectors to add.

		Streaming					
Mellanox)	+ Add					
▲ ▼ 0 ▼		Sessions					C
Dashboards	>	10 •					
Managed Elements	>	Name ↓	Collectors	Profil	e Inte	rval Status	State
🛔 Network Map		Filter	Filter	∇ Filter		er 🗸 Filter	Filt V
Services		WJH	NEO DB	Defa	ılt 5	0	0
Configuration Management	10 •					•	0
Lttl Telemetry		Name 1	Address Port	Protocol	Format	Ø	0
Monitoring	Filter V	Filter 🗸 🗌	Filter V Filter V	7		3 of 3 K ≤ Pa	ge 1 of 1 > >
Snanehote	4	NEO DB 1	10.209.2 8094	TCP	influx		
опарынна		interfaces	10.209.2 5122	TCP	jsonRPC		
Streaming		wjh_pac 1	10.209.2 5123	TCP	jsonRPC		
🙈 Tasks			1 to	3 of 3 💠 🔇 Pag	e1of1 > >		
🕄 Jobs	0						

Sessions Management

View Session

In order to view all available sessions, go to "Telemetry" \rightarrow "Streaming". A table will appear with a list of all sessions, including the predefined sessions marked in yellow.

	8	Streaming						
Mellanox TECHNOLOGIES		+ Add						
≜ - 0 -		Sessions						C
🚳 Dashboards	>	10 •						
I Managed Elements	~	Name ↓	Collectors	Profile	Interval	Status	State	
A Network Map		Filter V	Filter V	Filter 🗸	Filter	Filter	♥ Filter ♥	,
✗ Services		counters	🖋 Graphana	NEO Counters	5	0	0	
Configuration Management		WJH	🖋 NEO DB	Default	5	0	0	
÷		Interface Coun	🖋 test,NEO DB	Default	5	0	0	
Lett. Reports	~	Buffer Events		Default	5	0	ο	
Monitoring	1					1 to 4 of 4	IC C Page 1 of 1 > >I	
Snapshots								
Streaming								

Create a New Session

To add a new streaming session, click on the "New" button, insert the new session's name, and fillin the required parameters:

- Profile: Select one of the profiles -
 - NEO Counters
 - Traffic Counters

- Priority Counters
- Buffer Histograms
- FDB Table
- Routing Table
- Interval: The time interval for the data collection
- Data Collectors: The collectors to which the data will be sent. For more information on defining the collectors, you can use the pencil icon, or refer to <u>"Data Collector"</u>.

A It is possible to define up to five sessions per system, and one per type.

- It is impossible to create more than one session on the same profile for a specific device.
- A Before starting a buffer histogram session, make sure to configure the relevant traffic class on the switch using the "Enable Histogram" template.
- ▲ Use the "Enable Histogram" template to configure default session "buffer events".
- A Before running the routing profile, make sure it is enabled on the switch (run "ip routing").

ne	Enter session r	name	Interval			seconds	
ofile NEO Counters •		; v	Data Col	lectors	select Data C	ollectors	
Available Memb	ers			Session Mer	nbers		
10 🔻	Filter			10 •	Filter		
Name	IP	System Type		Name	IP	System	Туре
switch-c7fe70	172.20.203.53	Mellanox Switch			No devic	es found.	
switch-9f2c62	172.20.203.51	Mellanox Switch	»	Showing 0 to	0 of 0 entries		< >
switch-058d0c	172.20.203.50	Mellanox Switch	>				
Showing 1 to 3 (of 3 entries	< >	<				
			«				

Telemetry Agent Supported Counters Per Profile

Please visit the Telemetry Agent User Manual under Appendixes>Supported Telemetry Data Streaming>Supported Counters Per Profile for more information.

Enable/Disable Session

To enable or disable a session, right-click on it, and select the desired action: Enable/Disable.

• Warning: Running multiple sessions in high frequency may lead to high switch CPU conception.

Streaming

+ Add						
Sessions						C
10 🔻						
Name 4	Collectors	Profile	Interval	Status	State	
Filter	∇ Filter ∇	Filter	Filter	∇ Filter	Filter	7
■ my_session	✓ my_collector	NEO Counters	1	ο	ο	
HLW	Enable	Default	5	0	0	
Interface Cou	➡ Modify Members ➡ Delete	Default	5	0	0	
Buffer Events		c Default	5	0	0	
				1 to 4 of 4	<pre>Page 1 of 1 </pre>	

Edit Sessions Members

To modify the session members, right click on a session, and select "Modify Members". The session member's view will open. You can use the arrows to add and remove members from a session. You can run only one session per profile and no more than 5 sessions (in total) per switch. Each session can be sent to several collectors.

1e	my_session		Interva	1	se	conds
file	NEO Counters	; •	Data C	ollectors	y_collector	
Available Memb	ers			Session Membe	rs	
10 🔻	Filter			10 •	Filter	
Name	IP	System Type		Name	IP	System Type
switch-9f2c62	172.20.203.51	Mellanox Switch		switch-c7fe70	172.20.203.53	Mellanox Switch
switch-058d0c	172.20.203.50	Mellanox Switch	>	Showing 1 to 1 of	of 1 entries	< >
showing 1 to 2 of	of 2 entries	< >	>			
			<			
			«			

A You can run up to one session per profile, and each session can be sent to up to 3 different collectors (destinations).

Delete Session

To delete a session, right-click on it, and select "Delete". When deleting a session from the sessions table, the specified session will be stopped on all session members (switches) that are currently running it.

ssions					
IO v					
Name ↓	Collectors	Profile	Interval	Status	State
Filter	♥ Filter ♥	Filter	V Filter	♥ Filter	♥ Filter
my_session	mv collector	NEO Counters	1	ο	0
HLW	Enable	Default	5	0	0
Interface Cou	Modify Members	Default	5	0	0
	🔟 Delete	c. Dofault	5	0	0

Streaming

Session Members Status

To view the status of session members, click on the session, and a table with the following parameters will appear on the right side of the screen:

- IP: System IP
- Status: OK, Fail/Warning or Stop (green, yellow or gray icon, respectively)
- Error Description: Will be displayed only in case there is a general telemetry error
- Last Status Change: Specifies the exact time in which the last status change occurred.

Streaming											
+ Add											
Sessions						9	Session Members				0
10 •							10 •				
Name 4	Collectors	Profile	Interval	Status	State		Name 1 ↓	IP 2 ↓	Filters	Error Description	Last Status Change
Filter	Filter V	Filter V	Filter V	Filter V	Filter V		Filter V	Filter	Filter V	Filter V	Filter 🗸
my_session	my_collector	NEO Counters	1	0	0		switch-9f2c62	172.20.203.51	ACL,L1,L2,L3,TUN	No errors	2020-02-20 09:2
🔳 WJH	🖋 NEO DB	Default	5	•	0		switch-058d0c	• 172.20.203.50	ACL,L1,L2,L3,TUN	No errors	2020-02-20 09:2
Interface Count	🖋 NEO DB	Default	5	Fail	0					1 to 2 of 2 K <	Page 1 of 1
Buffer Events	NEO GRPC Collecto	Default	5	Ö	0						
				1 to 4 of 4	⊂ Page 1 of 1 ⊃ ⊃						

Device Sessions Information

You may view the running sessions and the sessions status of each device, by selecting "Managed Elements"-->"Devices", and clicking on the relevant device. The "Sessions" tab will appear in the "Device Information" panel on the right, as shown below. In case of a problem with the session, the problem type will be reflected in the session status.

Devices

A

				0	Device Inform	nation (172	.20.203.50)				3
All 🔹	10 •				General	Ports	Inventory Eve	ents Jobs	Device Access	Groups Links	Config
Name	IP ↑	System Type	Status	MAC	Telemetry	Snapshots	VLAN Link	Aggregation	Cables Docker C	ontainers Sessio	ons
Filter	Filter V	Filter 🎔	Filter V	Filter	10 •						
localhost	172.20.203.2	IBM System x365…	•	N/A	Name ↓		Collectors	Profile	Interval	Status	State
lab4	172.20.203.4	Red Hat KVM	•	98:03:9B:8D:1E:18	Filter-	7	Filter V	Filter_	Filter	V Filter	V Filter
lab5	172.20.203.5	Red Hat KVM	0	N/A	WIL		ANEO DR	Default	5		0
lab6	172.20.203.6	Red Hat KVM	0	N/A	Interfac		ANEO DB	Default	-		
localhost.localdo	172.20.203.13	Red Hat KVM	0	N/A	niteriac	e co	AND CODE	Default	5		
localhost	172.20.203.20	HP ProLiant DL1	0	N/A	Butter E	vents	NEO GRPC Coller	Default	5	•	0
switch-058d0c	172.20.203.50	📇 MSN2100		B8:59:9F:62:3D:00						1 to 3 of 3	○ Page 1 of 1 ≥
switch-9f2c62	2 172.20.203.51	🚢 MSN2100	() Lill	98:03:98:FC:36:80							
	2 172.20.203.52	📇 Mellanox Switch	0	N/A							
switch-c7fe70	2 172.20.203.53	📇 MSN2100	() Lat	B8:59:9F:7A:A1:40							
			1 to 10 of 12	⊆ Page 1 of 2 → →I							

Running multiple sessions in high frequency may lead to high switch CPU conception.

What Just Happened Filtering

For WJH session, it is possible to get drops of specific categories only and silence alerts about other categories. Unselected categories will not be streamed, thus it is recommended to select all the wanted categories.

					ø	Session Members					
						10 •					
Ļ	Collectors	Profile	Interval	Status	State	Name 1 ↓	IP 2 ↓	Filter	Filters:	Error Description	Last Status Cha
▼	Filter V	Filter V	Filter V	Filter V	Filter 🗸	Filter V	Filter	Filter	I 1	Filter V	Filter
ision	my_collector	NEO Counters	1	0	0	switch-9f2c62	0 172.20.203.51	11	✓ L2		2020-02-20 15
	🖋 NEO DB	Default	5	0	0	switch-058d0c	0 172.20.203.50	@ A0	✓ L3		2020-02-20 15
ice Count	🖋 NEO DB	Default	5	•	0				✓ TUNNEL	1 to 2 of 2	Page 1 of 1 ⊃
Events	NEO GRPC Collecto	Default	5	0	0						

Snapshots

Streaming

Telemetry snapshots allow the user to store snapshots of commands running periodically if the output was changed, and allow the user to search, view and compare these snapshots.





- 2. Select devices or group of devices.
- 3. Select a template or a command.
- 4. Select snapshot interval.
- 5. Click Finish.

A Right clicking an existing snapshot allows the user to run it immediately, edit, or delete it.

Snapshots Tab

The Snapshots tab displays information about all the snapshots that were taken, and it is divided to four sections:

• The snapshots section displays all the telemetry snapshots configured by the user.

Description		Last Run ↓		Last Change	
Filter	7	Filter	7	Filter) v
Bring-up: show mlag		2020-04-06 09:17:49		2020-04-02 12:42:48	
Bring-up: show mlag-vip		2020-04-06 09:17:49		2020-04-02 12:42:48	
■ Bring-up: show vlan		2020-04-06 09:17:48		2020-04-02 12:42:48	
Bring-up: show mac-address-table		2020-04-06 09:17:48		2020-04-02 18:12:48	
Bring-up: show interfaces switchport		2020-04-06 09:17:48		2020-04-02 12:42:48	
		1	to 5 of	7 📧 🤇 Page 1 of 2	>



• The selected snapshot timeline displays the times of latest changes detected.

• Telemetry Snapshots Members displays a list of the devices which are members in the selected telemetry snapshots.

Telemetry Snapshot Membe	Type and press Enter to	o search all snapshots		
Status at: 2020-04-02 12:42	:48 Changed Devices 🗆 Unc	hanged Devices		
IP	System Name	System Type	Last Change ↓	
Filter	♥ Filter	♥ Filter	Filter	7
172.20.203.50	switch-058d0c	Mellanox Switch	2020-04-02 12:42:48	
172.20.203.51	switch-9f2c62	Mellanox Switch	2020-04-02 12:42:48	
			1 to 2 of 2 🔣 < Page 1 of 1 🗦	

• Device Telemetry Snapshots displays the content of the selected device snapshot.

evice Tele	metry Snapshots						
View	Compare						
Type to s	earch snapshot output						
show vol	ltage						
	Davies Mater		Format and				
Module	Power Meter	кед	Voltage	Actual Voltage	Status	High Range	Low Range
MGMT	acdc-monitor1	SoC Core	0.97	0.97	OK	1.11	0.82
1GMT	acdc-monitor1	SoC VNN	1.03	1.03	OK	1.19	0.88
MGMT	acdc-monitor1	CPU 0.675V	0.68	0.67	ОК	0.78	0.57
IGMT	acdc-monitor1	1V	1.00	1.01	ОК	1.15	0.85
MGMT	acdc-monitor1	VDDQ	1.35	1.36	OK	1.55	1.15
IGMT	acdc-monitor1	1.8V	1.80	1.82	ОК	2.07	1.53
MGMT	acdc-monitor1	SYS 3.3V	3.30	3.34	ОК	3.79	2.80
MGMT	acdc-monitor1	12V	12.00	12.06	ОК	13.80	10.20
MONT	acds-moniton1	1 351/	1 35	1 36	OK	1 55	1 15

• The Compare tab displays the differences between the selected snapshot and any other snapshots.

View	Compare							
ompare l	atest snapshot with:	2020-09-18 16:25:46	•	•				
Latest :	snapshot 🔲 Selected s	snapshot						
show vo	ltage							
	0							
	Power Mater	Peg	Evnected	Actual	 Status	High		
Nodule	Power Meter	Reg	Expected Voltage	Actual Voltage	Status	High Range	Low Range	
1odule 1GMT	Power Meter acdc-monitor1	Reg SoC Core	Expected Voltage 1.01	Actual Voltage	Status OK	High Range 1.16	Low Range 0.86	
1odule 1GMT 1GMT	Power Meter acdc-monitor1 acdc-monitor1	Reg SoC Core SoC VNN	Expected Voltage 1.01 1.0 4 3	Actual Voltage 1.01 1.0 4 3	Status OK OK	High Range 1.16 1. 20	Low Range 0.86 19 0.88	8
Module MGMT MGMT MGMT	Power Meter acdc-monitor1 acdc-monitor1 acdc-monitor1	Reg SoC Core SoC VNN CPU 0.675V	Expected Voltage 1.01 1.0 4 3 0.68	Actual Voltage 1.01 1.0 <mark>4</mark> 3 0.68	Status OK OK OK	High Range 1.16 1. 20 0.78	Low Range 0.86 19 0.88 0.57	8
Module MGMT MGMT MGMT MGMT	Power Meter acdc-monitor1 acdc-monitor1 acdc-monitor1 acdc-monitor1 acdc-monitor1	Reg SoC Core SoC VNN CPU 0.675V 1V	Expected Voltage 1.01 1.043 0.68 1.00	Actual Voltage 1.01 1.0 4 3 0.68 1.01	Status OK OK OK OK	High Range 1.16 1. <mark>20</mark> 0.78 1.15	Low Range 0.86 19 0.88 0.57 0.85	8
Module MGMT MGMT MGMT MGMT MGMT	Power Meter acdc-monitor1 acdc-monitor1 acdc-monitor1 acdc-monitor1 acdc-monitor1	Reg SoC Core SoC VNN CPU 0.675V 1V VDDQ	Expected Voltage 1.01 1.043 0.68 1.00 1.35	Actual Voltage 1.01 1.0 4 3 0.68 1.01 1.36	Status OK OK OK OK OK	High Range 1.16 1. 20 0.78 1.15 1.55	Low Range 0.86 19 0.88 0.57 0.85 1.15	8

Tasks

The Tasks window displays the full Mellanox NEO® tasks list.

A task is an action defined by a user to apply on one or more devices, ports, or groups. Users can create a task or a task sequence, using the respective tabs under this window.

All of these tasks can be saved with no execution date, set to run immediately (in which case, it will turn into a job), or scheduled to occur once or repeatedly in a predefined time.

Tasks Tab

This tab enables you to create, run, remove and edit tasks.

Tasks Tasks Sequence					Show devices by, Name 👻
					0
+ Add					
10 🗸					
Action	Description	Objects	Created 4	Last	t Run
Filter	Filter 🗸 🗸	(Filter	♥ [Filter	V Filt	ter
Provisioning	Shows SNMP settings and status	⊜ r-ufm-sw76	2020-12-08 13:58:35		
Provisioning	Displays power supplies voltage level	⊜ r-ufm-sw76	2020-12-08 13:57:03		
Provisioning	💬 Enable Link Layer Discovery. Recommended	No Related Objects			
Provisioning	Discrete Content of Antipation Content of An	No Related Objects			
					l to 4 of 4 ⊣ ⊂ ⊂ Page l of l ⊃ ⊃ ⊢

Built-in Tasks

NEO comes with the following built-in tasks for common switch configuration. These tasks can run on all applicable switches (*Run On All* option) or on a user selected list of switches (*Run option*):

• Enable Docker for Mellanox switches - activates docker capabilities on the switch

• Enable Link Layer Discovery - activates LLDP capabilities on the switch. Enabling this is recommended for network topology discovery.

A These tasks are applicable to switches running Mellanox Onyx only.

Creating a New Task

To create a new task:

- 1. Under the Tasks tab in the "Tasks" panel, click "New". The Tasks wizard will open and allow you to select the desired operation: Provisioning, Onyx Software Upgrade, Driver Install, Apply Config, Generate Dump or Reboot.
- 2. You may associate the task to specific devices, ports, or groups by checking the "Associate Objects to Task" checkbox. If the checkbox is left unchecked, a template will be generated, and you will be required to select objects only when running the task.

Note: When creating a task for a number of ports, these ports have to belong to the same type (for example: Eth type).

Operation Object	cts Parameters Additional information Run	
Operation		
Objects Type	Devices Ports	
Associate Objects	s to Task	
	Provisioning	
evious		N

3. Click the "Next" button. In some cases, you will be requested to fill in several necessary parameters and provide additional information before the task can be executed.

Templates Lo	ad Insert Command
NVIDIA Mellanox Switch Templates (Ethernet)	Displays the VLAN table
Filter	
Name	show vlan
Show-Running-Config	
Show-Protocols	
Show-Power	
Show-MLAG-VIP	
Show-MLAG	
Show-Mac-Address-Table-JSON	
Show-Interface-Status-JSON	
Show-Health-Report	
Showing 9 to 16 of 113 templates < >	

4. The "Run" tab allows you to save the generated task as a template, save and run it immediately, or schedule a different running time.

w Task		
Operation Objects	Parameters Additional information Run	
Running Mode	Schedule •	
Start Time	Save Save and Run Now	
Recurrence	Schedule	
		Schedule
		Sonsaaro

If you wish to generate a recurring task, select "Schedule" as the Running Mode, and check

the "Recurrence" checkbox. Insert the desired start time, interval units, interval value and end time. Click the "Finish" button to complete the process.

• If the task's execution has been scheduled for a later time, a small clock icon (∅) will appear next to its listing.

Task Actions

- To view the task's properties, click the small speech balloon icon ($\stackrel{\mbox{\scriptsize pp}}{=}$) in the description column.
- To run a task on all devices in the network, right click on it, and select "Run on all". Note that the "Run on all" option is only supported in tasks that are not associated with specific objects ("No objects" in the Objects column).
- To edit a task, right click on it and select "Edit".
- To remove a task, right click on it, and select "Remove".

						0
+ Add						
10 ~						
Action	Description		Objects	Created \downarrow	Last Run	
Filter	♥ Filter	∇	Filter	 Filter	 Filter	<u>۷</u>
Provisioning	N Dup	VLAN table	© r-ufm-sw76	2020-12-11 18:43:51		
Provisioning	Edit	settings and status	⊚ r-ufm-sw76	2020+12+08 13:58:35		
Provisioning	a Demove	ver supplies voltage level	⊚ r-ufm-sw76	2020-12-08 13:57:03		
Provisioning	p choice ch	ayer Discovery. Recomme	No Related Objects			
Provisioning	💬 Enable Do	cker for NVIDIA Mellanox swi	No Related Objects			
						1 to 5 of 5 💠 C Page 1 of 1 💈 💚

• A new task can be generated through the Managed Elements panel as well. Go to "Devices" or "Groups", choose one of the available options, and click the "Create Task" button:

Generate Dump	×				
This operation may take a few minutes to complete					
Profiles	H H C X				
No Profile Selected					
Description					
Action Description					
Protocol					
SCP	~				
Server					
Hostname or IP Address					
Path					
Absolute path					
Username					
Username					
Password					
Password					
Clos	e Create Task Submit				

Task Sequence Tab

A group of tasks can be set through this tab to run successively. Users can determine the order of tasks within the task sequence.

To create a new task sequence:

1. Click the "Add" button under Task Sequence. Tasks

+ Add					
Name	Status	Created		Last Run	
Name Filter	Status V Filter	Created V Filter	V	Last Run Filter	5
Name Filter task-seq	Status V Filter Idle	Created V Filter 2020-12-08 13:57:1	⊽ 28	Last Run Filter	7
Name Filter task-seq dsfsadfasdf	Status V Filter Idle Idle	Created ▽ Filter 2020-12-08 13:57:1 2020-12-10 08:32:1	⊽ 28 57	Last Run	7

2. Once the Task Sequence wizard opens, set a name for the task group, and click "Next".

Task Seque	ence	×
Options	Tasks Run	
Name	Enter task sequence name	Task Sequence allows you to group several tasks, that will run in a sequence. Tasks in a sequence will run serially, such that if one of the tasks fails, consecutive tasks will not be executed.
Previous		Next

3. Choose the tasks from the list of Available Tasks and click "Next".

available Tasks				Selected	Tasks		
10 🗸					10 🗸		
Action	Description	Objects			Action	Description	Objects
Filter V	Filter V	Filter V			Filter V	Filter V	Filter 7
Provisioning	Shows SNMP settin	©10.209.36.16					
Provisioning	Displays power sup	€ 10.209.36.16	»			No tasks found	
			ĸ				

- A You can re-order the sequence of tasks by clicking one of the tasks in the right pane and moving it up or down.
- 4. The "Run" tab allows you to save the generated task sequence as a template, save and run it immediately, or schedule a different running time.

