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<td>10.6.8</td>
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<td>10.6.12</td>
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</tbody>
</table>
You can download a PDF version here.
1 Overview

NVIDIA® UFM® Enterprise Appliance is a powerful platform for managing InfiniBand scale-out computing environments. It is based on Ubuntu 18.04 OS, where the UFM Enterprise software is deployed and running as a Docker container. UFM enables data center operators to efficiently monitor and operate the entire fabric, boost application performance and maximize fabric resource utilization.
2 Software Download

To download the UFM software, please visit NVIDIA's Licensing Portal.

If you do not have a valid license, please fill out the NVIDIA Enterprise Account Registration form to get a UFM evaluation license.
3 Document Revision History

For the list of changes made to this document, refer to Document Revision History.
4 Technical Support

Customers who purchased NVIDIA products directly from NVIDIA are invited to contact us through the following methods:

- E-mail: Enterprisesupport@nvidia.com
5 Release Notes

NVIDIA UFM Enterprise Appliance is a powerful platform for managing InfiniBand scale-out computing environments. UFM enables data center operators to efficiently monitor and operate the entire fabric, boost application performance and maximize fabric resource utilization.

5.1 Changes and New Features

NOTE: ConnectX-7 adapters firmware (with a new GPIO configuration) improves long-term ConnectX-7 operation, and it is strongly desired that all customers upgrade to 28.39.2702 (or later).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLI Commands</td>
<td>Added the following CLI commands:</td>
</tr>
<tr>
<td></td>
<td>• In <strong>Docker Container</strong>:</td>
</tr>
<tr>
<td></td>
<td>• docker exec</td>
</tr>
<tr>
<td></td>
<td>• docker prune image</td>
</tr>
<tr>
<td></td>
<td>• In <strong>User Accounts</strong>:</td>
</tr>
<tr>
<td></td>
<td>• username root password</td>
</tr>
<tr>
<td></td>
<td>• In <strong>UFM Plugins</strong>:</td>
</tr>
<tr>
<td></td>
<td>• ufm plugin - Updated command</td>
</tr>
<tr>
<td></td>
<td>• In <strong>NVP</strong>:</td>
</tr>
<tr>
<td></td>
<td>• nvp set</td>
</tr>
<tr>
<td></td>
<td>• nvp get</td>
</tr>
<tr>
<td></td>
<td>• nvp dump</td>
</tr>
<tr>
<td></td>
<td>• nvp apply</td>
</tr>
<tr>
<td></td>
<td>• nvp apply force</td>
</tr>
<tr>
<td></td>
<td>• In <strong>Chassis Management</strong>:</td>
</tr>
<tr>
<td></td>
<td>• show version - updated command output and added a note</td>
</tr>
<tr>
<td></td>
<td>• In <strong>Operating System License</strong>:</td>
</tr>
<tr>
<td></td>
<td>• _shell - Added a note</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools Plugin</th>
<th>Added <strong>Appendix - NVP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>UFM OS</td>
<td>Integrated with UFM OS version 24.04.18-4</td>
</tr>
<tr>
<td>UFM Package</td>
<td>Integrated with UFM Enterprise version 6.17.0-6</td>
</tr>
<tr>
<td>UFM HA</td>
<td>Integrated with UFM HA version 5.5.0-9</td>
</tr>
<tr>
<td>MFT Package</td>
<td>Integrated with MFT version mft-4.28.0-9</td>
</tr>
<tr>
<td>MLNX_OFED</td>
<td>Integrated with MLNX_OFED version 23.10-1.1.9</td>
</tr>
<tr>
<td>Firmware</td>
<td>Integrated with firmware version XX.39.2702</td>
</tr>
</tbody>
</table>

For UFM Enterprise Changes and New Features, please refer to the **UFM Enterprise User Manual**.

5.2 Installation Notes

5.2.1 Supported NVIDIA Externally Managed Switches

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Latest Tested Firmware Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDR switches</td>
<td>MQM9790</td>
<td>31.2012.1068</td>
</tr>
<tr>
<td>HDR switches</td>
<td>MQM8790</td>
<td>27.2012.1010</td>
</tr>
<tr>
<td>Type</td>
<td>Model</td>
<td>Latest Tested Firmware Version</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>EDR switches</td>
<td>SB7790</td>
<td>15.2010.5108</td>
</tr>
<tr>
<td></td>
<td>SB7890</td>
<td></td>
</tr>
</tbody>
</table>

### 5.2.2 Supported NVIDIA Internally Managed Switches

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Latest Tested OS Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDR switches</td>
<td>MQM9700</td>
<td>MLNX-OS 3.11.1014</td>
</tr>
<tr>
<td>HDR switches</td>
<td>MQ8700, MCS8500, TQ8100-HS2F, TQ8200-HS2F</td>
<td>MLNX-OS 3.11.1014, NVOS 25.01.4000</td>
</tr>
<tr>
<td>EDR switches</td>
<td>SB7700, SB7780, SB7800, CS7500, CS7510, CS7520</td>
<td>MLNX-OS 3.10.5002</td>
</tr>
</tbody>
</table>

⚠️ For supported HCAs per MLNX_OFED version, please refer to MLNX_OFED Release Notes.

### 5.2.3 UFM GUI Client Requirements

The platform and GUI requirements are detailed in the following tables:

<table>
<thead>
<tr>
<th>Platform</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browser</td>
<td>Edge, Internet Explorer, Firefox, Chrome, Opera or Safari</td>
</tr>
</tbody>
</table>
| Memory     | • Minimum: 6 GB  
|            | • Recommended: 16 GB                          |

#### 5.2.3.1 MFT Package Version

<table>
<thead>
<tr>
<th>Platform</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFT</td>
<td>Integrated with MFT version mft-4.28.0-95</td>
</tr>
</tbody>
</table>

#### 5.2.3.2 UFM SM Version

<table>
<thead>
<tr>
<th>Platform</th>
<th>Type and Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM</td>
<td>UFM package includes SM version 5.19.0</td>
</tr>
</tbody>
</table>
5.2.3.3 UFM NVIDIA SHARP Software Version

<table>
<thead>
<tr>
<th>Platform</th>
<th>Type and Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVIDIA® Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™</td>
<td>UFM package includes NVIDIA SHARP software version 3.7.0</td>
</tr>
</tbody>
</table>

5.3 Bug Fixes in This Release

<table>
<thead>
<tr>
<th>Ref #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3775706</td>
<td>Fixed the issue in CLI where customer information is being written to syslog</td>
</tr>
<tr>
<td></td>
<td>Keywords: CLI commands, syslog</td>
</tr>
<tr>
<td></td>
<td>Discovered in Release: v1.7.0</td>
</tr>
<tr>
<td>3863958</td>
<td>Fixed issue where InfiniBand-InfiniBand links go to INIT - Failed Failover after enabling SHARP with PKeys</td>
</tr>
<tr>
<td></td>
<td>Keywords: SHARP, PKey, InfiniBand Link, Failover</td>
</tr>
<tr>
<td></td>
<td>Discovered in Release: v1.7.0</td>
</tr>
<tr>
<td>3811475</td>
<td>Fixed issue where UFM loggings REST API omits additional contents of the log when it spans over multiple lines</td>
</tr>
<tr>
<td></td>
<td>Keywords: UFM Loggings, REST API, Span over, Multiple Lines</td>
</tr>
<tr>
<td></td>
<td>Discovered in Release: v1.6.1</td>
</tr>
<tr>
<td>3803527</td>
<td>Fixed issue with Create History REST API while collecting SM Logs Error</td>
</tr>
<tr>
<td></td>
<td>Keywords: Create History, SM Log Error</td>
</tr>
<tr>
<td></td>
<td>Discovered in Release: v1.6.3</td>
</tr>
<tr>
<td>3864876</td>
<td>Fixed issue with UFM events not appearing in remote syslog</td>
</tr>
<tr>
<td></td>
<td>Keywords: UFM Events, Remote syslog</td>
</tr>
<tr>
<td></td>
<td>Discovered in Release: v1.6.1</td>
</tr>
</tbody>
</table>

Refer to UFM Enterprise Software Release Notes for further Bug Fixes.

5.4 Known Issues in This Release

N/A

5.5 Changes and New Features History

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFM CLI</td>
<td>Added tab autocompletion in UFM CLI. For more information, refer to Getting Help.</td>
</tr>
<tr>
<td>CLI Commands</td>
<td>Added the following CLI commands:</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>In <strong>Docker Container:</strong></td>
</tr>
<tr>
<td></td>
<td>- docker load &lt;image name&gt;</td>
</tr>
<tr>
<td></td>
<td>- docker pull</td>
</tr>
<tr>
<td></td>
<td>- docker remove image &lt;image name&gt; &lt;image version&gt;</td>
</tr>
<tr>
<td></td>
<td>- show docker images</td>
</tr>
<tr>
<td></td>
<td>- show docker ps</td>
</tr>
<tr>
<td></td>
<td>In <strong>UFM Process Commands</strong></td>
</tr>
<tr>
<td></td>
<td>- ufm process health start</td>
</tr>
<tr>
<td></td>
<td>- ufm process model start</td>
</tr>
<tr>
<td></td>
<td>- ufm process telemetry start</td>
</tr>
<tr>
<td></td>
<td>- ufm process sharp start</td>
</tr>
<tr>
<td></td>
<td>- ufm process telemetry start</td>
</tr>
<tr>
<td></td>
<td>- ufm process sm start</td>
</tr>
<tr>
<td></td>
<td>In <strong>UFM Plugins:</strong></td>
</tr>
<tr>
<td></td>
<td>- ufm plugin</td>
</tr>
<tr>
<td></td>
<td>- show ufm plugin</td>
</tr>
</tbody>
</table>

| UFM OS               | Integrated with UFM OS version 24.01.18-4                                                      |
| UFM Package          | Integrated with UFM Enterprise version 6.16.0-4                                               |
| UFM HA               | Integrated with UFM HA version 5.4.0-9                                                         |
| MFT Package          | Integrated with MFT version mft-4.27.0-83                                                       |
| MLNX_OFED            | Integrated with MLNX_OFED version 23.10-1.1.9                                                 |
| Firmware             | Integrated with firmware version XX.39.2702                                                   |

**Rev 1.6.2**

| UFM SM               | New routing algorithm for asymmetric QFT topologies                                             |
| UFM OS               | Integrated with UFM OS version 23.11.18-2                                                      |

**Rev 1.6.1**

| AAA TACACS+ Support  | Added support for AAA TACACS+. For more information, please refer to [Authentication, Authorization and Accounting (AAA)](https://example.com). |
|                      | Added support for three TACACS+ servers for AAA - with fallback or weighted priority.         |
|                      | Added per command authorization AAA TACACS+ support                                             |
|                      | Added IPv6 TACACS server support                                                                |
|                      | Added TACACS+ CLI command to allow the TACACS+ functionality. For more information, refer to TACACAS+. |
## CLI Commands

Added the following CLI commands:

- **In **Routing:
  - show {ip | ipv6} route
  - show {ip | ipv6} default-gateway

- **In **AAA Methods:
  - aaa authentication login default
  - show aaa

- **In **TACACS+:
  - tacacs-server
  - tacacs-server host
  - show tacacs

- **In **Chassis Management:
  - show files system
  - show resources

- **In **UFM License:
  - ufm license install
  - ufm license delete
  - show ufm license
  - show files ufm-license

- **In **UFM Configuration Management:
  - ufm configuration delete
  - ufm configuration export
  - ufm configuration fetch
  - ufm configuration import
  - ufm configuration upload
  - show files ufm-configuration

- **High-Availability**
  - ufm ha configure

- **In **UFM Multi-Port SM:
  - ufm multi-port-sm
  - show ufm multi-port-sm
  - ufm additional-fabric-interfaces
  - show ufm additional-fabric-interfaces

- **HCA Commands**
  - ib hca-vl15-window
  - show ib hca-vl15-window

- **In **NVIDIA SHARP:
  - ib sharp dump-files-generation enable
  - ib sharp dynamic-tree-allocation enable
  - ib sharp dynamic-tree-algorithm
  - ib sharp ib-qpc-sl <0-15>
  - ib sharp ib-sat-qpc-sl <0-15>
  - ib sharp allocation enable

## Client Certificate Authentication

Added support for pinning SAN with RegEx.

## Packages

<table>
<thead>
<tr>
<th>Package</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFM Package</td>
<td>Integrated with UFM version 5.3.0-17</td>
</tr>
<tr>
<td>UFM HA Package</td>
<td>Integrated with UFM HA version 6.15.0</td>
</tr>
<tr>
<td>UFM OS</td>
<td>Integrated with UFM OS version 23.10.18-9</td>
</tr>
<tr>
<td>MFT Package</td>
<td>Integrated with MFT mft-4.26.0-93</td>
</tr>
<tr>
<td>MLNX_OFED</td>
<td>Integrated with MLNX_OFED version 23.07-0.5.1</td>
</tr>
<tr>
<td>Firmware</td>
<td>Integrated with firmware version XX.38.2104 to resolve HCA overheating issue</td>
</tr>
</tbody>
</table>

### Rev 1.5.1

<table>
<thead>
<tr>
<th>Package</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFM Package</td>
<td>Integrated with UFM version 6.14.1</td>
</tr>
</tbody>
</table>

Rev 1.5.1
<table>
<thead>
<tr>
<th>MFT Package</th>
<th>Integrated with MFT version mft-4.25.0-200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable and Transceivers Burning</td>
<td>UFM supports second-source cable transceivers burn.</td>
</tr>
</tbody>
</table>

**Rev 1.5.0**

<table>
<thead>
<tr>
<th>Command Line Interface (CLI)</th>
<th>Enhanced CLI commands in the following chapters:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Service Upgrade</td>
<td>• In-Service Upgrade</td>
</tr>
<tr>
<td></td>
<td>• IP Management</td>
</tr>
<tr>
<td></td>
<td>• UFM data reset</td>
</tr>
<tr>
<td></td>
<td>• UFM HA nodes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In-Service Upgrade</th>
<th>Added support for in-service upgrade in HA configuration. For more information, refer to <a href="#">In-Service Upgrade</a>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UFM Factory Reset</td>
<td>Added support for UFM Factory Reset. For more information, refer to <a href="#">Appendix - UFM Factory Reset</a>.</td>
</tr>
<tr>
<td>UFM Package</td>
<td>Integrated with UFM version 6.14.0</td>
</tr>
<tr>
<td>UFM HA Package</td>
<td>Integrated with UFM HA version 5.1.1-6</td>
</tr>
<tr>
<td>UFM OS Package</td>
<td>Integrated with UFM OS version 23.07.18-3</td>
</tr>
<tr>
<td>MFT Package</td>
<td>Integrated with MFT version mft-4.25.0-63</td>
</tr>
</tbody>
</table>

**Rev 1.4.1**

<table>
<thead>
<tr>
<th>Command Line Interface (CLI)</th>
<th>Enhanced CLI commands in the following chapters:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• System Management</td>
</tr>
<tr>
<td></td>
<td>• UFM Commands</td>
</tr>
<tr>
<td></td>
<td>• InfiniBand Commands</td>
</tr>
</tbody>
</table>

| UFM Package | Integrated with UFM version 6.13.2 |
| UFM HA Package | Integrated with UFM HA version 5.1.1 |
| UFM HA Package | Integrated with UFM HA version 5.1.1-6 |
| UFM OS Package | Integrated with UFM OS version 2.1.11 |
| MFT Package | Integrated with MFT version mft-4.24.0-72 |
| Appliance OS License | Added appliance OS license mechanism to allow accessing the Shell with “root” permissions |

**Rev 1.3.1**

| Command Line Interface (CLI) | Added support for [Command Line Interface (CLI)](#) for initial configuration of the appliance |
| UFM Initial Settings | Removed the requirement to set the IPoIB address to the main IB interface used by UFM/SM (gv.cfg → fabric_interface). Refer to [Configuring the Fabric Interface](#). |
| UFM Package | Integrated with UFM version 6.12.1 |
| UFM HA Package | Integrated with UFM HA version 5.0.1 |
| UFM Logical Elements | UFM Logical Elements (Environments, Logical Servers, Networks) views are no longer available |
| UFM OS Package | Integrated with UFM HA version 2.1.7 |
### 5.6 Bug Fixes History

<table>
<thead>
<tr>
<th>Ref#</th>
<th>Description</th>
<th>Keywords</th>
<th>Discovered in Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>3754940</td>
<td><strong>Description</strong>: UFM upgrade and ufm_ha_cluster configuration wiped the operating system</td>
<td><strong>Keywords</strong>: UFM Upgrade, ufm_ha_cluster, OS, Wipe</td>
<td>1.6.2</td>
</tr>
<tr>
<td>3752196</td>
<td><strong>Description</strong>: Intermittent UFM REST API Failures</td>
<td><strong>Keywords</strong>: REST API, Failure</td>
<td>1.6.1</td>
</tr>
<tr>
<td>3758874</td>
<td><strong>Description</strong>: manage_the_unmanaged tool failure</td>
<td><strong>Keywords</strong>: manage_the_unmanaged, Failure</td>
<td>1.6.2</td>
</tr>
<tr>
<td>3672810</td>
<td><strong>Description</strong>: TACACS+ authorization encounter failure when attempting to execute a command with arguments that are exclusively allowed in the configuration file.</td>
<td><strong>Keywords</strong>: TACACS+; Per command Authorization</td>
<td>1.6.0</td>
</tr>
<tr>
<td>3673626</td>
<td><strong>Description</strong>: Accessing the CLI requires the entry of the sudo password.</td>
<td><strong>Keywords</strong>: CLI; Login; Sudo; Password</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Ref#</td>
<td>Description</td>
<td>Keywords</td>
<td>Discovered In Release</td>
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</tr>
<tr>
<td>3629287</td>
<td><strong>Description</strong>: UFM3.x unstable HCA due to overheating of transceiver</td>
<td><strong>Keywords</strong>: HCA overheating</td>
<td><strong>v1.5.0</strong></td>
</tr>
<tr>
<td>3575882</td>
<td><strong>Description</strong>: UFM event is not generated for a switch down</td>
<td><strong>Keywords</strong>: UFM Event, Switch Down</td>
<td><strong>v1.4.1</strong></td>
</tr>
<tr>
<td>3565820</td>
<td><strong>Description</strong>: The UFM start command does not reflect fabric-related issues (such as “no IB interface is running”)</td>
<td><strong>Keywords</strong>: UFM start</td>
<td><strong>v1.4.3</strong></td>
</tr>
<tr>
<td>3590777</td>
<td><strong>Description</strong>: After upgrading UFM new telemetry data is not being collected and presented in UI Telemetry tab.</td>
<td><strong>Keywords</strong>: Telemetry, Coredump</td>
<td><strong>1.15.0</strong></td>
</tr>
<tr>
<td>3549795</td>
<td><strong>Description</strong>: Fixed ufm_ha_cluster status to show DRBD sync status.</td>
<td><strong>Keywords</strong>: ufm_ha_cluster, DRBD, Sync Status</td>
<td><strong>1.4.1</strong></td>
</tr>
<tr>
<td>3547517</td>
<td><strong>Description</strong>: Fixed UFM logs REST API returning empty result when SM logs exist on the disk.</td>
<td><strong>Keywords</strong>: Logs, SM logs, Empty</td>
<td><strong>1.2.0</strong></td>
</tr>
<tr>
<td>3469639</td>
<td><strong>Description</strong>: Fixed REST RDMA server failure every couple of days, causing inability to retrieve ibdiagnet data.</td>
<td><strong>Keywords</strong>: REST RDMA, ibdiagnet</td>
<td><strong>1.3.1</strong></td>
</tr>
<tr>
<td>3499668</td>
<td><strong>Description</strong>: Fixed the replacement or overwriting of the IPv4 default gateway when specifying an IPv6 default gateway</td>
<td><strong>Keywords</strong>: IPv4, IPv6, Default Gateway, overwrite</td>
<td><strong>1.4.2</strong></td>
</tr>
<tr>
<td>3499983</td>
<td><strong>Description</strong>: Fixed inability to fetch bootstrap certificate when the user is set to “admin”</td>
<td><strong>Keywords</strong>: Bootstrap certificate, “admin”</td>
<td><strong>1.4.1</strong></td>
</tr>
<tr>
<td>3486980</td>
<td><strong>Description</strong>: Rectified inability to upload an image or certificate using user admin</td>
<td><strong>Keywords</strong>: Image, Certificate, SCP</td>
<td><strong>1.4.0</strong></td>
</tr>
<tr>
<td>Ref#</td>
<td>Description</td>
<td>Keywords</td>
<td>Discovered in Release</td>
</tr>
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<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>3486981</td>
<td><strong>Description:</strong> Rectified inability to add multiple NTP servers.</td>
<td>NTP Server</td>
<td>1.4.0</td>
</tr>
<tr>
<td>3468783</td>
<td><strong>Description:</strong> Fixed UFM version update in <code>/etc/ufm-release</code> upon manual</td>
<td>UFM CLI version, Update</td>
<td>1.4.0</td>
</tr>
<tr>
<td></td>
<td>upgrade of UFM CLI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3410826</td>
<td><strong>Description:</strong> Rectified inability to modify UFM user password</td>
<td>User Password, Update, Fail</td>
<td>1.3.1</td>
</tr>
<tr>
<td>3461058</td>
<td><strong>Description:</strong> When using the Dynamic Telemetry API to create a new telemetry</td>
<td>Dynamic, Telemetry, Log-rotate</td>
<td>1.4.0</td>
</tr>
<tr>
<td></td>
<td>instance, the log rotation mechanism will not be applied for the newly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>generated logs of the UFM Telemetry instance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3383916</td>
<td><strong>Description:</strong> Fixed Client CTRL+C server disruption</td>
<td>Client CTRL+C, Server functionality</td>
<td>Rest Over RDMA Image 1.0.0-21</td>
</tr>
<tr>
<td>3375414</td>
<td><strong>Description:</strong> Fixed improper functionality of UFM UI Dashboard</td>
<td>UI Dashboard</td>
<td>1.2.0</td>
</tr>
<tr>
<td>3342713</td>
<td><strong>Description:</strong> Fixed UFM Health configuration for periodic restarts of the</td>
<td>UFM Health, Telemetry, Periodic restarts</td>
<td>1.2.1</td>
</tr>
<tr>
<td></td>
<td>telemetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3459431</td>
<td><strong>Description:</strong> UFM System Dump cannot be extracted from UFM 3.0 Enterprise</td>
<td>System Dump, High-Availability</td>
<td>1.3.1</td>
</tr>
<tr>
<td></td>
<td>Appliance host when running in high-availability mode.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3461658</td>
<td><strong>Description:</strong> The network fast recovery configuration (`/opt/ufm/files/</td>
<td>Network Fast Recovery; Docket Container; Missing Configuration</td>
<td>1.4.0</td>
</tr>
<tr>
<td></td>
<td>conf/opensm/fast_recovery.conf) is missing when UFM is deployed in</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Docker Container mode.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3361160</td>
<td><strong>Description:</strong> Resolved the prolonged UFM upgrade time caused by a large</td>
<td>Long Upgrade Time, Historical Telemetry, Database File</td>
<td>1.2.0</td>
</tr>
<tr>
<td></td>
<td>historical Telemetry database table</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ref#</td>
<td>Description</td>
<td>Keywords</td>
<td>Discovered in Release</td>
</tr>
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<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
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</tr>
<tr>
<td>3228547</td>
<td><strong>Description:</strong> Client certificate authentication is not working on UFM Docker container after a Docker container restart</td>
<td><strong>Keywords:</strong> Client Certificate Authentication, Ubuntu, Docker</td>
<td><strong>Discovered in Release:</strong> 1.1.0</td>
</tr>
<tr>
<td>3143391</td>
<td><strong>Description:</strong> UFM agent port 6306 is blocked</td>
<td><strong>Keywords:</strong> UFM Agent</td>
<td><strong>Discovered in Release:</strong> 1.0.0</td>
</tr>
<tr>
<td>3116018</td>
<td><strong>Description:</strong> ufm-ha-watcher is not working</td>
<td><strong>Keywords:</strong> UFM-HA</td>
<td><strong>Discovered in Release:</strong> 1.0.0</td>
</tr>
</tbody>
</table>

