FabricManager User Guide

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ATTN: General Counsel

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Fabric Manager Installation

Install the Fabric Manager virtual machine (VM) to enable Fabric Manager in ExtremeCloud IQ - Site Engine.

Pre-Installation

The Fabric Manager is distributed in a deployable VMware-based .OVA template, which is similar to the other ZTP+ (Zero Touch Provisioning Plus)-based engines (for example,ExtremeControl).

The Fabric Manager supports two initial configuration modes for ExtremeCloud IQ - Site Engine discovery and registration:

- DHCP Mode
- Static Mode

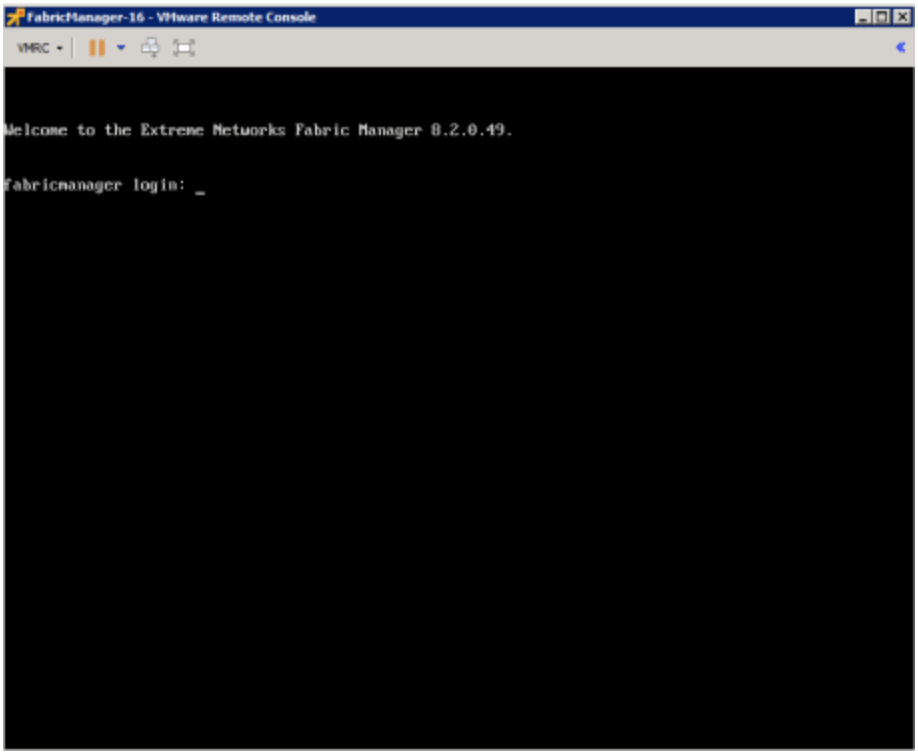
The DHCP mode is the default configuration mode during the Fabric Manager VM's initial startup. Use the static mode when providing a predefined set of networking configurations.

Fabric Manager Installation Static Mode

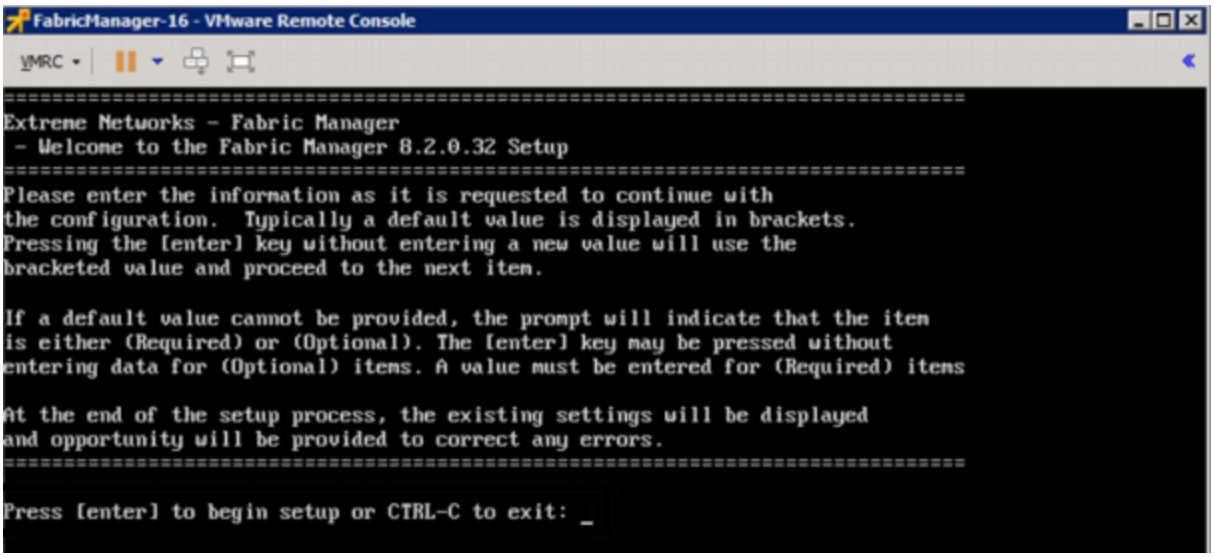
Fabric Manager begins installation in DHCP mode by default. Switch to static mode at any time during the initial installation by pressing the ENTER key.

Use the following instructions to install Fabric Manager in static mode:

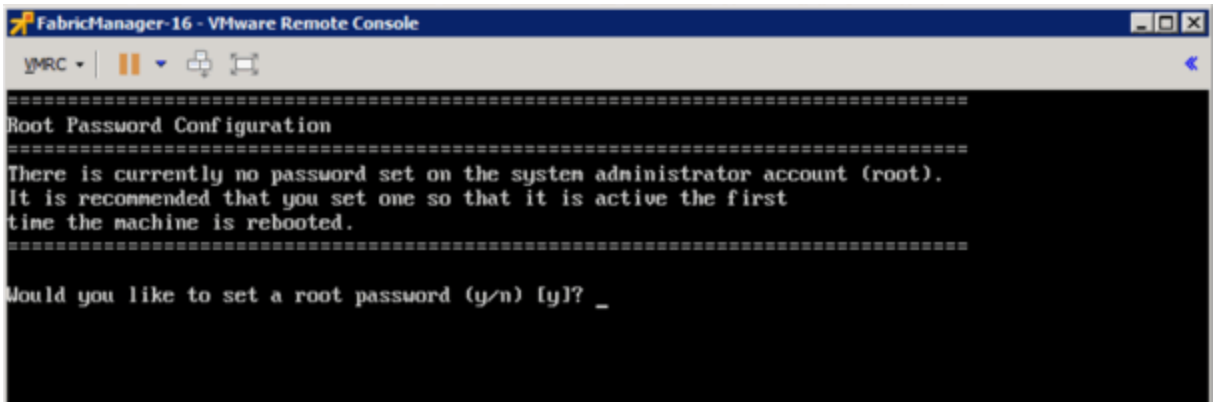
1. In the Console tab of the vSphere client, login as root with no password and press Enter.



2. Follow the installation process to complete installation of static mode:
    a. Begin the set-up.

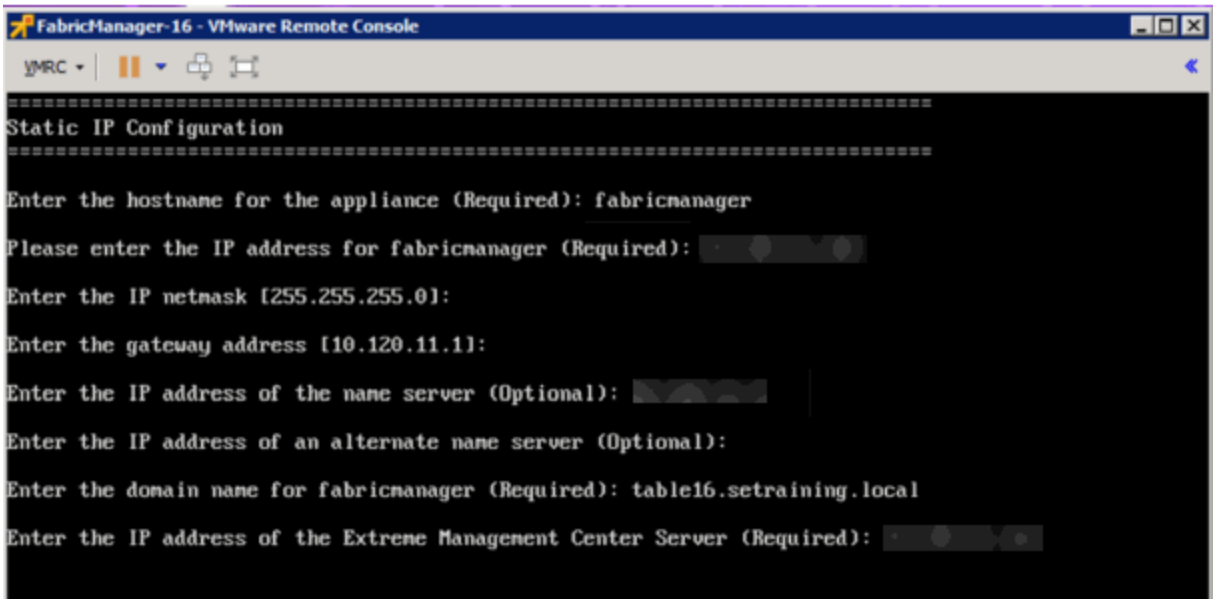


    b. Set a root password by entering y.



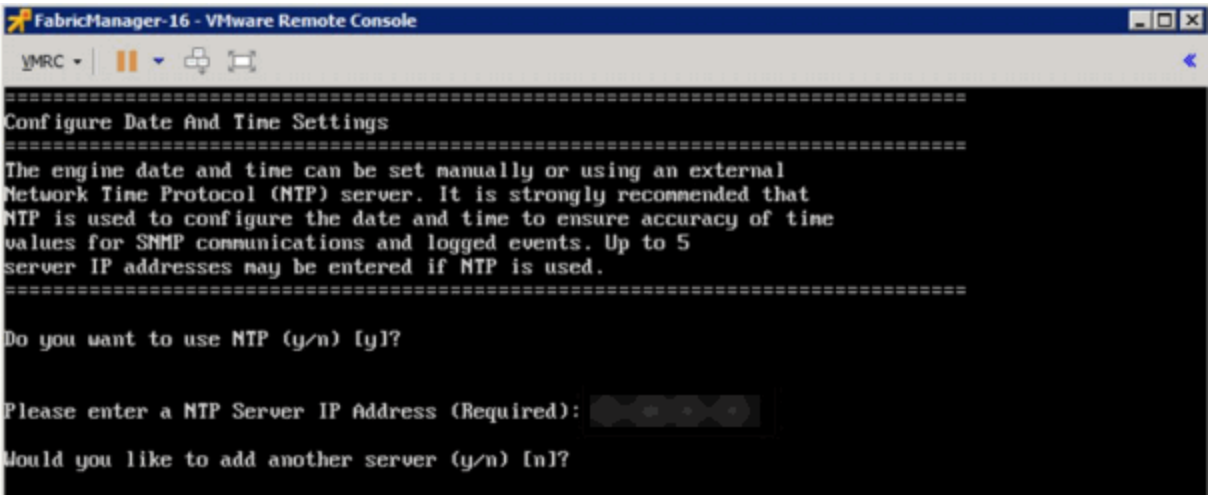
    c. Enter and re-type a UNIX password at the next prompt.

    The Static Configuration screen opens.



d. Enter a hostname.
e. Enter the IP address for the VM engine.
f. Enter the default IP Network netmask address.
g. Enter the default Gateway address.
h. Enter the IP address of the name server.
i. Enter the domain name specific to the table.
j. Enter the ExtremeCloud IQ - Site Engine server IP address.

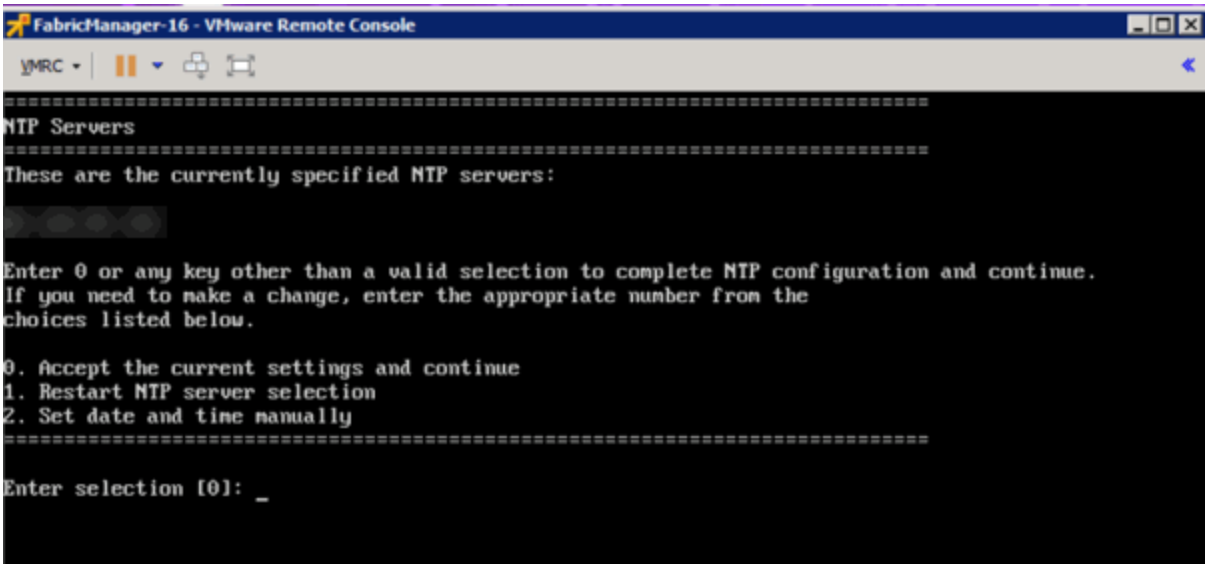
   The Date and Time Configuration screen opens.



k. Enter `y` at the next prompt to use NTP (Network Time Protocol).

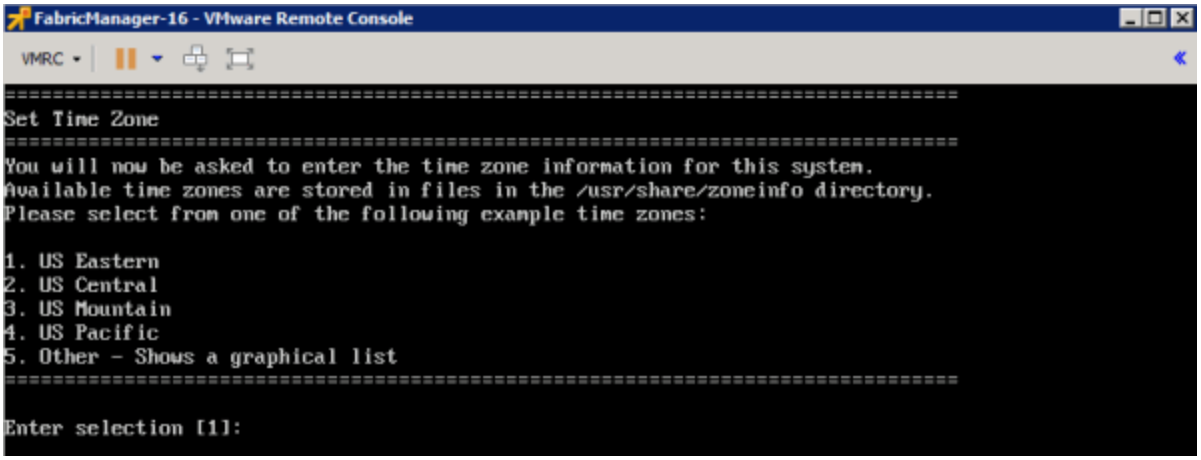
l. Enter the NTP Server IP Address.

m. Enter `n` at the next prompt to skip adding another NTP server. This is optional.