Fask Sequence		×
Options Tasks	Run	
Running Mode	Schedule	•
Start Time	Save Save and Run Now	
Recurrence	Schedule	
		Schedule
Previous		Finish

5. Click "Finish" to complete the process.
A right-click on the newly created task sequence will enable running (in case no scheduling was set), editing, and removing it.

IO ✓ Name Status Created Last Run Filter ✓ Filter ✓ Filter Idle >Run >20-12-08 13:57:28 >20-12-10 08:32:57 idsfsadfasdf Idle >Run >20-12-10 08:32:57	+ Add					
Filter ♥ Filter ♥ Filter ♥ Idle ▶ Run ≥0-12-08 13:57:28 >20-12-10 08:32:57	10 V	Status		Created	Last	t Run
Idle D20-12-08 13:57:28 dsfsadfasdf Idle Idle ► Run 20-12-10 08:32:57	Filter	∇ Filter	V	Filter	∇ Filt	ter S
I Remove	≣ task-seq dsfsadfasdf	Idle Idle	▶ Run & Edit @ Remove) 20-12-08 13 :)20-12-10 08:	57:28 32:57	

Notes:

- If a task is already scheduled to be run at a certain time, it will not appear in the list of available tasks. In order for it to appear, its scheduling should be removed, or alternatively, it could be recreated.
- If one task fails in the chain, the rest of the tasks that follow will be skipped and the process will not be completed successfully.
- If a device is part of a task sequence, users will not be able to remove it from the devices list.
- If a task is part of a task sequence, users will not be able to remove the task unless it is removed from the task sequence first.

Jobs

The Jobs window displays all Mellanox NEO® running tasks which were defined by a user and applied on one or more switches.

Mellanox NEO supports the following jobs:

- Software upgrade
- Reboot
- Provisioning
- Adding Systems
- Updating Access Credentials

Mellanox NEO users can monitor the progress of a running job, as well as the time it was created, its last update description and status.

When an action (software upgrade, reboot or provisioning) is started by the user, a new job is created. The initial state of every job is "Running". When the action is completed, the job state value can be either 'Completed', to indicate a successful job, or 'Completed With Error', if an error has occurred. In this case, the fault status will appear in red.

If during a switch action the related service (provider) goes down, all service (provider) related jobs will be aborted and the related jobs state will change to "Aborted".

A Job can also be a task that was scheduled by the system. Mellanox NEO users can monitor the progress of these jobs as well, but cannot control them.

Choosing 'View Summary' for a certain device will display the status of running sub jobs on all IP addresses. The jobs that were completed with errors can also be filtered for by checking the "Completed with Errors" checkbox (see below). Clicking on a device IP address, will display the output of the sub-job related to it.

A detailed list with a Summary Information field is also available when choosing one device.

lobs										Show devices by:	IP ·
											e 0 0
10 🗸											
ID	Description	Created ↓		Last Update		Status			Summary	Progress	
Filter 🗸	Filter V	Filter	v	Filter	7	Filter		8			
5853	Provisioning	2020-12-11 18:59:00		2020-12-11 18:59:11		Completed	l.		View Summary		
5691	Connectivity Check	2020-12-11 14:05:02		2020-12-11 14:05:0	7	Completed	With Errors		View Summary		
5066	Provisioning	2020-12-10 18:59:00		2020-12-10 18:59:0	9	Completed	l.		View Summary		
III 4740	Bring-up	2020-12-10 09:08:34		2020-12-10 09:08:	43	Completed			View Summary		
4722	Provisioning	2020-12-10 08:32:23		2020-12-10 08:32:	30	Completed	With Errors		View Summary		
4595	Start telemetry agent	2020-12-10 04:24:36		2020-12-10 04:25:	53	Completed	l.		View Summary		
4591	Load telemetry agent	2020-12-10 04:23:44		2020-12-10 04:24:	36	Completed	l.		View Summary		
4327	Provisioning	2020-12-09 18:59:00		2020-12-09 18:59:	10	Completed	l .		View Summary		
3647	Provisioning	2020-12-08 18:59:00		2020-12-08 18:59:	10	Completed	l .		View Summary		
3379	Setting Access VLAN on MLAG	2020-12-08 09:41:24		2020-12-08 09:41:	31	Completed	With Errors		View Summary		
										1 to 10 of 16 👘 🗧 Page 1 of	f2 > >I
Sub Jobs											
10 4											
ID	Description R	elated Object	Created 4		Last Update		Status		Summary	Progress	
Filter 🗸	Filter V	ilter	Filter	7	Filter	7	Filter		▽		
4740.2	Creating Telemetry Sna		2020-12-10	0 09:08:43	2020-12-10 09:0	3:43	Completed		View Summary		
4740.1	Creating Network Confi		2020-12-10	0 09:08:34	2020-12-10 09:0	3:43	Completed		View Summary		
										1to2of2 K Page1o	of1 ≥ ⊃!

Events

Events information is accessible through the dashboard or through the main menu. This view provides direct access to critical and recent events.

s by: Name	devices	Show d						Now	ox Care - Scan I	/ents
÷										
										10 🗸
courrences	Oc	Reason	Description		Nam	Source	Related Object	Timestamp 2 U	Category	Severity 1 ↓
ilter V	Fi	Filter 🗸	Filter V	v	Filt	Filter V	Filter_ V	Filter V	Filter	Filter V
9	219	Power supply is unresponsive	Power supply is unresponsive	ult	Pov	PS1	⊚ r-ufm-sw76	2020-12-12 14:29:42	*	0
593	135	Authentication failure trap rec	Authentication failure trap rec	ation Failure Snmp	Aut	Device Manager	⊚ r-ufm-sw76	2020-12-12 14:45:33	U	0
	41	Connection to 10.209.36.16 wer	Device unreachable	nreachable	Dev	Device Manager	⊚ r-ufm-sw76	2020-12-12 11:03:01		0
	3	The NVIDIA Mellanox ONYX m	The NVIDIA Mellanox ONYX m	Utilization	Hig	Device Manager	© r-ufm-sw76	2020-12-09 18:14:06	<u>12</u>	0
	1	Job for 'Connectivity Check' fa	Job failed	i .	Job	User Job	⊚ r-ufm-sw76	2020-12-11 14:05:07	Ð	0
	1	Job for 'Provisioning' failed. sh	Job failed	i .	Job	User Job	⊚ r-ufm-sw76	2020-12-10 08:32:30	Ø	0
	1	Job for 'Setting Access VLAN o	Job failed	i .	Job	User Job	⊚ r-ufm-sw76	2020-12-08 09:41:31	Ø	0
	3	Job for 'Discovering systems' f	Job failed	d .	Job	System Job	⊜ r-ufm-sw76	2020-12-03 10:45:08	Ø	0
л	87	Telemetry snapshot 'show volt	Telemetry Snapshot Diff Dete	y Snapshot Diff	Tele	task.2	© r-ufm-sw76	2020-12-12 14:44:01		0
	41	Connection to 10.209.36.16 has	Device connection restored	onnection Restored	Dev	Device Manager	⊚ r-ufm-sw76	2020-12-12 11:13:29	-	0

The events infrastructure allows filtering for events by criteria and defining them based on various triggers (for example, traps and threshold crossing), upon configurable ranges and severities. A user may acknowledge one or more events by right-clicking on them. The acknowledged events will be

grayed-out. Identical events are grouped as "occurrences" when the same event takes place more than once (see last column to the right). Events can also be derived from SNMP traps sent by the switch.

Through the Events menu, the user can induce an event scanning operation by clicking the

Mellanox Care - Scan Now button. Consequently, Mellanox NEO sends an email with details of events to Mellanox NOC. For details on Mellanox Care, see <u>Mellanox Care</u>; for details on the generated email, see <u>Events Policy Settings</u>.

Notifications

The Notifications window is Mellanox NEO's incoming messages box, providing the administrators network notifications of several types.

By clicking a specific notification, a table with further information will appear on the right side of the screen. For each of the notifications, the table can be saved, copied or printed by the user.

Mellanox NEO scans the network for mismatches and changes once every 24 hours. The user can view the number of unread notifications at any time, as it is constantly displayed next to the small envelope icon on the top right corner of the interface's frame.



Unread notifications will appear in a bold font until they are read for the first time. To remove notifications, right-click on the relevant notification and select "Remove".

Notifications

Severity Fit V O O O O O O O O O O O O O O O O O O	Title Filter Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot	Diff - Dis Diff - Dis	Timestamp Filter 2020-04-05 2020-04-05 2020-04-05	↓ 17:59:22 17:59:01	7
	Filter Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot	⊽ Diff - Dis Diff - Dis	Filter 2020-04-05 2020-04-05 2020-04-05	17:59:22 17:59:01	7
© ⊙ ≣ ⊙	Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot	Diff - Dis Diff - Dis Diff - Dis	2020-04-05 2020-04-05 2020-04-05	17:59:22 17:59:01	
⊘ ■	Telemetry Snapshot D Telemetry Snapshot D Telemetry Snapshot	Diff - Dis	2020-04-05	17:59:01	
■ ⊘	Telemetry Snapshot D Telemetry Snapshot)iff - Dis	2020-04-05		_
0	Telemetry Snapshot	A		17:54:09	
		I Remo	ve	17:54:01	
0	Telemetry Snapshot D)iff - Dis…	2020-04-05	17:49:22	
0	Telemetry Snapshot D)iff - Dis…	2020-04-05	17:49:01	
0	Telemetry Snapshot D)iff - Dis…	2020-04-05	17:44:09	
0	Telemetry Snapshot D)iff - test 3	2020-04-05	17:44:01	
0	Telemetry Snapshot D)iff - Dis…	2020-04-05	17:39:22	
0	Telemetry Snapshot D)iff - Dis…	2020-04-05	17:39:02	
			1 to	10 of 50 \leq Page 1 of 5 $>$	Я

Incoming notifications appear in blue pop-up windows in the bottom right corner of the screen.



Notification Types:

 MTU Mismatches - Mellanox NEO checks the common Maximum Transmission Unit (MTU) configured in the network. The common MTU is calculated according to the MTU of the majority of the active ports that were discovered in the network. Once the common MTU is calculated, NEO will check for the ports that have different MTU than the common MTU, and

lame	IP	Port	Network MTU	Port MTU	Action	
Filter	Filter V	Filter	Filter	∇ Filter	∇ Filter	
vitch-058d0c	172.20.20	Eth1/1	1500	5000	J [€] Fix	
vitch-9f2c62	172.20.20	Eth1/2	1500	5000	₽ Fix	
					1 to 2 of 2 C ≤ Page 1 of	f1 > ⇒
					1 to 2 of 2 K ≤ Page 1 of	f1 > ⇒
					1 to 2 of 2 K ≤ Page 1 of	f1 > >

will generate a notification about these ports.

• OS Mismatches - Mellanox NEO verifies that the latest operation system (OS) version is installed on all devices in the network. A notification is generated in case a device with an older version is found.

10 v					
Name	IP	Latest Detected OS Version	Current OS Version	Technology	Action
Filter	V Filter. V	Filter V	Filter V	Filter 🗸	Filter 5
r-ufm-sw77	172.20.2	3.8.2008	3.8.2003	ETH	ONYX Software Upgrade

A There are three OS types (IB, VPI and Ethernet), and therefore, three different latest versions.

• Configuration Diff - in case a configuration change has been performed on one of the switches, Mellanox NEO will generate a notification of this type.

Configuration Diff				
10 •				
Name	IP	Last Configuration	New Configuration	Summary
Filter V	Filter V	mm/dd/yyyy	mm/dd/yyyy	Filter V
switch-058d0c	172.20.203.50	2020-02-16 04:59:10	2020-02-17 04:59:10	View Diff Summary
switch-9f2c62	172.20.203.51	2020-02-14 04:59:10	2020-02-17 04:59:10	View Diff Summary
			1 to	2 of 2 I ⊂ ⊂ Page 1 of 1 ⊃ ⊃ I

The user may also view the changed content by clicking "View Diff Summary". The added text appears in green, while the removed text is red and crossed-out.

Configuration Diff	×
<pre>show running-config ## ## Running database "initial" ## Generated at 2020/02/16 0401/09/22 19:597:141 +0000 ## Hostname: switch-058d0c ## Product release: 3.8.1986 47_H2004 ##</pre>	
## ## Running-config temporary prefix mode setting ## no cli default prefix-modes enable	
<pre>## ## Chassis configuration ## no what-just-happened acl enable no what-just-happened auto-export acl enable no what-just-happened auto-export forwarding enable no what-iust-happened forwarding enable</pre>	
<pre>## ## Interface Ethernet buffer configuration ## traffic pool roce_lossless type lossless</pre>	•

• Telemetry Snapshot Diff - If a running snapshot change has been performed on one of the switches, Mellanox NEO will generate a notification of this type:

Filter		
rerity	Title	Timestamp
۲	Task Snapshot Diff - Displays power supplies voltage level.	2019-05-01 18:31:40
0	Latest Mellanox Software Packages	2019-05-01 11:39:35
-		2019-05-01

• Mellanox Onyx Notification - Mellanox NEO checks for a new available version of any of the following MLNX Onyx packages: SX_Eth, SX_VPI, SX_IB, SIB, and Spectrum, and if it finds any, it will generate a notification. Note that you can define which MLNX Onyx package or packages to be traced by NEO in the cfg. file.

Mellanox ONYX Notification			
10 •			
SW Package	Old Version	New Version	
Filter	V Filter	∇ Filter	7
Onyx	3.8.1888	3.8.2110	
MLNX-OS	3.8.1206	3.8.2102	
		1 to 2 of 2 🛛 < 🤇 Page 1	of 1 > >

• Mellanox WinOF Notification - Mellanox NEO checks for a new available version of either of the following WinOF packages: WinOF and WinOF-2, and if it finds any, it will generate a notification. Note that you can define which WinOF package to be traced by NEO in the cfg.

file.

Mellanox WinOF Notification			
10 •			
SW Package	Old Version	New Version	
Filter	▼ Filter	V Filter	▽
WinOF	5.50.52000	5.60	
WinOF-2	2.20	2.30	
		1 to 2 of 2	Page 1 of 1 > >

 Mellanox OFED Notification - Mellanox NEO checks for a new available version of either of the following OFED packages: MLNX_OFED and MLNX_EN, and if it finds any, it will generate a notification. Note that you can define which OFED package to be traced by NEO in the cfg. file.

Mellanox OFED Notification			
10 •			
SW Package	Old Version	New Version	
Filter	Filter	∇ Filter	7
MLNX_OFED	4.6-1.0.1.1	4.7-3.2.9.0	
MLNX_EN	4.5-1.0.1.0	4.7-1.0.0.1	
		1 to 2 of 2	of 1 🔿 🖂

• Firmware Notification - Mellanox NEO checks for a new available version of either of the following firmware packages: ConnectX-3, ConnectX-3 Pro, ConnectX-4, Connectx-4 Lx, ConnectX-5 and Connect-IB, and if it finds any, it generates a notification. Note that you can

Firmware Notification			
10 •			
SW Package	Old Version	New Version	
Filter	V Filter	∇ Filter	7
Connect-IB	10.16.1006.1	10.16.1006	
ConnectX-3	2.36.5000.1	2.36.5000	
		1 to 2 of 2	

define which firmware package will be traced by NEO in the cfg. file.

• Latest Mellanox Software Package - Once NEO is started, it checks for all of the latest packages available on <u>www.mellanox.com.</u>

Latest Mellanox Software Packages			
10 v			
Package		Current Version	
Filter	7	Filter	∇
Onyx		3.8.2110	
MLNX-OS		3.8.2102	
MLNX_OFED		4.7-3.2.9.0	
MLNX_EN		4.7-1.0.0.1	
WinOF		5.60	
WinOF-2		2.30	
		1 to 6 of 6	

• Topology Links Changed - When a new device is discovered after the creation of a Layer 3 provisioning service, and if the "Add Auto-Discovered Switches" checkbox is checked and the "Auto Configure Switches When Topology Changed" checkbox is unchecked, a notification of the new discovered device will be generated.

Topology Links Changed		
10 •		
Service Name	Service Description	Topology Updates
Filter	V Filter	V Filter
L3Network	L3_Network	Show Latest Changes
		1 to 1 of 1

Clicking "Show Details" will display further information about the new device and the other devices it is connected to.

Topology Link	Changed			×
10 V Operation	System IP	Port	Peer System IP	Peer Port
Filter Added Link	▼ Filter 10.209.37.248	Filter	▼ Filter ▼ 10.209.37.249 ▼	' Filter ♥ Eth1/7
			1 to 1 of 1	, Page 1 of 1 > >
			Close	e Apply L3 Configuration

Since the "Auto Configure Switches When Topology Changed" checkbox was unchecked before, the configuration of the new device will not be automatic. Click the "Apply L3 Configuration" button for the new device to be added to the service and a job will be created.

• Range Scan Results - when running an IP scan through the Discovery window under Settings, NEO will list all devices it has discovered during that scan, including their type. When NEO does not succeed in identifying the device type, the type column will read "Skipped", and

the	reason	will	be	provided	under	"Comments".

Range Scan Results						
10 •						
IP Address	Created as		Comments			
Filter	V Filter	v	Filter			∇
172.20.203.20	linux_host		N/A			
172.20.203.5	linux_host		N/A			
172.20.203.2	linux_host		N/A			
172.20.203.1	Skipped		Could not be classified			
172.20.203.6	Skipped		Device in Blacklist			
172.20.203.12	Skipped		Device in Blacklist			
				1 to 6 of 6 K ⊂	Page 1 of 1 >	

- "NEO-Host not installed" Mellanox NEO checks if there is any host on which NEO-Host is not installed. If such hosts are found, NEO generates a "NEO-Host not installed" notification.
- More notification types:
 - lldp scan result
 - range scan result
 - multicast scan result
 - prism added devices
 - vcenter added devices

System Health

Providers

Providers are the building blocks of Mellanox NEO. Each provider runs a specific service such as Managing Device Access, Device Provisioning, and IP Discovery. Providers are controlled by a controller.

Providers Information									0
25 🗸									
Name		Services		Topics		Connected		Last Update	
Filter	7	Filter	8	Filter_	8	Filter	7	Filter	7
Access Credentials		Access Credentials		Discovery		Ó		2020-12-15 18:38:13	
Device Manager		Device Management		Discovery, Action, Health		Ó		2020-12-15 18:38:17	
Ethernet Discovery		Ethernet Discovery		Discovery		Ó		2020-12-15 18:38:12	
IP Discovery		Discovery		Discovery		Ó		2020-12-15 18:38:16	
Solution Manager		Solution		Action		Ó		2020-12-15 18:38:16	
Device Provisioning		Provisioning		Action		Ó		2020-12-15 18:38:17	
SNMP Monitoring		Monitoring		Discovery		Ó		2020-12-15 18:38:13	
Telemetry		Telemetry		Discovery		Ó		2020-12-15 18:38:13	

If a provider is disconnected, a small bell icon appears at the top right corner of the screen. To identify the disconnected provider, click on the "Providers" tab, and in the "Connected" column of the "Providers Information" table, look for the red "thumbs down" icon.

		Providers									
Mellanox TECHNOLODIES INCO	'	Providers Information									0
A- 0- A		25 *									
Dashboards	*	Name		Services		Topics		Connected		Last Update	
Managed Elements	•	Filter	7	Filter	7	Filter	7	Filter	7	mm/dd/yyyy	7
A Network Map		Access Credentials		Access Credentials		Discovery		ò		2020-02-20 09:20:50	
		Device Manager		Device Management		Discovery, Action, Health		Ó		2020-02-20 09:20:42	
		Ethernet Discovery		Ethernet Discovery		Discovery		Ó		2020-02-20 09:20:43	
Contiguration Management		Host Manager		Host Management, vCenter		Discovery, Action, Health		Ó		2020-02-20 09:20:44	
Let Telemetry	•	IB Manager		IB Management		Action		Ó		2020-02-20 09:20:45	
🚯 Tasks	0	IP Discovery		Discovery		Discovery		Ó		2020-02-20 09:20:47	
		SNMP Monitoring		Monitoring		Discovery		Ó		2020-02-20 09:20:49	
Jobs	0	Performance		Performance		Action		Ó		2020-02-20 09:20:50	
	0	Device Provisioning		Provisioning		Action		Ó		2020-02-20 09:20:48	
Motifications	6	Solution Manager		Solution		Action		Ó		2020-02-20 09:20:49	
		Telemetry						\$			
System Health	*	Virtualization						Q			
E Settings										1 to 12 of 12	

Device Manager

Mellanox NEO® will collect Chassis Discovery and information on Mellanox switches, such as modules, traps, temperature, ports, OS, etc. For the device manager to receive SNMP traps for all managed switches, all systems must be configured accordingly.

Device Access Manager

The Credentials Provider is responsible for managing the access credentials of all managed systems and groups (defaults).

Devices access credential can be managed via Mellanox NEO[™] at three levels:

- 1. Global level (global groups) relevant for all devices that use a specific protocol (http, ssh or snmp).
- 2. Group level relevant for all devices which belong to a specific user-defined group.
- 3. Device level relevant for a specific device for which credentials were set (once unique device access credentials are set, they overwrite global or group credentials definitions.)

The credentials provider is agnostic to the stored attributes, in order to allow support for any protocol in the future.

For more information about access credentials configuration, see <u>"Configuring Access Credentials</u> within Mellanox NEO[™]".

Monitor Manager

- Forwards samples of all switch port counters to an internal 3rd party software: InfluxDB
- The controller will sample the counters of all the switches in the fabric at a configurable interval (default=5 minutes). The results will be displayed by InfluxDB.
- For more information, please refer to "<u>Configuring SNMP on Mellanox Onyx Switch (for Port</u> <u>Counters Monitoring)</u>"

ETH Discovery

The role of the ETH Discovery Provider is to discover the Ethernet topology type according to the LLDP protocol. In this phase, the LLDP information is collected using SNMP protocol. The controller initiates the periodic discovery process by providing a list of start-points and connection information. The provider sends the discovered data periodically, when it is containing the CIM objects and relations. The controller aggregator integrates the CIM objects and relations into the existing model and adds new devices as necessary.