### 5.7 Known Issue History

<table>
<thead>
<tr>
<th>Ref#</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>3773902</td>
<td><strong>Description:</strong> In congestion control, the cc-policy.conf file remains unchanged following the upgrade of the container version (with no changes made by the user)</td>
</tr>
<tr>
<td></td>
<td><strong>Keywords:</strong> Congestion Control, cc-policy.conf, Upgrade, Container</td>
</tr>
<tr>
<td></td>
<td><strong>Workaround:</strong> On the host, run the command:</td>
</tr>
<tr>
<td></td>
<td>```</td>
</tr>
<tr>
<td></td>
<td>docker exec -it ufm cp /opt/ufm/skeleton/conf/opensm/cc-policy.conf /opt/ufm/files/conf/opensm/cc-policy.conf</td>
</tr>
<tr>
<td></td>
<td>```</td>
</tr>
<tr>
<td></td>
<td><strong>Discovered in Release:</strong> 1.7.0</td>
</tr>
<tr>
<td>3775405</td>
<td><strong>Description:</strong> Upon UFM startup, an empty temporary folder will be created at /tmp folder every 10 minutes (due to periodic telemetry status check)</td>
</tr>
<tr>
<td></td>
<td><strong>Keywords:</strong> Empty folder, temporary, /tmp</td>
</tr>
<tr>
<td></td>
<td><strong>Workaround:</strong> Change instances_sessions_compatibility_interval parameter in gv.cfg to 30 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Discovered in Release:</strong> v1.6.0</td>
</tr>
<tr>
<td>3560659</td>
<td><strong>Description:</strong> Modifying the mtu_limit parameter for [MngNetwork] in gv.cfg does not accurately reflect changes upon restarting UFM.</td>
</tr>
<tr>
<td></td>
<td><strong>Keywords:</strong> mtu_limit, MngNetwork, gv.cfg, UFM restart</td>
</tr>
<tr>
<td></td>
<td><strong>Workaround:</strong> UFM needs to be restarted twice in order for the changes to take effect.</td>
</tr>
<tr>
<td></td>
<td><strong>Discovered in Release:</strong> v1.6.0</td>
</tr>
<tr>
<td>3729822</td>
<td><strong>Description:</strong> The Logs API temporarily returns an empty response when SM log file contains messages from both previous year (2023) and current year (2024).</td>
</tr>
<tr>
<td></td>
<td><strong>Keywords:</strong> Logs API, Empty response, Logs file</td>
</tr>
<tr>
<td></td>
<td><strong>Workaround:</strong> N/A (issue will be automatically resolved after the problematic SM log file, which include messages from 2023 and 2024 years, will be rotated)</td>
</tr>
<tr>
<td>Ref #</td>
<td>Issue</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| 369 941 9 | **Description:** After remanufacturing the UFM Enterprise Appliance from an ISO file as described in Appendix - Deploying UFM Appliance from an ISO File, rebooting or power cycling the host in High-Availability (HA) mode results in the unsuccessful start of the HA services.  
**Workaround:** Change the crontab option in UFM Enterprise Appliance via the OS shell `#crontab -e:`

```bash
@reboot /usr/sbin/netplan apply
```

to:

```bash
@reboot sleep 240 && /sbin/ip link set up dev idrac
```

**Keywords:** Reboot; HA; Power Cycle  
**Discovered in Release:** 1.6.0 |

| 351 141 0 | **Description:** Execution of UFM Fabric Health Report (via UFM Web UI / REST API) will trigger ibdiamet to use SLRG register, which might cause some of the Switch and HCA’s firmware to get stuck and cause the HCA’s ports to stay at “Init” state.  
**Keywords:** UFM Fabric Health Report; SLRG; Stuckness  
**Discovered in Release:** 1.5.0 |

| 343 238 5 | **Description:** Collect system dump for DGX host does not work due to missing sshpass utility.  
**Workaround:** Install sshpass utility on the DGX.  
**Keywords:** System Dump, DGX, sshpass utility |

| 346 165 8 | **Description:** UFM does not support HDR switch configured with hybrid split mode, where some of the ports are split and some are not.  
**Workaround:** UFM can properly operate when all or none of the HDR switch ports are configured as split.  
**Keywords:** HDR Switch, Ports, Hybrid Split Mode |

| N/A | **Description:** After the upgrade from UFM Enterprise Appliance v1.4.0 GA to UFM Enterprise Appliance v1.4.1 FUR, the network fast recovery path in `opensm.conf` is not automatically updated and remains with a null value `(fast_recovery_conf_file (null))`.  
**Workaround:** If you wish to enable the network fast recovery feature in UFM, make sure to set the appropriate path for the current fast recovery configuration file (`/opt/ufm/files/conf/opensm/fast_recovery.conf`) in the `opensm.conf` file located at `/opt/ufm/files/conf/opensm`, before starting UFM.  
**Keywords:** Network fast recovery, Missing, Configuration |

| N/A | **Description:** Upgrading the UFM Enterprise Appliance SW while upgrading the UFM Enterprise Appliance OS is not supported.  
**Workaround:** Do not use the `--appliance-sw-upgrade` flag while upgrading the UFM Enterprise Appliance OS. Alternatively, upgrade the UFM Enterprise Appliance SW as described in Software Upgrade.  
**Keywords:** SW Upgrade; OS Upgrade, `--appliance-sw-upgrade` |
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Issue</th>
</tr>
</thead>
</table>
| 347 360 0 | Description: The UFM Enterprise service is enabled while upgrading the UFM Enterprise Appliance SW on HA mode.  
**Workaround:** Disable the UFM Enterprise service after the upgrade in HA mode by running the following command:  
```
systemctl disable ufm-enterprise.service
```
  
  **Keywords:** SW Upgrade, HA Mode |
| 336 116 0 | **Description:** Upgrading UFM Enterprise Appliance from versions 1.3.0, 1.2.0 and 1.1.0 results in cleanup of UFM historical telemetry database (due to schema change). This means that the new telemetry data will be stored based on the new schema.  
**Workaround:** To preserve the historical telemetry database data while upgrading from UFM Enterprise Appliance version 1.3.0, 1.2.0 and 1.1.0, perform the upgrade in two phases. First, upgrade to UFM Enterprise Appliance v1.2.0, and then upgrade to the latest UFM version (UFM v1.3.0 or newer). It is important to note that the upgrade process may take longer depending on the size of the historical telemetry database.  
**Keywords:** UFM Historical Telemetry Database, Cleanup, Upgrade |
| 334 632 1 | **Description:** In some cases, when multiport SM is configured in UFM, a failover to the secondary node might be triggered instead of failover to the local available port  
**Workaround:** N/A  
**Keywords:** Multiport SM, Failover, Secondary port |
| N/A | **Description:** Enabling a port for a managed switch fails in case that port is not disabled in a persistent way (this may occur in ports that were disabled in previous versions of UFM Enterprise Appliance v1.3.0)  
**Workaround:** Set "persistent_port_operation=false" in `gv.cfg` to use non-persistent (legacy) disabling or enabling of the port. UFM restart is required.  
**Keywords:** Disable, Enable, Port, Persistent |
| 334 632 1 | **Description:** Failover to another port (multi-port SM) will not work as expected in case UFM was deployed as a docker container  
**Workaround:** Failover to another port (multi-port SM) works properly on UFM Bare-metal deployments  
**Keywords:** Failover to another port, Multi-port SM |
| 348 587 | **Description:** Replacement of defected nodes in the HA cluster does not work when PCS version is 0.9.x  
**Workaround:** N/A  
**Keywords:** Defected Node, HA Cluster, pcs version |
| 333 676 9 | **Description:** UFM-HA: If the back-to-back interface is disabled or disconnected, the HA cluster will enter a split-brain state, and the "ufm_ha_cluster status" command will stop functioning properly.  
**Workaround:** To resolve the issue:  
1. Connect or enable the back-to-back interface  
2. Run  
```
pcs cluster start --all
```
3. Follow instructions in Split-Brain Recovery in HA Installation  
**Keywords:** HA, Back-to-back Interface |
<table>
<thead>
<tr>
<th>Ref #</th>
<th>Issue</th>
</tr>
</thead>
</table>
| N/A   | **Description:** Running UFM software with external UFM-SM is no longer supported  
**Workaround:** N/A  
**Keywords:** External UFM-SM |
# 6 Introduction

This manual is intended for system administrators responsible for the installation, configuration, management and maintenance of the software and hardware of UFM Enterprise Appliance. NVIDIA® UFM® Enterprise Appliance is a powerful platform for managing InfiniBand scale-out computing environments.

## 6.1 Key Features

UFM provides a central management console, including the following main features:

- Pluggable platform for advanced functionality and third-party plugins
- Fabric dashboard including congestion detection and analysis
- Advanced real-time health and performance monitoring
- Fabric health reports
- Threshold-based alerts
- Fabric segmentation/isolation
- Quality of Service (QoS)
- Routing optimizations
- Central device management
- Task automation
- Logging
- High availability
- Daily Report: Statistical information of the fabric during the last 24 hours
- Event management
- Client certificate authentication
- Chassis health monitoring
7 Getting Started

The procedures described on this section assume that you have already installed and powered on your UFM Enterprise appliance according to the instructions in the Hardware Installation Guide.

- Obtaining the License
- Activating the License
- Configuring the Appliance for the First Time
- Starting UFM

7.1 Obtaining the License

UFM Enterprise Appliance is licensed per managed servers according to the UFM license agreement. When you purchase UFM Enterprise Appliance, you will receive an email with instructions on obtaining your product license. A valid license is a prerequisite for the installation and operation of UFM Enterprise Appliance.

UFM licenses are per managed node and are aggregative. If you install an additional license, the system adds the previous node number and the new node number and manages the sum of the nodes. For example, if you install a license for 10 managed nodes and an additional license for 15 nodes, UFM will be licensed for up to 25 managed nodes.

To obtain the license:

1. Go to NVIDIA's Licensing and Download Portal and log in as specified in the licensing email you received.
   - If you did not receive your NVIDIA Licensing and Download Portal login information, contact your product reseller.
2. If you purchased UFM directly from NVIDIA and you did not receive the login information, contact enterprisesupport@nvidia.com. Click on the Network Entitlements tab. You'll see a list with the serial licenses of all your software products and software product license information and status.

   ![Image of Network Entitlements tab](image)

   3. Select the license you want to activate and click on the “Actions” button.
   4. In the MAC Address field, enter the MAC address of the delegated license-registered host. If applicable, in the HA MAC Address field, enter your High Availability (HA) server MAC address. If you have more than one NIC installed on a UFM Server, use any of the MAC...
5. Click on Generate License File to create the license key file for the software.
6. Click on Download License File and save it on your local computer.

If you replace your NIC or UFM server, repeat the process of generating the license to set new MAC addresses. You can only regenerate a license two times. To regenerate the license after that, contact NVIDIA Sales Administration at enterprisesupport@nvidia.com.

7.2 Activating the License

Before starting the UFM software, copy your license file downloaded from NVIDIA’s Licensing and Download Portal to the /opt/ufm/files/licenses directory.

We recommend that you back up the license file.

Your software is now activated.

⚠️ In a High Availability configuration, the license files are replicated to the standby machine automatically.

7.3 Configuring the Appliance for the First Time

The diagram below describes the connectivity scheme of the UFM High-Availability cluster.
The following are instructions on how to configure the management and fabric (InfiniBand) interfaces in the UFM cluster.

### 7.3.1 Configuring the Management Interface

The NVIDIA UFM Enterprise Appliance has multiple Ethernet management interfaces. The primary management interface is eno8303. The MAC address for eno8303 is available on the pull tab and can be configured in the DHCP server. To use the remote management controller with DHCP, the free-range IP allocation must be enabled on the DHCP server.

The appliance supports a direct connection via a serial port.

For instructions on how to configure the management interface, please refer to Configuring the Appliance.

### 7.3.2 Configuring the Back-to-Back Interface

This interface should be used as the primary interface when configuring HA.
When operating in HA configuration, directly connect (back-to-back - without a management switch in the middle) the Master node to the Standby node. To do so, utilize the Ethernet management interface eno8403, as shown in the above diagram.

For your convenience, you may use the CLI command `interface` to set a static IP address for eno8403.

Example:

```
interface eno8403 ip address 11.0.0.11 /24
```

### 7.3.3 Configuring the Fabric Interface

As of UFM Enterprise Appliance v1.3.0 (UFM Enterprise v6.12.0), configuring the fabric interface is optional.

The NVIDIA UFM Enterprise Appliance has multiple InfiniBand interfaces. The primary interface is ib0.

Configure a static IPoIB with Network service (create the file `/etc/network/interfaces.d/ifcfg-ib0` and run ifup ib0).

Example of `ifcfg-ib0` file definition:

```
auto ib0
iface ib0 inet static
address 10.0.0.12
netmask 255.255.255.0
broadcast 10.0.0.255
```

For your convenience, you may use the CLI command `interface` to set a static IP address for ib0.

Example:

```
interface ib0 ip address 192.168.1.11 /24
```

For more details on how to configure the UFM Enterprise, please refer to UFM Enterprise Initial Configuration.

### 7.4 Starting UFM

#### 7.4.1 Starting UFM Procedure

1. Start the UFM Enterprise service. Run:

   ```
   # systemctl start ufm-enterprise.service
   ```

2. Wait 1 minute for the service to come up.

3. Ensure the service health. Run:

   ```
   # ufm_enterprise_sanity.sh
   Checking Service...
   ```
7.4.2 Logging Into UFM Web UI

To open UFM WEB UI, open the following URL in your browser: https://[SERVER_IP]/ufm/ and type the default credentials.
8 High Availability

UFM HA supports High-Availability on the host level for UFM Enterprise appliances. The solution is based on a pacemaker to monitor services, and on DRBD to sync file-system states.

The diagram below describes the connectivity scheme of the UFM High-Availability cluster.

8.1 High-Availability Configuration

UFM HA should be configured on two appliances, master and standby.

⚠️ High-availability should be configured first on the standby node. When completed, it should be configured on the master node.

Command Usage:

```
# ufm_ha_cluster config --help
Usage: ufm_ha_cluster config [options]
```

The config command configures ha add-on for ufm server.

Options:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-r</td>
<td>--role &lt;node role&gt;</td>
</tr>
<tr>
<td>-e</td>
<td>--peer-primary-ip &lt;ip address&gt;</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>-l</td>
<td>--local-primary-ip &lt;ip address&gt;</td>
</tr>
<tr>
<td>-E</td>
<td>--peer-secondary-ip &lt;ip address&gt;</td>
</tr>
<tr>
<td>-L</td>
<td>--local-secondary-ip &lt;ip address&gt;</td>
</tr>
</tbody>
</table>
| -i | --virtual-ip <virtual-ip> OR -N | --no-vip Cluster virtual IP OR  
|     | Do not create virtual IP resource - Mutual exclusive with virtual-IP option  |
|     | One of the two options is mandatory                                         |
| -p | --hacluster-pwd <pwd>          | hacluster user password - Mandatory                                          |
| -f | --ha-config-file <file path>   | HA configuration file - The default is ufm-ha.conf                           |

8.1.1 Configure HA with VIP (Virtual IP)

1. [On Standby Server] Run the following command to configure Standby Server:

   ufm_ha_cluster config -r standby \
   --local-primary-ip <local back-to-back IP> \
   --peer-primary-ip <peer back-to-back IP> \
   --local-secondary-ip <local management IP> \
   --peer-secondary-ip <peer management IP> \
   --virtual-ip <virtual management IP used for accessing the master node> \
   --hacluster-pwd <password>

2. [On Master Server] Run the following command to configure Master Server:

   ufm_ha_cluster config -r master \
   --local-primary-ip <local back-to-back IP> \
   --peer-primary-ip <peer back-to-back IP> \
   --local-secondary-ip <local management IP> \
   --peer-secondary-ip <peer management IP> \
   --virtual-ip <virtual management IP used for accessing the master node> \
   --hacluster-pwd <password>

Alternatively, you can run the CLI command ufm ha configure.

You must wait until after configuration for DRBD sync to finish before starting the UFM cluster. To check the DRBD sync status, run:

   ufm_ha_cluster status

8.1.2 Configure HA without VIP (on a Dual Subnet)

Please change the variables in the commands below based on your setup.

1. [On Standby Server] Run the following command to configure Standby Server:

   ufm_ha_cluster config -r standby \
   --local-primary-ip <local back-to-back IP> \

2. [On Master Server] Run the following command to configure Master Server:

```
ufm_ha_cluster config -r master \\
--local-primary-ip <local back-to-back IP> \\
--peer-primary-ip <peer back-to-back IP> \\
--local-secondary-ip <local management IP> \\
--peer-secondary-ip <peer management IP> \\
--hacluster-pwd <password> \\
--no-vip
```

Alternatively, you can run the CLI command `ufm ha configure dual-subnet`.

⚠️ You must wait until after configuration for DRBD sync to finish before starting the UFM cluster. To check the DRBD sync status, run:

```
ufm_ha_cluster status
```

### 8.2 High-Availability Cluster Management

- To manage the HA cluster, use the `ufm_ha_cluster` tool.

**ufm_ha_cluster Usage**

```
# ufm_ha_cluster --help

Usage: ufm_ha_cluster [-h|--help] <command> [options]
This script manages UFM HA cluster.
```

Options:

```
OPTIONS:
- [h|--help]                        Show this message

COMMANDS:
version           HA cluster version
config            Configure HA cluster
cleanup           Remove HA configurations
status            Check HA cluster status
failover          Master node failover
takeover          Standby node takeover
start             Start HA services
stop              Stop HA services
detach            Detach the standby from cluster
attach            Attach a new standby to cluster
enable-maintain   Enable maintenance to cluster
disable-maintain  Disable maintenance to cluster
reset             Reset DRBD connectivity from split-brain
is-master         Check if the current node is a master
is-running        Check if UFM services are running
is-ha             Check if running in HA mode
```

- For further information on each command, run:

```
ufm_ha_cluster <command> --help
```

- To check UFM HA cluster status, run:

```
ufm_ha_cluster status
```

- To start the UFM HA cluster, run:
To stop the UFM HA cluster, run:

ufm_ha_cluster stop

Execute the failover command on the master appliance to become the standby appliance. Run:

ufm_ha_cluster failover

Execute the takeover command on the standby machine to become the master appliance. Run:

ufm_ha_cluster takeover

For additional information on configuring UFM HA, please refer to Installing UFM Server Software for High Availability. Since the UFM HA package and related components (i.e. pacemaker and DRBD) are already deployed, follow instructions from step 6 (Configure HA from the main server) and onward.
9 Authentication, Authorization and Accounting (AAA)

AAA is a term describing a framework for intelligently controlling access to computer resources, enforcing policies, auditing usage, and providing the information necessary to bill for services. These combined processes are considered important for effective network management and security. The AAA feature allows you to verify the identity of, grant access to, and track the actions of users managing the system. The UFM Enterprise Appliance switch supports Terminal Access Controller Access Control device Plus (TACACS+) protocol.

- **Authentication** - authentication provides the initial method of identifying each individual user, typically by entering a valid username and password before access is granted. The AAA server compares a user's authentication credentials with the user credentials stored in a database. If the credentials match, the user is granted access to the network or devices. If the credentials do not match, authentication fails and network access is denied.
- **Authorization** - following the authentication, a user must gain authorization for performing certain tasks. After logging into a system, for instance, the user may try to issue commands. The authorization process determines whether the user has the authority to issue such commands. Simply put, authorization is the process of enforcing policies: determining what types or qualities of activities, resources, or services a user is permitted. Usually, authorization occurs within the context of authentication. Once you have authenticated a user, they may be authorized for different types of access or activity.
- **Accounting** - the last level is accounting, which measures the resources a user consumes during access. This includes the amount of system time or the amount of data a user has sent and/or received during a session. Accounting is carried out by logging of session statistics and usage information, and is used for authorization control, billing, trend analysis, resource utilization, and capacity planning activities.

Authentication, authorization, and accounting services are often provided by a dedicated AAA server, a program that performs these functions.

9.1 TACACS+

TACACS (Terminal Access Controller Access Control System), widely used in network environments, is a client/server protocol that enables remote access servers to communicate with a central server to authenticate dial-in users and authorize their access to the requested system or service. TACACS implements the TACACS Client and provides the AAA (Authentication, Authorization and Accounting) functionalities.

TACACS is used for several reasons:

- Facilitates centralized user administration
- Uses TCP for transport to ensure reliable delivery
- Supports inbound authentication, outbound authentication and change password request for the authentication service
- Provides some level of protection against an active attacker

For the list of TACACS+ CLI commands, please refer to TACACS+.
9.2 Configuring TACACS+ and Performing AAA

⚠ Note: TACACS+ should be configured on two appliances, master and standby.

9.2.1 Configuring TACACS+ on UFM Servers

- Add TACACS server with a key. Run:

  ```
  ufmpl (config) # tacacs-server host 10.209.102.86 key testkey123
  ```

- [Optional] Review the added server configuration. Run:

  ```
  ufmpl (config) # show tacacs
  ```

  Example:

  ```
  swx-ufm3-06 (config) # show tacacs
  TACACS+ defaults:
  Timeout      : 1
  TACACS+ servers:
  10.209.102.86:49: Key : *********
  ```

- Enable TACACS authentication. Run:

  ```
  ufmpl (config) # aaa authentication login default local tacacs+
  ```

- [Optional] Review the Authentication and Accounting methods. Run:

  ```
  ufmpl (config) # show aaa
  ```

  Example:

  ```
  swx-ufm3-06 (config) # show aaa
  AAA authorization:
  Map Order: remote-only
  Authentication method(s):
  local tacacs+
  Accounting method(s):
  tacacs+
  ```

9.2.2 Adding TACACS Users on the Server Side

⚠ The predefined "root" and "admin" users are local users, therefore, they can not be defined as remote TACACS+ users.

