VMware Integration for VxRail Fabric Automation SmartFabric User Guide, Release 1.1

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D&LLEMC

Notes, cautions, and warnings

(i) **NOTE: A NOTE indicates important information that helps you make better use of your product.**

⚠ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Contents

SmartFabric vCenter

The Dell EMC Open Manage Network Integration (OMNI) is an efficient REST API-based plug-in, which is integrated with VMware's vCenter. The plugin enables vCenter to easily deploy and manage a large virtual network of VMs and physical underlay on a VxRail HCI stack.

Using OMNI, day two operations and management of the hyperconverged fabric is a breeze. OMNI provides visibility into the virtual environment and dynamic infrastructure configuration deployment.

Dell EMC fabric solutions for HCI

As hyperconverged domains scale, the network fabric becomes the critical piece of successful deployment. Dell EMC fabrics deliver:

- **On-demand scalability** — to remain competitive, the modern data center requires the capability to dynamically grow and shrink based on business requirements. Dell EMC SmartFabrics and Dell EMC VxRail together provide an intelligent and capable architecture that scales on-demand, and increases the efficiency of the data center.
- **Increased availability at scale** — robust and redundant fabrics and storage are an absolute necessity for today's data center. A single failure should not cause a full-service interruption.

Dell EMC SmartFabric

SmartFabric is a one-of-a-kind feature, part of the Dell EMC SmartFabric OS10 flagship networking operating system. SmartFabric creates a fully integrated solution between the fabric and a hyperconverged domain infrastructure such as VxRail.

Customer can quickly and easily deploy and automate data center networking fabrics. SmartFabric enables faster time to production for hyperconverged and private cloud environments — at any scale — while being fully interoperable with existing data center infrastructure.

With SmartFabric Services, customers can quickly and easily deploy and automate data center networking fabrics. This enables faster time to production for hyperconverged and private cloud environments, at any scale while being fully interoperable with existing data center infrastructure.

Dell EMC VxRail key benefits

Faster time production time

- Plug-and-play fabric formation for VxRail
- Define the fabric policy in VxRail Manager
- SmartFabric to automate all fabric functions

Integrated lifecycle

- Fabric creation, expansion, and maintenance follow VxRail appliance model
- HCI fabric operations fully managed through VxRail Manager/vCenter

Better infrastructure visibility

- Tight integration between VxRail appliance and switches
- Fabric connectivity extended to switches required for VxRail solutions only

Improved SLA

- Fully validated software stack recommendation
- Protection from human-error due to predictable and repeatable HCI fabric experience

Enhanced support experience

- World-class Dell EMC HCI and fabric services
- Fabric that is integrated into VxRail services and support experience

**VxRail domain deployed with manual network configuration**

In previous VxRail deployments, the HCI administrator used VxRail Manager to automate the domain deployment, and scale out lifecycle management. vCenter is used to deploy applications and application networking. The physical network is manually configured and typically requires a network administrator to configure the switches.
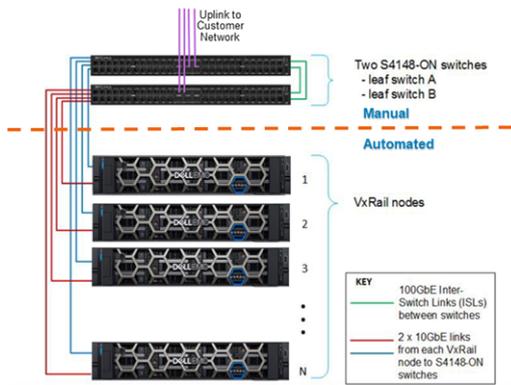
VxRail domain deployed with SmartFabric

With SmartFabric, the automation boundary is now extended to include Dell EMC top of rack (ToR) switches. The HCI administrator can deploy the VxRail domain, however, the ToR switches are automatically configured to provide the required networking services for the VxRail domain.
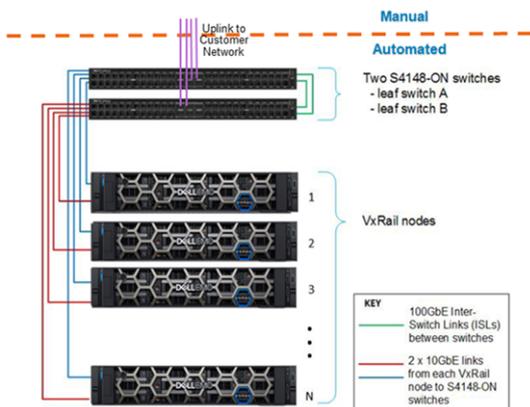
Getting started

This information describes the component requirements.

Dell EMC VxRail

- Dell EMC VxRail release 4.7.410 or 4.7.211 with VMware vCenter 6.7 Update 2 (U2) or later.

Dell EMC ToR switches

- Dell EMC S4112F-ON, S4112T-ON, S4128F-ON, S4128T-ON, S4148F-ON, S4148T-ON, S5212F-ON, S5224F-ON, S5248F-ON, and S5296F-ON running Dell EMC SmartFabric OS10, release 10.4.3.4 or later.

SmartFabric vCenter

- Dell EMC SmartFabric for VMware vCenter
- VMware vCenter ESXi 6.7 or later
- Web browser to interact with the VMware vSphere client and SmartFabric integration

Quick steps

1. **Enable SmartFabric for VxRail on ToR switches**. Upgrade ToR switches to the required SmartFabric OS10 software version, then enable SmartFabric for VxRail.
2. **Deploy VxRail domain using VxRail Manager**. VxRail Manager automatically discovers the SmartFabric environment, and automates the network fabric for VxRail fabric deployment.
3. **Deploy SmartFabric for vCenter**. Create VM and register it with the vCenter used for the VxRail domain. SmartFabric provides single-pane management of ToR network fabric through vCenter and fabric automation for all VM networks and vMotion operations.
4. **Leverage zero-touch fabric automation for Day 2 VxRail Operations**.

Additional resources

- Dell EMC SmartFabric OS10 User Guide, release 10.4.3.0
- Dell EMC VxRail Appliance Administration Guide, release 4.7.x
- Dell EMC VxRail Appliance Software 4.7.x Release Notes
- Dell EMC VxRail Multirack Deployment Guide
- Dell EMC VxRail QuickStart Guide
- Dell EMC VxRail Network Planning Guide

ON-Series switch installation

This information describes how to install a Dell EMC PowerSwitch ON-Series switch in your network.

If your switch came preinstalled with Dell EMC SmartFabric OS10 release 10.4.3.4 or later, see Log into OS10.

(i) **NOTE: For detailed hardware installation steps, see the product-specific *Installation Guide* at www.dell.com/support/.**

Supported hardware

- S4112F-ON, S4112T-ON
- S4128F-ON, S4128T-ON
- S4148F-ON, S4148T-ON
- S5212F-ON
- S5224F-ON
- S5248F-ON
- S5296F-ON

Topics:

- Download OS10 image and license
- Installation using ONIE
- Log into OS10
- Install OS10 license

Download OS10 image and license

This information explains how to download an OS10 image and license.

OS10 may come factory-loaded and is available for download from the Dell Digital Locker (DDL). A factory-loaded OS10 image includes a perpetual license. An OS10 image that you download has a 120-day trial license, and requires a perpetual license to run beyond the trial period.

For more information, see the Setup Guide that is shipped with your device and these FAQs:

- Frequently asked Questions
- My Account FAQs

Download OS10 image and license

- Reinstall the license on a Dell EMC open network installation environment (ONIE) switch with a factory-installed OS10 image and license
- Install operating system10 on a Dell EMC ONIE switch without an OS or license installed
- Upgrade the OS10 image

Your OS10 purchase allows you to download software images posted within the first 90 days of ownership. To extend the software entitlement, you must have a Dell EMC ProSupport or ProSupport Plus contract on your hardware.

Reinstall license on factory-loaded OS10

OS10 runs with a perpetual license on an ONIE-enabled device with OS10 factory-loaded. The license file is installed on the switch. If the license becomes corrupted or wiped out, you must download the license from DDL under the purchaser's account and reinstall it.

1. Sign in to DDL using your account credentials.
2. Locate the hardware product name with the entitlement ID and order number.
3. Check that the device service tag displays in the `Assigned To:` field on the `Products` page.
4. Click **Key Available for Download**.
5. Select how to receive the license key — by email message or downloaded to your local device.
6. Click **Submit**.
7. Save the License.zip file and follow the steps in Install OS10 license.

Download OS10 for a switch without OS installed

You can purchase the operating system10 image with an after point-of-sale (APoperating system) order for a Dell EMC ONIE-enabled device that does not have a default operating system or license installed. After the order is complete, you receive an email message notification with a software entitlement ID, order number, and link to the DDL.

To extend the entitled download period, bind the software entitlement to the switch service tag to be the same time as the support contract. By default, OS10 software entitlement allows you to download OS10 software images posted before the purchase date and within 90 days of the date.

1. Sign into DDL using your account credentials.
2. Locate your entitlement ID and order number that is sent by email message, then select the product name.
3. On the **Product** page, the `Assigned To:` field on the Product tab is blank; click **Key Available for Download**.
4. Enter the device service tag that you purchased the OS10 for in the `Bind to:` and `Re-enter ID:` fields. This step binds the software entitlement to the service tag of the switch.
5. Select how to receive the license key — by email message or downloaded to your local device, then click **Submit** to download the License.zip file.
6. Select the **Available Downloads** tab, select the OS10 release to download, then click **Download**.
7. Read the Dell End User License Agreement. Scroll to the end of the agreement, then click **Yes, I agree**.
8. Select how to download the software files, then click **Download Now**.

Unpack binary image and store on local server

1. After you download the OS10 image, unpack the .tar file and store the OS10 binary image to a local server. For example, to unpack a .tar file on a Linux server or from the ONIE prompt:

```
tar -xf tar_filename
```

2. Generate a checksum for the downloaded OS10 binary image by running the `md5sum` command on the image file. Ensure that the generated checksum matches the checksum that is extracted from the .tar file.

```
md5sum image_filename
```

3. Copy the OS10 image file to a local server using the `copy` command.

See Installation using ONIE and Install OS10 license for complete installation and license information.

Download an image for OS10 upgrade

1. Sign into DDL using your account credentials.
2. Locate the entry for your entitlement ID and order number that is sent by email message, then select the product name.
3. Select the **Available Downloads** tab, select the OS10 release to download, then click **Download**.
4. Read the Dell End User License Agreement. Scroll to the end of the agreement, then click **Yes, I agree**.
5. Select how to download the software files, then click **Download Now**.
6. Unpack the binary image and store on a local server.

See Upgrade OS10 for complete upgrade information.

Installation using ONIE

This information explains how to install OS10 using ONIE.

⚠ **CAUTION: Installing OS10 or another operating system using ONIE erases all software configuration on the switch. The configuration settings are not recoverable. Store a regular backup of the switch configuration locally.**

If you purchase an ONIE-only switch or if you want to replace an existing operating system, download an OS10 image (see Download OS10 image), then install an OS10 software image using ONIE-based autodiscovery or a manual installation:

- **Automatic installation** — ONIE discovers network information including the dynamic host configuration protocol (DHCP) server, connects to an image server, and downloads and installs an image automatically.
- **Manual installation** — Manually configure your network information if a DHCP server is not available, or if you install the OS10 software image using USB media.

System setup

Verify that the system is connected correctly before installation:

- Connect a serial cable and terminal emulator to the console serial port — required serial port settings are 115200, 8 data bits, no flow control, and no parity.

- Connect the Management port to the network if you prefer downloading an image over a network. To locate the Console port and the Management port, see the *Getting Started Guide* shipped with your device or the platform-specific *Installation Guide* at www.dell.com/support.

Install OS10

During bootup, press ESC to display the ONIE boot menu. An ONIE-enabled device boots with preloaded diagnostics and ONIE software.

```
+----------------------------------------------------------+
|*ONIE: Install OS                                         |
| ONIE: Rescue                                             |
| ONIE: Uninstall OS                                       |
| ONIE: Update ONIE                                        |
| ONIE: Embed ONIE                                         |
| ONIE: Diag ONIE                                          |
+----------------------------------------------------------+
```

- `Install OS` — Boots to the ONIE prompt and installs an OS10 image using the automatic discovery process. When ONIE installs a new operating system (OS) image, the previously installed image and OS10 configuration are deleted.
- `Rescue` — Boots to the ONIE prompt and allows for manual installation of an OS10 image or updating ONIE.
- `Uninstall OS` — Deletes the contents of all disk partitions, including the OS10 configuration, except ONIE and diagnostics.
- `Update ONIE` — Installs a new ONIE version.
- `Embed ONIE` — Formats an empty disk and installs ONIE.
- `Diag ONIE` — Runs system diagnostics.

After the ONIE process installs an OS10 image and you later reboot the switch in `ONIE: Install OS` mode (default), ONIE takes ownership of the system and remains in Install mode — ONIE Install mode is sticky — until a OS10 image successfully installs again. To boot the switch from ONIE for any reason other than installation, select the `ONIE: Rescue` or `ONIE: Update ONIE` option from the ONIE boot menu.

> ⚠️ **CAUTION: During an automatic or manual OS10 installation, if an error condition occurs that results in an unsuccessful installation, perform `Uninstall OS` first to clear the partitions if there is an existing OS on the device. If the problem persists, contact Dell EMC Technical Support.**

Manual installation

If a DHCP server is not available, you can manually install an OS10 software image. If the IP address for the Management port (`eth0`) is not automatically discovered, ONIE sets the IP address to `192.168.3.10`. You must manually configure the Management port and configure the software image file to start installation.

1. Save the OS10 software image on an SCP/TFTP/FTP server.
2. Power up the switch and select `ONIE Rescue` for manual installation.
3. (Optional) Stop DHCP discovery if the device boots to ONIE Install.

```
$ onie-discovery-stop
```

4. Configure the IP addresses on the Management port, where *x.x.x.x* represents your internal IP address. After you configure the Management port, the response is `up`.

```
$ ifconfig eth0 x.x.x.x netmask 255.255.0.0 up
```

5. Configure the default gateway, where *x.x.x.x* represents your gateway IP address.

```
$ route add default gateway x.x.x.x
```

6. Install the software on the device. The installation command accesses the OS10 software from the specified SCP, TFTP, or FTP URL, creates partitions, verifies installation, and reboots itself.

```
$ onie-nos-install image_filename location
```

For example, enter

```
ONIE:/ # onie-nos-install ftp://a.b.c.d/PKGS_OS10-Enterprise-x.x.xx.bin
```

Where *a.b.c.d* represents the location to download the image file from, and *x.x.xx* represents the version number of the software to install.

The OS10 installer image creates several partitions, including OS10-A (active and default) and OS10-B (standby). After installation completes, the switch automatically reboots and loads OS10.

Install manually using USB drive

You can manually install the OS10 software image using a USB device. Verify that the USB device supports a FAT or EXT2 file system. For instructions to format a USB device in FAT or EXT2 format, see the accompanying Windows documentation for FAT formatting or Linux documentation for FAT or EXT2 formatting.

1. Plug the USB storage device into the USB storage port on the switch.
2. Power up the switch to automatically boot using the `ONIE: Rescue` option.
3. (Optional) Stop ONIE discovery if the device boots to `ONIE: Install`.

   ```
   $ onie-discovery-stop
   ```

4. Create a USB mount location on the system.

   ```
   $ mkdir /mnt/media
   ```

5. Identify the path to the USB drive.

   ```
   $ fdisk -l
   ```

6. Mount the USB media plugged in the USB port on the device.

   ```
   $ mount -t vfat usb-drive-path /mnt/media
   ```

7. Install the software from the USB, where `/mnt/media` specifies the path where the USB partition is mounted.

   ```
   $ onie-nos-install /mnt/media/image_file
   ```

The ONIE autodiscovery process discovers the image file at the specified USB path, loads the software image, and reboots the switch. See the ONIE User Guide for more information.

Log into OS10

This information explains how to log into OS10.

To log into an OS10 switch, power up and wait for the system to perform a power-on self-test (POST). Enter `admin` for both the default user name and user password. For better security, change the default `admin` password during the first OS10 login. The system saves the new password for future logins. After you change the password through the CLI, enter the `write memory` command to save the configuration.

```
OS10 login: admin
Password: admin
Last login: Mon Mar 25 13:58:27 2019 on ttyS0

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.


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-*          Dell EMC Network Operating System (OS10)         *-
-*                                                           *-
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-*                                                           *-
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jurisdictions. All other marks and names mentioned herein may be
trademarks of their respective companies.

OS10# write memory
```

Install OS10 license

If OS10 is factory-loaded on your switch, you do not need to install an OS10 license. If you download OS10 on a trial basis, OS10 comes with a 120-day trial license. To continue with uninterrupted use, purchase and install a perpetual license to avoid the OS10 device rebooting every 72 hours.

After you install OS10 and log in, install the license to run OS10 beyond the trial license period. For more information, see Download OS10 image and license. The OS10 license is installed in the */mnt/license* directory.

1. Download the License.zip file from DDL (see Download OS10 image and license).
2. Open the zip file and locate the license file in the Dell folder. Copy the license file to a local or remote workstation.
3. Install the license file from the workstation in EXEC mode.

```
license install {ftp: | http: | localfs: | scp: | sftp: | tftp: | usb:} filepath/filename
```

- `ftp://userid:passwd@hostip/filepath` — Copy from a remote FTP server
- `http://hostip/filepath` — Copy from a remote HTTP server
- `http://hostip` — Send request to a remote HTTP server.
- `localfs://filepath` — Install from a local file directory.
- `scp://userid:passwd@hostip/filepath` — Copy from a remote SCP server.
- `sftp://userid:passwd@hostip/filepath` — Copy from a remote SFTP server.
- `tftp://hostip/filepath` — Copy from a remote TFTP server.
- `usb://filepath` — Install from a file directory on a storage device that is connected to the USB storage port on the switch.
- `filepath/filename` — Enter the directory path where the license file is stored.

> (i) **NOTE: When installing a license through a VRF instance, OS10 supports only some file transfer methods.**

File transfer method	Default VRF	Management VRF[1]	Nondefault VRF
FTP	Yes	Yes	No
HTTP	Yes	Yes	No
localfs	Yes	Yes	Yes
SCP	Yes	Yes	No
SFTP	Yes	Yes	No
TFTP	Yes	Yes	No
USB	Yes	Yes	Yes

[1] Before you configure the Management VRF for use in OS10 license installation, delete all IP addresses on the Management interface.

Install license — SCP

```
OS10# license install scp://user:userpwd@10.1.1.10/CFNNX42-NOSEnterprise-License.xml
License installation success.
```

Install license — localfs

1. Copy the license file from the FTP server location to the home directory on the system.

```
OS10# copy ftp://admin:admin@10.11.95.101//home/admin/LADF/7B900Q2-NOSEnterprise-
License.XML
home://7B900Q2-NOSEnterprise-License.XML
```

2. (Optional) Use the `show copy-file status` command to check the status of the file copy.

```
OS10# show copy-file status
File Transfer State: idle
--------------------------------------------------
State Detail:        idle
Task Start:          2019-02-15T00:46:35Z
Task End:            2019-02-15T00:46:36Z
Transfer Progress:   100 %
Transfer Bytes:      3795 bytes
```

```
File Size:              3795 bytes
Transfer Rate:          8 kbps
```

3. Verify that the license is present in the home directory.

```
OS10# dir home
Directory contents for folder: home
Date (modified) Size (bytes) Name
-------------------- ------------ -----------------------
2019-02-15T00:47:25Z 3795 7B900Q2-NOSEnterprise-License.XML
```

4. Run the license install command and specify the path to the home directory location where the license was downloaded in step 1.

```
OS10# license install localfs://home/admin/7B900Q2-NOSEnterprise-License.XML
[ 5784.994389] EXT4-fs error (device dm-0): ext4_has_uninit_itable:3039: comm
CPS_API_instanc: Inode table for bg 0 marked as needing zeroing
License installation success.
```

Install license using management VRF

```
OS10(config)# ip vrf management
OS10(conf-vrf)# interface management
OS10(conf-vrf)# exit
OS10(config)# ip sftp vrf management
OS10(config)# exit
OS10# license install sftp://user:userpwd@10.1.1.10/CFNNX42-NOSEnterprise-License.xml

License installation success.
```

Verify license installation

```
OS10# show license status

System Information
------------------------------------------------------
Vendor Name         :       DELL
Product Name        :       S4128F-ON
Hardware Version    :       A01
Platform Name       :       x86_64-dellemc_s4128_c2538-r0
PPID                :       CN0X4XRXCES007980029
Service Tag         :       9CLSG02
Product Base        :
Product Part Number:
License Details
---------------
Software            :       OS10-Enterprise
Version             :       10.4.3.0
License Type        :       PERPETUAL
License Duration    :       Unlimited
License Status      :       Active
License location    :       /mnt/license/9CLSG02.lic
------------------------------------------------------
```

Troubleshoot license installation failure

An error message displays if the installation fails.

```
License installation failed
```

1. Verify the installation path to the local or remote license location.
2. Check the log on the remote server to find out why the FTP or TFTP file transfer failed.
3. Ping the remote server from the switch — use the ping and traceroute commands to test network connectivity. If the ping command fails:

   · If the remote server is reachable through the Management route, check if the Management route is configured correctly.
   · If the remote server is reachable through a front-panel port, check if the static or dynamic route is present.
4. Install the server with the license file on the same subnet as the switch.
5. Check if the server is up and running.

Enable SmartFabric for VxRail

This information explains how to enable SmartFabric for VxRail.

1. Log into the Linux shell.

```
S4128F-1# system "sudo -i"

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for admin:
root@S4128F-1:~#
```

2. Run the VxRail personality with sudo privilege to set the default ICLs and uplinks for the platform and reboots the switch in Fabric mode.

   ⓘ **NOTE: Dell EMC Services works with you to define the values for the script.**

3. Enter **Y** to enable SmartFabric for VxRail and reboot the switch automatically.

4. Run the VxRail personality to enable the VxRail personality profile. Use the options to override the default configurations for ICLs, uplinks, management VLANs, uplink breakouts, and uplink dynamic LAG configurations.

   ⓘ **NOTE: To enable the VxRail personality profile for a single switch, use the `-i None` option.**

```
root@OS10:~# sfs_enable_vxrail_personality.py -h
usage: Create VxRail Cluster [-h] [-d DOMAIN] [-u UPLINK] [-i ICL] [-t] [-l]
                             [-b
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X2
5GE,4X10GEFixedFormFactor}]
                             [-m MANAGEMENT_VLAN] [-j JUMPBOX_INTERFACE]
                             [-a ADDITIONAL_BREAKOUT]

This command creates a SmartFabric Services cluster of Dell EMC OS10EE
switches with the information provided below.

optional arguments:
  -h, --help            show this help message and exit
  -d DOMAIN, --domain DOMAIN
                        Domain-Id for the SmartFabric Services cluster
                        formation. Accepted Values [1..254].
  -u UPLINK, --uplink UPLINK
                        Uplink Interfaces separated by a comma (,). If empty,
                        it takes the default value for the platform. If there
                        is no uplink, provide 'None/Null'
  -i ICL, --icl ICL     VLT Inter Chassis Link(ICL) interfaces separated by a
                        comma (,). If empty, it takes the default value for
                        the platform. If there is no ICL value (in case of
                        single node cluster), input the value as 'None/Null'
  -t, --tagged          Flag to indicate if management VLAN is tagged on the
                        on the TOR uplink ports. By default Uplinks are not
                        tagged. Default management VLAN 1 is untagged on
                        Uplink interfaces.
  -l, --lacp_mode       Flag to indicate if LACP is to be enabled on the TOR
                        uplink ports to the spine switches. By default LACP on
                        TOR uplink ports is not enabled.
  -b
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X2
5GE,4X10GEFixedFormFactor}, --breakout_uplink
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X2
5GE,4X10GEFixedFormFactor}
                        The breakout mode for uplink interfaces.
```

```
        -m MANAGEMENT_VLAN, --management_vlan MANAGEMENT_VLAN
                            Public Management VLAN (Untagged VLAN). By default
                            management VLAN is 1.
        -j JUMPBOX_INTERFACE, --jumpbox_interface JUMPBOX_INTERFACE
                            The jumpbox interface.
        -a ADDITIONAL_BREAKOUT, --additional_breakout ADDITIONAL_BREAKOUT
                            The additional breakouts of phy-ports or port-groups.
                            The format is -a '4X10GE{phy-port1/1/2,phy-
                            port1/1/3};1X40GE{phy-port1/1/4,phy-port1/1/5}'. The
                            available breakouts are ['4X50GE', '2X50GE', '2X40GE',
                            '1X100GE', '4X25GEFixedFormFactor', '1X40GE',
                            '2X100GE', '4X10GE', '8X10GE', '8X25GE', '4X25GE',
                            '4X10GEFixedFormFactor'] Note. Provide the multiple
                            additional_breakout (-a) separated by semicolon (;)
                            and within single quote (')
```

(i) **NOTE: Options are case-sensitive, for example, enter 2X50GE not 2x50ge.**

Topics:

- Configure extended options
- OS10 SmartFabric mode
- Validate SmartFabric
- Disable SmartFabric
- Supported topologies

Configure extended options

This information explains the extended options including the optional jump box interface, and breakout access ports connected to end-hosts such as VxRail nodes, or generic servers at 10 GE speed.