For ETH discovery to work properly, the user must configure LLDP for all managed devices. For more information, see <u>"Configuring Mellanox Onyx Switch for LLDP Discovery"</u> and <u>"Configuring Host for LLDP Discovery"</u>.

For LLDP Discovery to work properly on Mellanox Onyx systems, Mellanox Onyx version 3.4.1802 is a minimum requirement.

IP Discovery

IP Discovery provider can operate in 2 optional modes:

 Auto-Discovery - automatic discovery of devices found within a specified range of IP addresses using Mellanox UFM-Agent. In this mode, Mellanox NEO controller discovers all Mellanox Onyx switches by sending multicast messages. Every Mellanox Onyx switch responds to the controller with its IP address. This information is stored in the controller repository.

Mellanox NEO auto-discovery requires multicast traffic to be enabled on the managed switches.

- 2. Manual IP scan manual discovery of devices of one or more types found within a specified range of IP addresses, run according to the following algorithm:
 - Checks for connectivity with a ping
 - If alive, NEO scans all devices and classifies them according to their type, using the following protocols in order:
 - i. SNMP classification (SNMP v2, SNMP v3 using global credentials)
 - ii. SSH connectivity with Linux credentials
 - iii. WinRM with Windows classification

When IP Discovery is loading, it reports the list of configured IP addresses to the controller. The controller stores this information in its repository.

Device Provisioning

The Device Provisioning function allows the users to play a list of switch CLI commands on a list of Mellanox switches.

To run a command or a series of commands on one device or more:

1. Right-click on the desired devices, and select "Provisioning". Devices

All	10 •			
Name	IP ↑	System Type	Status	MAC
Filter V	Filter	V Filter	Filter V	Filter V
localhost	172.20.203.2	IBM System x365…	0	N/A
lab4	172.20.203.4	Red Hat KVM	0	E4:1D:2D:61:F5:D3
lab5	172.20.203.5	Red Hat KVM	0	N/A
lab6	172.20.203.6	Red Hat KVM	0	N/A
localhost.localdo	172.20.203.13	Red Hat KVM	0	N/A
localhost	172.20.203.20	HP ProLiant DL1…	0	N/A
switch-058d0c	☑ 172.20.203.50	🖀 MSN2100	<u>е</u> ш	B8:59:9F:62:3D:00
switch-9f2c62	☑ 172.20.203.51	🖀 MSN2100	<u>е</u> ш	98:03:9B:FC:36:80
	☑ 172.20.20	Provisioning	•	N/A
switch-c7fe70	C 172.20.20	NEO Telemetry Agent	? Ш	B8:59:9F:7A:A1:40
	C	Reboot	1 to 10 of 12	← Page 1 of 2 → →
	ŵ	Remove		
	Ø.	Acknowledge		

2. In the dialog window, type the switch CLI commands that you wish to run on the selected devices, click the "Apply" button, and then "Start".

Provisioning		
Templates		
Insert Command	? Global Varia	bles
snmp		
show sing		
	Reset Apply	
Selected Devices		
Selected Devices	Name	Profile
Selected Devices IP IP T2 20 203 50	Name switch-058d0c	Profile
Selected Devices	Name switch-05840c switch-92c52	Profile Ethumet
Selected Devices IP 172 20 203 50 172 20 203 51 172 20 203 53 172 20 203 53	Name switch-05840c switch-92/c52 switch-c7/e70	Profile Ethamet Ethamet

Notes:

• Your category selection will determine the template's availability according to the chosen device protocol type: a template categorized as "General" will be available for all managed devices, a template categorized as "InfiniBand" will be available for

Infiniband devices only, and a template categorized as "Ethernet" will be available for Ether- net devices only.

- New CLI templates can also be uploaded manually to the Mellanox NEO[™] templates folder (/opt/neo/controller/templates).
- Built-in Linux Cumulus templates are also available
- To edit the command or create a new one, refer to "Events Policy Settings".
- 3. Once the commands are initiated, Jobs and Sub-Jobs will be opened accordingly. To view the commands' outputs, click on the "View Summary" button.

<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						Show devices by: Name
D v						
0	Description	Created 4	Last Update	Status	Summary	Progress
ilter S	Filter	∽ mm/dd/yyyy	∽ mm/dd/yyyy	♥ Filter	V	
17	Enable Docker	2020-02-20 09:37:50	2020-02-20 09:37:50		View Summary ()	
						1 to 1 of 1 C Page 1 of 1 P
						ltolofl C Pagelofl >
Jobs						ltolofl K ⊂ Pagelofl >
Jobs						itolofi K C Hage lofi D
Jobs	Description	Related Object	Created ↓	Last Update Statu	s Summary	Itolofi K Pagelofi Z
Jobs	Description	Related Object ▼ Filter ▼	Created ↓ ///mm/dd/yyyy マ	Last Update Stat. mm/dd/yyy ⊽ Filte	s Summary r⊽	Progress
Jobs	Description Filter Enable Docker	Related Object ♥ Filter ♥	Created ↓ mm/dd/yyy ♀ 2020-02-20 09:37:50	Last Update Statt. mm/dd/yyyy ♀ Filte 2020-02-20 09:37:50 Runf	s Summary r V View Summ	Progress

Configuring Access Credentials within Mellanox NEO

Using Mellanox NEO GUI

The default global access credentials are detailed in the following table. They can be changed through the "Settings" tab by selecting the "Device Access" view and filling-in the desired credentials for the relevant protocol.

Access Credentials

НТТР	SSH	SNMP	SNMP V2	SNMP V3	SNMP TRAP
Username: admin Password: Admin	Username: admin Password: Admin	Read Communit	Port: 16 Timeour	1 t: 2 [s] Retries: 2	Port: 162 Interface: eth0
secured (HTTPS): true Timeout: 60s Port: 443	Port: 22	y: pub- lic		Private authentication protocol password: adminauth123 Privacy protocol password: adminpriv123	Protocol: v2 Community: public

By default NEO will scan systems via snmpV2c protocol. In order to override specific device protocol setting definitions (for example, changing specific protocol type/protocol port/timeout/number of retries for a specific system), contact <u>Mellanox Support</u>.

Settings													
Discovery	System	Logs	Users	Device Access	Email	Events Policy	Switch Upgrade	Telemetr	y Virtualization				
System Type :	Mellar	ox ONYX	¥										
O HTTP													>
SSH													>
@ SNMP													~
on													
				Access Cre	dentials					Connect	ion Settings		
Read Cor	nmunity								Timeout (seconds)				
									2 Retries				
									2				
									Port				
									161				
Update													
SNMP v	3												>

Under HTTP settings, you can select between HTTP and HTTPS, by checking/unchecking the "SSL Secured Connection (HTTPS)" toggle button.

The Protocols section is only shown when the protocols are relevant to the system type. This applies to Global Settings and Unique Device Access.

It is possible to overwrite the defined credentials for a specific group or a specific system in the fabric:

Unique Group Access Credentials

This option can be enabled when creating a new group by checking the "Create Unique Credentials for this Group" checkbox. Once the group is created, its access credentials changeability mode cannot be altered. In case the checkbox is checked, devices for which unique access credentials are defined, will not appear as available for association with this group.

A device cannot be associated with more than one group that allows creating unique access credentials.

Group Wizard		×
Information Membe	ars Device Access	
Group Name	lab2	
Group Description	lab2 Group	
Group Members	Devices Ports	
Create unique crede	initials for this group	
		Next

In order to change the access credentials for a specific group, select the desired group, click the "Device Access" tab and edit the credentials for the relevant protocol.

Unique Device Access Credentials

In order to change the access credentials for a specific device, click on the "Devices" sub-menu, select the "Credentials" tab and edit the credentials for the relevant protocol.

▲ In case the selected device is associated with a group for which unique group access credentials are defined, the unique credentials defined for the group will be overwritten by the unique device credentials, for the specific device.

Groups					
+ New					
				Group Information	
10 •				Devices Device Access	
Name	Description	Members	Credentials	4.0770	
Filter	Filter V	Filter 🛛		Ø mir	
I Group1	Group1	Devices	v		
Other-Switches	Third Party Switches Group	Devices	0	Username	
Nutanix-Hosts	Nutanix Hosts Group	Devices	0	admin	
Mellanox-Spectrum-Sw	Mellanox Spectrum Switch	Devices	0	Password	
Mellanox-Switches	Mellanox Switches Group	Devices	0		
Linux-Switches	Linux Switches Group	Devices	0		
ConnectX-5-Hosts	Mellanox ConnectX-5 Hos	Devices	0		
ConnectX-4-Hosts	Mellanox ConnectX-4 Hos	Devices	0	opdate	
Telemetry-Enabled	Mellanox Spectrum Switch	Devices	0		
Windows-Hosts	Windows Hosts Group	Devices	0		
		1 to 10 of 1	r I< ≤ Page 1 of 2 → →I	✓ SNMP	
				SNMP v3	

High Availability

This window is meant to grant more stability to the system. NEO can be installed on three nodes so that if the main node (known as the "active" node) fails, another node which has all NEO persistence data saved will take over, and the system will remain functioning properly. The three nodes form a cluster and will constantly be synchronized. While the main node is the active node, the other two will be in a "standby" mode, set in an order from 2-3, according to priority. The standby node can take over the active node in case of a failover due to an error.

High Availability

Mode: Virtual IP Address:		Activated 10.215.53.99							
Role	IP	Name	Core Service	Data Sync Status	Priority				
0	10.215.52.6	reg-r-vrt-052-006.mtr.labs.mlnx	0	2016-09-08 17:37:23	1				
0	10.215.53.5	reg-r-vrt-053-005.mtr.labs.mlnx	0	2016-09-08 17:37:23	3				
0	10.215.53.6	reg-r-vrt-053-006.mtr.labs.mlnx	0	2016-09-08 17:37:23	2				

The virtual IP address that appears on top of the table in the figure above is the gateway for the NEO UI in all nodes/physical IP addresses listed in the table.

- Each node is identified by its IP address and name.
- "Priority" column enumerates the nodes according to their priority:
 - 1- the active node
 - 2- the first node to take over the active node in case of a fail-over
 - 3- the second node to take over the active node in case of a fail-over
- The colored icons under the "Role" column indicate the node status: Blue - active Orange - stand-by
- "Core Service" column indicates the health status of the nodes: Green - OK
 Red - Failure
- "Data Sync Status" column indicates the time at which the nodes were last updated/ synchronized. This status is configured to update every several minutes.
- A right-click on the active node will enable performing a manual fail-over on it. After confirming the action, it might take up to a minute for the stand-by to automatically take over. You might also have to restart the GUI.
- A right-click on any of the stand-by nodes will enable performing a manual take-over.

After confirming the action, it might take up to a minute for the active node to be disabled and the stand-by node to take over.

For HA installation and configuration, please refer to section "Installing NEO for High Availability".

Logs

Logs View

The Logs window provides a summary of all activities performed by Mellanox NEO in a list that can be filtered for NEO providers, log types and the number of the last lines.

Logs View

Controller	۳	console.log	۳	Search	Q	1000		•	📥 Download Logs
Log View									2
2020-02-20 02:22:06.768 rmg INFO Received Message 2020-02-20 02:22:06.768 controller INFO Starting 2020-02-20 02:22:06.782 controller INFO agregat 2020-02-20 02:22:06.538 web-info INFO user: admi 2020-02-20 02:22:06.538 web-info INFO user: admi 2020-02-20 02:22:07.633 web-info INFO user: admi 2020-02-20 02:22:08.578 web-info INFO user: admi 2020-02-20 02:22:08.578 web-info INFO user: admi 2020-02-20 02:22:09.578 web-info INFO user: admi 2020-02-20 02:22:09.578 web-info INFO user: admi 2020-02-20 02:22:09.518 controller INFO Resages 2020-02-20 02:22:09.528 controller INFO Starting 2020-02-20 02:22:09.238 web-info INFO user: admi 2020-02-20 02:22:09.238 web-info INFO	Topic to agging dis. (admi))))))))))))))))))))))))))))))))))))	idiscovery, service:Virtual: regate discovery informatio covery information from Vir instrator), uri (http://17. histrator), uri (http://17. notification, category:not discovery, sorvice:Bevice i discovery information of found matched callback for found matched callback for errors [1 histrator), uri (http://17. histrator), use put in act tion run_cli was put sorters.	zation, moc from Virtu 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 20,203.5/r 11 [1011.1 20,203.5/r 120,203.5/r 120,203.5/r 130,203.5/r 140,203.5/	deidelta walization. done. done/app/userz/?15821833; neo/app/settings/neo_ipi/ neo/app/orosi/setting/tra-kilds?/ neo/app/rovis/seting/tra-kilds?/ neo/app/rovis/seting. ten/app/rovis/seting. ten/app/rovis/seting. ten/app/rovis/seting. ten/app/rovis/seting. ten/app/rovis/seting. ten/app/rolles/image/s/ neo/app/rolles/image/s/ neo/app/rolles/image/s/ neo/app/rolles/image/s/ neo/app/rolles/image/s/ add uill be run later, blo add uill be run later, blo ten/add uiller nu later, blo ten/add uille run later, blo add uill be run later, blo ten/add uiller nu later, blo	1779&tz=Asia&2F Asia&2F2erusal Asi72erusalaen, meth Turasiaen, meth Jugara Asia&7 collectors}_ upgrade/images upgrade/images upgrade/images upgrade/images isSi1833277 collectors]_ follectors]_ follectors]_ sking jobs are: kking jobs are:	<pre>Jerusalem), method em), method: (GET) dd: (GET) dd: (GET) storm, method: (GET) storm, method: 15021033237058tt=A 3227648tr=Asia%2FJ ?_=15021033237058tt=A m] [Application] [tics?_=15021033237058tt=A m] [Application] [1502103237058tt=A s 10</pre>	<pre>:: (GET) (GET) (GET) sisKXF7Erusalem), method: (erusalem), method: (GET) z=AsisKXF7Erusalem), method Jobs] [Job failed] [Job for B6&tz=AsisKXF7Erusalem), me en, method: (GET) sisKXF7Erusalem), method: (</pre>	GET) 1: (GET) · 'Device Managemer rthod: (GET) (GET)	nt Discovery' failed.
2020-02-20 02:22:09.405 controller INFO AC aggreg	ator: tor:nr	the following systems may be occessGroupMembersChanged- be	affected b	by last AC aggregation:					
2020-02-20 02:22:09.405 controller INFO AC aggre	ator:	the following systems may be	affected b	by last AC aggregation:					
2020-02-20 02:22:09.405 controller INFO ACAggregs 2020-02-20 02:22:09.405 controller INFO AC aggreg	tor:pro	ocessGroupMembersChanged- h the following systems may be	ndling syst	tems: by last AC aggregation:					
2020-02-20 02:22:09.406 controller INFO AC aggreg	tor:pr	ocessGroupMembersChanged- h	ndling syst	tems:					
2020-02-20 02:22:09.406 controller INFO AC aggre	ator:	the following systems may be	affected b	by last AC aggregation:					-

By clicking "Download Logs", all logs for all NEO providers and log types will be saved in one tar.gz file that can be downloaded.

Log Types

- console.log contains the union of related component (controller or provider) logs
- controller.log contains logging information for Mellanox NEO's central controller component
- events.log contains logging information regarding events of a related component
- jobs.log contains logging information regarding related component jobs (currently running actions)
- repository.log contains logging information on related component repository changes
- zmq.log contains logging information on related component ZMQ communication
- rest.log contains logging information on rest calls for a related component
- web-info.log contains logging information on web access of a controller
- monitors.log contains logging information on InfluxDB accessing via controller monitoring API
 - InfluxDB is a Scalable Realtime Graphing open source tool (<u>http://</u> <u>InfluxDB.wikidot.com/start</u>) licensed by Creative Commons Attribution-ShareAlike 3.0 License.
- web-access.log contains logging information on web access of a specific internal service

Log files are located in the file system, according to the specific component (Controller or Provider):

- Controller logs are located at: /opt/neo/controller/log
- Access Credentials Provider logs are located at: /opt/neo/providers/ac/log
- IP Discovery Provider logs located at: /opt/neo/providers/discovery/log
- Device Manager Provider logs located at: /opt/neo/providers/dm/log
- Monitoring Provider logs located at: /opt/neo/providers/monitor/log
- Provisioning Provider logs located at: /opt/neo/providers/provisioning/log
- ETH Discovery Provider logs located at: eth discovery log /opt/neo/providers/ethdisc/ log/
- Solution Manager logs located at: /opt/neo/providers/solution/log/
- IB Manager logs located at: /opt/neo/providers/ib/log/

Settings

This section describes the different Settings tabs.

Setting	S												
Discovery	System	Logs	Users	Device Access	Email	Events Policy	Switch Upgrade	Telemetry	Virtualization				
Allowed	Blacklist												
+ Add	Q Scan All												
Allowed Lis													
10 🗸													
Active	Range/Subr	net								Auto Provisioning	System Type	Tier	
Active	Range/Subr	net							▼	Auto Provisioning	System Type	Tier	
Active	Range/Subr	net				10.209.38.100				Auto Provisioning	System Type NVIDIA Mellanox ONYX	Tier	8
Active	Range/Subr	net				10.209.38.100			▽	Auto Provisioning Enable SNMP Enable LLDP	System Type NVIDIA Mellanox ONYX	None V	î
Active	Range/Subr	net				10.209.38.100			γ	Auto Provisioning C Enable SNMP Enable LLDP SNMP Traps	System Type NVIDIA Mellanox ONYX	Tier None V	Î
Active	Range/Subr	net				10.209.38.100				Auto Provisioning C Enable SNMP Enable LLDP S SNMP Traps	System Type	None V	ŝ
Active	Range/Subr	net				10.209.38.100			⊽	Auto Provisioning	System Type NVIDIA Mellanox ONYX	I Tier	= ===================================

Discovery

NEO supports two methods of device discovery:

- Auto-Discovery periodic automatic discovery of devices
- IP Scan manual discovery of devices

When running NEO for the first time, devices are not automatically discovered, unless the following discovery buttons are used:

- Agent Discovery button when turned on, NEO enables automatic discovery of Mellanox Onyx switches. For further information, refer to "Auto-Discovery" method under "IP Discovery" in <u>Providers</u>.
- LLDP Discovery button when turned on, NEO enables automatic discovery of switches and hosts on which LLDP is enabled. For further information, refer to "ETH Discovery" under <u>Providers</u>.

+ Add button - using this option, users are able to add a device either by manually typing its IP address, or by scanning a range or a subnet of IP addresses:

Discover By		
IP	Range	Subnet
Device		
Device IP		
System Type		
Mellanox OI	NYX	•
+ Add Devices		
IF		
Filter		ν ·
No iter	ns were fou	und
Auto Provision	ning 🚯	
SNMP		
SNMP Tra	ps	
	Submit	Cancel

• Discover by IP:

Insert the Device IP address,

select its type, and click the "+Add" button to add the device. Repeat the action for all devices you wish to add. Once all devices are added, click "Submit".

A window with the devices that have been added will be displayed. Clicking one of the devices will show the system status.

Adding systems

1.2.3.4	Description: Adding systems Output: System has been added.	
Each newly added de	evice under this window will automa	atically appear in
the "Allowed" list und	er Settings → Discovery, in a graye	ed-out row.

• Discover by Range/Subnet:

Discover By

IP	Range	Subnet
	. /	
System Typ	e	>
Auto Provis	ioning	>
Discovery N	/lethod	>
Discovery E	By Tier 🚯	
All		•
	Save	Cancel

Insert the IP range or subnet address to scan for devices, and select the device types to discover, and the discovery methods to use:

System Type	×	
Mellanox ONYX	Discovery Method	~
Nutanix Host		
Cumulus Linux Windows Host	Multicast	
· II DP when checked NE(discovers all devices found with	nin the rang

- LLDP when checked, NEO discovers all devices found within the range specified and on which LLDP is enabled
- Multicast when checked, NEO discovers all Mellanox Onyx switches found within the range specified using multicast

You can optionally specify a tier for the devices discovered by the scan. The tier is used to present the network map in a hierarchical structure.

• Auto-provisioning - users may define some provisioning actions that run automatically on all the added devices:

	~
SNMP	
SNMP Traps	

• SNMP - configure the device to listen and respond to SNMP requests (SNMP version 2c). Supported for Cumulus switches.

- SNMP Traps configure device to send SNMP traps to NEO. The SNMP trap version (2c/3) is decided by the Onyx global SNMP credentials used. Supported for Onyx switches.
- LLDP configure device to enable LLDP protocol. Supported for Onyx and Cumulus switches.
 - ▲ If a device is not applicable for a certain auto-provisioning task, NEO will skip this device.

Once a discovery operation is created, it will be added to the "Allowed" list, where all checkboxes/ fields can be edited:

Allowed List											
Page Size:	10 •										
Active	Range/Subnet		Discovery Method		Upon Discovery	P Scan		Tier			
Filb 🗸	Filter	۷.	Filter	7	Filter	Filter	₽	Filt	8	Fil	8
2	10.209.36.162		UDP Multicast		Enable SNMP Enable LLDP SNMP Traps			All	٣		8
×	10.209.37.246		ULDP		Enable SNMP Enable LLDP SNMP Traps			All	Y		•
2	10.209.37.217 - 10.209.37.218		□ LLDP □ Multicast		Enable SNMP Finable LLDP SNMP Traps	Mellanox ONYX Linux Host Nutanix Host	*	All	¥	۹	ŵ
2	10.209.36.161 - 10.209.36.162		LLDP Multicast		 ✓ Enable SNMP ✓ Enable LLDP ✓ SNMP Traps 	Mellanox ONYX Linux Host Nutanix Host	÷	All	¥	۹	۲
Please ensu	re that global device credentials have been set, as they are needed for device discovery.					1 to 4 of 4		< Page	1 of 1		

Notes:

- When removing a row using the ^{im} icon, devices that were discovered in the range specified in that row will be removed from NEO
- When adding a device through the Devices window under Managed Elements, it will be added to the same list, without the option to edit the relevant row. When removing the device from NEO, the row will be removed from the list.
- · When removing a device from NEO, it will automatically be blacklisted under

the Blacklist tab. These devices can be removed from it by clicking the 🧧 icon.

