Dell EMC SmartFabric Director

User Guide Release 1.2



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.

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Revision history

This table provides an overview of the changes in this guide.

Table 1. Revision history

Release	Revision	Description
1.1.0	A00 (January 2020)	Initial release
1.1.1	A01 (March 2020)	 Define switch lifecycle job — Enter a user-specified OS10 image name Upgrade SFD — Upgrade SFD software
1.2.0	A02 (May 2020)	 Installation using vCenter 6.7 — Updated information on service tag input Specify system settings — Added new section to upload the service tag Create user accounts — Updated screenshots for user management Define fabric intent — Added BFD to Layer 3 configuration

SmartFabric Director

Dell EMC SmartFabric Director (SFD) enables data center operators to build, operate, and monitor an open network underlay fabric. SFD works with Dell EMC PowerSwitch Series switches to ensure that their physical underlay networks are tuned for the specific overlay environment.

SFD enables the physical switch underlay infrastructure to keep pace with the changing demands of virtualized and software-defined networks, and provides customers a single view for operating, managing, and troubleshooting of physical and virtual networks.

Features

- Abstracted view of the fabric—no must manage individual switches
- · Define, build, and maintain a Layer 2 or Layer 3 leaf spine data center fabric (underlay)
- · Intent template-based provisioning underlay
- · Authoritative repository of intent and switch configuration and state
- · Fabric health management and monitoring including events, logs, alarms, states, and metrics (counters)
- · Operator-driven remediation
- Full life-cycle management of switches including grouping of switches and scheduling of jobs
- · Uses OpenConfig (gNMI, gNOI) for provisioning and streaming telemetry of switches

Inputs

- Provisioning using REST or gRPC/gNOI
- ONIE and gNOI life-cycle management
- Streaming telemetry using gRPC
- Agentless or Agent interface to switches
- L2 or L3 fabric topology

Streaming telemetry

Model-driven telemetry is a new approach for network monitoring. Data is streamed from network switches continuously, using a push model which provides near real-time access to operational statistics. Applications can subscribe to specific data items they need, by using standard-based YANG data models.

Streaming telemetry enables users to push data off the switch to an external collector at a higher frequency, more efficiently, and data on-change streaming.

Models

- · destination-group tells the switch where to send telemetry data and how
- · sensor-group identifies a list of YANG models that the switch should stream
- subscription-profile ties together the destination-group and the sensor-group

Getting started

3

This information describes the component and configuration requirements.

Dell EMC SmartFabric Director

• Dell EMC SmartFabric Director release 1.2.0

SmartFabric OS10

All PowerSwitches must be running Dell EMC SmartFabric OS10:

Release 1.2.0	10.5.1.2
Release 1.1.2	10.5.0.4 or 10.5.0.5
Release 1.1.1	10.5.0.4 or 10.5.0.5
Release 1.1.0	10.5.0.4

Dell EMC PowerSwitches

- · S4048-ON, S4048T-ON
- · S4112F-ON, S4112T-ON
- S4128F-ON, S4128T-ON
- · S4148F-ON, S4148FE-ON, S4148T-ON
- S4248FB-ON, S4248FBL-ON
- · S5212F-ON
- S5224F-ON
- S5232F-ON
- · S5248F-ON
- · S5296F-ON
- · \$6010-ON
- · Z9100-ON
- · Z9264F-ON

VMware 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)
- 4vCPU
- 16G memory
- 100G available disk space (higher disk sizes may be required depending on fabric size and data retention requirements)

VMware NSX-T

See docs.vmware.com/VMware NSX-T Data Center for complete NSX-T 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) nonsupported for Flash client; supported for HTML5 client
- Text or JSON editor to modify the JSON wiring diagram if required

Software installation

This information describes how to install SFD in your SmartFabric OS10 network. If your switch came preinstalled with Dell EMC SmartFabric OS10, see Log in to SmartFabric OS10.

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

Topics:

- Download SFD image
- Log in to SmartFabric OS10
- Upgrade SFD

Download SFD image

This information explains show to download the SmartFabric Director software image.

- **1.** Sign into DDL using your account credentials.
- 2. Locate your entitlement ID and order number, then select the product name.
- 3. Select the **Products** tab and view your service tag that is located under Associated Hardware of Software ID; write the service tag down. The service tag is needed during first-time setup. The service tag is also visible in the license key.
- 4. Select the Available Downloads tab, select the wanted files to download, then click Download.
- 5. Read the Dell End-User License Agreement. Scroll to the end of the agreement, then click Yes, I agree.
- 6. Select how to download the software files, then click Download Now.
- 7. After you download the image, unpack the .tar file on a Linux or Windows server, then open the README file for instructions on how to validate the OVA file.
- i NOTE: The available downloads include the software image, release notes, user guide, and JSON wiring diagram template (see Fabric wiring diagram definition for complete information).

Log in to SmartFabric OS10

To log in to SmartFabric OS10, turn on the device and wait for the system to perform a power-on self-test (POST). Enter admin for both the default username and user password.

For better security, change the default admin password during the first SmartFabric 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: Thu Dec 12 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.
  _ *
        Dell EMC Network Operating System (OS10)
_*
                                                   *_
  Copyright (c) 1999-2020 by Dell Inc. All Rights Reserved.
-*
                                                   * _
_ *
```

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OS10# write memory

Check SmartFabric OS10 version

1. View the SmartFabric OS10 version in EXEC mode.

```
OS10# show version
Dell EMC Networking OS10-Enterprise
Copyright (c) 1999-2020 by Dell Inc. All Rights Reserved.
OS Version: 10.5.0.4
Build Version: 10.5.0.4.433
Build Time: 2019-12-12T22:18:40-0700
System Type: S4148F-ON
Architecture: x86_64
Up Time: 2 days 03:37:25
```

2. (Optional) If your switch is not preloaded with SmartFabric OS10 10.5.0.4, you must upgrade the operating system (see Upgrade SmartFabric OS10 in the *Dell EMC SmartFabric OS10 User Guide*).

Upgrade SFD

This information explains how to upgrade SFD to the next software release.

i NOTE: If you are running SFD 1.1.0 or 1.1.2, you can directly upgrade to 1.2.0. If you are running SFD 1.1.1, you must first upgrade to 1.1.2, then upgrade to 1.2.0. The SFD software cannot be downgraded to a lower version.

1. Download the upgrade bundle, then store it locally on SFD, or in a remote location (see Download SFD image).

i NOTE: The SFD image name and upgrade bundle name should not be modified. The installation or upgrade will fail if you change the filenames.

2. SSH to the IP address configured for SFD.

```
login-srv-05-user%:~> ssh username@sfd.local@ip_address
admin@sfd.local@10.12.124.125's password:
Last login: Wed May 6 18:00:59 2020 from 10.12.1.9
```

3. Log in to the SFD CLI (see Using the CLI).

```
admin@sfd.local@SFD-R5:~$ sfd
DellEMC SmartFabric Director CLI
sfd>
```

4. Upgrade the SFD software from an absolute path on a local server.

sfd> upgrade absolute path of upgrade bundle

or

Upgrade the SFD software from a remote host.

sfd> upgrade absolute path of upgrade bundle on remote host --server remote server IP -- username username --password password

On successful upgrade, Upgrade successful! displays.

5. Verify the upgrade, and compare the current installed software version with the intended SFD version.

sfd> cat /opt/vmware/nfc/version/NFC_VERSION

For complete information about the upgrade command, see upgrade.

Switch configuration

This information explains how to configure SmartFabric OS10 before installing SFD. For complete configuration information, see the *Dell EMC SmartFabric OS10 User Guide*.

Topics:

- Management interface
- Crypto security
- Switch-port profiles
- NTP server configuration

Management interface

This information explains how to configure Management interface access to network devices. You can configure the Management interface, but the configuration options on this interface are limited. You cannot configure gateway addresses and IP addresses if it appears in the main routing table. Proxy ARP is not supported on this interface.

1. Configure the Management interface in CONFIGURATION mode.

interface mgmt 1/1/1

2. By default, DHCP client is enabled on the Management interface. Disable DHCP client operations in INTERFACE mode.

no ip address dhcp

3. Configure an IP address and mask on the Management interface in INTERFACE mode.