Jump box interface

You can connect a laptop to any switch port of the S5200 or S4100 Series switch. Note that the switch port may need breakout and copper transceiver depending on the laptop network adapter type. This specific switch port is referred to as the *jumpbox interface*.

The jump box interface and breakout type can be configured when enabling the VxRail personality profile. For example, to configure SmartFabric Services for an S5200-ON Series on port group 1/1/1, connected to the VxRail nodes at 10G speed and assigned interface 1/1/1 to the jump box host, use this syntax:

```
# sfs_enable_vxrail_personality.py -a '4X10GEFixedFormFactor{port-group1/1/1}' -j 1/1/1:1
```

(i) **NOTE: It is mandatory to create a jump box interface if the VxRail Manager is to be accessed through the spine switch. This connectivity can be achieved with the Management interface VLAN on all transit switches by distinguishing between the external Management VLAN and the internal Management VLAN. The external Management VLAN must pass through the spine switch.**

Port breakout

SmartFabric supports switch port breakouts during VxRail personality profile configuration. The personality profile supports all port breakout modes.

(i) **NOTE: Breakout configurations do not take place immediately after the switch resets. Allow between 30–60 seconds for the breakout configurations to take place after the switch cluster is configured with configurations such as VLT, port channels, and so on.**

S41xx platform personality profile

```
root@OS10:~# sfs_enable_vxrail_personality.py -h
usage: Create VxRail Cluster [-h] [-d DOMAIN] [-u UPLINK] [-i ICL] [-t] [-l]
                             [-b {1X40GE,4X10GE}] [-m MANAGEMENT_VLAN]
                             [-j JUMPBOX_INTERFACE] [-a ADDITIONAL_BREAKOUT]

This script create a cluster group of OS10 switch nodes with the below
information provided.

optional arguments:
  -h, --help            show this help message and exit
```

```
   -d DOMAIN, --domain DOMAIN
                        Domain-Id for the SmartFabric Services cluster
                        formation. Accepted Values [1..254].
   -u UPLINK, --uplink UPLINK
                        Uplink Interfaces separated by a comma (,). If empty,
                        it takes the default value for the platform. If there
                        is no uplink, provide 'None/Null'
   -i ICL, --icl ICL    VLT Inter Chassis Link(ICL) interfaces seperated by a
                        comma (,). If empty, it takes the default value for
                        the platform. If there is no icl value (in case of
                        single node cluster), input the value as 'None/Null'
   -t, --tagged         Flag to indicate if management VLAN is tagged on the
                        on the TOR uplink ports. By default Uplinks are not
                        tagged. Default management VLAN 1 is untagged on
                        Uplink interfaces.
   -a, --active_mode    Flag to indicate if LACP is to be enabled on the TOR
                        uplink ports to the spine switches. By default lacp on
                        TOR uplink ports is not enabled.
   -b {2X50GE,4X25GE,4X10GE}, --breakout_uplink {2X50GE,4X25GE,4X10GE}
                        The breakout mode for uplink interfaces.
   -m MANAGEMENT_VLAN, --management_vlan MANAGEMENT_VLAN
                        Public Management VLAN (Untagged VLAN). By default
                        management VLAN is 1.
   -j JUMPBOX_INTERFACE, --jumpbox_interface JUMPBOX_INTERFACE
                        The jumpbox interface.
   -a ADDITIONAL_BREAKOUT, --additional_breakout ADDITIONAL_BREAKOUT
                        The additional breakouts of phy-ports or port-groups.
                        The format is -a '4X10GE{phy-port1/1/2,phy-
                        port1/1/3};1X40GE{phy-port1/1/4,phy-port1/1/5}'. The
                        available breakouts are ['1X40GE', '4X10GE']
```

S52xx platform personality profile

```
root@OS10:~# sfs_enable_vxrail_personality.py -h
usage: Create VxRail Cluster [-h] [-d DOMAIN] [-u UPLINK] [-i ICL] [-t] [-l]
                             [-b
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X25GE
,4X10GEFixedFormFactor}]
                             [-m MANAGEMENT_VLAN] [-j JUMPBOX_INTERFACE]
                             [-a ADDITIONAL_BREAKOUT]

This command creates a SmartFabric Services cluster of Dell EMC OS10EE
switches with the information provided below.

optional arguments:
  -h, --help            show this help message and exit
  -d DOMAIN, --domain DOMAIN
                        Domain-Id for the SmartFabric Services cluster
                        formation. Accepted Values [1..254].
  -u UPLINK, --uplink UPLINK
                        Uplink Interfaces separated by a comma (,). If empty,
                        it takes the default value for the platform. If there
                        is no uplink, provide 'None/Null'
  -i ICL, --icl ICL     VLT Inter Chassis Link(ICL) interfaces separated by a
                        comma (,). If empty, it takes the default value for
                        the platform. If there is no ICL value (in case of
                        single node cluster), input the value as 'None/Null'
  -t, --tagged          Flag to indicate if management VLAN is tagged on the
                        on the TOR uplink ports. By default Uplinks are not
                        tagged. Default management VLAN 1 is untagged on
                        Uplink interfaces.
  -l, --lacp_mode       Flag to indicate if LACP is to be enabled on the TOR
                        uplink ports to the spine switches. By default LACP on
                        TOR uplink ports is not enabled.
  -b
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X25GE
,4X10GEFixedFormFactor}, --breakout_uplink
{4X50GE,2X50GE,2X40GE,1X100GE,4X25GEFixedFormFactor,1X40GE,2X100GE,4X10GE,8X10GE,8X25GE,4X25GE
,4X10GEFixedFormFactor}
                        The breakout mode for uplink interfaces.
  -m MANAGEMENT_VLAN, --management_vlan MANAGEMENT_VLAN
                        Public Management VLAN (Untagged VLAN). By default
                        management VLAN is 1.
```

```
   -j JUMPBOX_INTERFACE, --jumpbox_interface JUMPBOX_INTERFACE
                       The jumpbox interface.
   -a ADDITIONAL_BREAKOUT, --additional_breakout ADDITIONAL_BREAKOUT
                       The additional breakouts of phy-ports or port-groups.
                       The format is -a '4X10GE{phy-port1/1/2,phy-
                       port1/1/3};1X40GE{phy-port1/1/4,phy-port1/1/5}'. The
                       available breakouts are ['4X50GE', '2X50GE', '2X40GE',
                       '1X100GE', '4X25GEFixedFormFactor', '1X40GE',
                       '2X100GE', '4X10GE', '8X10GE', '8X25GE', '4X25GE',
                       '4X10GEFixedFormFactor']
```

(i) **NOTE: `FixedFormFactor` and `port-group` are intended to be used only when breaking out interfaces on S5200-ON Series switches.**

S4100-ON Series breakout types

The S4112-ON supports breakout types of 50G, 40G, 25G, and 10G on ports 13, 14, and 15. The S4128-ON supports breakout types of 50G, 40G, 25G, and 10G on ports. Only the S4148-ON Series switches support switch-port-profile configuration which has different speed settings per profile.

Breakout 40G ports

The S4148-ON Series switch-port-profile determines the enabled front-panel ports, supported breakout modes, and unified ports. You can change the switch-port-profile to customize uplink and unified port operation, and the availability of front-panel data ports.

Profile-1 is used for 10 GbE and 100 GbE uplinks (default on S4148-ON Series switches), and profile-2 is used for 40 GbE uplinks.

```
OS10(config)# switch-port-profile 1/1 ?
  profile-1  [DEFAULT]
             Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7-10: 1x100g default mode,4x25g,4x10g,2x50g;
             Port 27,28: Unavailable in this profile
  profile-2  Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7-10: 1x40g default mode,4x10g;
             Port 27,28: 1x40g default mode,4x10g
  profile-3  Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7-10: 1x100g default mode,1x40g,4x25g,4x10g;
             Port 27,28: 1x40g default mode,4x10g
  profile-4  Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7-10: 1x100g default mode,1x40g,2x50g,4x10g;
             Port 27,28: 1x40g default mode,4x10g
  profile-5  Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7,9: 1x100g default mode,1x40g,4x25g,4x10g;
             Port-group 8,10: 1x40g default mode,4x10g;
                Port 27,28: 1x40g default mode,4x10g
  profile-6  Supported Breakout Modes: Port-group 1-6: 1x10g;
             Port-group 7,9: 1x100g default mode,1x40g,2x50g,4x10g;
             Port-group 8,10: 1x40g default mode,4x10g;
             Port 27,28: 1x40g default mode,4x10g
```

1. Change the switch-port-profile from default profile-1 to the wanted profile in Full Switch mode.

```
OS10(config)# switch-port-profile 1/1 profile-2
Warning: Switch port profile will be applied only after a save and reload. All management
port configurations will be retained but all other configurations will be wiped out after
the reload.
OS10(config)# end
```

2. Save the configuration, then reload the switch.

```
OS10# write memory
OS10# reload

Proceed to reboot the system? [confirm yes/no]:yes
```

3. After the system reloads, enable the VxRail personality profile for an uplink breakout, OR a server-facing breakout.

```
# sfs_enable_vxrail_personality.py -u "1/1/25:1,1/1/26:1" -b 4X10GE
```

Server-facing port breakout

```
# sfs_enable_vxrail_personality.py -a '4X10GE{port-group1/1/25}'
```

4. Verify the switch-port-profile.

```
# show switch-port-profile
| Node/Unit | Current   | Next-boot | Default   |
|-----------+-----------+-----------+-----------|
| 1/1       | profile-1 | profile-1 | profile-1 |
```

S5200-ON Series breakout types

S5200-ON Series breakout configuration is done using port-groups, unlike physical port configuration on the S4100-ON Series. Use the `show port-group` command to view the individual port or switch interfaces of each port-group. This command also displays the current/default port speed of the port-group. Port breakout supports 50G, 100G, and 2x100G ports depending on the port being used for breakout.

(i) **NOTE: Only the S5248-ON switch ports have 2x100G ports.**

Breakout 100G port

```
# sfs_enable_vxrail_personality.py -b '4X25GE' -u "1/1/53:1,1/1/54:1"
```

Breakout 2x100G port

```
# sfs_enable_vxrail_personality.py -b '8X10GE' -u "1/1/49:1, 1/1/51:1"
```

Breakout server-facing 100G port

```
# sfs_enable_vxrail_personality.py -a '4X10GE{port-group1/1/16}'
```

Breakout server-facing 2x100G port

```
# sfs_enable_vxrail_personality.py -a '8X25GE{port-group1/1/13}'
```

Breakout examples

S5200-ON Series — Breakout interfaces eth1/1/1-4 (port-group1) for VxRail 10GE connection

```
# sfs_enable_vxrail_personality.py -a '4X10GEFixedFormFactor{port-group1/1/1}' -j 1/1/1:1
```

- Uplink is `eth1/1/1-4`, breaking out to 10GE
- Jump box is `eth1/1/1:1` at 10GE
- Depending on the specific model type of the S5200-ON Series switch, a default uplink interface is selected. In this case, the SF5212F-ON uses `eth1/1/13` as the default uplink.
- Port-channel is `static` (without the `-l` option)

S5212F-ON — Breakout interfaces eth1/1/1 (port-group1) and eth1/1/11 (port-group3) for VxRail 10GE connection

```
# sfs_enable_vxrail_personality.py -a '4X10GEFixedFormatFactor{port-group1/1/1,port-group1/1/3}' -t -l -j ethernet1/1/1:1
```

- Uplink is `eth1/1/13` (10 GE) >> default
- Jump box is `eth1/1/1:1` at 10GE
- Port-channel LACP enable on uplinks using `-l`
- Tag all VLANs on uplinks using `-t`
- Management VLAN left on VLAN 1 as default

S5212F-ON — Breakout interfaces eth1/1/1 (port-group1) and eth1/1/11 (port-group3) for VxRail 10GE connection

```
# sfs_enable_vxrail_personality.py -b '4x10GE' -u 1/1/14:1 -a '4X10GEFixedFormFactor{port-group1/1/1,port-group1/1/3}'
```

- Uplink is `eth1/1/14`, breaking out to 10GE >> default
- Jump box is `eth1/1/1` at 10GE

- Port-channel is `static` (without the `-1` option)

S5212F-ON — Breakout interface eth1/1/1 (port-group1) for VxRail 10GE connection

```
# sfs_enable_vxrail_personality.py -b '4x25GE' -u 1/1/14:2 -a '4X10GEFixedFormFactor' {port-
group1/1/1} -j ethernet1/1/1:1
```

- Uplink is `eth1/1/14:2`, breaking out to 25GE
- Jump box is `eth1/1/1` at 10GE

S4100-ON Series — Breakout interface eth1/1/25 and eth 1/1/26for VxRail 10GE connection

```
# sfs_enable_vxrail_personality.py -b '4X10GE' -u '1/1/25:1,1/1/26:1' -j ethernet1/1/1
```

- Uplinks are `eth1/1/25:1` and `1/1/26:1`, breaking out to 10GE
- Jump box is `eth1/1/1`

S4112T-ON — Breakout interface eth1/1/15:1 for VxRail 25GE connection

```
# sfs_enable_vxrail_personality.py -b '4x25GE' -u 1/1/15:1 -j ethernet1/1/1:1
```

- Uplink is `eth1/1/15:1`, breaking out to 25GE
- Jump box is `eth1/1/1`

OS10 SmartFabric mode

This information describes the available commands that are a subset of the OS10 CLI configuration commands. All other CLI commands are not available when in SmartFabric mode.

For complete CLI configuration information, see the Dell EMC SmartFabric OS10 User Guide, release 10.4.3.0.

SmartFabric mode

- `clock` — configure clock parameters
- `end` — exit to EXEC mode
- `exit` — exit from the current mode
- `help` — display available commands
- `hostname` — set the system hostname
- `interface` — configure the Management interface, VLAN interface, or an interface range
- `ip name-server` — configure the IP address of a name server (up to three name servers)
- `logging` — configure system logging
- `management route` — configure the IPv4/IPv6 management route
- `no` — delete or disable commands in Configuration mode
- `ntp` — configure network time protocol
- `snmp-server` — configure the simple network management protocol server
- `spanning-tree disable` — disable spanning-tree globally
- `mac-flush-timer` — set the time used to flush MAC address entries
- `mode` — enable spanning-tree mode such as multiple spanning-tree (MST) mode or rapid spanning-tree protocol (RSTP) mode
- `mst` — configure MST mode
- `rstp` — configure RSTP mode
- `vlan` — configure spanning-tree on a VLAN range
- `username` — create or modify user credentials

Operating mode differences

Full switch mode

- All configuration changes you save are retained after you reload the switch

SmartFabric mode

- All switch interfaces are assigned to VLAN1 by default, and are in the same Layer 2 (L2) bridge domain
- All configuration changes are saved in the running configuration, by default
- Use the `show running-configuration` command to display the current configuration

Only the configuration changes that you make using the OS10 administrative commands — supported in both modes — are saved and retained. All other CLI configuration commands are disabled.

- `clock`
- `hostname`
- `ip name-server`
- `logging`
- `management route`
- `ntp`
- `snmp-server`
- `spanning-tree`
- `username`

> (i) **NOTE: Although front-panel port interfaces operate in Layer 2 (L2) mode by default, L2 bridging is disabled. Verify configuration changes using feature-specific `show` commands such as `show interface` and `show vlan`, instead of `show running-configuration`.**

Validate SmartFabric

This information explains how to validate SmartFabric for VxRail.

1. Log into the Linux shell.
2. Run the VxRail personality with sudo privilege to validate the OS10 switch configuration in SmartFabric and display all the test cases and results.

```
# sfs_validate_vxrail_personality.py

Checking VxRail Personality Profile and profile...
Chosen Profile is  vxrail - Test status - passed
Switch-Operting Mode is SmartFabric Mode - Test status - passed
Checking the ICL status..
Chosen ICL = ['ethernet1/1/29', 'ethernet1/1/30'] Programmed ICLs =  ['ethernet1/1/29',
'ethernet1/1/30'] - Test status - passed
The ICL interface ethernet1/1/30 operational status is up - Test status - passed
The ICL interface ethernet1/1/29 operational status is up - Test status - passed
Checking the Uplink status..
Chosen Uplinks = ['ethernet1/1/25', 'ethernet1/1/26'] Programmed Uplinks =
['ethernet1/1/25', 'ethernet1/1/26'] - Test status - passed
The uplink interface ethernet1/1/25 operational status is up - Test status - passed
The uplink interface ethernet1/1/26 operational status is up - Test status - passed
Checking management VLAN
Chosen management VLAN  1 is programmed and operational up . - Test status - passed
Checking control VLAN
The control VLAN 3939 is programmed and operational up . - Test status - passed
Checking VLT VLAN
The VLT VLAN is programmed and operational up . - Test status - passed
```

Disable SmartFabric

This information explains how to disable SmartFabric Services for VxRail.

> (i) **NOTE: These steps do not retain the configuration set on the switch fabric by SmartFabric. If you perform these steps on an active VxRail cluster, the cluster is disabled and it forces a rebuild.**

1. Log into the Linux shell.
2. Run the VxRail personality with sudo privilege to delete all user configurations that are completed through SmartFabric Services and reboot the OS10 switch in Full Switch mode. Running this command allows you to configure the switch manually using the OS10 CLI.

```
# sfs_disable.py

Turning off SmartFabric Services will erase all the configuration performed through
SmartFabric Services and the switch will removed from SmartFabric cluster and the switch
will now have to be manually configured.
For workloads that were communicating with the SmartFabric Services Master need to be
```

```
reconfigured for manual deployment.
Are you sure you want to continue with the changes by rebooting the OS10 node?.(y/n)
```

3. Enter **Y** to disable SmartFabric Services for VxRail configuration and reboot the switch automatically.

Supported topologies

This information captures only certified, tested, and supported topologies as it pertains to Dell EMC SmartFabric and VxRail HCI deployments.

Topology 1

Single VxRail Cluster1   Single VxRail Cluster2
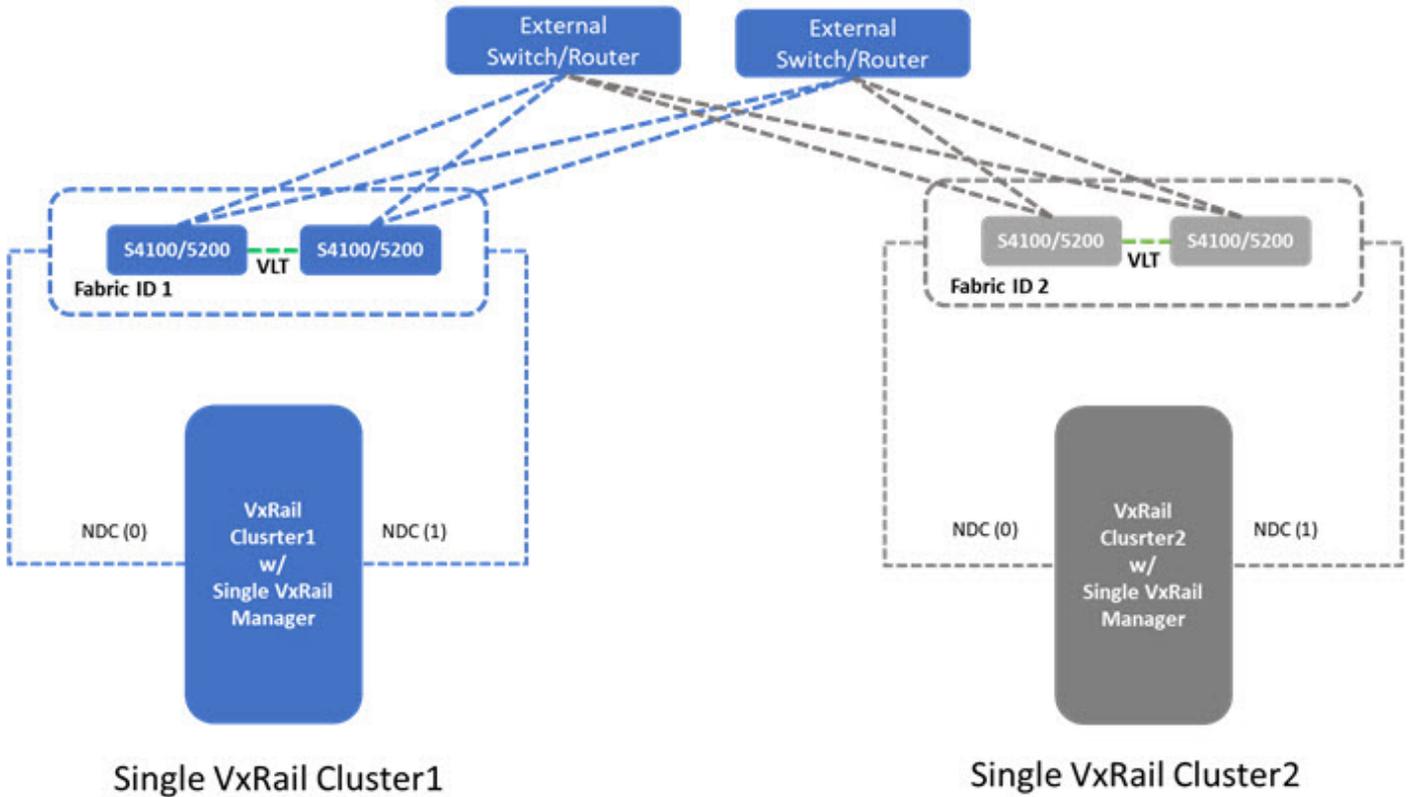
- No redundancy at the customer device
- VLT on the Dell EMC switches
- Single uplinks from each Dell EMC ToR. These uplinks can be configured as single static port channels with LACP if wanted. Both ends of the uplink must match port channel configurations.
- VxRail node connections use the rNDC connections only.
- No stretched VxRail cluster

Topology 2
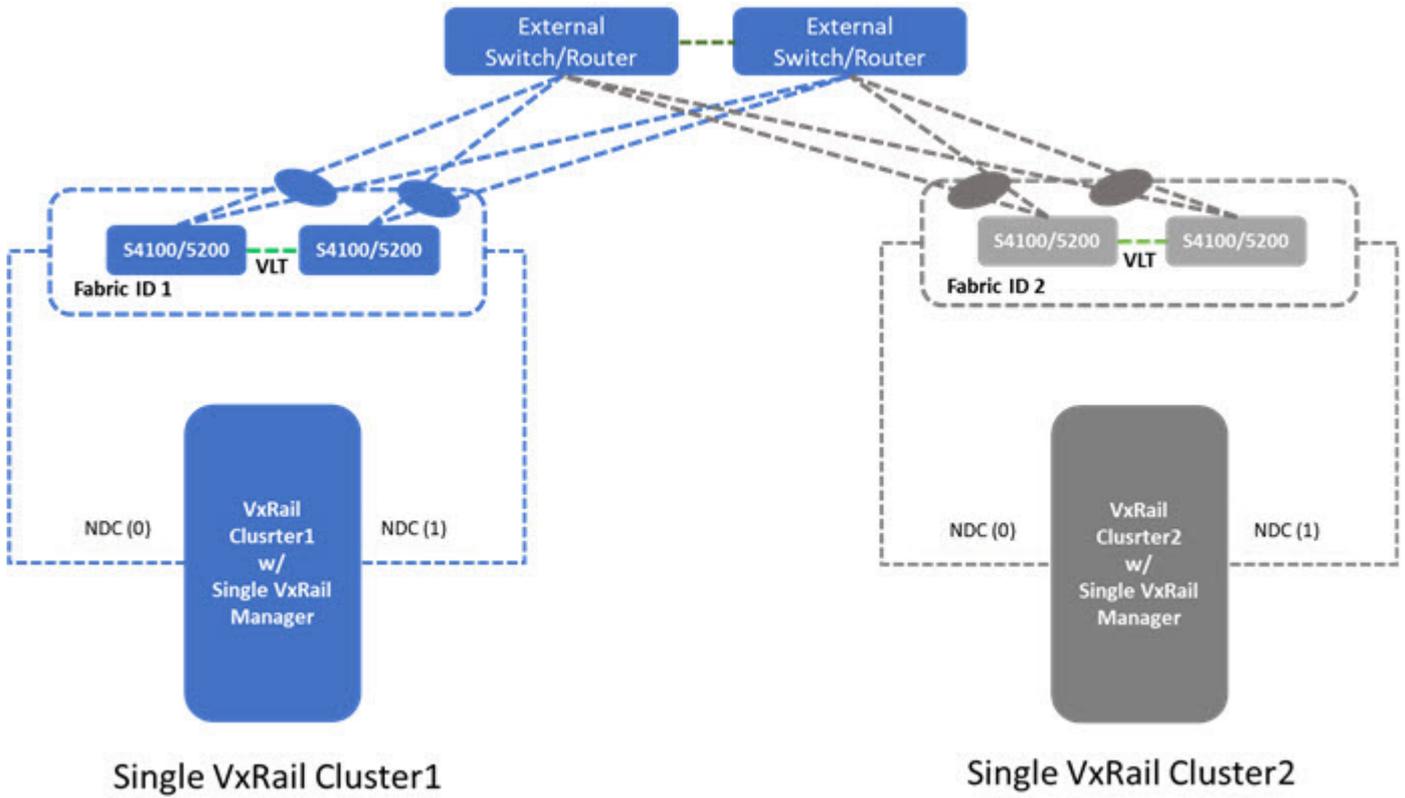
- Redundancy at the customer device, allowing for the creation of redundant uplinks from the Dell EMC ToR to the customer device, and the opposite way
- VLT on the Dell EMC ToR; vPC, MLAG, VLT, or similar capability at the customer device
- Dual uplinks from each Dell EMC ToR, and the number of uplinks can be more than two if wanted.
- VxRail node connections use the rNDC connections only.
- Two separate "Fabrics" have been created.
- No stretched VxRail cluster

OpenManage Network Integration

OpenManage Network Integration (OMNI) is a component of SmartFabric Services that integrates with VMware vCenter for zero-touch fabric automation of the physical network infrastructure corresponding to the virtual network operations within vCenter. OMNI also serves as a front-end management application SmartFabric Service instances, enabling administrators to manage and operate one or more network fabrics that are deployed with SmartFabric Services.