A simple configuration file is provided below:

```
accounting file = /var/log/tac_plus.acct
key = testkey123
user = testuser1 {
```
global = cleartext testpass1
service = exec { priv-lvl=15 }
cmd = help { permit .* }
cmd = enable { permit .* }
cmd = configure { permit terminal }
cmd = show {
    permit ufm.*
    deny .* }
}
user = testuser2 {
    global = cleartext testpass2
    service = exec { priv-lvl=15 }
cmd = help { permit .* }
cmd = enable { permit .* }
cmd = configure { permit terminal }
cmd = ufm {
    permit "logging .*"
    deny .* }
cmd = no {
    permit "ufm logging .*"
    deny .* }
cmd = show { permit .* }
}
user = testuser3 {
    default service = permit
    global = cleartext testpass3
    service = exec { priv-lvl=15 }
}

From the above configuration example

- There are 3 TACACS users named testuser1, testuser2 and testuser3 with respective passwords of testuser1, testuser2 and testuser3.
- The secret of the TACACS server is testkey123, assuming that this server is running at an IP address of 10.209.102.86. This information is used to register a TACACS server using the tacacs-host command in UFM CLI.
- testuser1 can only execute the show ufm commands. Executing any other command is not allowed.
- testuser2 can execute all show commands and can configure only the [no] ufm logging commands.
- testuser3 can execute all commands since the default service is permit.
10 Command Line Interface (CLI)

UFM Enterprise Appliance is equipped with an industry-standard command line interface (CLI). The CLI is accessed through SSH session or directly through the console port, following login with username (admin) and credentials (admin). Following the initial login, the user is asked to set a new password.

This section explains how to use the CLI of UFM Enterprise Appliance.

⚠️ Ignored Commands

To support backward compatibility with automation for initial configuration, the following commands are being ignored (they do not output error):

1. `cli default auto-logout 1`
2. `no cli default paging enable`
3. `no cli default progress enable`
4. `no cli default prompt confirm-reload`
5. `no telnet-server enable`
6. `no interface <ifname> dhcp`
7. `no interface <ifname> ipv6 enable`
8. `no interface <ifname> shutdown`
9. `write memory`

10.1 CLI Modes

The CLI has the following modes, and each mode makes available a different set of commands for execution. The different CLI configuration modes are:

<table>
<thead>
<tr>
<th>Mode/Context</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>standard</td>
<td>When the CLI is launched, it begins in Standard mode. This is the most restrictive mode and only has commands to query a restricted set of state information. Users cannot take any actions that directly affect the system, nor can they change any configuration.</td>
</tr>
<tr>
<td>enable</td>
<td>The &quot;enable&quot; command moves the user to Enable mode. This mode offers commands to view all state information and take actions like rebooting the system, but it does not allow any configuration to be changed. Its commands are a superset of those in Standard mode. To return to Standard mode, enter &quot;exit&quot;.</td>
</tr>
<tr>
<td>config</td>
<td>The &quot;configure terminal&quot; command moves the user from Enable mode to Config mode. This mode has a full unrestricted set of commands to view anything, take any action, or change any configuration. Its commands are a superset of those in Enable mode. To return to Enable mode, enter &quot;exit&quot;. Note that moving directly from/to Standard mode to/from Config mode is impossible.</td>
</tr>
<tr>
<td>config interface management</td>
<td>Configuration mode for management interfaces</td>
</tr>
</tbody>
</table>
10.2 Prompt and Response Conventions

The prompt always begins with the hostname of the system. What follows depends on what command mode the user is in. To demonstrate by example, assuming the machine name is "ufm-enterprise-app", the prompts for each of the modes are:

```
ufm-enterprise-app >          (Standard mode)
ufm-enterprise-app #          (Enable mode)
ufm-enterprise-app (config) # (Config mode)
```

The following session shows how to move between command modes:

```
ufm-enterprise-app >                        (You start in Standard mode)
ufm-enterprise-app > enable                 (Move to Enable mode)
ufm-enterprise-app #                        (You are in Enable mode)
ufm-enterprise-app # configure terminal     (Move to Config mode)
ufm-enterprise-app (config) #               (You are in Config mode)
ufm-enterprise-app (config) # exit          (Exit Config mode)
ufm-enterprise-app #                        (You are back in Enable mode)
ufm-enterprise-app # exit                   (Exit Enable mode)
ufm-enterprise-app >                        (You are back in Standard mode)
```

Commands entered do not print any response and simply show the command prompt after you press <Enter>.

10.3 Using "no" Command Form

Several config commands feature a "no" form whose purpose is to reset a parameter value to its inherited or default value, or to disable a configuration.

10.4 Getting Help

Enter “help” to view a description of the interactive help system. Note that the CLI supports command and/or parameter tab-completions. Thus, to learn which commands start with the letter “c”, type “c” and click twice on the Tab key to get the following:

```
ufm # u<tab>  
ufm username
ufm # u
```

This signifies that there are two commands that start with the letter “u”: "ufm", "username".

10.5 System Management

- **10.5.1 Network Interfaces**
  - **10.5.1.1 Interface**
    - **10.5.1.1.1 interface**
    - **10.5.1.1.2 show interfaces**
    - **10.5.1.1.3 ip address**
    - **10.5.1.1.4 ipv6 address**
  - **10.5.1.2 Hostname**
    - **10.5.1.2.1 hostname**
    - **10.5.1.2.2 ip name-server**
10.5.1 Network Interfaces

This section describes the commands that configure and monitor the network interface.
10.5.1.1 Interface

10.5.1.1.1 interface

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>eno8303</th>
<th>Management port 0 (out of band)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>eno8403</td>
<td>Management port 1 (out of band)</td>
</tr>
<tr>
<td></td>
<td>eno12399np0</td>
<td>Management port 2 (out of band)</td>
</tr>
<tr>
<td></td>
<td>eno12409np1</td>
<td>Management port 3 (out of band)</td>
</tr>
<tr>
<td>ib0</td>
<td>InfiniBand interface 0</td>
<td></td>
</tr>
<tr>
<td>ib1</td>
<td>InfiniBand interface 1</td>
<td></td>
</tr>
<tr>
<td>ib2</td>
<td>InfiniBand interface 2 (UFM 3.0 only)</td>
<td></td>
</tr>
<tr>
<td>ib3</td>
<td>InfiniBand interface 3 (UFM 3.0 only)</td>
<td></td>
</tr>
</tbody>
</table>

Default: N/A
Configuration Mode: config
History: 1.3.0
Example
ufmapl (config) # interface eno8303
ufmapl (config interface eno8303) #

Related Commands: N/A
Notes: N/A

10.5.1.1.2 show interfaces

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>eno8303</th>
<th>Management port 0 (out of band)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>eno8403</td>
<td>Management port 1 (out of band)</td>
</tr>
<tr>
<td></td>
<td>eno12399np0</td>
<td>Management port 2 (out of band)</td>
</tr>
<tr>
<td></td>
<td>eno12409np1</td>
<td>Management port 3 (out of band)</td>
</tr>
<tr>
<td>ib0</td>
<td>InfiniBand interface 0</td>
<td></td>
</tr>
<tr>
<td>ib1</td>
<td>InfiniBand interface 1</td>
<td></td>
</tr>
<tr>
<td>ib2</td>
<td>InfiniBand interface 2 (UFM 3.0 only)</td>
<td></td>
</tr>
<tr>
<td>ib3</td>
<td>InfiniBand interface 3 (UFM 3.0 only)</td>
<td></td>
</tr>
</tbody>
</table>

Default: N/A
Configuration Mode: enable
History: 1.6.0 Updated example and added command syntax
### Example

```bash
swx-ufm3-06 # show interfaces eno8303
Interface eno8303 status:
  Comment           : 
  Admin up          : yes
  Link up           : yes
  DHCP running      : yes
  IP address        : 10.209.36.101
  Netmask           : 255.255.252.0
  IPv6 enabled      : yes
  Autoconf enabled  : N/A
  Autoconf route    : N/A
  Autoconf privacy  : N/A
  DHCPv6 running    : yes
  IPv6 addresses    : 2
  IPv6 address:
    fcfc:fcfc:209:36:b27b:25ff:fee9:30c8/64
    fe80::b27b:25ff:fee9:30c8/64
  Speed             : 1000Mb/s (auto)
  Duplex            : Full (auto)
  Interface type    : ethernet
  Interface source  : physical
  MTU               : 1500
  HW address        : b0:7b:25:e9:30:c8

Rx:
  6109552397 bytes
  45457113 packets
  36881549 multicast packets
  295 discards
  0 errors
  0 overruns
  0 frame

Tx:
  242521186 bytes
  1211397 packets
  0 discards
  0 errors
  N/A overruns
  0 carrier
  1211397 collisions
  1000 queue len
```

### Related Commands

```
interface <ifname> ip address <IP address> <netmask>
```

### Notes

10.5.1.1.3 ip address

```bash
ip address <IP address> <netmask>
```

Sets the IP address and netmask of this interface.

### Syntax Description

<table>
<thead>
<tr>
<th>IP address</th>
<th>IPv4 address</th>
</tr>
</thead>
<tbody>
<tr>
<td>netmask</td>
<td>Subnet mask of IP address</td>
</tr>
</tbody>
</table>

### Default

N/A

### Configuration Mode

config interface

### History

1.3.0

### Example

```
ufmap1 (config interface eno8303) # ip address 10.10.10.10 255.255.255.0
```

### Related Commands

interface

### Notes

The command sequence is important. The `ip address` command should be used first during automation since it clears both default-gateway and name-server settings.
### 10.5.1.1.4 IPv6 Address

**Syntax Description**

IPv6 address <IPv6 address>/<netmask>

Configures static IPv6 address and netmask to this interface, static option is possible.

<table>
<thead>
<tr>
<th>Default</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Mode</td>
<td>config interface management</td>
</tr>
<tr>
<td>History</td>
<td>1.3.0</td>
</tr>
</tbody>
</table>

**Example**

```
ufmapl (config interface eno8303)# ipv6 address fe80::202:c9ff:fe5e:a5d8/64
```

**Related Commands**

N/A

**Notes**

N/A

---

### 10.5.1.2 Hostname

#### 10.5.1.2.1 Hostname

**Syntax Description**

hostname

Sets a static system hostname.

<table>
<thead>
<tr>
<th>Default</th>
<th>No server name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.3.0</td>
</tr>
</tbody>
</table>

**Example**

```
ufmapl(config) # hostname ufmapl-hostname
```

**Related Commands**

N/A

**Notes**

N/A

---

### 10.5.1.2.2 IP Name-Server

**Syntax Description**

`ip name-server <ipv4 address> [no ip name-server]`  
`no ip name-server`

Configures DNS servers to be used. The no form of the command clears the name server.

<table>
<thead>
<tr>
<th>Default</th>
<th>No server name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
</tbody>
</table>

---

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History

1.4.2 Updated command description and added the no form of the command
1.3.0 First release

Example

ufmapl (config)# ip name-server 9.9.9.9

Related Commands N/A

Notes

The command sequence is important. The `ip name-server` command should be used during automation, after running the `ip address` and the `ip default-gateway` commands.

### 10.5.1.2.3 `{ip | ipv6} host`

```
{ip | ipv6} host <hostname> <ip-address>
no {ip | ipv6} host <hostname> <ip-address>
```

Sets the static domain name. The no form of the command clears the domain name.

**Syntax Description**

- **hostname** String
- **ip-address** IPv4 or IPv6 address

**Default** N/A

**Configuration Mode** config

**History** 1.5.0

**Example**

```
ufmapl (config)# ip host test-host 1.2.3.4
ufmapl (config)# ipv6 host my-ipv6-host 2001::8f9
```

**Related Commands** show hosts

**Notes**

### 10.5.1.2.4 show hosts

```
show hosts
```

Displays hostname, DNS configuration, and static host mappings.

**Syntax Description** N/A

**Default** N/A

**Configuration Mode** Any configuration mode

**History** 1.4.0
Example

```
Example
ufmap1 (config) # show hosts
Hostname: aux-ufm3-02
Name servers:
10.211.0.124 (on eno8303)
10.211.0.121 (on eno8303)
10.7.77.135 (on eno8303)
Domain names:
str.labs.mlnx (on eno8303)
Static IPv4 host mappings:
127.0.0.1 --> localhost
Static IPv6 host mappings:
::1 --> ip6-localhost
::1 --> ip6-loopback
ff02::1 --> ip6-allnodes
ff02::2 --> ip6-allrouters
```

Related Commands N/A
Noes N/A

10.5.1.3 Routing

10.5.1.3.1 ip default-gateway

```
ip default-gateway <address>
no ip default-gateway <address>
```

Configures a static default route. The no form of the command removes the static route.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>gateway IPv4 or IPv6 address</td>
</tr>
</tbody>
</table>

Default N/A

Configuration Mode config

History

- 1.4.2 Updated syntax description and added a no form of the command
- 1.3.0 First release

Example

```
Example
ufmap1 (config)# ip default-gateway 10.209.36.1
```

Related Commands N/A

Notes

The command sequence is important. The `ip default-gateway` command should be used during automation, **after** running the `ip address` command as it requires a static IP setting.

10.5.1.3.2 ipv6 default-gateway

```
ipv6 default-gateway <address>
no ipv6 default-gateway <address>
```

Configures a static default route. The no form of the command removes the static route.

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>gateway IPv6 address</td>
</tr>
</tbody>
</table>


Default N/A
Configuration Mode config
History 1.4.2
Example `ufmapl (config)# ip default-gateway ::1`
Related Commands N/A
Notes The command sequence is important. The `ip default-gateway` command should be used during automation, after running the `ip address` command as it requires a static IP setting.

### 10.5.1.3.3 show `{ip | ipv6}` route

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>static</th>
<th>Filters the table with the static route entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # show ip route</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td>default 0.0.0.0 10.209.255.252.0 0.0.0.0 eno8303 dhcp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interface 10.209.255.255 0.0.0.0 eno8303 dhcp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interface 169.254.1.0 0.0.0.0 idrac</td>
<td></td>
</tr>
<tr>
<td></td>
<td>interface 172.17.0.0 0.0.0.0 docker0</td>
<td></td>
</tr>
<tr>
<td>Related Commands</td>
<td>`{ip</td>
<td>ipv6}` route</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 10.5.1.3.4 show `{ip | ipv6}` default-gateway

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>static</th>
<th>Displays the static configuration of the default gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # show ip default-gateway</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Active default gateways: 10.209.255.255 (interface: eno8303)</td>
<td></td>
</tr>
<tr>
<td>Related Commands</td>
<td>`{ip</td>
<td>ipv6}` default-gateway</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 10.5.2 NTP

#### 10.5.2.1 ntp enable

<table>
<thead>
<tr>
<th>ntp enable</th>
<th>Enables NTP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax Description</td>
<td>N/A</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.3.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

#### 10.5.2.2 ntp server

<table>
<thead>
<tr>
<th>ntp server &lt;address&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>no ntp server &lt;address&gt;</td>
</tr>
<tr>
<td>Configures an NTP server</td>
</tr>
<tr>
<td>The no form of the command removes NTP server</td>
</tr>
<tr>
<td>Syntax Description</td>
</tr>
<tr>
<td>Default</td>
</tr>
<tr>
<td>Configuration Mode</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>1.3.0</td>
</tr>
<tr>
<td>Example</td>
</tr>
</tbody>
</table>

#### 10.5.2.3 ntp peer

<table>
<thead>
<tr>
<th>ntp peer &lt;address&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>no ntp peer &lt;address&gt;</td>
</tr>
<tr>
<td>Configures an NTP peer</td>
</tr>
<tr>
<td>The no form of the command removes the NTP peer</td>
</tr>
<tr>
<td>Syntax Description</td>
</tr>
</tbody>
</table>
### 10.5.3 Software Management

#### 10.5.3.1 image fetch

**Syntax**
```
image fetch <URL>
```

Downloads a system image from a remote host.

**Syntax Description**
- **URL**
  - HTTPS, SCP and SFTP are supported
  - Example: `scp://username[:password]@hostname/path/filename`

**Default**
N/A

**Configuration Mode**
config

**History**
1.5.0

**Example**
```
ufmapi (config) # image fetch scp://root:123456@192.168.10.125/tmp/
ufm-appliance-1.5.0-6-omu.tar
```

**Related Commands**
- `show images`

**Notes**
- The image format must be as follows: `ufm-appliance-<version>-omu.tar`
- Please delete the previously available image, prior to fetching the new image
- See section In-Service Upgrade at [UFM Enterprise Appliance Upgrade](#)

#### 10.5.3.2 image install

**Syntax**
```
image install <image-name>
```

Installs an image file.

**Syntax Description**
- **image name**
  - Specifies the image name

**Default**
N/A

**Configuration Mode**
config

**History**
1.5.0
Example

ufmapl (config) # image install ufm-appliance-1.5.0-6-omu.tar

Verifying image...
Extracting image...
Installing image...
20230809-07_24_52: UFM-OS UPGRADE to version 23.07.18-3 STARTED
20230809-07_24_52: UFM-OS UPGRADE [STARTED ]
WARNING!!!
/tmp/ufm_os_upgrade_ml2ah98f/ufm-appliance-1.5.0-4-omu/ufm-os-upgrade.sh will require a restart upon completion.
OFED drivers, kernel and kernel models will not work properly until the server is rebooted!!!

In case of a change to the secureboot certificate , a message will be prompted to the screen to indicate that an action is needed when restarting.

20230809-07_24_52: Highavailability is detected, node role is: stand-by
20230809-07_24_53: Check if ufm-enterprise.service is running
20230809-07_24_53: ufm-enterprise.service is not running, continue with the upgrade
20230809-07_24_53: Extracting ISO...
20230809-07_24_53: CERTIFICATE-VALIDATION [PASSED ]
20230809-07_24_54: HA-STANDBY-MODE-ACTIVATE [PASSED ]
20230809-07_24_54: Backup MA cluster config to /var/tmp/ufm_os_upgrade_23_07_18-3/pcs_config_backup_23.07.18-3.tar.bz2
20230809-07_24_55: HA-PREPARATION [PASSED ]
20230809-07_24_55: A newer kernel version is detected: 4.15.0-213-generic, installing
20230809-07_25_22: KERNEL-UPGRADE [PASSED ]
20230809-07_25_22: Preparing MOFED repo
20230809-07_25_24: MOFED-PREPARATION [PASSED ]
20230809-07_25_24: Upgrading UFM-APPLIANCE SW
20230809-07_27_01: Upgrading UFM-APPLIANCE SW finished
20230809-07_27_01: APPLIANCE-UPGRADE [PASSED ]
20230809-07_27_01: HA-PACKAGES-UPGRADE [PASSED ]
20230809-07_27_01: Upgrading telemetry packages... [PASSED ]
20230809-07_27_01: TELEMETRY-REQUIREMENTS-UPGRADE [PASSED ]
20230809-07_27_06: updating firmware
20230809-07_27_19: FW-UPGRADE [PASSED ]
20230809-07_27_19: Upgrading packages...
20230809-07_28_15: PACKAGES-UPGRADE [PASSED ]
20230809-07_28_15: Upgrading collection tools...
20230809-07_28_15: Updating FW rules
20230809-07_28_22: UFMCLI tar is copied to /opt/ufm-os-firstboot to run on next-boot.
20230809-07_28_22: UFMCLI-PREPARATION [PASSED ]
20230809-07_28_22: HA-STANDBY-MODE-DERACTIVATE [PASSED ]
20230809-07_28_22: UFM-OS-UPGRADE [PASSED ]
20230809-07_28_22: UFM-OS-UPGRADE finished, kernel modules, OFED and new kernel wont function properly until reboot is performed.
20230809-07_28_22: Please reboot the server.

Please check log file for more details: /var/log/ufm_os_upgrade_23.07.18-3.log
Upgrade steps status information: /var/log/ufm_os_upgrade_23.07.18-3_status.log.

Related Commands

show images

Notes

- The image should be installed on the standby node only. Installation on the master node is not allowed.
- Once the installation is complete, perform system reboot using the command:

  reload

10.5.3.3  image delete

<table>
<thead>
<tr>
<th>image delete &lt;image-name&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deletes the specified image file from the hard drive.</td>
</tr>
</tbody>
</table>

Syntax Description

<table>
<thead>
<tr>
<th>image-name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies the image name</td>
</tr>
</tbody>
</table>

Default

| N/A |

Configuration Mode

| config |
10.5.3.4 show images

show image
Displays information about the system images and boot parameters.

Syntax Description N/A
Default N/A
Configuration Mode Any configuration mode
History 1.5.0

Example

ufmapl (config) # show images
Installed images:
Partition 1:
  version: ufm_appliance UFMAPL_1.4.3.1_UFM_6.13.2.5 2023-06-13 08:42:27 x86_64
  Images available to be installed:
  1: Image : ufm-appliance-1.5.0-6-omu.tar

Related Commands image delete
image fetch
image install

Notes

10.5.4 User Management and AAA

10.5.4.1 User Accounts

10.5.4.1.1 username

username root disable
no username root disable
Disable logging into root account
The no form of the command reenable login into root account

Syntax Description N/A
Default N/A
Configuration Mode config
History 1.4.1

Example

ufmapl (config) # username root disable
10.5.4.1.2  username root password

username root password <password>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>password</th>
<th>Specifies a password for the user in string form.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.8.0</td>
<td>Updated command name</td>
</tr>
<tr>
<td></td>
<td>1.4.2</td>
<td>First release</td>
</tr>
<tr>
<td>Example</td>
<td>ufmapl (config) # username root password 123456</td>
<td></td>
</tr>
</tbody>
</table>

Related Commands  N/A
Notes          N/A

10.5.4.2  AAA Methods

10.5.4.2.1  aaa authentication login default

aaa authentication login default <auth method> [ <auth method> ]
Sets a sequence of authentication methods. Up to two methods can be configured.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>auth-method</th>
<th>Possible values:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• local</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• tacacs+</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
</tbody>
</table>

Example
ufmapl (config) # aaa authentication login default local tacacs+

Related Commands  show aaa
Notes          Setting tacacs+ as one of the authentication methods enables tacacs. Setting no tacacs+ and only local in the authentication methods disables tacacs.
10.5.4.2.2  show aaa

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
</tbody>
</table>

Example

```
ufmapl [ mgmt-sa ] (config) # show aaa
AAA authorization:
    Map Order: remote-only
    Authentication method(s):
        local
tacacs+
    Accounting method(s):
        tacacs+
```

Related Commands

- `aaa authentication login default`

Notes

10.5.4.3  TACACS+

10.5.4.3.1  tacacs-server

```
tacacs-server [key <secret> | timeout <seconds>]
no tacacs-server [key | timeout]
```

Sets global TACACS+ server attributes.
The no form of the command resets the attributes to default values.