```
ip address A.B.C.D/prefix-length
```

4. Enable the Management interface in INTERFACE mode.

no shutdown

Configure Management interface

```
OS10(config) # interface mgmt 1/1/1
OS10(conf-if-ma-1/1/1) # no ip address dhcp
OS10(conf-if-ma-1/1/1) # ip address 10.1.1.10/24
OS10(conf-if-ma-1/1/1) # no shutdown
```

For complete information about configuring Management interfaces, see the *Dell EMC SmartFabric OS10 User Guide Release 10.5.0* at www.dell.com/support/.

Crypto security

This information explains how to prepare your switch for SmartFabric Director from the OS10 side to install the crypto security profile and license.

The gNMI agent, available with SmartFabric OS10 release 10.5.0.1 and later, provides a new interface to configure OS10 devices. It uses gNMI protocol and OpenConfig YANG models to support create, read, update, and delete (CRUD) operations, life cycle management through gNOI and configuration of streaming telemetry.

The gNMI agent listens to SFD to receive remote configuration-change requests or upgrade and downgrade instructions. As a part of these remote configuration changes, the gNMI agent enables the telemetry agent to transmit preconfigured sensor group data in the OpenConfig format to SFD.

Setup crypto security

1. Log in to SmartFabric OS10, then verify that the installed software version meets the requirements.

```
OS10# show version
Dell EMC Networking OS10 Enterprise
Copyright (c) 1999-2020 by Dell Inc. All Rights Reserved.
OS Version: 10.5.0.4
Build Version: 10.5.0.4.433
Build Time: 2019-09-26T03:50:26+0000
System Type: S4148F-ON
Architecture: x86_64
Up Time: 00:07:08
```

2. Verify your switch operating mode.

OS10# show switch-operating-mode

Switch-Operating-Mode : Full Switch Mode

3. Set up the crypto security profile and certificate, then replace gnmi-os10-0 with a security-profile name of your choice; format is gnmi-xxx-0 where xxx is any string.

```
OS10(config)# crypto security-profile gnmi-os10-0
OS10(conf-sec-profile)# certificate gnmi-os10-0
OS10(conf-sec-profile)# exit
```

4. Start restconf.

OS10(config) # rest api restconf

5. Set up the gnmi-security-profile.

OS10(config)# gnmi-security-profile gnmi-os10-0 OS10(config)# exit

6. Create crypto certificate.

```
OS10# crypto cert generate self-signed cert-file home://gnmi-os10-0.crt key-file home://
gnmi-os10-0.key cname os10
Processing certificate ...
Successfully created certificate file and key
```

7. Install the certificate.

```
OS10# crypto cert install cert-file home://gnmi-os10-0.crt key-file home://gnmi-os10-0.key
Processing certificate ...
Certificate and keys were successfully installed as "gnmi-os10-0.crt" that may be used in
a security profile. CN = os10
```

8. Set the switch operating mode to SFD, then verify the mode.

9. Save the configuration.

OS10# write mem

10. SFD displays an informational message to reload the device for SFD mode to take effect; reload the switch.

OS10# reload

For complete information about crypto security profiles, see the Dell EMC SmartFabric OS10 User Guide Release 10.5.0.

Switch-port profiles

This information explains switch-port profiles. A port profile determines the enabled front-panel ports and supported breakout modes on Ethernet and unified ports. Change the port profile on a switch to customize uplink and unified port operation, and the availability of front-panel data ports.

To change the port profile at the next reboot, use the switch-port-profile command with the wanted profile, save it to the startup configuration, then use the reload command to apply the changes.

1. Configure a platform-specific port profile in CONFIGURATION mode. For a stand-alone switch, enter 1/1 for node/unit.

i NOTE: Switch-port profiles are platform-specific. If switch-port-profile is not available, the configuration is not available for your specific platform.

```
switch-port-profile node/unit profile
```

2. Save the port profile change to the startup configuration in EXEC mode.

write memory

3. Reload the switch in EXEC mode.

reload

The switch reboots with the new port configuration and resets the system defaults, except for the switch-port profile and these configured settings:

- Management interface 1/1/1 configuration
- Management IPv4/IPv6 static routes
- System hostname
- Unified forwarding table (UFT) mode
- ECMP maximum paths

You must manually reconfigure other settings on the switch after you apply a new port profile and reload the switch.

() NOTE: After you change the switch-port profile, do not immediately back up and restore the startup file. You must use the write memory command and reloading the switch using the reload command or the new profile does not take effect.

Configure port profile

```
OS10(config)# switch-port-profile 1/1 profile-6
OS10(config)# exit
OS10# write memory
OS10# reload
```

Verify port profile