OMNI virtual appliance

The OMNI virtual appliance is delivered as a single OVA file that can be deployed as a stand-alone virtual machine or deployed as a plug-in for VMware vCenter. The OMNI OVA file can be downloaded from the Dell Support portal at https://www.dell.com/support/home/us/en/19/product-support/product/dell-openmanage-network/drivers.

For VxRail deployments and other environments with VMware vCenter, it is recommended to deploy OMNI as a plug-in to vCenter to enable Zero-Touch automation of physical network fabric for corresponding virtual network configurations, provide greater visibility into physical network connectivity for virtual network interfaces, and provide single pane of management of the network fabrics through vCenter GUI.

OMNI virtual machine deployment is currently tested and supported only on the VMware ESXi hypervisor, even though it is expected that the OVA could be deployed in other x86 hypervisors.

OMNI system requirements

VMware ESXi

- Virtualization-ready x86 server
- VMware ESXi 6.7 U1, U2 (recommended); ESXi 6.5, U1, U2, U3
- VMware vSphere Enterprise Plus license
- Virtual appliance (OVA)
- 2vCPU
- 16G memory
- 20G available disk space (higher disk sizes may be required depending on fabric size and data retention requirements)

More requirements

- Web browser — Chrome (version 72.0.3626.121 and later) and Firefox (version 68.0 and later) recommended
- vSphere web client 6.5 U1, U2, U3 — supported for Flash client; not supported for HTML5 client
- vSphere web client 6.7 (all versions) — non supported for Flash client; supported for HTML5 client

OMNI networking requirements

A single OMNI appliance can manage one or more SmartFabric instances. It is required that OMNI has network connectivity to each of the SmartFabric Instances. Each SmartFabric instance elects a single switch as a master node (SFS Master) and OMNI communicates with the SFS Master node for all fabric operations.

SmartFabric Master out-of-band management network

For OMNI to discover and start managing a SmartFabric instance, OMNI requires connectivity with the SFS Master out-of-band IPv4 address. A network interface for the OMNI virtual machine must have IP reachability to the switch out-of-band management network.

SmartFabric Master in-band client control network

When OMNI is deployed on a VxRail node or a generic server that is directly connected to the SmartFabric instance that it is managing, then OMNI can communicate with the SmartFabric Master using the client control network (3939). A network interface for the OMNI virtual machine must have access to this client control network, and an IPv6 address must be assigned to establish IPv6 connectivity with the SFS Master virtual IPv6 address.

(i) **NOTE: Even when OMNI is deployed in-band, it is recommended to set up connectivity with the out-of-band Management network of the switches in the network fabric to separate management traffic with user data traffic, and also to enable faster image downloads to the switches.**

Topics:

- [Create virtual machine](#)
- [Log into VM console](#)
- [SmartFabric vCenter setup](#)
- [vCenter registration](#)
- [Dashboard](#)
- [Monitoring](#)

Create virtual machine

This information describes how to import the SmartFabric OVA file into the content library, then create a virtual machine (VM).

Download and install OVA

You can add items to a content library by importing files from your local system. You can import an OVA package to use as a template for deploying virtual machines.

1. Download the OVA from the VMware Solution Exchange or Dell EMC Networking Support, then store the OVA image locally.
2. Select **Hosts and Domains**, select the domain that the plug-in needs to manage, then select **Action** > **Deploy OVF Template**.
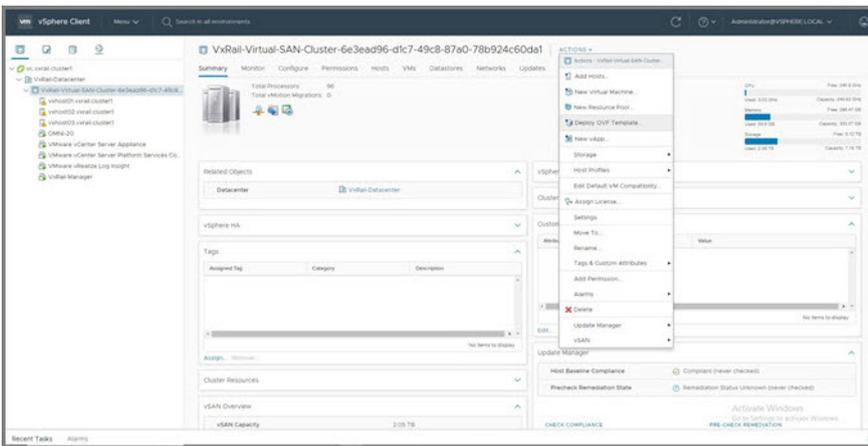
3. Select **Local file**, click **Choose Files** and select `OMNI.ova` from a local source, then click **Next**.
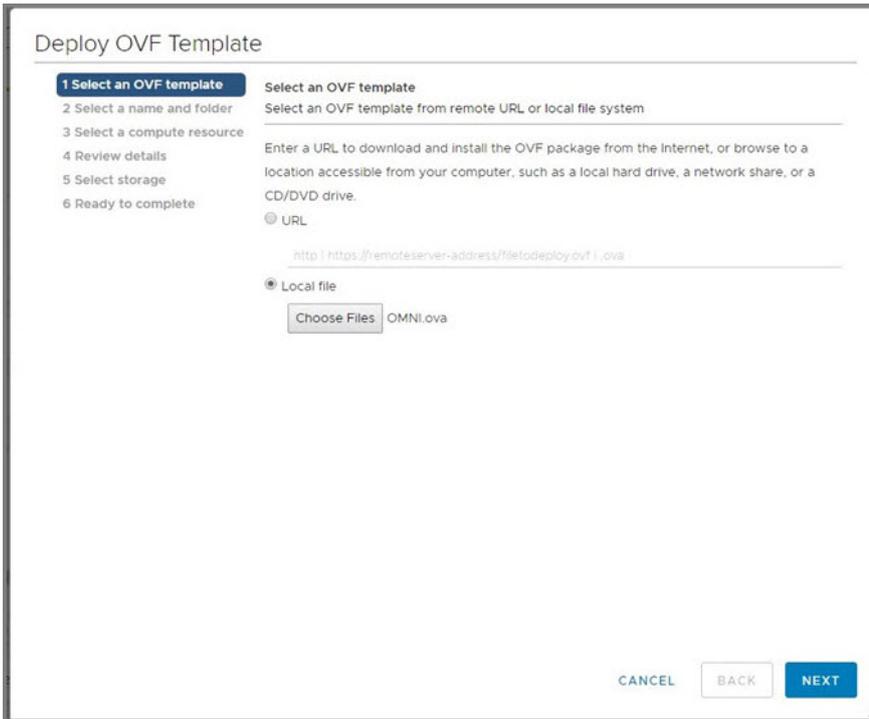
4. Select a name and folder for the VM, then click **Next**.
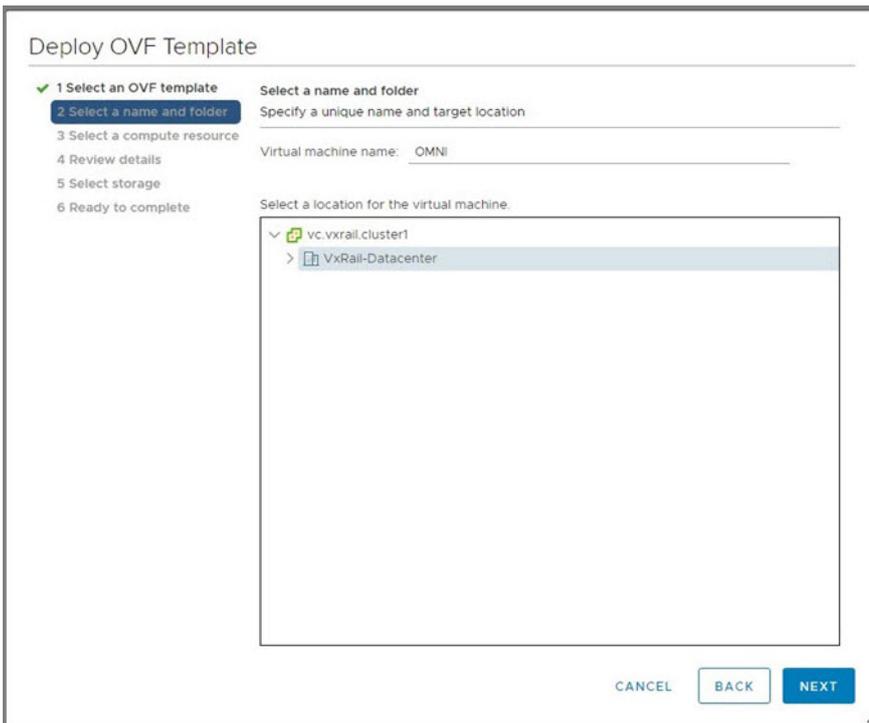
5. Select the destination compute resource, then click **Next**.
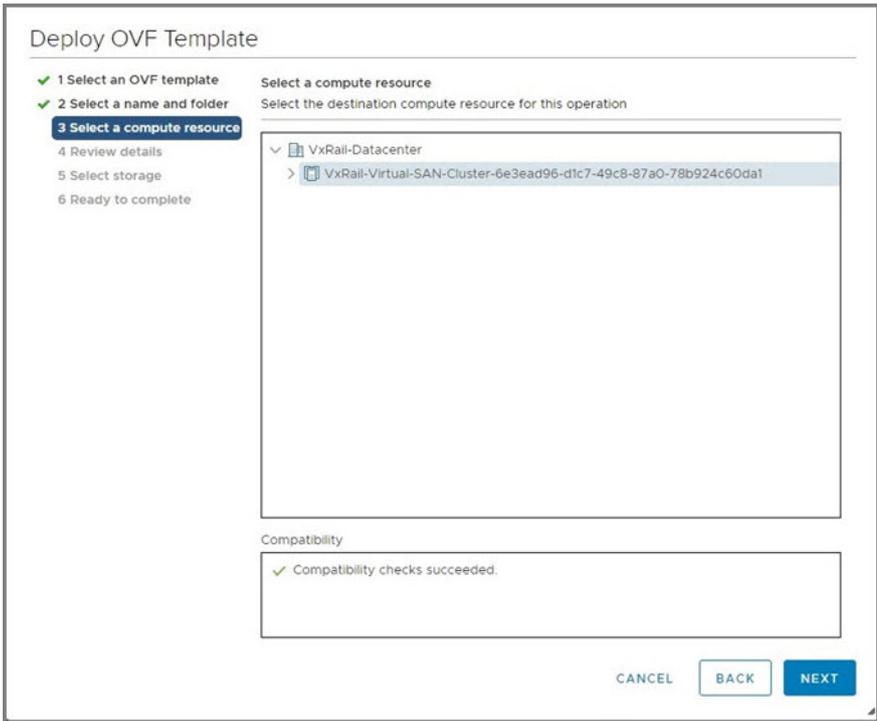
6. Review and verify the template details, then click **Next**.
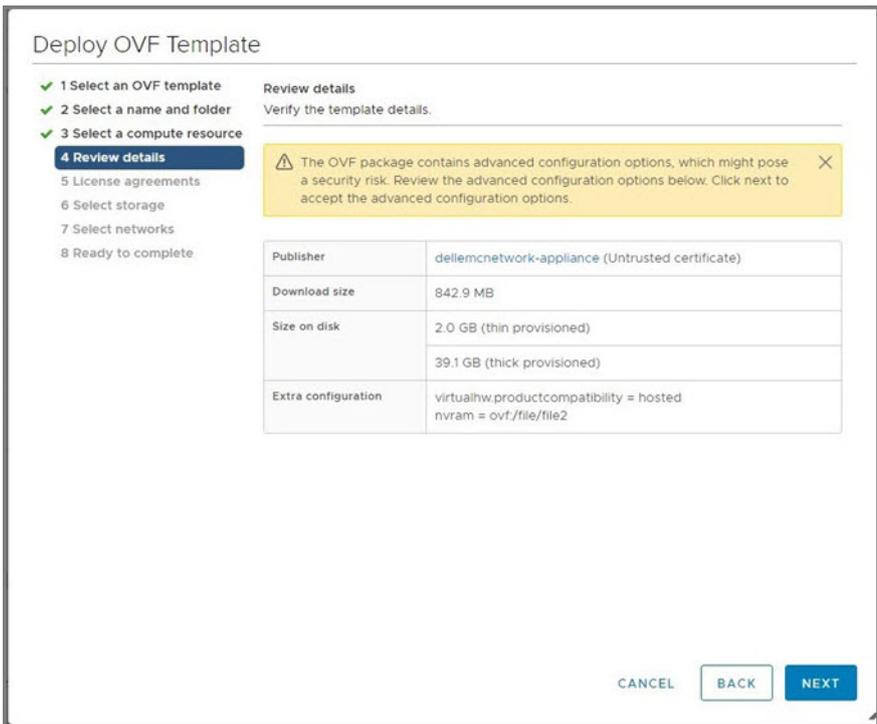
7. Accept the end-user license agreement (EULA), then click **Next**.
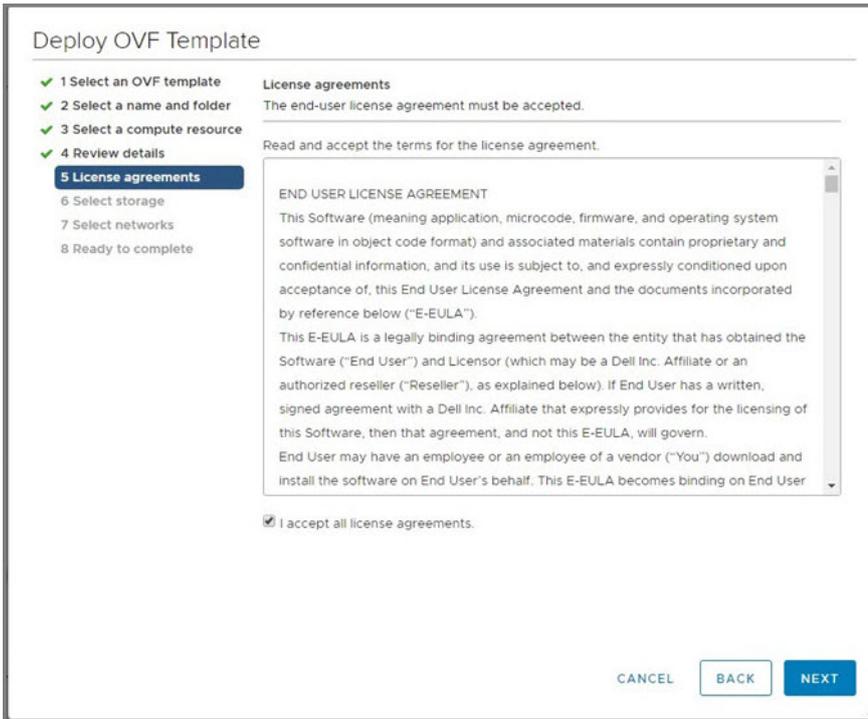
8. Select the VSAN datastore for the configuration and disk files, then click **Next**.
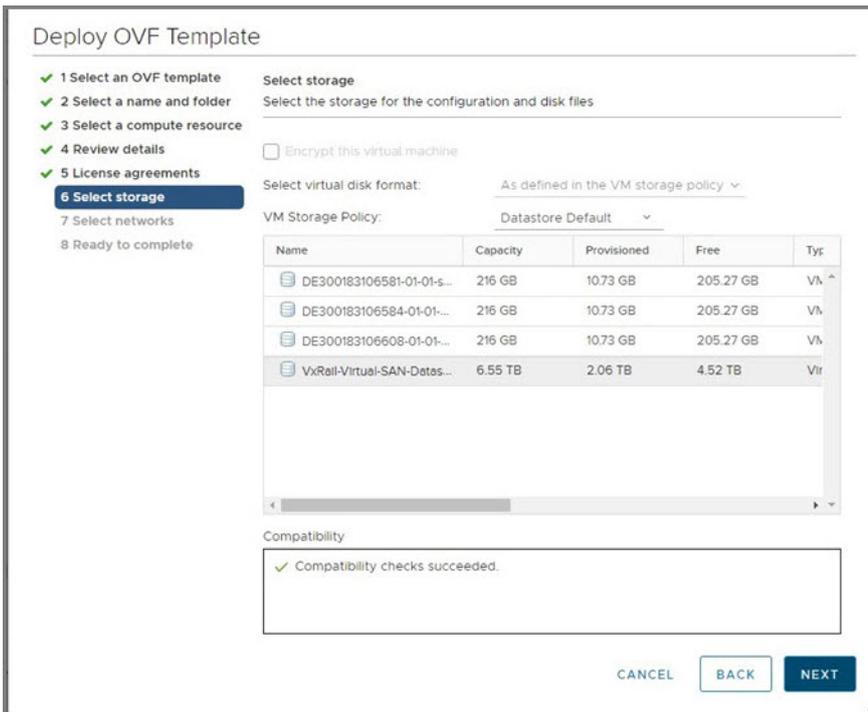
9. Select a destination network for each network source, then click **Next**. The VxRail Management Network must be assigned to the VxRail internal Management network. The default VLAN ID for this network is 3939. The vCenter Server network must be connected to the port group where the vCenter is reachable for plug-in deployment of the VM.

10. Click **Finish** to start creation of the VM, then power on the VM.

Log into VM console

The SmartFabric VM console allows you to configure the software to best suit your needs.

You can configure SmartFabric through the VM console after you complete the authentication step. The VM console automatically closes after 10 minutes (default), and can be customized to meet your needs.

- Two NICs — ens160 for IPv4 static/dynamic and ens192 for IPv6 link local with IPv4 disabled
- Hostname, domain, and DNS server
- User password

- Self-signed SSH and TLS certificate regeneration
- Third-party SSH and TLS certificate installation
- SmartFabric password for the fabric
- Reboot and logout
- Export support bundle
- Display connectivity status with vCenter Server
- Display connectivity status with SmartFabric
- Supports up to 10 vCenter Server instances
- Supports up to 16 SmartFabric domains

This information describes how to log into the VM console.

1. After the new VM powered on, open the VM console.
2. Enter `admin` for both the default username and password.

```
Debian GNU/Linux 9 dellemc-networkappliance tty1

dellemc-networkappliance login: admin
Password:
Linux dellemc-networkappliance 4.9.0-7-amd64 #1 SMP Debian 4.9.110-3+deb9u2 (2018-08-13) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Updating the password from default value
Changing password for admin.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
```

3. If this is a first-time login, change the password.

   After the passwords are successfully updated, self-signed certificates are created. You can change the certificates later with menu options.

ⓘ **NOTE: The sudo password is the same as the password set for the `admin` user.**

ⓘ **NOTE: Root user is disabled by default. To set the password to enable root user, use the SmartFabric menu. You can only access root user through the console.**

SmartFabric vCenter setup

This information describes how to set up the appliance with the required network interface configurations, and registration with vCenter and SmartFabric. The latest version supports up to 10 vCenters and 16 SmartFabric domains.

As part of the initial setup, interface profiles can first be configured using an SSH client to configure the vCenter and SmartFabric registration. Using SSH, you can copy and paste into the window to lessen the chances of entering the wrong password.