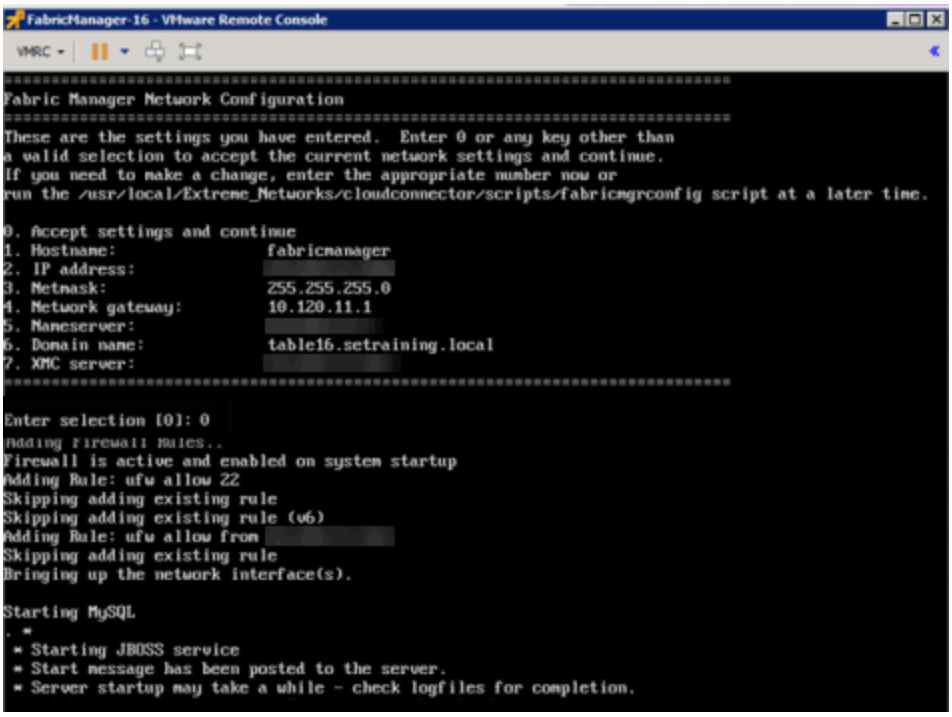
n. Enter the default `0` and accept the current settings and continue.

o. Select the correct Time Zone for your network.



p. Enter the number that corresponds to your time zone.

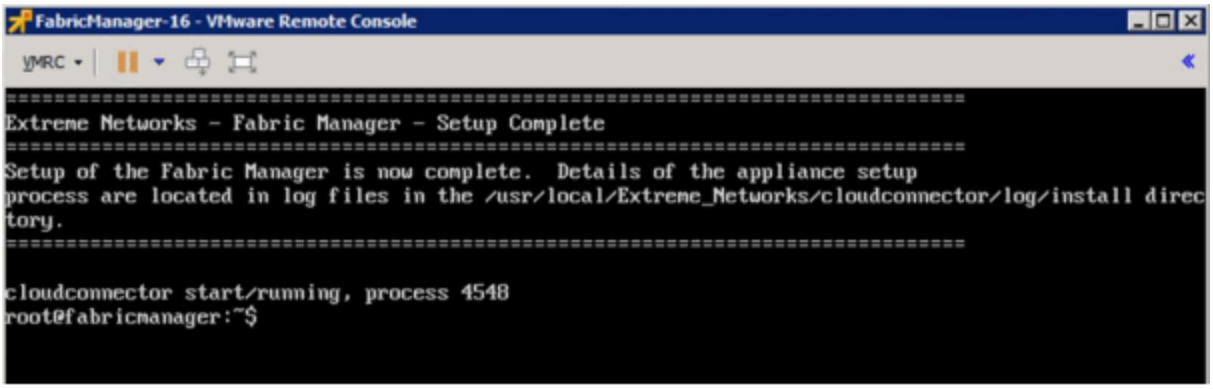
The Fabric Manager Network Configuration screen displays a summary of the configuration options you selected.



q. Enter 0 to confirm all the selections displayed are correct.

To modify any selection, enter the corresponding number of the item you want to change.

r. A Setup Complete message displays when installation is complete.



Adding Fabric Manager to ExtremeCloud IQ - Site Engine

After you install the Fabric Manager virtual machine (VM), you can add it to ExtremeCloud IQ - Site Engine and enable it via ZTP+ (Zero Touch Provisioning Plus) functionality.

NOTE: You need to upgrade the firmware in ExtremeCloud IQ - Site Engine to add and launch the Fabric Manager engine.

- How to Upgrade Firmware in ExtremeCloud IQ - Site Engine
- Fabric Manager ZTP+ Configuration in ExtremeCloud IQ - Site Engine
- ExtremeCloud IQ - Site Engine Fabric

Fabric Topology Definition on the Sites Tab

Use the **Fabric Topology Definition** tab to create a fabric topology definition, configure fabric topology settings, and review fabric topology paths and sites. You can also rename or delete a fabric topology definition.

Create a Topology Definition

You can create a Topology Definition on the **Sites** tab in ExtremeCloud IQ - Site Engine. After you create topology definitions, you can add them to sites in your network to build a fabric topology map.

To create a topology definition:

1. Access the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Navigate to **Topology Definitions** in the left-panel tree.
4. Right-click **Topology Definitions**.
5. Select **Create Topology Definition**.

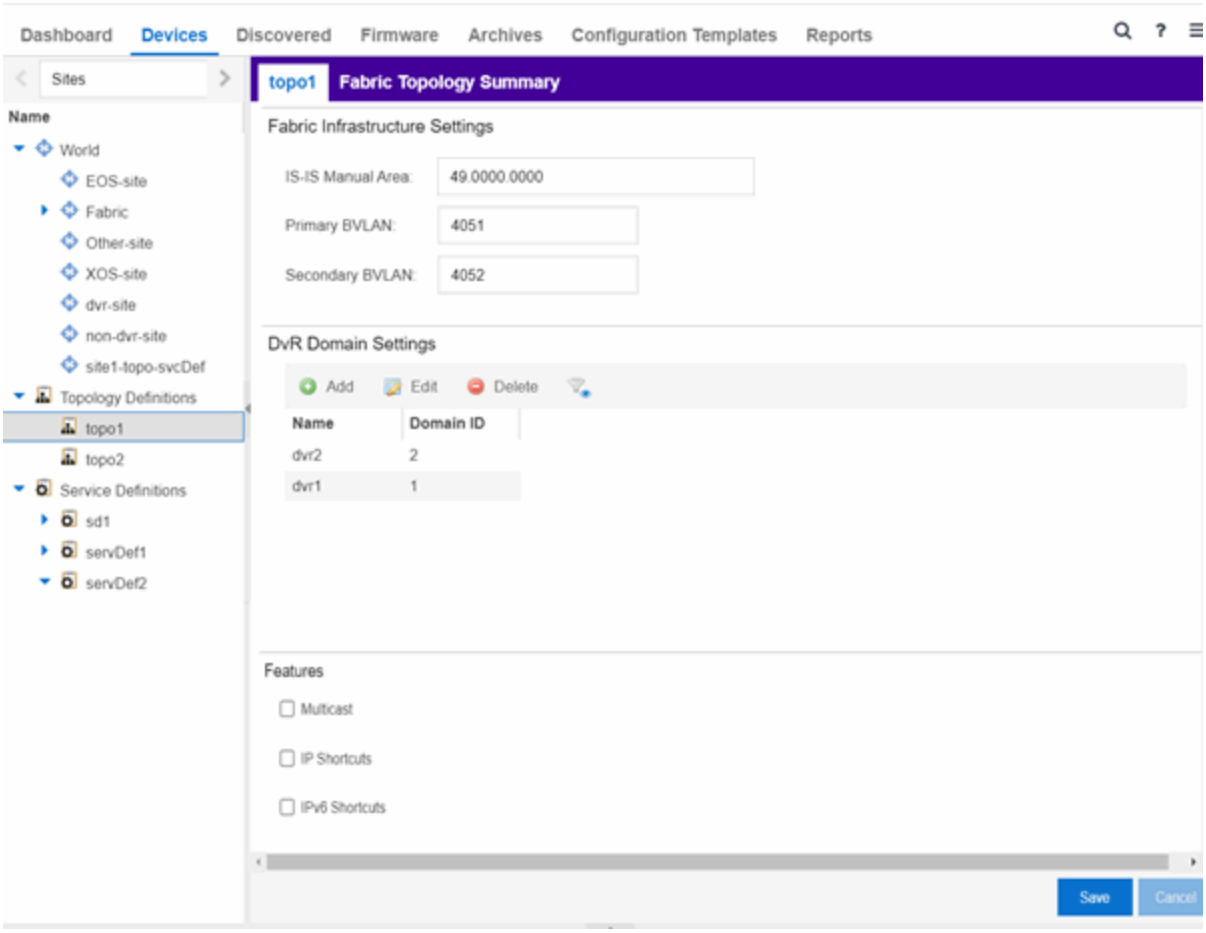
   The **Create Topology Definition** window opens.
6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Fabric Type** drop-down.
8. Select **OK** to create the topology definition.

Configure a Topology Definition

After the topology definition is created, it is available in the **Sites tab** left-panel tree. Select it to open a new right panel that includes the Fabric Name tab and a Fabric Summary tab.

Fabric Name Tab

Use the **Fabric Name** tab to configure the topology definition.



The Topology Definition tab includes the following sections:

Fabric Infrastructure Settings

The following fields are included in the Fabric Infrastructure Settings section:

- ISIS Manual Area - Use a xx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx format (1-13 bytes).
- Primary BVLAN - Enter the Primary Backbone VLAN (BVLAN).
- Secondary BVLAN - Enter the Secondary BVLAN.

DvR Domain Settings

The following fields are included in the DvR Domain Settings section:

- Name - The Domain name assigned to the DvR Domain. Select the down arrow to open the drop-down list to access sort, hide columns and search filter functionality for the domain name column.
- Domain ID - The identifying number assigned to the DvR Domain. Select the down arrow to open the drop-down list to access sort, hide columns and numeric filter functionality for the Domain ID column.

You can also Add, Edit, or Delete DvR Domain settings.

Features

The following fields are included in the Features section:

- Multicast - Select the check box to configure to distribute data to multiple recipients.
- IP Shortcuts - Select the check box to enable IPv4 Shortcuts for the topology definition.
- IPv6 Shortcuts - Select the check box to enable IPv6 Shortcuts for the topology definition.

Select **Save** to save the topology definition settings you selected.

After the topology definition is created and configured, you can apply it to a site within your network. After fabric topologies have been assigned to a site, they cannot be deleted.

Fabric Summary tab

The Fabric Summary tab lists any fabric topologies you have created and the sites to which they are assigned.

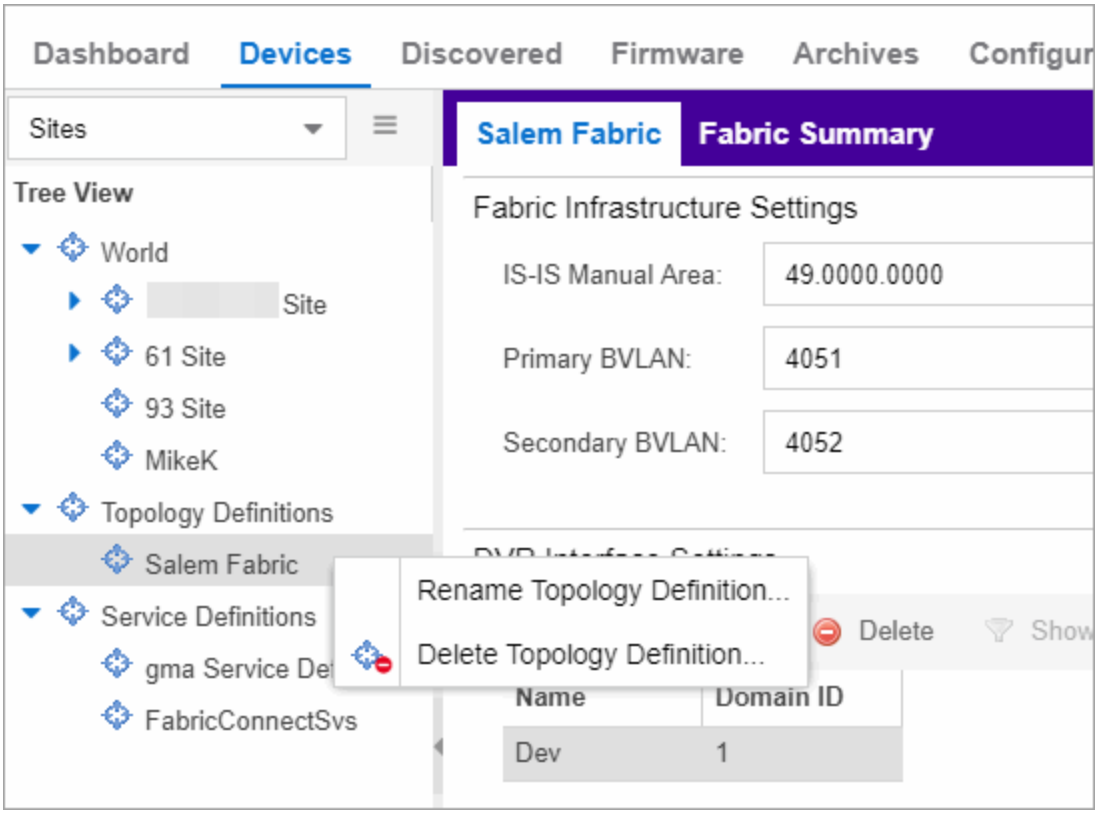
Rename a Topology Definition

After a topology definition has been created and configured, you can change or modify its name.

To rename a topology definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Topology Definitions** in the left-panel.

4. Right-click the topology definition you are renaming.



5. Select **Rename Topology Definition**.
6. Enter a new name in the **Name** field.
7. Select **OK** to change the topology name.

Delete a Topology Definition

After a topology definition has been created and configured, you can delete it; however, a topology definition cannot be deleted if it has been assigned to a site.

To delete a topology definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand the **Topology Definitions** in the left-panel.
4. Right-click the topology definition you are deleting.
5. Select **Delete Topology Definition**.
6. Select **Yes** to delete the topology definition you selected.