```
OS10(config) # show switch-port-profile 1/1
```

For complete information about configuring specific ON-Series switch-port profiles, see the *Dell EMC SmartFabric OS10 User Guide Release 10.5.0.*

NTP server configuration

This information explains how to set up network time protocol (NTP) to synchronize timekeeping among a set of distributed time servers and clients. The protocol coordinates time distribution in a large, diverse network. NTP clients synchronize with NTP servers that provide accurate time measurement. NTP clients choose from several NTP servers to determine which offers the best available source of time and the most reliable transmission of information.

i NOTE: The NTP server configured on SFD should be on premise (located in the same data center as SFD), and reachable by SFD. Using NTP servers (such as time.google.com) that are not on premise or need Internet access for SFD to interface with is not recommended.

To get the correct time, OS10 synchronizes with a time-serving host. For the current time, you can set the system to poll specific NTP time-serving hosts. From those time-serving hosts, the system chooses one NTP host to synchronize with and acts as a client to the NTP host. After the host-client relationship establishes, the networking device propagates the time information throughout its local network.

For complete information about NTP, see the Dell EMC SmartFabric OS10 User Guide.

Enable NTP

NTP is disabled by default. To enable NTP, configure an NTP server where the system synchronizes. To configure multiple servers, enter the command multiple times. Multiple servers may impact CPU resources.

Enter the IP address of the NTP server where the system synchronizes in CONFIGURATION mode.

OS10(config) # ntp server *ip-address*

View system clock state

OS10(config) # do show	ntp status
system peer:	0.0.0
system peer mode:	unspec
leap indicator:	11
stratum:	16
precision:	-22
root distance:	0.00000 s
root dispersion:	1.28647 s
reference ID:	[73.78.73.84]
reference time:	00000000.0000000 Mon, Jan 1 1900 0:00:00.000
system flags:	monitor ntp kernel stats
jitter:	0.000000 s
stability:	0.000 ppm
broadcastdelay:	0.000000 s
authdelay:	0.000000 s

View calculated NTP synchronization variables

OS10(config)# c remote	lo show ntp assoc local	ciat st	ions poll	reach	delay	offset	disp
10.16.150.185	10.16.151.123	16	1024	0 0	.00000	0.000000	3.99217
OS10# show ntp remote	associations local	st	poll	reach	delay	offset	disp
10.16.150.185	10.16.151.123	16	1024	0 0	.00000	0.000000	3.99217

First-time setup

This information explains what you must do if setting up SmartFabric Director for the first time.

Topics:

- Installation using vCenter 6.7
- Installation using vCenter 6.5
- Log in to SmartFabric Director
- Specify system settings
- Create user accounts

Installation using vCenter 6.7

This information describes how to import the SmartFabric Director OVA file into the content library, then create a virtual machine (VM). It is recommended that SFD is installed on a server which is part of your infrastructure rack, and is different from workload servers.

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 DDL or the VMware Solution Exchange, then store the OVA image locally or on a server.
- 2. Select Hosts and Domains, select the domain that the plug-in must 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. You can use either a URL or a local file.

Select an OVF template 2 Select a name and folder	Select an OVF template Select an OVF template from remote URL or local file system
3 Select a compute resource 4 Review details 5 Select storage 5 Ready to complete	Enter a URL to download and install the OVF package from the internet, or browse to a location accessible from your computer, such as a local hard drive, a network share, or a CD/DVD drive. O URL
	Choose Files No file chosen

4. Select a name and folder for the VM, then click Next.

2 Select a name and folder	Select a name and folder Specify a unique name and target location
3 Select a compute resource 4 Review details	Virtual machine name: std
5 Select storage 6 Ready to complete	Select a location for the virtual machine.
	 ✓ 🔁 10.196.207.148 > DC1

5. Select the destination compute resource, then click Next.

 1 Select an OVF template 2 Select a name and folder 	Select a compute resource Select the destination compute resource for this operation
4 Review details 5 Select storage 6 Ready to complete	✓ DC1 Custer1 Custer2-Switches S Cluster3 Custer3 wi-hs2-p1015.eng.vmware.com
	Compatibility Compatibility checks succeeded.
	CANCEL BACK NEX

6. Review and verify the template details, then click Next.

2 Select a name and folder	Review details Verify the template det	ais.	
4 Review details			
5 License agreements	Publisher	No certificate present	
6 Select storage	Product	Dell EMC SmartFabric Director	
7 Select networks	Dramload size	44.68	
8 Customize template	Commond size	1.4 00	
a weady to complete	Size on disk	7.7 GB (thin provisioned)	
		100.0 GB (thick provisioned)	

7. Accept the user license agreement (EULA), then click Next.

1 Select an OVF template 2 Select a name and folder	License agreements The end-user license agreement must be accepted.
3 Select a compute resource 4 Review details	Read and accept the terms for the license agreement.
5 License agreements 6 Select storage	Congratulations on your new Dell EMC purchase!
7 Select networks 8 Customize template	Your purchase and use of this Dell EMC product is subject to and governed by the Dell
9 Ready to complete	EMC Commercial Terms of Sale, unless you have a separate written agreement with
	Dell EMC that specifically applies to your order, and the End User License Agreement
	(E-EULA), which are each presented below in the following order:
	Commercial Terms of Sale
	End User License Agreement (E-EULA)
	The Commercial Terms of Sale for the United States are presented below and are also
	available online at the website below that corresponds to the country in which this
	product was purchased.
	By the act of clicking "I accept," you agree (or re-affirm your agreement to) the
	I accept all license agreements.

8. Select the data store to store the configuration and datafile, then click Next.

 2 Select a name and folder 	Select storage Select the datastore in which	to store the conf	iguration and disk fil	es	
 3 Select a compute resource 4 Review details 5 License agreements 6 Select storage 7 Select networks 	Encrypt this virtual machines Select virtual disk format: VM Storage Policy:	ne (Requires Key Thin Data	Management Server Provision store Default		
8 Customize template	Name	Capacity	Provisioned	Free	Type
9 Ready to complete	datastore1	1.85 TB	2.73 TB	121.91 GB	VN
	Compatibility				

9. Select a destination network for each network source, then click **Next**. 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.

 2 Select an OVF template 2 Select a name and folder 	Select networks Select a destination network for each source network.							
 4 Review details 	Source Network	Source Network T Destination Network						
5 License agreements	VM Network		VM Network		×.			
6 Select storage 7 Select networks				1 10	ms			
B Customize template 9 Ready to complete	IP Allocation Settings							
	IP allocation:	Stat	ic - Manual					
	IP protocol:	IPv4						

- Enter the system name for the appliance, select the checkbox if SSH access is enabled, list the NTP servers (space separated), enter the Domain Name Server, then click Next. The Service Tag can be added later as part of the system settings after logging into SFD.
 Select Networking Properties to protocility the tagget by
- $\label{eq:linear} \textbf{11.} \hspace{0.1 in } \textbf{Select Networking Properties} \hspace{0.1 in } \textbf{to customize the template}.$

.

2 Select a name and folder 3 Select a compute resource	Customize template Customize the deployment property	erties of this softwar	e solution.	
 4 Review details 5 License agreements 	> Networking Properties	3 settings		
 6 Select storage 	> SFD Host Properties	3 settings		
7 Select networks 8 Customize template	> System Services	3 settings		

12. Enter the IPv4 address for this interface, the netmask, and the default IPv4 gateway address for this VM.

 1 Select an OVF template 2 Select a name and folder 	Customize template Customize the deployment properties of this software solution.				
 3 Select a compute resource 4 Review details 5 License agreements 	 Networking Properties 	3 settings			
 6 Select storage 7 Select networks 	IPv4 Address	The IP address for this interface.			
8 Customize template 9 Ready to complete	Netmask	The netmask or prefix for this interface.			
	Default IPv4 Gateway	The default gateway address for this VM.			
	> SFD Host Properties	3 settings			
	> System Services	3 settings			

13. Select SFD Host Properties, then enter the password for the SFD host.

1 Select an OVF template 2 Select a name and folder 3 Select a compute resource	Customize template Customize the deployment properties of this software solution.			
4 Review details 5 License agreements	> Networking Properties 3 settings			
6 Select storage	 SFD Host Properties 	3 settings		
Select networks B Customize template S Ready to complete	adminĝsfd.local password	Initial password for the admini@sfd.local user account. Password ①		
		Password		
	Hostname	Specifies the system name for the appliance std		
	SSH access for user adminĝsfd.local	8		
	> System Services	3 settings		

14. Select System Services, enter the list of NTP servers separated by a space, then click Next.

 1 Select an OVF template 2 Select a name and folder 3 Select a compute resource 	Customize template Customize the deployment properties of this software solution.				
 4 Review details 5 License agreements 	> Networking Properties	3 settings			
6 Select storage	> SFD Host Properties	3 settings			
7 Select networks 8 Customize template	 System Services 	3 settings			
9 Ready to complete	NTP Servers	The list of NTP servers (space separated).			
		0			
	Domain Name Servers	The domain name server IPv4 addresses for this VM (space separated).			
	Domain Search Path	The domain search path for this VM (space separated).			

15. Click $\ensuremath{\textit{Finish}}$ to start creation of the VM, then power on the VM.

i NOTE: Once installation finishes, it may take 7 to 12 minutes for the SFD VM to be fully operational.

Installation using vCenter 6.5

This information describes how to modify the .vmx file for a successful SmartFabric Director installation on vSphere 6.5. You must edit the .vmx file and comment out the nvram location setting.

i NOTE: If you are using vSphere 6.7, go to the next section. If you are using vSphere 6.5, you must modify the nvram setting before creating a VM.

- 1. Shut down the SFD virtual machine.
- 2. Download the .vmx configuration file from the VM folder, then open the file in a text editor.
- **3.** Comment out the nvram setting.