Syntax Description

- `key`  Set a secret key (shared hidden text string) known to the system and to the TACACS+ server
- `timeout`  Timeout in seconds (1-60)

Default

- `1 second`

Configuration Mode

- `config`

History

- `1.6.0`

Example

```
ufmapl (config) # tacacs-server key testkey
```

Related Commands

- `show tacacs`
- `tacacs-server host`

Notes

Each TACACS+ server can override the global secret parameter using the command “tacacs-server host”
10.5.4.3.2 tacacs-server host

```
tacacs-server host <ip-address> {auth-port <port> | key <secret>}
no tacacs-server host <ip-address> {auth-port <port>}
```

Configures TACACS+ server attributes.
The no form of the command removes the TACACS+ server.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip-address</td>
<td>TACACS+ server IP address</td>
</tr>
<tr>
<td>auth-port</td>
<td>TACACS+ server UDP port number</td>
</tr>
<tr>
<td>key</td>
<td>Set a secret key (shared hidden text string) known to the system and to the TACACS+ server</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Default</th>
<th>Default TCP port is 49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufmapi (config) # tacacs-server key testkey</td>
</tr>
</tbody>
</table>

Related Commands
- show tacacs
- tacacs-server

Notes
- TACACS+ servers are tried in the order they are configured
- If the user does not specify a parameter for this configured TACACS+ server, the configuration will be taken from the global TACACS+ server configuration. Refer to "tacacs-server" command.

10.5.4.3.3 show tacacs

```
show tacacs
```

Displays TACACS+ configurations.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
</tbody>
</table>
| Example             | ufmapi (config) # show tacacs
|                     | timeout : 1 |
|                     | TACACS+ servers: |
|                     | 10.209.16.156:49; |
|                     | Key : ******** |
|                     | 1.2.3.4:49; |
|                     | Key : ******** |

Related Commands
- tacacs-server
- tacacs-server host

Notes
### 10.5.5 Chassis Management

#### 10.5.5.1 show resources

<table>
<thead>
<tr>
<th>show resources</th>
<th>Displays system resources.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax Description</td>
<td>N/A</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Any configuration mode</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
</tbody>
</table>

#### Example

```plaintext
ufmapl (config) # show resources
Total      Used      Free
Physical 65460 MB 2719 MB 60741 MB
Swap       16252 MB  0 MB   16252 MB
Number of CPUs: 64
CPU load averages: 0.16 / 0.08 / 0.04

CPU 1
  Utilization: 0%
  Peak Utilization Last Hour: 0% at 2023-11-05 09:45:01
  Avg. Utilization Last Hour: 0%

CPU 2
  Utilization: 5%
  Peak Utilization Last Hour: 19% at 2023-11-05 09:45:01
  Avg. Utilization Last Hour: 7%
...

CPU 64
  Utilization: 0%
  Peak Utilization Last Hour: 1% at 2023-11-05 09:45:01
  Avg. Utilization Last Hour: 1%
```

#### Related Commands

#### Notes

#### 10.5.5.2 show version

<table>
<thead>
<tr>
<th>show version</th>
<th>Displays version information for the currently running system image.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax Description</td>
<td>N/A</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Any configuration mode</td>
</tr>
<tr>
<td>History</td>
<td>1.8.0, Updated command output, added system serial number and a note</td>
</tr>
<tr>
<td>History</td>
<td>1.4.2, Updated command output</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0, First release</td>
</tr>
</tbody>
</table>
Example

```
ufmapl (config) # show version
Product name:        ufm_appliance
Product release:     UFMAPL_1.8.0.5_UFM_6.17.0.5
Build date:          2024-04-30 13:43:46
Version summary:     ufm_appliance UFMAPL_1.8.0.5_UFM_6.17.0.5 2024-04-30 13:43:46 x86_64
UFM OS:              24.04.18-3
UFM HA:              5.5.0-9
UFM CLI:             1.6.0-5
System serial num:   MT9876X12345
Number of CPUs:      64
System memory:       2674 MB used / 60049 MB free / 65400 MB total
Swap:                0 MB used / 16252 MB free / 16252 MB total
```

Related Commands
N/A

Notes
For devices with IDM v1.0.0, the serial number (SN) is generated based on ODM SN since the NVIDIA SN is not available.

10.5.5.3 show files system

```
Syntax Description
detail     Displays more detailed information on file-system

Default     N/A

Configuration Mode
Any configuration mode

History
1.6.0

Example

```
ufmapl (config) # show files system
Statistics for /var filesystem:
  Space Total      1649517 MB
  Space Used       23438 MB
  Space Free       1626079 MB
  Space Available  1542216 MB
  Space Percent Free 98%
  Inodes Percent Free 99%
Statistics for /opt/ufm/files filesystem:
  Space Total      150105 MB
  Space Used       294 MB
  Space Free       149811 MB
  Space Available  140116 MB
  Space Percent Free 99%
  Inodes Percent Free 99%
```

Related Commands
N/A

Notes

10.5.6 Operating System License

⚠️ The following CLI commands relate to the operating system license. For UFM License CLI commands, please refer to UFM License.

```
license install
license install <url>
Installs a UFM appliance OS license file from a remote host.
```
### Syntax Description

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>url</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>https, sftp are supported. Example: <code>sftp://username:password@hostname/path/filename</code></td>
</tr>
</tbody>
</table>

| Default          | N/A |

| Configuration Mode | config |

| History | 1.4.1 | First release |

| History | 1.4.3 | Added the first note in the "Notes" row. |

**Example**

```
ufmapl (config) # license install sftp://root:root/tmp/nvidia-ufm-os-restricted-3922146848058.lic
```

### Related Commands

- `license delete`
- `show license`

### Notes

- The license installation is used to access the SHELL in cases where the root account is disabled. For UFM Enterprise license installation, please refer to [Activating the UFM Enterprise License](#).
- The license format must be as follow: `*.lic`
- The license installation overrides the existing license, if present.
- To generate UFM appliance OS license, the management interface MAC address (eno8303) should be provided to NVIDIA by running the `show interfaces` command.

### 10.5.6.1 license delete

<table>
<thead>
<tr>
<th>license delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deletes a UFM appliance OS license file from the hard drive.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
</table>

| Default          | N/A |

| Configuration Mode | config |

| History | 1.4.1 |

**Example**

```
ufmapl (config) # license delete
```

### Related Commands

- `license install`
- `show license`

### Notes

- N/A

### 10.5.6.2 show license

<table>
<thead>
<tr>
<th>show license</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays UFM appliance OS license information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
</table>

| Default          | N/A |

| Configuration Mode | config |

| History | 1.4.1 |

54
Example

ufmapl (config) # show license
Customer ID: NVIDIA RND TESTING
SN: 194042963524002
Type: Subscription
Status: Valid
MAC address: b0:7b:25:e9:79:a2

Related Commands
license install
license delete

Notes
N/A

10.5.6.3 _shell

_shell
Runs a UNIX command shell such as bash. This shell command replaces the CLI; when the user exits the shell, they will be returned to the CLI.

Syntax Description
N/A

Default
N/A

Configuration Mode
enable

History
1.8.0 Added a note
1.4.1 First release

Example

ufmapl # _shell
root@ufmapl:~#

Related Commands
license install
license delete
show license

Notes
The OS license check is disabled by default. To enable it, set:

[security]:os-license = true in /opt/ufmcli/conf/ufmcli_cfg.yaml

10.5.7 Docker Container
docker load <image name>

docker load <image name>
Loads a docker image from a TAR archive.

Syntax Description
image name
Name of the TAR image to be loaded

Default
N/A

Configuration Mode
config

History
1.7.0

Example

ufm (config) # docker load ufm-plugin-ndt_1.1.1-17-docker.img.gz
### Related Commands
- `image fetch`
- `show docker images`
- `docker remove`

### Notes
The image should be downloaded into the UFM Enterprise appliance from a remote host.

#### 10.5.7.1 docker pull

**Syntax**
```
docker pull <image-name>[::<version>]
```
Pulls a docker image from a docker repository.

**Syntax Description**
- `image-name[::<version>]`
  - **Format:** Name:Version
  - If only “Name” is provided, “version” defaults to latest

**Default**
N/A

**Configuration Mode**
config

**History**
1.7.0

**Example**
```
ufm (config) # docker pull mellanox/ufm-plugin-ndt:1.1.1-17
```

**Related Commands**
- `show docker images`
- `docker remove`

**Notes**

#### docker remove image <image name> <image version>

**Syntax**
```
docker remove image <image-name> <image-version>
```
Removes an image from the Linux docker service.

**Syntax Description**
- `image-name`
  - Name of the image to be deleted
- `image-version`
  - Version of the image to be deleted

**Default**
N/A

**Configuration Mode**
config

**History**
1.7.0

**Example**
```
ufm (config) # docker remove image mellanox/ufm-plugin-ndt 1.1.1-17
```

**Related Commands**
- `show docker images`
- `docker remove`

**Notes**

#### 10.5.7.2 show docker images

**Syntax**
```
show docker images
```
Displays docker images.
Syntax Description | N/A
---|---
Default | N/A
Configuration Mode | enable
History | 1.7.0
Example

```plaintext
ufm (config) # show docker images
```

<table>
<thead>
<tr>
<th>Image</th>
<th>Version</th>
<th>Created</th>
<th>Size</th>
<th>Digest</th>
</tr>
</thead>
<tbody>
<tr>
<td>mellanox/ufm-plugin-ndt</td>
<td>1.1.1-17</td>
<td>2 months ago</td>
<td>1.59GB</td>
<td>sha256:89e613154dd3f0d99a54780926c338c2ed8b1ab85ac581e788eaf1223f3c831bae3</td>
</tr>
</tbody>
</table>

Related Commands
- show docker ps
- docker remove
- docker pull
- docker load

Notes

### 10.5.7.3 show docker ps

```
show docker ps
```

Displays docker containers.

Syntax Description | N/A
---|---
Default | N/A
Configuration Mode | enable
History | 1.7.0
Example

```plaintext
ufm (config) # show docker ps
```

<table>
<thead>
<tr>
<th>Container</th>
<th>Image:Version</th>
<th>Created</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm-plugin-ndt</td>
<td>mellanox/ufm-plugin-ndt</td>
<td>4 seconds ago</td>
<td>Up 1 seconds</td>
</tr>
</tbody>
</table>

Related Commands
- show docker images
- docker remove
- docker pull
- docker load

Notes

### 10.5.7.4 docker exec <container-name> <program-executable>

```
docker exec <container-name> <program-executable>
```

Executes a program within a running docker container.

Syntax Description
- **container-name**: Name of the running docker container
- **program-executable**: Linux command

Default | N/A
10.5.7.5 docker prune image

**docker prune image**

Removes all dangling docker prune images.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config docker</td>
</tr>
<tr>
<td>History</td>
<td>1.8.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufm (config) # docker prune image</td>
</tr>
</tbody>
</table>

**Related Commands**

- show docker images
- docker remove image

**Notes**
• 10.6.3.6 show files ufm-configuration

• 10.6.4 Data Management
  • 10.6.4.1 ufm data reset

• 10.6.5 Management Interface Monitoring
  • 10.6.5.1 ufm mgmt-interface monitor enable
  • 10.6.5.2 ufm mgmt-interface monitor interval
  • 10.6.5.3 ufm mgmt-interface
  • 10.6.5.4 show ufm mgmt-interface

• 10.6.6 UFM Logs
  • 10.6.6.1 show ufm logging
  • 10.6.6.2 ufm logging syslog enable
  • 10.6.6.3 ufm logging syslog
  • 10.6.6.4 ufm logging syslog ufm-log enable
  • 10.6.6.5 ufm logging syslog ufm-events enable
  • 10.6.6.6 ufm logging level

• 10.6.7 UFM Web Client
  • 10.6.7.1 ufm web-client mode
  • 10.6.7.2 ufm web-client associate-user
  • 10.6.7.3 show ufm web-client
  • 10.6.7.4 ufm web-client client-authentication cert-refresh enable
  • 10.6.7.5 ufm web-client client-authentication cert-refresh ca-cert
  • 10.6.7.6 ufm web-client client-authentication cert-refresh server-cert
  • 10.6.7.7 ufm web-client client-authentication cert-refresh run-now

• 10.6.8 UFM Audit
  • 10.6.8.1 ufm track-conf-changes enable
  • 10.6.8.2 show ufm track-conf-changes

• 10.6.9 High-Availability
  • 10.6.9.1 ufm ha
  • 10.6.9.2 ufm ha configure
  • 10.6.9.3 ufm ha configure dual-subnet
  • 10.6.9.4 ufm ha-nodes
  • 10.6.9.5 show ufm ha-nodes

• 10.6.10 UFM Multi-Port SM
  • 10.6.10.1 ufm multi-port-sm
  • 10.6.10.2 show ufm multi-port-sm
  • 10.6.10.3 ufm additional-fabric-interfaces
  • 10.6.10.4 show ufm additional-fabric-interfaces

• 10.6.11 UFM Plugins
  • 10.6.11.1 ufm plugin
  • 10.6.11.2 show ufm plugin

• 10.6.12 NVP
  • 10.6.12.1 nvp set
  • 10.6.12.2 nvp get
  • 10.6.12.3 nvp dump
  • 10.6.12.4 nvp apply
  • 10.6.12.5 nvp apply force

• 10.6.13 UFM Process Commands
• 10.6.13.1 ufm process health start
• 10.6.13.2 ufm process model start
• 10.6.13.3 ufm process telemetry start
• 10.6.13.4 ufm process sharp start
• 10.6.13.5 ufm process telemetry start
• 10.6.13.6 ufm process sm start

10.6.1 General

10.6.1.1 ufm start

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm start</td>
<td>Starts UFM. The no form of the command stops UFM.</td>
</tr>
<tr>
<td>no ufm start</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**
N/A

**Default**
N/A

**Configuration Mode**
config

**History**
1.4.1

**Example**

```plaintext
ufmapl (config) # ufm start
```

**Related Commands**
show ufm status

**Notes**

10.6.1.2 show ufm status

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show ufm status</td>
<td>Displays the status of UFM. The outcome of the command varies according to the working mode.</td>
</tr>
</tbody>
</table>

**Syntax Description**
N/A

**Default**
N/A

**Configuration Mode**
config

**History**
1.4.2 Updated command output
1.4.0 First release
ufmapl (config) # show ufm status

Cluster name: ufmc1uster
WARNING: corosync and pacemaker node names do not match (IPs used in setup?)
Stack: corosync
Current DC: swx-ufm3-02 (version 1.1.18-2k07d5c5a9) - partition with quorum
Last updated: Thu Jun 1 19:06:57 2023
Last change: Thu Jun 1 19:06:11 2023 by root via crm_resource on swx-ufm3-02

2 nodes configured
5 resources configured
Online: [ swx-ufm3-01 swx-ufm3-02 ]
Full list of resources:

Master/Slave Set: ha_data_drbd_master [ha_data_drbd]
  Masters: [ swx-ufm3-01 ]
  Slaves: [ swx-ufm3-02 ]
Resource Group: ufmc1uster-grp
  ha_data_file_system (ocf::heartbeat:Filesystem): Started swx-ufm3-01
  ufm-ha-watcher (systemd:ufm-ha-watcher): Started swx-ufm3-01
  ufm-enterprise (systemd:ufm-enterprise): Started swx-ufm3-01
Daemon Status:
  corosync: active/enabled
  pacemaker: active/enabled
  pcsdr: active/enabled
DRBD_RESOURCE: ha_data
DRBD_CONNECTIVITY: Connected
DISK_STATE: UpToDate
PEER_DISK_STATE: UpToDate
PEER_DRBD_ROLE: Secondary
DRBD Sync Status:
  version: 8.4.19 (api:1/proto:86-101)
  srcversion: 7C5B8378BE913D722F67EFD
  ns:9044 nr:59762612 dw:159771656 dr:2813 al:48 bm:0 lo:0 pe:0 ua:0 ap:0
  ep:1 wo:0 oos:0

================================================================================
UFM Main Processes
================================================================================
ModelMain          Process is : [ Running ]
Opensm             Process is : [ Running ]
Unhealthy Ports    Process is : [ Running ]
Daily Report       Process is : [ Running ]
UFM Health         Process is : [ Running ]
UFM Telemetry      Process is : [ Running ]
UFM                Running
================================================================================
HA Summary
================================================================================
Local
Primary IP          11.0.0.11
Secondary IP        10.209.44.115
DRBD                Running Primary
DRBD State          ConnectionState = Connected - DiskState = UpToDate
Peer
Primary IP          11.0.0.12
Secondary IP        10.209.44.116
DRBD                Running Secondary
DRBD State          ConnectionState = Connected - DiskState = UpToDate
================================================================================
swx-ufm3-01 (config) #

Related Commands
N/A

Notes
- The output example above is taken from a high-availability setup
- If working in HA mode, you will receive information on the HA status
- The process status can be one of the below:
  - Running - the process is running
  - Stopped - the process is not running
**10.6.2 UFM License**

### 10.6.2.1 ufm license install

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>url</th>
<th>https, scp and sftp are supported. Example: scp://username[:password]@hostname/path/filename, usb:/path/filename.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td>ufmpl (config) # ufm license install scp://root:1234569010.209.1.21/tmp/volt-ufm-advanced.lic</td>
</tr>
</tbody>
</table>

**Related Commands**

- ufm license delete
- show ufm license

**Notes**

- The license format must be as follow: volt-ufm-*.*, mlnx-ufm-*.*, or nvidia-ufm-*.*
- Duplicate license are not permitted. You must delete the previous license before installing the new one.

### 10.6.2.2 ufm license delete

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>filename</th>
<th>UFM license filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td>ufmpl (config) # ufm license delete volt-ufm-advanced.lic</td>
</tr>
</tbody>
</table>

**Related Commands**

- ufm license install
- show ufm license

**Notes**

### 10.6.2.3 show ufm license

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Displays UFM license information.</td>
</tr>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>---------</td>
<td>-----</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmap1 (config) # show ufm license
<table>
<thead>
<tr>
<th>Customer ID</th>
<th>SN</th>
<th>swName</th>
<th>Type</th>
<th>MAC Address</th>
<th>Exp. Date</th>
<th>Limit</th>
<th>Functionality</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>495760397</td>
<td>123456778</td>
<td>UFM</td>
<td>Evaluation</td>
<td>NA</td>
<td>2090-11-21</td>
<td>1024</td>
<td>Advanced</td>
<td>Valid</td>
</tr>
</tbody>
</table>
```

Related Commands
- ufm license install
- ufm license delete

Notes

---

### 10.6.2.4 show files ufm-license

```
ufmap1 (config) # show files ufm-license
```

**Syntax Description**

Displays a list of UFM license files

<table>
<thead>
<tr>
<th>Default</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmap1 (config) # show files ufm-license
nvidia-ufm-advanced.lic
```

Related Commands
- ufm license delete

Notes

---

### 10.6.3 UFM Configuration Management

#### 10.6.3.1 ufm configuration delete

```
ufmap1 (config) # ufm configuration delete <zip-file>
```

Deletes a configuration zip file from the hard drive.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>zip-file</th>
<th>Zip filename to delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
ufmap1 (config) # ufm configuration delete ufm-config-20121128-180857.zip
```

Notes
### 10.6.3.2 ufm configuration export

```
ufm configuration export [-<zip-file>]
```

Exports UFM configuration to a file (a zip archive).

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>zip-file</th>
<th>UFM configuration of exporting the zip file</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

```
ufmapl (config) # ufm configuration export
```

**Notes**

If no zip file is provided, a zip archive is created with the name: `ufm-config-<date>-<time>.zip` (e.g. `ufm-config-20130327-153314.zip`)

### 10.6.3.3 ufm configuration fetch

```
ufm configuration fetch <url>
```

Downloads UFM configuration files from a remote host or a USB device.

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>url</th>
<th>The URL path from where the configuration file can be downloaded. https, scp and sftp are supported. Example: <code>scp://username[:password]@hostname/path/filename</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
</tbody>
</table>

**Example**

```
ufmapl (config) # ufm configuration fetch usb:/ufmapp/ufmconf1.zip
```

**Related Commands**

- ufm configuration upload
- ufm configuration import
- ufm configuration delete
- ufm configuration fetch

**Notes**

- If no zip file is provided, a zip archive is created with the name: `ufm-config-<date>-<time>.zip` (e.g. `ufm-config-20130327-153314.zip`)
### 10.6.3.4 ufm configuration import

**ufm configuration import <zip-file> [upgrade]**
Imports UFM configuration from a file (a zip archive).

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>zip-file</td>
<td>Zip filename from which to import</td>
</tr>
<tr>
<td>upgrade</td>
<td>Imports UFM-SDN Appliance configuration from a previous version and upgrades it to the latest one</td>
</tr>
</tbody>
</table>

**Default**
N/A

**Configuration Mode**
config

**History**
1.6.0

**Example**

```
ufmapl (config) # ufm configuration import ufm-config-20121128-180857.zip
```

**Related Commands**
- ufm configuration upload
- ufm configuration export
- ufm configuration delete
- ufm configuration fetch

**Notes**

### 10.6.3.5 ufm configuration upload

**ufm configuration upload <filename> <url>**
Uploads UFM configuration to a remote host or a USB device (a zip archive).