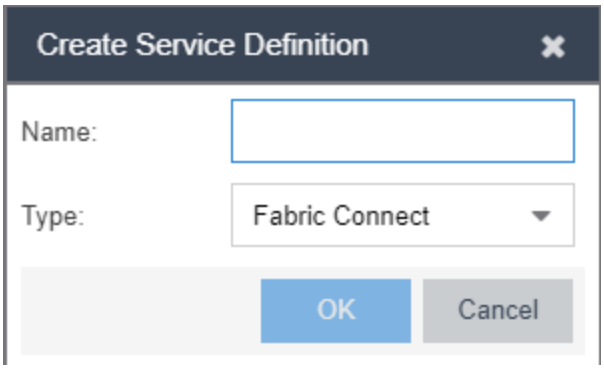
How to Create a Fabric Service Definition

You can create a service definition in the **Sites tab** in ExtremeCloud IQ - Site Engine. Service definitions display information configured in service applications definitions. When created, service definitions are added to sites in your network and are used to build a fabric topology map.

Create a Service Definition

To create a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Select **Service Definitions** in the left-panel.
4. Right-click **Service Definitions**.
5. Select **Create Service Definition**.



   The **Create Service Definition** window opens.
6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Type** drop-down list.
8. Select **OK** to create the service definition.

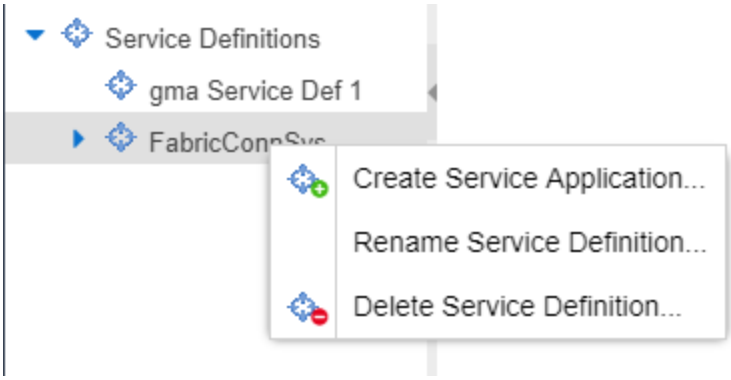
After the service definition is created and configured, you can apply it to a site within your network. When fabric services have been assigned to a site, they cannot be deleted.

Service Definition Panel

After the service definition is created, it is available in the left-panel tree. Select it to open a new right panel that includes a **Services** tab and a **Service Summary** tab.

Rename a Service Definition

After a service definition has been created and configured, you can change or modify its name.

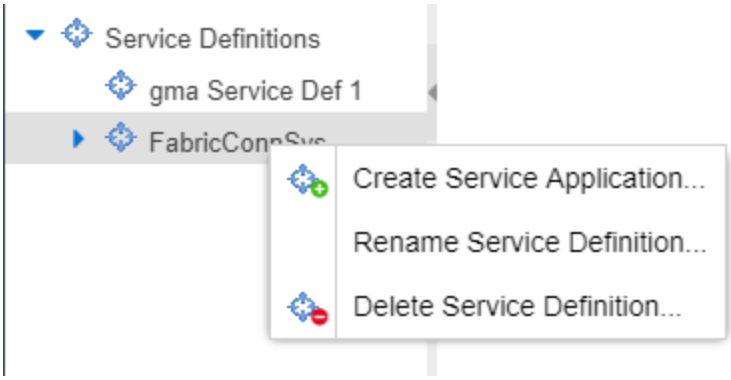


To rename a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are renaming.
5. Select **Rename Service Definition**.
6. Enter a new name in the **Name** field.
7. Select **OK** to rename the service definition.

Delete a Service Definition

When a service definition has been created and configured, you can delete it; however, a service definition or any of its associated service applications cannot be deleted if it has been assigned to a site.



To delete a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are deleting.
5. Select **Delete Service Definition**.
6. Select **Yes** to delete a service definition.

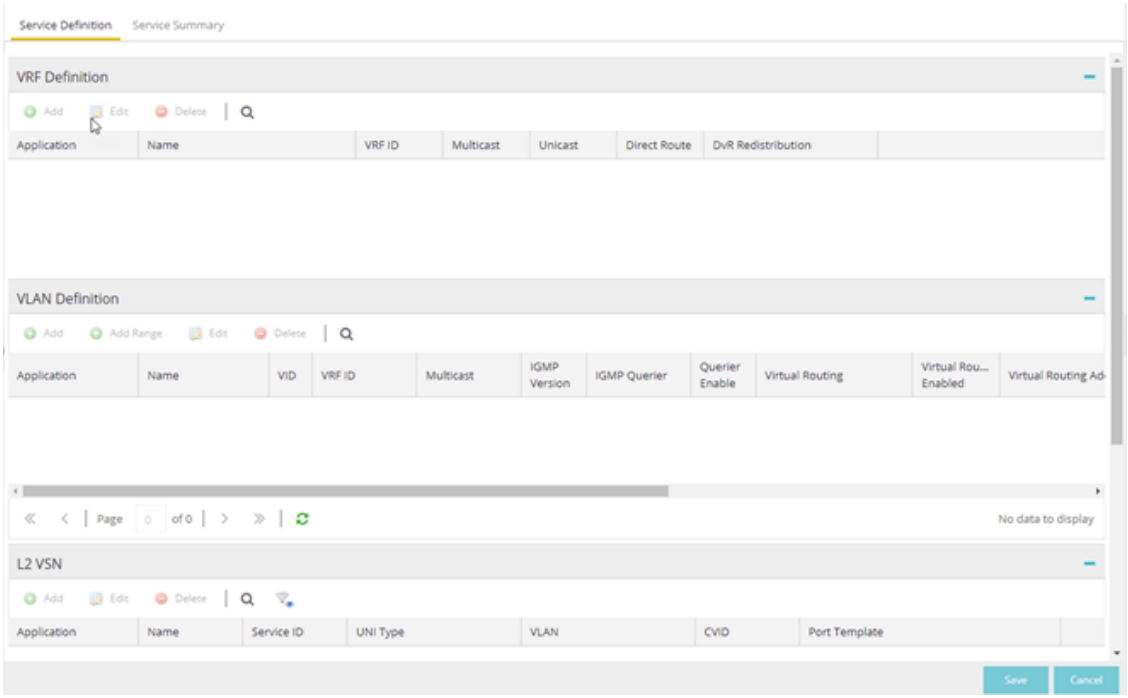
For information on related topics:

- Services
- Fabric
- Sites
- Devices

Services

The **Services** tab displays virtual routing and forwarding functionality configured as part of a service application, the virtual local area networks defined for the service application, as well as all of the services included in a service application or all of the services included in a service definition, depending if you select a service application or a service definition in the left-panel, respectively.

The **Services** tab is included in the **Sites** tab.



The Services tab includes three tables:

- VRF Definition — Create and configure VRF (Virtual Routing and Forwarding) definitions for the service application. VRFs allow for networking paths to be segmented without using multiple devices.
- VLAN Definition — Create and configure VLAN (Virtual Local Area Network) definitions for the service application.
- L2 VSN — Configure the L2 Virtual Services Networks (VSNs).
- L3 VSN — Configure the L3 Virtual Services Networks (VSNs).

VRF Definition

The VRF Definition table allows you to configure virtual routing and forwarding definitions included as part of the service.

Name
The name of the VRF definition.

VRF ID
The ID number assigned to the VRF definition.

VLAN Definition

The VLAN Definition table allows you to configure virtual local area network definitions included as part of the service.

Name
The name of the VLAN definition.

VID
The ID number assigned to the VLAN.

VRF ID
The ID number assigned to the VRF definition.

Multicast
Indicates the service sends IP packets to a group of hosts on the network.

IGMP Version
Indicates which version of IGMP is utilized on the port (Version 1 or Version 2).

IGMP Querier
The address of the IGMP Querier. This feature is used when there is no multicast router in the VLAN to originate the queries.

Querier Enable
Indicates whether an IGMP Query is enabled.

Virtual Routing

Displays the version of VRRP the default gateway is using:

- NONE — Virtual routing is not configured on the VLAN.
- VRRPv2 — VRRP version 2 is configured on the VLAN. VRRP version 2 only supports IP addresses in IPv4 format.
- VRRPv3 — VRRP version 3 is configured on the VLAN. VRRP version 3 supports IP addresses in both IPv4 and IPv6 formats.
- DvR - DvR functionality is configured on the VLAN.

NOTE: Virtual Routing is only supported on VOSS/Fabric Engine devices.

Virtual Routing Enable

Indicates whether virtual routing is enabled for the VLAN.

Virtual Routing Address

The IP address for the virtual routing interface. The Virtual Routing address must be in the same subnet as the VLAN subnet address.

VRRP ID

An identifier devices use to determine peer devices that participate in a virtual routing interface.

VRRP Priority

A value used by VRRP peers to determine the role of each of the devices in the VLAN. The default value is 100. The device with the largest value is assigned the role of Master. For example, in a VLAN with two routers, one with a VRRP Priority of 200 and one with a VRRP Priority of 100, the router with a VRRP Priority of 200 becomes the Master. In the event of identical priority numbers, the devices use the MAC address to determine priority.

VRRP Backup Master

This option determines if the backup router is able to forward traffic independently outside of the VLAN (enabled), or must forward the traffic to the Master router before it is forwarded outside of the VLAN (disabled).

VRRP Advertisement Interval

Indicates frequency (in seconds) that protocol packets are sent from the virtual router in the VLAN.

VRRP Hold Down Timer

Indicates the amount of time (in hundredths of a second) that the backup router waits for the primary router to respond before it becomes the primary router.

DHCP Snooping

Indicates whether DHCP snooping is enabled for the VLAN. DHCP Snooping is a Layer 2 security feature, that provides network security by filtering untrusted DHCP messages received from the external network causing traffic attacks within the network. DHCP Snooping is based on the concept of trusted versus untrusted switch ports. Switch ports configured as trusted can forward DHCP Replies, and the untrusted switch ports cannot. DHCP Snooping acts like a firewall between untrusted hosts and DHCP servers.

ARP Inspection

Indicates whether ARP inspection is enabled. Dynamic ARP Inspection (DAI) is a security feature that validates ARP packets in the network. Without DAI, a malicious user can attack hosts, switches, and routers connected to the Layer 2 network by poisoning the ARP caches of systems connected to the subnet, and intercepting traffic intended for other hosts on the subnet. DAI prevents these attacks by intercepting, logging, and discarding the ARP packets with invalid IP to MAC address bindings. The switch dynamically builds the address binding table from the information gathered from the DHCP requests and replies when DHCP Snooping is enabled. The switch pairs the MAC address from the DHCP request with the IP address from the DHCP reply to create an entry in the DHCP binding table. When you enable DAI, the switch filters ARP packets on untrusted ports based on the source MAC and IP addresses seen on the switch port. The switch forwards an ARP packet when the source MAC and IP address matches an entry in the address binding table. Otherwise, the switch drops the ARP packet.

NOTE: DHCP Snooping must be enabled to use ARP Inspection.

Service Application Name

The Service Application Name table displays all of the services included in a service application or all of the services included in a service definition, depending if you select a service application or a service definition in the left-panel, respectively. The Services tab is included in the Sites tab.

Services are created within service applications. You can include multiple services within an application. Service applications are then included within service definitions. You can also include multiple service applications within a service definition. A service definition that includes a complete set of services is then assigned to a site, which configures the fabric-enabled devices within that site.

The Services tab is only configurable when you select a service application. The services displayed when selecting a service definition are read-only.

L2 VSN

Name

The name of the Layer 2 service.

Service ID

The I-SID, which is the system-defined ID number assigned to the fabric service.

UNI Type

The User-Network-Interface (UNI) of the fabric service. The following interface types are available:

- Switched — A VLAN-ID and a port (VID, port) mapped to a Layer 2 VSN I-SID. With UNI type, VLAN-IDs can be reused on other ports and mapped to different ISIDs.
- Transparent - A physical port maps to a Layer 2 VSN I-SID (all traffic through the port, 802.1Q tagged or untagged, ingress and egress maps to the I-SID).

NOTE: All VLANs on a Transparent Port UNI interface now share the same single MAC learning table of the Transparent Port UNI I-SID.

- CVLAN — a platform customer VLAN-ID.

CVLAN

The customer VLAN-ID of the associated CVLAN UNI type.

VLAN

The VLAN assigned to the fabric service.

CVID

Specifies the customer VLAN ID of the associated switched UNI port.

AutoSense Service Type

Defines if the L2 VSN service is auto-assigned by the switch-level AutoSense detection. The following types are available:

- AP Untagged — If the AutoSense feature detects Access Point, then this service is automatically assigned to the port.
- Camera Untagged — If the AutoSense feature detects Camera then this service is automatically assigned to the port.
- Voice Untagged — If the AutoSense feature detects a VoIP device then this service is automatically assigned to the port.
- Voice Tagged — If the AutoSense feature detects a VoIP device then this service is automatically assigned to the port.
- Proxy Switch Auth Tagged — If the AutoSense feature detects a Fabric Attach switch capable of authenticating (ERS devices) then this service is automatically assigned to the port.
- Proxy Switch No Auth Untagged — If the AutoSense feature detects a Fabric Attach switch is not capable of authenticating (EXOS/Switch Engine devices) then this service is automatically assigned to the port.
- Proxy Switch Auth & Proxy Switch No Auth — If the AutoSense feature detects any physical Fabric Attach switch (ERS/EXOS/Switch Engine device) then this service is automatically assigned to the port.
- Data Untagged — If the AutoSense feature does not detect a device type then this service is automatically assigned to the port.
- None — AutoSense is not related to this L2VSN service.

NOTE: Each AutoSense Service Type can only be used once on a switch. The switch cannot use two different service IDs with the same AutoSense Service Type.

AutoSense Service CVID

The AutoSense Service CVID value defines the 802.1q VLAN tag sent from the switch to the device. If the AutoSense Service Type is Voice Tagged or Proxy Switch Auth Tagged or Proxy Switch Auth & Proxy Switch No Auth then AutoSense Service CVID must be defined. The value range is 1-4094.

Port Template

If the UNI Type is Switched or Transparent you can select from the Global Port templates to define the purpose of the port.

L3 VSN

Name

The name of the Layer 3 service.

Service ID

The I-SID, which is the system-defined ID number assigned to the service.

VRF

Select the virtual routing and forwarding definition included as part of the service.

Multi Cast

Select to indicate that the service sends IP packets to a group of hosts on the network.

Unicast

Select to indicate that the service sends IP packets to a single recipient on the network.

Direct Route

Select to indicate that the service sends IP packets directly to another device without going through a third device.

Fabric

The ExtremeCloud IQ - Site Engine Fabric technology is a solution to manage your domains seamlessly and interdependently across both physical and virtual servers, storage, and networks. It is designed to be highly efficient, flexible enough to adapt to your network's varying traffic volume, and easily maintained with minimal intervention. You can provision Fabric functionality on the Sites tab in ExtremeCloud IQ - Site Engine.