```
.encoding = "UTF-8"
config.version = "8"
virtualHW.version = "10"
pciBridge0.present = "TRUE"
svga.present = "TRUE"
pciBridge4.present = "TRUE"
pciBridge4.virtualDev = "pcieRootPort"
pciBridge5.present = "TRUE"
pciBridge5.virtualDev = "pcieRootPort"
<snip>
#nvram = "ovf:/file/file2" <- The 'nvram' entry must be commented out</pre>
```

4. Save the changes, replace the file on the VM folder, then exit the text editor.

- 5. Start the VM.
- () NOTE: If SmartFabric Director is restarted and if any changes have been made to the switches (such as switches reloaded) during this time, it is recommended to reload the switch again after SFD is up. This ensures that the complete configuration is redownloaded to the switches.

Log in to SmartFabric Director

This information explains how to log in to SmartFabric Director.

- 1. Open a browser window, then enter the IP address that is specified during installation of the SFD VM in vCenter.
- 2. Enter admin@sfd.local for the username and the password that is configured during VM deployment, then click Login.

Welcome to	
Dell EMC	
SmartFabric Director	
Sign in with your email address.	
Engl address	
Permort	
LOSIN	

If the system administrator has enabled Active Directory, enter your AD username and password, then click Login.

Welcome to Dell FMC	
SmartFabric Director	
Use your email address or AD credentials.	
AD User	
Username	
Password	

Specify system settings

This information describes the system settings for SmartFabric Director.

About

The About tab displays the SmartFabric Director software version and the Software Service Tag. This information is helpful when upgrading the software.

DOLLEMC		SmartFebric Director	
e	Settings and Administration		
() Dentoard () Configurations () Monitoring	Annue Une Weiser Weiser Weiser Weiser Verser System Status Ad Source Status mage Source Searches Medica Verser 10.050030		
% SFD Notification	BW Bevice Sag. DELLARITIEST		
A Wring Diagrams			
(3) Life Cycle Management			
Settings and Administrati.			
the fit of the second second			

VMware Manager integrations

i NOTE: You can only have one active VMware Manager integration with SmartFabric Director.

- 1. Select Settings and Administration > VMware Manager Integrations.
- 2. Click Add VMware Manager to configure the VMware Manager integration.
- 3. Enter the required connection information for the VMware Manager, then click OK.

DELLEMC					SmartFabric Director	administrational -
٩.	Settings	and Administration				
Deshoard E. Configurations	Alter	User Management VMware Manager Integrations System Settings AD Server Switch In	rege Servers			
IS Monitoring IS STD Notification			244	Detate	Passifilia	
A wing Diagrams			vöerter Server	() annun andreg here. and	The vCenter that man ode topology lest be	ago system test 32 = 0 Mileo
fettings and Administration						
						1.tems

- 4. (Optional) To remove the current VMware Manager connection, click **Remove** and follow the steps.
 - () NOTE: If you remove the current VMware Manager Integration, you must add a new VMware Manager connection to OMNI.

System settings

1. Select the Settings and Administration icon from the left, then select System Settings.



2. Click Add DNS Server, enter the IPv4 address, then click Save.

De	LEMC					SmartFabric Director	¢	admentisticional -
			Add DNS 1	Server	CANCE, INVE	SmartFabric Director	4	

AD server

1. (Optional) Select the AD Server tab to specify an Active Directory Server.

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	Million and Administration					
Territoria di		and the set of the set	a lines i			
Configurations .						
et statuetar	0 mm	1 1010	1. Man	A COMPANY.	4 MILLION	
tradingers.	0 1	(stational)			are to prove to pass of the	
Road and Address of the						
			*			

2. (Optional) Click Add AD Server, enter the server URL, username (admin), password, optional attributes, and optional description, then click Add.

(i) NOTE: If you do not set up an Active Directory Server, you must create user accounts.

Add AD Server		× .		
-	methodal	-		
	No. of Academic Street	-		
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ambain (splinal)	Area a construction of the			
Deceptor payment				
	(1995)	-		

You can also edit or delete a previously added AD server.

ALLEMC .				martFabric Director	a	
Settings and Administration						
About User Management	VMware Manager Integrations	lystem Settings AD Server Sv	itch Image Servers			
+ ADD AD SERVER (2 1000)	a					
EDT EDT EDT EDT EDT EDT EDT EDT EDT EDT						
C I REMOVE	() abrin	do+vmware.do+com		Just now	•	

Switch image servers

1. Select Switch Image Servers, then click Add image server.

	u Switch Image Server X	
Turk Turk Base to Prove	4	

2. Select the image transport type, enter the IP address/FQDN, enter an option description, then click Add. The new image server information displays.

	ttion Imment VMware Manager Integrations System Settings AD Server Switch Immediate Sectors DON ▼ Type ▼ Usename ▼ Base Direct Recent com SFTP Immediate Sectors SFTP Immediate Sectors			SmartFabric	Director 🔶	dmin@sfd.loca
Settings and Administration						
About User Management N	Mware Manager Integration	s System Settings AD S	ierver Switch Image Serve	ers		
	/E					
IP Address / FQDN	Type	T Username	T Base Directory	T Description	▼ Last Up	odated
del digitaliocker.com	SETP		/user/home		Just no	ow

3. (Optional) Select the image server checkbox, then click **Remove** to delete the image server.

Upload service tag to SFD

- 1. Sign into DDL using your account credentials (see Download SFD image).
- $\label{eq:main_constraint} \textbf{2.} \quad \text{Download the SFD license file (XML) to your local file system.}$
- 3. Select Settings and Administration, then click Upload.

D¢					SmartFabric Director	4	admin@sfd.local ~
>>	Settings and Administration						
@ 	About User Management	System Settings	Service Integration	Backup & Restore			
E.	() No Service Tag is found. Please up	pload license file (.XML) co	ntaining service tag.				
×6.	SmartFabric Director Version	1.1.0.1582684069					
86	Service Tag ()						
٢							
۲							

4. Click Browse to locate the XML license file, then click Upload.

DK	ALL EMC			SmartFabric Director	A	almonth total
	Altiput Unite Newspacement System formings Beneficie Relative Selection Develope Newspace Statistics Beneficie Relative Mainter Trig Statistics Beneficie Relative Upload Service Tag X Please upload license file (XML) containing service tag. (Interport Strip Upper Views Views)					
		Upload Service Tag Please upload license file (XML) containing service tag ABCDEF-SPD Loome XML X	CANCEL UPLOAD			

The upload service tag progress displays.

De					among tanga -
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Anton Jonnya Mananan Manan Matanan	Upload Service Tag Please upload license file (XML) containing se (ABCORF-SPD Loavie XML) 3	rvice tag.		

When the upload completes, the progress updates. Click the checkbox to finish.

D¢	ALL EMC			SmartFabric Director	12	almonthistical -
	Attack User Management System harrings Sensor registration Manage Management Management Management Management Management Upload Service Tag X Please upload license file (XML) containing service tag. Management Management					
		Upload Service Tag Please upload license file (XML) containing to (altCOEF-SPD License XML) ×	xervice tag.			

SFD extracts the service tag from the license file, then updates the About page.

Dá	KLL EMC				SmartFabric Director	۵	
>>	Settings and Administration						
Ø R	About User Management	System Settings	Service Integration	Backup & Restore			
E.	SmartFabric Director Version	1.1.0.1582684069					
×6.	Service Tag ()	ABCDEFG					