Black List			
Device IP	. +		
IP	Action		
Filter	7		
172.20.	203.52/32	Ē	
192.16	58.1.6/32	圃	
172.20	.203.4/32	圃	
1.1.1	1.22/32	圃	
192.16	58.1.4/32	Ē	
			Apply

Devices can be added to the blacklist manually by inserting the device's IP under the Blacklist tab.

"Scan All" option can be used when wishing to discover devices that belong to all device types specified in the in the "Select System Type" field.

ved List							
v							
tive Range/Sub	et		Discovery Method	Auto Provisioning	System Type	Tier	
Filter		7					
¥	172.20.203.50		ILLDP	Carable SNMP	Mellanox ONYX	All Y	t
			Multicast	C Enable LLDP			
				SNMP Traps			
	172.20.203.0/24		✓ LLDP	C Enable SNMP	Mellanox ONYX	All 🔻 C	λ Ι
			Multicast	C Enable LLDP	Linux Host		
				SNMP Traps	Nutanix Host		

System

Maintenance Mode

When turned on, this mode prevents the system from creating events.

Modifying Management IP Address

It is possible to edit the management IP of Mellanox NEO. The management IP address is used for the purposes of the telemetry agent, configuring SNMP traps, and multicast discovery.

• The management IP configuration is updated dynamically if not configured by the user and if the user has one management IP address or DNS resolve available.



Backup and Restore

The user can create backups of NEO and restore them:

Backup and Restore				
+ Create Backup	port Backup			
Backups				
10 •				
Name	Created	Description	Version	
Filter	V Filter	Filter	∇ Filter	
🔳 🛢 NEOconfig2	2020-04-09 19:08:23	Configuration file 2	2.6.0-11	
Seconfig1	2020-04-09 18:51:18	Configuration file 1	2.6.0-11	O Upgrade
				 Restore
			1 to 2 of 2	in Delete

- Under Backup and Restore, the following actions can be performed:
 - Create a new NEO backup. This will create a backup of NEO's settings and discovery data.
 - Import Backup. The user can import a backup that already exists.
 - Backups table context menu:
 - Upgrade: upgrades an old backup file to work with the current NEO.
 - Restore: restores and applies the selected backup to NEO.
 - Export: exports selected backup as a tar file.
 - Delete: deletes the selected file.
- Change a backup name or description after creating it.

How to create NEO backups and restore them:

1. In NEO GUI go to the Settings tab \rightarrow System tab \rightarrow Backup and Restore. Settings

Discovery	System	Logs	Users	Device Access	Email	Events Pol	icy Switch Upgrade			
Maintenance	Mode			off						
Managemen	t IP:		10	209.36.60 🖋						
Backup and	Restore									
+ Create Ba	ackup	Limport Ba	ackup							
Backups										
10 🗸										
Name				Created			Description		Version	
Filter				Filter		7	Filter	7	Filter	7
						No back	ups			
									0 to 0 of 0	< Page 0 of 0 > >

2. Create backup "NEOconfig2".

Create Backup	×
Name	
NEOconfig2	
Description	
Configuration file 2	
	Create

3. In order to move the backup to another machine/NEO in the fabric, you need to export the backup file to a Windows folder.

Backup and Restore				
+ Create Backup	iport Backup			
Backups				
10 •				
Name ↑	Created	Description	Version	
Filter	Filter	Filter	Filter	7
🔳 🛢 NEOconfig1	2020-04-09 18:51:18	Configuration file 1	2.6.0-11	rade
Seconfig2	2020-04-09 19:23:10	Configuration file 2	2.6.0-11 ② Rest	ore
			🕹 Expo	ort
			1 to 2 of 2 🗎 Dele	ete

When 2 backup images are created, the "Create Backup" and "Import Backup" buttons are grayed out.

This creates the tgz file "NEOconfig1.tar.gz".

A When using export, NEO saves the file on the NEO client (not on the server).

4. In order to restore the NEO backup, import the tgz file using the GUI.

Discovery	System	Logs	Users	Device Access				
Maintenance Managemen	e Mode t IP:		17	off 2.20.203.5 🖍				
Backup and	Restore	a Backup fro	om Computer					
+ Create B	ackup 🔟	Import B	ackup					
A When us	▲ When using import NEO searches for the file on the NEO client (not on the server).							
A Restorin results	ng a switch co with a switch	nfigured v with the A	vith NEO Ag Agent instal	ent to a snapshot led.	without the agent,			

Saving Files on Remote Storage

NEO is able to save data files in a remote shared location. The following directories will be redirect to the shared location:

- Data (for backup, built-in tasks configuration tool, groups notifications, reports, smtp, telemetry)
- Logs
- Templates

Activate:

To activate this feature, perform the following steps:

- 1. Stop NEO.
- 2. Mount a local drive to a remote shared location.
- 3. Edit:

```
/opt/neo/controller/conf/controller.cfg
```

From:

```
[Controller]
share_location=LOCAL
```

to:

share_location=/new_location

4. Restart NEO.

Result:

If the shared location is empty, an initial copy of the shared location data will be saved to / new_location/neo.

All links to data, logs and templates will point to the relevant shared location. In case of HA file replication, stopping and activating the node will update the shared location.

Upgrade:

In case of upgrade, NEO will update the shared location data, so you will be able to continue working with it.

Disable:

To disable this feature, perform the following:

- 1. Stop Mellanox NEO.
- 2. Edit:

```
/opt/neo/controller/conf/controller.cfg
```

to:

[Controller] share_location=LOCAL

3. Restart NEO.

Logs

In order to configure the type of logs saved in the logging server, go to "Verbosity Level", and select the required type: DEBUG/INFO/WARNING/ERROR.

A The verbosity level set in this menu applies only to the controller console log.

Settings

Discovery	System	Logs	Users	Device Access	Email	Events Policy	Switch Upgrade	Telemetry	Virtualization	
Verbosity L	evel									~
			DEBUG	INFO WARNI	NG ER	ROR				
									Save	
Syslog										>

To send the log files to the local machine, check the desired log files (controller/web/events.log) with their severity from the radio buttons (INFO/WARNING/ERROR), and click "Save".

Local Mode

Settings Discovery System Logs Users Device Access Email Events Policy Switch Upgrade Telemetry Virtualization > Verbosity Level Syslog on Log Files Minimal Severity WARNING ERROR Controller.log INFO Web-info.log INFO WARNING ERROR Events.log INFO WARNING Destination local remote Save

To send the log files to one or more remote machines (you may add as many as 5 destination machines using the icon), provide the destination/s IP address, port number, minimal severity and protocol (UDP/TCP), check the desired log files (controller/web/events.log) with their severity from the radio buttons (INFO/WARNING/ERROR), and click "Save".

Please note that the only log files that can be send to the syslog are the following NEO controller files:

- Controller.log
- Web-info.log
- Events.log

Remote Mode

Settings Discovery System Logs Users **Device Access** Email Events Policy Switch Upgrade Telemetry Virtualization > Verbosity Level Syslog on Log Files Minimal Severity ERROR Controller.log INFO WARNING Web-info.log INFO WARNING ERROR Events.log INFO WARNING ERROR Destination local remote IP Port Protocol Minimal Severity UDP • 10.224.40.13 514 INFO • + Save

Users

The "Users" view lists the system's users and their roles, and allows adding new users. Administrators can also remove users from the list, upgrade users' level to administrators and downgrade administrators' level to users. The "admin" administrator is the only user that cannot be removed or downgraded.

Unlike administrators, standard users cannot:

- Change credentials
- Access the "Notifications" tab
- Access the "Logs" tab
- Access the "Providers" tab
- Access the "Tools" tab

To add a new user, click "New" and fill in the required credentials (see <u>Mellanox NEO GUI</u> <u>Fields Validations</u>).

0		e 8 -		
S	er	tir	າຕ	s
-	~		.9	~

Discovery	System	Logs	Users	Device Access	Email	Events Policy	Switch	h Upgrade	
🚑 New									
10 🗸									
User Na	me							Role	
Filter) 7	Filter	7
adm	n							administrator	
								1 to 1 of 1 ⊣ < ⊂ Page 1 of 1	

Settings		
Discovery System Logs Users Device Access	New User	×
Ar New	Name admin	
10 V User Name	Password	
Filter	Confirm Password	
admin	Retype Password	
najaj	Role administrator V	1 to 3 of 3
	Close Sub	mit

Device Access

The "Device Access" view allows administrators to change the default global access credentials for each protocol (HTTP, SSH, SNMP and SNMPv3), and change the connection settings for SNMP and SNMPv3 protocols. Such changes will only apply to devices for which no unique access credentials are defined (either exclusively or in association to a group).

Settings		
Discovery	System Logs Users Device Access Email Events Policy Switch Upgrade Telement	ry Virtualization
System Type :	Mellanox ONYX •	
O HTTP		>
SSH		>
O SNMP		~
on		
	Access Credentials	Connection Settings
Read Con	munity	Timeout (seconds)
•••••		60
		Retries 2
		Port
		161
Update		
SNMP v	3	>
A	Note that only one of the SNMP protocols protocols can be activated/deactivated u	can be activated at the same time. These sing the on/off button.
A	The active Onyx SNMP protocol version als to listen to SNMP traps. This SNMP version the "SNMP Traps" auto-provisioning option	so affects the SNMP protocol version that NEO uses is also used to configure switches when checking

Email

The Email view is divided to two sections:

- The SMTP section allows administrators to configure a default email client to be used by Mellanox NEO for event notifications. Once the requested SMTP parameters are filled, the user can select the type of events for which email notifications are generated. For more information, see <u>Events</u> section.
- The Recipient Lists section allows the user to add email addresses lists to be used to distribute specific event alerts. To add a new list, click on the "New" button, insert a list name and a list of the desired email addresses, separated by commas (with no spaces).

Settings

Discovery System Logs Users Device Access En	nail Events Policy Switch Upgrade Telemetry Virtualization	
SMTP	Recipient Lists	Email Addresses
Sender Name 4-20 characters - letters, numbers and whitespaces	Le New	會 Clear Email List
Username	10 v	10 v
admin	Filter ∑	Filter
Password	 test Error-Events-Mailing-List 	test@test.com
	Critical-Events-Mailing-List	1 to 1 of 1
Server Address Server Address	1 to 4 of 4	
Email Address		
Sender address		
Port 0 25		
Use SSL		
Submit		

New Recipient List	×
Name	
Lab_Team	
Emails	
lab1@mellanox.com.lab1@mellanox.com.lab1@mellanox.com	
Please be notified that all WJH events are disabled by default. In case you want to receive them by email, make sure to enable the required events at the Events Policy table (Settings \rightarrow Events Policy)	
Close Submit	

Configuring Email Notifications According to Event Severity

User are able to add an email to predefined mailing lists for events with different severities (i.e. Critical/Error/Warning). Once emails are added to a certain recipient list, NEO will send email notification for all events with that particular severity destined to the addresses defined within the recipient list.

Recipient Lists	Email Addresses
Le New Delete C Edit	10 ▼ Email Filter ♥ example@gmail.com
Critical-Events-Mailing-List	1 to 1 of 1 🥂 < Page 1 of 1 🗦 💚
Warning-Events-Mailing-List 1 to 3 of 3	

Events Policy

The "Events Policy" view allows the user to activate and deactivate events, and to define the severity, condition-value and description of each event. Clicking an event name displays its relevant Event Information table.

Settings nts Policy Switch Upgrade Events Event Infe 10 10 Filter V Module Status Cha OS M No TTL One or more dev Planned Reload MTU Mis 1 to 1 of 1 Page 1 of 1 Device ... System OS Ve CPU Temperature E. Device Port Port State Event Test Trap Received Device Page 1 of 10 > 1 to 10 of 93

The Event Information table displays the following columns:

- "Active" check or uncheck boxes to activate or deactivate events as desired.
- "Severity" there are 5 severity types: Info, Notice, Warning, Error and Critical. You may match each of the events to the appropriate severity type, as you see fit.
- "Trigger", "Operator" and "Value" these 3 parameters are used to define the circumstances which lead to the event's generation. The "Value" is configurable, and may be a single number, or a range of values, depending on the event type.
- "TTL" "Time To Live" (TTL) is used for setting a time frame within which an event that is taking place will become auto-acknowledged.
 - "No TTL" is set as default for most device evens and indicates that no TTL has been set for a specific event. To set a TTL, click the "No TTL" description and set the time

frame in seconds, minutes, or hours, and click the \checkmark icon.

 "24h" is set as default for most application events and indicates an autoacknowledgment within 24 hours. This time frame can be edited by clicking the "24h" description and setting any other number of seconds/minutes/hours and then clicking



- "Event Description" a brief definition of the event. You may edit the event description by clicking it.
- "Task" associate an existing task to the selected condition. If a task is not assigned to objects, it will run on the objects on which the event took place.
- "Filter" select a specific group for which the conditional event will apply. If no filter is set, the event will apply on all devices/ports in the network and will appear under the "Events" window. If a filter is set for a certain group, the event will only apply on the devices/ports in that group.

To create a new filtered condition, either click the "+" icon, or right click the event you wish to clone. Choose "Create a new filtered condition", and select the groups you wish to apply the new conditional event on.

- "Email Notification" (\square) set recipient lists to which alert emails will be sent when the event occurs, by clicking on the plus sign adjacent to the relevant event.
- "Mellanox Care" this column is enabled for setting only after operating the Mellanox Care feature.

A Mellanox Care is a special service requiring a license. To obtain a license, please contact <u>Mellanox Support.</u>

For all the events with a checked Mellanox Care box, NEO generates and sends a regular email to Mellanox NOC with details of these events. (Note that the boxes of some events are checked by default.)

The Mellanox Care email is sent at the frequency defined in the Mellanox Care configuration ("sending_interval" parameter), and contains an aggregate of event occurrences during the last "scanning" interval. The details of the events are kept in a NEO database that is cleared each time an email is sent. Note that if no events occur during a scanning interval, no email will be sent for this interval. Mellanox NEO enables the user to "induce" a Mellanox Care email and not wait for the entire scanning interval to expire. To do so, go to the Events menu (left pane) and click the

Mellanox Care - Scan Now button (see below). This generates and sends an email to Mellanox NOC with the aggregated events since the last sent email. The events database will be cleared after this email too.
		Events	are - Scan Now	
Dashboards	>	10 🔻		
Managed Elements	>	Severity	Category	Timestamp ↓
📥 Network Map		Filter 7	Filter., V	mm/dd/yyyy
🗲 Services		•	==	2020-02-17 16:08:34
Configuration Management		0		2020-02-17 16:08:34
- 5 5		0	Image: A start of the start	2020-02-17 16:06:00
	>	0	Ø	2020-02-17 16:06:00
🚓 Tasks 🛛 🚺		0	Ø	2020-02-17 16:06:00
🕤 Jobs 🛛 🚺		0	Ø	2020-02-17 16:00:50
		0	Ø	2020-02-17 16:00:24
		0	au	2020-02-17 15:59:40
Notifications (42		0	[.did]	2020-02-17 15:59:31
🗏 System Health	>	0	ŧ	2020-02-17 15:58:28
Settings				

Further information on events can be found in <u>Application Events</u> and <u>Device Events</u>.

Image Profile

Through the Image Profiles view, users can define profiles with parameters required for NEO to execute switch software (Onyx) upgrade, driver install, Docker image load or generate switch dump file.

These profiles will become available under Managed Elements \rightarrow Devices (right-click a host/ device) \rightarrow Onyx Software Upgrade/Driver Install/Load Docker/Remote Folder \rightarrow (dialog window) Profiles drop down menu.

To create a profile:

- 1. Click the "Add" button.
- 2. Fill in the data, including the type of profile (Onyx Software Upgrade/Driver Install/Docker Container/Remote Folder), and click "Save".

Name	
Profile Name	
Туре	
ONYX Software Upgrade	v
Description	
Action Description	
Protocol	
SCP	•
Server	
hostname	
Path	
/absolute/path/to/file/	
Image	
image_file.img	
Username	
username	
Password	

A new profile with user-defined parameters will be created.

	System	Logs	Users	Device Access	Email	Events Policy	Switch Upgrade	Telemetry	Virtualizat
nage Mana	agement								
rofile									
+ Add	🛓 Downl	oad Mellan	ox OFED	Lownload Mellar	nox ONYX				
Deefler									
Promes									
Name				Туре		Last	Modified \downarrow		
Filter.			7	Filter		∇ mm	/dd/yyyy	7	
oyn	x1			sw_upgrade		2020	-02-16 16:52:03		
						11010	f1 10 0 Pane 1 c	of >>	

- To edit an existing profile, click it, modify the parameters on the right pane, and either click "Save" to overwrite it, or click "Save As" to create a new profile
- To remove a profile, right-click it and select "Remove"

These profiles will become available under Managed Elements \rightarrow Devices (right-click a host/ device) \rightarrow Onyx Software Upgrade/Driver Install/Load Docker \rightarrow (dialog window) Profiles drop down menu.

Users can create up to 200 SW Upgrade/Docker Container/Driver Install profiles.

Image Management

An alternative option to <u>Image Profile</u>, image management allows users to upload an NOS image directly from their local machine to the NEO management system.

ONYX Software Upgrade	×
Image Management	
	Add Delete
Profile	
	Close Create Task Submit

Users may reach the Image Management screen by following any of the following procedures:

- Managed Elements → Devices → Right-clicking one of the listed devices → Install → Onyx Software Upgrade
- Tasks \rightarrow +Add \rightarrow Operation tab \rightarrow Onyx Software Upgrade operation \rightarrow Objects tab \rightarrow Adding devices to be upgraded \rightarrow Parameters tab
- Settings \rightarrow Switch Upgrade tab

By clicking the Add button, users are able to browse their local machine's directories and select the NOS image they would like to load.

ONY	X Software Upgrade	×
• In	nage Management	
0	nyx-X86_64-3.8.2008.img Add Delete	
O Pr	rofile	
	Close Create Task Submi	t

Users are able to upload up to 2 images to have on hand by clicking Add again and selecting a new image file.

ONYX Software Upgrade		×
Image Management		
onyx-X86_64-3.8.2008.img onyx-X86_64-3.8.2004.img	Add Delete	
Profile		
	Close Create Task Submit	

Telemetry

Priority Counters

This section shows the priorities available for monitoring and usage in RoCE configuration. Each priority level has an on/off switch next to it, to enable or disable its usage. Priority 0 is always available and only one additional priority can be selected at a time. These priorities are used in the Telemetry wizard if Spectrum switches are monitored. If a priority level is enabled, it can be selected for the Telemetry operation.

Settings

Discovery	System	Logs	Users	Device Access	Email	Events Policy	Switch Upgrade	Telemetry	Virtualization
Quality-of-s	ervice Moni	toring				~			
Priority 0			on						
Priority 1				off					
Priority 2				off					
Priority 3			оп						
Priority 4				off					
Priority 5				off					
			S	ave					
Data Collec	tors					>			

Displays access credentials for the specific Mellanox device in four protocols - HTTP, SSH, SNMP, SNMP v3.

Data Collector

The Data Collector is the IP and port of the server that will collect the telemetry raw data. Settings

Discovery	System	Logs	Users	Device A	ccess	Email	Events F	olicy	Switch Upgra	ade	Telemetry	Virtualizati
Quality-of-s	ervice Moni	toring					>					
Data Collec	tors						~					
Nan	ne	IP		Port	Fo	ormat						
NEO GR	PC Co	172.20.203	.5	7658	gRPC	· · · ·						
NEO DB		172.20.203	.5	8094	Influx							
NEOgRF	PC	172.20.203	.5	2004	gRPC	· · ·	m +					
NEOGRE		172.20.203	.0	2004	дкрс	•	•					
							Save					

NEO is configured to a number of default collectors, which cannot be removed.

• Collectors that are related to sessions cannot be removed.

Make sure to add a collector before creating a session.

Virtualization

In this page, the user can define integration with various hypervisors. This can help NEO acquire information about the VMs running on them and handle VM lifecycle events to proper VLAN configuration on the switches.

VLAN provisioning operations can be viewed under jobs (Jobs with the description Create/Delete VLAN, Create/Delete Network and Create/Delete Cluster are VLAN Provisioning jobs).

VLAN Provisioning Port Mode - the user can select what mode the switch ports are working with (Hybrid/Trunk). This will be used when using NEO to handle VM lifecycle events and change switch VLAN configuration accordingly.



VMware vCenter DVS Configuration

vCenter Server is the centralized management utility for VMware, and is used to manage virtual machines, multiple ESXi hosts, and all dependent components from a single centralized location. In this section, the user can define VMware vCenter connectivity information, which allows managing ESXi hosts.

vCenter DVS Configuration			~
VLAN Provisioning Per port VLAN provisioning VXLAN Provisioning Disabled VXLAN Provisioning Disabled VXLAN Provisioning Disabled VXLAN Provisioning VXLAN Pro	The VMware VCenter Integration enables NEO to provide visibility into virtual environments which operate with a Distributed Virtual Switch. The Integration enables VL/N and VXLAN tunnels auto-provisioning according to the VCenter admin coeffiguration, these enabling an automatic VM migration capability across nodes and douds. Global VLAN provisioning Auto VLAN provisioning on all Switches and Ports once VLAN is created	Available Clusters	C(cluster2 C(cluster1
VCenter Address Port 10.209.26.208 443	Per port VLAN provisioning Auto VLAN provisioning on destination Switch Port after VM has migrated, some packet loss may be experienced until provisioning is completed	1 to 2 of	2 (< Page 1 of 1 →)
administrator@vsphere.local	VXLAN Provisioning VXLAN tunnels will be auto provisioned upon new VLAN creation	Disc	over Clusters Save
Password			
Connect >			

The VLAN Provisioning drop down contains the following options:

- Disabled VM lifecycle events will not be handled. NEO will only retrieve VM information from vCenter.
- Global VLAN provisioning NEO will listen to network events. In case of a network change event (e.g. adding or removing a network), NEO will add or remove VLANs to/from all switch ports. VLANs will be removed from the ports but will not be removed from the switch. This is the recommended VLAN provisioning mode when working with Live Migration. In this mode, the VLANs' auto-provisioning is performed upon network creation (before the VM migration event) therefore, it prevents traffic lose.
- Per port VLAN provisioning NEO will listen to VM lifecycle events. In case of a VM change (e.g. VM added, removed or migrated) which required changes in VLANs, NEO will add or remove the VLAN accordingly from the relevant switch ports.
 Some packet loss may be experienced until provisioning is completed.