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>filename</td>
<td>The UFM configuration of uploading the file name</td>
</tr>
<tr>
<td>url</td>
<td>The URL path from where the configuration file can be uploaded. Supported formats: https, scp and sftp. Example: <code>scp://username[:password]@hostname/path/ filename</code></td>
</tr>
</tbody>
</table>

**Default**
N/A

**Configuration Mode**
config

**History**
1.6.0

**Example**

```
ufmapl (config) # ufm configuration upload ufm-config-20121128-180857.zip scp://mlnx:123456@172.30.3.201/tmp
```

**Related Commands**
- ufm configuration export
- ufm configuration import
- ufm configuration delete

**Notes**
10.6.3.6 show files ufm-configuration

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # show files ufm-configuration
ufm-config-20231105-102019.zip
```

10.6.4 Data Management

10.6.4.1 ufm data reset

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.5.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ufm data reset
This command resets UFM data (configuration and database) and consequently deletes installed web client related certificates.
Are you sure you wish to proceed? [yes/no] yes
UFM reset to factory defaults finished successfully.
```

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

This command is available in standalone mode only. For resetting UFM in HA mode, refer to `no ufm ha`. 
### 10.6.5 Management Interface Monitoring

#### 10.6.5.1 ufm mgmt-interface monitor enable

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm mgmt-interface monitor enable</td>
<td>Enables monitoring of the management interface. The no form of the command disables monitoring of the management interface.</td>
</tr>
</tbody>
</table>

**Syntax Description**  
N/A

**Default**  
Disabled

**Configuration Mode**  
config

**History**  
1.4.0

**Example**

```
ufmap1 (config) # ufm mgmt-interface monitor enable
```

**Related Commands**

- ufm mgmt-interface monitor interval
- ufm mgmt-interface
- show ufm mgmt-interface

**Notes**

#### 10.6.5.2 ufm mgmt-interface monitor interval

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
</table>

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>time</td>
<td>The management interface monitoring interval. Range: 5-180 seconds.</td>
</tr>
</tbody>
</table>

**Default**  
10 seconds

**Configuration Mode**  
config

**History**  
1.4.0

**Example**

```
ufmap1 (config) # ufm mgmt-interface monitor interval 15
```

**Related Commands**

- ufm mgmt-interface monitor enable
- ufm mgmt-interface
- show ufm mgmt-interface

**Notes**

#### 10.6.5.3 ufm mgmt-interface

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm mgmt-interface &lt;interface&gt;</td>
<td>Configures the management interface to be monitored.</td>
</tr>
</tbody>
</table>

**Syntax Description**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interface</td>
<td>Management interface to be monitored (e.g. eno8303, eno8403)</td>
</tr>
</tbody>
</table>

**Default**  
eno8303
<table>
<thead>
<tr>
<th>Configuration Mode</th>
<th>config</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufmap1 (config) # ufm mgmt-interface eth0</td>
</tr>
<tr>
<td>Related Commands</td>
<td>ufm mgmt-interface monitor enable</td>
</tr>
<tr>
<td></td>
<td>ufm mgmt-interface monitor interval</td>
</tr>
<tr>
<td></td>
<td>show ufm mgmt-interface</td>
</tr>
<tr>
<td>Notes</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### 10.6.5.4 show ufm mgmt-interface

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufmap1 (config) # show ufm mgmt-interface</td>
</tr>
<tr>
<td></td>
<td>Management interface monitoring:</td>
</tr>
<tr>
<td></td>
<td>Interface name: eno303</td>
</tr>
<tr>
<td></td>
<td>Enabled: Yes</td>
</tr>
<tr>
<td></td>
<td>Monitoring interval: 10 seconds</td>
</tr>
<tr>
<td>Related Commands</td>
<td>ufm mgmt-interface monitor enable</td>
</tr>
<tr>
<td></td>
<td>ufm mgmt-interface monitor interval</td>
</tr>
<tr>
<td></td>
<td>ufm mgmt-interface</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

### 10.6.6 UFM Logs

#### 10.6.6.1 show ufm logging

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
</tbody>
</table>
Example

<table>
<thead>
<tr>
<th>Command</th>
<th>Output</th>
</tr>
</thead>
</table>
| `ufmapl (config) # show ufm logging` | Number of archived log files to keep: 15
Log rotation size threshold: 100M
Ufm-log level: WARNING
Syslog:
  Enabled: No
  Server: Local
  Level: WARNING
Ufm-log enabled: No
Ufm-events enabled: No |

Related Commands

Notes

10.6.6.2 ufm logging syslog enable

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ufm logging syslog enable</code></td>
<td>Enable sending UFM logs to syslog. The no form of the command disables sending UFM logs to syslog.</td>
</tr>
<tr>
<td><code>no ufm logging syslog enable</code></td>
<td>Disable sending UFM logs to syslog.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Disabled</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
</tbody>
</table>

Example

```
ufmapl (config) # ufm logging syslog enable
```

Related Commands

Notes

This change takes effect after UFM restart.

10.6.6.3 ufm logging syslog

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ufm logging syslog &lt;host:port&gt;</code></td>
<td>Sends UFM logs to a remote syslog server. The no form of the command sends UFM logs to the local syslog server.</td>
</tr>
<tr>
<td><code>no ufm logging syslog</code></td>
<td>Disable sending UFM logs to syslog.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>port</th>
<th>Remote syslog hostname and port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
<td></td>
</tr>
</tbody>
</table>

Example

```
ufmapl (config) # ufm logging syslog 172.30.36.120:514
```

Related Commands

Notes

This change takes effect after UFM restart.
## 10.6.6.4 ufm logging syslog ufm-log enable

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Disabled</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # ufm logging syslog ufm-log enable</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>This change takes effect after UFM restart.</td>
</tr>
</tbody>
</table>

## 10.6.6.5 ufm logging syslog ufm-events enable

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # ufm logging syslog ufm-events enable</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>This change takes effect after UFM restart.</td>
</tr>
</tbody>
</table>

## 10.6.6.6 ufm logging level

```
ufm logging level <log-level>
Sets the severity level of certain log messages.
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>log-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>WARNING</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.6</td>
</tr>
</tbody>
</table>
10.6.7 UFM Web Client

10.6.7.1 ufm web-client mode

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm web-client mode</td>
<td>Configures Access mode to the UFM web clients.</td>
<td>https</td>
</tr>
<tr>
<td>https-client-authentication</td>
<td>HTTPS access with client authentication</td>
<td>https-client-authentication</td>
</tr>
</tbody>
</table>

**Default**

https

**Configuration Mode**

config

**History**

1.4.0

**Example**

ufmap1 (config) # ufm web-client mode https-client-authentication

**Related Commands**

show ufm web-client
ufm web-client client-authentication
ufm web-client associate-user

**Notes**

ufm web-client associate-user

**Syntax Description**

san | Client certificate subject alternative name
username | UFM username

**Default**

N/A

**Configuration Mode**

config

**History**

1.4.0

**Example**

ufmap1 (config) # ufm web-client associate-user ufm.mellanoxhpc.net admin
10.6.7.3  show ufm web-client

show ufm web-client
Displays UFM web client settings.

Syntax Description  N/A
Default  N/A
Configuration Mode  enable
History  1.4.0

Example

```
ufmapl (config) # show ufm web-client
Mode: HTTPS
Client authentication: Yes
Bootstrap certificate file: Present
CA certificate file: Present
Server certificate file: Present
Server certificate hostname: ufm.mellanoxhpc.net
User Associations:
  SAN:  ufm.mellanoxhpc.net
  User:  ufmsysadmin
Certificate Auto-refresh:
  Enabled: Yes
  CA certificate URL: https://mellanox.com/cacert
  Server certificate URL: https://mellanox.com/servercert
  Server certificate thumbprint: 2268BDD79DF7FD8C818EB97F315AE0F35D223A15
  Last checked: 2019-04-20 20:57:21
  Last update: 2019-04-20 20:57:21
```

Related Commands  ufm web-client mode
                    ufm web-client client-authentication
                    ufm web-client associate-user

Notes

10.6.7.4  ufm web-client client-authentication cert-refresh enable

ufm web-client client-authentication cert-refresh enable
no ufm web-client client-authentication cert-refresh enable
Enables UFM web client certificates auto-refresh.
The no form of the command disables the feature.

Syntax Description  N/A
Default  Disabled
Configuration Mode  config
History  1.4.0

Example

```
ufmapl (config) # ufm web-client client-authentication cert-refresh enable
```

Related Commands  show ufm web-client
10.6.7.5 ufm web-client client-authentication cert-refresh ca-cert

```
fm web-client client-authentication cert-refresh ca-cert <download-url>
no ufm web-client client-authentication cert-refresh ca-cert <download-url>
```

Sets the download URL for root/intermediate certificate. The no form of the command clears the root/intermediate certificate auto-refresh settings.

**Syntax Description**

<table>
<thead>
<tr>
<th>download-url</th>
<th>Download URL for root/intermediate certificate</th>
</tr>
</thead>
</table>

**Default**

N/A

**Configuration Mode**

config

**History**

1.5

**Example**

```
ufmapl (config) # ufm web-client client-authentication cert-refresh ca-cert
"https://mellanox.com/cacerts"
```

**Related Commands**

show ufm web-client

**Notes**

10.6.7.6 ufm web-client client-authentication cert-refresh server-cert

```
ufm web-client client-authentication cert-refresh server-cert <url> <thumbprint>
no ufm web-client client-authentication cert-refresh server-cert <url> <thumbprint>
```

Sets the download URL for server and bootstrap certificates. The no form of the command clears the server and bootstrap certificates auto-refresh settings.

**Syntax Description**

<table>
<thead>
<tr>
<th>url</th>
<th>https and sftp are supported. Example: <code>sftp://username[:password]@hostname/path/filename</code>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>thumbprint</td>
<td>Server certificate thumbprint</td>
</tr>
</tbody>
</table>

**Default**

N/A

**Configuration Mode**

config

**History**

1.4.0

**Example**

```
ufmapl (config) # ufm web-client client-authentication cert-refresh server-cert "https://mellanox.com/servercerts"
2268BD79DF7FD9C8158897F315AB0F3ED221515
```

**Related Commands**

show ufm web-client

**Notes**
### 10.6.7.7 ufm web-client client-authentication cert-refresh run-now

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # ufm web-client client-authentication cert-refresh run-now</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td>show ufm web-client</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

### 10.6.8 UFM Audit

#### 10.6.8.1 ufm track-conf-changes enable

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Enabled</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # ufm track-conf-changes enable</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td>show ufm track-conf-changes</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

#### 10.6.8.2 show ufm track-conf-changes

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
</tbody>
</table>
ufmapl (config) # show ufm
Track UFM configuration changes: No

Related Commands
ufm track-conf-changes enable
no ufm track-conf-changes enable

Notes

10.6.9 High-Availability

10.6.9.1 ufm ha

ufm ha [failover | takeover]
Performs High Availability failover/takeover operations.

Syntax Description
failover
Failover can be performed only on master (active) machine

takeover
Takeover can be performed only on slave (standby) machine

Default
N/A

Configuration Mode
config

History
1.4.1

Example
ufmapl (config) # ufm ha takeover

Related Commands

10.6.9.2 ufm ha configure

ufm ha configure <standby|master> <local primary IP> <peer primary IP> <local secondary IP> <peer secondary IP> <virtual ip> <hacluster-pwd>
no ufm ha
Applies HA configuration. The no form of the command reverts the appliance to a standalone configuration.

Syntax Description
node-role
Master or standby

local-primary-ip
Local node primary IP address

peer-primary-ip
Peer node primary IP address

local-secondary-ip
Local node secondary IP address

peer-secondary-ip
Peer node secondary IP address

virtual ip
Virtual IP used for accessing the active (master) machine

hacluster-pwd
hacluster user password
10.6.9.3  ufm ha configure dual-subnet

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>node-role</th>
<th>Master or standby</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>local-primary-ip</td>
<td>Local node primary IP address</td>
</tr>
<tr>
<td></td>
<td>peer-primary-ip</td>
<td>Peer node primary IP address</td>
</tr>
<tr>
<td></td>
<td>local-secondary-ip</td>
<td>Local node secondary IP address</td>
</tr>
<tr>
<td></td>
<td>peer-secondary-ip</td>
<td>Peer node secondary IP address</td>
</tr>
<tr>
<td></td>
<td>hacluster-pwd</td>
<td>hacluster user password</td>
</tr>
</tbody>
</table>

Default
N/A

Configuration Mode
config

History
1.4.0

Example
```
swx-ufm3-01 (config) # ufm ha configure dual-subnet standby 11.0.0.12 11.0.0.11 10.209.44.12 10.209.44.11 10.209.44.111 123456
```

Related Commands

Notes
1. The local and peer primary interfaces should be connected directly back-to-back
2. The command must be ran first on standby node and only then on the master node
10.6.9.4  ufm ha-nodes

ufm ha-nodes <master hostname> <standby hostname>
no ufm ha-nodes
Sets the HA nodes information in UFM configuration.
The no form of the commands clears the HA nodes information from the
UFM configuration.

Syntax Description
- master hostname: The originally set master node hostname.
- standby hostname: The originally set standby node hostname.

Default
N/A

Configuration Mode
config

History
1.5.0

Example
ufmapl (config) # ufm ha-nodes ufm-host-01 ufm-host-02

Related Commands
- show ufm ha-nodes

Notes

10.6.9.5  show ufm ha-nodes

show ufm ha-nodes
Shows the UFM HA configuration that is set in UFM.

Syntax Description
N/A

Default
N/A

Configuration Mode
config

History
1.5.0

Example
ufmapl (config) # show ufm ha-nodes
08c0eb030098609a:11.0.0.12:1,08c0eb0300986042:11.0.0.11:2

Related Commands
- ufm ha-nodes

Notes
N/A

10.6.10  UFM Multi-Port SM

10.6.10.1  ufm multi-port-sm

ufm multi-port-sm enable
ufm multi-port-sm ha-enable
no ufm multi-port-sm enable
Enables configuring OpenSM with multiple GUIDs.
The no form of the command disables configuring OpenSM with multiple GUIDs.

Syntax Description
- enable: enables configuring OpenSM with multiple GUIDs
- ha-enable: enables multi-port SM with high availability

Default
N/A

Configuration Mode
config

History
N/A

Example
ufmapl (config) # ufm multi-port-sm enable
ufmapl (config) # ufm multi-port-sm ha-enable
ufmapl (config) # no ufm multi-port-sm enable

Related Commands
- show ufm multi-port-sm

Notes
N/A
### Default
Disabled

### Configuration Mode
config

### History
1.6.0

### Example
```
ufm (config) # ufm multi-port-sm enable
```

### Related Commands
- `show ufm multi-port-sm`

### Notes
- `ufm multi-port-sm enable`

---

### 10.6.10.2 show ufm multi-port-sm

```
show ufm multi-port-sm
```
Displays whether configuring OpenSM with multiple GUIDs is enabled.

### Syntax Description
N/A

### Default
N/A

### Configuration Mode
config

### History
1.6.0

### Example
```
ufm (config) # show ufm multi-port-sm
Enable
```

### Related Commands
- `ufm multi-port-sm enable`

### Notes
- `ufm multi-port-sm enable`

---

### 10.6.10.3 ufm additional-fabric-interfaces

```
ufm additional-fabric-interfaces
no ufm additional-fabric-interfaces
```
Sets additional fabric interfaces for OpenSM.
Clears the additional fabric interfaces list.

### Syntax Description
N/A

### Default
N/A

### Configuration Mode
config

### History
1.6.0

### Example
```
ufm (config) # ufm additional-fabric-interfaces ib1
```

### Related Commands
- `ufm multi-port-sm enable`

### Notes
- `ufm multi-port-sm enable`
10.6.10.4  show ufm additional-fabric-interfaces

```
show ufm additional-fabric-interfaces
Displays the additional fabric interfaces list used by OpenSM.
```

Syntax Description  N/A
Default  N/A
Configuration Mode  config
History  1.6.0
Example
```
ufm (config) # show ufm additional-fabric-interfaces ib1
```

Related Commands  ufm multi-port-sm enable
Notes

10.6.11  UFM Plugins

10.6.11.1  ufm plugin

```
ufm plugin <plugin-name> [add [tag <plugin tag>] | enable | remove | upgrade tag <plugin tag> [force]]
no ufm plugin <plugin-name> enable
Manages the UFM plugin.
The no form of the command disables the UFM plugin.
```

Syntax Description

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>add [tag &lt;plugin tag&gt;]</td>
<td>Adds UFM plugin with an optional plugin tag</td>
</tr>
<tr>
<td>enable</td>
<td>Enables UFM plugin</td>
</tr>
<tr>
<td>remove</td>
<td>Removes UFM plugin</td>
</tr>
<tr>
<td>upgrade tag &lt;plugin tag&gt; [force]</td>
<td>Upgrades UFM plugin data with an optional force flag which forces stops the plugin if it is running while the upgrade procedure</td>
</tr>
</tbody>
</table>

Default  N/A
Configuration Mode  config
History  1.8.0  Added the upgrade tag <plugin tag> [force]
1.7.0  First release
Example
```
ufm (config) # ufm plugin ndt add tag 1.1.1-17
```

Related Commands  show ufm plugin
Notes

- The plugin can be added, removed, upgraded, enabled or disabled while UFM is running.
- The plugin will be started upon UFM startup.
- Disabling the plugin will only stop it.
- Removing the plugin also clears all its folders and files (including configuration and logs).

### 10.6.11.2 show ufm plugin

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Displays UFM plugin information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>enabled</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.7.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufm (config) # show ufm plugin
Plugin ndt:
  Enabled:           Yes
  Plugin tag:       1.1.1-17
Shared volumes:    /opt/ufm/files/log:/log,/dev:/host_dev
HTTPD port:        8980
HTTPD file:        Present
State:             running
CPU limit:         unlimited
```

Related Commands:
- ufm plugin add, ufm plugin remove, ufm plugin enable, no ufm plugin enable

Notes

### 10.6.12 NVP

#### 10.6.12.1 nvp set

<table>
<thead>
<tr>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nvp set &lt;file_name&gt; &lt;key&gt; &lt;value&gt;</td>
</tr>
<tr>
<td>Changes the configuration of a file based on the key-value pair provided by the user</td>
</tr>
</tbody>
</table>

```
nvp set opensm.conf qos TRUE
```

Related Commands

Notes
### 10.6.12.2 nvp get

**nvp get**<br>

```
nvp get <file_name> <key>
```

Retrieve the configuration of file based on the key entered by the user

**Syntax Description**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>file_name</td>
<td>Refers to the file name</td>
</tr>
<tr>
<td>key</td>
<td>Refers to the key</td>
</tr>
</tbody>
</table>

**Default**

N/A

**Configuration Mode**

config

**History**

1.8.0

**Example**

```
ufmapl (config) # nvp get opensm.conf qos
```

**Related Commands**

**Notes**

Get can retrieve the configuration of only those files, that have been modified via the nvp set.

### 10.6.12.3 nvp dump

**nvp dump**

```
nvp dump
```

Generates a JSON file containing the configuration of all the NVP-supported configuration files

**Syntax Description**

N/A

**Default**

N/A

**Configuration Mode**

config

**History**

1.8.0

**Example**

```
ufmapl (config) # nvp dump
```

**Related Commands**

**Notes**

### 10.6.12.4 nvp apply

**nvp apply**

```
nvp apply
```

Moves all the files that have been changed via the nvp set command to their original location and restarts the UFM Server for changes to take effect.

**Syntax Description**

N/A

**Default**

N/A

**Configuration Mode**

config
### 10.6.12.5 nvp apply force

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.8.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # nvp apply force</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td>nvp apply</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>

**10.6.13 UFM Process Commands**

### 10.6.13.1 ufm process health start

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.7.0</td>
</tr>
<tr>
<td>Example</td>
<td><code>ufmapl (config) # ufm process health start</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td>show ufm status</td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
</tbody>
</table>
### 10.6.13.2 ufm process model start

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
<th>Default</th>
<th>Configuration Mode</th>
<th>History</th>
<th>Example</th>
<th>Related Commands</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm process model start</td>
<td>Starts/restarts the UFM ModelMain process. The no form of the command stops the UFM ModelMain process.</td>
<td>N/A</td>
<td>config</td>
<td>1.7.0</td>
<td>ufmpl (config) # ufm process model start</td>
<td>show ufm status</td>
<td>When stopping the UFM ModelMain process, the UFM health is also stopped in order not to start the UFM ModelMain process.</td>
</tr>
</tbody>
</table>

### 10.6.13.3 ufm process telemetry start

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
<th>Default</th>
<th>Configuration Mode</th>
<th>History</th>
<th>Example</th>
<th>Related Commands</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ufm process telemetry start</td>
<td>Starts/restarts UFM telemetry process. The no form of the command stops UFM telemetry process.</td>
<td>N/A</td>
<td>config</td>
<td>1.7.0</td>
<td>ufmpl (config) # ufm process telemetry start</td>
<td>show ufm status</td>
<td>When stopping the UFM telemetry process, the UFM health is also stopped in order not to start the UFM telemetry process.</td>
</tr>
</tbody>
</table>

When stopping the UFM telemetry process, the UFM health is also stopped in order not to start the UFM telemetry process.
### 10.6.13.4 ufm process sharp start

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.7.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ufm process sharp start
```

**Related Commands**
show ufm status

**Notes**
When stopping the SHARP Aggregation Manager process, the UFM health is also stopped in order not to start the SHARP Aggregation Manager process.

---

### 10.6.13.5 ufm process telemetry start

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.7.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ufm process telemetry start
```

**Related Commands**
show ufm status

**Notes**
When stopping the UFM Telemetry process, the UFM health is also stopped in order not to start the UFM Telemetry process.
### 10.6.13.6 ufm process sm start

<table>
<thead>
<tr>
<th>Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.7.0</td>
</tr>
</tbody>
</table>
| Example     | ufm process sm start  
ufm process sm restart  
no ufm process sm start |

Starts/restarts the SM. The no form of the command stops the SM.

**Related Commands**
- show ufm status

**Notes**
When stopping the SM process, the UFM health is also stopped in order not to start the SM process.

### 10.7 InfiniBand Commands

#### 10.7.1 OpenSM

##### 10.7.1.1 ib sm configuration import

<table>
<thead>
<tr>
<th>Description</th>
<th>Imports the Subnet Manager configuration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.1</td>
</tr>
<tr>
<td>Example</td>
<td>ib sm configuration import partition-conf-user-ext sftp://admin:123456@192.168.1.12/tmp/partitions.conf.user_ext</td>
</tr>
</tbody>
</table>

**Related Commands**
- show ib sm configuration import

**Notes**
N/A

##### 10.7.1.2 show ib sm allow-both-pkeys

<table>
<thead>
<tr>
<th>Description</th>
<th>Displays if both full and limited memberships on the same partition are enabled or not.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax Description</td>
<td>N/A</td>
</tr>
</tbody>
</table>
**Default**: N/A

**Configuration Mode**: Enable

**History**: 1.4.0

**Example**

```
ufmapl (config) # show ib sm allow-both-pkeys
disable
```

**Related Commands**: `ib sm allow-both-pkeys`

**Notes**: N/A

### 10.7.1.3 ib sm allow-both-pkeys

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Default</strong></td>
<td>Disabled</td>
</tr>
<tr>
<td><strong>Configuration Mode</strong></td>
<td>config</td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>1.4.0</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ib sm allow-both-pkeys
```

**Related Commands**: `show ib sm allow-both-pkey`

**Notes**: N/A

### 10.7.1.4 show ib sm keep-pkey-indexes

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Default</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Configuration Mode</strong></td>
<td>Enable</td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>1.4.0</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # show ib sm keep-pkey-indexes
enable
```

**Related Commands**: `ib partition management defmember`

**Notes**: N/A
10.7.1.5 ib sm keep-pkey-indexes

ib sm keep-pkey-indexes
no ib sm keep-pkey-indexes
Preserves PKey indexes belonging to the historical PKeys configured on the port when generating PKey tables for a certain port. The no form of the command calculates PKey indexes belonging to the historical PKeys configured on the port.