For additional information about Fabric functionality, see the *Configuring Fabric Basics and Layer 2 Services on the VOSS Operating System Software VSP 8600* guide for the latest VSP 8600 release.

ExtremeCloud IQ - Site Engine's fabric solution consists of two major components:

- Fabric Manager — A virtual engine that provides ExtremeCloud IQ - Site Engine with fabric topology information and allows you to configure fabric functionality on your fabric-enabled devices.
- Fabric Tab — The tab within ExtremeCloud IQ - Site Engine that allows you to view and configure the fabric functionality on your devices.

NOTE: Beginning with ExtremeCloud IQ - Site Engine version 8.5.5, the Ubuntu Operating System has upgraded to version 18.04.5 for the Fabric Manager.

The Fabric Manager engine must be installed and running on your network for the Fabric tab in ExtremeCloud IQ - Site Engine to receive and display fabric topology information.

Once the Fabric Manager engine is running in ExtremeCloud IQ - Site Engine, the Fabric tab on the Devices tab displays information about the fabric topologies currently configured on your devices.

NOTES: The following device types support fabric functionality:

ERS35xx with firmware version 5.3.7 and later, ERS36xx with firmware version 6.2.0 and later, ERS48xx with firmware version 5.12.0 and later, ERS49xx with firmware version 7.6.0 and later, ERS59xx with firmware version 7.6.0 and later, VSP7024 with firmware version 10.4.6 and later, VSP4xxx with firmware version 6.1.3 and later, VSP7xxx with firmware version 6.1.3 and later,VSP8xxx with firmware version 6.1.3 and later

For minimum requirements, see ExtremeCloud IQ - Site Engine Configuration and Requirements.

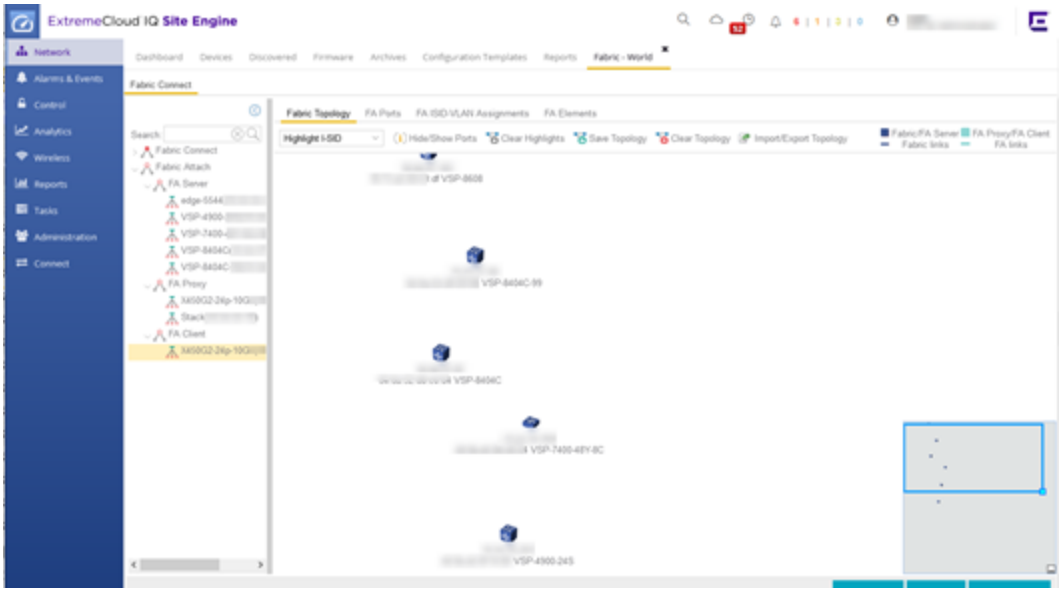
Accessing Fabric in ExtremeCloud IQ - Site Engine

After adding the Fabric Manager engine in ExtremeCloud IQ - Site Engine, view the fabric topologies configured on your devices on the Fabric tab.

To access the Fabric tab:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Right-click a site in the left-panel tree.
4. Select **More Views** > **Fabric Topology** from the menu.

   The **Fabric** tab opens.



Fabric Tab

The **Fabric** tab includes three sub-tabs:

- Fabric Topology — Displays the fabric topologies configured on your fabric-enabled devices.
- FA Ports — Displays the ports on which fabric is configured.
- FA ISID-VLAN Assignments — Allows you to view Virtual Extensible LANs (VXLANs) that tunnel Layer 2 traffic over a Layer 3 network in the fabric topologies you configure.

For information on related topics:

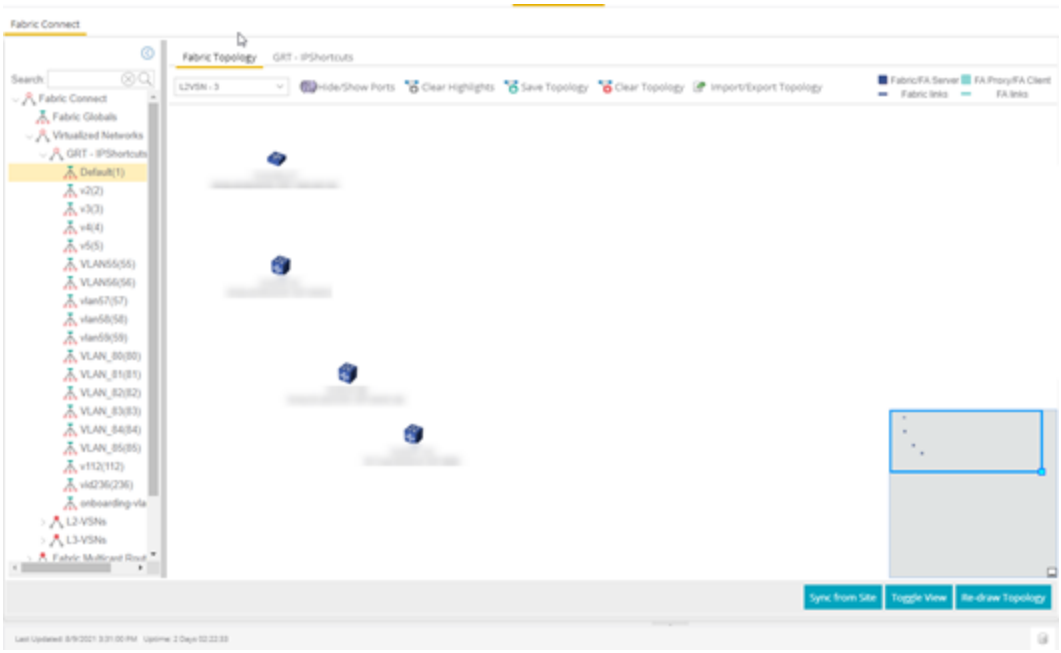
- Services
- Service Summary
- Fabric Connect
- Fabric Assist

Fabric Connect

ExtremeCloud IQ - Site Engine's **Fabric Connect** within the Fabric Manager engine displays your network's fabric technology and extended fabric functionality. Fabric Connect uses Fabric Topology templates that allow you to view and to configure SPBm (Shortest Path Bridging), based L2 and L3 Virtual Services Networks (VSNs), as well as IP-shortcut based VSNs. The Fabric Attach extends Fabric technology functionality to network elements or hosts that are not SPB-capable.

The Fabric Connect tab allows you to view topologies with the fabric-enabled sites in your network. Select the **Toggle View** button to display fabric services for individual devices.

NOTE: Fabric Connect uses Fabric Topology templates that define the topologies, services and service applications that comprise the Fabric Topology. Create the topology and service definitions via the Sites tab before you assign the Fabric Connect Topology to a site and access the **Fabric Connect** tab.



The Fabric Connect tab is divided into two sections: the left-panel tree view and a Fabric Topology right-panel map view.

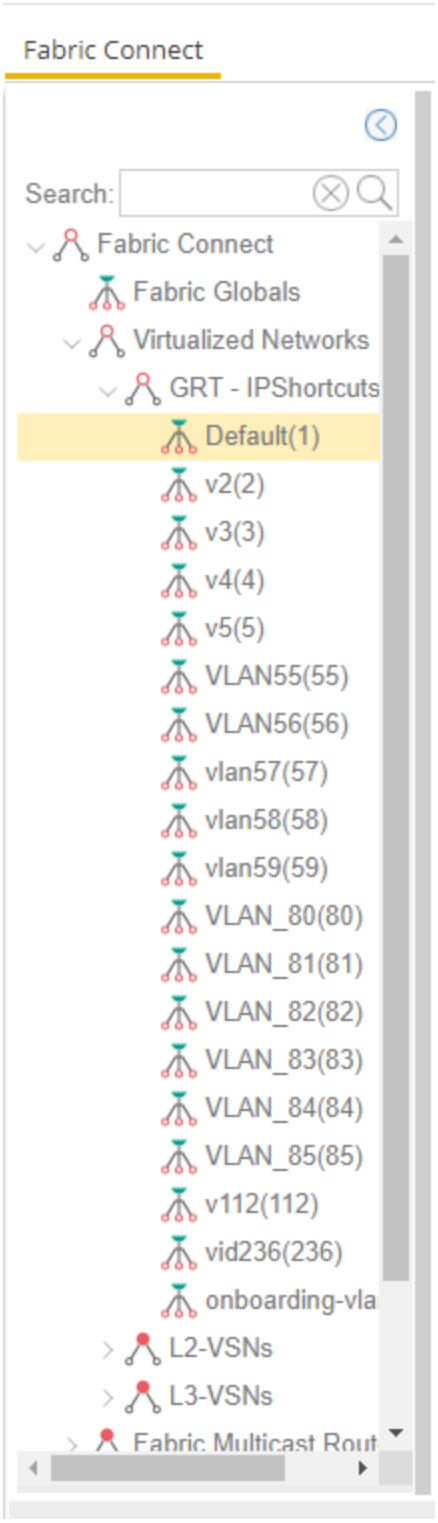
Left-Panel Tree

Beginning in version 23.04.10, ExtremeCloud IQ - Site Engine supports two Fabric technology infrastructures: Fabric Connect and Fabric Attach (FA). The left-panel tree includes Fabric

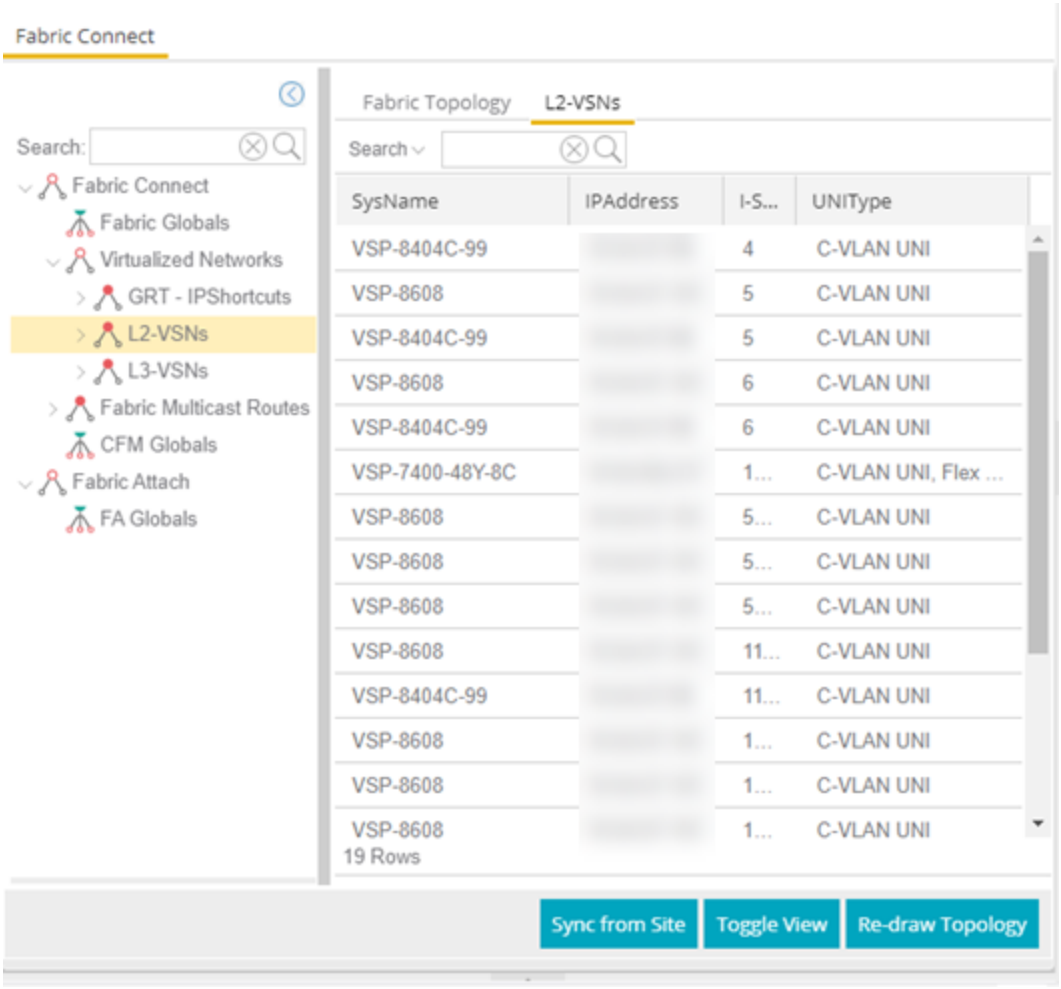
Connect and Fabric Attach folders that expand to display all fabric services you have configured in your network.

Fabric Connect Folder

Select the Fabric Connect tab to display the fabric topologies configured on the devices in the site.



Select a service in the Fabric Connect folder to open a fabric topology map and a service name tab in the right panel. The map displays the devices enabled with the services you selected and the service name tab displays a table with details about that service.



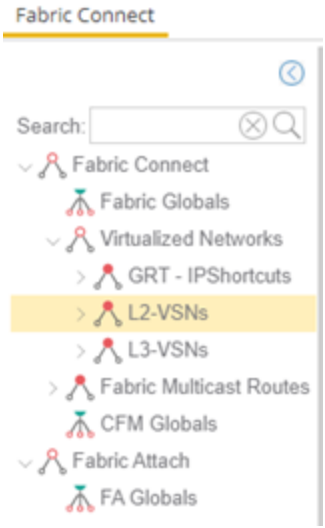
Select the **Toggle View** button to display Fabric Connect fabric services for individual devices.

Fabric Attach Folder

The Fabric Attach (FA) extends Fabric technology functionality to network devices that are not SPB-capable. The Fabric Attach tab displays global, server and proxy capable services for your network and devices.