The VXLAN Provisioning drop down contains the following options:

- Disabled -VXLAN tunnels will not be configured on VM lifecycle events.
- L2 VXLAN tunnels will be configured on VM lifecycle events, and NEO will treat them as layer 2, without gateway configuration.

Upon filling the vCenter IP address, port, username and password, the user should click the Connect button to make sure the details are correct and NEO can connect the vCenter.

The Connect button should be clicked after every change so the new information will be processed by NEO.

Limitations:

• Regular Virtual Switches are not supported (this capability supports only Distributed Virtual Switches)

- Old events are not supported
- Removing network adapters while VM is ON is not supported
- Network configuration changes (DVS changes) are not supported
- NEO allows adding a list of ESXi manually or by choosing a cluster. For each cluster that will be chosen, a group will be created for the dedicated cluster.

To add a ESXi device manually:

See Adding/Removing Devices.

To add a cluster:

If the connection to vCenter is successful, a list of clusters managed by vCenter will be shown in the Clusters table.

Under Available Clusters a list of available clusters will be shown, mark the ones that you want to discover.

To refresh the list, click Discover Clusters.

To save and discover the Clusters, click Save and new ESXi hosts will be discovered under Managed Elements:

+ Add										
				c	Device Information (17	2.20.203.5)			3.10.0-957.12.2.el7.x8	6_64 ❷
All	10 •				General Ports	Inventory Ev	ents Jobs Device Access	Group	s Links Config	
Name	IP ↑	System Type	Status	MAC	Telemetry Snapshot	S				
Filter 🗸	Filter V	Filter V	Filter V	Filter 🗸	10 •					
localhost	172.20.203.2	■ IBM System x365…	0	N/A	Name		Description		Credentials	
🔳 lab5	172.20.203.5	Red Hat KVM	0	N/A	Filter	V	Filter			
lab6	172.20.203.6	Red Hat KVM	•	N/A	Linux-Moste		Linux Hocts Group		0	
localhost.localdo	172.20.203.12	Red Hat KVM	•	N/A	Linux-Hosts		Linux Hosts Group		0	
localhost.localdo	172.20.203.13	Red Hat KVM	0	N/A	NEO-Host-Active		Hosts with NEO-Host Installed	Group	0	
localhost	172.20.203.20	HP ProLiant DL1	0	N/A	ConnectX-4-Hosts		Mellanox ConnectX-4 Hosts Gi	oup	0	
switch-058d0c	2 172.20.203.50	📇 MSN2100	0	B8:59:9F:62:3D:00					1 to 3 of 3 C Page 1 of 1	
switch-9f2c62	2 172.20.203.51	📇 MSN2100	0	98:03:98:FC:36:80						
			1 to 8 of 8	< Page 1 of 1 > >						

Prism AHV Configuration

In this section the user can define Nutanix Prism Central and Prism Element connectivity information. NEO uses it to get information from Prism regarding devices, VM information and lifecycle events. For further information, refer to <u>Mellanox NEO/Nutanix Prism Plug-in</u>.

Prism AHV Configuration			
VLAN Provisioning		Prism Elements Credentials	
Per port VLAN provisioning	The Nutanix PRISM integration enables NEO to provide visibility into the virtual environment connected to the network. The Integration enables VLAN and VXLAN tunnels autorprovisioning according to the PRISM admin configuration, these enabling an automatic VM micration capability across nodes and	10 *	+ Add
Switch OS	clouds.	Element IP	
Onyx •	(Jaha) M. Maravisianian	Filter	
	Auto VLAN provisioning on all Switches and Ports once VLAN is created	default	1
VXLAN Provisioning		10.209.39.27	28
Uisavicu .	Per port VLAN provisioning Auto VLAN provisioning on destination Switch Port after VM has migrated, some packet loss may be		
Prism Central IP Port	experienced until provisioning is completed	1 to 2 o	12 < < Page 1 of 1 ⇒ ⇒
10.209.39.39 9440			
Prism Central Username	VXLAN Provisioning VXLAN tunnets will be auto provisioned upon new VLAN creation		
admin	Allocated Category ID		
Prism Central Password	From the start of subret The GW IP address will be the first IP in the subnet e.g 192.168.1.0/24 GW IP 192.168.1.1		
	From the end of subnet The GW IP address will be the last IP in the subnet e.g 192.168.1.0/24 GW IP 192.168.1.254		
			Connect >

The VLAN Provisioning drop down contains the following options:

- Disabled VM lifecycle events will not be handled. NEO will only retrieve VM information from vCenter.
- Global VLAN provisioning NEO will listen to network events. In case of a network change event (e.g. adding or removing a network), NEO will add or remove VLANs to/from all switch ports. VLANs will be removed from the ports but will not be removed from the switch. This is the recommended VLAN provisioning mode when working with Live Migration. In this mode, the VLANs' auto-provisioning is performed upon network creation (before the VM migration event) therefore, it prevents traffic lose.
- Per port VLAN provisioning NEO will listen to VM lifecycle events. In case of a VM change (e.g. VM added, removed or migrated) which required changes in VLANs, NEO will add or remove the VLAN accordingly from the relevant switch ports.

The VXLAN Provisioning drop down contains the following options:

- Disabled -VXLAN tunnels will not be configured on VM lifecycle events.
- L2 VXLAN tunnels will be configured on VM lifecycle events, and NEO will treat them as layer 2, without gateway configuration.
- L3 VXLAN tunnels will be configured on VM lifecycle events, and NEO will treat them as layer 3, with gateway configuration. (supported only for Cumulus OS)
- Allocated Gateway IP chooses whether the allocated gateway IP will be in the beginning of the subnet or in the end
- Prism Central IP IP, port, username and password are used to connect to the Prism Central. In case of working without Prism Central, put the Prism Element details instead.
- Prism Elements Credentials in this table the user should fill the username and passwords of each Prism Element in the network. Use "default" to fill the same credentials to all Prism Elements or specify credentials per Prism Element IP.

Add Element	×
Prism Element Credentials	
Element Ip	
Element Ip	
Username	
Password	
Cancel	Add

Upon filling the Prism Central IP address, port, username and password, and the Prism Element credentials, the user should click the Connect button to make sure the details are correct and NEO can connect the Prism. If the connection is successful, the switches and Nutanix hosts known to Prism will be added to NEO. This might take a couple of minutes.

The Connect button should be clicked after every change so the new information will be processed by NEO.

When enabling VLAN provisioning, the user can also set some advanced properties that affect the communication with Prism:

covery System Logs Users	Device Access Email Events Polic	y Image Profiles Telemetry Virtualization		
a tab includes the relevant attributes and con the vmware vCenter and Nutanix Prism virt	figuration for virtualization related features and int ualization orchestrators	egrations		
W Provisioning Port Mode Hybrid	Connection Settings			
vCenter DVS Configuration	Timeout			
Dian AUR Conference	10			
First Arty Configuration	Session Timeout			
	86400		Prism Elements Credentials	
VLAN Provisioning Global VLAN provisioning	Description Destrict	vide visibility into the virtual environment connected to		
Clobal VD at provisioning	40	AN tunnels auto-provisioning according to the PRISM	+ Add	Filter
Switch OS		in migration explosing across notes and course.	Element IP	
Cumulus •	Events Port		default	1
VVI AN Provisioning	8080	once VLAN is created	1.2.3.4	ø 🗎
L2 - without gateway configuration *			10 • < > 1 to 2 of 2	
	Cancel	t after VM has migrated, some packet loss may be		
Allocated Gateway IP				
From the start of subnet				
Prism Central IP Port	VXLAN Provisioning VXLAN tunnels will be auto provisioned	upon new VLAN creation		
10.209.39.39 9440				
D1 0 1 11	Allocated Gateway IP			
admin	From the start of subnet			
uum	The GW IP address will be the first IP From the end of subnet	in the subnet e.g 192.168.1.0/24 GW IP 192.168.1.1		
Prism Central Password	The GW IP address will be the last IP	in the subnet e.g 192.168.1.0/24 GW IP 192.168.1.254		
••••••				
				Connect A

Add a device either by manually typing its IP address, or by scanning a range or a subnet of IP addresses.

Start the Restore task by right click on the image.

Configuring Managed Network Components

In order for Mellanox NEO® to retrieve information from Mellanox Onyx® managed switches and hosts, additional configuration on switches and hosts is required.

Configuring SNMP on Mellanox Onyx Switch (for Port **Counters Monitoring**)

To configure all Mellanox Onyx managed switches via Mellanox NEO GUI, perform the following:

- 1. Go to the "Managed Devices" table (Managed Elements \rightarrow Devices).
- 2. Select the desired Mellanox Onyx switches to configure SNMP on (you can select multiple switches).
- 3. Right click on the selected switches and click on "Provisioning"
- 4. In the "Provisioning" view, click on the "Templates" button and load the "Enable-SNMP" template.
- 5. Click on the "Apply" button.
- 6. To send the configuration to the selected switches, click on the "Start" button. This will redirect you to the "Jobs" table.
- 7. Make sure that all sub-jobs (all switches) are completed successfully.

Provisioning		
E Templates		
Insert Command	? Global Variables	
Description		
<pre>snmp-server enable snmp-server community public </pre>		
	Reset Apply	
Selected Devices		
IP	Name	Profile
172.20.203.2	localhost	KVM
172.20.203.3	localhost.localdomain	NEOHOST
iii 172.20.203.4	lab4	NEOHOST

To configure the SNMP-V3 protocol, refer to the Mellanox Onyx User Manual.

A For the SNMP monitoring to work properly, the credentials on the switch must match the Mellanox NEO switch settings.

Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO

NEO can listen to SNMP traps and generate events upon receiving them. NEO supports both SNMP v3 and v2c traps.

By default, NEO listens to SNMP v2c traps. If you want to use SNMP v3, refer to <u>Setting NEO SNMP</u> <u>Trap Protocol Registration</u> in order to configure NEO to listen to it.

You can configure the switches to send SNMP traps to NEO using one of these two methods:

- Using auto-provisioning: When adding the device, check the SNMP Traps auto-provisioning option. The protocol version configured (2c/3) depends on the SNMP protocol version active in the Onyx global credentials.
- Using provisioning templates:
 - a. Go to the "Managed Devices" table (Managed Elements \rightarrow Devices).
 - b. Select one or more of the desired Mellanox Onyx switches to configure SNMP on (you can select multiple switches).
 - c. Right-click the selected switches and click "Provisioning".
 - d. In the "Provisioning" view, click the "Templates" button and load template relevant for the SNMP protocol you use ("Set-SNMP-V2c-Traps" or "Set-SNMP-V3-Traps"). For example:

Provisioning					
2 Templates					
Edit Command	?	Global Variab	les		
Adds a trap-receiver for SNMP v2c traps with given community		IP Address		Address of trap receiver	÷
System Type : minxos switch					
		Community I	Name	Community name to use	Û
Selected Devices					
IP	Name			Profile	
172.20.203.50	switch-058d0c		Ethernet		
✓ Undate Device Information					
Take Running Config Spanshot					
Configuration Write					
Start Create Task					

- e. Click the "Apply" button.
- f. Set the "ip_address" field in the "Global Variables" panel to be your Mellanox NEO IP address.
- g. Click the "Start" button. This will redirect you to the "Jobs" table.
- h. Make sure that all sub-jobs (all switches) are completed successfully.

A NEO removes itself as an SNMP trap listener from Onyx switches when they are removed.

Setting NEO SNMP Trap Protocol Registration

NEO listens by default to SNMP v2c traps. If the user changes the active SNMP protocol in the Onyx global credentials, the trap listening is also changed accordingly.

To configure NEO side SNMP v3 or v2c trap listening properties, edit the file /opt/neo/providers/ dm/conf/netservice.cfg.

• When working with SNMP v2c, configure the following attributes in the [Snmp] section:

[Snmp]
#valid protocol: snmpV2c, snmpV3
protocol=snmpV2c
#valid for snmpV2c
community=public

• When working with SNMP v3, configure the following attributes in the [Snmp] section:

```
[Snmp]
#valid protocol: snmpV2c, snmpV3
protocol=snmpV3
#valid for snmpV3
#valid auth protocol: MD5, SHA
auth_protocol=MD5
#valid priv protocol: DES, AES-128
priv_protocol=DES
auth_password=adminauth123
priv_password=adminpriv123
```

For the configuration changes to take effect, restart NEO by running:

```
/opt/neo/neoservice restart
```

Configuring Mellanox Onyx Switch for LLDP Discovery

To configure all managed Mellanox Onyx switches via the Mellanox NEO GUI, perform the following:

- 1. Go to the "Managed Devices" table (Managed Elements \rightarrow Devices).
- 2. Select the desired Mellanox Onyx switches to configure SNMP on (you can select multiple switches).
- 3. Right click on the selected switches and click on "Provisioning".
- 4. In the "Provisioning" view, click on the "Templates" button and load the "Enable-LLDP" template.
- 5. Click on the "Apply" button.
- 6. Click on the "Start" button to send the configuration to the selected switches.
- 7. Click on the "Start" button. This will redirect you to the "Jobs" table.
- 8. Make sure all sub-jobs (all switches) are completed successfully.

Configuring Host for LLDP Discovery

In order to allow the LLDP to discover hosts, you must configure it accordingly. For instructions, refer to the following community page: <u>HowTo Enable LLDP on Linux Servers for Link Discovery</u>.

When configuring LLDP on the host, please make sure to configure the LLDP to publish the management IPv4 address of the host (i.e. the IP that Mellanox NEO must recognize and manage). Not doing so might result in non-deterministic behavior.

Configuring Windows Host for Basic Authentication

Basic authentication works across firewalls and proxy servers. Basic authentication requires valid user name and password to access content.

By default, Windows host authentication type is Kerberos. In order to connect to NEO, make sure basic authentication is enabled as well.

Allow basic and unencrypted message passing over WinRM on each of the Windows managed machines. Run the following command over PowerShell:

winrm set winrm/config/service @{AllowUnencrypted="true"}
winrm set winrm/config/service/auth @{Basic="true"}

Set the device credentials in the UI. Username attribute format must include the domain (username@domain), for example: <u>administrator@mellanox.com</u>.

Device Information (172.20.203.50)			3.8.20
General Ports Inventory Ev Telemetry Snapshots VLAN Link	ents Jobs Aggregation	Device Access Groups Links Config Cables Docker Containers	
O HTTP			~
Access Credentials	į	Connection Settings	
Username		SSL Secured Connection (HTTPS)	
admin		on	
Password		Timeout (seconds)	
		60	
		Port	
		443	
Update			
⊘ SSH			>
♥ SNMP			>
SNMP v3			>

Appendix - Mellanox NEO/Nutanix Prism Plug-in

The Mellanox NEO/Nutanix Prism plug-in is a software add-on that offers enhanced functionality to Mellanox and Nutanix customers. As of NEO v2.5, the plug-in is bundled with NEO and will be automatically activated when enabling Prism integration in the bring-up wizard or the virtualization settings.

Nutanix Prism offers enhanced network capabilities, including a set of APIs to use Prism's accumulated VM data. Mellanox uses these new APIs to develop an integrated solution between Nutanix Prism and Mellanox NEO, which adds network automation for Nutanix Virtual Machine life-cycle management.

This integration addresses the most common use-cases of the Nutanix hyperconverged cloud: VLAN auto-provisioning on Mellanox switches for Nutanix VM creation, migration and deletion.

Mellanox NEO/Nutanix Prism plug-in purpose is to synchronize between a Nutanix cluster deployed with Mellanox switches, using the Mellanox NEO platform. By using this plug-in, users can start a service to listen to Nutanix cluster's events and have the infrastructure VLANs provisioned transparently. The plug-in can be installed and run on any RHEL/CentOS server (v6 or above) that has connectivity to both Nutanix Prism and the NEO API (including the NEO server itself).



Definitions, Acronyms and Abbreviations

Name	Description
Nutanix AOS	Nutanix Acropolis Operating System
Nutanix Node	A hypervisor server with Nutanix AOS installed
Nutanix Cluster	A group of nodes with Nutanix AOS installed
CVM	Controller Virtual Machine. Each cluster node has a CVM. Commands can be executed in CVM to take effect on the node

Name	Description
Prism	The web interface of Nutanix Cluster for network configuration, that creates VMs, etc. It can be accessed using any CVM IP address: https:// <cvm_ip>:9440/console</cvm_ip>

Key Features

The plug-in enables the following functionalities:

- Registering and listening to Nutanix Prism events
- Supporting auto-sync and switch auto-provisioning in the following events:
 - VM Creation
 - VM Deletion
 - VM (live/non-live) migration
 - Periodically
 - Upon service start
 - Subnet Creation
 - Subnet Deletion
- Supporting the following switch port modes:
 - LAG port channel
 - MLAG port channel
 - Port splitters
- Supporting the following Mellanox switch systems:
 - Mellanox SN2000 series of Ethernet switch systems
 - Mellanox SX1000 series of Ethernet switch systems
 - Supporting Cumulus switches

General Prerequisites

Make sure the following requirements are fulfilled in order for the Nutanix Prism plug-in to work properly:

- Nutanix Appliance v5.0.0.2 or above installed over cluster nodes with aspects documented in <u>Nutanix website</u>
- NEO v2.1 or above installed in the network
- SNMP and LLDP enabled on Mellanox switches
- Mellanox NEO/Nutanix Prism plug-in installed, configured and running
- All Nutanix nodes connected to the Mellanox switch
- IP connectivity between Prism and the NEO VM where the plug-in is installed

Typical Configuration



Setup Prerequisites

Cluster Nodes Configuration

1. Enable LLDP on the switches of the environment:



2. Add the switches to the Nutanix Prism web UI. Click the wrench symbol on the right -> Network switch.

Network Switch Configuration	? >
Configure one or more network switches for stats collection.	
Switch Configuration . SNMP Profile	
+ Add Switch Configuration	
SWITCH IP HOST IPS	
10.209.24.102	Z - X

 Create the Nutanix cluster network using Prism. Click the wrench symbol on the right -> Network Configuration. Make sure to edit the new network and identify the IP ranges if needed.

Network Configurati	on	? X
Configure one or more n	etworks to be used for NIC configurat	tion.
+ Create Network		
NAME	VLAN ID	
br1_vlan99	vlan.99	2 · X
br1_vian100	vlan.100	× · ×
		Close

4. Assign a virtual IP to the Nutanix cluster. Click the wrench symbol on the right -> Cluster Details -> CLUSTER VIRTUAL IP ADDRESS.

▲ For further information about Nutanix cluster network configuration, please refer to <u>Nutanix Connect Blog</u>.

Note:

- When there is more than one connection to the same switch, configure the LAG as follows:
 - a. Configure Link Aggregation Control Protocol (LACP) on the switch.
 - b. Add the LACP configuration as follows:
- For LACP bond type:

ovs-vsctl set port br0-up lacp=active

• For normal bond type:

ovs-vsctl set port br0-up lacp=off

NEO Virtual Machine Configuration

Add the Nutanix cluster connected switches to the NEO devices using NEO UI.

Installing Nutanix Prism Plug-in

By default, the plug-in is installed with NEO on the same machine, and is managed by NEO. In case you want to install the plug-in independently on another machine, download the plug-in from the <u>MyMellanox</u> portal, and install the Mellanox NEO/Nutanix Prism plug-in rpm. Run:

```
# yum install nutanix-neo-<version>.x86_64.rpm
```

For example:

```
# yum install nutanix-neo-2.5.0-3.x86_64.rpm
```

Nutanix Prism Plug-in Usage

When working with the plug-in that is bundled with NEO, all the configuration can be done from the web UI (see <u>Prism AHV Configuration</u>). This configuration will be saved in /opt/neo/controller/conf/ nutanix-neo-plugin.cfg file. In case you work with an independent plug-in, follow the steps below:

1. Fill in the required details in the plug-in configuration file: /opt/nutanix-neo/config/nutanix-neo-plugin.cfg:

#	Section: NEO server info	
#	username:	(required) NEO username
#	ip:	(required) NEO server IP or NEO virtual IP in case
#		of NEO HA
#	password:	(required) NEO password
#		The password should be encrypted by the util/encrypt_config tool
#	session_timeout:	(required) timeout of user session (default 86400)
#	timeout:	(required) timeout of connection (default 10)
#	auto_discovery:	(required) auto add switches that are discovered in
#		Nutanix cluster to NEO. Should be boolean
#	add_host_credentials:	(optional) set Nutanix host's username and password
#		in NEO
#	host_ssh_username:	(optional) SSH login username for Nutanix hosts,
#		required if add_host_credentials is True
#	host_ssh_password:	(optional) SSH login password for Nutanix hosts,

```
required if add_host_credentials is True
                                                                                                                    The password should be encrypted by the util/encrypt_config tool
(optional) The order in which reserved IPs
should be taken from the subnet start/end
(optional) MTU to be used for vxlan interface
   # vlan_ip_order:
   # vxlan mtu:
   # fast_migration:
                                                                                                                    (optional) True will make a fast migration
   [NEO]
 ip =1.2.3.4
#Protocol for communicating with NEO. Valid values are http/https.
#This property is optional, default is https.
protocol=https

 session_timeout = 86400
timeout = 10
auto_discovery = True
 add_host_credentials = False
host_ssh_username = root
host_ssh_password = SV5Y2RNPX3VIMIHT3UPWQUX7SFNHZIU5TRYSMQX7NCB5DUQ2SXYQ====
 switch_ssh_username =
# The password should be encrypted by the util/encrypt_config tool
# The password should be encrypted by the util/encrypt_config tool
switch_ssh_password =
vlan_ip_order = end
vxlan_mtu = 9216
fast_migration = true
# When VLAN provisioning is disabled, the plugin will only add the
# cluster devices to NEO.
# When VLAN provisioning is enabled, in addition to device adding, the plugin
# will notify NEO on any change in VM that requires VLAN re-configuration.
# Valid values: true/false. Default is true.
# When DCI is enabled, switch IPs are sent to NEO on network creation
# Valid values: true/false
 # Valid values: true/false
dci_enable = False
dci_mode= L2
    $ Section: Nutanix PRISM Central and cluster info

$ username: (required) Nutanix prism central username

$ ip: (required) CVM IP or Virtual IP

$ of Nutanix prism central

$ password: (required) Nutanix prism central user password

$ requests_retries: (required) Nutanix cluster default username

$ cluster_default_password: (required) Nutanix cluster default username

$ cluster_default_password: (required) Nutanix cluster default password

$ cluster_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter_inter
                                                                                                           (overrides cluster_default_username
for the given IP)
(optional) Specific Nutanix cluster password
(overrides cluster_default_username
         cluster <ip> password:
                                                                                                                  for the given IP)
The password should be encrypted by the util/encrypt_config tool
   [PRISM]
  username = admin
username = admin
ip =4.3.2.1
password =OXBLXJO4U36CE5CVMRTBFII53I45N4RGPZQCCFGTW6ORS7AZPIRQ====
requests_retries = 40
cluster_default_username = username
cluster_default_password = BSCKG3ETU2Q3N7WZH4LIK2M2U3C2UXGVTKXBCMQOMHEPUVDTJLVQ====
 # Section: Server where plugin installed
# ip: (optional) IP of the server from the same subnet as the Nutanix Cluster.
# if the ip left empty, then the plugin will obtain the server's interface
# ip that is connected to same network as Nutanix cluster.
# port: (required) TCP port on server should be unused to receive events from
# from Nutanix cluster.
# if the port is used, then the plugin will kill the process that uses
# the port and reclaim it.
[SERVER]
   [SERVER]
   ip =
 port = 8080
```

A The passwords in the output above are encrypted. To update/change them, use the following encryption command:

/opt/nutanix-neo/utils/encrypt_config.py --section <configuration file section> --option <configuration option name> --value <clear text value>

For example: /opt/nutanix-neo/utils/encrypt_config.py --section PRISM -option password --value my_password

2. Start the service after installing the plug-in:

service nutanix-neo start

3. The service will now apply the required changes in VLANs with interfaces assigned to them through NEO APIs. If two VMs are created over the same network, PING must work between the two VMs despite the Nutanix node hosting it in the cluster. In case of VM migration, the plug-in will apply the changes required on the switch to maintain connectivity.