&							
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0							

Create user accounts

This information describes how to add user accounts to SmartFabric Director. You can add local users through SmartFabric Director, or you can use the Active Directory Server. You can enable or disable SSH access for a local user, activate or deactivate, and remove a local user.

(i) NOTE: If you have setup an Active Directory Server, you do not need to add local users.

1. Select the User Management tab to add local users.

D∜	LEMC	SmartFabric Director	🛕 admin@sfd.local ~
>>	Settings and Administration		
	About User Management System Settings Service Integration Backup & Restore		
6.	+ ADD USER 📀 ACTIVATE ACCOUNT 🚫 DEACTIVATE ACCOUNT 🖹 DELETE		
×6.	Username 🕹 Name Y Contact Phone Number Y Role Y Account Status Y SSH	T Updated By T	Last Updated T
25	Settings and Administration About User Management System Settings Service Integration Backup & Restore + ADD USER ActivatE ACCOUNT DialeTE DialeTe DialeTe Internet Name Contact Roome Number V Role Account Status V Updated By Lest Updated : @ adminipation +1 (800) 624-9897 system admin @ Activat ENABLED adminipatiolocal Feb. 14, 2020 12:00:0091	Feb. 14, 2020 12:00:00PM	
٢			
•			
			K < 1 /1 → N

2. Click Add local user, then enter the new user email address, password twice, first and last name, optional phone number, select the user role, then click Add.

(i) NOTE: Each new le	ocal user has admin role privileges	s automatically, and SSH st	atus is enabled by default.

DILLEMC			
Add Local User		×	
Username (email address)	janedoeëdomain		
Password	Password must have between 8-20 characters, 1 lowercase	•	
Confirm Password	character, 1 numeric character, and 1 special character	0	
First Name	Add Local User x Username (email address) janedoe@domain Password Image: Confirm Password First Name Jane Last Name Doe Contact Phone Number (optional) e1 (555) 555-5555 Role admin		
Last Name	Doe	e#domain Prostate between B-20 characters, Buowcraet	
Contact Phone Number (optional)	+1 (555) 555-5555 Example: +1 (555) 555-5555	-	
Role	admin	<u>·</u>	
	CANCEL	ADD	

3. (Optional) Continue adding new users, or you can select Edit to modify any user profile, or select Remove to delete the user account.

About	User Management Syst	tem Settings Servic	e Integration Backu	p & Restore						
+ ADD			OUNT 🚊 DELETE							
0	Usemame 🖕	Name T	Contact Phone Number 🔻	Role T	Account Status T	SSH	٣	Updated By 7	f Last Updated	
:	(8) administrational	System Admin	+1 (800) 624-9897	system admin	@ Active	ENABLED		admin@sfd.local	Feb. 14, 2020 12:00	OOP
0 1	(2) aaroniee@domain	Aaron Lee	*1 (555) 555-5555	admin	Active	ENABLED		admin@sfd.local	Feb. 14, 2020 12:10:0	DOP8
0 :	(2) betseysmith@domain	Betsey Smith	*1 (555) 555-5555	admin	Active	ENABLED		admin@sfd.local	Feb. 14, 2020 12:15:0	OPN
0 :	EDIT	vin Butler	+1 (555) 555-5555	admin	Active)	ENABLED		admin@sfd.local	Feb. 14, 2020 12:20:	OOP
0 :	OVERRIDE PASSWORD	ly Martin	+1 (555) 555-5555	admin	Active)	ENABLED		admin@sfd.local	Feb. 14, 2020 12:15:0	OP
0 :	DEACTIVATE ACCOUNT	e Doe	*1 (555) 555-5555	admin	Active	ENABLED		admin@sfd.local	Feb. 14, 2020 12:13:0	
0 :	DISABLE S5H	hel Knowles	*1 (555) 555-5555	admin	Active	ENABLED		admin@sfd.local	Feb. 14, 2020 12:12:0	OP

4. (Optional) Modify the user profile, then click **Save**.

						admin@sfd.local ~
E	dit User			×		
	sername mail address)	janedoe⊜domain				
Fid	rst Name	Jane				
La	ast Name	Doe				
CC NU	ontact Phone umber (optional)	*1 (555) 555-5555 Example: *1 (555) 555-5555				
Re	ole	admin		~		
			CANCEL	SAVE		

7

Using SmartFabric Director

This information describes how to build, define, and deploy a data center SmartFabric. After completion of the SFD bootstrap and integration into your data center network operations, you are now ready to build, define, and deploy a SmartFabric. The steps outline a deployment where the operator specifies the SmartFabric for the first time, starting with a clean state.

Topics:

- Import fabric wiring diagram
- Define fabric intent
- Approve fabric intent
- Deploy fabric intent
- Reimport a wiring diagram

Import fabric wiring diagram

This information describes how to use the fabric definition screens to import a fabric wiring diagram. Fabric definition describes the switches, their roles (spine, leaf, or edge leaf), and the wiring diagram of how these switches interconnect.

You must specify the reachability information, such as the Management IP and credentials (username and password) of each switch, so that SFD can connect to the switches.

i NOTE: The fabric wiring diagram must be edited manually using a text or JSON editor. Using Fabric Design Center enables automatic generation of the JSON file.

It is assumed that the switches have been racked, stacked, and connected as per the wiring diagram. All switches must have the minimum version of SmartFabric OS10 10.5.0.4 installed, along with the base configuration to connect, and communicate through the gNMI and gNOI interfaces. For more information about the base configuration, see Configuration.

You must define the role of each switch, and the interface type such as interlink, host, or edge facing. It is expected that the switches are wired per the definition in the wiring diagram.

- · Interlinks are switch ports that are used to connect a leaf switch to a spine switch
- Host interfaces are switch ports that are connected to host
- · Edge interfaces (on an edge leaf) are switch ports that are connected to an external switch

Using Fabric Design Center

Dell EMC Fabric Design Center allows you to automatically create a JSON file based on your selections.

- 1. Open a browser, then go to fdc.emc.com and log in with your Dell Customer/Partner credentials.
- 2. Select the checkbox to agree to the terms of use, then click OK.
- 3. Select either Designing network fabric for a customer opportunity or Trying Fabric Design Center, then click OK.

abric Design Center

- 4. Select Build-Your-Own-Network Design at the top.
- 5. Create your Layer 2 or Layer 3 network, then click **Apply**. You can select the number of racks that are needed for the design. The default number of spines is calculated based on the default bandwidth to the rack.

Home Turnkey Network Design	Build-Your-Own Network Design Import	t Network De	sign 059 to 0510 Config Conversion		
uild-Your-Own Network	Design				
Fabric Details					×
Network Fabric Name	NewFabric		External Network Connectivity	Layer 3	
Fabric Design	Layer 3 Leaf and Spine		External Network Routing Protocol	rBGP	
Fabric Routing Protocol	eBCP	•	External Network Connections per Uplink Switch	2 x 10G SFP+	
Default Leaf/ToR Switch	55248F-ON		Default Spine Switch	55232F-ON	
Default Bandwidth to Rack	400	G	Number of Workload Racks	2	
Network Overlay	BCP EVPN	٠			

6. Verify the fabric design, then click Next. You can also click Edit and make any necessary changes to meet your requirements.

Home	a Turnia	ry Network Design	Build Your-Own N	Intwork Desig	m Import Network De	sign OS9	to OS10 Config Co	Cuersion CO				
uild	Your-C	wn Network	Design									
F.	abric D	etails										×
Net	twork Fabr	ic Name	Newfi	Newfabric		External	External Network Connectivity		Layer 3		9	Stat
Fab	ric Design		Layer	3 Leaf and 5	pine	External	Network Routing	Protocol	eBGP			
Fat	oric Routin	g Protocol	eBGP			External I Uplink Sv	External Network Connections per Uplink Switch		2x00G SFP+			
De	fault Leaf/	ToR Switch	\$\$248	F-ON		Default S	pine Switch		\$\$232F-	ON		
De	fault Band	width to Rack	400G									
Ne	twork Ove	rlay	BGP E	VPN								
Nor	rkload	Racks (Leaf I	Nodes) +									
					Workload		and a state of the	Rack				