1. Select **0. Full Setup**.

```
#####################################################################
   Welcome to Dell EMC OpenManage Network Integration (OMNI) Management
#####################################################################

   Menu
   ---------------------------------------------------------------
0.  Full Setup
1.  Show Version
2.  Interface Configuration Menu
3.  Install SSL Certificates from Remote Server
4.  OMNI Management Service Menu
5.  OMNI VSphere Client Plugin Menu
6.  Password/SSL Configuration Menu
7.  Upgrade Appliance
8.  Reboot Appliance
9.  Show EULA
10. Logout

Enter selection [0 - 10]:
```

2. Select **Edit a connection**, then click **OK**.
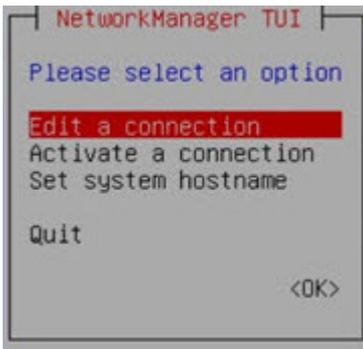
3. Select **Wired Connection 1**, then click **Edit Connection**.
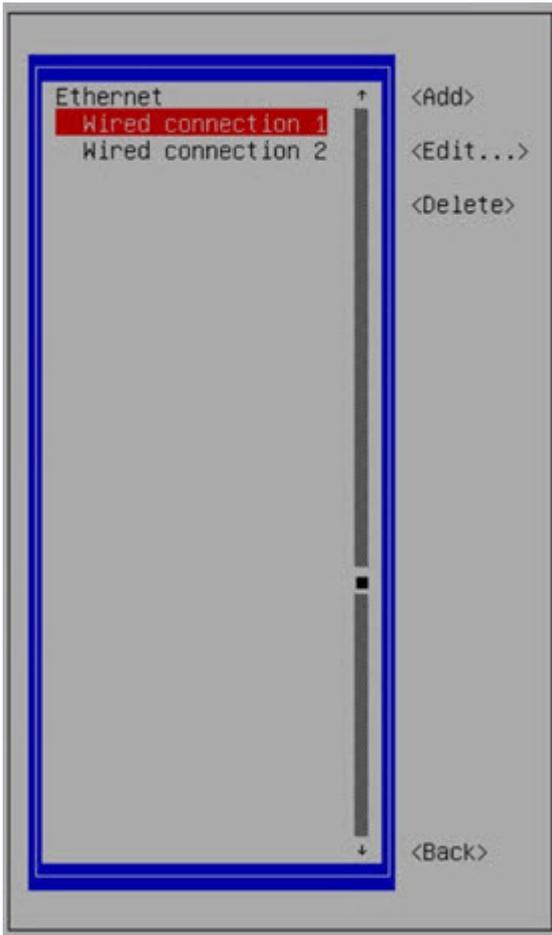
4. Verify Ethernet (ens160) is connected to the vCenter reachable network. Change the Profile name to **vcenter server network**, then click **<Show>** to the right of IPv4 configuration.

```
                        ┤ Edit Connection ├
         Profile name vcenter server network_____
               Device 00:50:56:AF:97:A2 (ens160)_____

    ♦ ETHERNET                                              <Show>

    ♦ IPv4 CONFIGURATION <Automatic>                        <Show>
    ♦ IPv6 CONFIGURATION <Ignore>                           <Show>

    [X] Automatically connect
    [X] Available to all users

                                              <Cancel>  <OK>
```
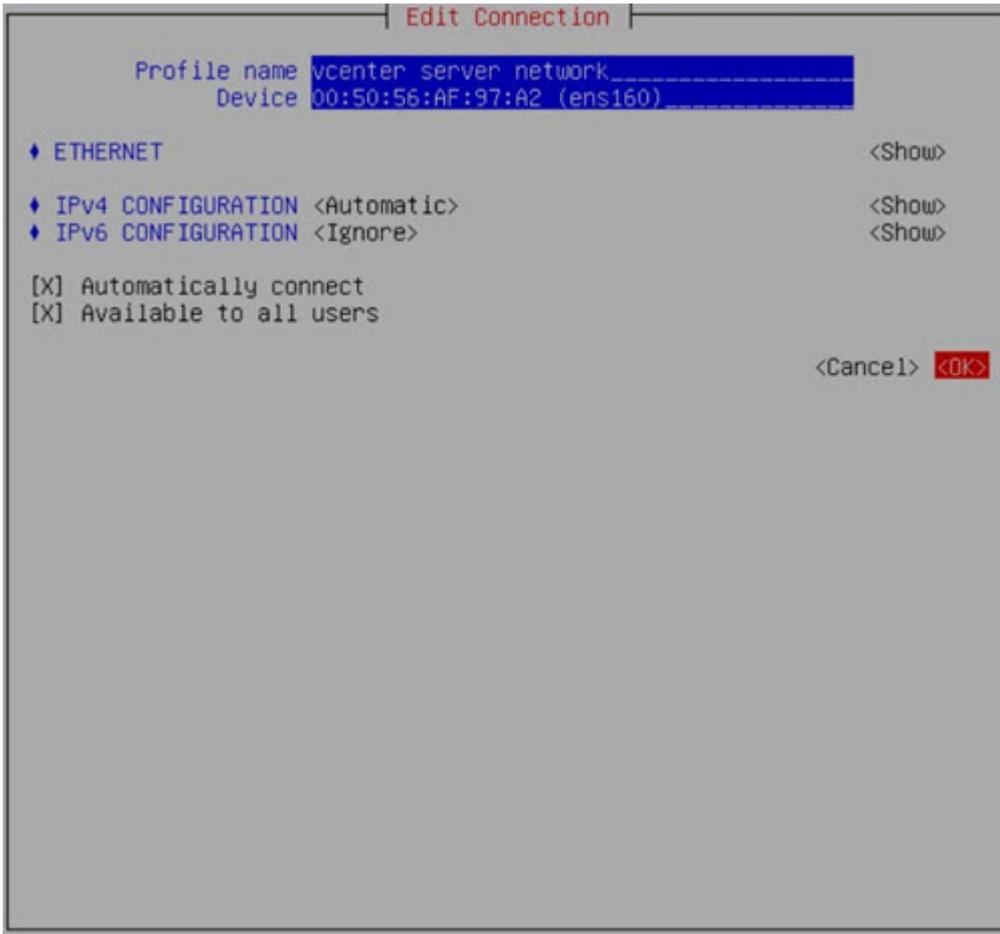
5. Select **Manual/DHCP**, set the DNS servers, set the Search Domains, then click **<Hide>**.

```
                        ┤ Edit Connection ├
         Profile name vCenter Server Mgmt█
               Device 00:50:56:92:9D:C1 (ens160)

    ▬ ETHERNET                                              <Show>

    ┬ IPv4 CONFIGURATION <Manual>                           <Hide>
          Addresses 16.1.1.41/24              <Remove>
                    <Add...>
            Gateway 16.1.1.254_____
        DNS servers 16.1.1.60               <Remove>
                    <Add...>
      Search domains st.vxrail.cluster1      <Remove>
                    <Add...>

              Routing (No custom routes) <Edit...>
    [ ] Never use this network for default route
    [ ] Ignore automatically obtained routes

    [ ] Require IPv4 addressing for this connection


    ▬ IPv6 CONFIGURATION <Ignore>                           <Show>

    [X] Automatically connect
    [X] Available to all users

                                              <Cancel> <OK>
```

6. Click **<Show>** to the right of IPv6 configuration, disable IPv6, click **<Hide>**, then click **OK**.

```
                    ┤ Edit Connection ├
        Profile name Wired connection 1_____
              Device 00:50:56:AF:27:01 (ens160)_____

 ♦ ETHERNET                                                <Show>

 ♦ IPv4 CONFIGURATION <Automatic>                          <Hide>
         Addresses <Add...>
           Gateway _____
        DNS servers <Add...>
     Search domains <Add...>

            Routing (No custom routes) <Edit...>
 [ ] Never use this network for default route
 [ ] Ignore automatically obtained routes

 [ ] Require IPv4 addressing for this connection


 ♦ IPv6 CONFIGURATION <Automatic>                          <Show>

 [X] Automatically connect
 [X] Available to all users

                                               <Cancel> <OK>
```

7. Select **Wired Connection 2**, then click **Edit Connection**.

```
┌──────────────────────────────────┐
│ ┌──────────────────────────┐     │
│ │ Ethernet              ↑  │ <Add>│
│ │   vcenter server network │      │
│ │ ▐Wired connection 2▌     │<Edit...>│
│ │                          │      │
│ │                          │<Delete>│
│ │                          │      │
│ │                          │      │
│ │                          │      │
│ │                          │      │
│ │                          │      │
│ │                          │      │
│ │                        ■ │      │
│ │                       ↓  │<Back>│
│ └──────────────────────────┘     │
└──────────────────────────────────┘
```
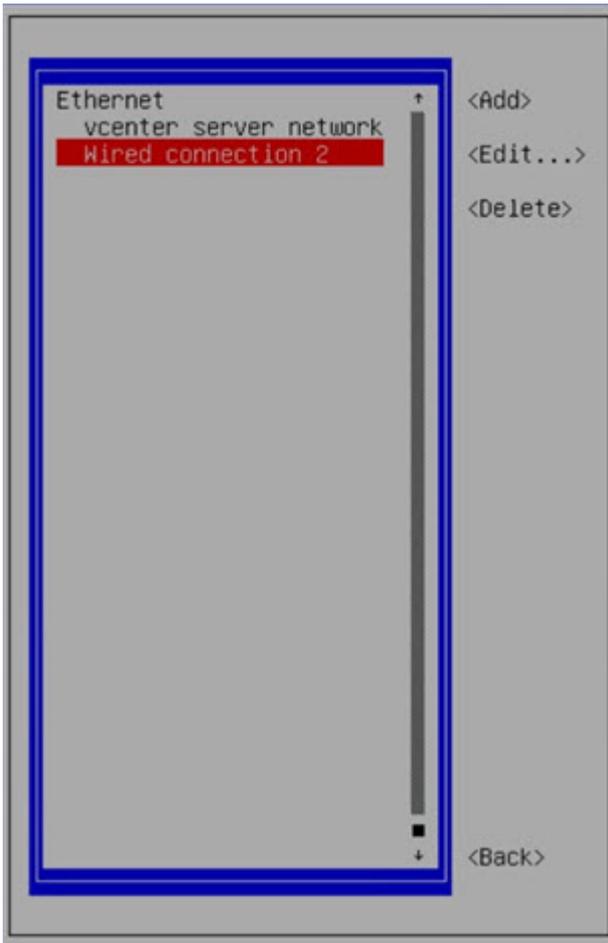
8. Verify Ethernet (ens192) is connected to the IPv6 VxRail management network. This is known as the VxRail internal Management network, and IPv6 is required for this network.
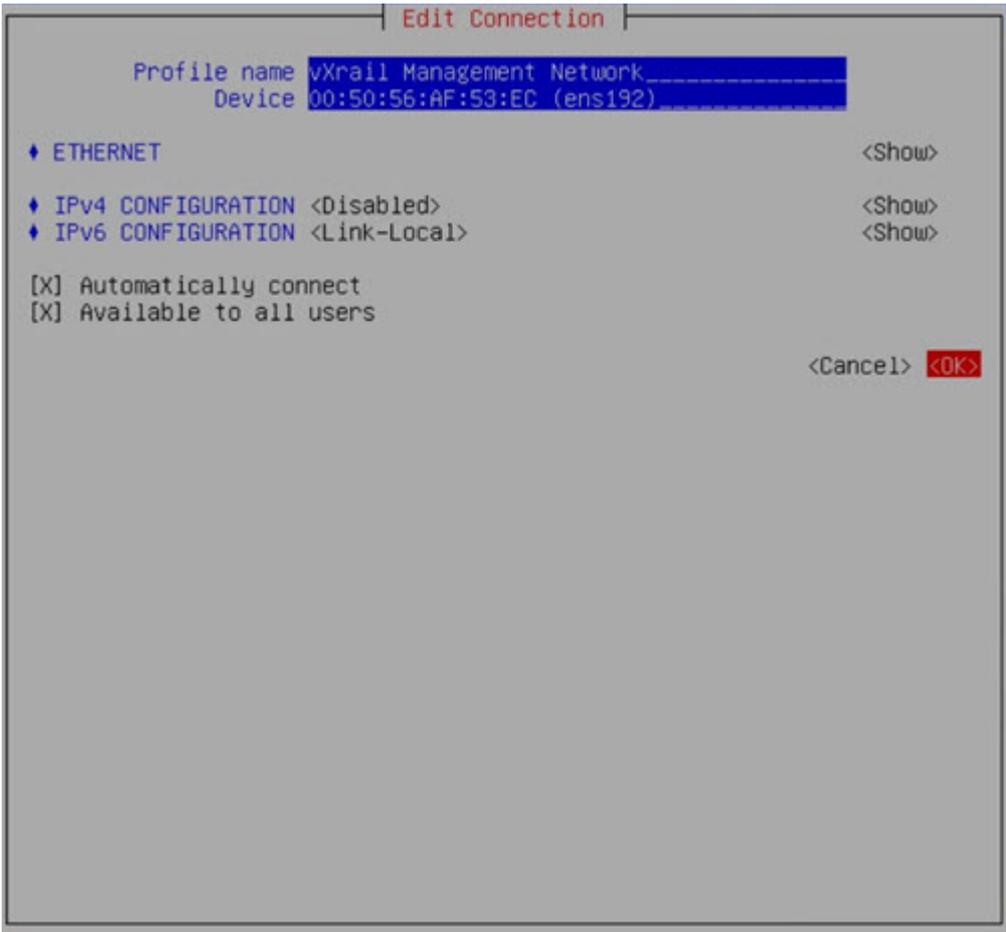
9. Change the name to **vxrail management network**, disable the IPv4 address on this interface, select IPv6 to be the link-local address, then click **OK**.
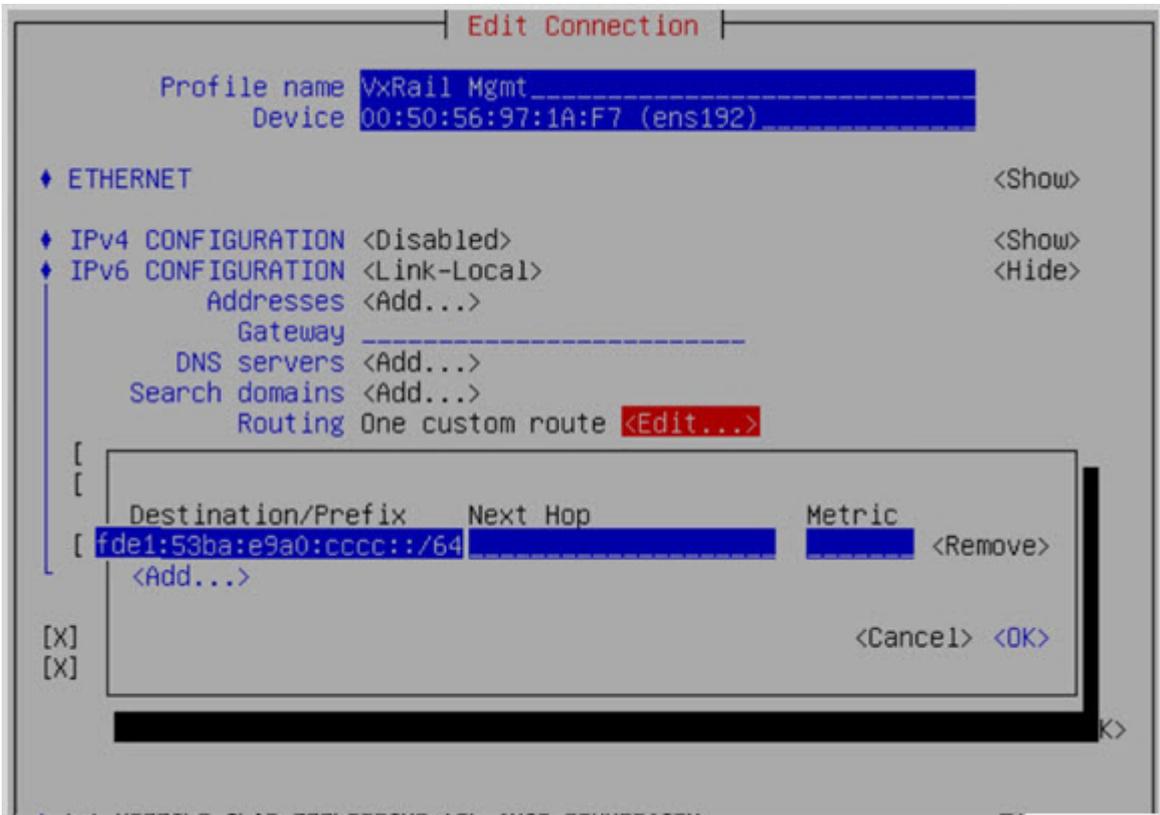
10. Your connection list is now updated with vCenter and VxRail profile names. Click **Back** to activate the connection profiles.

Activate connection profiles

ⓘ **NOTE: To populate DNS entries automatically, each profile must be deactivated, then activated.**

1. Select **Activate a Connection**, then click **OK**.
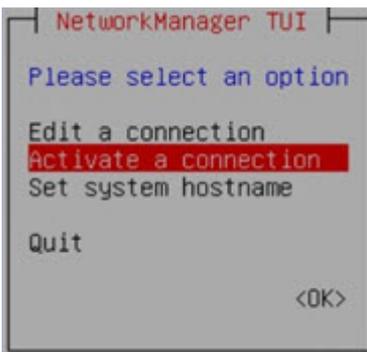
2. Select the **vcenter server network** profile, then click **Deactivate**. Repeat for the vxrail management network.

```
Ethernet (ens160)                  ↑   <Deactivate>
* vcenter server network

Ethernet (ens192)
* vXrail Management Network




                                   ■




                                   ↓   <Back>
```
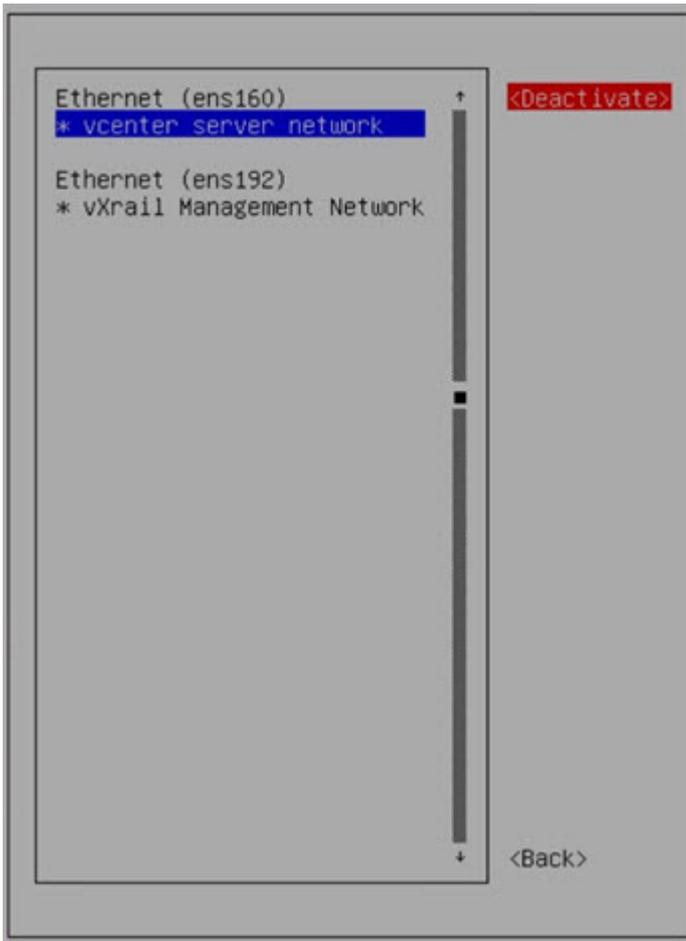
3. Select the **vcenter server network** profile, then click **Activate**. Repeat for the vxrail management network.
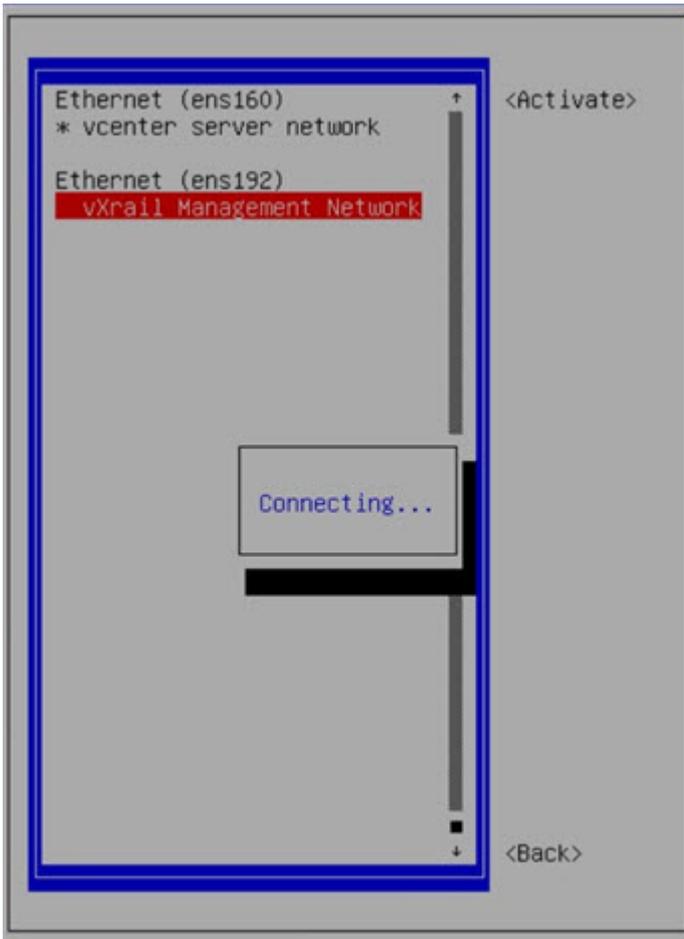
4. Click **Back**, then **OK** to exit the network management UI.

5. Configure the valid NTP Server IP address or hostname, then click **Enter**. Go to the next section for the SSL certificate installation.

ⓘ **NOTE: If the NTP Server is not configured, the SmartFabric appliance VM synchronizes with the ESXi server time zone.**

vCenter registration

This information describes how to install an optional SSL certificate, register the vCenter plug-in, and register SmartFabric.

SSL certificates have been automatically generated after the password is successfully updated. For more information, see Log into VM console.

ⓘ **NOTE: Multiple OMNI instances cannot be mapped to a single vCenter instance. If a situation where multiple VxRail clusters exist with their own respective fabric instances, Dell EMC recommends to map these fabric instances to a single vCenter instance. For example, VxRail cluster1 will ideally have its own vCenter-1 VM instance, and the same is true for VxRail cluster 2 with its own vCenter-2 VM instance. In this case, OMNI-1 will map to vCenter-1, and OMNI-2 will map to vCenter-2.**

If you do not want to create individual OMNI to vCenter mappings, you do have the option of mapping multiple fabric instances to a single OMNI mapped to a single or primary vCenter instance.

1. Select **N** to not install the SSL certificate now, or select **Y** to install the SSL certificate, then enter the remote SCP server IP/hostname, username, and file path to the SSL certificate.

2. Enter the OMNI IP or FQDN to register with the vCenter instance. If an FQDN has been created for the OMNI plug-in, **do not** use the IP address of the OMNI plug-in.

```
NTP Server IP/Hostname: 16.1.1.60
2019-04-08 21:22:39 INFO  [setup.sh] Deleting NTP server entry
2019-04-08 21:22:39 INFO  [setup.sh] Adding 16.1.1.60 as an NTP server
2019-04-08 21:22:39 INFO  [setup.sh] Restarting NTP service

Install SSL certificates from remote Server [y]? n
2019-04-08 21:22:41 INFO  [setup.sh] Registering OMNI Plugin with vCenter
2019-04-08 21:22:41 INFO  [setup.sh] Starting Web Server service
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Web Server Service active
2019-04-08 21:22:41 INFO  [setup.sh] Stopping Application Server and Zero Touch Management applicati
on services
Removed /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Application Server Service Stop successful
Removed /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Zero Touch Management Application Service Stop successful
OMNI IP/FQDN to use for registration:
```

3. Enter the vCenter Server username and vCenter Server password. Repeat this step to register each vCenter instance (up to 10).

```
NTP Server IP/Hostname: 16.1.1.60
2019-04-08 21:22:39 INFO  [setup.sh] Deleting NTP server entry
2019-04-08 21:22:39 INFO  [setup.sh] Adding 16.1.1.60 as an NTP server
2019-04-08 21:22:39 INFO  [setup.sh] Restarting NTP service

Install SSL certificates from remote Server [y]? n
2019-04-08 21:22:41 INFO  [setup.sh] Registering OMNI Plugin with vCenter
2019-04-08 21:22:41 INFO  [setup.sh] Starting Web Server service
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Web Server Service active
2019-04-08 21:22:41 INFO  [setup.sh] Stopping Application Server and Zero Touch Management applicati
on services
Removed /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Application Server Service Stop successful
Removed /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Zero Touch Management Application Service Stop successful
OMNI IP/FQDN to use for registration: dellemc-os10-plugin.st.vxrail.cluster1
Appliance IP : dellemc-os10-plugin.st.vxrail.cluster1
vCenter Server FQDN: vc.st.vxrail.cluster1
vCenter Server Username: administrator@vsphere.local
vCenter Server Password:
```

4. Enter the REST user password used during the VxRail cluster configuration through VxRail Manager.

```
NTP Server IP/Hostname: 16.1.1.60
2019-04-08 21:22:39 INFO  [setup.sh] Deleting NTP server entry
2019-04-08 21:22:39 INFO  [setup.sh] Adding 16.1.1.60 as an NTP server
2019-04-08 21:22:39 INFO  [setup.sh] Restarting NTP service

Install SSL certificates from remote Server [y]? n
2019-04-08 21:22:41 INFO  [setup.sh] Registering OMNI Plugin with vCenter
2019-04-08 21:22:41 INFO  [setup.sh] Starting Web Server service
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Web Server Service active
2019-04-08 21:22:41 INFO  [setup.sh] Stopping Application Server and Zero Touch Management applicati
on services
Removed /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Application Server Service Stop successful
Removed /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Zero Touch Management Application Service Stop successful
OMNI IP/FQDN to use for registration: dellemc-os10-plugin.st.vxrail.cluster1
Appliance IP : dellemc-os10-plugin.st.vxrail.cluster1
vCenter Server FQDN: vc.st.vxrail.cluster1
vCenter Server Username: administrator@vsphere.local
vCenter Server Password:
SmartFabric VIP: fde1:53ba:e9a0:cccc:0:5eff:fe00:1102
OS10 SmartFabric Rest User Password:
Retype OS10 SmartFabric Rest User Password:
```

(i) **NOTE: The REST user password is only requested once. Use caution to avoid entering an incorrect password.**

The registration response displays before going to the full SmartFabric menu. SSH is enabled on the IP configured on ens160 (vCenter Server Network), and root SSH is not enabled.