Syntax Description
N/A

Default
Enabled

Configuration Mode
config

History
1.4.0

Example
ufmapl (config) # no ib sm keep-pkey-indexes

Related Commands
show ib sm keep-pkey-indexes
ib sm allow-both-pkeys

Notes
N/A

10.7.1.6 show ib sm virtualization

show ib sm virtualization
Displays virtualization support.

Syntax Description
N/A

Default
N/A

Configuration Mode
enable

History
1.4.0

Example
ufmapl (config) # show ib sm virtualization enable

Related Commands
ib sm virtualization enable
ib sm virtualization ignore

Notes
N/A
10.7.1.7  ib sm virtualization enable

```
ib sm virtualization enable  
no ib sm virtualization enable  
Enables virtualization on all supported ports (default).  
The no form of the command disables virtualization on all supporting ports.
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Enabled</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufmapl (config) # ib sm virtualization enable</td>
</tr>
</tbody>
</table>

**Related Commands**
show ib sm virtualization

**Notes**
It is not possible to modify the virtualization support in case OpenSM or UFM are running.

10.7.1.8  ib sm virtualization ignore

```
ib sm virtualization ignore  
No virtualization support.
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td>ufmapl (config) # ib sm virtualization ignore</td>
</tr>
</tbody>
</table>

**Related Commands**
show ib sm virtualization

**Notes**
It is not possible to modify the virtualization support in case OpenSM or UFM are running.

10.7.1.9  show ib sm root-guid

```
show ib sm root-guid  
Displays all configured root GUIDs for the SM.
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>enable</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
</tbody>
</table>
| Example            | ufmapl (config) # show ib sm root-guid  
0xe0002c0903006ada818  
0xe0002c0903006ae128  
0xe0002c0903006af528 |

ufmapl (config) # show ib sm root-guid
0xe0002c0903006ada818
0xe0002c0903006ae128
0xe0002c0903006af528
### Related Commands
- ib sm root-guid

### Notes
- N/A

#### 10.7.1.10 ib sm root-guid

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>guid</th>
<th>The root GUID number in hexadecimal notation For example: 0x0002c903006ad830</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
<td></td>
</tr>
</tbody>
</table>

#### Example
```
ufmapl (config) # ib sm root-guid 0x0002c903006ad830
```

#### Related Commands
- show ib sm root-guid

#### Notes
- The list of root GUIDs are relevant when the routing algorithm is up-down or fat-tree.

#### 10.7.1.11 show ib sm routing-engines

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
<th>Displays number of CPUs configured to use for parallel calculations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>enable</td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
<td></td>
</tr>
</tbody>
</table>

#### Example
```
ufmapl (config) # show ib sm routing-engines ar_updn
```

#### Related Commands
- ib sm routing-engines

#### Notes
- N/A

#### 10.7.1.12 ib sm routing-engines

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>engine</th>
<th>Multiple routing engines can be specified separated by space. Supported engines: ar-dor, ar-ftree, ar-torus, ar-updn, chain, dfp, dfp2, dor, ftree, minhop, pqft, torus-2QoS, updn)</th>
</tr>
</thead>
</table>

---

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### Default

<table>
<thead>
<tr>
<th>Default</th>
<th>1</th>
</tr>
</thead>
</table>

### Configuration Mode

<table>
<thead>
<tr>
<th>Configuration Mode</th>
<th>config</th>
</tr>
</thead>
</table>

### History

<table>
<thead>
<tr>
<th>History</th>
<th>1.4.0</th>
</tr>
</thead>
</table>

### Example

```
ufmapl (config) # ib sm routing-engines ar-updn
```

### Related Commands

| show ib sm routing-engines |

### Notes

| N/A |

---

**10.7.1.13 show ib sm ar-sl-mask**

<table>
<thead>
<tr>
<th><strong>Syntax Description</strong></th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Default</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Configuration Mode</strong></td>
<td>enable</td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>1.4.0</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>ufmapl (config) # show ib sm ar-sl-mask 0xffff</td>
</tr>
<tr>
<td><strong>Related Commands</strong></td>
<td>ib sm ar-sl-mask</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>

**10.7.1.14 ib sm ar-sl-mask**

```
ib sm ar-sl-mask <mask>
no ib sm ar-sl-mask
```

<table>
<thead>
<tr>
<th><strong>Syntax Description</strong></th>
<th>mask</th>
<th>Range: 0x0000-0xffff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Default</strong></td>
<td>0xffff</td>
<td></td>
</tr>
<tr>
<td><strong>Configuration Mode</strong></td>
<td>config</td>
<td></td>
</tr>
<tr>
<td><strong>History</strong></td>
<td>1.4.0</td>
<td></td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>ufmapl (config) # ib sm ar-sl-mask 0xffff</td>
<td></td>
</tr>
<tr>
<td><strong>Related Commands</strong></td>
<td>show ib sm ar-sl-mask</td>
<td></td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

---

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### 10.7.1.15  show ib sm configuration import

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>enable</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>
  ufnamel (config) # show ib sm configuration import  
  partitions.conf.user_ext  |
| Related Commands   | ib sm configuration import |
| Notes              | N/A |

Displays imported subnet manager configuration files.

### 10.7.1.16  ib sm partition-config-merge

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>
  usname (config) # ib sm partition-config-merge  |
| Related Commands   | ib sm configuration import partition-config-user-ext |
| Notes              | The SM must be running for this command to work. |

Merges the partitions.conf.user_ext into the partitions.conf and starts the heavy sweep on the SM. To use after importing the specific file or importing all configuration files.

### 10.7.1.17  ib sm sharp enable

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Enables NVIDIA® Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ on all supporting switches. The no form disables NVIDIA SHARP on all supporting switches.
<table>
<thead>
<tr>
<th>Configuration Mode</th>
<th>config</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ib sm sharp enable
```

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>show ib sm sharp</th>
</tr>
</thead>
</table>

| Notes            | It is not possible to modify the NVIDIA SHARP support parameter in case OpenSM is running. |

### 10.7.1.18  ib sm sharp ignore

<table>
<thead>
<tr>
<th>ib sm sharp ignore</th>
</tr>
</thead>
<tbody>
<tr>
<td>No NVIDIA SHARP support. This command does not change the current switch configuration. If NVIDIA SHARP is enabled on the switch, it will remain enabled. If it is disabled on the switch, it will remain disabled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>config</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # ib sm sharp ignore
```

<table>
<thead>
<tr>
<th>Related Commands</th>
<th>show ib sm sharp</th>
</tr>
</thead>
</table>

| Notes            | It is not possible to modify the NVIDIA SHARP support parameter in case OpenSM is running. |

### 10.7.1.19  show ib sm sharp

<table>
<thead>
<tr>
<th>show ib sm sharp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays NVIDIA SHARP support.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td>Enable</td>
</tr>
<tr>
<td>History</td>
<td>1.4.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # show ib sm sharp ignore
```

| Related Commands | ib sm sharp enable  
ib sm sharp ignore |
|------------------|------------------|

### 10.7.2 HCA Commands

#### 10.7.2.1 `ib hca-vl15-window`

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th><code>value</code></th>
<th><code>1,2,4,8,16,32,64,128</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Configuration Mode</td>
<td><code>config</code></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

```
UFM-APL (config) # ib hca-vl15-window 6
```

**Related Commands**
- `show ib hca-vl15-window`

**Notes**
- UFM system must be rebooted to apply the new configuration

#### 10.7.2.2 `show ib hca-vl15-window`

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>N/A</td>
</tr>
<tr>
<td>Configuration Mode</td>
<td><code>Enable</code></td>
</tr>
<tr>
<td>History</td>
<td>1.6.0</td>
</tr>
<tr>
<td>Example</td>
<td></td>
</tr>
</tbody>
</table>

```
ufmapl (config) # show ib hca-vl15-window
/dev/mst/mt4123_pciconf0:
    Running configuration: default
/dev/mst/mt4123_pciconf1:
    Running configuration: default
```

**Related Commands**
- `ib hca-vl15-window`

**Notes**
- The example shows an instance where the system has not been rebooted after implementing new configuration
### 10.7.3 Partition

#### 10.7.3.1 ib partition management defmember

<table>
<thead>
<tr>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
</tr>
<tr>
<td>• full - full membership</td>
</tr>
<tr>
<td>• limited - limited membership</td>
</tr>
</tbody>
</table>

**Default**

Full membership

**Configuration Mode**

config

**History**

1.4.0

**Example**

ufmapl (config) # ib partition management defmember limited

**Related Commands**

show ib partition

**Notes**

- The defmember setting controls the ability of end nodes to communicate over the management partition
- It is not possible to modify the defmember in case OpenSM or UFM are running

#### 10.7.3.2 show ib partition

<table>
<thead>
<tr>
<th>Syntax Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

**Default**

N/A

**Configuration Mode**

enable

**History**

1.4.0

**Example**

ufmapl (config) # show ib partition

management: default membership: full

**Related Commands**

ib partition management defmember

**Notes**

N/A
10.7.4 NVIDIA SHARP

10.7.4.1 ib sharp enable

<table>
<thead>
<tr>
<th>ib sharp enable</th>
<th>no ib sharp enable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables NVIDIA® Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™. The no form of the command disables NVIDIA SHARP.</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**
N/A

**Default**
N/A

**Configuration Mode**
cfg

**History**
1.4.0

**Example**

```
ufmap1 (config) # ib sharp enable
```

**Related Commands**
show ib sharp

**Notes**
N/A

10.7.4.2 ib sharp allocation enable

<table>
<thead>
<tr>
<th>ib sharp allocation enable</th>
<th>no ib sharp allocation enable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enables NVIDIA SHARP allocation reservation. The no form of the command disables NVIDIA SHARP allocation reservation.</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**
N/A

**Default**
N/A

**Configuration Mode**
cfg

**History**
1.6.0

**Example**

```
ufmap1 (config) # ib sharp allocation enable
```

**Related Commands**
show ib sharp

**Notes**

10.7.4.3 ib sharp smx-protocol

| ib sharp smx-protocol {sockets | ucx} | no ib sharp smx-protocol |
|---------------------------------------|-------------------------|
| Configures network protocol to be used by SMX. The no form of the command restores the network protocol to default. |

**Syntax Description**
N/A

**Default**
sockets

**Configuration Mode**
cfg
### ib sharp topology-api enable

**Syntax Description**

| N/A |

**Default**

| Disabled |

**Configuration Mode**

| config |

**History**

| 1.4.0 |

**Example**

```
ufmapl (config) # ib sharp topology-api enable
```

**Related Commands**

| show ib sharp |

**Notes**

| N/A |

---

### show ib sharp

**Syntax Description**

| N/A |

**Default**

| N/A |

**Configuration Mode**

| config |

**History**

| 1.6.0 | Updated the output to reflect the new settings |

| 1.4.0 | First release |

**Example**

```
ufmapl (config) # show ib sharp
Enabled: No
Allocation: No
SMX protocol: sockets
Topology API: No
Dump file generation: Yes
Dynamic tree allocation: No
Dynamic tree algorithm: 0
IB QPC SL: 0
IB SAT QPC SL: 1
```

**Related Commands**

| N/A |

**Notes**

| N/A |
### 10.7.4.6 ib sharp dump-files-generation enable

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ib sharp dump-files-generation enable</td>
<td></td>
</tr>
<tr>
<td>no ib sharp dump-files-generation enable</td>
<td></td>
</tr>
<tr>
<td>Enables dumping SHARP's internal state to files</td>
<td></td>
</tr>
<tr>
<td>The no form of the command disables dumping SHARP's internal state to files</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**: N/A

**Default**: Disable

**Configuration Mode**: config

**History**: 1.6.0

**Example**:
```
ufmapl (config) # ib sharp dump-files-generation enable
```

**Related Commands**: show ib sharp

**Notes**: N/A

### 10.7.4.7 ib sharp dynamic-tree-allocation enable

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ib sharp dynamic-tree-allocation enable</td>
<td></td>
</tr>
<tr>
<td>no ib sharp dynamic-tree-allocation enable</td>
<td></td>
</tr>
<tr>
<td>Enables dynamically allocated trees for each SHARP job</td>
<td></td>
</tr>
<tr>
<td>The no form of the command disables dynamically allocated trees for each SHARP job</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**: N/A

**Default**: Enable

**Configuration Mode**: config

**History**: 1.6.0

**Example**:
```
ufmapl (config) # ib sharp dynamic-tree-allocation enable
```

**Related Commands**: show ib sharp

**Notes**: N/A

### 10.7.4.8 ib sharp dynamic-tree-algorithm

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ib sharp dynamic-tree-algorithm &lt;0-1&gt;</td>
<td></td>
</tr>
<tr>
<td>no ib sharp dynamic-tree-algorithm</td>
<td></td>
</tr>
<tr>
<td>Sets which algorithm should be used by the dynamic tree mechanism</td>
<td></td>
</tr>
<tr>
<td>The no form of the command restores the algorithm used by the dynamic tree mechanism to default</td>
<td></td>
</tr>
</tbody>
</table>

**Syntax Description**: N/A

**Default**: 0

**Configuration Mode**: config
<table>
<thead>
<tr>
<th>History</th>
<th>1.6.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>ufmapl (config) # ib sharp dynamic-tree-algorithm</code></td>
</tr>
<tr>
<td>Related Commands</td>
<td><code>show ib sharp</code></td>
</tr>
<tr>
<td>Notes</td>
<td>N/A</td>
</tr>
</tbody>
</table>

10.7.4.9 **ib sharp ib-qpc-sl <0-15>**

- **Description**
  - Set the IB QP context SL for SHARP data path communication
  - The no form of the command restores the IB QP context SL for SHARP data path communication to default

- **Syntax**
  - N/A

- **Default**
  - 0

- **Configuration Mode**
  - config

- **History**
  - 1.6.0

- **Example**
  - `ufmapl (config) # ib sharp ib-qpc-sl 1`

- **Related Commands**
  - `show ib sharp`

- **Notes**
  - N/A

10.7.4.10 **ib sharp ib-sat-qpc-sl <0-15>**

- **Description**
  - Sets the IB QP context SL for SHARP streaming data path communication
  - The no form of the command restores the IB QP context SL for SHARP streaming data path communication to default

- **Syntax**
  - N/A

- **Default**
  - 1

- **Configuration Mode**
  - config

- **History**
  - 1.6.0

- **Example**
  - `ufmapl (config) # ib sharp ib-sat-qpc-sl 1`

- **Related Commands**
  - `show ib sharp`

- **Notes**
  - N/A
11 UFM Enterprise Appliance Upgrade

Upgrading the UFM Enterprise Appliance is supported up to two previous GA software versions (GA -1 or GA -2).
For example, if you wish to upgrade to UFM Enterprise Appliance v1.8.0, it is possible to do so only from UFM Enterprise v1.7.0 or v1.6.1.

This is the recommended upgrade procedure, which involves upgrading all UFM Enterprise appliance software components and operating system. For additional upgrade procedures of specific software components, please refer to Appendix - Software Components Upgrade.

As of UFM Enterprise Appliance version 1.5.0, upgrading the appliance on HA supports an in-service upgrade, meaning UFM can continue running during the steps of the upgrade, and there is no need to stop UFM before the upgrade.

The upgrade is performed on both Master and Standby nodes.

To upgrade the UFM Enterprise Appliance software:
1. On the standby server, extract the OMU image to the /tmp folder:

   ```bash
   tar -xzf ufm-appliance-<version>-omu.tar -C /tmp
   ```

2. On the standby server, access the installation folder and upgrade script:

   ```bash
   standby# cd /tmp/ufm-appliance-<version>-omu
   ```

3. Run the UFM upgrade script on the standby server:

   ```bash
   ./ufm-os-upgrade.sh --yes --reboot
   ```

4. After the reboot procedure is complete, a systemd service (ufm-os-firstboot.service) runs the remainder of the upgrade procedure. Once completed, a message is prompted to all open terminals including the status:
   "UFM-OS-FIRSTBOOT-FAILURE" - if installation is failed.
   "UFM-OS-FIRSTBOOT-SUCCESS" - if installation succeeded.

   Example:

   ![Status Message]

   To manually check the status, run `systemctl status ufm-os-firstboot.service`. If it is already finished, an error message is prompted stating that there is no such service. In that case, the log /var/log/ufm-os-firstboot.log can be checked instead.

   ```bash
   systemctl status ufm-os-firstboot.service
   ```
Example:

```
root@ufm-aio3:~# systemctl status ufm-os-firstboot
Unit ufm-os-firstboot.service could not be found.
root@ufm-aio3:~#
```

⚠️ Do NOT proceed to the next step before ensuring that the `systemctl status ufm-os-firstboot.service` service has been completed.

5. After the completion of the upgrade script, the UFM code is upgraded, while the UFM data remains unchanged. The automatic upgrade of UFM data will take place during the next UFM startup. To initiate this process, execute a failover from the Master node (or perform a takeover from the Standby node).

```
master# ufm_ha_cluster failover
```

⚠️ The upgrade script logs the data to `/var/log/ufm_os_upgrade_<UFM-OS version>.log` and outputs simultaneously it to the screen. In case of an issue, UFM data can be restored to factory default. For more information, refer to Appendix - UFM Factory Reset.

6. Once UFM is operational on the upgraded node (formerly the standby node), proceed to replicate steps 1 to 3 on the non-upgraded node (previously the master node).

### 11.1 In-Service Upgrade via CLI

Alternatively, in-service upgrade can be performed via the CLI. The upgrade is performed on both Master and Standby nodes.

Follow the below instructions:

1. On the Standby node, fetch the new image from a remote server. Run:

```
ufmapl (config) # image fetch <download URL>
```

2. On the Standby node, install the new image. Run:

```
ufmapl (config) # image install <image name>
```

3. Reload the Standby UFM Enterprise Appliance. Run:

```
ufmapl (config) # reload
```

4. After the completion of the upgrade on the Standby node, the UFM code is upgraded, while the UFM data remains unchanged. The automatic upgrade of UFM data will take place during the next UFM startup. To initiate this process, execute a failover from the Master node. Once the Standby node is up and running, perform a failover on the Master node. Run:

```
ufmapl (config) # ufm_ha failover
```
5. Once UFM is operational on the upgraded node (formerly the standby node), proceed to replicate steps 1 to 3 on the non-upgraded node (previously the Master node).
12 Troubleshooting

12.1 Split-Brain Recovery in HA Installation

The split-brain problem is a DRBD synchronization issue (HA status shows DUnknown in the DRBD disk state), which occurs when both HA nodes are rebooted. For example, in cases of electricity shut-down. To recover, please follow the below steps:

- **Step 1:** Run the following command to clear the cluster failure.

  ```
  pcs resource cleanup
  ```

  If the split-brain issue is not resolved, perform the below steps.

- **Step 2:** Manually choose a node where data modifications will be discarded. It is called the split-brain victim. Choose wisely; all modifications will be lost! When in doubt, run a backup of the victim’s data before you continue.

  When running a Pacemaker cluster, you can enable maintenance mode. If the split-brain victim is in the Primary role, bring down all applications using this resource. Now switch the victim to the Secondary role:

  ```
  victim# drbdadm secondary ha_data
  ```

- **Step 3:** Disconnect the resource if it’s in connection state WFConnection:

  ```
  victim# drbdadm disconnect ha_data
  ```

- **Step 4:** Force discard of all modifications on the split-brain victim:

  ```
  victim# drbdadm connect --discard-my-data ha_data
  ```

- **Step 5:** Resync starts automatically if the survivor is in a WFConnection network state. If the split-brain survivor is still in a Standalone connection state, reconnect it:

  ```
  survivor# drbdadm connect ha_data
  ```

  Now the resynchronization from the survivor (SyncSource) to the victim (SyncTarget) starts immediately. There is no full sync initiated, but all modifications on the victim will be overwritten by the survivor’s data, and modifications on the survivor will be applied to the victim.
13 Appendixes

The root page null could not be found in space NVIDIA UFM Enterprise Appliance Software User Manual v1.8.0.

13.1 Appendix - Chassis Health Monitoring

13.1.1 Overview

Chassis Health Monitoring enables monitoring hardware alerts via `rsyslog` and generating external events in UFM. The alerts are written to `/var/log/syslog`.

Monitoring hardware health status is essential for failure prevention and maintenance. The Chassis Health Monitoring service is run as a Docker container.

13.1.2 Configuration

1. Generate UFM token authentication. Run:

   ```
   POST https://<UFM server IP>/ufmRest/app/tokens
   ```

2. Set the UFM server hostname and authentication token in `/opt/ufm/chassis_health/chassis_health.conf`:

   ```
   [connection]
   # UFM server hostname. In case of HA, it should be the VIP
   hostname =
   
   [authentication]
   # UFM server user credentials
   token =
   ```

3. Restart the Chassis Health Monitoring service for changes to take effect. Run:

   ```
   systemctl restart ufm-chassis-health.service
   ```

   Once the service runs, the status can be viewed via `systemctl` (```systemctl status ufm-chassis-health.service```) and `/var/log/chassis_health_fluentd_console.log` file.

13.2 Appendix - Secure Boot Activation and Deactivation

- 13.2.1 Enabling Secure Boot
  - 13.2.1.1 Add NVIDIA Certificate to MOK DB
  - 13.2.1.2 Enable Secure Boot

- 13.2.2 Disable Secure Boot
  - 13.2.2.1 Disable Secure Boot in the BIOS
  - 13.2.2.2 Remove the NVIDIA Certificate from MOK db

This section provides instructions on how to enable/disable the Secure Boot feature in UFM Enterprise Appliance.
13.2.1 Enabling Secure Boot

The NVIDIA public certificate needs to be imported to the Machine Owner Key DB (MOK DB) before enabling secure boot. To do so, follow the below steps:

13.2.1.1 Add NVIDIA Certificate to MOK DB

1. Download NVIDIA certificate `mlnx_signing_key_pub.der` to a temporary folder.
   checksums:
   - MD5: c3ce3dcad0f38b02a9cbb991ce1bc7f4
   - sha256: ff7fe8c650e936079a8add2900b190f9e7f3806e5ad42e48c2b88408a6ce70aa

   ```
   cd /tmp
   wget http://www.mellanox.com/downloads/ofed/mlnx_signing_key_pub.der
   ls -ltrh .
   ```

   Example:

   ```
   root@ubuntu:/tmp# ls -ltrh mlnx_signing_key_pub.der
   -rwxr-xr-x 1 root root 1.5K Feb 23 2017 mlnx_signing_key_pub.der
   ```

2. Import the `mlnx_signing_key_pub.der` to MOK DB using `mokutil`:

   ```
   cd /tmp
   mokutil --import ./mlnx_signing_key_pub.der --root-pw
   ```

   The certificate is in the enrolled queue at this point. Upon the next server reboot, a 10 second prompt appears at the start of the boot process to confirm the certificate addition. It is important to confirm the certificate addition at this stage. Failure to do so requires you to repeat the procedure.
   To be able to interact with the prompt, a console connection is needed either from the serial port or from the web console available via Remote Management.