	Rack#	Rack Name	Switches	Ports	Workload Bandwidth(Gbps)	Rack Unit	Uplink Connections	Rack Oversubscrip Ratio	tion	EDGE Rack	Actions	
>	Rack#	Rack Name Rack-1	Switches S5248F-ON	Ports 0	Workload Bandwidth(Gbps) NA	Rack Unit	Uplink Connections 4 X 100	Rack Oversubscrip Ratio	tion	EDGE Rack	Actions G B + Workload	

7. Select SFD wiring for the file format, then click Download to save the JSON file for importing into SFD.

Selection Selection <t< th=""><th>cal View Network View Wiring Diagram Bill of Mate</th><th>eials Network Configuration Configuration Download</th><th></th><th></th><th></th></t<>	cal View Network View Wiring Diagram Bill of Mate	eials Network Configuration Configuration Download			
Witches Procession			Select Format:	101	Download
Witches #dkMade #d #d Navidaro-UNI-1 \$227-01 #d #d Navidaro-UNI-2 \$227-01 #d #d Navidaro-UNI-2 \$227-01 #d #d Navidaro-UNI-2 \$227-01 #d #d Navidaro-UNI-2 \$247-01 #d #d Navidaro-UNI-2 \$248-01 #d #d Navidaro-UNI-3 \$248-01 #d #d				101	
Jackhard Jakob Naka Jackhard	Switches	for the Marcel		9VG	
Namber Offici Alarvin Description Nacharo UMA S20-Alar Description Nacharo UMA S20-Alar E	Sween Name	SWICH POOR		PNG	
Nachárcz, UÁL SS248-0N Image Nachárcz, UÁL SS248-0N Image Nachárcz, UÁL-3 SS248-0N Image Nachárcz, UÁL-3 SS248-0N Image Nachárcz, UÁL-4 SS248-0N Image	NewFabric-SPINE-2	55232F-ON		STD-Wring	
Instalaci, LM-2 Stal4-04 Implementation Instalaci, LM-3 Stal4-04 Implementation Instalaci, LM-4 Stal4-04 Implementation	NewFabric-LEAF-1	55248F-ON			
Inselator.(2013) SS200-CM Neufabro.(2014) SS200-CM	NewFabric-LEAF-2	55248F-ON			
Newfabric-(UM-4 SS2467-CN	NewFabric-LEAF-3	\$\$248F-ON			
	NewFabric-LEAF-4	55248F-ON		•	

For complete information, see the Dell EMC Fabric Design Center User Guide.

Import a wiring diagram

You can import a JSON wiring diagram file through the user interface. On reading the JSON file, the user interface displays the fabric graph as described in the JSON file. You can download a JSON wiring template from DDL.

i NOTE: Once the JSON file is imported or activated, any active intent of the fabric is no longer valid, and a new intent must be defined and submitted for approval.

1. Click Import Fabric.



2. Go to the file location, then select the JSON file to import.

D¢	ILLEMC	SmartFabric Directo	or 🗘	adminig	sfd.local
	IMPORT FABRIC				
	Importing SETUP5-2SPINES-8-LEAVES.json				

Wiring import success.

D%	LLEMC	SmartFabric Director	
*	Wiring Diagrams ()		
// D R R R R R R R R R R R R R R R R R R	Wring Diagrams () No Active Wring Diagram Looks like we don't have an active network fabric yet. Select a wring diagram to define your fabric intent.	Image: Setup-5-2-SPNE-8 Image: Setup-5-2-SPNE-8 Layer 3 Fabric INACTIVE	

3. Select **Create New Intent** to define and associate a fabric intent with the wiring diagram.

D⊗	LLEMC		SmartFabric Director	۵	8
»	Wiring Diagrams ()				
2 I I I I I I I I I I I I I I I I I I I	No Active Wiring Diagram Looks like we don't have an active network fabric yet. Select a wiring diagram to define your fabric intent.	BAPORT GOFFINE INTENT M COEATE NEW INTENT M T Type T COPY ACTIVE INTENT Layer 3 Fabric COPY OTHER INTENTS >	Status Y Updated by Y INACTIVE admini@stfd.local	Last Updated Oct. 4, 2019	
			K <	1 /1 →	Я

4. Select **View** to display the wiring diagram.

D¢	LLEMC		SmartFabric Director	۵	8
»	Wiring Diagrams (1)				
0 k k 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Active Wiring Diagram Looks like we don't have an active network fabric yet. Select a wiring diagram to define your fabric intent.	MPORT GENERATION C DELITE DEFINE INTENT DELITE VEW	 Status V Updated by RACTIVE admini@stfd.local 	Last Updated Oct. 4, 2019	*
			к «	1 /1 >	н

Imported wiring diagram.



Define fabric intent

This information describes how to define a fabric intent. You can either import a previously defined fabric intent or start a new one from scratch.

Select fabric template

- 1. Click **Fabric Intent** from the left column to view and define fabric intents, then click **Get Started**. If there are no existing fabric intents, you can use the user interface to specify the fabric intent. Any such file can be used as a seed and edited.
- 2. Enter the Fabric Name, select a Layer 3 BGP Leaf Spine Fabric, then click Next.

i NOTE: Release 1.2.0 supports a Layer 3 BGP leaf spine fabric, or a Layer 2 leaf spine fabric.

D≪LL EMC			SmartFabric Director	۵	admin@sfd.	local ~
	Select Fabric Start with one of the Fabric Name Fabric Template	Template network fabric template. US-WEST-DC2-POOS Select a template to start Layer 2 VLT Fabric Layer 2 VLT Fabric Layer 3 BGP Leaf Spine Fabric with NSX-T Overlay (VSX Manager required)		44		×
					CANCEL	NEXT

Layer 3 fabric

The leaf spine network template for a Layer 3 fabric is different than the Layer 2 fabric. This information explains the Layer 3 fabric.

Define leaf spine networking

You are now ready to specify the parameters to generate configuration for the interlinks between the leaf and spine switches.

1. For Layer 3 BGP leaf spine fabric, specify the leaf AS number range (start and end); spine AS number range (start and end), fabric interlink subnet, and the /32 loopback IP address seed. SFD generates a per-switch configuration for the interlinks between the leaf and spine switches.

abric Intent Definition	Defining Leaf-Spine Networking for US-WEST-DO	C2-POD5 - Layer 3 Network Fabric
1 Select Fabric Template		
	Leaf Switches 😝 8 ieaves	Spinet Spine2
2 Define Leaf-Spine Networking	Spine Switches 2 spines	
3 Define Host Networking	Leaf ASNs Start Size End	
4 Submit for Approval	64601 128 94728	//////////////////////////////////////
	Spine ASNs Start Size End	////XXX/////
	64801 16 64816	//HXXNNV
	Fabric Interlink Base Profix 1023880.07/16 Loopback Base IP 100.007/32 > Advanced Settings DETAIL COMPISURATION Leaf Leaf	

2. (Optional) Click **Detail Configuration** to view the interlinks between the leaf and spine switches, or click **Clear** to clear the specified intent, along with the detailed (per switch) configuration for the interlinks. Click **Back** to return, or click **Next** to continue.
| Fabric Intent Definition | Defining L | eaf-Spine | Networking fo | or US-WES | T-DC2- | POD5 - L | ayer 3 Network Fabric | |
|--------------------------------|---------------------|---|---------------|------------|------------|---|---|-----------|
| 1 Select Fabric Template | Leaf Switches | 8 leaves | | Switches | interlinks | Inter-Chassis | Networking Advanced Settings | |
| 2 Define Leaf-Spine Networking | Spine Switches | 2 spines | | Switch 🕈 🔻 | ASN T | Loopback T | Interlinks & LAGs | |
| 3 Define Host Networking | Leaf ASNs
Start | Size | End | Leaf-1 | 64601 | 10.0.2.1 | e Leaf-1 portchannel-1 to Leaf-2 portchannel-1 | 😝 3 more |
| 4 Submit for Approval | 64601 | 128 | 94728 | Leaf-2 | 64602 | 10.0.2.2 | ee Leaf-2 portchannel-1 to Leaf-1 portchannel-1 | 😝 3 more |
| | | | | Leaf-3 | 64603 | 10.0.2.3 | ee Leaf-3 portchannel-1 to Leaf-4 portchannel-1 | e 3 more |
| | Spine ASNs
Start | Size | End | Leaf-4 | 64604 | 10.0.2.4 | 😝 Leaf-It portchannel-1 to Leaf-3 portchannel-3 | |
| | 64801 | 16 | 64816 | Leaf-5 | 64605 | 10.0.2.5 | 😝 Leaf-S portchannel-1 to Leaf-6 portchannel-1 | 😝 3 more |
| | 192168.0.0 / 16 | | Leaf-6 | 64606 | 10.0.2.6 | eal-6 portchannel-1 to Leal-5 portchannel-1 | 1) 😝 3 more | |
| | Fabric Interlink B | tase Prefix 192. | 100.0.07 10 | Leaf-7 | 64607 | 10.0.2.7 | eat-7.portchannel-1 to Leat-6 portchannel-1 | 😝 3 more |
| | Loopback Base I | p 10.0 | 0.0/32 | Leaf-8 | 64608 | 10.0.2.8 | Gent & portcharvel-1 to Leaf-7 portcharvel-1 | 😝 3 moire |