Examples:

• VM Creation:

The user creates a VM on the Nutanix cluster over a new VLAN ID 99 that did not exist on the switch before. Prism web UI will show the following output:

Unnamed VM	v 🤓 - 🌲	0 🔍 🗸		R					Q ?~ 1	≱ ~ ∣ A	dmin 🚨 🗸
Overview · Table									+ Create		
VM						 Include Contro 	iller VMs 🕐 1 VM (filte	ered from 5) · · · <	> · 🌣 - Sean	ch in table	Q
 VM NAME 	HOST IP ADI	CORES	MEMORY CAPACITY	STORAGE	CPU USAGE	CONTROLLER READ IOPS	CONTROLLER WRITE IOPS	CONTROLLER IO BANDWIDTH	CONTROLLER AVG IO LATENCY	BACKUP	FLASH MODE
VM_1	NTNX- 165M6B480114- B	1	1 GiB	- / 0 GiB	0.47%	-				Yes	No

The Nutanix-NEO service sends APIs to NEO to implement a job that will update the switch side about adding VLAN ID 99 to the switch with relevant Nutanix host ports, as follows:

• VM Migration:

VM will be migrated to an automatically chosen host through Nutanix Prism web UI, as

follows:

	^
HOST	
System will automatically select a host.	~

	1
Cancel	Migrate
	-

The Nutanix-NEO service will send APIs to NEO to trigger jobs that will update the switch side with the new changes (adding VLAN ID for new host details/removing VLAN ID from old host details) as follows:

Create VLAN		Show devices by:	Name	××
r-nutanix-sw05	Description: Create VLAN Output: cli session prefix-modes enable vlan 99 exit vlan 99 name "nutanix_demo" interface ethernet 1/1/1 switchport hybrid allowed-vlan add 99 excessesconfiguration write			
	Zero-touch is disabled			

Delete VLAN	Show devices by: Name 🗸 🗙
r-nutanix-sw05	Description: Delete VLAN Output: interface ethernet 1/2 switchport hybrid allowed-vlan remove 99 vlan 99 no name ************************
•	

Note: Nutanix-NEO service only detects running VMs.

Nutanix-NEO Debug Files

- /var/log/nutanix-neo/console.log
- /var/log/nutanix-neo/nutanix_neo_server.log

VXLAN Support

For the VXLAN support to operate, the plug-in must be running when you create the VXLAN on Nutanix. In addition, the VTEPs must be configured on the switches, and ping all VTEPs from all switches.

A Vlan ID 0 is not allowed, since it is the native network.

NEO VXLAN Templates

NEO has templates for creating and removing VXLAN from a Cumulus or ONYX switches. When you create a network on the Nutanix tool, it will run a provisioning job for NEO to add a VXLAN, using a designated template.

"Cumulus-Add-VXLAN" template:

Configurations					
Network Snapshots Global Configuration Provisioning Ten	plates				
Showing 7 out of, 197 Click to reset all filters. Template Name ▽ ↑	Insert Command	?	Global Variables		?
vid (wi	Adding VXLAN VNI to switch		Vlan Id	VLAN ID	8
Cumulus-Add-VXLAN	cli session prefix-modes enable vlan «vlanid»		Vni Id	VNLID	ŧ
Cumulus-Add-VXLAN-With_GW	exit				
Cumulus-Remove-VXLAN	interface nve 1 nve vni <vni_id> vlan <vlan_id> interface nve 1 nve vlan <vlan_id> neigh-suppression</vlan_id></vlan_id></vni_id>				
Linux_Disable_VXLAN_Configuration	Interface free frite fran Hangla freigh sappresson		Specific Variables		?
Linux_Enable_VXLAN_Configuration					
Remove-VXLAN					
1 to 7 of 7 👘 🖉 Page 1 of 1 之 🖄					
	System Type : minxos_switch				
	Reset Save as template Validate				

"Cumulus-Remove VXLAN" template:

Configurations



"Onyx-Add-VXLAN" template:

Configurations

Network Snapshots Global Configuration Provisioning Ter	mplates				
Showing 7 out of, 197 Click to reset all filters.	Incart Command		Clobal Variables		
Template Name 🗸 🗅	inser coninand	ŕ	Giobal variables		ſ
Val law	Adding VXLAN to switch		Vlan Id	VLAN ID	[®]
Add-VXLAN	Contradictors when St.	*			
E Cumulus-Add-VXLAN	# Add VLAN and VNI to bridge:		Vni Name	VNI Name	
Cumulus-Add-VXLAN-With_GW	net add bridge bridge ports <vni_name></vni_name>			MTU of VVI AN interface	
Cumulus-Remove-VXLAN	net add bridge bridge vids <vlan_id></vlan_id>		Mtu	MITO OF VALAN INterface	Ξ
Linux_Disable_VXLAN_Configuration	# Add VLAN to VNI Mapping:		Vnild	VNLID	(iii)
Linux_Enable_VXLAN_Configuration	net add vxlan <vni_name> vxlan id <vlan_id></vlan_id></vni_name>				
Remove-VXLAN	# Add VLAN to VTEP bridge:				
1 to 7 of 7 P < € Page 1 of 1 >>>	net add vxlan <vni_name> bridge access <vlan_id> net add vxlan <vni_name> bridge arp-nd-suppress on net add vxlan <vni_name> bridge learning off</vni_name></vni_name></vlan_id></vni_name>	.	Specific Variables		?
	System Type : cumulus_switch Reset Save as template Validat	e			

"Onyx-Remove-VXLAN" template:

Create network

Description:	
CI CALE IICLINI K	
Output:	
/etc/network/interfaces 2021-01-04 22:04:48.511558713 +0000	
+++ /run/nclu/ifupdown2/interfaces.tmp 2021-01-20 14:32:15.655212739 +0000 @& -187,33 +187,40 @&	
auto swp55	
iface swp55	
auto swp56	
iface swp56	
mtu 9216	
auto bridge	
iface bridge	
 bridge-ports swp1 swp3 swp4 swp5 swp6 swp7 vni10150 vni10250 vni10555 vni10124 	
SWD12 SWD40 SWD55 SWD27 SWD14 SWD21 SWD52 SWD41 SWD28 SWD20 SWD18 SWD9 SWD16 SWD51 SWD45 swm17 swm10 swm46 swm13 swm11 swm26 swm29 swm47 swm28 swm20 swm55 swm44 swm22	9
swp39 swp48 swp34 swp34 swp19 swp51 swp53 swp36 swp15 swp54 swp37 swp42 swp34 swp34 swp34 swp34 swp54	3
swp25 swp50 swp33 swp38	
 bridge-vids 100 111 124 130 1/0 180 190 200 222 230 230 333 1010 bridge-norts swn1 swn3 swn4 swn5 swn6 swn7 swn8 swn9 swn10 swn11 swn12 swn13 swn14 	
swp15 swp16 swp17 swp18 swp19 swp20 swp21 swp22 swp23 swp24 swp25 swp26 swp27 swp28	
swp29 swp30 swp31 swp32 swp33 swp34 swp35 swp36 swp37 swp38 swp39 swp40 swp41 swp42	
swp43 swp44 swp45 swp46 swp47 swp48 swp49 swp50 swp51 swp52 swp53 swp54 swp55 vni10124	
vni10150 vni10250 vni10555 vni10099	
+ bridge-vids 99-100 111 124 150 170 180 190 200 222 230 250 555 1010	
bridge-vlan-aware yes	
auto mgmt	
iface mgmt	



Create network		Show devices by:	Name	×
r-neo-cswn03	<pre>auto mgmt iface mgmt address 127.0.0.1/8 address 11/128 vrf-table auto auto swp2 iface swp2 +auto vlan99 + address 192.168.1.254/24 + address 192.168.1.254/24 + vlan-raw-device bridge + uto vlan124 iface vlan124 address 124.124.124.254/24 address 124.124.124.254/24 address-virtual 22:aa:7c:7c:7c:1 124.124.1/24 vlan-id 124 vlan-raw-device bridge auto vlan150 ifare vlan150</pre>			
	address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 address -55.55.55.254/24 address -virtual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge			Ţ
			CI	ose

Show devices by: Name 🗸 🕷



Create network

Close

Create network

Show devices by: Name 🗸 🗙

<pre>net add/del commands since the last "net commit"</pre>	r-neo-cswn03		*
User Timestamp Command cumulus 2021-01-20 14:32:14.691963 net add vlan 99 cumulus 2021-01-20 14:32:14.766632 net add vlan 99 cumulus 2021-01-20 14:32:14.766632 net add vlan 99 cumulus 2021-01-20 14:32:14.81674 net add vlan 99 cumulus 2021-01-20 14:32:14.914367 net add bridge bridge ports vni10099 cumulus 2021-01-20 14:32:14.914367 net add bridge bridge ports vni10099 cumulus 2021-01-20 14:32:14.914367 net add bridge bridge ports vni10099 cumulus 2021-01-20 14:32:15.08042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20		net add/del commands since the last "net commit"	
User Timestamp Command			
<pre></pre>		User Timestamp Command	
<pre>cumulus 2021-01-20 14:32:14.691963 net add vlan 99 cumulus 2021-01-20 14:32:14.766632 net add vlan 99 ip address 192.168.1.254/24 cumulus 2021-01-20 14:32:14.976632 net add vlan 99 ip address-virtual 22:aa:00:a8:01:01 192.168.1.1/24 cumulus 2021-01-20 14:32:14.97762 net add bridge bridge ports vni10099 cumulus 2021-01-20 14:32:15.05213 net add vxlan vni10099 bridge access 99 cumulus 2021-01-20 14:32:15.020842 net add vxlan vni10099 bridge access 99 cumulus 2021-01-20 14:32:15.020842 net add vxlan vni10099 bridge access 99 cumulus 2021-01-20 14:32:15.279375 net add vxlan vni10099 bridge ap-nd-suppress on cumulus 2021-01-20 14:32:15.215.200842 net add vxlan vni10099 bridge ap-nd-suppress on cumulus 2021-01-20 14:32:15.31666 net add vxlan vni10099 stp portbpdufilter cumulus 2021-01-20 14:32:15.49814 net add vxlan vni10099 stp portbpdufilter cumulus 2021-01-20 14:32:15.49814 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.5149814 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.49814 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3.3 cumulus 2021-01-20 14:32:15.371356 net add vxlan vni10099 truga 10cal-tunnelip 3.3.3 cumulus 2021-01-20 14:32:15.57135 net add vxlan vni10099 truga</pre>			
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<pre>22:aa:c0:a8:01:01 192.168.1.1/24 cumulus 2021-01-20 14:32:14.914367 net add bridge bridge vids 99 cumulus 2021-01-20 14:32:15.062513 net add vxlan vni10099 vxlan id 99 cumulus 2021-01-20 14:32:15.134958 net add vxlan vni10099 bridge access 99 cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.279375 net add vxlan vni10099 bridge learning off cumulus 2021-01-20 14:32:15.351666 net add vxlan vni10099 stp bpduguard cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 stp portbpdufilter cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 mtu 9216 cumulus 2021-01-20 14:32:15.49814 net add vxlan vni10099 mtu 9216 /etc/network/interfaces 2021-01-04 22:04:48.511558713 +0000 +++ /run/nclu/ifupdown2/interfaces.tmp 2021-01-20 14:32:16.274212729 +0000 @@ -187,33 +187,40 @@ auto swp55 iface swp55 iface swp56 iface swp56 iface bridge iface bridge</pre>		cumulus 2021-01-20 14:32:14.837649 net add vlan 99 ip address-virtual	
<pre>cumulus 2021-01-20 14:32:14.914367 net add bridge bridge ports vni10099 cumulus 2021-01-20 14:32:14.987962 net add bridge bridge vids 99 cumulus 2021-01-20 14:32:15.134958 net add vxlan vni10099 bridge access 99 cumulus 2021-01-20 14:32:15.208042 net add vxlan vni10099 bridge arp-nd-suppress on cumulus 2021-01-20 14:32:15.279375 net add vxlan vni10099 bridge learning off cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 stp bpduguard cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 stp bpduguard cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 stp portbpdufilter cumulus 2021-01-20 14:32:15.422613 net add vxlan vni10099 stp norbpdufilter cumulus 2021-01-20 14:32:15.571356 net add vxlan vni10099 mtu 9216 /etc/network/interfaces 2021-01-04 22:04:48.511558713 +0000 +++ /run/nclu/ifupdown2/interfaces.tmp 2021-01-20 14:32:16.274212729 +0000 @@ -187,33 +187,40 @ auto swp55 iface swp55 auto swp56 iface swp56 iface swp56 iface bridge iface bridge</pre>		22:aa:c0:a8:01:01 192.168.1.1/24	
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<pre>+ vlan-raw-device bridge + vlan-raw-device bridge + auto vlan124 iface vlan124 address 124.124.124.254/24 address-virtual 22:aa:7c:7c:10 124.124.124.1/24 vlan-raw-device bridge auto vlan150 iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 iface vlan555 iface vlan555 saddress 55.55.254/24 address 55.55.254/24 address 55.55.1/24 vlan-raw-device bridge +auto vnin0099 + iface vni10099 + bridge-arcess 99 + bridge-arcess 99 + bridge-arcess 99 + bridge-arcess 91 + mit gel6</pre>		+ address-virtual 22:aa:c0:a8:01:01 192.168.1.1/24	
<pre>+ Viahraw-device bridge + auto vlan124 iface vlan124 address 124.124.224.254/24 address -virtual 22:aa:7c:7c:01 124.124.124.1/24 vlan-raw-device bridge auto vlan150 iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 iface vlan555 address 55.55.254/24 address 55.55.1/24 vlan-raw-device bridge +auto vni0099 +iface vni10099 +iface vni10099 + bridge-access 99 + bridge-learning off + mstpct1-portbpdufilter yes + mtu 9216</pre>		+ vlan-id 99	
<pre>auto vlan124 iface vlan124 address 124.124.254/24 address-virtual 22:aa:7c:7c:10 124.124.1/24 vlan-id 124 vlan-raw-device bridge auto vlan150 iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @ vlan-raw-device bridge auto vlan555 iface vlan555 iface vlan555 iface vlan555 vlan-raw-device bridge +auto vni1009 +iface vnitual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 +iface vni10099 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-arp-nd-suppress + bridge-arp-nd-suppress + b</pre>		+ vian-raw-device bridge	
<pre>iface vlan124 address 124.124.124.254/24 address-virtual 22:aa:7c:7c:r0:1124.124.124.1/24 vlan-raw-device bridge auto vlan150 iface vlan150 address 10.10.15.254/24 @e -221,20 +228,31 @e vlan-raw-device bridge auto vlan555 iface vlan555 iface vlan555 iface vlan555 iface vlan555 iface vlan555 iface vlan555 iface vlan555 vlan-raw-device bridge +auto vni10099 +iface vni10099 + bridge-access 99 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-larning off = mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		auto vlan124	
<pre>address-virtual 22:aa:7c:7c:7c:1 124.124.124.124 vlan-id 124 vlan-id 124 vlan-aw-device bridge auto vlan50 iface vlan50 address 10.10.15.254/24 @@ -221,20.4228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.55.254/24 address 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vn10099 +iface vn10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off mstpctl-portbpdugard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		1tace vlan124 address 124.124.124.254/24	
<pre>vlan-id 124 vlan-raw-device bridge auto vlan150 address 10.10.15.254/24 @@ -221,20.4228,31 @@ vlan-id 150 vlan-raw-device bridge auto vlan555 ifface vlan555 address 55.55.55.254/24 address -virtual 22:aa:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vn10099 +iface vn10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbgdufilter yes + mtu 9216</pre>		address-virtual 22:aa:7c:7c:01 124.124.124.1/24	
<pre>vian-raw-device bridge auto vlan150 iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.55.254/24 address -virtual 22:aa:37:37:01 55.55.55.1/24 vlan-raw-device bridge +auto vn10099 +iface vn10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-learning off + mstpct1-portbydugard yes + mtu 9216</pre>		vlan-id 124	
<pre>auto vlan150 iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.254/24 address -virtual 22:aa:37:37:01 55.55.55.1/24 vlan-raw-device bridge +auto vn10099 +iface vn10099 +iface vn10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off + mstpctl-bpduguard yes + mtu 9216 </pre>		vian-raw-device bridge	
<pre>iface vlan150 address 10.10.15.254/24 @@ -221,20 +228,31 @@ vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.254/24 address -virtual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 + bridge-access 99 + bridge-access 99 + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbgdufilter yes + mtu 9216</pre>		auto vlan150	
<pre>dud ess 10.10.15.29/24 @ -221,20 +228,31 @@ vlan-id 150 vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.55.254/24 address-virtual 22:aa:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 + iface vni10099 + bridge-access 99 + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbydufilter yes + mtu 9216</pre>		iface vlan150 address 10 10 15 254/24	
<pre>vlan-id 150 vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.254/24 address-virtual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-aw-device bridge +auto vni10099 + iface vni10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		@G -221,20 +228,31 @@	
<pre>vlan-raw-device bridge auto vlan555 iface vlan555 address 55.55.254/24 address-virtual 22:aa:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 +iface vni10099 + bridge-arccass 99 + bridge-arccass 99 + bridge-arccass 99 + bridge-arccass 04 /pre>		vlan-id 150	
<pre>auto vlan555 iface vlan555 address 55.55.254/24 address-virtual 22:aa:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 + iface vni10099 + bridge-access 99 + bridge-access 99 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		vlan-raw-device bridge	
<pre>iface vlan555 address 55.55.55.254/24 address virtual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vni10099 +iface vni10099 + bridge-access 99 + bridge-access 99 + bridge-larning off + mstpctl-boduguard yes + mstpctl-bortbguguard yes + mtu 9216 </pre>		auto vlan555	
address 55.55.254/24 address-virtual 22:aa:37:37:37:01 55.55.55.1/24 vlan-id 555 vlan-raw-device bridge +auto vnil0099 +iface vnil0099 + bridge-access 99 + bridge-access 99 + bridge-learning off + mstpcl-bpduguard yes + mstpcl-portbydugilter yes + mtu 9216		iface vlan555	
vlan-id 555 vlan-raw-device bridge +auto vni10099 + iface vni10099 + bridge-access 99 + bridge-access 99 + bridge-learning off + mstpcl-bpduguard yes + mstpcl-portbpdufilter yes + mtu 9216		address 55.55.55.254/24 address-virtual 22:aa:37:37:37:01 55.55 55 1/24	
<pre>vlan-raw-device bridge +auto vni10099 +iface vni10099 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216 </pre>		vlan-id 555	
<pre>+auto vni10099 +iface vni10099 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-larning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216 </pre>		vlan-raw-device bridge	
<pre>+iface wni1009 + bridge-access 99 + bridge-arp-nd-suppress on + bridge-arning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216 </pre>		+auto vni10099	
<pre>+ bridge-access 99 + bridge-arp-nd-suppress on + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		+iface vni10099	
<pre>+ bridge-arp-na-suppress on + bridge-learning off + mstpctl-bpduguard yes + mstpctl-portbpdufilter yes + mtu 9216</pre>		+ bridge-access 99	
+ mstpcl-bpduguard yes + mstpcl-portbpdufilter yes + mtu 9216		+ bridge-arp-nd-suppress on + bridge-learning off	
+ mstpctl-portbpdufilter yes + mtu 9216		+ mstpctl-bpduguard yes	
+ mtu 9216			
		+ mstpctl-portbpdufilter yes	

Close

reate network		Show devices by:	Name 🗸 🛠
r-neo-cswn03	<pre>itace vn10124 bridge-access 124 bridge-learning off mstpctl-bpduguard yes mstpctl-portbpdufilter yes mtu 9216 vxlan-id 124 vxlan-local-tunnelip 3.3.3.3</pre>		•
	net user Timestamp C cumulus 2021-01-20 14:32:14.691963 n cumulus 2021-01-20 14:32:14.766632 n cumulus 2021-01-20 14:32:14.837649 n 22:aa:c0:a8:01:01 192.168.1.1/24 cumulus 2021-01-20 14:32:14.914367 cumulus 2021-01-20 14:32:14.914367 n cumulus 2021-01-20 14:32:15.02513 n cumulus 2021-01-20 14:32:15.14958 n cumulus 2021-01-20 14:32:15.79375 n cumulus 2021-01-20 14:32:15.351666 n cumulus 2021-01-20 14:32:15.949314 n cumulus 2021-01-20 14:32:15.49914 n cumulus 2021-01-20 14:32:15.571356 n	et commit et add vlan 99 et add vlan 99 ip address 192.168.1.254/24 et add vlan 99 ip address-virtual et add bridge bridge ports vni10099 et add vlan vni10099 vxlan id 99 et add vxlan vni10099 bridge access 99 et add vxlan vni10099 bridge arp-nd-suppress et add vxlan vni10099 vridge arp-nd-suppress et add vxlan vni10099 vridge arp-nd-suppress et add vxlan vni10099 stp portbpdufilter et add vxlan vni10099 stp notbpdufilter et add vxlan vni10099 mtu 9216	on .3.3.3
			Close

The network must be created on both Nutanix clusters with the same VLAN ID, subnet and gateway.