5. The SmartFabric OMNI plug-in registration with vCenter status displays. Press **Enter** to continue.

```
NTP Server IP/Hostname: 16.1.1.60
2019-04-08 21:22:39 INFO  [setup.sh] Deleting NTP server entry
2019-04-08 21:22:39 INFO  [setup.sh] Adding 16.1.1.60 as an NTP server
2019-04-08 21:22:39 INFO  [setup.sh] Restarting NTP service

Install SSL certificates from remote Server [y]? n
2019-04-08 21:22:41 INFO  [setup.sh] Registering OMNI Plugin with vCenter
2019-04-08 21:22:41 INFO  [setup.sh] Starting Web Server service
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Web Server Service active
2019-04-08 21:22:41 INFO  [setup.sh] Stopping Application Server and Zero Touch Management applicati
on services
Removed /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Application Server Service Stop successful
Removed /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service.
2019-04-08 21:22:41 INFO  [setup.sh] OMNI Zero Touch Management Application Service Stop successful
OMNI IP/FQDN to use for registration: dellemc-os10-plugin.st.vxrail.cluster1
Appliance IP : dellemc-os10-plugin.st.vxrail.cluster1
vCenter Server FQDN: vc.st.vxrail.cluster1
vCenter Server Username: administrator@vsphere.local
vCenter Server Password:
SmartFabric VIP: fde1:53ba:e9a0:cccc:0:5eff:fe00:1102
OS10 SmartFabric Rest User Password:
Retype OS10 SmartFabric Rest User Password:
2019-04-08 21:23:45,336 Extension Registration succeed with: vc.st.vxrail.cluster1
2019-04-08 21:23:45 INFO  [setup.sh] Starting Application Server and Zero Touch Management applicati
on services
Created symlink /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service → /etc/systemd/sy
stem/dellvcenterapp.service.
2019-04-08 21:23:45 INFO  [setup.sh] OMNI Zero Touch Management Application Service Start successful
Created symlink /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service → /etc/system
d/system/vcenterappgunicorn.service.
2019-04-08 21:23:45 INFO  [setup.sh] OMNI Application Server Service Start successful (plugin versio
n 1.0.45).
press [enter] to continue...
```

6. Logout of all vCenter sessions that you have registered, then log back into the registered vCenter.

(i) **NOTE: You cannot register the same vCenter instance from another SmartFabric VM.**

Map multiple fabric instances to a single OMNI plug-in

This information explains how to map fabric instances to a single vCenter instance. If you do not want to create individual OMNI to vCenter mappings, you have the option of mapping multiple fabric instances to a single OMNI mapped to single or primary vCenter instance.

Prepare the Management IP address

1. Configure a Management IP address on all Dell EMC ToRs enabled with SmartFabric Services.
2. Verify that the OMNI VM can ping or reach the Management IP addresses of all of the Dell EMC ToR switches enabled with SmartFabric Services.

Add additional fabric instances

To add additional fabric instances, the OMNI plug-in VM uses the **Master** role switch IP Management address.

1. Verify the Master role switch.

```
switch# system bash
admin@switch:~$ cps_get_oid.py observed/dnv-cluster/cluster
```

Command output:

2. Click **Add SmartFabric Instance** to add additional fabric instances.
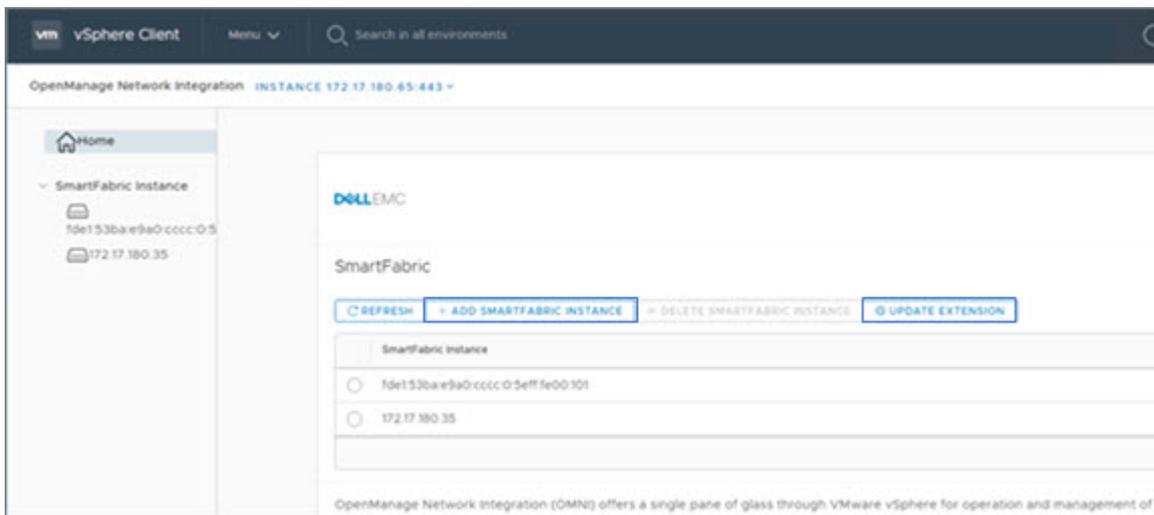
3. Enter the Master IP management address.
4. Enter the REST_USER API admin password used during deployment of the VxRail cluster through VxRail Manager. Use **admin** for the password if no password has been defined.
5. Click **Update Extension** to synchronize OMNI with the newly added fabric instances.

Dashboard

This information describes how to access SmartFabric vCenter through the vSphere Client. A shortcut is available from the vSphere Client left-pane within the menu dropdown and shortcuts view.

ⓘ **NOTE: Before you use the plug-in, you must set up a Dell EMC SmartFabric appliance in vSphere.**
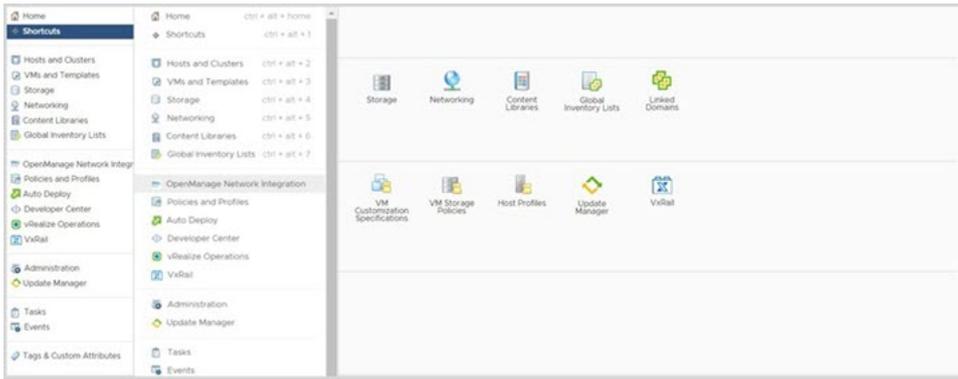
When you select SmartFabric, the home page displays information about the SmartFabric domains being managed. This page also allows you to update extensions if available. Information includes:

- Switch details that are part of the SmartFabric domain
- Operating system version
- Lifecycle status
- List of networks created
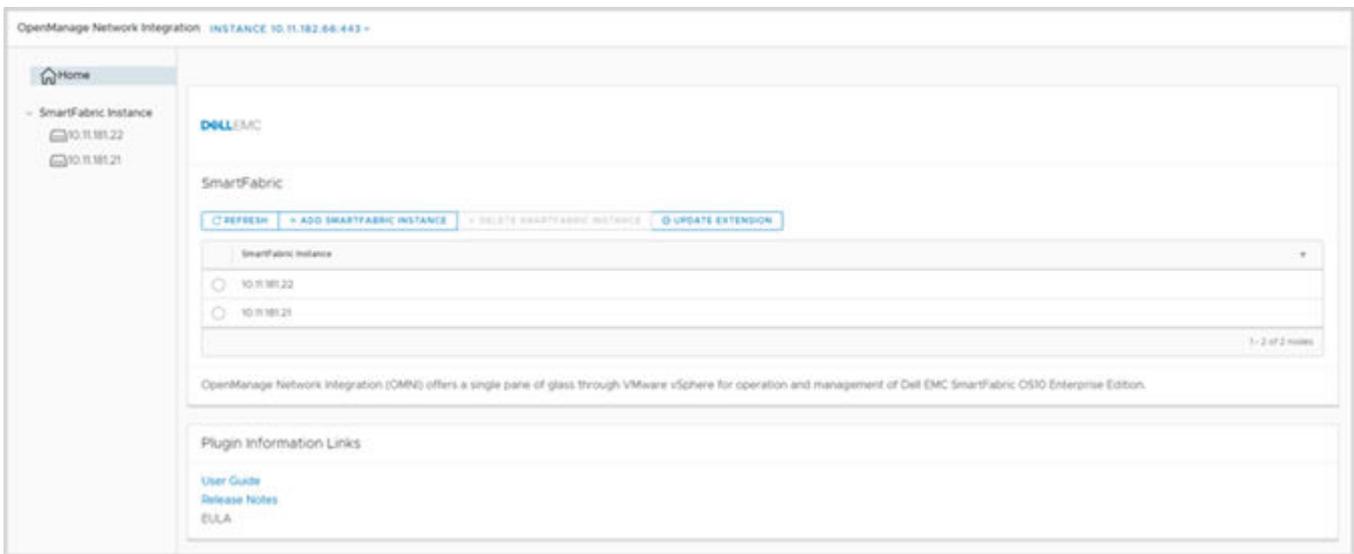
Monitoring

This information describes supported deployment, virtual standard switch (VSS), distributed virtual switch (DVS), and usage.

Supported deployment

A single SmartFabric instance manages up to 16 SmartFabric domains. You can register the SmartFabric instance with up to 10 separate instances of vCenter that have the hosts that are connected to a managed SmartFabric domain.

Virtual standard switch

When you configure port groups of a VSS with VLANs, the respective *active* and *standby* physical adapter interfaces are automatically configured by SmartFabric vCenter on the top of racks (ToRs) and uplink of the SmartFabric. This is shown as tasks on the registered vCenter tasks pane. VLAN changes are reflected on the ToRs and SmartFabric Uplink seamlessly. Any unused VLANs in the domains purge automatically.

(i) **NOTE: Deleting port groups or the VSS itself will clear all unused VLANs from the SmartFabric.**

Distributed virtual switch

When you configure port groups of a DVS with VLANs, the respective *active* and *standby* physical adapter interfaces of the hosts that are part of the DVS are automatically configured by SmartFabric on the ToRs and SmartFabric Uplink. This is shown as tasks on the registered vCenter tasks pane. Each host has a separate task that is created for this task. VLAN changes are reflected on the ToRs and SmartFabric Uplink seamlessly. Any unused VLANs in the domains purge automatically.

(i) **NOTE: Deleting port groups or the DVS itself clears all unused VLANs from the SmartFabric.**

Distributed virtual switch (DVS) provides an option to change the VLAN of uplink port-groups. SmartFabric ignores port-group configuration if the VLAN type port-group is set to VLAN trunking or private VLAN.

Dell EMC recommends keeping the DVS uplink in Trunking mode and configures the virtual port groups with VLANs for each network. SmartFabric configures the respective VLANs on the ToRs and SmartFabric Uplinks.

System management

This information explains common SmartFabric system management operations.

- **Appliance reboot**

  Configurations are persistent. Any services running are enabled at startup and continue to run. If the services stop, the services must be brought up again to monitor the domain.

  Go to SmartFabric Console Login and select **Option 7. Reboot Appliance**. Recommendation is to enable auto start for the VM after power on of the host or domain after the first setup. This ensures that the domain is always managed properly by the plug-in.

- **Change appliance DNS**

  SmartFabric requires vCenter FQDN to be resolved properly for it to connect stemless. Any change in DNS must be updated on the application through **Option 2. Interface Configuration Menu**. You must then set the proper DNS for the interface which connects to the respective vCenter; see note.

- **Connect to multiple vCenter networks**

  SmartFabric by default comes with only two network adapters. To connect to multiple vCenter servers across different networks, you must edit the VM to add multiple adapters from vCenter.

  Configure all interfaces through **Option 2. Interface Configuration Menu** with the proper IP and DNS. Activate and deactivate the new connections, register the plug-in with vCenter, and then SmartFabric starts managing the network adapter changes.

- **Change appliance SSL certificates**

  The SmartFabric appliance uses certificates to generate a thumbprint of the appliance for vCenter registration. To update the package with proper thumbprint, you must complete the registration process again to avoid connection failures between the appliance and vCenter.

  Go to the SmartFabric home page, select **Update Extension**. The UI picks up the changes and starts communicating with the SmartFabric appliance.

- **Upgrade plugin package on vCenter**

  You can upgrade the plug-in package on new releases without having to deploy a new SmartFabric appliance. For more information, see the Upgrade SmartFabric vCenter plugin.

- **Plugin sync behavior**

  When you power off the SmartFabric VM, any changes you make on the respective hosts through vCenter do not reflect on the fabric. When you power on the VM (registering), the plug-in syncs all the states of VLANs for all the hosts.

- **VxRail switch add**

  When SmartFabric detects any new VxRail switch added to the registered vCenter, the switch changes will not be synced for 20 minutes for the VxRail Manager to finish setting up the switch for the domain. After the 20 minute timer expires, the plug-in will start syncing the states of the host if it is part of the managed domain.

(i) **NOTE: Although the vCenter IP address can be used, we recommend using only the vCenter hostname.**

Topics:

Host network inventory

This information describes how to view information about physical Dell EMC PowerSwitch infrastructure running SmartFabric OS10.

Host network inventory page

Select a host in vCenter, select the **Monitor** tab, then select OMNI vCenter in the monitor sidebar.

Refresh button

Click **Refresh** to update the host network inventory data and display updated contents.

Physical adapter table

Select a switch to view detailed information. The table is default-sorted by descending switch name to group physical adapters belonging to the same switch.
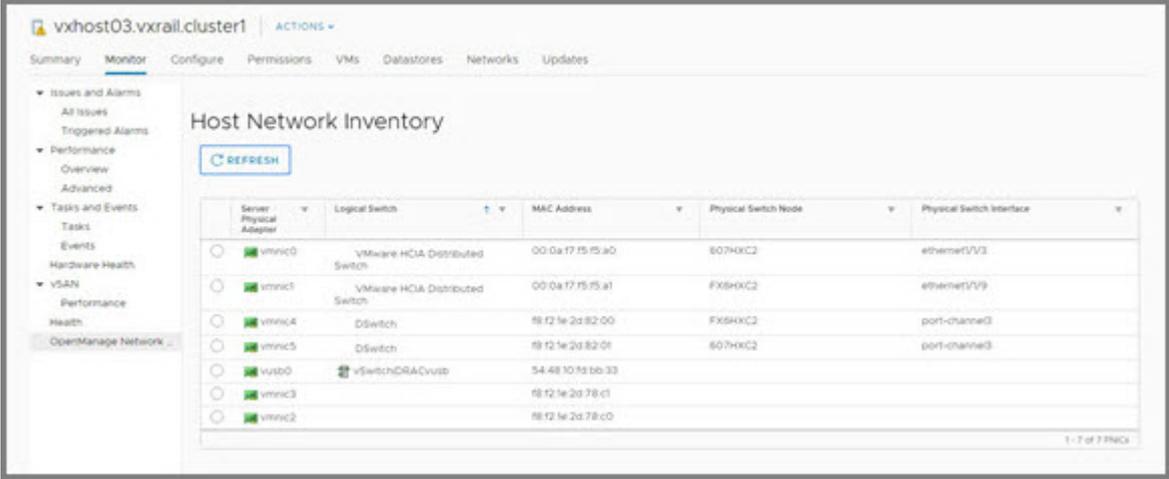
- Physical adapter — physical network adapter name
- Virtual switch — name of switch the physical adapter is connected to
- MAC address — MAC address of the physical adapter
- Physical switch — physical switch that is connected to the fabric
- Physical switch interface — physical switch port this server network adapter is wired to

Logical switch

Displays information about the logical switch that is connected to the selected physical adapter.

- Switch tab — includes name of switch, MTU in bytes of switch, physical adapters connected to the switch. and uplink ports on the switch
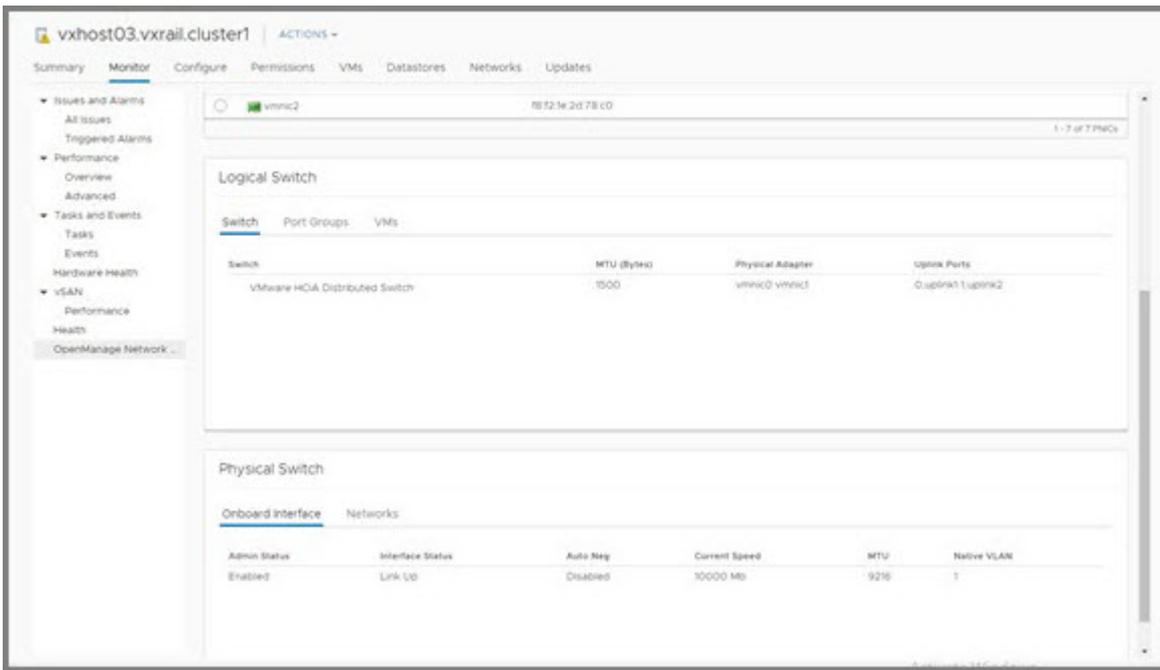
- Port groups tab — includes the name of port groups, and VLAN IDs for each port group
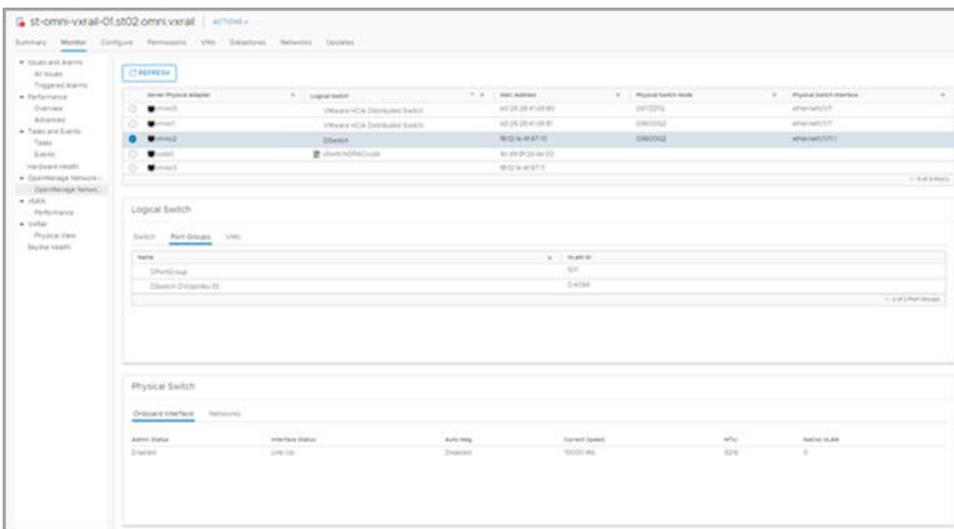
- VMs tab — includes the name of VMs of that host that is connected to a single virtual switch
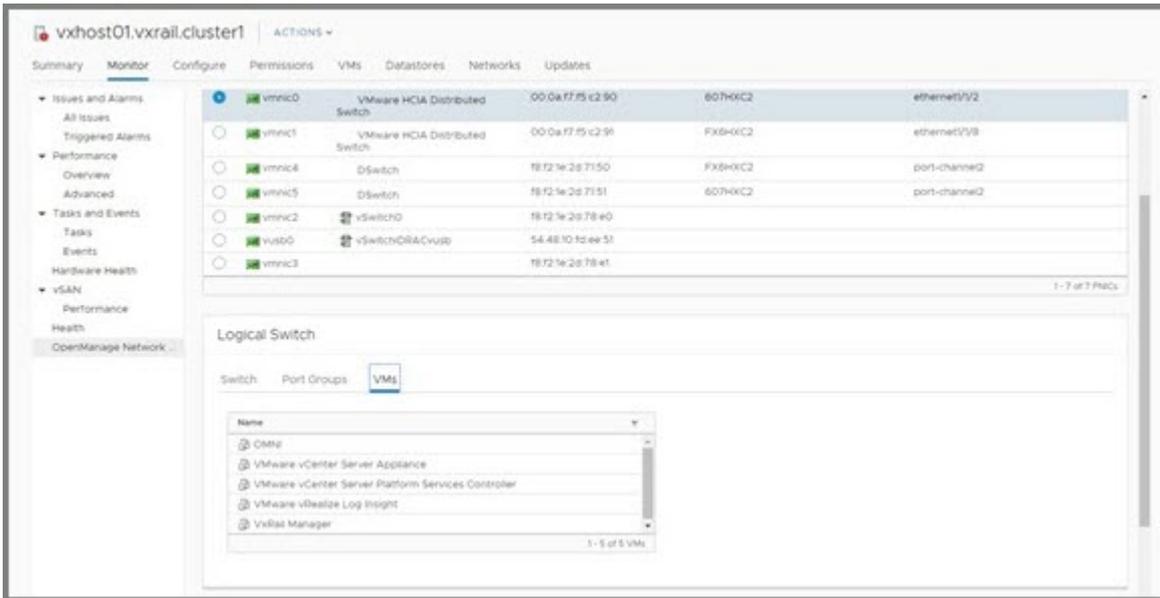
Physical switch

Displays information about the onboard interface. This information displays only when there is a physical connection between the VxRail domains and OMNI.