   Verify the certificate in the enrolled queue:

   ```
   mokutil --list-new
   ```

3. Login to Remote Management via https://<iDRAC-ip address>
4. To open the virtual web console, click on “Dashboard” → “Virtual Console”

5. Power cycle the server (at boot startup a 10 second prompt appears to verify the certificate addition)

On the top menu, go to “Power” → “Reset System (warm boot)"

The server will now reboot.

6. At boot startup, a confirmation prompt appears to verify certificate addition. The prompt closes after 10 seconds, so if missed, the certificate addition procedure needs to be done again.

When the prompt appears, press any key to interact.
7. Navigate to “Delete MOK”
8. View the certificate to be enrolled. To verify, press “View key0”.

Press “Enter” to exit the view.
9. Select "Continue" from the menu and press Enter.

10. Select "Yes" from the menu, and press Enter.
11. A password prompt appears, then, enter the OS Root user credentials.

12. Select "Reboot" and press Enter. After the reboot is completed, the certificate is removed.

13.2.1.2 Enable Secure Boot
1. Login to Remote Management available via https://<iDRAC-ip address>
2. Navigate to "Configuration" → "BIOS Settings" → "System Security" and press the drop down menu (arrow).

3. Scroll down to "Secure Boot" and select "Enabled" from the drop menu. Click the "Apply" button.

4. Scroll to the bottom of the page and click on "Apply And Reboot" button, this will reboot the server and perform the configuration.
5. An Information Popup is prompted. Click on the "Job Queue" button (can also be navigated from "Maintenance" → "Job Queue").
6. Wait for the Jobs to finish and reach 100%

7. Validate that secure boot is enabled and active (from the terminal).

    mokutil --sb-state

    root@ubuntu:~# mokutil --sb-state
    SecureBoot enabled

    mokutil --list-enrolled | grep -i mellanox

    root@ubuntu:~# mokutil --list-enrolled | grep -i mellanox
    Issuer: Mellanox Technologies, Mellanox Technologies signing key/emailAddress=support@mellanox.com
    Subject: Mellanox Technologies, Mellanox Technologies signing key/emailAddress=support@mellanox.com

13.2.2 Disable Secure Boot

Disabling secure boot is not recommended and may cause security issues.

Secure Boot needs to be disabled prior to removing the NVIDIA public certificate.
The removal of the certificate is optional and can be skipped if secure boot should be re-enabled at some point in the future.

13.2.2.1 Disable Secure Boot in the BIOS
1. Login to Remote Management (https://<iDRAC-ip address>)
3. Scroll down to “Secure Boot” and select “Disabled” from the drop menu, and click the “Apply” button.

4. Scroll to the bottom of the page and click on the “Apply And Reboot” button; this will reboot the server and perform the configuration.
5. An Information Popup is prompted. Click on the "Job Queue" button (can also be navigated from "Maintenance" → "Job Queue").
6. Wait for the completion of the jobs (reach 100%).

![Job Completion](image)

7. Validate that secure boot is Disabled (from the terminal).

```
root@ubuntu:/tmp:~ ls -ltrh mlnx Signing_key pub.der
-rw-r--r-- 1 root root 1.5K Feb 23 2017 mlnx Signing_key pub.der
```

13.2.2.2 Remove the NVIDIA Certificate from MOK db

Perform this step if you want to entirely remove NVIDIA’s certificate from MOK DB. This step is optional and is not required to disable secure boot. Skip this if you wish to enable secure boot at a later time.

1. Login as root to the UFM server.
2. Check current enrolled certificates.

```
mokutil --list-enrolled
```

Search for “Issuer: O=Mellanox Technologies..” and note the key ID above the start of this certificate:

```
root@ubuntu:~# mokutil --sb-state
```

3. Download the `mlnx Signing_key pub.der` to a temporary folder (the DER certificate file must be present to be deleted). If the certificate is not available, it can be exported.

```
ct /tmp
wget http://www.mellanox.com/downloads/ofed/mlnx Signing_key pub.der
```

Or export from current keys (all the keys are named MOK-000X.der) and search the NVIDIA certificate.
Validate the certificate:

```
openssl x509 -inform der -in MOK-0002.der -noout -issuer
```

4. Remove the certificate from the MOK db. The below example lists MOK-0002.der, the naming convention might be different.

```
mokutil --delete ./MOK-0002.der --root-pw
```

The above can be validated by running

```
mokutil --list-delete
```

⚠️ The certificate is in the enrolled queue at this point. Upon the next server reboot, a 10 second prompt appears at the start of the boot process to confirm the certificate addition. It is important to confirm the certificate addition at this stage. Failure to do so requires you to repeat the procedure. To be able to interact with the prompt, a console connection is needed either from the serial port or from the web console available via Remote Management.

5. Login to Remote Management (https://<iDRAC-ip address>)
6. click on “Dashboard” → “Virtual Console” to open the virtual web console.

7. Power cycle the server (at boot startup, a 10 second prompt appears to verify the certificate deletion).
   On the top menu: “Power” → “Reset System (warm boot)”.

   The server now performs reboot.

8. Once the startup procedure begins, a confirmation prompt appears to verify certificate deletion. The prompt closes after 10 seconds, if missed, the certificate deletion procedure needs to be repeated.
   Once the prompt appears, press any key to interact.
9. Navigate to "Delete MOK".
10. View the certificate to be deleted. To verify, press “View key0”.

Press “Enter” to exit the view.
11. Select "Continue" from the menu and press the Enter key.

12. Select "Yes" from the menu and press the Enter key.
13. Once a password prompt appears, enter the OS root user credential.

14. Select "Reboot" from the menu and press Enter. Upon reboot completion, the certificate is removed.
13.3 Appendix - Deploying UFM Appliance from an ISO File

This section provides a step-by-step guide for deploying UFM Enterprise Appliance from an ISO file.

The ISO installation is set to use interface “eno8303” via a DHCP as default; if DHCP is unavailable, the installer will request manual intervention to set the IP address manually on “eno8303” or to skip the IP settings altogether.

If IP settings are skipped, they can be set manually after the installation. Refer to Getting Started.

If a different interface should be used, skip the IP settings when prompted.

### 13.3.1 Deploying UFM Appliance from an ISO File

Extract the `ufm-appliance-<version>-omu.tar` to a temporary directory.

```bash
Extract TAR file

tar xzf /path/to/tar.tar -C /tmp
```

An ISO file and an upgrade script will be present inside the directory.

```bash
Extract TAR file

ls -ltrh /tmp/ufm-appliance-<version>/
```

Follow the following steps based on the desired method of installation.

#### 13.3.1.1 Virtual Media via Management Port

1. Open a web browser and navigate to https://<IDRAC-ILO-address>
2. On the Dashboard pane, click on the virtual console icon on the bottom right corner of the screen.
3. A new virtual console window will pop out, on the top right corner, click on the virtual media.
4. Click on the "Connect Media" button.

5. Under the "Map CD/DVD" section, click on "Choose file" and select the `ufm-appliance-<version>.iso` file extracted from the tar archive previously extracted and click on the
"Map Device" button. Then, "Close".
6. Click on the "Boot" menu button on the top left, on the opened menu choose "Virtual CD/DVD/ISO".
7. Click on the "Power" menu button and select "Reset System (warm boot)" entry.
8. At this point an automatic installation should start.

![Installation screen](image)

Installation will auto start after 30 seconds, press the enter key to start it immediately.

9. Proceed to Finalizing the Installation.

13.3.1.2 Physical USB

13.3.1.2.1 Burn ISO to USB

13.3.1.2.1.1 Windows

1. Download and open Rufus (Rufus).
2. Select the USB device from the drop down menu under "Devices".
   
   Click on "SELECT" and select `ufm-appliance-<version>.iso`
   
   Validate that the "Partition Scheme" is MBR and "Target System" is "BIOS or UEFI", as seen in the screenshot below.
   
   Click "START".
[Image of Rufus software settings window]

1. Selected drive: sandisk (D:) [18 GB]
3. Start button highlighted
3. An "ISOHybrid image detected" prompt will pop up, choose "Write in DD mode" and click "OK".

![ISOHybrid image detected](image)

The image you have selected is an 'ISOHybrid' image. This means it can be written either in ISO Image (file copy) mode or DD Image (disk image) mode. Rufus recommends using ISO Image mode, so that you always have full access to the drive after writing it. However, if you encounter issues during boot, you can try writing this image again in DD Image mode.

Please select the mode that you want to use to write this image:
- [ ] Write in ISO Image mode (Recommended)
- [x] Write in DD Image mode

4. Another message will appear stating that all data on the USB device will be lost, click "OK and continue".

![Rufus warning](image)

WARNING: ALL DATA ON DEVICE 'NO_LABEL (Disk 1) [16 GB]' WILL BE DESTROYED.
To continue with this operation, click OK. To quit click CANCEL.

5. Wait for Rufus to finish.

### 13.3.1.2.1.2 Linux

1. Identify the USB drive:

   ✩ Do not run the following commands on a hard drive device, but only on the USB. The USB drive in the below command is mapped to sdb.

   ```bash
   root@ubuntu18:~ ls -ltrh /dev/disk/by-id/usb-
   lrwxrwxrwx 1 root root 9 Jan 2 13:44 /dev/disk/by-id/usb-
   lrwxrwxrwx 1 root root 10 Jan 2 13:44 /dev/disk/by-id/usb-
   ``

2. Copy the ufm-appliance-<version>.iso to the USB using the following dd command:

   ✩ Do NOT run the following commands on a hard drive device but only on the USB. The USB drive in the below command is mapped to /dev/sdb.

   ```bash
   root@ubuntu18:~ ls -ltrh /dev/disk/by-id/usb-
   lrwxrwxrwx 1 root root 9 Jan 2 13:44 /dev/disk/by-id/usb-
   ```
3. Verify that the USB is bootable:

```
root@ubuntu18:~# fdisk -l /dev/sdb
Disk /dev/sdb: 14.9 GiB, 16005464064 bytes, 31260672 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x594ec03e
Device Boot Start   End   Sectors  Size Id Type
/dev/sdb1 *       64 15679439 15679376 7.5G 17 Hidden HPFS/NTFS
```

4. Unplug the USB.

13.3.1.2.2 Manufacture UFM Appliance via the USB

1. Plugin the USB device to the back panel (Front panel USB is disabled).
2. Open a web browser and navigate to https://<IDRAC-ILO-address>.
3. Navigate to “Configuration” → “BIOS Settings” → “Boot Settings” and set “Generic USB boot” option to enabled.

4. On the same pane, scroll down to “One-Time Boot” → “One-Time Boot Device List” select “UEFI Boot Sequence Device”.
   In “UEFI Boot Sequence Device”, select the connected USB device and click apply. On the bottom of the page click on “Apply And Reboot” button.
5. A popup message will appear click on "Job Queue" button.
6. A "Job Queue" pane will open to monitor the progress of the created job.

7. Navigate to the Dashboard pane, click on the virtual console icon on the bottom right corner of the screen.

A new console window will appear that shows the progress of restarting the node to USB.
8. At this point an automatic installation should start.

The installation will auto start after 30 seconds, press the enter key to start it immediately.

9. Proceed to the following section to proceed with the installation.
13.3.1.3 Finalizing the Installation

Installation may take 20-90 minutes and depends on the chosen media; with USB it takes around 20 minutes and via the virtual media take around 90 minutes (this may vary and depends on network speed).

1. Installation should start automatically, and the progress is presented on the screen.
2. In case a DHCP is not available or not configured, a prompt will pop up with notification stating that DHCP cannot be set.
3. Press “Enter” to continue, a sub menu will appear.

You can choose the preferred option and follow the instructions on the screen by configuring it manually, or skip network configuration and add them at a later point.

4. The installation procedure should continue.
The installer may seem stuck when the status bar gets to "Running preseed" (14-16 %)
- it takes a while to pass this, the script runs in the background and the progress can
be seen by switching to tty4 (optional) by opening the virtual keyboard.

This should be done on the virtual keyboard, otherwise it will close the installation
window. The installation window can be opened by pressing "ALT+F4" on the virtual
keyboard.

tty4 will open and the install log will show current status.
5. To return to the progress screen, click on "ALT+F1" on the virtual keyboard.
6. The server will automatically reboot when the installation procedure is completed.

At this point, the login screen will appear.

The installation procedure is not finished yet. At this point, an automatic service will install additional SW (including the UFM Enterprise Appliance).

Upon installation completion, a message will appear on any attached terminal stating UFM-OS-FISTBOOT-SUCCESS for successful installation, or UFM-OS-FISTBOOT-FAILED for failed installation.

A log can be checked in `/var/log/ufm-os-firstboot.log`.

The below is an example from an attached ssh session:

```
Broadcast message from root@ufm-a03 (somewhere) (Fri Dec 30 18:47:32 2022):
UFM-OS-FIRSTBOOT-SUCCESS, installation succeeded additional info is available in /var/log/ufm-os-firstboot.log
```

Example from the console web screen:
To manually check if the installation procedure has completed or is still running:

```
systemctl status ufm-os-firstboot.service
```

If the installation is still running, the below status will be presented:

If the installation is completed, an error message stating that `ufm-os-firstboot.service`
does not exist (as it is deleted when the installation is finished).

7. The installation is now finished and the UFM Enterprise Appliance can be started. If the network configuration step is skipped in previous steps, it can now be configured.

13.4 Appendix - UFM Factory Reset

This section provides a comprehensive guide on resetting UFM to its original factory settings.

⚠️ WARNING!!! this operation will remove all user data and configuration and will restore UFM to its factory defaults.

⚠️ The UFM Factory-Reset will exclusively revert UFM to its original factory settings, leaving HA configurations unaffected. To remove HA, it is essential to execute `ufm_ha_cluster cleanup` before initiating the factory reset.

13.4.1 UFM Docker Container Factory Reset

To reset UFM to its factory defaults when using UFM on a Docker container, follow these steps.

1. Ensure that UFM is not up and running. If UFM is running, stop it.

   For Stand-alone (SA) installations:

   ```
   systemctl stop ufm-enterprise
   # validate that ufm is not running
   systemctl status ufm-enterprise
   ```

   For High-Availability setups (perform the following on the master node only):
2. Run `mellanox/ufm-enterprise` Docker Container with the following flags:

```bash
docker run -it --name=ufm_installer --rm \
  -v /var/run/docker.sock:/var/run/docker.sock \
  -v /tmp:/tmp \
  -v /opt/ufm/files:/opt/ufm/shared_config_files/ \n  mellanox/ufm-enterprise:latest \
  --factory-reset
```

<table>
<thead>
<tr>
<th>Flag</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>--name=ufm_installer</code></td>
<td>Mandatory</td>
<td>The container name must be called ufm_installer.</td>
</tr>
<tr>
<td><code>-v /var/run/docker.sock:/var/run/docker.sock</code></td>
<td>Mandatory</td>
<td>The docker socket must be mounted on the docker container.</td>
</tr>
<tr>
<td><code>-v /tmp:/tmp</code></td>
<td>Optional</td>
<td>Logs of the operation can be viewed in /tmp on the host in case it is mounted.</td>
</tr>
<tr>
<td><code>-v /opt/ufm/files:/opt/ufm/shared_config_ufm/</code></td>
<td>Mandatory</td>
<td>For the factory reset to persist, it is essential to have the /opt/ufm/files directory mounted from the host. TBD: eylon - naming convention of the /opt/ufm/files/</td>
</tr>
<tr>
<td><code>mellanox/ufm-enterprise:latest</code></td>
<td>Mandatory</td>
<td>The docker image name.</td>
</tr>
<tr>
<td><code>--factory-reset</code></td>
<td>Mandatory</td>
<td>This action will signal the UFM container to initiate the factory reset process.</td>
</tr>
</tbody>
</table>

**WARNING:** This operation will erase all user data and configurations, resetting UFM to its factory defaults.

**CAUTION:** This step does not require user confirmation, meaning UFM will be restored to factory defaults immediately once initiated.

---

13.4.2 UFM Factory Reset via CLI

13.4.2.1 UFM Factory Reset in HA Configuration

![Warning]
The UFM Factory-Reset will exclusively revert UFM to its original factory settings, including the HA configurations.

1. On the Master node, stop the UFM cluster. Run:

   ```
   ufmpl (config) # no ufm start
   ```

2. On both Master and Standby nodes, reset the UFM cluster configuration to factory settings. Run:
13.4.2.2 UFM Factory Reset in Standalone Configuration

⚠️ The UFM Factory-Reset will exclusively revert UFM to its original factory settings.

1. Stop the UFM service. Run:

   ```
   ufmpl (config) # no ufm start
   ```

2. Reset the UFM data to factory settings. Run:

   ```
   ufmpl (config) # ufm data reset
   ```

13.5 Appendix - Software Components Upgrade

⚠️ It is recommended to upgrade all UFM Enterprise appliance software components as listed in UFM Enterprise Appliance Upgrade. This section includes optional instructions on how to upgrade specific software components.

- **Upgrading UFM Enterprise Appliance Operating System**: Involves UFM Enterprise appliance operating system upgrade only.
- **Upgrading All UFM-Related Software Components**: Involves all UFM-related software components, including UFM Enterprise, Docker Container and UFM HA. The upgrade is done on all software components at once.
- **Upgrading Specific UFM-Related Software Component**: Involves upgrading specific UFM-related software components separately.

13.5.1 Upgrading UFM Enterprise Appliance Operating System

This section provides a step-by-step guide for UFM Enterprise Appliance Operating System upgrade. Each UFM Enterprise Appliance software has an additional tar file with a `-omu.tar` suffix (OMU stands for OS Manufacture and Upgrade). This tar file can be used to re-manufacture the server and to upgrade the operating system/software on the server.

13.5.1.1 Extracting the Software

1. Copy the OMU tar file to a temporary directory on the server.

   ```
   UFM-APPLIANCE - ufm-appliance<version>-<revision>-omu.tar
   ```

After the factory reset procedure is completed, both UFM nodes are configured as Standalone mode.
2. Extract the contents of the tar file to /tmp.

```
tar vxzf /ufm-appliance-<version>-<revision>-omu.tar -C /tmp/
```

3. Change to the extracted directory.

```
cd /tmp/ufm-appliance-<version>-<revision>-omu
```

4. An upgrade script and an ISO file are included in the extracted directory.

```
ls -al .
./ufm-os-upgrade.sh
ufm-appliance-<version>-<revision>.iso
```

The following flags are available in the upgrade script help.

```
# ufm-os-upgrade.sh --help
ufm-os-upgrade.sh will upgrade and install OS packages.

IMPORTANT!!! a reboot is mandatory after the finalization of this script, kernel and kernel models will not work properly until the server is rebooted.

Additional SH installations will be automatically invoked after reboot, a message will pop on all open terminals with the installation status:
*UFM-OS-FIRSTBOOT-FAILURE* - if installation is failed.

*UFM-OS-FIRSTBOOT-SUCCESS* - if installation succeeded.

Additional info will be available in */var/log/ufm_os_upgrade_@@UFM-OS-VERSION@@.log* log file.
Upgrade steps status information can be viewed in */var/log/ufm_os_upgrade_@@UFM-OS-VERSION@@_status.log* log file.

Syntax: ufm-os-upgrade.sh [options]

options
-d,--debug debug info will be visible on the screen.
-r,--reboot Automatically reboot the server when upgrade is finished.
 P.S. if secure boot is enabled and a new certificate is enrolled the server will not automatically reboot even if this flag is set.
-y,--yes Will not prompt for user acknowledgements, use with CAUTION user prompts will be assumed as answered yes.
-h,--help print this help message.
```

⚠️ IMPORTANT!!! System reboot is mandatory once the upgrade procedure is completed. The **-r** flag can be used to automatically reboot the server at the end of the upgrade. Note that some kernel modules may not work properly until server reboot is performed.

### 13.5.1.2 Standalone Mode Upgrade

1. Stop UFM service by running the following command:

```
systemctl stop ufm-enterprise.service
```

2. Run the upgrade script.

⚠️ System reboot is mandatory once the upgrade procedure is completed. The **-r** flag can be used to automatically reboot the server.

The **--appliance-sw-upgrade** flag CAN NOT !!! be supplied to upgrade the UFM Enterprise Appliance SW.
The \texttt{-y} flag can be supplied to skip user questions (the flag does not automatically reboot the server on its own. For auto reboot, combine with the \texttt{-r} flag)

Once a secure boot certificate is updated/installed, the script will not auto reboot even if \texttt{-y} and \texttt{-r} flags are provided. That is because the addition of certificates require manual user intervention at boot (after the upgrade).

There is a 10 seconds window to press any button when prompted during the boot procedure and insert the server root password in order to import the certificate. Further details are available in \textbf{Appendix - Secure Boot Activation and Deactivation}.

In the following example the server will auto reboot when upgrade is finished.

\begin{verbatim}
./ufm-os-upgrade.sh -y -r
\end{verbatim}

3. In case a secure-boot certificate is installed/upgraded, the following warning is presented:

\begin{verbatim}
WARNING!!
The secure boot certificate have been removed, to enroll the newly installed certificate:
[1] reboot the server:
[2] a warning screen will pop out notifying a new certificate have been enrolled
[3] there is a 10 seconds window to apply the new certificate (if missed please refer to manual on how to update the certificate manually)

If secure boot is enabled please discard this message
\end{verbatim}

In that case the server does not reboot automatically, a manual configuration is required at boot (a 10 second prompt appears during the boot. For more information, refer to \textbf{Appendix - Secure Boot Activation and Deactivation}.

To continue with the upgrade procedure, manually reboot the server from as instructed in \textbf{Appendix - Secure Boot Activation and Deactivation}.

4. After the reboot procedure is complete, a systemd service (\texttt{ufm-os-firstboot.service}) runs the remainder of the upgrade procedure. Once completed, a message is prompted to all open terminals including the status:

"\texttt{UFM-OS-FIRSTBOOT-FAILURE}" - if installation is failed.

"\texttt{UFM-OS-FIRSTBOOT-SUCCESS}" - if installation succeeded.

\textbf{Example:}

\begin{verbatim}
root@ufm-aio3:~# systemctl status ufm-os-firstboot.service
ufm-os-firstboot.service  23:47:32 up 2 days, 1:31:31 ago
\end{verbatim}

To manually check the status, run \texttt{systemctl status ufm-os-firstboot.service}. If it is already finished, an error message is prompted stating that there is no such service. In that case, the log /\texttt{var/log/ufm-os-firstboot.log} can be checked instead.

\begin{verbatim}
systemctl status ufm-os-firstboot.service
\end{verbatim}

\textbf{Example:}

\begin{verbatim}
root@ufm-aio3:~# systemctl status ufm-os-firstboot
Unit ufm-os-firstboot.service could not be found.
root@ufm-aio3:~# 
\end{verbatim}

\textbf{13.5.1.3 High-Availability Mode Upgrade}

Upgrade on HA should be done first on the stand-by node and after that on the master node, each node upgrade is similar to the SA instructions.
In case the Standby node is unavailable, the upgrade can be run on the Master node only, however, some additional steps will be required after the appliance is upgraded.

⚠️ In case a secure boot certificate needs to be updated/installed, the script will stop execution and request the user to install the secure-boot certificate, secure-boot does not have to be active (although it is highly recommended), but the certificate must be installed/updated by the user before proceeding to the upgrade.

The upgrade script will verify that the certificate is up to date and will stop execution if it needs to be installed/updated (this happens at the start of the script)

1. [On the stand-by Node]: Copy and extract the OMU tar file to a temporary directory.
2. [On the stand-by Node]: Run the upgrade script.

⚠️ System reboot is mandatory once the upgrade procedure is completed. The `-r` flag can be used to automatically reboot the server.

The `-y` flag CAN NOT !!! be supplied to upgrade the UFM Enterprise Appliance SW.

The `-y` flag can be supplied to skip user questions (the flag does not automatically reboot the server on its own. For auto reboot, combine with the `-r` flag).

In the following example the server auto reboots once the upgrade procedure is completed:

```bash
cd /tmp/ufm-appliance-<version>-<revision>-omu
./ufm-os-upgrade.sh -y -r
```

3. If `-r` flag was not provided reboot the server when the script will finish (a question will show on the screen that will ask to reboot if No was answered a manual reboot is required) to manually reboot the server:

   ```bash
   reboot now
   ```

4. After the reboot procedure is complete, a systemd service (ufm-os-firstboot.service) runs the remainder of the upgrade procedure. Once completed, a message is prompted to all open terminals including the status:
   "UFM-OS-FIRSTBOOT-FAILURE" - if installation is failed.
   "UFM-OS-FIRSTBOOT-SUCCESS" - if installation succeeded.

Example:

```bash
root@ufm-a013:~# systemctl status ufm-os-firstboot.service
```

To manually check the status, run `systemctl status ufm-os-firstboot.service`. If it is already finished, an error message is prompted stating that there is no such service. In that case, the log `/var/log/ufm-os-firstboot.log` can be checked instead.