NOTE: You can enable Fabric Attach on the following switches:

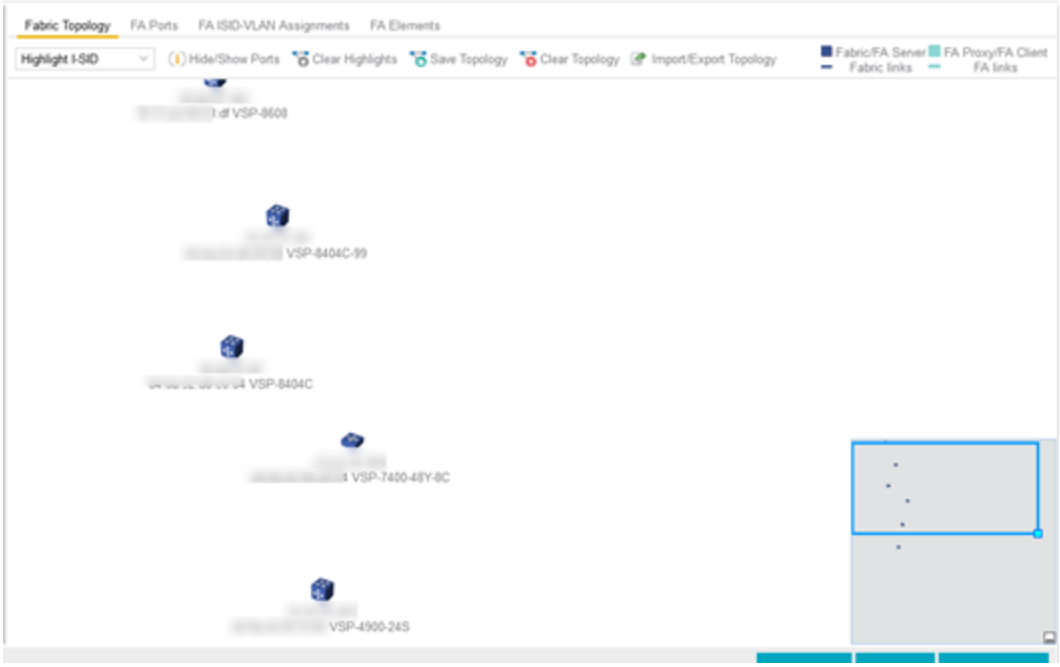
FA Server — for VOSS/Fabric Engine, ERS 49xx v5.9.2 and later, ERS 4850 v5.9.2 and later, and ERS 59xx series devices; FA Proxy (client proxy) — for ERS 35xx, ERS 48xx, ERS 49xx, ERS 55xx, ERS 56xx, ERS 59xx, and VSP 70xx series devices; FA Standalone Proxy (client proxy) — for ERS 35xx, ERS 48xx, ERS 55xx, ERS 56xx, ERS 59xx, and VSP 70xx series devices



Select a service in the Fabric Attach folder to open a fabric topology map and a VSN tab in the right panel. The map displays the devices enabled with the service you selected and the VSN Home tab displays a table with details about the VSNs enabled on the site. Select the **Toggle View** button to display Fabric Attach services for individual devices.

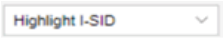
Right-Panel Topology Map

The Fabric Topology panel includes the **Fabric Topology** tab that displays a topology map of the fabric-enabled sites or devices in your network. You can use the topology map to gain a high-level view of your network, or to view detailed information about devices and links in the topology. Drag your device icons in the topology map to rearrange the map. Additionally, you can modify and save your map layouts in the Fabric Topology tab.



Topology Tab Tools

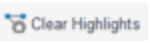
The Fabric Topology tab includes the following tools:

Fabric Service 

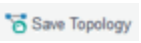
Lists fabric services in your network. Select a service from the drop-down list to display it in the topology map.

Hide/Show Ports

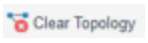
Use to hide or display fabric enabled ports in your network.

Clear Highlights 

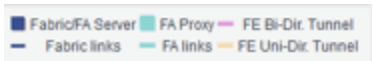
Use to clear existing highlights on the topology map.

Save Topology 

Use to save your topology map.

Clear Topology 

Use to remove the devices in your topology map.

Color Legend 

The types of fabric services are coded by colors in the topology map.

Topology Tab Buttons

The Fabric Topology tab also includes the following buttons that allow you to further manipulate the fabric service and topology data:

Sync From Site
Use to copy the fabric service configuration for the site to all the devices in the map.

Toggle View
Select to display fabric topology, services and tables for individual devices.

Re-draw Topology
Select to display an alternate topology arrangement.

Help
Select to access ExtremeCloud IQ - Site Engine help.

For information on related topics:

- Services
- Service Summary
- Sites
- Devices
- Fabric Assist

Fabric Assist

The purpose of Fabric Assist is to help you set up your Fabric Connect network as quickly as possible. It will also eliminate the need to perform manual operations repetitively.

Fabric Assist helps you to migrate your existing VLAN-centric network to a Fabric Connect network. Fabric Assist accomplishes the migration by enhancing VLAN provisioning using the following features:

- VLAN Trunk Mode – Identifies a port as a VLAN trunk and automatically adds all the device VLANs as tagged.
- VLAN Range - Imports many VLANs to the device instead of manually adding and editing one entry at a time.
- Layer 2 VSN Service Creation - Automatically maps VLAN entries to Layer 2 VSNs.
- VLAN Pruning - Prevents the unnecessary configuration of VLANs that have no egress.
- Import to Service Definition - Enables you to import a device's active configuration into a Service Application, which you can then use as a configuration template for other devices managed by ExtremeCloud™ IQ - Site Engine.

IMPORTANT: With the VLAN Trunk Mode and Layer 2 VSN Service Creation features, you can provision VLAN trunk ports and Layer 2 VSNs automatically. Do not use these features if the device is running Fabric Attach. Fabric Attach dynamically makes equivalent configuration changes, and if Fabric Assist is enabled, it will change those settings to static on the device.

For information on related topics:

- Provision VLAN Trunks Automatically
- How to Edit a Port Template
- Add a Range of VLANs at the Device Level
- Add a Range of VLANs at the Site Level
- Add a Range of VLANs at the Service Definition Level
- Enable Fabric Assist
- Fabric Assist L2 VSN Considerations

Fabric Manager ZTP+ Configuration

Fabric Manager is a resilient, scalable, and highly efficient network management application that allows your network domains to operate interdependently, efficiently, and with minimal

intervention. Fabric Manager allows you to monitor the fabric topology and service applications on your network.

Fabric Manager is deployed as a separate virtual machine (VM) in ExtremeCloud IQ - Site Engine, and is enabled via ZTP+ (Zero Touch Provisioning Plus) functionality.

General Network Configuration

Fabric Manager supports two initial configuration modes for ExtremeCloud IQ - Site Engine discovery and registration: DHCP mode and Static mode. DHCP is the default configuration mode.

Use the Static mode when providing a predefined set of networking configurations.

Use the DHCP mode so the engine can communicate with the ExtremeCloud IQ - Site Engine server. The following DHCP settings and DNS mapping of **extremecontrol** are for when Fabric Manager is installed in DHCP Mode:

- The DHCP Server needs to return a DNS Server and Domain Name to the ZTP+ device. It is the default mode of configuration during the Fabric Manager VM's initial bootup cycle.
- The DNS Server needs to map the name **extremecontrol.<*domain-name*>** to the IP address of the ExtremeCloud IQ - Site Engine server.

Once ExtremeCloud IQ - Site Engine and the ZTP+ device are pre-configured, you can add the site definition to the ExtremeCloud IQ - Site Engine database. For information, see How to Add Fabric Manager.

For information on related topics:

- Sites
- Profiles
- Add Device
- Edit Device
- Devices

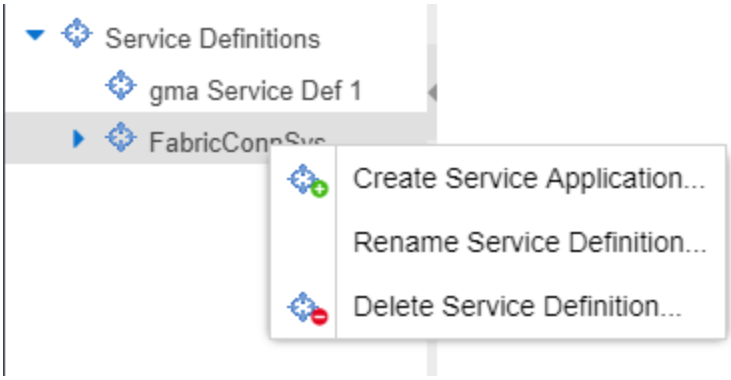
How to Create a Service Application

You can create a service application via the **Sites** tab in ExtremeCloud IQ - Site Engine. Service definitions display information from service applications. When created, service applications are added to sites in your network and are used to build a topology map.

Create a Service Application

To create a service application:

1. Access the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition in which you want to create the service application.



5. Select **Create Service Application**.

   The **Create Service Application** window opens.
6. Enter a name in the **Name** field.
7. Select **OK**.
8. Select the newly created service application.
9. Use the Services tab and a Service Summary tab to configure the service application.

The service application is created. After the service application is created and configured, you can apply it to a site within your network. After services have been assigned to a site, they cannot be deleted.

NOTE: A Service Application must have the same fabric type as its associated Service Definition. For example, if a Service Definition is created with Fabric Connect type, it can only have Service Applications of Fabric Connect type. Currently, Fabric Connect is the only fabric type available.

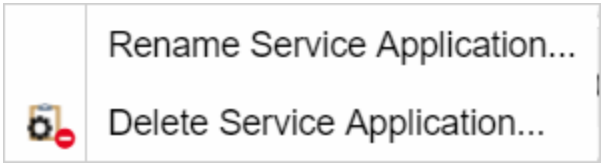
After the service application is created, it is available in the left-panel tree and a new right panel opens that includes a Services tab and a Service Summary tab.

Rename a Service Application

To change the name of a service application:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Service Definitions** in the left-panel.

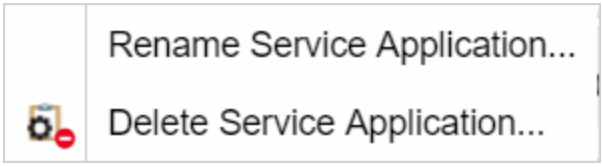
4. Right-click the service application you are renaming.



5. Select **Rename Service Application**.
6. Enter a new name in the **Name** field.
7. Select **OK** to change the name of the service application.

Delete a Service Application

You can delete all user-defined service applications, unless the service application or any of its associated service definitions are assigned to a site.



To delete a service application:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service application you are deleting.
5. Select **Delete Service Application**.
6. Select **Yes** to delete the service application.

For information on related topics:

- Services
- Fabric
- Sites
- Devices

How to Add Fabric Manager

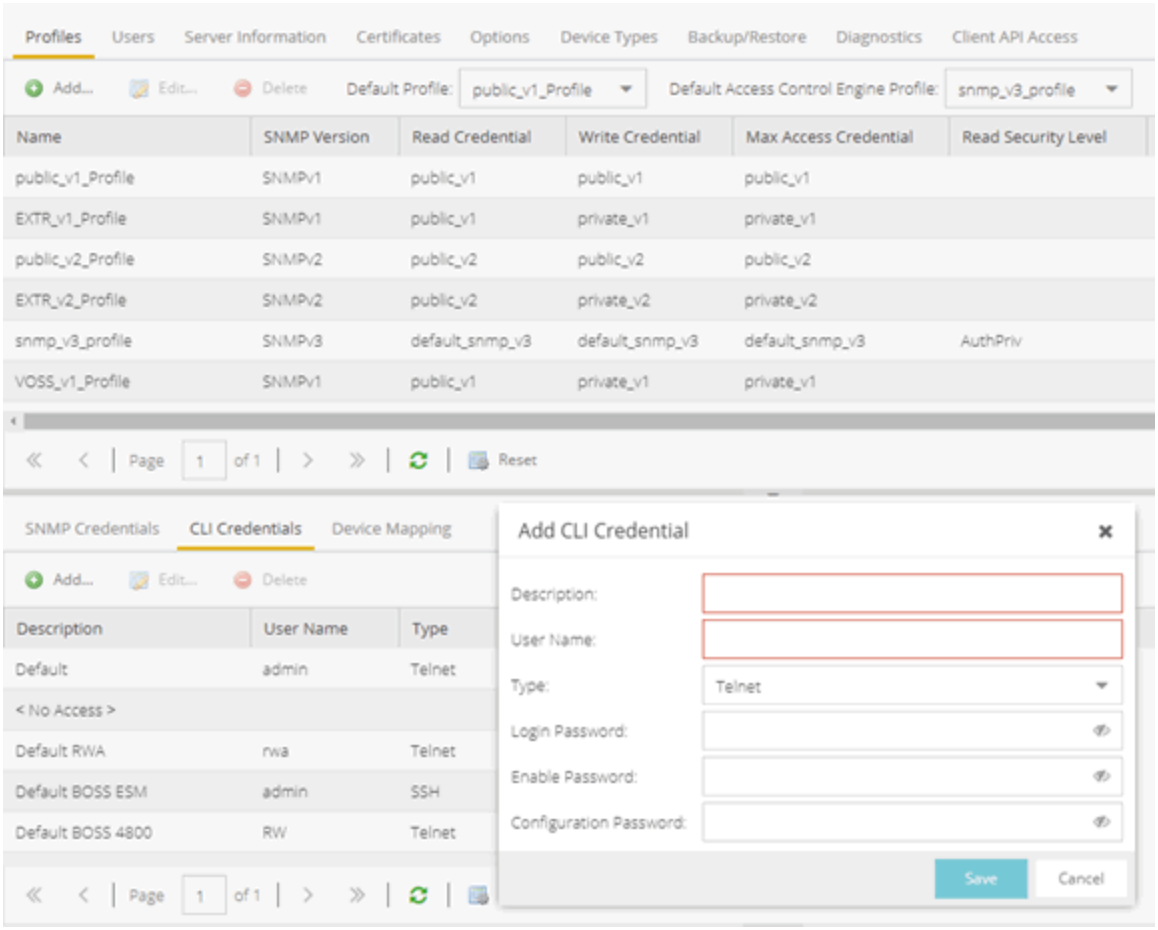
Once you install the Fabric Manager virtual machine (VM), you can add it to ExtremeCloud IQ - Site Engine and enable it via ZTP+ (Zero Touch Provisioning Plus) functionality.

Adding Fabric Manager to ExtremeCloud IQ - Site Engine

Prior to adding the Fabric Manager engine, you must create an Administration Profile for the Fabric Manager with CLI credentials. Fabric Manager uses the Administrator Profile as an additional user account.

Add CLI Credentials

1. Launch ExtremeCloud IQ - Site Engine.
2. Open the **Administration > Profiles** tab.
3. In the bottom panel, select the **CLI Credentials** tab.