| | | 101000000000000000000000000000000000000 | | Spine-1 | 64801 | 10.0.1.1 | 😝 Spine-1 portchannel-1 to Leaf-1 portchannel-2 | 7 more |
| | > Advanced s | settings | | Spine-2 | 64802 | 10.0.1.2 | Spine-2 portchannel-1 to Leaf-1 portchannel-3 | 7 more |
| | | | | CLOSE | | | ₿ C [Ť | /10 > > |

Details of interlinks configuration for Layer 3 fabric.

D¢					SmartF	abric Directo	n 🗘	
» Ø	Fabric Intent Definition	Defining Leaf-Spine	Networking fo	or US-WEST-DC2-PC	DD5 - Layer	3 Network	k Fabric	×
a	1 Select Fabric Template	Leaf Switches 😝 8 inaves		Switches Interlinks Int	er-Chassis Netwo	rking Advanc	ed Settings	
in in	2 Define Leaf-Spine Networking	Spine Switches 8 2 spines		interlinks T	Source IF 💠 🝸	Source IP 🔻	Destination IF Y	Dest. IP T
&	3 Define Host Networking	Leaf ASNs Start Size	End	Spine-1:1/1/1 to Leaf-1:1/1/1	Spine-1:1/1/1	192.168.1.0	Leaf-1 : 1/1/1	192.168.1.1
-01	4 Submit for Approval	64601 128	94728	Spine-110/3 to Leaf-31/1/1	Spine-11/1/3	192.100.1.2	1 ext.3 : 5/1/1	192.100.1.5
		Spine ASN Start Size	End	Spine-1:1/1/4 to Leaf-4:1/1/1	Spine-1:VV4	192.168.1.6	Leaf-4 : 1/1/1	192,168.1.7
		64801 16	64816	Spine-1:1/1/5 to Leaf-5:1/1/1	Spine-1:1/1/5	192.168.1.8	Leaf-5 : VV1	192.168.1.9
		testore attaction of an		Spine-1:1/1/6 to Leaf-6:1/1/1	Spine-1:1/1/6	192.168.1.10	Leaf-6 : 1/1/1	192.168.1.11
		Fabric Interlink Base Prefix 192	.168.0.0 / 16	Spine-1:1/1/7 to Leaf-7:1/1/1	Spine-1:1/1/7	192.168.1.12	Leaf-7 : 1/1/1	192.168.1.13
		Loophark Base IP 10.0	0.0.0/32	Spine-1:1/1/8 to Leaf-8:1/1/1	Spine-1:1/1/8	192.168.1.14	Leaf-8 : 1/1/1	192.168.1.15
				Spine-2:1/1/1 to Leaf-1:1/1/2	Spine-2:1/1/1	192.168.2.0	Leaf-1: 1/1/2	192.168.2.1
		Advanced Settings		Spine-2:1/1/2 to Leaf-2:1/1/2	Spine-2:1/1/2	192.168.2.2	Leaf-2: VV2	192.168.2.3
		DETA	IL CONFIGURATION	Spine-2:1/1/3 to Leaf-3:1/1/2	Spine-2:1/1/3	192.168.2.4	Leaf-3: I/V2	192.168.2.5
				Spine-2:1/1/4 to Leaf-4:1/1/2	Spine-2:1/1/4	192.168.2.6	Leaf-4 : 1/1/2	192.168.2.7
				Spine-2:1/1/S to Leaf-5:1/1/2	Spine-2:1/1/5	192.168.2.8	Leaf-5:1/V2	192.168.2.9
				Spine-2:1/1/6 to Leaf-6:1/1/2	Spine-2:1/1/6	192.168.2.10	Leaf-6 : 1/1/2	192.168.2.11
							K K	1 / 10 > ×
				CLOSE				
							BACK	CLEAR

Details of interchassis configuration for Layer 3 fabric.

GLL EMC					SmartFabric Director	admin@sht.loc
Create New Fabric	Defining Leaf-Spine N	etworking for US-WEST-DC2-PO	D5 - Layer 3 BGP Leaf Sp	pine Fabric		
1 Select Fabric Template	Edge Switches	Desta anti-	Seliches Interinks Me	Chassis Networking Advanced Settings		
2 Define Leaf-Spine Networking	Leaf Switches	G leaves	VLT©			
	Spine Switches	2 55745	VLT Pair	y VLT Interlinia	y Donwit	Y
4 Detrie Doge tecnology 5 Suppril for Approxit	Leaf ASNs Start Size 64601 128	End 64928	() 11-92-952987-02 () 11-92-952987-04	mrsc-1528/02.01_mrsc-1528/04.03 mrsc-1528/04.03 mrsc-1528/04.03	127	
	Soline ASNs Spine ASNs Start Size	End		regression 42.000 mg-relation 44.00 regression 42.00 regression 42.000 mg-relation 44.00 regression 42.00 regression 42.00 regression 42.00 regression 42.00 regression 42.00 regression 42.00 regression 42.00		
	64001 10 6412-65314 Eabler Infanting Base Drafty	64636		 m spc + 12284* 02 L (M_m + 92 + 32284* 04 L (M) m spc + 12284* 02 L (M_m + 92 + 32284* 04 L (M)) 		
	Loopback Base IP	10 0 0 0/32 10 0 0 0/32	11-50-57100-22	e electrocolitital = electrocolitital e electrocolitital = electrocolitital e electrocolitital = electrocolitital	127	
	RSTP ()			# # 50: 29/00-22.1/9_# 50: 29/00-22.1/9		
	uro 🕡			(a) In sec 4900-321.37		
	Fabric BFD	ON		et ap: 29000-22138_strap: 28000-23138.)		4 ter
	мти	1500 1500-16000	CLOSE			
		DETAL CONFIGURATION				
					BACK	CLEAR

Details of advanced settings for Layer 3 fabric.

Dé	ALEMC			Smart	Fabric Director	admin@std.local -
*	Create New Fabric	Defining Leaf-Spine Ne	tworking for US-WEST-DC2-POI	D5 - Layer 3 BGP Leaf Spine Fabric		
<u>a</u>	1 Select Fabric Template	Edge Switches	() 2 eope xeees	Switches Interlinks Inter Chassis Networking Advanced Settings		-
21	2 Define Leaf-Spine Networking	Leaf Switches	D Heves	v UFD		
5		Spine Switches	() 2 spines	Tigleix State Group y Upstream Interfaces		Ψ.
*	4 Define Logy Networking	Leaf ASNs		10-gc-45296F-02 -1 III-gc-45296F-02 : port-channell, II-gc-45296F-02 : port-channel2		
		529	510	strigt s5296/-04_1 strigt s5296/-04_port channe2_strigt s5296/-04_port-channell		
		6450-6804	04928	strigic d900-22 1 strigic d900-22 port-channell, strigic d900-22 port-channel2		
		Spine ASNs		st-sp-2900-23 1 81-sp-2900-23 port-channel2, st-sp-2900-23 port-channel1		
		Start Size	End	35-92-652321-08-1 81-92-652325-08 port-channel2, st-92-652321-08 port-channel7		
		64601 16 5410-51014	64616	15-gc-s52125-09 1 s1-gc-s52125-09 port-channell, s1-gc-s52125-09 port-channel2		
		Fabric Intertink Base Prefix	N2 M8 0 0/M			6.ters
		Loopback Base IP	192 X88 D 0/NE	 Fatric BFD 		
		·	10 0 0 0/12	Tx interval (ms) 200		
		RSTP		Richterval (ms) 200		
		UFD 🕥		Missed Packets 3		
		Fabric BFD	ON	+2		
		мти	1500			
			DETAIL CONFIGURATION	close		
					BACK	CLEAR NEXT

3. BFD is enabled by default on all interlinks between the leaf and spine, and can be configured to enable between edge leaf to external switch. In Layer 2 topology, BFD can be configured to enable between edge leaf and external switch. Select **Advanced Settings** to view the Fabric BFD settings.

Fabric Intent Definition	Defining Leaf-S	pine Networking f	or US-WEST-DC2-POD5 - Layer 3 Network Fabric
1 Select Fabric Template	Leaf Switches 🥃 🛙	eaves	Switches Interfale: Inter-Chassie Naturching Advanced Satings
2 Define Leaf-Spine Networking	Spine Switches 🛞 2	pines	> UFD
3 Define Host Networking	Leaf ASNs Start Size	Fod	
4 Submit for Approval	64601 128 64512 - 65527 mini	94728 mum of 8	Tx Interval (ms) 100
	Spine ASNs		Rx Interval (ms) 100
	Start Size 64801 16	e End 64816	Missed Packets 3
	64512 - 65533 mini Fabric Interlink Base Subnet	mum of 2 192.168.0.0 / 16 192.168.0.0 / 16	
	Loopback Base IP	10.10.10.1 / 32	
	✓ Advanced Setting:		
	RSTP ()		
	UFD 🕕		
	Fabric BFD 🕕	ON	
	мти	1500 1500 - 9000	
		DETAIL CONFIGURATION	CLOSE

4. Specify the settings for SFD to connection with the vCenter; select **System Settings** from the left column, then select **VMware Manager Integration**. A list of vCenter Server connections previously configured display. If there are no existing vCenter Server connections, this table is blank.

DØLLEMC	SmartFabric Director	Ц	
 Fabric Intent Definition 	Defining Host Networking for US-WEST-DC2-POD5 - Layer 3 Network Fabric		\times
I Select Fabric Template I Define Leaf-Spine Networking I Define Host Networking I Define Edge Networking I Define Edge Networking I Define Idge Networking I Define Idge Networking I Define Idge Networking I Submit for Approval	No Vianas found	P2	Y
	к < 1 // васк		N TX

 Click Add VMware Manager, select vCenter Server, enter the IP address/FQDN, enter the user credentials (username/password), enter an optional description (up to 255 characters), then click Add. The username/password does not display; click the eye icon to make the password visible.

D¢LLEMC			SmartFabric Director	4	8
ADD VMWA	REMANAGER	~			
Туре	Select an account type to start	<u> </u>			
IP Address/FQDN	urtport	_			
Username	Required	_			
Password	Required	<u></u>			
Description (optional)					
	CANC EL	ADD			

Define host networking

You are now ready to specify the parameters to generate configuration for host-facing ports, inter-VLAN routing, and host dual-homing. This screen also indicates the IP or DNS address of the vCenter (VMware Manager) used to manage the VMs on the hosts that are connected to this fabric.

1. Click Add VLAN to add the configuration for each port-group for the vCenter Server, enter the VLAN ID corresponding to a portgroup, enter an optional description, then click Next.