```bash
systemctl status ufm-os-firstboot.service
```
Example:

```
root@ufm-ai03:~# systemctl status ufm-os-firstboot
Unit ufm-os-firstboot.service could not be found.
root@ufm-ai03:~#
```

5. After the stand-by node have finished the upgrade check the HA cluster status

All the nodes in the cluster should be online and the current node should remain a stand-by (Secondary in DRBD_ROLE)

6. [On the Master Node]: Fail-over the UFM to the stand-by node (upgraded node will become master and current node will become stand-by).

```
ufm_ha_cluster failover
```

wait for all the resource of UFM are up and running on the upgraded node.

7. repeat the procedure on the un-upgraded node (which is now acting as stand-by).

13.5.2 Upgrading All UFM-Related Software Components

The installation process consists of replacing the containers/packages with the new version and upgrading the UFM data.

1. Copy the tarball file of UFM Enterprise Appliance software to the /tmp folder.
2. Connect to the UFM Enterprise Appliance via SSH.
3. Stop the UFM service/cluster before upgrading.
   
   In SA mode, run:
   ```
   # systemctl stop ufm-enterprise.service
   ```
   
   In HA mode, run:
4. Extract the tarball file and run the installer for the upgrade. Run:

```
# cd /tmp
# tar xvf ufm-appliance-sw-<version>.tar
# cd ufm-appliance-sw-<version>
# ./install.sh
```

**Installer Options:**

```
-q|--quiet
```

Upgrade UFM without prompt

In HA mode, this step should be performed on both servers.

5. After the upgrade, start the UFM service/cluster.
   - In SA mode, run:
     ```
     # systemctl start ufm-enterprise.service
     ```
   - In HA mode, run:
     ```
     # ufm_ha_cluster start
     ```

6. Wait one minute for the service to come up.
7. Ensure the service health. Run:

    ```
    # ufm_enterprise_sanity.sh
    Checking Service... Done
    Checking Images... Done
    Checking Containers... Done
    Checking ufm REST server... Done
    Sanity tests completed successfully!
    ```

### 13.5.3 Upgrading Specific UFM-Related Software Component

#### 13.5.3.1 Upgrading UFM Docker in SA Mode

Stop the UFM service before upgrading. Run:

```
systemctl stop ufm-enterprise.service
```

For detailed information on upgrading the UFM docker in standalone mode, please refer to [Upgrading UFM on Docker Container](#).

#### 13.5.3.2 Upgrading UFM Docker in HA Mode

Stop the UFM cluster before upgrading. Run:

```
ufm_ha_cluster stop
```
For detailed information on upgrading the UFM docker in high availability mode, please refer to [Upgrading UFM on Docker Container](#).

### 13.5.3.3 Upgrading UFM HA Package

1. Stop the UFM cluster before upgrading. Run:
   ```bash
touch docker/ufm_ha_cluster_stop
```
2. Download the UFM-HA package on both servers using the following command:
   ```bash
   https://www.mellanox.com/downloads/UFM/ufm_ha_5.3.0-17.tgz
   ```
3. On both servers, extract the downloaded UFM-HA package under `/tmp/`
4. On both servers, go to the extracted directory `/tmp/ufm_ha_XXX` and run the installation script:
   ```bash
   ./install.sh --upgrade
   ```
5. After the upgrade, start the UFM HA Cluster. Run:
   ```bash
   ufm_ha_cluster start
   ```

### 13.5.3.4 Upgrading UFM Enterprise Appliance CLI Package

1. Copy the tarball of the UFM CLI package to the `/tmp` folder.
2. Extract the tarball file and run the installer. Example:
   ```bash
   # cd /tmp
   # tar xvf ufmcli_<version>.tgz
   # cd ufmcli_<version>
   # ./install.sh
   Creating the UFM3 CLI repository file /etc/apt/sources.list.d/ufmcli.list
   Refreshing the UFM3 CLI packages information...
   Installing the UFM3 CLI package...
   Removing the UFM3 CLI local repository /etc/apt/sources.list.d/ufmcli.list
   Done.
   ```
3. Once the upgrade procedure is completed, connect to the UFM Enterprise Appliance via SSH with admin. Run:
   ```bash
   ssh admin@hostname
   ```

### 13.6 Appendix - Deploy and Run UFM Plugins

#### 13.6.1 Overview

UFM plugins are service programs that can be dynamically loaded to extend the functionality of UFM Enterprise.

The plugins are Docker containers, and their life cycle is being managed by UFM.

Functions commonly added by optional UFM plugins include:
- REST-RDMA (REST requests over IB to the UFM server)
- NDT (NDT topo diff)
- ALM (Autonomous Link Maintenance)
- GNMI

### 13.6.2 Lifecycle

The UFM plugin lifecycle is managed by UFM. It is the user's responsibility to pull/load the plugin Docker container image on both master and standby nodes.

- **Add** - The plugin’s data is copied to the host. In case UFM is running, it will be started.
- **Disable** - The plugin is stopped immediately if UFM is running, and it will not start upon UFM start. However, its data is still accessible via the host.
- **Enable** - The plugin is re-started immediately if UFM running or on the next UFM start.
- **Remove** - The plugin is stopped, and all its data is removed.

### 13.6.3 Configuration

- **Pull the UFM plugin image. Run:**
  
  ```sh
  docker pull mellanox/ufm-plugin-ndt:1.1.1-17
  ```

- Alternatively, load the UFM plugin image. Run:
  
  ```sh
  image fetch sftp://root:123456@192.168.1.10/tmp/ufm-plugin-ndt_1.1.1-17-docker.img.gz
  docker load ufm-plugin-ndt_1.1.1-17-docker.img.gz
  ```

- Review the plugin image.

  ```sh
  Show docker images
  =================================================================================================
  Image                        Version   Created        Size    Digest
  =================================================================================================
  mellanox/ufm-plugin-ndt:1.1.1-17 2 months ago 1.59GB <none>
  ```

- **Deploy the plugin. Run:**
  
  ```sh
  ufm plugin ndt add tag 1.1.1-17
  ```

- **Review the plugin settings. Run:**

  ```sh
  Show ufm plugin
  Plugin ndt:
  Enabled: Yes
  Plugin Tag: 1.1.1-17
  Shared volumes: /opt/ufm/files/log:/log,/dev:/host_dev
  HTTPD port: 8080
  HTTPD file: Present
  State: running
  CPU limit: unlimited
  ```

⚠️ The plugin’s Docker container is started/stopped upon UFM start/stop. In case UFM is already running when the plugin is added/enabled, it will be started. While, in case it is disabled/removed, it will be stopped.
For the relevant CLI commands, refer to [UFM Plugins](#) and [Docker Container](#).

### 13.7 Appendix - NVP

#### 13.7.1 Overview

The NVP is designed to help customers change, retrieve, and apply the configuration changes to UFM configuration files. NVP aims to simplify the process, sparing users from manually editing the config files. NVP follows a transactional model approach, modifying/setting the configuration on temporary files. These changes are only integrated into the actual configuration upon executing the `apply` command. The tool supports three file types:

1. **flat config**: Refers to files that only have key-value pairs
2. **ini**: Refers to files that have sections associated with key-value pairs
3. **xml**: Refers to XML formatted files

It is important to note that the current version of NVP does not facilitate adding new configurations to existing configuration files. The tool is provided as a plugin and can be operated either as a standalone application using Docker commands or invoked through CLI commands. All the examples provided below illustrate the usage of NVP via UFM3CLI.

The tool supports the following functionalities:

1. **set**
2. **get**
3. **dump**
4. **apply**
5. **help**

⚠️ NVP operates on a transactional model, therefore it is recommended to avoid using it alongside manual configuration edits. Doing so may result in the loss of manually made changes when NVP applies its configurations to the relevant files. Users can either manually edit the configuration and then use NVP or vice versa, however it is not advisable to use them simultaneously.

Please note that the tool's plugin operates without a running daemon. Upon adding the plugin via the plugin infrastructure, its status remains "stopped" signifying its inactive state without a daemon. However, when a user initiates NVP (either through standalone Docker usage or via the CLI commands), the image activates, executes the command, performs the necessary operations, and then exits.

To add tools/NVP plugin, perform the following:

- Add the tools plugin with "latest" tag, run:

```bash
ufm plugin tools add tag latest
```
• It is recommended to disable the plugin as it is unnecessary for UFM to monitor the tools plugin. When the tools plugin invokes NVP Apply, it triggers a restart of UFM and all the plugins it monitors. To prevent this, disable the Tools/NVP plugin by running:

```
no ufm plugin tools enable
```

### 13.7.1.1 NVP Set

The Set API is designed to change a file's configuration based on the user's key-value pair. It updates the specified key with a new value. The NVP tool generates an error indicating 'key not found' if the given key is not found. Additionally, NVP refrains from making any changes if the new value for the key is identical to the old one. It is important to note that both the key and value are case-sensitive.

Refer to `nvp set` for command syntax.

Example of the `nvp set` command that changes `qos value` to TRUE for opensm.conf (flat config):

```
nvp set opensm.conf qos TRUE
```

Similarly, for INI:

```
nvp set gv.cfg GarbageCollector.enable false
```

For XML files, a valid XPath must be provided. See below examples of the `nvp set` command for an XML config:

```
... The XPath must be enclosed in double quotes for NVP to function. ...
```

```
nvp set UFMHealthConfiguration.xml "./*TestsSchedule/Test[@Name='CheckMgmtInterface']/Frequency/Value" 20
nvp set UFMHealthConfiguration.xml "./*SupportedTests/Test[Name='CpuUsageTest']/TestOperation[Name='CPUTest']/Parameters/Parameter[Name='ThresholdInPercents']/Value" 128
```

... Note that there may be instances where files share identical names but are located in different directories. In such scenarios, NVP requires the file name to include its parent directory. For example, consider the file `launch_ibdiagnet_config.ini`, which exists in both `secondary_telemetry_defaults` and `telemetry_defaults` directories. If a user intends to modify the file within `secondary_telemetry_defaults`, the command should resemble the following: ...

```
nvp set secondary_telemetry_defaults/launch_ibdiagnet_config.ini <key> <val>
```
To assign an empty value using the "nvp set" command, pass an empty string as the value. For example:

```
nvp set gv.cfg Multisubnet.multisubnet_role ""
```

### 13.7.1.2 NVP Get

The purpose of the "nvp get" command is to retrieve the configuration from a file based on the key provided by the user. If NVP cannot locate the specified key, it raises an error indicating 'key not found'. It is important to note that the "nvp get" retrieves values from the transactional configuration. This means that only files whose configurations have been modified by the user using the "nvp get" command will be accessible to it. Please note that the key is case-sensitive.

Refer to `nvp get` for command syntax.

An example of "nvp get" command that would retrieve qos from opensm.conf (flat config):

```
nvp get opensm.conf qos
```

Similarly, for INI:

```
nvp get gv.cfg GarbageCollector.enable
```

For XML files, a valid XPath must be provided. Here are a few examples of GET commands for XML configurations:

```
nvp get UFMHealthConfiguration.xml ./TestsSchedule/Test[@Name="CheckMgmtInterface"]/Frequency/Value
nvp get UFMHealthConfiguration.xml ./SupportedTests/Test[@Name="CpuUsageTest"]/TestOperation[@Name="CPUTest"]/Parameters/Parameter[@Name="ThresholdInPercents"]/Value
```

### 13.7.1.3 NVP Dump

The nvp dump command produces a unified JSON file. This JSON file contains the configurations of all the NVP-supported configuration files represented as JSON objects, consolidated into a single JSON structure. Each file's content or configuration is appended to create an aggregated JSON structure. The sequence of the JSON dump corresponds to the original configuration file's order.

Refer to `nvp dump` for command syntax.

### NVP Apply

The nvp apply command involves a two-step process. First, the NVP nvp apply command relocates all files that have been changed through the nvp set command to their original positions. The second step involves restarting the UFM Server to implement the new changes. The relocation of modified files from the transaction folder to their actual locations occurs independently of whether the UFM server is offline or if any errors arise during the UFM server
restart process. Notably, NVP does not support rollback functionality in the event of an unsuccessful UFM server restart. Therefore, the first step of the `nvp apply` command operates irrespective of the outcome of the second step (UFM restart success/failure). However, if an error occurs during the first step, the function will prompt an appropriate error message and exit without attempting to restart the UFM.

⚠ Please note that a confirmation prompt is presented to the user before proceeding with this action, as the command restarts the UFM.

Refer to `nvp apply` for command syntax.

### 13.7.1.4 NVP Apply Force

To bypass prompts, users can utilize the force option. This will initiate the UFM restart without any user interaction. Refer to `nvp apply force` for command syntax.

### 13.8 Tools Plugin

#### 13.8.1 NVP Tool Overview

The NVP is designed to help customers change, retrieve and apply the configuration changes to UFM parameter settings within config files. NVP aims to simplify the process, sparing users from manually editing the config files. It is important to note that NVP follows a transactional model approach, changing/setting the configuration on temporary files. These changes are only integrated into the configuration upon executing the `apply` command. The tool supports three file types:

1. flat config: Refers to files that only have key-value pairs
2. ini: Refers to files that have sections associated with key-value pairs
3. xml: Refers to XML formatted files

It is important to note that the current version of NVP does not facilitate adding new configurations to existing configuration files. The tool is provided as a plugin and can be operated either as a standalone application using Docker commands or invoked through CLI commands. All the examples provided below illustrate the usage of NVP via CLI.

The tool supports the following functionalities:

1. set
2. get
3. dump
4. apply
5. help
Please note that the tool's plugin operates without a running daemon. Upon adding the plugin via the plugin infrastructure, its status remains "stopped" signifying its inactive state without a daemon. However, when a user initiates NVP (either through standalone Docker usage or via the CLI commands), the image activates, executes the command, performs the necessary operations, and then exits.

13.8.1.1 NVP Set

The Set API is designed to change the configuration of a file based on the key-value pair provided by the user. It updates the specified key with a new value. If the given key is not found, the NVP tool generates an error indicating 'key not found'. Additionally, NVP refrains from making any changes if the new value for the key is identical to the old one. It is important to note that both the key and value are case sensitive.

Refer to TBD: link for command specifications.

An example of SET API that would change qos value to TRUE for opensm.conf(flat config) would be:

```
nvp set opensm.conf qos TRUE
```

Similarly, for INI

```
nvp set gv.cfg GarbageCollector.enable false
```

For XML files, a valid xpath must be provided. Few examples of SET for a XML config are: NOTE: The xpath must be enclosed in double-quotes for NVP to function.

```
nvp set UFMHealthConfiguration.xml "./TestsSchedule/Test[@Name='CheckMgmtInterface']/Frequency/Value" 20
nvp set UFMHealthConfiguration.xml "./SupportedTests/Test[@Name='CpuUsageTest']/TestOperation[@Name='CPUTest']/Parameters/Parameter[@Name='ThresholdInPercents']/Value" 120
```

NOTE: It is important to note that, there might be situation where file names are same but files are present in the different location. In this case, NVP expects file name to include its parent directory. For example, file `launch_ibdiagnet_config.ini` is present both in `secondary_telemetry_defaults` and `telemetry_defaults`. If user want to modify the file present in `secondary_telemetry_defaults`, command should look like below:

```
nvp set secondary_telemetry_defaults/launch_ibdiagnet_config.ini <key> <val>
```

To set an empty value using SET, empty string can be passed while using SET. Example:

```
nvp set gv.cfg Multisubnet.multisubnet_role ""
```

13.8.1.2 NVP Get

The Get API aims to retrieve the configuration of file based on the key entered by the user. In case, NVP is not able to find the given key, NVP throws an error of 'key not found'. It is important to note that, GET API retrieves the value from the transactional configuration. It means, only the files whose configuration has been changed by the user using the SET API will be visible to the GET API. Note that the key is case sensitive.

Refer to TBD: link for command specifications.

An example of GET API that would retrieve qos from opensm.conf(flat config) would be:

```
nvp get opensm.conf qos
```

Similarly, for INI
nvp get gv.cfg GarbageCollector.enable

For XML files, a valid xpath must be provided. Few examples of GET for a XML config are:

nvp get UFMHealthConfiguration.xml ./TestsSchedule/Test[@Name="CheckMgmtInterface"]/Frequency/Value
nvp get UFMHealthConfiguration.xml ./SupportedTests/Test[@Name='CpuUsageTest']/TestOperation[@Name='CPUTest']/Parameters/Parameter[@Name='ThresholdInPercents']/Value

13.8.1.3 NVP Dump

The NVP dump generates a single json file. The generated json file contains the configuration of all
the NVP supported configuration files as json objects dumped in one single json. Content/
configuration of each file is appended, overall to create a combined json structure. The order in the
json dump aligns with that of the original configuration file.

Refer to TBD: link for command specifications.

13.8.1.4 NVP Apply

The Apply API is a 2 step process. First, the NVP Apply moves all the files that have been changed
via SET API to their original location. The second step involves re-starting the UFM Server so that
the new changes take effect. Moving of changed files from transaction folder to the actual location
is independent of UFM server being down or any error occurs while re-starting the UFM server. NVP
does not support of roll-back in case UFM restart is not successful. So, the first step of APPLY API is
independent of the success/failure 2nd step(UFM restart). Ofcourse, if an error occurs in the first
step, NVP APPLY would throw an appropriate error and exit with trying to restart the UFM.

NOTE: A prompt is displayed for user if they would like to continue or not with this action as the API
involves UFM restart. The API expects the below syntax:

Refer to TBD: link for command specifications.

To not receive any prompts user may use force option. This will restart the UFM without any
prompt. The syntax for the same is:

Refer to TBD: link for command specifications.
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  - **General**  
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  - **Network Interfaces**  
    - show interfaces  
  - **License**  
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1.4.0 | May 5, 2023 | Updated the following sections:
- Changes and New Features
- Installation Notes
- Bug Fixes in This Release
- Known Issues in This Release
- High Availability
- UFM Enterprise Appliance Upgrade

Added the following sections:
- Appendix - Software Components Upgrade

Added the following CLI Commands:
- **General**
  - show ufm status

- **System Management**
  - show hosts
  - show version

- **OpenSM**
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  - show ib sm allow-both-pkeys
  - show ib sm keep-pkey-indexes
  - show ib sm keep-pkey-indexes
  - show ib sm virtualization
  - show ib sm virtualization enable
  - show ib sm virtualization ignore
  - show ib sm root-guid
  - show ib sm root-guid
  - show ib sm routing-engines
  - show ib sm routing-engines
  - show ib sm ar-sl-mask
  - show ib sm ar-sl-mask
  - show ib sm configuration import
  - show ib sm partition-config-merge

- **Partition**
  - show ib partition
  - show ib partition management defmember

- **SHARP Aggregation Manager**
  - ib sharp enable
  - ib sharp smx-protocol
  - ib sharp topology-api enable
  - show ib sharp

- **SHARP Configuration in OpenSM**
  - ib sm sharp enable
  - ib sm sharp ignore
  - show ib sm sharp

- **High-Availability**
  - ufm ha configure dual-subnet

- **Management Interface Monitoring**
  - show ufm mgmt-interface
  - show ufm mgmt-interface monitor interval
  - show ufm mgmt-interface
  - show ufm mgmt-interface monitor enable

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  - show ufm logging
  - ufm logging syslog enable
  - ufm logging syslog
  - ufm logging syslog enable
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  - ufm logging level

- **UFM Web Client**
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<td>• <strong>UFM Audit:</strong></td>
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<td>• ufm track-conf-changes enable</td>
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<td>• show ufm track-conf-changes</td>
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<td>May 15, 2023                    Added Upgrading UFM Enterprise Appliance CLI Package</td>
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<td>1.3.1</td>
<td>Feb 19, 2023</td>
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<td>• <a href="#">Changes and New Features</a></td>
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<td>• <a href="#">Bug Fixes in This Release</a></td>
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<td>• <a href="#">Known Issues in This Release</a></td>
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<td>Mar 16, 2023</td>
<td>Updated <a href="#">Changes and New Features</a> - Added MFT package integration details</td>
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<td>Feb 6, 2023</td>
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<td>• Added a note under Configuring the Fabric Interface</td>
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<td>• Command Line Interface (CLI)</td>
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<td>• Appendix - Secure Boot Activation and Deactivation</td>
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<td>• Appendix - Deploying UFM Appliance from an ISO File</td>
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<td>Feb 6, 2023</td>
<td>• Added Troubleshooting</td>
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<td>• Appendix - Chassis Health Monitoring</td>
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