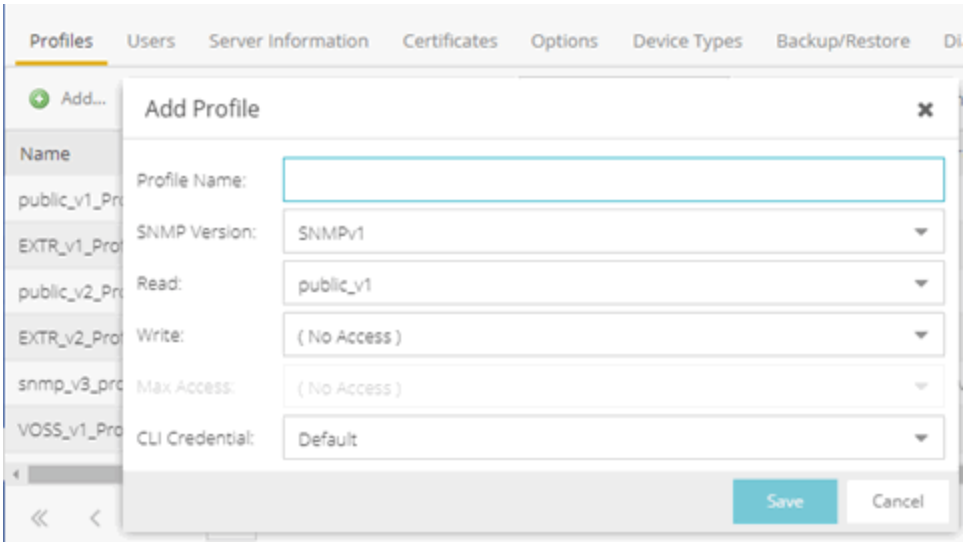


4. Select the **Add** button (Add) to open the **Add CLI Credential** window.
5. Enter a name for the CLI Credential in the **Description** field.
6. Enter **root** in the **User Name** field.

7. Select **SSH** from the **Type** drop-down list.
8. Enter a password in the **Login Password** field.
   This password must be the same password that you provided in Step 2b of the Fabric Manager Installation Static Mode topic.
9. Enter a password in the **Enable Password** field.
10. Enter a password in the **Configuration Password** field.
11. Select **Save**.

Create Administration Profile

1. At the top of the **Profiles** tab, select the **Add** button (Add) to open the **Add Profile** window.



2. In the **Profile Name** field, enter a name for this profile.
3. In the **SNMP Version** field, select **SNMPv1**.
   Fabric Manager does not use SNMP; the SNMP credentials here are just placeholders.
4. In the **Read** field, select **Ping Only**.
5. In the **Write** field, select either **No Access** or **Ping Only**.
6. In the **CLI Credential** field, select the same CLI Credential that you created in Step 4 of the Add CLI Credentials topic.
7. Select **Save**.

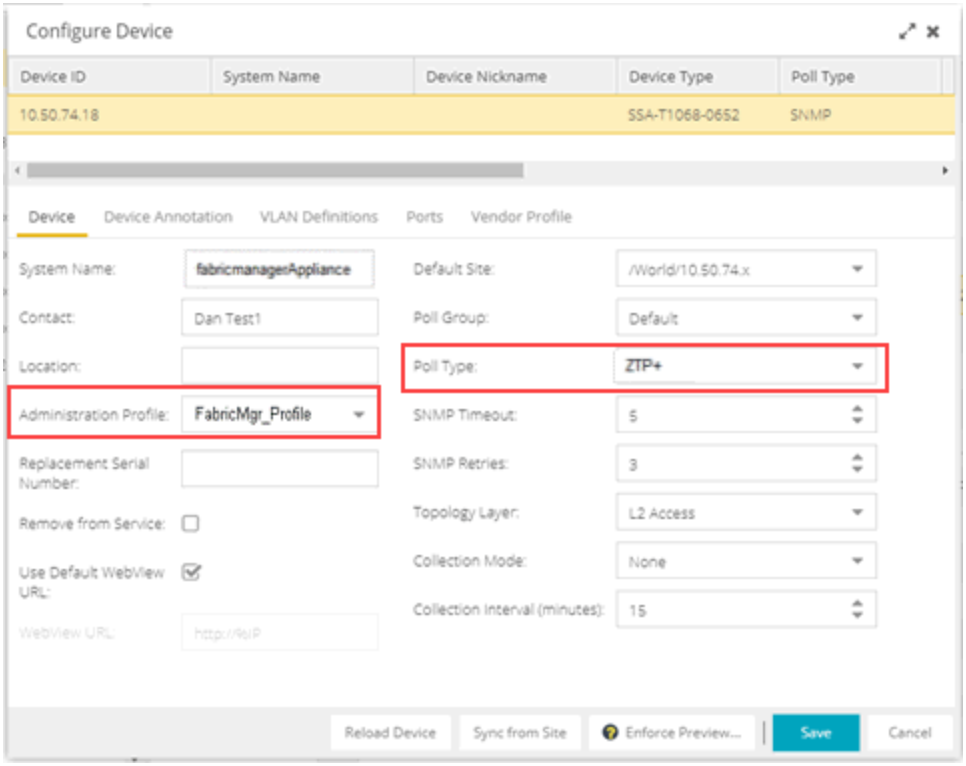
Add Administration Profile to the Fabric Manager engine

1. Open the **Network** > Discovered tab in ExtremeCloud IQ - Site Engine.

NOTE: The Fabric Manager appears as a device on the **Discovered** tab. It is listed with a **Status** of **ZTP+ Pending Edit**, indicating the configuration needs to be edited before adding it to the ExtremeCloud IQ - Site Engine server.

2. Right-click the new Fabric Manager file and select **Configure Devices** tab from the drop-down list.

   The **Configure Device** window opens.



3. Select the profile you created from the **Administration Profile** drop-down list.
4. Select **ZTP+** from the **Poll Type** drop-down list.
5. Select the **ZTP+ Device Settings** tab in the **Configure Device** window.
6. Configure the fields on the ZTP+ Device Settings tab to determine how the Fabric Manager is managed by ExtremeCloud IQ - Site Engine using ZTP+ functionality.

ZTP+ Discovery

Once the ZTP+ discovery process is complete, the Fabric Manager engine is added to the ExtremeCloud IQ - Site Engine database and moves from the **Network** > **Discovered** tab to the **Network** > **Devices** tab. The ZTP+ discovery process may take up to five minutes to complete.

NOTES: If you did not select **Automatically Add Devices** on the **Site** tab, the Fabric Manager engine remains on the **Discovered** tab with a **Status** of **ZTP+ Complete**. Select the file, select the **Add Devices** button (the Add Device window appears), and select the **Add** button to add the device to the ExtremeCloud IQ - Site Engine database.

In the event a configuration is not correctly transmitted to the switch or if connectivity is lost during any part of this process, the file resets and allows the process to restart.

The Fabric Manager engine **Status** (displayed on the Discovered tab) is now **ZTP+ Staged**, indicating ExtremeCloud IQ - Site Engine will push the configuration to the device the next time the device contacts ExtremeCloud IQ - Site Engine.

When ExtremeCloud IQ - Site Engine pushes the configuration to the Fabric Manager engine, the **Status** is **ZTP+ Complete**.

- ExtremeCloud IQ - Site Engine Fabric
- Fabric Connect

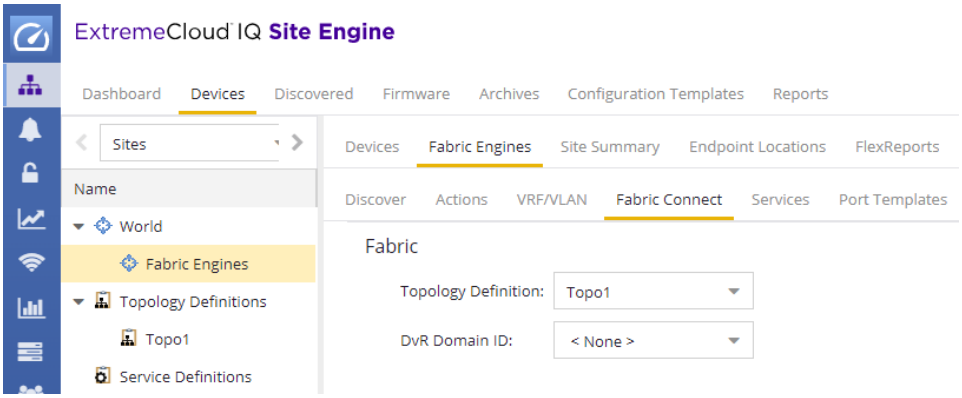
Applying Fabric Services

When you have created and configured your fabric topology, service and service application services, you can apply them to sites within your network. When fabric topology and services have been assigned to a site, they cannot be deleted.

NOTE: Services not assigned to a service definition (where NONE has been selected) can be deleted from a site after they have been assigned to that site.

Applying a Fabric Topology to a Site

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Select a site in the left-panel tree.
4. Select the site name tab in the **Devices** sub-tab.

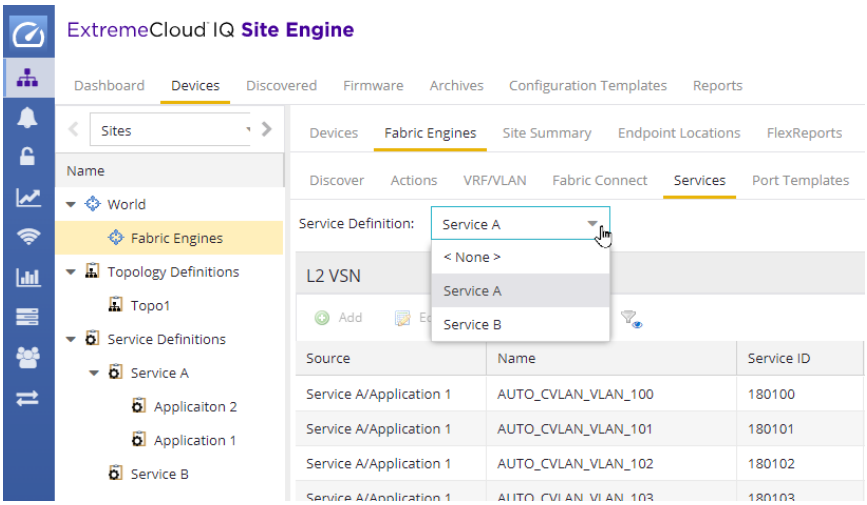


5. Select the **Fabric Connect** tab.
6. Select the topology you want to apply to the site from the **Topology Definition** drop-down list.
7. Select the DVR Domain from the **DVR Domain** drop-down list.
8. Select **Save**.

NOTE: Only one Fabric Topology and one DVR Domain can be assigned a site in ExtremeCloud IQ - Site Engine.

Applying a Service Application to a Site

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Select a site in the left-panel tree.
4. Select the site name tab in the **Devices** sub-tab.
5. Select the **Services** tab.
6. Select the service definition you want to apply to the site from the **Service Definition** drop-down list. The service application details that you configured to the service definition display in the L2 VPN and L3 VPN tables.



7. Select Save to apply the services to the site.

Applying Fabric to Port Templates

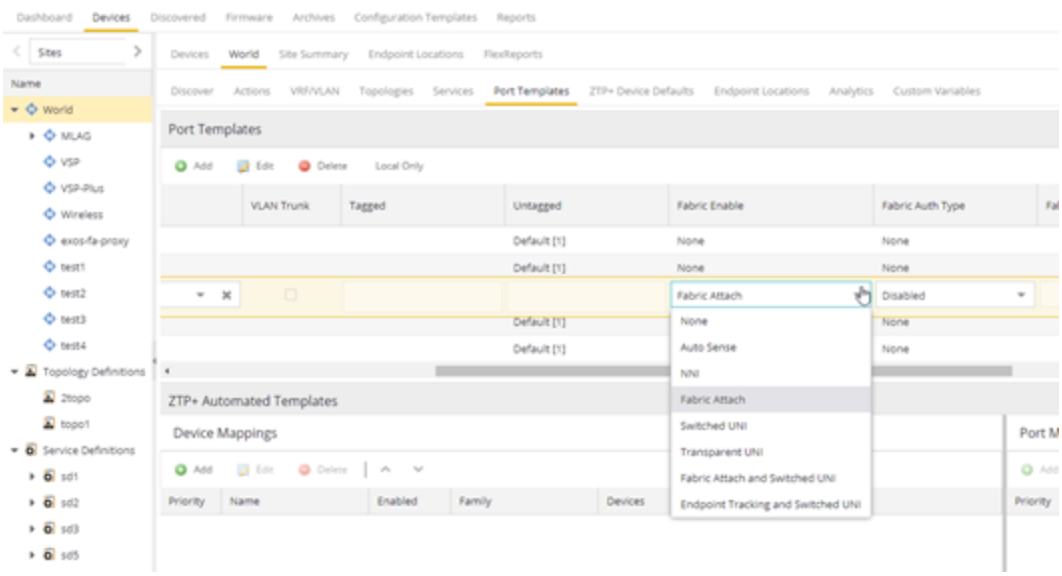
The Port Templates Configuration window enables you to configure ports with a Fabric role. When complete, you can apply the Port Templates configuration to a device.

ExtremeCloud IQ - Site Engine supports the following Fabric roles:

- None
- NNI
- Fabric Attach
- Switched UNI
- Transparent UNI
- Fabric Attach and Switched UNI

NOTE: The Fabric Attach (FA) and Switched UNI (S-UNI) option means that the port is configured for both features, but only one feature is active at any one time. The mode is determined by which mapping request the port receives first (FA or S-UNI). Ports receive mapping requests via LLDP TLVs.

The following screen capture shows the Port Templates window, which you can access from either the World view or from a specific Site.



Use the following steps to configure fabric to a port template:

NOTE: Port templates for which you configure Fabric Enable values must be configured as Global port templates. To create a Global port template, select the World site and select **Global** from the **Source** drop-down list.

1. Open the **Network > Devices** tab.
2. Select **World** or a specific Site, and then the **Port Templates** tab.
3. Select a template, and then the Edit (Edit) button.
4. Under Fabric Enable, select a fabric mode.
5. Under Fabric Auth Type, select an authentication type.
6. Under Fabric Auth Key, select an authentication key if available.
7. Select **Save**

Applying Fabric to Ports

The Port Configuration window enables you to edit the fabric information about the ports on a device.

ExtremeCloud IQ - Site Engine supports the following Fabric roles:

- None
- NNI
- Fabric Attach
- Switched UNI

- Transparent UNI
- Fabric Attach and Switched UNI

NOTE: The Fabric Attach (FA) and Switched UNI (S-UNI) option means that the port is configured for both features, but only one feature is active at any one time. The mode is determined by which mapping request the port receives first (FA or S-UNI). Ports receive mapping requests via LLDP TLVs.

Use the following steps to configure fabric to a port:

1. Open the **Network > Devices** tab.
2. Select **Devices**.
3. Select the **Menu** icon (☰) or right-click on a device.
4. Select **Configure**.
   The Configure Device window opens.
5. Select **Ports**.
6. Select a port, and then the Edit (Edit) button.
7. Under Fabric Enable, select a fabric mode.
8. Under Fabric Auth Type, select an authentication type.
9. Under Fabric Auth Key, select an authentication key if available.
10. Select **Save**.

Applying Fabric Services to a Device

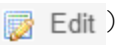
After you have applied fabric topologies and services to a site, you can also apply the fabric services to devices assigned to that site.

Applying Fabric Topology to a Device

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Select **Configure Device** from the drop-down list. The **Configure Device** window opens.
5. Select the **Fabric Connect** tab.
6. Select the **Sync from Site** button to populate the tab with the fabric topology details you applied to the site. The topology details you applied to the site will be applied to the device, as long as the device you have selected is assigned to the same site.
7. To populate the tab manually, select the **Enable Fabric** checkbox.
8. Select a **Fabric Role** from the drop-down list.
9. Enter a system ID number in the **System ID** field.