- Onboard interface
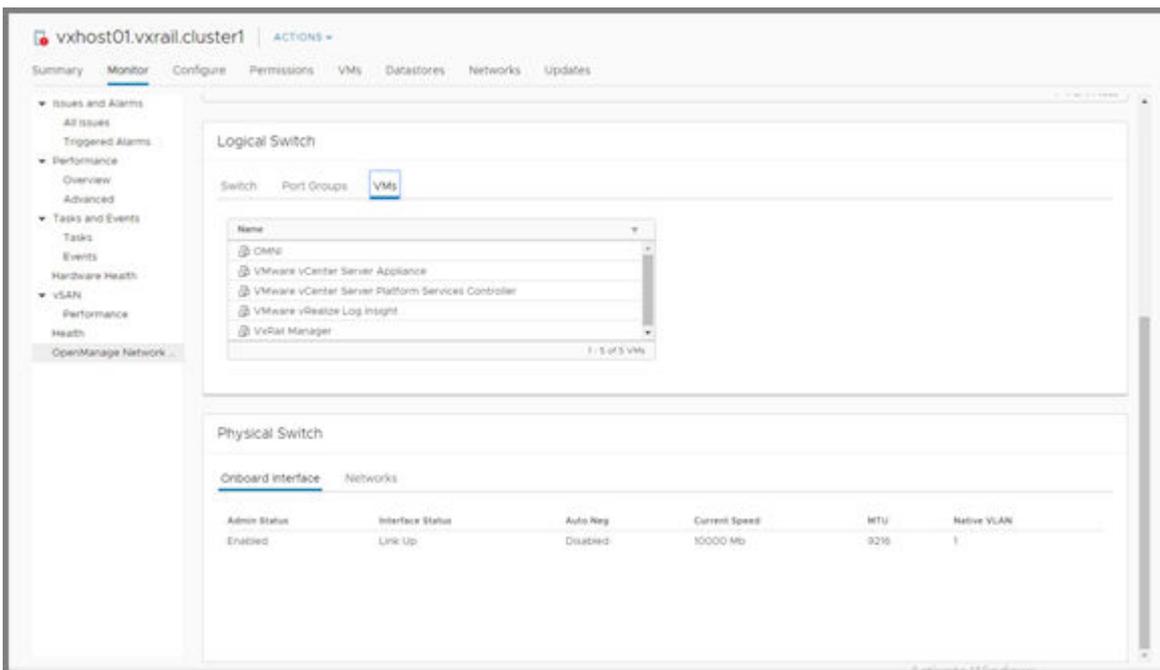
- Admin Status — configured state of the physical interface
- Interface Status — current operations state of the physical switch port
- Auto Neg — negotiation status of the physical interface
- Current Speed — current operational speed of the physical interface
- MTU — maximum transmitting unit configured on the physical interface
- Native VLAN — untagged default VLAN for the physical switch
- Networks
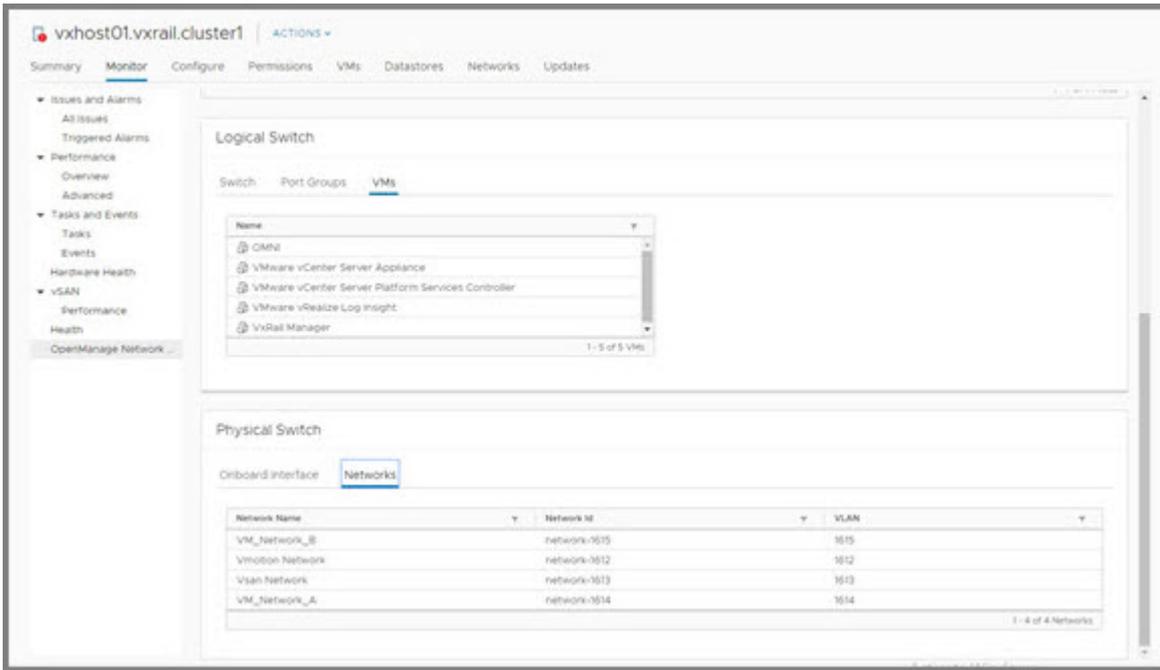
- Network Name — name of the VLAN network
- Network ID — unique identifier of the fabric network
- VLAN — tagged VLAN of the switch port

Fabric summary

This information describes the selected Fabric Summary. Select the fabric from the left-pane to view details on the fabric. Click **Refresh** at any time to update details.
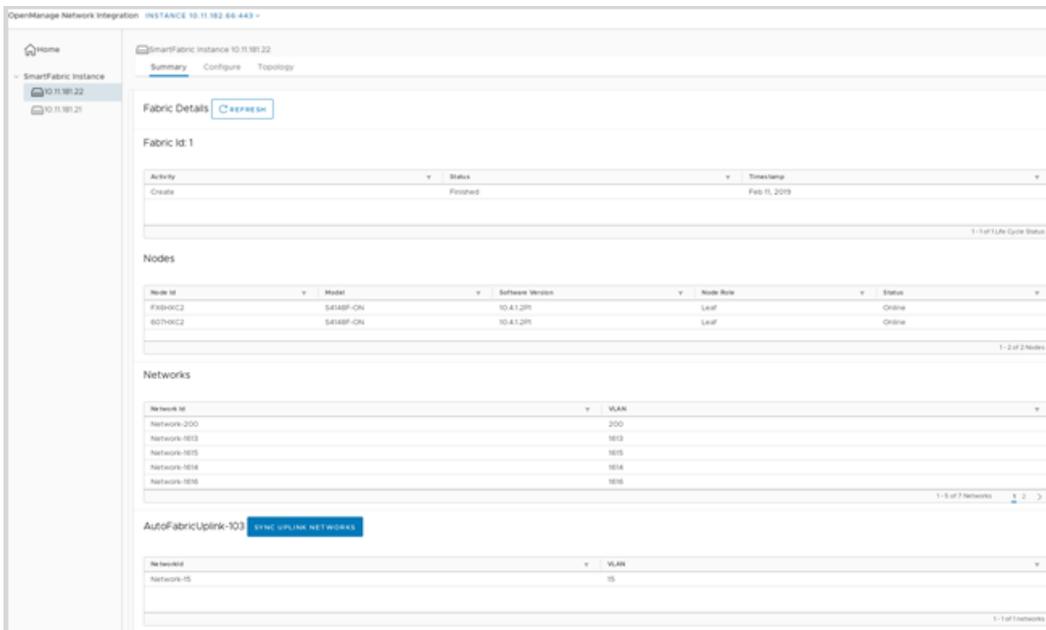
User uplinks

This information describes how to create, edit, or delete fabric uplinks. You can create uplinks on each fabric with available interfaces which are not part of an existing uplink, server connected ports, or part of a SmartFabric automation and jump port.

Once you have created an uplink, you can then associate networks to the uplink and change or modify interfaces. These user-managed uplinks require configuration of networks through SmartFabric vCenter.

(i) **NOTE: If you delete an uplink, any unused networks and ports will be available for future use.**

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **User Uplinks**.
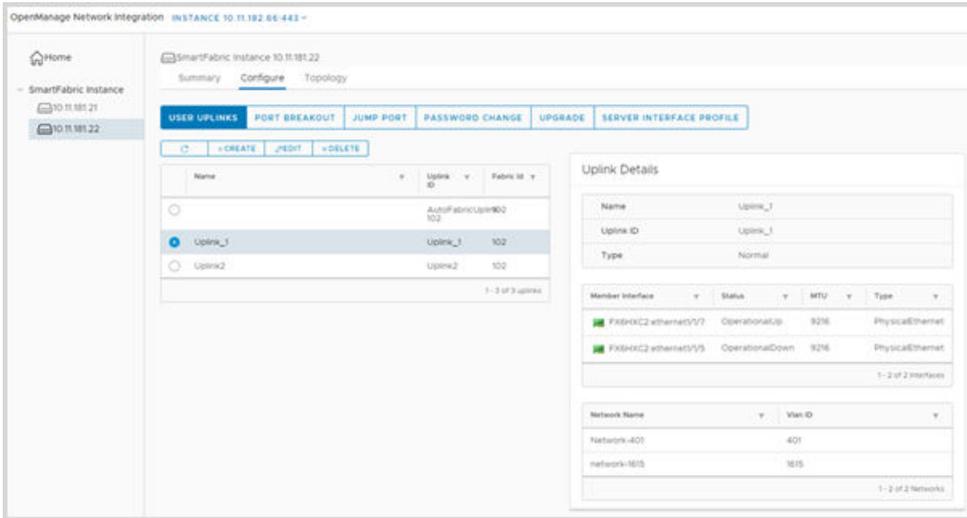
Create user uplinks

You can create an uplink by selecting the fabric with a unique user-given name, then select the interfaces and networks through the wizard interface to create a user uplink.

1. Select the Uplink Name, select the fabric, then click **Next**.
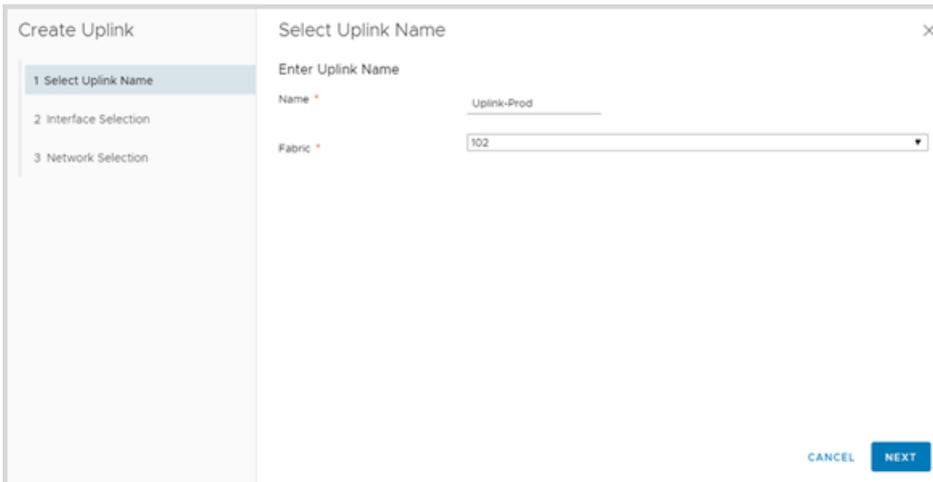
2. Click **Select Interfaces**, select the interfaces to add to the fabric uplink from the top list, then click **Add**.
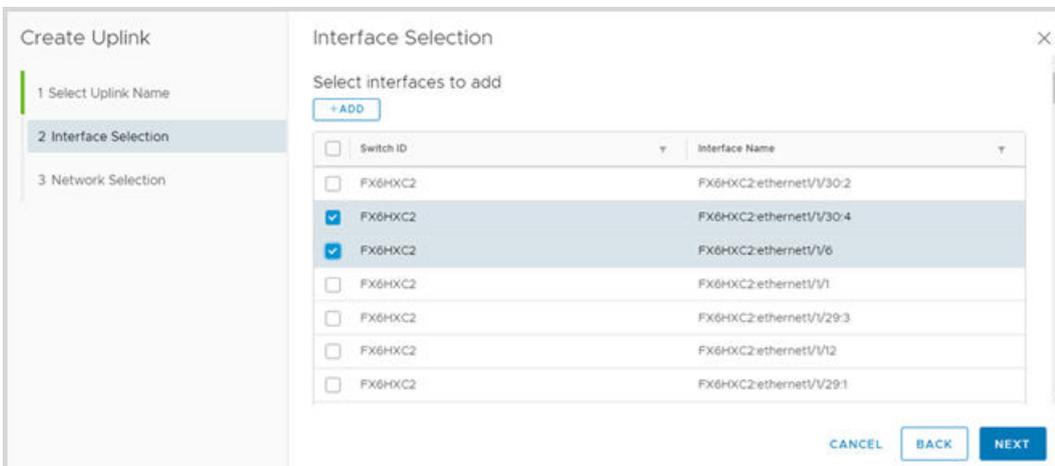
3. The interfaces are now selected for the fabric uplink; click **Next**.
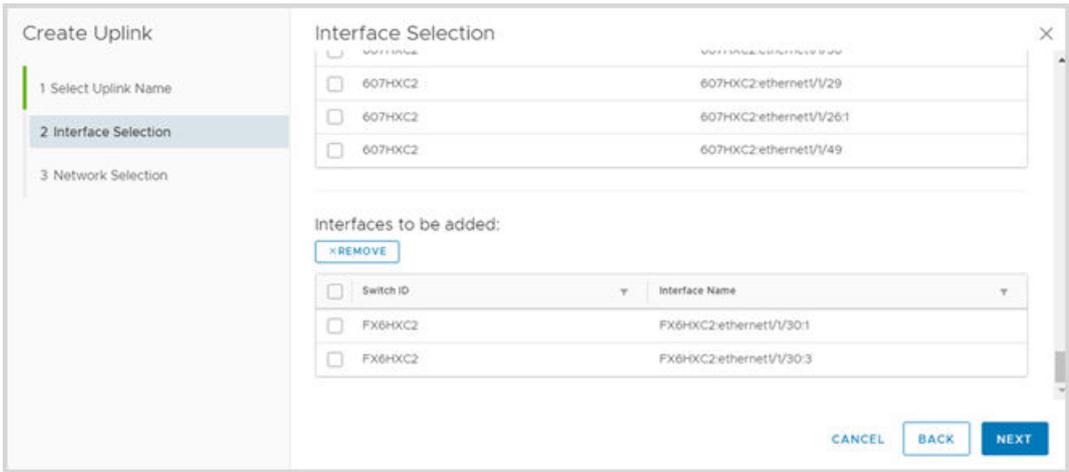
4. Select networks to add to the fabric uplink from the top list, then click **Add**.
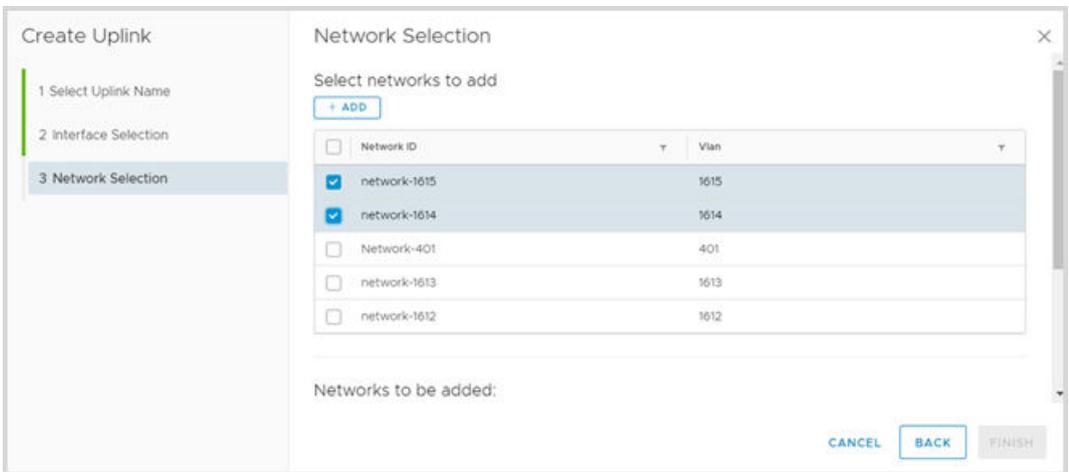
5. The networks are now selected for the fabric uplink; click **Finish**.
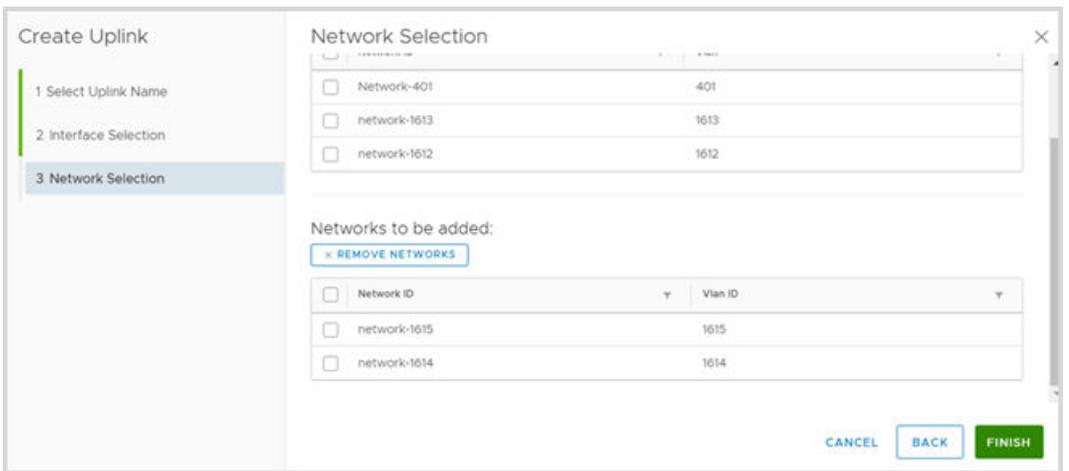
Edit user uplink

ⓘ **NOTE: You can only edit user-created uplinks. Default system uplinks cannot be edited.**

1. Select the uplink, then click **Edit**.
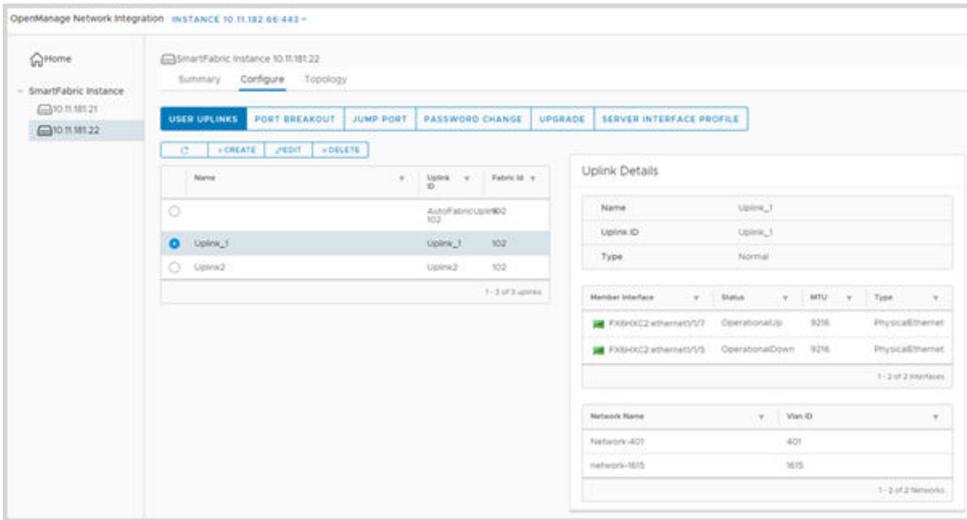
2. Add or delete the interfaces to change, then click **Next**. The new interface selection displays at the bottom.
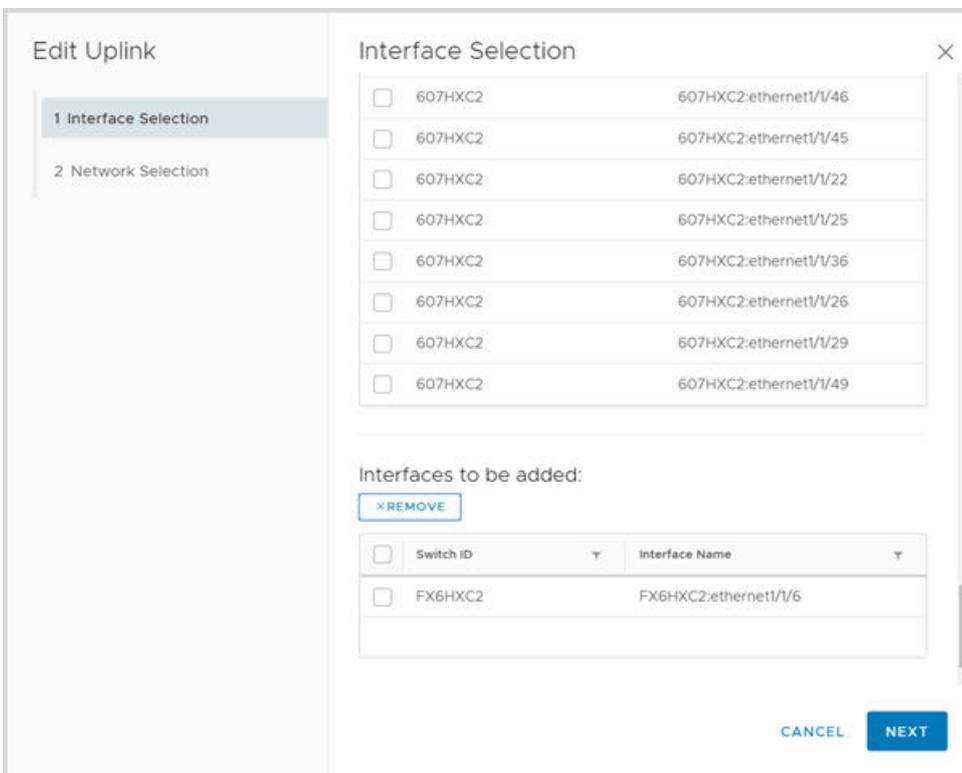
3. Add or delete the networks to change; the new network selection displays at the bottom.
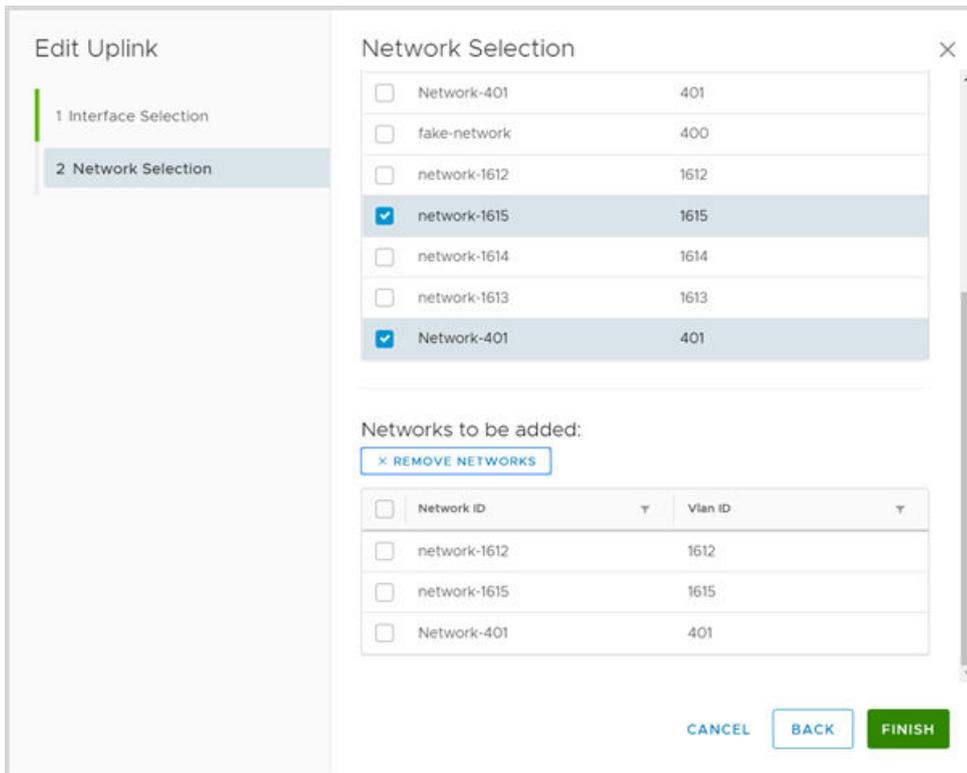
4. Click **Finish**.

Delete user uplink

(i) NOTE: **You can only delete user-created uplinks. Default system uplinks cannot be deleted.**

1. Select the uplink to delete, then click **Delete**.
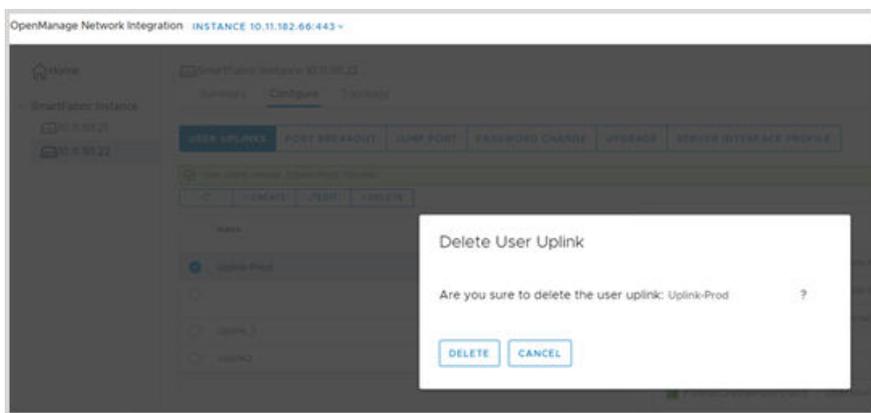
2. Click **Delete**.

Port breakout

This information describes how to display and configure breakout-capable ports. You can choose any breakout mode available on the configuration to move back and forth.