Examining the Connection

Once the networks on the Nutanix tool and the VMS are created, and a NIC is connecting between the network to the VMs, the VM on Cluster 1 must be able to ping the VM on Cluster 2:

ro	ot@loca	alhost	t ~>ping	10.209	.221.10			
PI	NG 10.2	209.22	21.10 (1	0.209.2	21.10) 56(84	4) bytes	s of data.	
64	bytes	from	10.209.	221.10:	icmp_seq=1	ttl=64	time=0.796	ms
64	bytes	from	10.209.	221.10:	icmp_seq=2	ttl=64	time=0.218	ms
64	bytes	from	10.209.	221.10:	icmp_seq=3	ttl=64	time=0.200	ms
64	bytes	from	10.209.	221.10:	icmp_seq=4	ttl=64	time=0.260	ms
64	bytes	from	10.209.	221.10:	icmp_seq=5	ttl=64	time=0.232	ms
64	bytes	from	10.209.	221.10:	icmp_seq=6	ttl=64	time=0.338	ms
64	bytes	from	10.209.	221.10:	icmp_seq=7	ttl=64	time=0.238	ms

Appendix - Events

Application Events

Event	Triggers	Permission Level	Default Severity	Category	Sub Category	Supporte d
Job completed with errors	All sub jobs were completed, but some of them failed	user	error	Application	Jobs	Yes
Job com- completed	All sub jobs were completed successfully	user	info	Application	Jobs	Yes
Device removed	Device removed	admin	Info	Application	General	Yes

Device Events

Event	Triggers	Permis sion Level	Defaul t Severi ty	Cate gory	Sub Catego ry	Comments
ACL Dropped Packet	Access Control List	admin	Notice	Port	WJH	-
Layer 2 Dropped Packet	 Destination MAC is reserved (DMAC=01-80-C2-00-00-0x) Ingress spanning tree filter Ingress VLAN filtering MLAG port isolation Multicast egress port list is empty Port loopback filter Source MAC equals destination MAC Source MAC is multicast Unicast FDB action discard VLAN tagging mismatch 	admin	Notice	Port	WJH	-

Event	Triggers	Permis sion Level	Defaul t Severi ty	Cate gory	Sub Catego ry	Comments
Layer 3 Dropped Packet	 Blackhole ARP/neighbor Blackhole route Checksum or IPver or IPv4 IHL too short Destination IP is loopback address Egress Router interface is disabled Ingress Router interface is disabled IPv4 destination IP is link local IPv4 destination IP is local network (destination=0.0.0.0/8) IPv4 LPM unicast miss IPv4 source IP is limited broadcast IPv6 destination in multicast scope FFx0:/16 IPv6 destination in multicast scope FFx1:/16 IPv6 LPM unicast miss Multicast MAC mismatch Non IP packet Non-routable packet Packet bigger than MTU Router interface loopback Source IP is in class E Source IP is unspecified TTL is too small Unicast destination IP but non- unicast destination MAC Unresolved next-hop 	admin	Notice	Part	ΗLW	
Tunnel Dropped Packet	 Decapsulation error Overlay switch:SMAC equals DMAC Overlay switch:SMAC is multicast 	admin	Notice	Port	HLW	-
General Fault	 Internal Bus Error trap Process Crash trap Process Unexpected Exit trap Unexpected Shutdown trap Chip Down trap Module is unresponsive trap 	admin	Warning	Devic e	General	triggers discovery refresh - modules
General Fault recovery	Module has been restored to its normal state trap	admin	Info	Devic e	General	triggers discovery refresh modules

Event	Triggers	Permis sion Level	Defaul t Severi ty	Cate gory	Sub Catego ry	Comments
Power fault	 Insufficient Power trap Power Redundancy Mismatch trap Low Power trap Power supply is unresponsive trap Unit voltage is out of range trap 	admin	Warning	Devic e	Power	triggers discovery refresh modules, power supplies
Power fault recovery	 Low Power Recover trap Unit voltage is in range trap Power supply has been restored to its normal state trap 	admin	Info	Devic e	Power	triggers discovery refresh - power supplies
Fans fault	 Insufficient Fans trap Fan speed is below minimal range trap Fan is unresponsive trap Fan is not present trap Insufficient number of working fans in the system trap 	admin	Warning	Devic e	Fans	triggers discovery refresh modules, fans
Fans fault recovery	 Insufficient Fans Recover trap Fan has been restored to its normal state trap The system currently has sufficient number of working fans trap 	admin	Info	Devic e	Fans	triggers discovery refresh modules, fans
Temperatur e Fault	 Power supply temperature is too hot trap Chip Over Temperature Reset trap Chip Over Temperature trap Chip temperature is too hot trap Temperature Sensor over threshold trap 	admin	Warning	Devic e	Tempera ture	triggers discovery refresh temperature sensors
Temperatur e Fault recovery	 Power supply temperature is back to normal trap Chip temperature is back to normal trap 	admin	Info	Devic e	Tempera ture	triggers discovery refresh temperature sensors
High CPU Utilization	CPU Utilization High trap	admin	Warning	Devic e	CPU	-
Low Disk Space	Disk Space Low trap	admin	Warning	Devic e	Resourc e s	-
IB SM state changed	IB SM up trap IB SM down trap IB SM restart trap	admin	Info	Devic e	Net- working	-
Link up	Link Up trap	admin	Info	Devic e	Net- working	triggers topology refresh
Link down	Link Down trap	admin	Warning	Devic e	Net- working	triggers topology refresh
Authenticati on Failure	Authentication Failure trap	admin	Warning	Devic e	Security	-
Test trap received	Test trap	admin	Info	Devic e	General	-

Event	Triggers	Permis sion Level	Defaul t Severi ty	Cate gory	Sub Catego ry	Comments
Planned reload	Device has resumed after a planned reload operation	admin	Notice	Devic e	Reboot	-

Appendix - Mellanox NEO GUI Fields Validations

Page	Field	Validation		
Reports	Title	Alphanumeric + "_", "-" (4-20)		
Users	UserName	Alphanumeric + "_", "-", "." (4-20)		
	Password	All characters except space (4-20)		
Groups	Name	Alphanumeric + "_", "-" (4-20)		
Credentials (HTTP)	UserName	Alphanumeric + "_", "-", "." (1-20)		
	Password	All characters except space (1-20) The password field can be left blank.		
Credentials (SSH)	UserName	Alphanumeric + "_", "-", "." (1-20)		
	Password	All characters except space (1-20) The password field can be left blank.		
Credentials (SNMP)	Read Community	All characters except space (1-20)		
Credentials (SNMPV3)	UserName	All characters (1-20)		
SMTP	Sender Name	Alphanumeric + "_", space allowed (4-20)		
	UserName	Alphanumeric + "_", "." (4-20)		
	Password	All characters except space (4-20) The password field can be left blank.		
	Email	A valid email address (exactly one "@" sign, and at least one "." in the section following the "@")		
	Recipients	Valid Emails, comma separated		
	Server	Valid Server Name - Valid Server IP		
	Port	int 1-65535		
Event Policy	Value	int 0-65535		
	Description	All characters (1-1024)		
SW Upgrade	Protocol	'scp' or 'ftp'		
	Server	Valid Server Name Regex Valid Server IP Regex		
	Path	All characters (1-1024) must start with "/"		
	Image	All characters (1-1024)		
	UserName	Alphanumeric + "_", "-", "." (1-20)		
	Password	All characters except space (1-20)		

Appendix - Activating Switch Telemetry Using Telemetry Agent

To use NVIDIA® Mellanox® NEO® as a controller for the telemetry agent, perform the following steps:

1. Go to Settings \rightarrow Telemetry, and configure the Data Collector. The Data Collector is the server to which the telemetry agents send their data.

Settings

Discovery	System	Logs	Users	Device Acces	ss Email	Events Poli	cy Swit	ch Upgrade	Telemetry	Virtualization
Quality-of-s	ervice Moni	toring					>			
Data Collec	tors						~			
				Dent	5-					
	ame	10.2	IP	Port	Fo	rmat				
NEO DB		10.2	13.91.141	8094	Influx	*				
NEO JSON	Collector	10.2	13.91.141	7658	JSON	~	+			
							Save			

Go to the NEO Devices table, and select the switch on which you want to activate the 2. telemetry agent.

You can check the devices in a Telemetry-supported group, to see if the switch has Docker capability.

The selected switch must have Docker capabilities. You might need to update the OS version for Docker support.

Gro	วน	ps
-----	----	----

				Group Information	ו	
) v Showing 3 out of 16	, Click to reset all filters			Devices	vice Access	
ame ∇	Description	Members	Crede	10 🗸		
tel 🛛 🗸	Filter V	Filter V		Name ↑	IP	System Type
Telemetry-Enabled	NVIDIA Mellanox Spectr	Devices	0	Filter	V Filter 5	7 Filter
Telemetry-Supported	NVIDIA Mellanox Spectr	Devices	0	r-dmz-ufm-sw6	0 10 209 38 155	NVIDIA Mella
Telemetry-Active	NVIDIA Mellanox Spectr	Devices	0	r-ufm-sw/78	10.209.37.78	
	1 to 3 of 3	IC C Page	1of1 > >I	r-ufm-sw/79	10.209.37.78	NVIDIA Mella
				ufm-switch16	10.209.37.248	NVIDIA Mella
				ufm-switch17	10 209 37 249	NVIDIA Mella
				ufm-switch26	10 209 38 131	NVIDIA Mella
				GITT-SWITCH20	10.200.00.101	A VIDIA MEIIA

3. Right-click on the relevant device, and install the NEO telemetry agent.

Devices					
+ Add					
				Provisioning formation (10.209.37.248)	3.9.1014
All	✔ 10	~		Linstall La Install La Install Y Events Jobs Device A	ccess
Name	IP ↑	Syste	Status	s C Reboot leiemetry Snapshots VLAN	
Filter 🎔	Filter V	Fil V	F V		
r-ufm-sw78	10.209.37.78	🗟 MS	0 📶	Go To Map Compare	
r-ufm-sw79	10.209.37.79	🗟 MS	0 📶	🗎 History Monitoring 🕨	
III ufm-switch	L 10.209.37.248	MS	0	🗠 Live Monitoring 🕨 🚽 Please Select 👻 🛓 🛍 🕨	C C
ufm-switch	10.209.37.249	🗟 MS	0 📶	Create MLAG with Search, Q	
ufm-switch	10.209.38.100	🗟 MS	Abd	Add To Group	
ufm-switch	10.209.38.131	🞯 MS	0 📶	Add To Site	
N/A	L 10.209.38.144	@ NV	0	🛓 Generate Dump	
N/A	L 10.209.38.146	@ NV	0	N/A	

4. Following a successful installation, the right-click menu for the device presents the new options set of "NEO Telemetry Agent", where you can stop/run the telemetry container, uninstall the telemetry agent or upgrade the telemetry agent if available.

Add						
				 Provisioning Connectivity Check 	ormation (10.209.37.248)	
All	♥ 10 ♥			▲ Install Install Install	► Run Events Jobs D Telemetry Spapshots	Device VI AN
Name	IP ↑ Filter	System	Status	C Reboot	Uninstall Docker Containers	
r-ufm-sw78	⊡ 10.209.37.78	@ MS	0 Ш	Acknowledge	277	
r-ufm-sw79	10.209.37.79 10.209.37.248	🗟 MS		Live Monitoring	%	
ufm-switch17	IO 10.209.37.249			Elive Buffers Utilization Elion Create MLAG with		
ufm-switch26 ufm-switch26	☑ 10.209.38.100☑ 10.209.38.131			Add To Group	CPU2	
N/A	⊡ 10.209.38.144	≪ NVI…	0	🛓 Generate Dump	m) (1496)	
N/A	☑ 10.209.38.146	💿 NVI	0	N/A		

			 Provisioning Connectivity Check 	Device Information (1
All	► 10 ►	Syster	Le Install Le Install Telemetry Agent C Reboot Remove	Stop Recirculation Port
Filter ∇ r-ufm-sw78 ■ r-ufm-sw79	Filter ▼ ² 10.209.37.78 ² 10.209.37.79	Filt MS	 Acknowledge Go To Map History Monitoring 	Memory
ufm-switch16 ufm-switch17	□ 10.209.37.248 □ 10.209.37.249 □ 10.209.37.249	MS MS MS	Live Monitoring Live Buffers Utilization Create MLAG with	33.63%
ufm-switch26	Image: 10.209.38.131 Image: 10.209.38.131 Image: 10.209.38.144 Image: 10.209.38.144		Add To Group Add To Site Generate Dump	CPU1 (5%)
Appendix - What Just Happened® Reasons

Category	Name	Description	Severit y
Ethernet	Ingress Packet Reserved DMAC	Destination MAC is Reserved (DMAC=01-80- C2-00-0x)	Notice
Ethernet	Ingress Switch Vtag Allow	VLAN tagging mismatch	Notice
Ethernet	Ingress Switch VLAN	VLAN filtering	Notice
Ethernet	Ingress Switch STP	Ingress spanning tree filter	Notice
Ethernet	Lookup Switch UC	Unicast FDB discard	Notice
Ethernet	Lookup Switch MC Null	Multicast list is empty	Notice
Ethernet	Lookup Switch LB	Port loopback filter	Notice
Ethernet	Ingress Packet SMAC is MC	Source MAC is multicast	Notice
Ethernet	Ingress Packet SMAC Equals DMAC	Source MAC equals destination MAC	Notice
IP	Ingress Router No HDR	Non IP packet	Notice
IP	Ingress Router UC DIP MC DMAC	Unicast destination IP but non-unicast destination MAC	Notice
IP	Ingress Router DIP LB	Destination IP is loopback address	Notice
IP	Ingress Router SIP MC	Source IP is multicast	Notice
IP	Ingress Router SIP Class E	Source IP is in class E	Notice
IP	Ingress Router SIP LB	Source IP is loopback	Notice
IP	Ingress Router SIP Unspecified	Source IP is not specified	Notice
IP	Ingress Router IP HDR	Checksum or IPver or IPv4 IHL too short	Notice
IP	Ingress Router MC DMAC	Multicast MAC mismatch	Notice
IP	Ingress Router SIP Equals DIP	Source IP equals to destination IP	Notice
IP	Ingress Router SIP BC	IPv4 source IP is limited broadcast	Notice
IP	Ingress Router DIP Local Network	IPv4 destination IP is local network	Notice
IP	Ingress Router DIP Link Local	IPv4 destination IP is link local	Notice
IP	Router IRIF Disabled	Ingress IP interface is disabled	Notice
IP	Router ERIF Disabled	Egress IP interface is disabled	Notice
IP	Router LPM4	IPv4 LPM unicast miss	Notice
IP	Router LPM6	IPv6 LPM unicast miss	Notice
IP	MC Scope IPv6 0	IPv6 destination in multicast scope FFx0:/16	Notice
IP	MC Scope IPv6 1	IPv6 destination in multicast scope FFx1:/16	Notice
Tunnel	Decapsulation Packet	Remained packet is too short	Notice
Tunnel	Decapsulation Error	Decapsulation error	Notice
Tunnel	Overlay Switch SMAC Multicast	Overlay: source MAC is multicast	Notice
Tunnel	Overlay Switch SMAC Equals DMAC	Overlay: source MAC equals destination MAC	Notice

Document Revision History

Release	Date	Description		
2.7	August 06, 2020	Added: Section " <u>Events</u> " Section " <u>WJH Category Distribution</u> " Section " <u>Services</u> " Section " <u>Configuration Changes</u> " Section " <u>WJH Filtering</u> " Section " <u>Categories Distribution</u> " Section " <u>Categories Distribution</u> " Section " <u>Events Distribution Per Switch</u> " Section " <u>Connectivity Check</u> " Section " <u>Connectivity Check</u> " Section " <u>Cables</u> " Updated: Section " <u>Navigator Tabs</u> " Section " <u>Monitoring Window</u> " Section " <u>General Dashboard</u> " Section "Network Health"		
2.6	May 26, 2020	 Added: Section "NEO Health Monitoring" Section "Time-based WJH Events" Section "Compare Configuration" Section "Auto-Provisioning" Section "Installation Prerequisites" Section "Installation Prerequisites" Section "Installation Prerequisites" Section "Installing NEO for High Availability" Section "Installing Mellanox NEO Application" Section "Installing Mellanox NEO as Docker Container" Section "Section "Listalling Mellanox NEO as Docker Container" Section "Installing Mellanox NEO as Docker Container" Section "Installing Mellanox NEO as Docker Container" Section "Installing Mellanox NEO as Docker Container" Note under Available Service Element Operations → Idle → Clean-up Section "Adding Devices" Section "Removing Devices" Section "Baikt Tab" Section "Baikt Tab" Section "Backup and Restore" Section "Configuring Email Notifications According to Event Severity" Section "Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO" Section "Setting NEO SNMP Trap Protocol Registration" 		
2.5	November 17, 2019	 Added the following sections: <u>Built-in Tasks</u> <u>Setting NEO SNMP Trap Protocol Registration</u> Updated the following sections: <u>Configuring Mellanox Onyx Switch for Sending Traps to Mellanox NEO</u> <u>Logs</u> <u>Local Mode</u> 		

Release	Date	Description		
	October 2, 2019	 Added two items to Known Issues section of Release Notes: Running WJH on a Cumulus switch is not supported. (Up to the release of NEO v2.5, no Cumulus version that supports WJH existed.) If a device (Linux host or switch) is removed from NEO while some Mellanox switches are running telemetry, then all the telemetry sessions running on these switches will be stopped. 		
	September 26, 2019	 Incorporated the Quick Start Guide document into the User Manual. Added a new Element Operation (Clean-up) to table <u>Available</u> <u>Service Elements' Operations</u> Added What-Just-Happened (WJH) Device Events. See <u>Device</u> <u>Events</u> Added <u>Prism AHV Configuration</u> Updated <u>Virtualization Settings</u> Added <u>What Just Happened Filtering</u> Added <u>Uninstalling NEO as a Docker Container</u> Updated the Bring Up wizard screenshots due to a new look- and-feel interface. See <u>Bring Up Wizard</u> Updated the <u>Create a New Session</u> section, updated the profiles list Updated <u>Mellanox NEO/Nutanix Prism Plug-in</u> Updated <u>NEO VXLAN Templates</u> Removed the switch limitation from section <u>Limitations</u>. Removed section DCI Support from <u>Mellanox NEO/Nutanix</u> Prism Plug-in 		
2.4	April 30, 2019	Added the following sections: • <u>Telemetry Snapshots</u> • <u>Virtualization Settings</u> • <u>Generate Dump</u> • <u>Bring-up Wizard</u> and its subsections Updated the following sections: • <u>"Main Tabs/Categories/Navigator Buttons"</u> and its subsections • <u>"Managed Elements"</u> and its subsections • <u>"Monitoring"</u> • <u>"Configuring Windows Host for Basic Authentication"</u> • <u>What Just Happened Overview</u> • <u>Network Map</u> and its subsections • Updated the <u>Network Notifications Icon</u> screenshot: no eco mode		
2.3.1	March 3, 2019	Updated the following section: <u>"Configuring Host for LLDP Discovery"</u> 		
	January 31, 2019	No changes have been performed in this release		

Release Notes Revision History

- <u>Release Notes Changes and Features History</u>
- Bug Fixes History

Release Notes Changes and Features History

This section lists the changes and new features of the previous versions of Mellanox NEO®.