10. Enter a nickname in the **SPBM Nickname** field.
11. Check the **Multicast** checkbox, if needed.
12. Check the **IP Shortcuts** checkbox, if needed.
13. Enter the system name in the **System Name** field.
14. Select the **Enforce Preview** button.

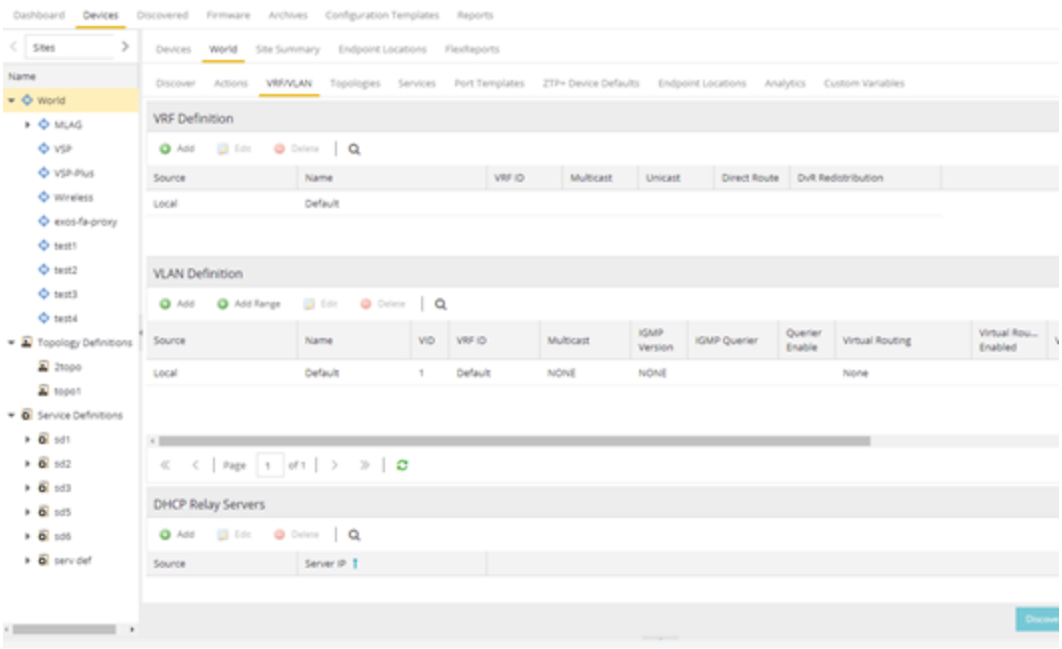
Applying Fabric Services to a Device

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Select **Configure Device** from the drop-down list. The **Configure Device** window opens.
5. Select the **Services** tab. The service details that you configured to the site display in the L2 VPN and L3 VPN tables.
6. Select the **Sync from Site** button to populate the tab with the fabric service details you applied to the site. The service details you applied to the site will be applied to the device, as long as the device you have selected is assigned to the same site.
7. Select the Add () button to add an L2 VSN or L3 VSN service to the device.
8. Select the Edit () button to edit service details that were populated from the site.
9. Select the **Enforce Preview** button.

NOTE: The L3VPN table is disabled when the device is set as a DVR Leaf node.

Adding and Deleting VRF Definitions

1. Open the **Network > Devices tab**.
2. Select **Sites** from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Select **Configure Device** from the drop-down list. The **Configure Device** window opens.
5. Select the **VRF/VLAN** tab.



The top table on the **VRF/VLAN** tab in the **Configure Device** window displays read-only VRF details you applied to the site. You can add a new VRF to the device.

1. Select the Add (Add) button.
2. Enter the name of a VRF in the **Name** field.
3. Enter the ID number in the **VRF ID** field.
4. Select **Update** to add the VRF to the device.
5. Select the **Enforce Preview** button.

You can delete a VRF from the **VRF/VLAN** tab.

1. Select a VRF in the table.
2. Select the **Delete** (Delete) button.
3. Select **Yes** to remove the VRF.

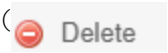
Adding and Deleting VLAN Definitions

1. Open the **Network > Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Right-click a site in the left-panel tree.
4. Select **Configure Device** from the drop-down list. The **Configure Device** window opens.
5. Select the **VRF/VLAN** tab.

The middle table on the **VRF/VLAN** tab in the Configure Device window displays read-only VLAN details you applied to the site. You can add a new VLAN to the device.

1. Select the Add () button.
2. Enter the name of a VLAN in the **Name** field.
3. Enter the ID number in the **VLAN ID** field.
4. Select **Update** to add the VLAN to the device.
5. Select the **Enforce Preview** button.

You can delete a VLAN from the **VRF/VLAN** tab.

1. Select a VLAN in the table.
2. Select the **Delete** () button.
3. Select **Yes** to remove the VLAN.

Enforcing the Fabric Configurations

After you enforce previews on the **Fabric Connect**, **Services**, and **VRF/VLAN** tabs, use the **Compare Device Configuration** window to enforce the configurations to the device. Additionally, the **VLAN Definition** tab allows you to enforce the **VLAN** and **Ports** fabric configurations.

Enforcing Fabric Connect

1. Select **Enforce Preview** on the **Fabric Connect** tab in the **Configure Device** window.
2. The Compare Device window opens.
3. Select the Fabric Connect Enforce Option.
4. Select **Enforce**.

Enforcing Fabric VRF

1. Select **Enforce Preview** on the **VRF/VLAN** tab in the **Configure Device** window.
2. The Compare Device window opens.
3. Select the **VRF/VLAN** tab.
4. Select **Enforce**.

Enforcing Fabric Services

1. Select **Enforce Preview** on the **Services** tab in the **Configure Device** window.
2. The Compare Device window opens.
3. Select the Services Enforce Option.

4. Select the **L2 VPN** tab.
5. Select **Enforce**.
6. Select the **L3 VPN** tab.
7. Select **Enforce**.

Enforcing Fabric VLAN

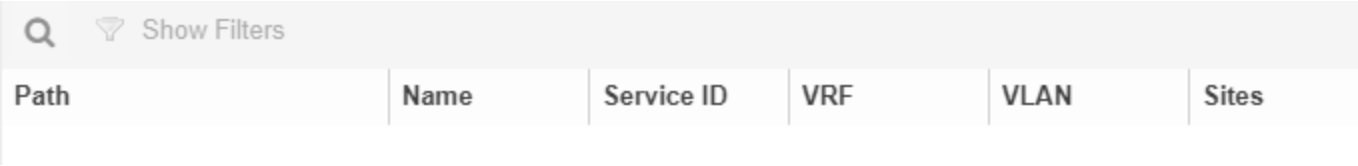
1. Select **Enforce Preview** on the **VLAN** tab in the **Configure Device** window.
2. The Compare Device window opens.
3. Select the VLAN Definition Enforce Option.
4. Select **Enforce**.

Enforcing Fabric Port

1. Select **Enforce Preview** on the **Ports** tab in the **Configure Device** window.
2. The Compare Device window opens.
3. Select the Ports Enforce Option.
4. Select **Enforce**.

Service Summary

The **Service Summary** tab displays a summary of the fabric services you create and the sites to which they are assigned.



Path
The path to the Service Application in which the service is located.

Name
The name of the fabric service included in the service application or definition.

Service ID
The I-SID, which is the system-defined ID number assigned to the service.

VRF
The ID number assigned to the VRF definition.

VLAN
The ID number assigned to the VLAN.

Sites
The site to which the fabric service is assigned.

- Services
- Fabric
- Sites

Fabric Topology Definition on the Sites Tab

Use the **Fabric Topology Definition** tab to create a fabric topology definition, configure fabric topology settings, and review fabric topology paths and sites. You can also rename or delete a fabric topology definition.

Create a Topology Definition

You can create a Topology Definition on the **Sites** tab in ExtremeCloud IQ - Site Engine. After you create topology definitions, you can add them to sites in your network to build a fabric topology map.

To create a topology definition:

1. Access the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Navigate to **Topology Definitions** in the left-panel tree.
4. Right-click **Topology Definitions**.
5. Select **Create Topology Definition**.

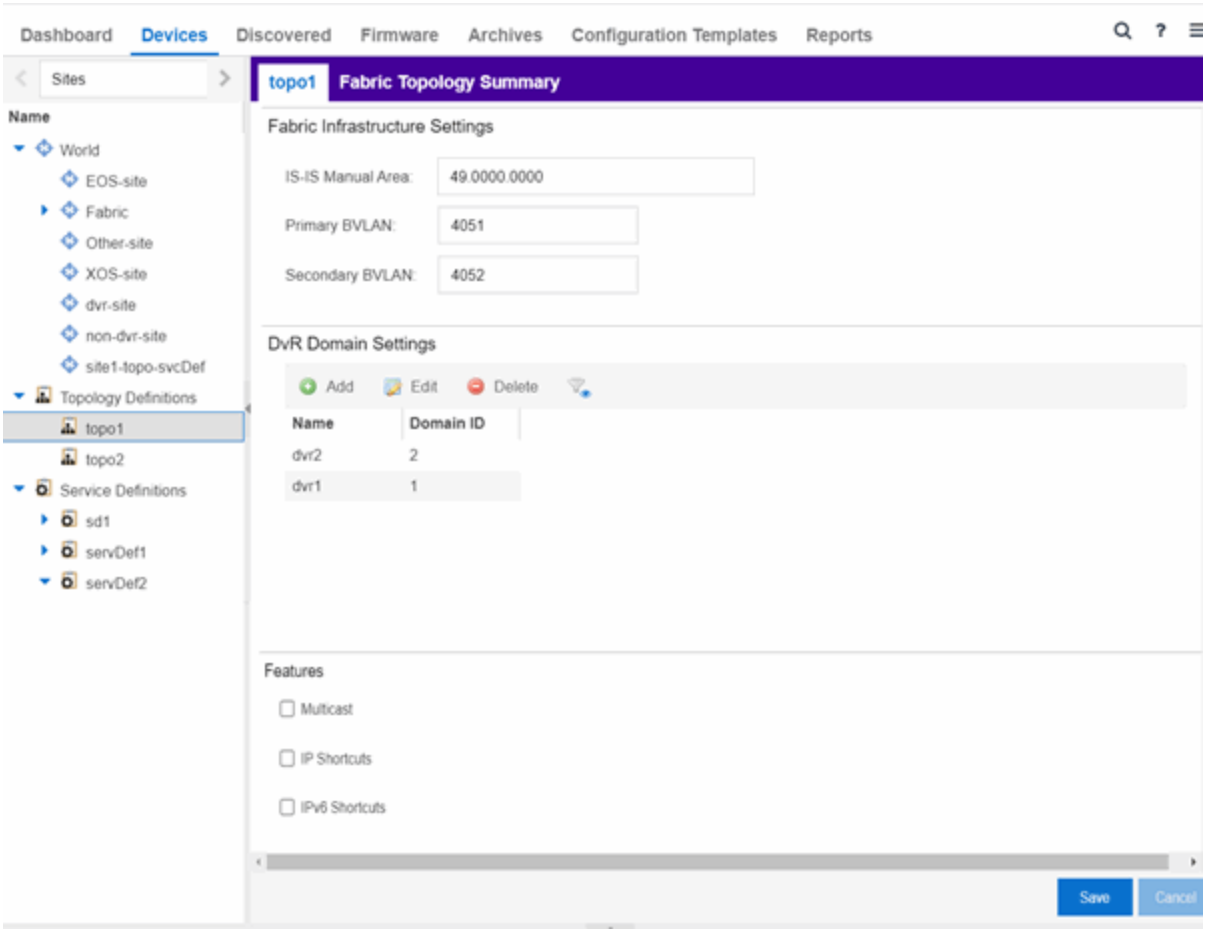
   The **Create Topology Definition** window opens.
6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Fabric Type** drop-down.
8. Select **OK** to create the topology definition.

Configure a Topology Definition

After the topology definition is created, it is available in the **Sites tab** left-panel tree. Select it to open a new right panel that includes the Fabric Name tab and a Fabric Summary tab.

Fabric Name Tab

Use the **Fabric Name** tab to configure the topology definition.



The Topology Definition tab includes the following sections:

Fabric Infrastructure Settings

The following fields are included in the Fabric Infrastructure Settings section:

- ISIS Manual Area - Use a xx.xxxx.xxxx.xxxx.xxxx.xxxx.xxxx format (1-13 bytes).
- Primary BVLAN - Enter the Primary Backbone VLAN (BVLAN).
- Secondary BVLAN - Enter the Secondary BVLAN.

DvR Domain Settings

The following fields are included in the DvR Domain Settings section:

- Name - The Domain name assigned to the DvR Domain. Select the down arrow to open the drop-down list to access sort, hide columns and search filter functionality for the domain name column.
- Domain ID - The identifying number assigned to the DvR Domain. Select the down arrow to open the drop-down list to access sort, hide columns and numeric filter functionality for the Domain ID column.

You can also Add, Edit, or Delete DvR Domain settings.

Features

The following fields are included in the Features section:

- Multicast - Select the check box to configure to distribute data to multiple recipients.
- IP Shortcuts - Select the check box to enable IPv4 Shortcuts for the topology definition.
- IPv6 Shortcuts - Select the check box to enable IPv6 Shortcuts for the topology definition.

Select **Save** to save the topology definition settings you selected.

After the topology definition is created and configured, you can apply it to a site within your network. After fabric topologies have been assigned to a site, they cannot be deleted.

Fabric Summary tab

The Fabric Summary tab lists any fabric topologies you have created and the sites to which they are assigned.

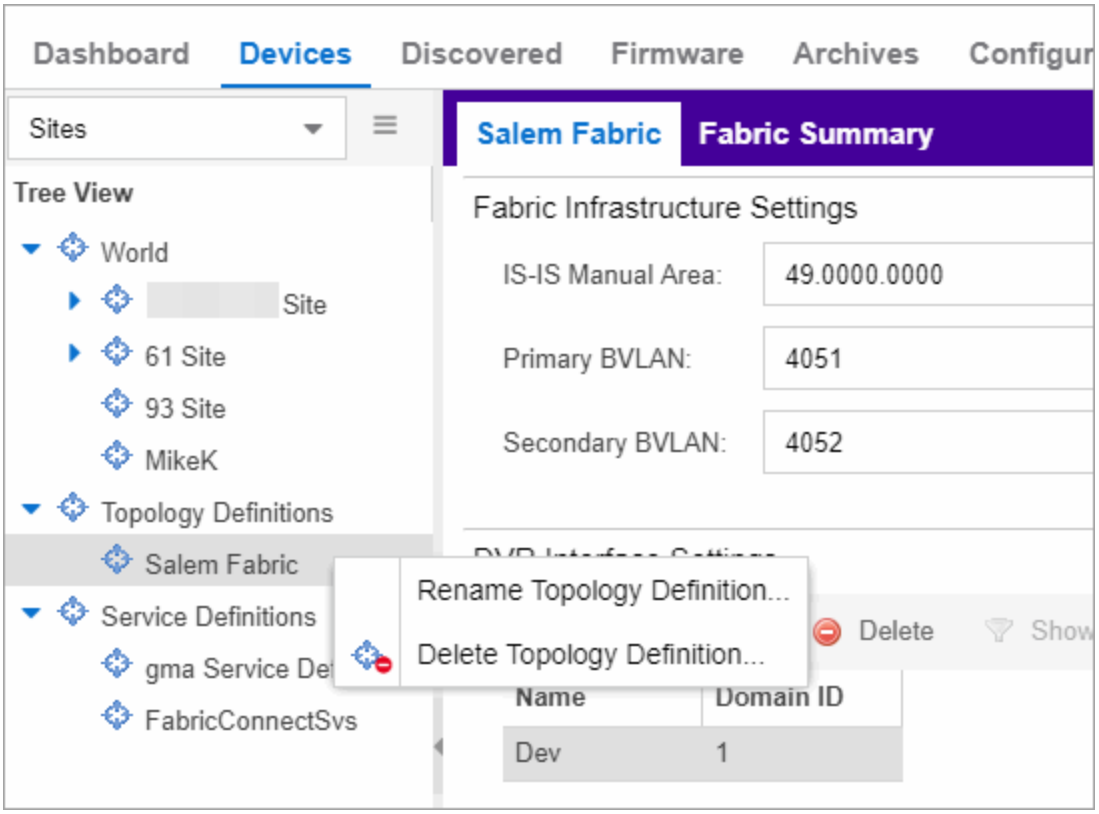
Rename a Topology Definition

After a topology definition has been created and configured, you can change or modify its name.