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **Port Breakout**.
   (i) NOTE: **Only breakout-capable ports are listed in the Port Breakout table. The S4148F/T/U/FE-ON switch port breakout is based on the switch-port-profile configuration (see Configure extended options).**
3. Select the port to display breakout port details.
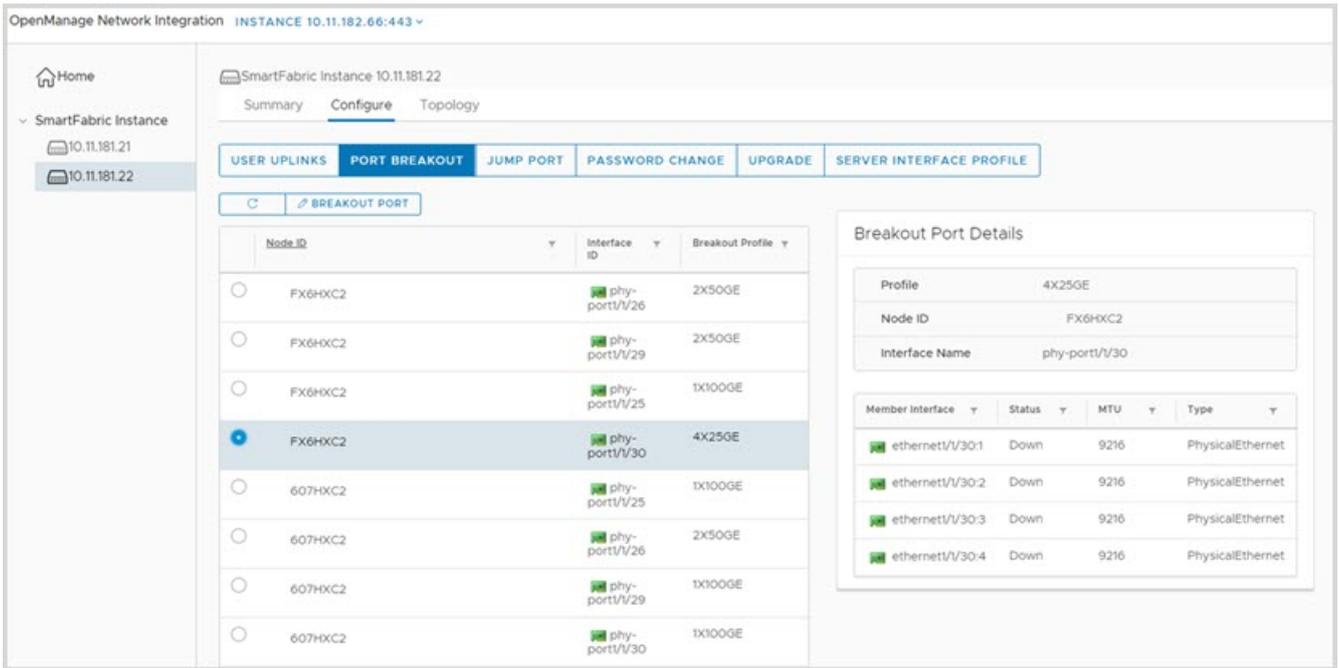
4. Select breakout mode, then click **Submit**.
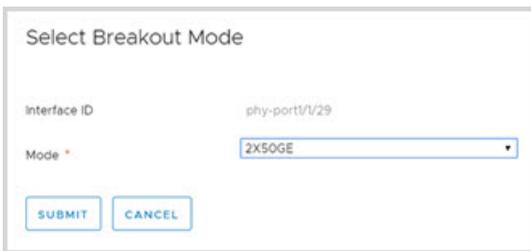
Jump port

This information describes jump port operations. Only one port per switch can be configured as a jump port. You can select any available port that is not part of an uplink or intercluster link, or connected to an ESXi server which is part of SmartFabric deployment.

If you would like to change an existing jump port, you must unconfigure it, then add the new jump port. Removing a jump port makes the port available for all traffic, and can be connected to a VxRail switch.

Add new jump port

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **Jump Port**.
3. Select the switch, select the interface, then click **Add Jump Port**.
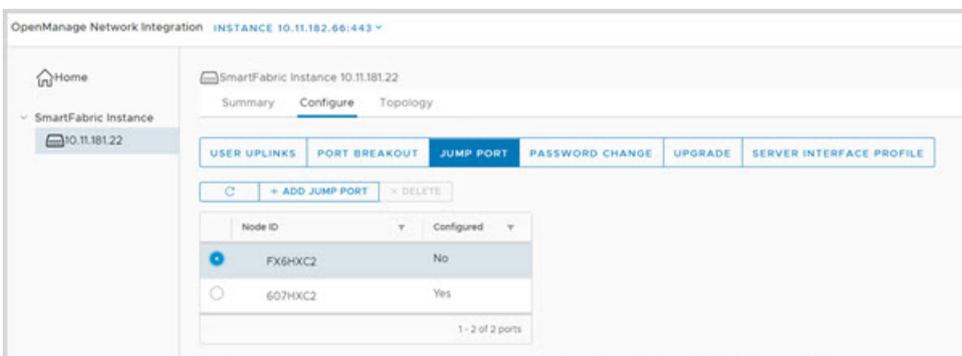
4. Enter the VLAN description, then click **Add**.

Reconfigure jump port

1. Select the switch that is configured with a jump port, then click **Delete** to delete the jump port.
2. Follow the steps in **Add new jump port**.

Password change

This information describes how to change the password for the SmartFabric domain.

> (i) **NOTE: If you change the password, the SmartFabric password must be updated on theVxRail Manager as well.**

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **Password Change**.
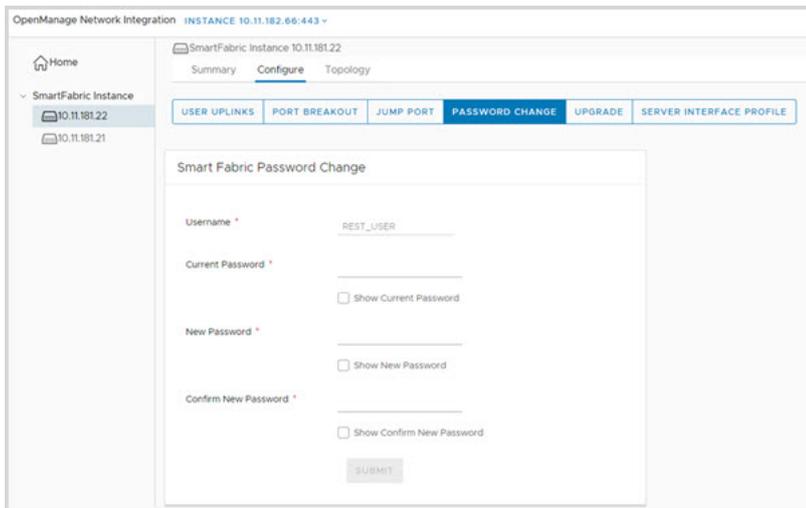
3. Enter the current password for the SmartFabric domain.
4. Enter the new password for the SmartFabric domain, then confirm the new password again.
5. Click **Submit**. An alert displays at the top after the operation completes.

Upgrade image

This information describes how to upgrade the OS10 image of the fabric. Fabric upgrade displays a list of user-uploaded images to SmartFabric vCenter.

Upload image

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **Upgrade**.
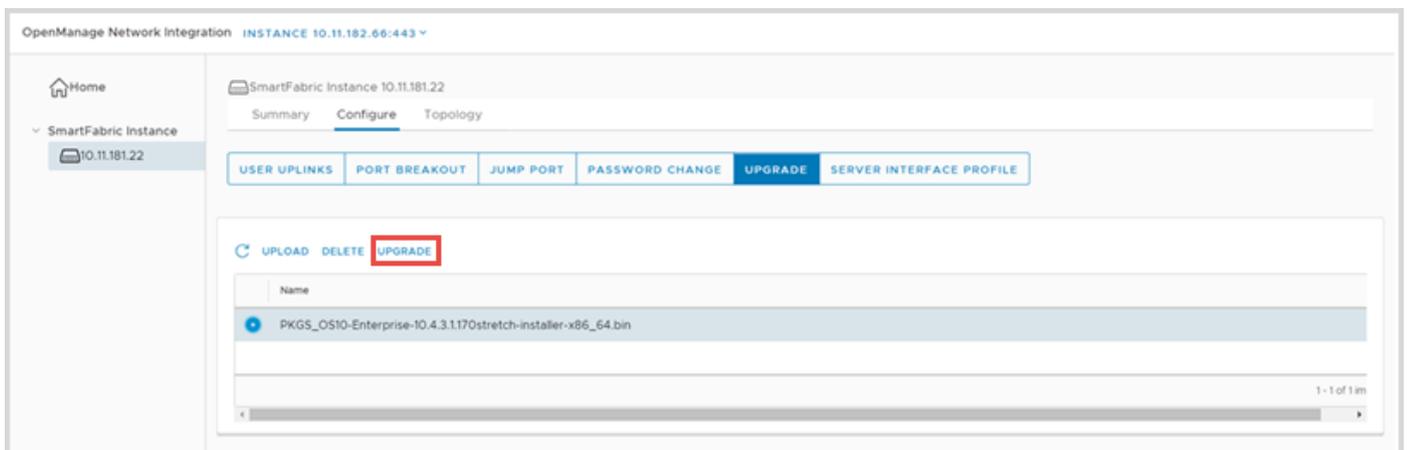
3. Click **Upload**, click **Choose File**, navigate to the image file, and select the file, then click **Upload**.

4. Click **Close**. You can repeat these steps to upload more images.

5. Click **Yes** to confirm the upgrade.
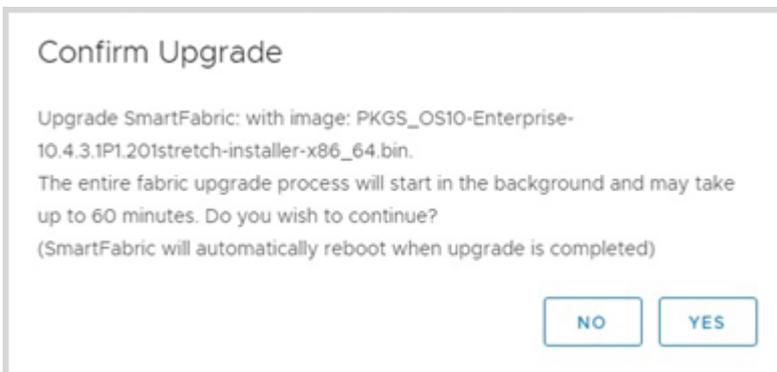
Delete image

1. Select the image to delete, then click **Delete**.
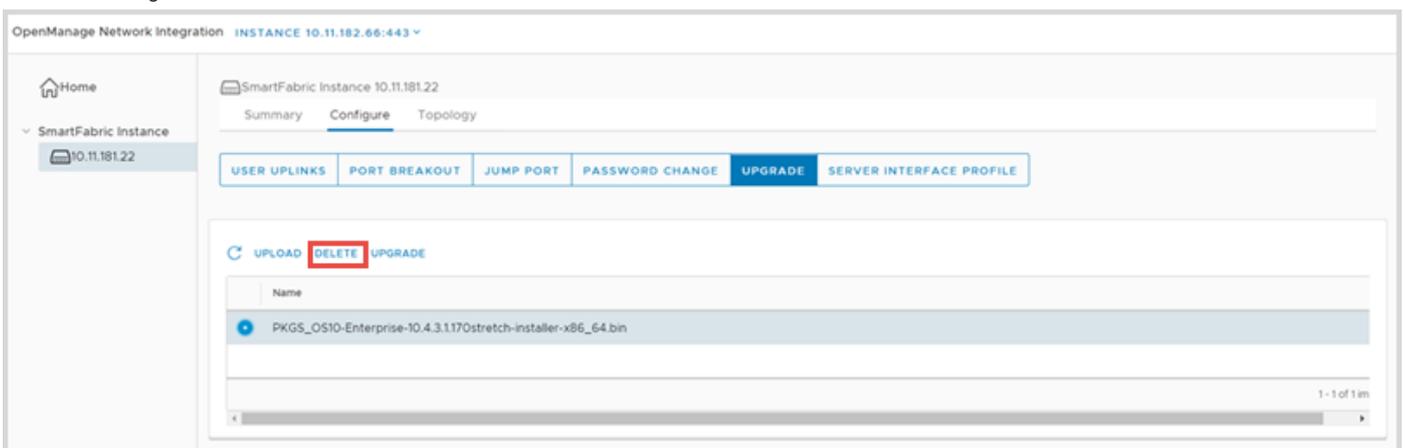
2.
3. Click **Yes** to delete the image, or **No** to cancel.

Upgrade fabric

1. Select the image to upgrade, then click **Upgrade**.
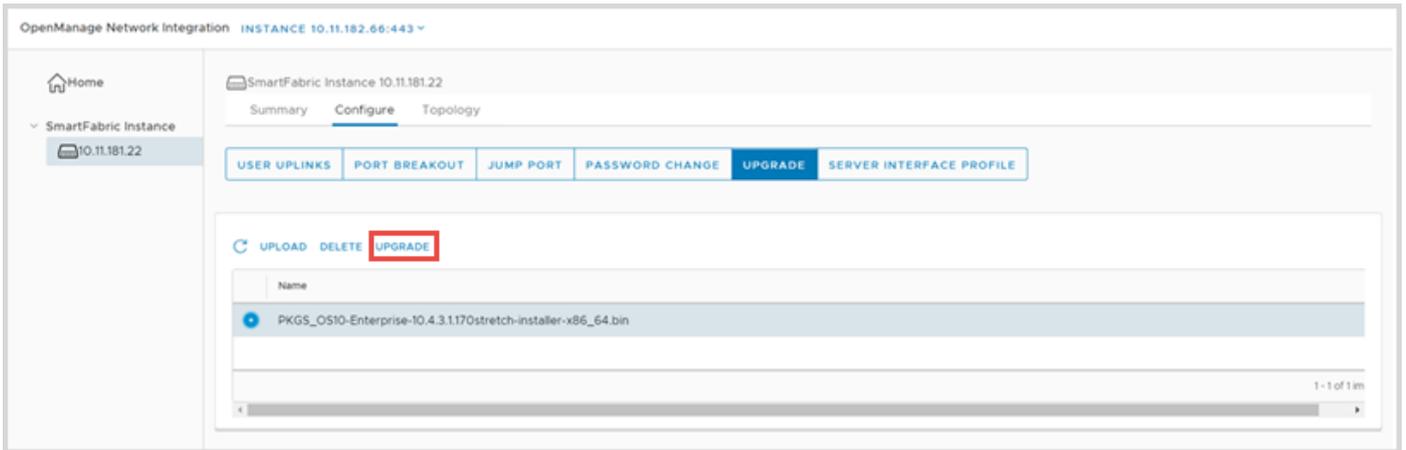
2. Click **Yes** to confirm the upgrade, or **No** to cancel the upgrade. The successful image upgrade message displays.

ⓘ **NOTE: One switch is upgraded at a time so that there is no loss of connectivity for the VxRail cluster.**

The vCenter Task Console displays including the status of the upgrade task. The percentage that is completed on vCenter shows 50% complete when the image has finished uploading the SmartFabric image, and 100% when SmartFabric completes the upgrade.
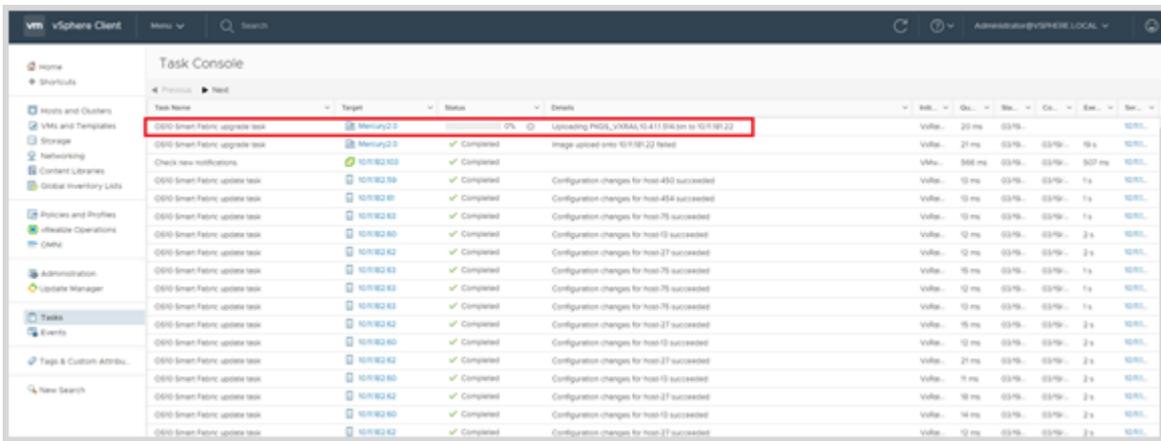
Server interface profile

This information describes how to configure a SmartFabric server interface profile.

The Server Interfaces Profile List displays a list of Server Profile IDs and their respective onboard status. Select a profile to view details pertaining to that specific profile including:

- Interface ID
- Fabric ID
- Native VLAN
- Networks (if applicable) including the network name and VLAN ID

Create profile

1. Select SmartFabric vCenter, then select **SmartFabric**.
2. Select the specific SmartFabric instance, select **Configure**, then select **Server Interface Profile**.
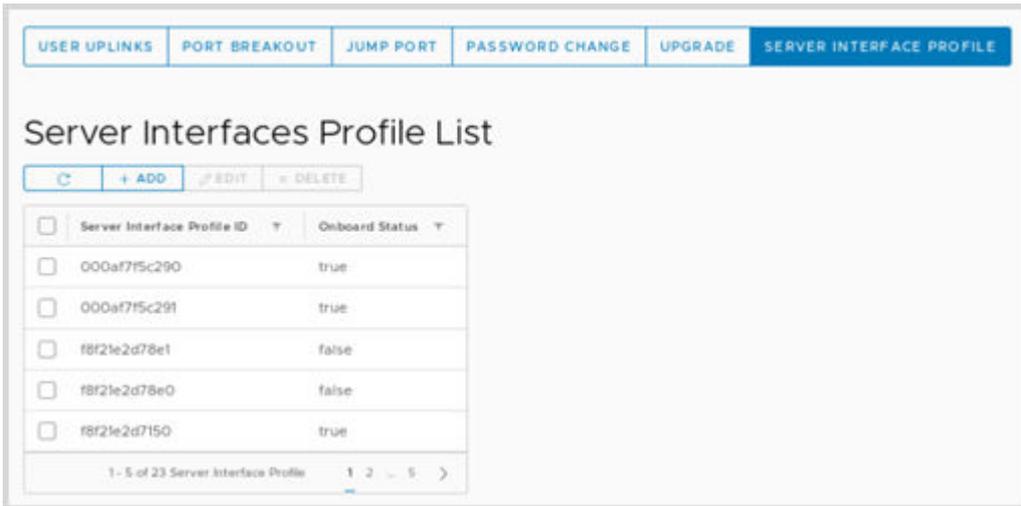
3. Click **Add** to create a Server Interfaces Profile.
4. Enter the name of the new profile, then click **Next**.
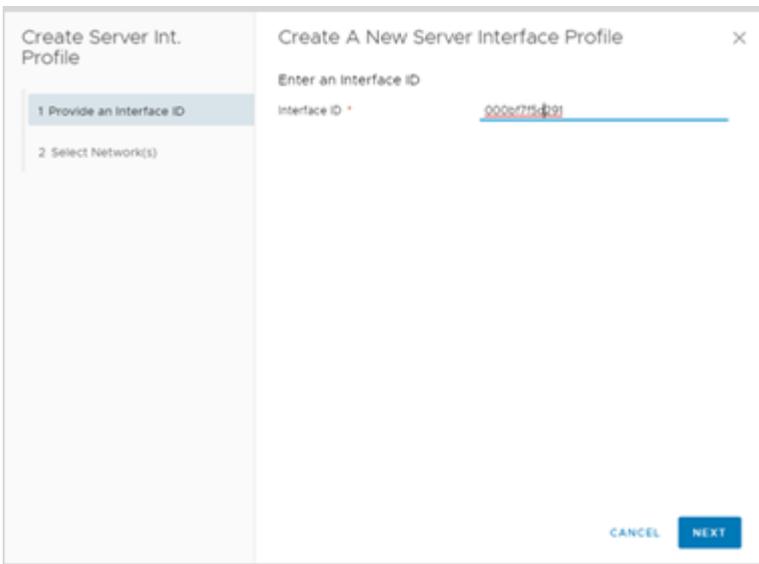
5. Click **Select Networks**, select the networks to assign to the profile, then click **Add**.
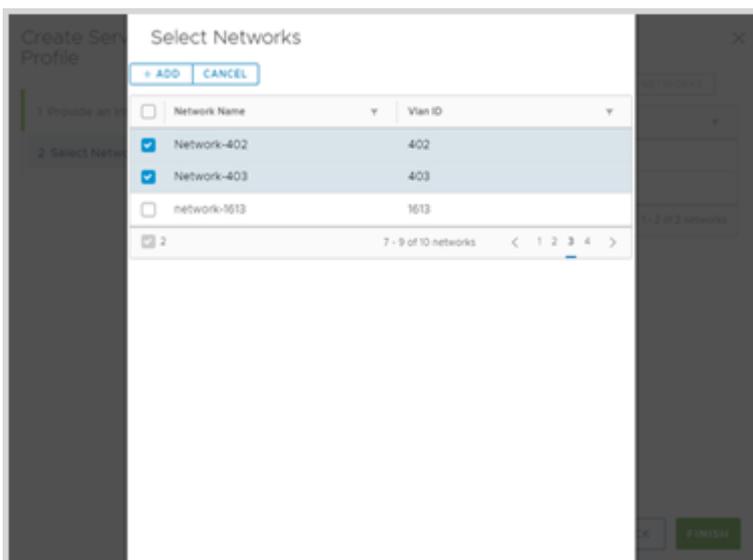
6. (Optional) Click **Create Network**, enter the name of a new network to assign to the profile, then click **Create**.
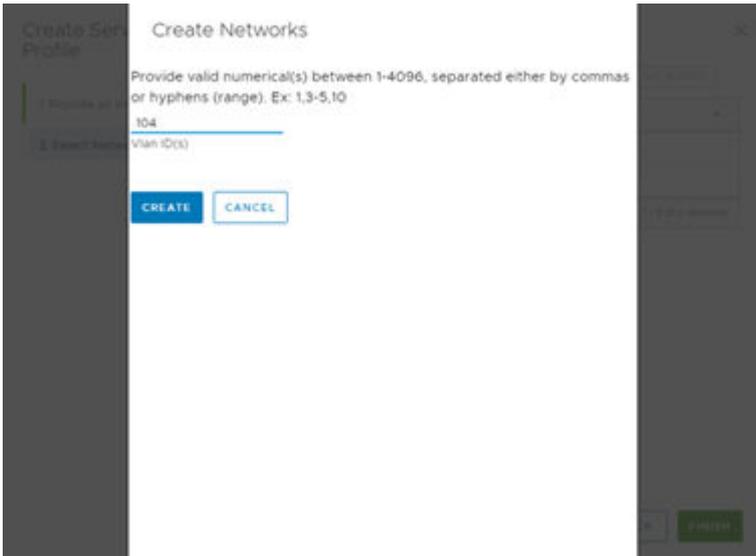
7. Click **Finish**.
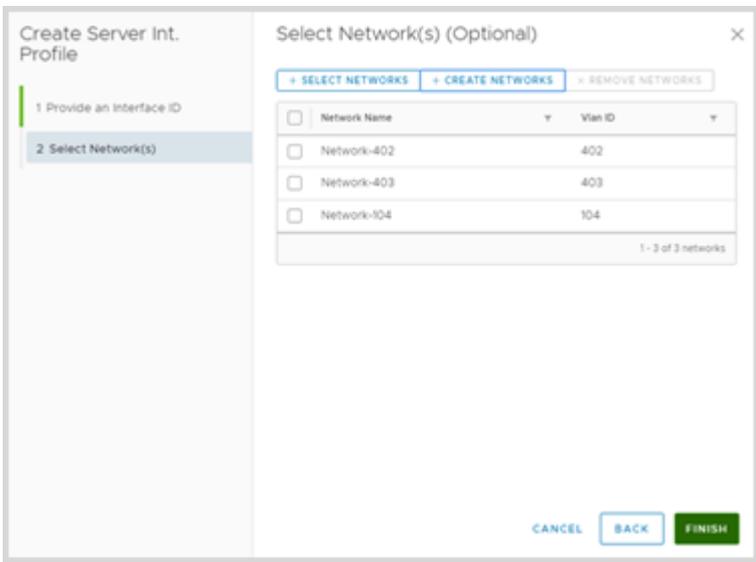
Edit profile