Feature	Description	
	Rev 2.6	
Infrastructure	Transition to Python 3Changing all UI tables to Grid Tables	
Health monitoring	Added support for monitoring NEO processes and restarting them if they fail	
Dashboard inventory	Display all managed devices inventory at NEO dashboard	
Services	 Added <u>clean-up option for MLAG</u> service Aligned all services to have the same look and feel like bringup wizard 	
Network map	Added support for viewing sites in Network Map screen	
Auto-provisioning	 Automatically register for SNMP traps for every newly added Onyx switch Automatically configure SNMP and LLDP for every newly added Cumulus switch 	
User management	Added support for limited view for NEO read only user	
UI enhancements	 Added alternative to right click operations Display switch names whenever switches are displayed Aligned devices status and health for all managed devices Aligned the format of all error handling messages 	
NEO container HA	Add support for NEO docker container to run in high availability mode	
VLAN auto-provisioning	 Updating switch information (VLANs) once VLAN auto-provisioning is done Added support for auto-VLAN provisioning according to the switchport mode detected Configuring the VLAN name as part of the auto VLAN provisioning 	
Switch configuration comparison	Added option to compare configurations between two or more switches	
Telemetry enhancements	 Added protection for users to not use localhost (127.0.0.1) if they are deploying telemetry agent Added option to configure telemetry collectors via the telemetry streaming page 	
NEO container upgrade	Added support for upgrading NEO container using docker volumes	
NEO discovery	Added pop-up indication and notification summary for every device being discovered (by scanning)	
Events policy enhancement	Added 3 predefined recipient lists per severity for users who want to send all NEO events for specific severity to a specified list of recipients	
Rev 2.5.1		
Telemetry Agent	Upgraded the Telemetry Agent to version 2.5.1-5	
Telemetry Agent	Added provisioning templates to configure the Telemetry Agent via NEO	

Telemetry Agent	Telemetry Agent LAG and MLAG discovery mechanism is now configurable and is disabled by default	
NEO Discovery	Improved NEO switch interfaces discovery mechanism to be more efficient	
WJH	The legend in WJH timeline graph is now displayed by reason category	
	Rev 2.5	
WJH Enhancements	Added support for collecting and viewing ACL dropped packets.	
	Added support for collecting and viewing L1 dropped packets.	
	Added support for filtering the WJH reasons categories when querying WJH from the switch.	
Bring up wizard enhancements	Added support for multiple MLAGs configuration within the Bring Up wizard	
	Added support for VMWare vCenter and Nutanix Prism integrations setting via the Bring Up wizard.	
Auto VLAN Provisioning	Added support for automatic VLAN provisioning (on both Onyx and Cumulus switches) in case of networking or VM event, triggered by the vCenter.	
	Added support for automatic VLAN provisioning over remote clusters (VXLAN) using Onyx switches connected to Nutanix AHV hypervisors.	
	Added support for extending the amount of hypervisors in the Nutanix setup when working in "Global VLAN Provisioning" mode.	
Transition to InfluxDB	Enabled collecting and inserting telemetry and monitoring data into InfluxDB (instead of Graphite).	
RoCE Cleanup	Added support for removing RoCE configuration from switches which are part of NEO RoCE service.	
NEO on Switch	Integrated the InfluxDB as part of NEO on Switch (NEO docker container) capability.	
Enhanced Data collection	NEO was optimized to collect data from either Monitoring or Telemetry. Once Telemetry is enabled, Monitoring is disabled and vise versa.	
Telemetry Agent	Performance improvements and more efficient way to collect telemetry data and stream it to external collector.	
	Added support for upgrading the telemetry agent version via NEO Web UI.	
	Added a mechanism which prevents the telemetry agent deployment in case the switch and NEO clocks are not synchronized.	
	Added support for retrieving telemetry data for logical switch ports like LAG and MLAG.	
	Added support for streaming telemetry data to Kafka Consumer.	
	Added RAM limitation of 300M for the docker container running the telemetry agent.	
	Added a new notification which lists the current switches that are using old telemetry agent version (which require upgrade).	
Rev 2.4		
Snapshot Differences and Notifications/Events	Allows the user to create a telemetry snapshots of periodic CLI command output. These snapshots can be used to alert the user when a difference is found in the output.	
gRPC Streaming Enhancements	Streams the Telemetry data to NEO using a unified collector with gRPC protocol.	
Optimize NEO Refresh Rate	Shortens the refresh time of the device's Docker data.	

Bring-up wizard for 2-switch MLAG for ESF	Allows the user to bring-up a network from scratch in a few quick steps.		
VMware vCenter Virtualization Support (DVS)	Allows the user to manage ESXi hosts in NEO.		
Generate System Dump	Allows the user to generate debug dumps for Onyx switches and upload them to a remote folder.		
Support L2 in the ToR use-case	Nutanix integration for L2 networks.		
Nutanix Calm BP update	Updated NEO Blueprint on Nutanix Calm.		
Nutanix Plugin API Change to Webhook v3	Updated NEO Nutanix plugin to use Nutanix v3 REST APIs.		
Package InfluxDB as an External Container with NEO	Provides a Docker container with InfluxDB and Grafana to be used as a Telemetry data collector.		
Grafana Visualization Pack (on top of InfluxDB)			
What-Just-Happened (WJH) Debug	Provides the user more information on WJH failures.		
Link Monitoring	Provides the user better visibility on the device and the ports' traffic, and the network behavior.		
WJH integration with SDK	Integrated the Telemetry Agent with SDK for WJH data.		
Onyx EVPN Templates	Added templates for EVPN configuration on Onyx.		
WJH Enhancements	Enhanced the WJH dashboard user interface.		
Telemetry	Added support for modifying the collectors to an existing session.		
Power Management	Removed support for the eco mode as this capability is not supported in Spectrum based switches.		
Rev 2.3.1			
Telemetry Agent	Telemetry sessions performance improvements		
NEO Telemetry Management	Telemetry status reflection improvement		
Discovery	Add option for disabling VLAN discovery		
Task Management	Added an option to attach additional NEO data model attributes to the collected switch information		
NEO VM Deployment	Improved the NEO OVA image for easier VM deployments		
Rev 2.3			
RoCE Dashboard	The RoCE Dashboard contains a snapshot of the RoCE related network state, including information on service state, traffic and events. RoCE services can also be added and managed from this dashboard.		
Nutanix Virtualization Improvements	Allows discovering the virtualization information (VM name) using prism central API.		
Cisco Model 2960 Switches Support	Cisco switches model 2960 can be managed by NEO, apart from provisioning related operations.		
What Just Happened	A dashboard that contains information about packet drops in the fabric.		
MAC Address table for Onyx	Allows the Telemetry Agent to retrieve MAC Tables data.		
Switch Agent (Onyx): Routing Tables	Allows the Telemetry Agent to retrieve Routing Tables data.		
Telemetry Agent for SwitchDev (interface and port counters)	Allows running the telemetry agent as a docker container on SwitchDev switches. The data is collected using ethtool.		
Telemetry Agent for Linux Host	Allows running the telemetry agent as a docker container on Linux hosts. The data is collected using ethtool.		

LLDP Discovery APIAutomatic SNMP v3 Registration	Enables the user to attach the 'Register for SNMP v3 traps for Mellanox switch' built-in task to the 'Device Added' event so it will run every time a new device has been added.	
Port Unsilenced Admin State	Added support for 'Unlicensed' port admin state.	
Planned-Reload Event	Added a new event policy - 'Planned Reload'.	
MAC Address Table Scheduled Task	Allows the user to set a scheduled task to obtain the MAC address table for each Onyx device.	
	Rev 2.2	
Telemetry Agent Enhancements	 Added calculated counters (rate and normalized counters) Added error handling and telemetry sessions status Added support for multiple sessions and multiple destinations Added a mechanism for triggering threshold crossing events 	
Telemetry Agent on Cumulus Linux	Added support for deploying and running telemetry agent on Cumulus Linux.	
Telemetry Integration with ELK	Added support for switch telemetry data integration with ELK.	
One Click RoCE	Added support for deploying RoCE on Windows and Cumulus Linux systems.	
Network Map Enhancements	 Added support for link utilization (showing bandwidth utilization per link) Added a new hierarchical view of managed devices 	
Log Debug level via Web UI	Added support for NEO controller log debug level.	
Multi-site Support	Added support for grouping and managing devices per site	
Network Path	Added a view of the optional network paths between a selected switch and a target host.	
Nutanix Integration	Added support for NEO integration with Nutanix Prism Central and Multi-Cloud environment.	
	Rev 2.1	
One-click RoCE	 Updated the RoCE recipes for: 1. ECN only 2. ECN + QoS 3. ECN + QoS + PFC. Added the ability to select specific switches, hosts and ports to RoCE provision. Added the ability to easily grow the RoCE fabric after the initial provisioning with additional switches, hosts and ports. 	
Telemetry Agent (Early Availability)	The NEO telemetry agent is a software module designed to run inside a Docker container operated on a Mellanox Spectrum switch system. The agent collects data on the switch, and streams it out to an external data collector for processing, analysis and presentation. The telemetry agent can be centrally deployed and managed from the NEO application or from a 3 rd party controller.	
Mellanox Spectrum Containers Management	Added the ability to orchestrate Docker containers on Mellanox Spectrum switch systems operated with Mellanox Onyx software.	
Cable Inventory	Added the ability to view and manage an inventory of cables across the fabric through one pane of glass.	
NEO Docker Appliance	The NEO Docker appliance is a pre-packaged Docker container image operating on CentOS and installed with the NEO 2.1 software.	
Backup & Restore	Added the ability to backup and restore a NEO instance for data protection and recovery purposes.	

Event Management	 The condition ID was changed to be numeric instead of textual data The event description contains the condition message instead of the reason The reason field is generated by NEO, and contains Reason information per event ID. The user cannot modify the Reason information The 'RelatedObjectID', 'RelatedObjectName' and 'RelatedObjectType' new attributes were added to each event The 'Parent' attribute was changed to 'RelatedSystem'. Only one related system is supplied The 'ConditionID' attribute was added Additional log data entries were added - 'ConditionID', Event sequence ID and related object data The corrective description is generated by NEO, and contains corrective information per condition ID 		
Remote Storage	Added the ability to change the default path where NEO stores all configuration files from the local host to a remote storage.		
NEO-Host Notification	Added new notification listing hosts that are not installed with NEO-Host, as well as the ability to install the latest NEO-Host software.		
Device Access	Added the ability to set http/https device access for every Mellanox Onyx operated device.		
Export/Import Network Map Views	Added the ability to export Network Map views as files and import them to other NEO user environments.		
QoS Monitoring	Added the ability to set traffic priority for monitoring, with priority 3 being the default for RoCE traffic.		
Network Services	Added an option to automatically create a network snapshot before applying a service configuration to allow a restoration point in case of a failure.		
Provisioning	Added several new provisioning templates.		
Rev 2.0.5			
RoCE Profiles Support	Added the ability to use MLNX_OS 3.6.5000 traffic pool APIs for RoCE service configuration.		
HTTPS Communication	Added the option to replace HTTP access to the switches with HTTPS access.		
Configuration Management Module	Added a new module to consolidate all related configuration management functions, such as network provisioning templates, global configuration templates, etc. in a single pane of glass.		
Running-Config Variables	Added the ability to use variables in running-config templates such that a single running-config can be provisioned on multiple switches in a single operation.		
Network Snapshots	Added support for creating network-wide snapshot of switch running- configurations to use as restoration points. By default, a network snapshot is created automatically by the system every 24 hours.		
One-click MLAG	Expanded the existing MLAG service to provision and validate IP networks and servers on the switch and host.		
Nutanix AHV Support	Added support for auto-discovery and visibility of Nutanix Acropolis (AHV) virtual machines across the network fabric.		
Linux Virtual Networking	Added modeling and visibility into a Linux host virtual networking and virtual functions bridging to physical adapters.		
NEO Virtual Appliance for PowerKVM	Added support for new NEO Virtual Appliance compatible with PowerKVM based systems.		

Device MAC	Added a new identifier for switch systems.	
Device Access	Added SNMP-based connection settings per switch and changed "Device Credentials" to "Device Access".	
Syslog Server	Added configuration options to set up to five servers to export syslog messages to, each has its own service/port settings.	
Live Monitoring Interval Improvement	Reduced the minimal counters monitoring interval of Spectrum and SwitchX devices from 20 to 2 seconds.	
NMOS API	Added support for Networked Media Open Specifications (NMOS) API. For further information on NMOS, visit the following links: <u>https://www.nmos.tv/about_NMI.html</u>	
	Rev 1.9	
Enhanced Server/NIC Support	Added Mellanox adapter and port information through integration with NEO-Host software operated on the host.	
Enhanced Device Discovery	Disabled the default automated device discovery mechanism, and enabled the user to create and manage a discovery policy of allowed IP subnets and/or ranges.	
	Added a new discovery solution of IP subnet/range scan.	
Configuration Management	Added the option to schedule a configuration swap/rollback on a Mellanox switch or a group of switches using an Apply Config task operation.	
	Added the option to edit switch configuration through a built-in config editor.	
One-Click RoCE Service	Added built-in automation for the provisioning and validation of RDMA over Converged Ethernet (RoCE). This feature is designed for Mellanox Spectrum switch systems operated with Mellanox Onyx, and Linux servers operated with Mellanox ConnectX-4 or ConnectX-5.	
RoCE Monitoring	Added sampling of additional counters on Mellanox switches, used for RoCE traffic. This feature is designed for Mellanox Spectrum switch systems operated with Mellanox Onyx.	
NEO Software Upgrade	Added an enhanced solution for NEO software upgrade from NEO v1.9 and up.	
Enhanced Device State	 Added the following new device states: Pending Reboot - indicates that a device is pending reboot (as a result of a software upgrade or apply configuration) Reboot Status - indicates the status of a device upon reboot operation 	
Enhanced LAG/MLAG Support	 Added an enhanced support for LAG/MLAG port-channels on Mellanox Onyx powered switch systems with: One-click provisioning - configuring LAG/MLAG ports configuration based on physical connectivity LAG/MLAG information - added information on LAG/MLAG port members/peers, state, MTU, etc. One-click validation - monitoring existing LAG/MLAG ports through network services 	
Rev 1.8		
Network Health Enhancements	 Added new network health tests for: IP connectivity between all nodes to all nodes, or random selection of one node per switch/rack. Multicast latency and bandwidth tests between all nodes to all nodes, or random selection of one node per switch/rack. 	

Network Health Report	Allows the user to execute data traffic tests across the network, to ensure utmost network performance		
Task Sequence	Allows the user to select multiple tasks that will run in a sequence, to achieve end-to-end network automation in a single run-time		
End to End RoCE Automation	Added a new wizard that configures Lossless RoCE/Resilient RoCE on an entire fabric comprised of Mellanox switches, Linux and Windows hosts		
Ports Group	Enablse the user to create a group of ports, to achieve port-level network automation and create monitoring policies		
Software Upgrade Profiles	Allows the user to manage software upgrade profiles for a more intuitive way to upgrade Mellanox software on switches and servers		
VLAN Auto-Provisioning for Nutanix Acropolis Virtualization	Added network automation for configuring VLAN networks on Mellanox switches, for Nutanix Acropolis VM life-cycle, VM creation, VM migration and deletion. This is provided as a software add-on/plug-in.		
	Rev 1.7		
High Availability	Added the option to install and run NEO on a cluster of nodes that are synchronized and can take over each other in cases of failovers		
Cable Information	Added the option to view cable information of selected devices, ports and groups		
Performance Monitoring	Added the ability to run performance checks between two hosts		
New Supported Virtual Appliances	 Added new VM images of NEO for the following hypervisors: VMWare Workstation ESXI Server Virtual-BOX Hyper-V 		
Port Level Provision	Added the ability to run provisioning actions for Mellanox Onyx switch ports		
L3 Network Provisioning	Added the option to define a dynamic layer 3 network configuration which can be automatically applied for new discovered systems		
Syslog Configuration	Added the option to change NEO syslog configuration settings and filter for events to be written to Syslog		
Support for 3rd Party Switches	Added support for managing HP and Brocade switches via monitoring and provisioning		
Saving Topology Layouts	Added the option to save a user-defined layout of the discovered topology		
Skin Personalization	Added the option to personalize the UI view of NEO in terms of colors and theme		
Rev 1.6.1			
NEO Installation and Start-up Enhancements	 Made various enhancements to the NEO installation process to make the installation experience easier for the user. These enhancements include: An error message that appears once Python packages conflict with NEO packages during installation. An error message that appears once RPM conflict with NEO packages during installation. An error message that appears when trying to access NEO GUI while SELinux is enabled. This message asks for disabling SELinux to be able to access the GUI. 		
Mellanox Virtual Modular Switch (VMS)	Added support for configuring SN2410 and SN2700 switch systems as members in VMS.		
	Rev 1.6.0		

Enhanced Network Awareness	Presents VLAN and LAG configuration data per Mellanox switch on the fabric.		
Virtualization Support	Enables NEO to automatically identify and extract data from Linux KVM hypervisos regarding virtual machines' properties and virtual switches. This data is presented to the user per device and on a fabric level.		
Services View	Services View is a single pane of glass for initial network provisioning and monitoring. NEO services are used to provision complex configurations on multiple devices, and upon completion, constantly monitors these configurations. It includes an Out-of-the-box support for Virtual Modular Switch (VMS), Lossless Fabric, MLAG, and MTU services.		
Live Monitoring	Enables the user to create graph reports on device and traffic counters with intensive polling rates, whenever real-time monitoring capabilities are needed.		
Configuration Management	 Enhanced configuration management with the following capabilities: Provision new switches by pushing full device config Rollback switch config to a last known good configuration New global config repository to manage global device configurations 		
MLNX_OFED Software Upgrade	Added the option to upgrade MLNX_OFED software on Linux servers.		
Maintenance Mode	Enables the user to set NEO to maintenance mode where all NEO events will be disabled.		
Dashboard Enhancements	Added the option to create custom device heatmap views based on various types of attributes (CPU, memory, traffic, etc.), and user-defined thresholds.		
Network Map Enhancements	 Enhanced network map with the following capabilities: Added filtering capabilities based on device type (switch, host, etc.), severity (warning, error, etc.) and VLAN number. Enhanced search capabilities to use standard strings. 		
Mellanox Care Support	Enables Mellanox NEO customers to subscribe to Mellanox Care support service, where all configured events/alerts will be relayed to the Mellanox Care support team constantly.		
Logs	Added the option to download log files.		
Kerberos Authentication	Added support for Kerberos authentication for Windows hosts management.		
Rev 1.5			
Topology Map	Added a visual view of the physical connectivity between managed devices.		
VMS Configuration	Added a wizard for Virtual Modular Switch $^{\rm m}$ (VMS) configuration.		
Provisioning of 3rd Party Switches	Added the option to provision configurations to 3rd party switches using templates.		
Traffic Monitoring of 3rd Party Switches	Added the option to monitor traffic counters for 3rd party switches using SNMP protocol.		
NEO SDK Enhancement	Added support for additional SDK scripts for NEO integrations.		
Task Management Enhancement	Enhanced performance of task management and task editing.		
RH7.0 Support	Added the option to install NEO on an RH7.0 system.		
VM Deployment	Added a pre-configured Virtual Machine (VM) image with NEO for deploying it on a Linux KVM hypervisor system.		

Bug Fixes History

Below are the fixes	that were made	e in previous rele	ases.

Ref. #	Issue
2170410	Description: Configuration restore after upgrade failed, causing the upgrade procedure not to work properly.
	Keywords: Upgrade procedure
	Discovered in version: 2.5.1
	Fixed in version: 2.6
2022521	Description: RoCE errors appear when RoCE is disabled in the switch.
	Keywords: RoCE; errors
	Discovered in version: 2.5.1
	Fixed in version: 2.6
1971770	Description: It is not possible to access NEO due to high CPU utilization.
	Keywords: CPU
	Discovered in version: 2.5
	Fixed in version: 2.6
2037732	Description: Port MTU is presented with the wrong value (-1).
	Keywords: MTU
	Discovered in version: 2.5.1
	Fixed in version: 2.6
2037729	Description: Interface utilization appears as 104% but packet drops occur in interface.
	Keywords: Utilization, packet drop
	Discovered in version: 2.5.1
	Fixed in version: 2.6
1992679	Description: In NEO virtualization, the user field for VCenter is character- limited.
	Keywords: Virtualization
	Discovered in version: 2.5.1
	Fixed in version: 2.6
1922607	Description: Fixed the issue that resulted in all running telemetry sessions on the switches to be removed when removed a system (which was not running telemetry) from NEO.
	Keywords: Telemetry Agent
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1
1960703	Description: Fixed the NEO WJH purging mechanism (cleanup of old WJH events).
	Keywords: WJH
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1

Ref. #	Issue
1973761	Description: Fixed the generation of several WJH reasons and enabled their exposure via the NEO WJH dashboard.
	Keywords: WJH
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1
1958795	Description: Fixed an issue in the Telemetry Agent that caused the Agent to crash when splitting ports.
	Keywords: Telemetry Agent
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1
1957584	Description: Fixed the log rotate mechanism for the Nutanix Plugin.
	Keywords: Log Rotate Mechanism
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1
1959451	Description: Fixed issue in "NEO on Switch" that caused NEO providers status to appear offline.
	Keywords: NEO providers
	Discovered in Release: 2.5
	Fixed in Release: 2.5.1
1731941	Description: Moved UFM REST requests to use secure transport protocol (from HTTP to HTTPS).
	To use the HTTP protocol, set supplier_protocol = http in the IB provider configuration file.
	Keywords: UFM, CloudX, HTTP, HTTPS
	Discovered in Release: 2.3.1
	Fixed in Release: 2.4
-	Description: Fixed a memory leak on NEO telemetry agent which occurred during telemetry sessions (WJH and Counters sessions).
	Keywords: Memory Leak, Telemetry Agent
	Discovered in Release: 2.3.0
	Fixed in Release: 2.3.1
1640823	Description: Fixed an issue where NEO CloudX API failed to connect UFM during a stress test.
	Keywords: CloudX, Stress Test
	Discovered in Release: 2.1.0-5
	Fixed in Release: 2.3.1
1593466	Description: Fixed an issue where NEO discovery failed to operate when the Fan Status was 'NOT PRESENT'
	Keywords: Fan Status
	Discovered in Release: 2.3.0
	Fixed in Release: 2.3.1

Ref. #	Issue
1370061	Description: Fixed an issue in VLAN mode, where NEO reported a switch port as an access port instead of a hybrid port in case of a hybrid port with "only one VLAN".
	Keywords: VLAN Mode
	Discovered in Release: 2.1
	Fixed in Release: 2.2
1281752	Description : Fixed " <i>GraphiteSupplier: Failed to get response</i> " error (a workaround for versions prior to 2.1.0 can be found <u>here</u>).
	Keywords: GraphiteSupplier
	Discovered in Release: 2.0.5
	Fixed in Release: 2.1.0
1296798	Description : Fixed an issue where the Static IP was lost following a reboot of NEO OVA image.
	Keywords: Static IP, OVA
	Discovered in Release: 2.0.5
	Fixed in Release: 2.1.0
1321485	Description: Fixed an issue where Live Monitoring failed on split ports.
	Keywords: Split ports
	Discovered in Release: 2.0.5
1281714	Description : Fixed an issue where following switch upgrade, the new version was not displayed in the UI.
	Keywords: Switch upgrade
	Discovered in Release: 2.0.5
	Fixed in Release: 2.1.0
1321708	Description : Fixed an issue where the REST API sent a 'dummy' cookie as part of the response.
	Keywords: Cookies
	Discovered in Release: 2.0.5
	Fixed in Release: 2.1.0
777783	Description: Fixed an issue where the installation would exit with a vague error message. This issue occurred when NEO was installed using an installation package which was not compatible with the OS version.
	Keywords: Installation, OS version validation
	Discovered in Release: 1.6
	Fixed in Release: 1.6.1
777713	Description : Fixed the issue where a missing RPM (pyOpenSSL) in RedHat 7 used to cause NEO to crash during initialization.
	Keywords: RPM, initialization, RedHat 7
	Discovered in Release: 1.6
	Fixed in Release: 1.6.1

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