To rename a topology definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Topology Definitions** in the left-panel.

4. Right-click the topology definition you are renaming.



5. Select **Rename Topology Definition**.
6. Enter a new name in the **Name** field.
7. Select **OK** to change the topology name.

Delete a Topology Definition

After a topology definition has been created and configured, you can delete it; however, a topology definition cannot be deleted if it has been assigned to a site.

To delete a topology definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand the **Topology Definitions** in the left-panel.
4. Right-click the topology definition you are deleting.
5. Select **Delete Topology Definition**.
6. Select **Yes** to delete the topology definition you selected.

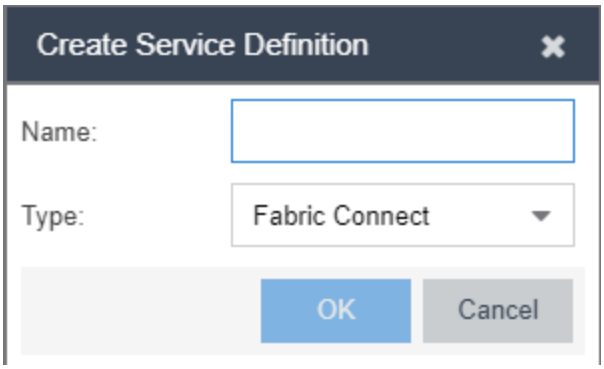
How to Create a Fabric Service Definition

You can create a service definition in the **Sites tab** in ExtremeCloud IQ - Site Engine. Service definitions display information configured in service applications definitions. When created, service definitions are added to sites in your network and are used to build a fabric topology map.

Create a Service Definition

To create a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Select **Service Definitions** in the left-panel.
4. Right-click **Service Definitions**.
5. Select **Create Service Definition**.



   The **Create Service Definition** window opens.
6. Enter a name in the **Name** field.
7. Select **Fabric Connect** from the **Type** drop-down list.
8. Select **OK** to create the service definition.

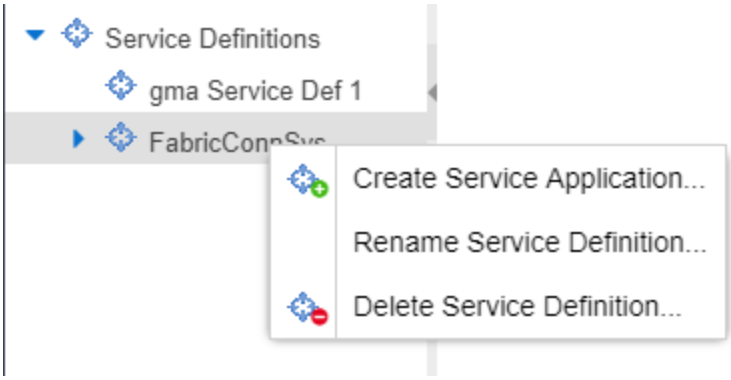
After the service definition is created and configured, you can apply it to a site within your network. When fabric services have been assigned to a site, they cannot be deleted.

Service Definition Panel

After the service definition is created, it is available in the left-panel tree. Select it to open a new right panel that includes a **Services** tab and a **Service Summary** tab.

Rename a Service Definition

After a service definition has been created and configured, you can change or modify its name.

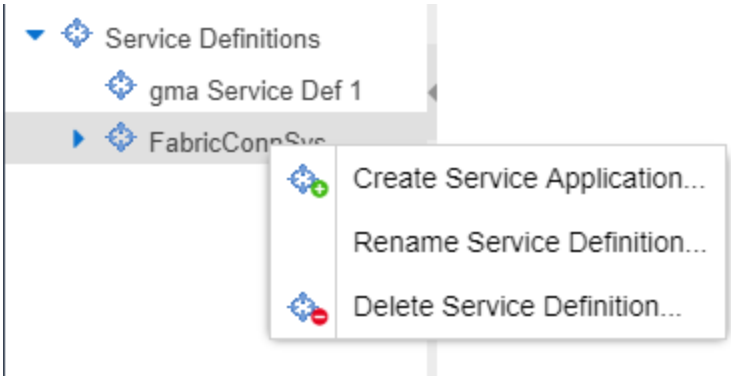


To rename a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel tree drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are renaming.
5. Select **Rename Service Definition**.
6. Enter a new name in the **Name** field.
7. Select **OK** to rename the service definition.

Delete a Service Definition

When a service definition has been created and configured, you can delete it; however, a service definition or any of its associated service applications cannot be deleted if it has been assigned to a site.



To delete a service definition:

1. Open the **Devices** tab.
2. Select **Sites** from the left-panel drop-down list.
3. Expand **Service Definitions** in the left-panel.
4. Right-click the service definition you are deleting.
5. Select **Delete Service Definition**.
6. Select **Yes** to delete a service definition.

For information on related topics:

- Services
- Fabric
- Sites
- Devices

Upgrading Fabric Manager

Use the following procedure to upgrade your version Fabric Manager.

Prerequisites

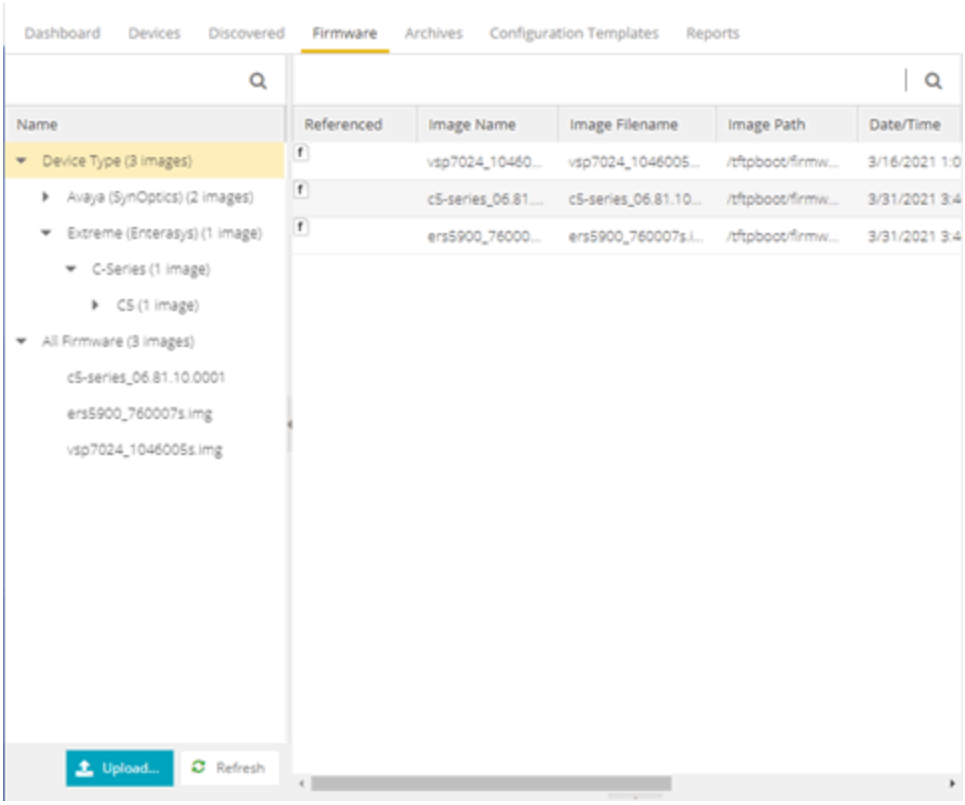
- Upgrade ExtremeCloud IQ - Site Engine to the later version before you upgrade Fabric Manager to the corresponding build number.
- Ensure that both the current and target ExtremeCloud IQ - Site Engine and Fabric Manager build numbers are the same.
- Download the latest upgrade bundle from the Extreme Networks software download Portal.
- Change **Login Information** from **Anonymous** to appropriate SCP credentials in the SCP Server Properties section in the **Administration** > **Options** > **Inventory Manager** > **File Transfer** tab.

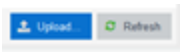
NOTE: After you deploy Fabric Manager and then register with ExtremeCloud IQ - Site Engine, only the user credential associated with the Fabric Manager profile has SSH login access.

Upgrade Procedure

1. Open the **Network** tab in ExtremeCloud IQ - Site Engine.

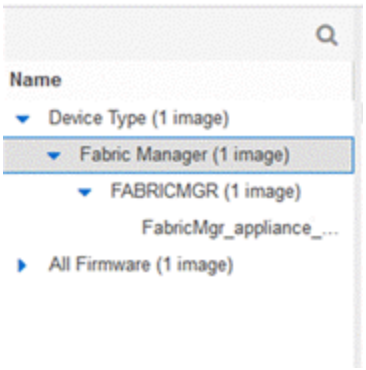
2. Select the **Firmware** tab.



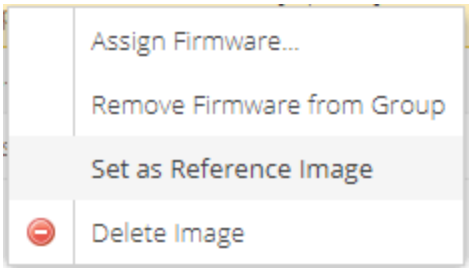
3. On the left panel, select **Upload**  .
4. In the Directory field, select the **SCP** radio button and select **Upload**.

5. Select on **Drop files here or select to browse** and select the previously downloaded upgrade bundle.
6. Select the **Upload** button to initiate the bundle upload to the ExtremeCloud IQ - Site Engine server.

   Once the upload is completed successfully, if not previously added after selecting the **Refresh** button, a new entry appears under Device Type called Fabric Manager.

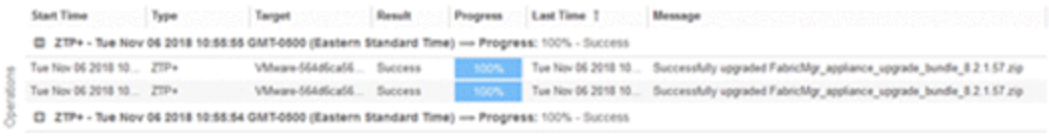


7. Navigate through the newly added Device type until you see the bundle image listed.
8. Right-click the bundle listed on the main panel and select **Set as Reference Image**.

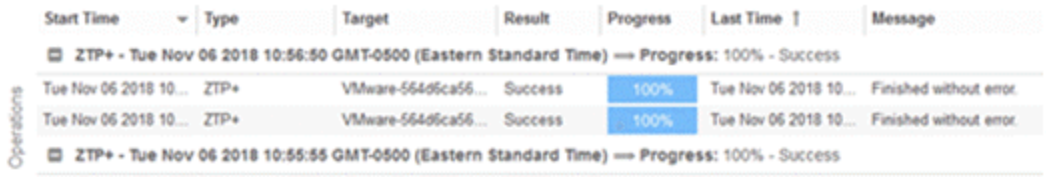


This step sets this image bundle as the Reference upgrade image for Fabric Manager. The upgrade process to get triggered by default can take **up to five minutes** depending on the poll interval set on ExtremeCloud IQ - Site Engine.

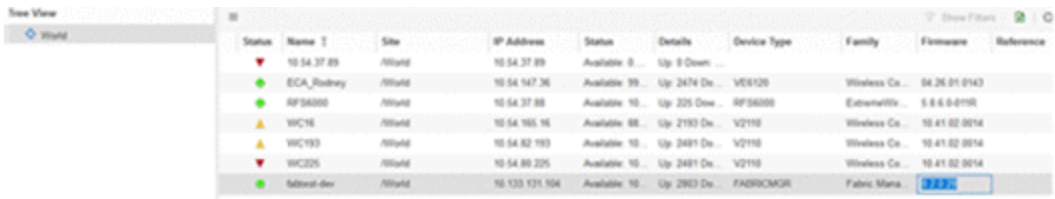
9. Open the **Operations** log on ExtremeCloud IQ - Site Engine and wait until a log of type 'ZTP+' with the message `Successfully upgraded FabricMgr_appliance_upgrade_bundle_<version_number>.zip` appears.



This is followed by a message `Finished without error` to indicate the upgrade operation has been completed by the ZTP+.



10. When the upgrade is complete, the details on Fabric Manager are updated to the latest version.



Post Upgrade Steps

1. Ensure that the same user credential associated with the Fabric Manager profile has SSH login access.
2. Navigate to the previously added and referenced upgrade image and un-reference it by right selecting the bundle and then selecting **Unset as Reference Image**.

- ExtremeCloud IQ - Site Engine Fabric
- Fabric Connect

Troubleshooting

This troubleshooting guide provides a list of items to check when ExtremeCloud IQ - Site Engine functionality is failing to perform correctly. Locate a problem in the left column and then review the troubleshooting information in the right column.

Problem	Troubleshooting Steps
Error contacting a wireless controller. The controller shows a Warning icon. 	1. Verify that the Configuration password in the CLI Credential used for this device is properly configured. a. From ExtremeCloud IQ - Site Engine, access **Administration** > **Profiles** tab. b. Select the **CLI Credentials** subtab. c. Select the CLI Credential being used by the controller's Profile, and select **Edit**. d. Verify the user name and password used in the credential. For wireless controllers, add the Login password to the Configuration password field instead of the Login password field. The username and Configuration password specified here must match the username and Login password configured on the controller. e. Verify the SSH connection type is selected. f. Select **OK**. g. Use this CLI Credential in the controller's Profile. **NOTE:** When configuring profiles for ExtremeWireless Controllers, you must ensure that controllers are discovered using an SNMPv2c or SNMPv3 profile. The profile must also contain SSH CLI credentials for the controller. Wireless Manager uses the controller's CLI to retrieve required information and to configure managed controllers. 2. Verify that the following ports are accessible through firewalls for the ExtremeCloud IQ - Site Engine Server and Wireless Controllers to communicate: SSH: 22 SNMP: 161, 162 Langley: 20506