1. Select the Server Interface Profile from the display, then click **Edit**.
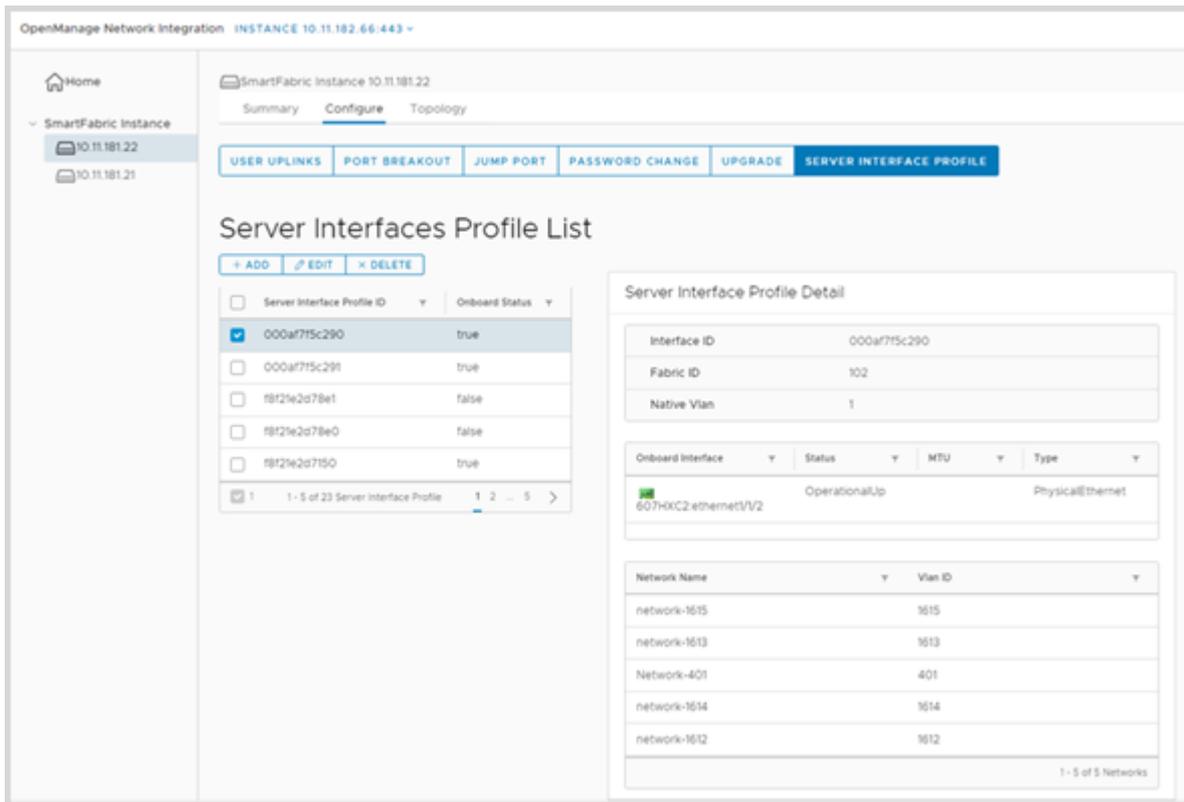
2. (Optional) Select the network to edit from the Server Interface Profile, then click **Add**.
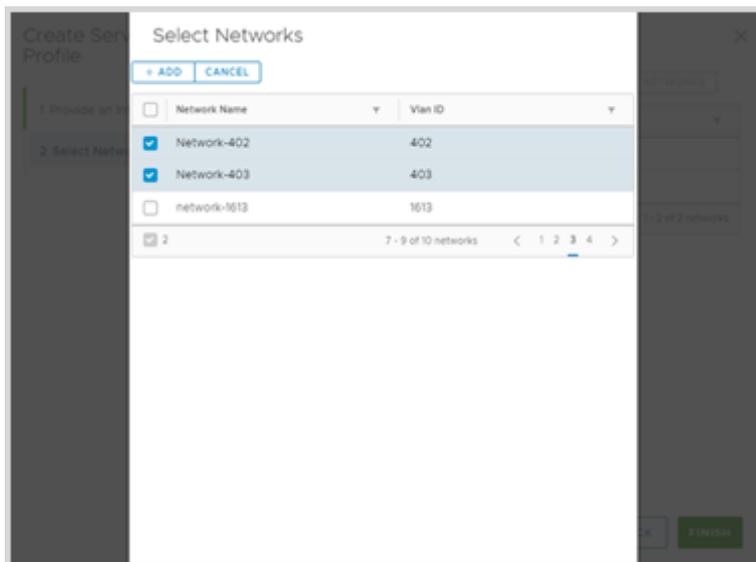
3. Click **Remove Network**, then click **Finish**.

Delete single profile

1. Select the Server Interface Profile from the display, then click **Delete**.
2. Click **Delete** to confirm removal of the Server Interface Profile.

Delete multiple profiles

1. Select the Server Interface Profiles from the display, then click **Delete**.

Delete Server Interface Profile(s)}

Are you sure you want to delete **3** server interface profile(s)?

000bf7f5d291   544810fdbb33   544810fdee51

DELETE   CANCEL
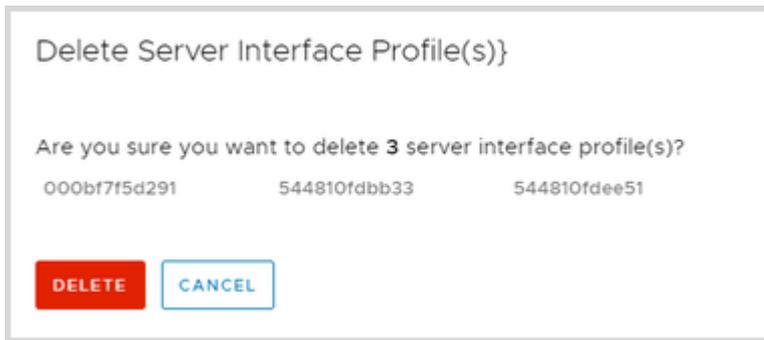
2. Click **Delete** to confirm removal of the Server Interfaces Profile.

Fabric topology

This information explains how to display the fabric topology and switch information. Switch information includes destination interface, destination switch, interface ID, interface name, switch ID, and type.

1. Select SmartFabric vCenter, then select **SmartFabric**
2. Select the specific SmartFabric Instance, then click **Topology**.
3. Mouse over a fabric to display switch details.
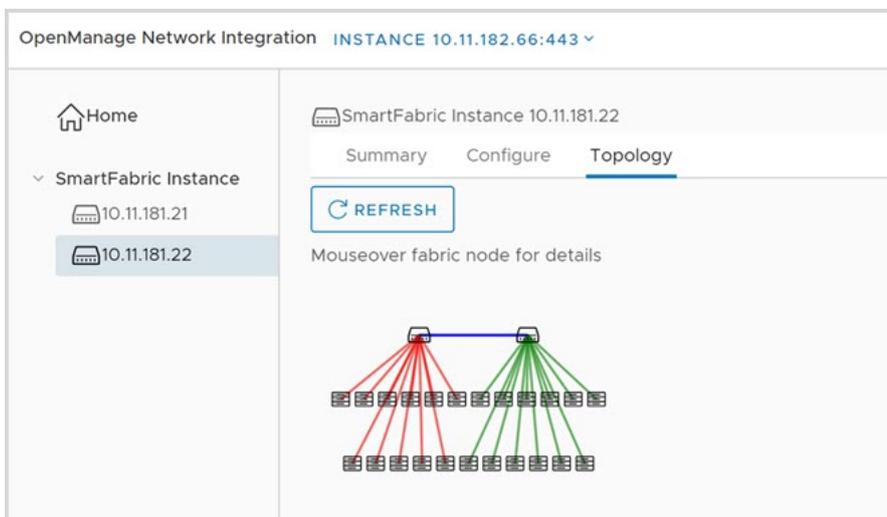
4. Click **Refresh Topology Data** to update the topology information.

Switch replacement

This information explains how to switch a SmartFabric environment with another switch running SmartFabric.

1. Capture all wiring connections from the Dell EMC switch to be replaced. Pay close attention to all the switch ports being used, or uplinks and interlink connections (links between the Dell EMC switches).
2. Write these configurations:

    - Hostname
    - Management IP address if any
    - DNS and NTP IP addresses if configured
    - Spanning-tree mode; SmartFabric Services run RPVST by default
    - Other spanning-tree parameters

3. Ensure that the new Dell EMC switch has the same OS10 version as the existing Dell EMC show.

```
# show version
```

4. Enable SmartFabric Services on the new switch and define the uplinks, interlink ports, plus any other more parameters such as management VLAN, LACP, VLAN tagging, and so on.

For example, if the uplink port is 1/1/4 and the interlink ports are 1/1/6,1/1/8, no VLAN tagging, LACP auto, management VLAN 1 as default.

```
# sfs_enable_vxrail_personality.py -i 1/1/6,1/1/8 -u 1/1/4 -l
```

5. Reload the switch.
6. Connect the new switch to the existing switch running SmartFabric currently. Make all connections between the switches, uplinks, and VxRail nodes.
7. The new switch reboots, and during the reboot, the database configuration on the new switch will be updated by the existing switch to establish a synchronized database between both switches. Allow several minutes for this to take place.
8. Once the configurations have synchronized, review the command outputs on both switches as they should match.

```
# show vlan
```

This command shows a primary and secondary peer status depending on which switch the command is run on.

```
# show vlt 255
```

```
# show lldp neighbor
```

Lifecycle management

This information explains common lifecycle operations including upgrading of the SmartFabric solution including VxRail nodes, SmartFabric OS10, SmartFabric vCenter appliance, and switch replacement.

These are the required steps to upgrade the SmartFabric solution:

1. Upgrade all VxRail nodes (see Upgrade VxRail nodes).
2. Upgrade OpenManage Network Integration (see Upgrade image).
3. Upgrade SmartFabric OS10 (see Upgrade OS10).

Topics:

Upgrade OS10

This information describes upgrading of individual switches. You can upgrade the entire fabric through SmartFabric (see Upgrade image).**Download OS10 binary**

1. Download and unpack the new OS10 binary image (see Download OS10 image and license), then copy the binary image to a local server.
2. (Optional) Back up the current running configuration to the startup configuration in EXEC mode.

   ```
   copy running-configuration startup-configuration
   ```

3. Back up the startup configuration in EXEC mode.

   ```
   copy config://startup.xml config://backup_file_name
   ```

4. Download the new OS10 binary image from the local server in EXEC mode.

   ```
   image download server-filepath
   ```

5. (Optional) View the current software download status in EXEC mode.

   ```
   show image status
   ```

Install OS10 binary

(i) **NOTE: The `image install` command installs the image binary to the standby partition. If the active partition contains modified files or custom packages, they will not be available in the standby partition. You must back up modified files, then reinstall the packages after downloading the software image.**

1. Install the OS10 image in EXEC mode.

   ```
   image install image-url
   ```

2. (Optional) View the status of the current software install in EXEC mode.

   ```
   show image status
   ```

3. Change the next boot partition to the standby partition in EXEC mode. Use the `active` parameter to set the next boot partition from standby to active.

   ```
   boot system standby
   ```

4. (Optional) Verify that the next boot partition has changed to standby in EXEC mode.

```
show boot detail
```

5. Reload the new software image in EXEC mode.

```
reload
```

6. Install the OS10 license. See Install OS10 license for complete instructions.

Verify OS10 version

```
OS10# show version
Dell EMC SmartFabric OS10
Copyright (c) 1999-2019 by Dell Inc. All Rights Reserved.
OS Version: 10.4.3.0
Build Version: 10.4.3.85
Build Time: 2019-02-18T17:06:10-0800
System Type: S4048-ON
Architecture: x86_64
Up Time: 2 days 05:58:01
```

Upgrade SmartFabric vCenter appliance

This information explains how to upgrade the OMNI appliance. You must be in the Appliance Console to use these steps. Once you upgrade the appliance, you must then register the appliance with the vCenter Server.

(i) **NOTE: OMNI 1.0 to version 1.1 upgrade is not supported. See the *VMware Integration for VxRail Fabric Automation SmartFabric release notes* for a workaround.**

1. Download the OMNI upgrade image and store the image locally.
2. Select **7. Upgrade Appliance**.


```
###############################################################################
     Welcome to Dell EMC OpenManage Network Integration (OMNI) Management
###############################################################################

     Menu
     ----------------------------------------------------
0.  Full Setup
1.  Show Version
2.  Interface Configuration Menu
3.  Install SSL Certificates from Remote Server
4.  OMNI Management Service Menu
5.  OMNI Web Client Plugin Menu
6.  Password/SSL Configuration Menu
7.  Upgrade Appliance
8.  Reboot Appliance
9.  Show Eula
10. Logout

Enter selection [0 - 10]: 7
2018-10-19 12:31:35 INFO  [setup.sh] Getting the upgrade file
Remote SCP Server IP/Hostname: 10.11.182.197
Username: delaware
Path to the upgrade zip file: /home/delaware/sdk/delware/Dell0HMSOvaSetup/packer/uploads/uploads.zip
The authenticity of host '10.11.182.197 (10.11.182.197)' can't be established.
ECDSA key fingerprint is SHA256:0Dxo1clmixj2E1i/TV3M19zveuCMEsALha3vaJHNMGg.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.11.182.197' (ECDSA) to the list of known hosts.
delaware@10.11.182.197's password:
```

The display lists all the applications to be upgraded along with the old and new versions. Upgrading requires restarting the services.

3. Enter **Y** to continue.

After the upgrade completes, the session logs out.

4. Press **Enter** to continue.
5. Select **5. OMNI Web Client Plugin Menu** to register the plug-in, then select **Register/Update OMNI vSphere Client Plugin with vCenter**.

6. Enter the FQDN to use for registration, then repeat the steps to update the plug-in with the vCenter Server.

(i) **NOTE: Before you can use the plug-in, you must set up a Dell EMC SmartFabric vCenter Appliance (see SmartFabric network integration). You can get to the SmartFabric home page using the shortcuts in vCenter. Find the shortcuts in the vCenter sidebar, inside the vCenter Menu dropdown list, and in the vCenter Shortcuts view.**
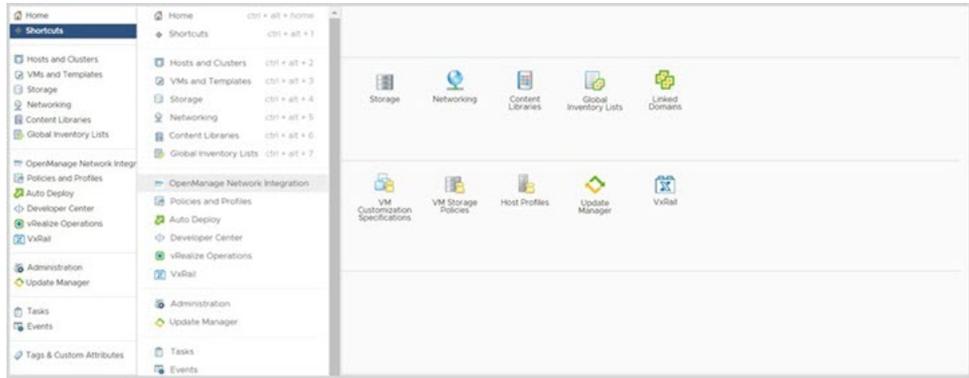
Unregister SmartFabric appliance from vCenter

These steps are used to unregister the appliance from the vCenter. If you would like to move SmartFabric to a different vCenter, you must unregister the appliance before moving it to a new vCenter.

1. Log into the SmartFabric console.
2. Select option **4. SmartFabric vSphere Client Plugin Menu**.
3. Select option **2. Unregister SmartFabric vSphere Client Plugin with vCenter**, then press **Enter** to continue.

4. Provide the vCenter credentials to unregister the plug-in from the vCenter Server.

(i) **NOTE: Once the unregistration completes, you must log out of the vCenter Server to delete the SmartFabric menu.**

Upgrade VxRail nodes

This information describes upgrading of all VxRail nodes using VxRail Manager.

Updating system software

Use the System tab on the VxRail cluster Configure window to install updates for the system software installed on your VxRail appliance.

(i) **NOTE: You may not be able to update your system software if:**

- **You are using a stretch cluster VxRail configuration**
- **You have standard vSphere licenses**
- **Your cluster is in an unhealth state or has critical health alarms**

Open a service request or contact your sales representative or reseller to update your system.

Access the vSphere Client

1. Open the vSphere Clients, then click **Hosts and Clusters** from the left navigation bar.
2. Select your VxRail cluster, then select the **Configure** tab.
3. Select **VxRail > System** from the inner left navigation bar to display the System tab.
4. Click **Update** in the Help Information section.
5. (Optional) Scroll the **System Software Installed on this Cluster List** to view the system software installed on your VxRail appliance. If a new version is available, click **Internet Upgrade**.

Upgrade options

1. Click **Upgrade** to view the upgrade options, then click **Internet Upgrade** to download a new version of the software. If you do not have Internet access, click **Local Upgrade** to use upgrade from local storage.
2. Click **Continue** to start the software upgrade.
3. Enter your login information for the VxRail Manager and vCenter Server, the PSC root account and password, and the vCenter Server administrator account and password, then click **Submit**.
4. Click **Refresh** to reload the System Software Installed on this Cluster screen. The new software version displays in the Installed Components List.

For complete information, see Dell EMC VxRail Appliance Administration Guide, release 4.7.x.

Troubleshooting

This information troubleshoots the SmartFabric vCenter appliance connectivity, SmartFabric errors, and UI population errors.

SmartFabric appliance connectivity

Check the IP and DNS settings and connection status.

1. Select **2. Interface Configuration Menu**.

2. Select **1. Show Interfaces** (q to close view).

3. Select **2. Show Connection Status**.

4. Issue a curl https request from the SmartFabric vCenter appliance console to the plug-in appliance IP configured on ens160.

SmartFabric error

Check ens192 has IPv6 link-local address that is enabled and is up.

(i) **NOTE: Multiple fabric or vCenter registrations are shown in Status SmartFabric Management Service.**

1. Select **2. Status SmartFabric Managment Service**.

All services must be active. If they are not all active, restart the service by selecting **4. Restart SmartFabric Management Service**. Confirm that the error is resolved.

2. Confirm the password that is supplied during registration is correct. If not correct, reregister the plug-in to update the SmartFabric password on the appliance.

Configure NTP server

(i) **NOTE: If the NTP server is not configured, the SmartFabric vCenter appliance VM will not synchronize with the data center.**

1. Select **2. Interface Configuration Menu**.

2. Select **5. Configure NTP Server**.

3. Enter the **Validate NTP Server IP address/host name**.

NTP server status

1. Select **2. Interface Configuration Menu**.

2. Select **4. Show NTP Server**.

```
------------------------------
OMNI Interface Configuration Menu
------------------------------
1.  Show Interfaces
2.  Show Connection Status
3.  Configure Interfaces
4.  Show NTP Status
5.  Configure NTP Server
6.  Exit

Enter selection [1 - 6]: 4
NTP is configured
NTP Server: 16.1.1.60
```

3. Enter the **Validate NTP Server IP address/host name**.

UI is not populated

> (i) NOTE: **If any IP or SSL certificate changes on the SmartFabric VM, click Update Extension on the SmartFabric vCenter dashboard.**

Check the service status on the plug-in VM.

1. Select **4. Restart SmartFabric Management Service**.
2. Select **2. Status SmartFabric Management Service** to list the registered vCenter and SmartFabric the VM is managing. Confirm that all services are active.

Create support bundle

1. Select **4. SmartFabric Management Service Menu**.
2. Select **5. Create Support Bundle** to create a support bundle at /tmp/support-bundle.tar.gz on the SmartFabric VM.


```
------------------------------
OMNI Management Service Menu
------------------------------
1.  Start OMNI Management Service
2.  Status OMNI Management Service
3.  Stop OMNI Management Service
4.  Restart OMNI Management Service
5.  Create Support Bundle
6.  Change Application Log Level
7.  Exit

Enter selection [1 - 6]: 5
2018-11-06 15:09:39 INFO  [setup.sh] Creating Support Bundle..
2018-11-06 15:09:39 INFO  [setup.sh] OMNI Appliance Version ..........(3.0.7)
2018-11-06 15:09:39 INFO  [setup.sh] OMNI Web Client Plugin Version .............(1.0.7)
2018-11-06 15:09:39 INFO  [setup.sh] Removing old support-bundle file
2018-11-06 15:09:39 INFO  [setup.sh] Support Bundle creation successful
2018-11-06 15:09:39 INFO  [setup.sh] Support Bundle available for SCP at /tmp/support-bundle.tar.gz
press [enter] to continue...
```

3. From an external host, scp using *admin* to transfer the support bundle file out. SCP credentials for the SmartFabric appliance are the same as the SmartFabric appliance console password. By default, the username and password is admin/admin.

> (i) NOTE: **Recommendation is to set the log level change to DEBUG before creating the support bundle.**

Change log level

1. Select **4. SmartFabric Management Service menu**.
2. Select **6. Change Application Log Level** to display the current log level and switch accordingly.


```
------------------------------
OMNI Management Service Menu
------------------------------
1.  Start OMNI Management Service
2.  Status OMNI Management Service
3.  Stop OMNI Management Service
4.  Restart OMNI Management Service
5.  Create Support Bundle
6.  Change Application Log Level
7.  Exit

Enter selection [1 - 6]: 6
2018-11-06 15:11:41 INFO  [setup.sh] Current Application Log Level: ERROR

Existing Log Level will be replaced. Proceed? [y]? y
2018-11-06 15:11:44 INFO  [setup.sh] Changing Application Log Level to: DEBUG
2018-11-06 15:11:44 INFO  [setup.sh] Stopping Application Server and Zero Touch Management applicati
on services
2018-11-06 15:11:44 INFO  [setup.sh] OMNI Application Server Service inactive
2018-11-06 15:11:44 INFO  [setup.sh] OMNI Zero Touch Management Application Service inactive
2018-11-06 15:11:44 INFO  [setup.sh] Starting Application Server and Zero Touch Management applicati
on services
Created symlink /etc/systemd/system/multi-user.target.wants/dellvcenterapp.service → /etc/systemd/sy
stem/dellvcenterapp.service.
2018-11-06 15:11:44 INFO  [setup.sh] OMNI Zero Touch Management Application Service Start successful
Created symlink /etc/systemd/system/multi-user.target.wants/vcenterappgunicorn.service → /etc/system
d/system/vcenterappgunicorn.service.
2018-11-06 15:11:45 INFO  [setup.sh] OMNI Application Server Service Start successful
2018-11-06 15:11:45 INFO  [setup.sh] Log Level Change successful
press [enter] to continue...
```

3. Stop if the log level is already on the wanted log level.

Reset SmartFabric VM password

1. Reboot the VM from vCenter, then select **Advanced Options for Debian GNU/Linux**.

2. Press e to highlight **Debian GNU/Linux, with Linux 4.9.0-7amd64**.

3. Use the arrow keys to go to the line starting with `linux` and ending with `ro quiet`.
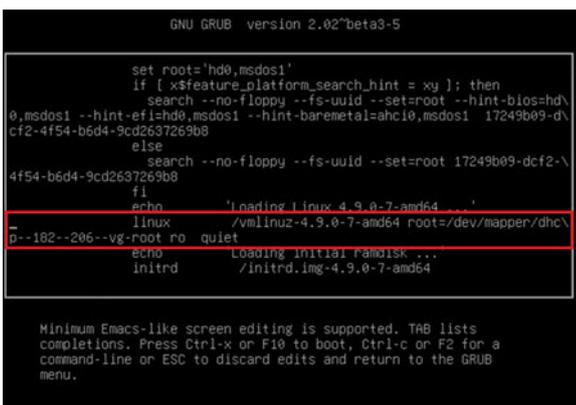
4. Append `init=bin/bash` after `ro quiet`.

5. Press **Ctrl-X** to boot into the shell with root access.

6. Remount the / directory.

```
# mount / -re -o remount
```

7. Change the password for admin using `passwd admin`, then enter and confirm the new password.

8. Reset the VM from vCenter. You should be able to login through the new password for the SmartFabric VM.

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