KALL EMC			SmartFabric Director	م admini8sfd.local
Fabric Intent Definition	Define Host Networking 1	for US-WEST-DC2-POD	5 - Layer 3 Network Fabric	>
1 Select Fabric Template	VMware Manager(s)	ex.eng.vmware.com)		
2 Define Leaf-Spine Networking	VLAN ID 🕈 VLAN Type 🔻	Leaf Pair T VRRP VIP T	Virtual Interface 1 Y IP1 Y Virtual Interface	2 Y IP2 Y Description Y
3 Define Host Networking	i 101 Management	B Leaf-1: Leaf-2 × 10.11.254	Leaf-1 : vian101 10.1.1.1 Leaf-2 : vian10	10.1.1.2
4 Submit for Approval		B Leaf-3 : Leaf-4 X 10.1.2.254	Leaf-3 : viant01 10.1.2.1 Leaf-4 : viant0	01 10.1.2.2
		B Leaf-5 : Leaf-6 X 10.1.3.254	Leaf-5 : vian101 10.1.3.1 Leaf-6 : vian10	10.1.3.2
		B Leaf-7 : Leaf-8 × 10.14.254	Leaf-7 : viant01 10.1.4.1 Leaf-8 : viant0	01 10.1.4.2
	102 Storage	B Leaf-3 : Leaf-4 X 10.15.254	Leaf-3 : vian102 10.15.1 Leaf-4 : vian10	02 10.1.5.2
	: 103 vMotion	B Levi-1: Levi-2: X 10.1.6.254	Leaf-1: vlan103 10.1.6.1 Leaf-2: vlan10	03 10.1.6.2
	🗌 : 104 Workload	B Leuf-3 : Leuf-4 X 10.1.7.254	Leaf-3 : vian104 10.1.7.1 Leaf-4 : vian10	04 10.1.7.2
	i 105 Workload	B Leaf-5 : Leaf-6 X 10.18.254	Leaf-5 : vian105 10.18.1 Leaf-6 : vian10	05 10.1.8.2
				$K \in \fbox{1}/1 \rightarrow 3$
				BACK

- 2. Associate one or more VLT pairs to a VLAN ID from the list of available VLT pairs (derived from the wiring diagram). Each leaf in the VLT pair has its own SVI IP, and each VLAN in the VLT pair has a VRRP virtual IP in the same subnet as the VLAN.
- 3. (Optional) Delete any VLAN ID row by selecting the checkbox to the left of each row.
- 4. Navigate between pages by using the arrows; click **Back** to go to the previous step, or click **Next**.

Layer 2 fabric

This information explains the Layer 2 fabric. The leaf spine networking template for a Layer 2 fabric is different from that for a Layer 3 fabric.

Define leaf spine networking

For Layer 2 leaf spine fabric, you do not need to specify any parameters. SFD generates a per-switch configuration for the interlinks between the leaf and spine switches.

- 1. Select **Configurations** from the left column to view and define fabric intents, then click **Get Started**. If there are no existing fabric intents, you can use the user interface to specify the fabric intent. Any such file can be used as a seed and edited.
- 2. Enter the Fabric Name, select Layer 2 Leaf Spine Fabric, then click Next.

D	LEMC			SmartFabric Director	₽,	admin@sfd.local
> © • • • • • •	Elect Fabric Template Submit for Approval	Select Fabric Start with one of the Rabric Name Fabric Template	Template network fabric template. US-WEST-DC2-PODS Select a template to start Layer 2 VLT Fabric Layer 3 DF Leaf Spine Fabric	Smartradric Director	4	administrational
٥			Layer 3 BGP Leaf Spine Fabric with NSX-T Overlay (NSX Manager required)			
						CANCEL NEXT

You are now ready to specify the parameters to generate configuration for the host facing ports, inter-VLAN routing, and host dualhoming. This screen also indicates the IP or DNS address of the vCenter (VMware Manager) used to manage the VMs on the hosts that are connected to this fabric.

1. For Layer 2 leaf spine fabric, SFD generates a per switch configuration for interlinks between the leaf and the spine switches. Click **Next** to continue.

D	KLL EMC	SmartFabric Director 🚊 administrational -
» @	Fabric Intent Definition	Defining Leaf-Spine Networking for US-WEST-DC2-POD5 - Layer 2 VLT Leaf Spine Fabric $\qquad imes$
R	1 Select Fabric Template	Leaf Switches Spinet Spinet Spinet
14	2 Define Leaf-Spine Networking	Spine Switches
85	3 Define Host Networking	> Advanced Settings
8	4 Submit for Approval	DETAL CONFIGURATION
		BACK CLEAR NEXT

2. (Optional) Click **Detail Configuration** to view the per switch configuration, click **Clear** to clear the specified intent, along with the detailed (per switch) configuration for the interlinks. Click **Back** to return, or click **Next** to continue.

(i) NOTE: Fields cannot be edited.

D			SmartFabric Director 🛕 administid.local -
» Ø	Fabric Intent Definition	Defining Leaf-Spine Networking for	or US-WEST-DC2-POD5 - Layer 2 VLT Leaf Spine Fabric $$ $ imes$
>> (C) 日 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	I Select Fabric Template I Select Fabric Template I Define Leaf-Spine Networking I Define Host Networking 4 Submit for Approval	Defining Leaf-Spine Networking for Leaf Switches @ I lowes Spine Switches @ I gones > Advanced Settings DETAIL CONFIGURATION	or US-WEST-DC2-POD5 - Layer 2 VLT Leaf Spine Fabric Switches interlinks interfaces inter-chassis Networking Advanced Settings within the last 10/10 is gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-2 @ Last 20/10 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-3 @ Last 20/10 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-4 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 20/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 10/07 @ 2 more Leaf-6 @ Last 40/01 is 5gene 10/07 @ Last 40/07 is 5gene 20/07 @ 4 more Spine 2 @ Last 10/01 is 5gene 20/07 @ Last 40/07 is 5gene 20/07 @ 4 more
			$\mathbf{x} \in \mathbf{T} / \mathbf{T} \rightarrow \mathbf{x}$
			BACK CLEAR NEXT

Details of interlinks configuration for Layer 2 fabric.

DILLEMC			SmartFabric Director	🛕 admin@sfd.local ~
» Fabric Intent Definition	Defining Leaf-Spine Networking fo	or US-WEST-DC2-POD5 -	Layer 2 VLT Leaf S	pine Fabric $ imes$
Fabric Intent Definition Select Fabric Template Define Leaf-Spine Networking 3 Define Host Networking 4 Submit for Approval	Definiting Lear Spine Retrieventing it Leaf Switches Spine Switches (a) 2 topon > Advanced Settings DETAIL CONFIGURATION	Switches Interfinits Y Spine-1V/1 to Leaf-1V/1 Spine-1V/2 to Leaf-1V/2 Spine-1V/2 to Leaf-2V/1 Spine-1V/2 to Leaf-2V/1 Spine-1V/2 to Leaf-2V/1 Spine-2V/2 to Leaf-2V/2 Spine-2V/2 to Leaf-2V/1 Spine-2V/2 to Leaf-2V/2 Spine-2V/2 to Leaf-2V/2 Spine-2V/2 to Leaf-2V/3 Spine-2V/2 to Leaf-2V/3 Spine-2V/2 to Leaf-2V/3 Spine-2V/2 to Leaf-2V/4 Spine-1V/5 to Leaf-3V/7 Spine-1V/7 to Leaf-2V/2	Edgel 2 VE1 CEBI 3 Inter-chassis Networking Source # Y Spine-1V/V1 Spine-1V/V2 Spine-1V/V2 Spine-2V/V3 Spine-2V/V3 Spine-2V/V3 Spine-2V/V4 Spine-2V/V4 Spine-1V/V5 Spine-2V/V4	Advanced Settings Advanced Settings Ueat-11//1 Leat-11//2 Leat-21//2 Leat-21//2 Leat-21//2 Leat-21//4 Leat-21//4 Leat-31//1 Leat-31//1 Leat-31//1 Leat-31//1 Leat-31//1 Leat-31//1 Leat-31//1 Leat-31//2 Leat
		Spine-15VV8 to Leaf-45VV2 Spine-2:1V/5 to Leaf-33VV3 Spine-2:1V/6 to Leaf-33VV4 CLOSE	Spine-1:VV8 Spine-2:VV5 Spine-2:VV6	Lesi-4:1//2 Lesi-3:1//3 Lesi-3:1//4 R < 1 /3 > % BACK CLEAR NEXT

Details of interchassis configuration for Layer 2 fabric.

D&LLEMC			SmartFabric Director	admin@sfd.local ~
 Create New 1 Select Fabric Te 2 Define Leaf Spin. 3 Define Host Net 4 Define Edge Net 5 Submit for Appr 	Defining Leaf-Spine N 2 VLT Fabric 6451-6451-64516 6451-6451-64516 192-168-046-6 192-168-046-6 192-168-046-6 192-168-046-6 100-06/22 VLFD () Fabric BFD () MTU	DN 0N 9000 1550 - 9000	ED-128-1588872470186-1589214567	7025 - Layer
			BACK	CLEAR NEXT

Details of advanced settings for Layer 2 fabric.

(i) NOTE: RSTP is enabled by default and cannot be disabled.

DØLLEMC	SmartFabric Director 🥂 admin8std.3	ocal ~
 Fabric Intent Definition 	Defining Leaf-Spine Networking for US-WEST-DC2-POD5 - Layer 2 VLT Leaf Spine Fabric	\times
Select Fabric Template	Leaf Switches 😝 Blowns Switches Interlinks Interfaces Inter-chassis Networking Advanced Settings	
2 Define Leaf-Spine Networking	Spine Switches 3 2 spines VUFD	
3 Define Host Networking	✓ Advanced Settings Uplink State Group: ▼ Upstream Interfaces	
4 Submit for Approval	RSTP () ON Leaf-1:1 Leaf-1:1/V53	
	UFD () C Leaf-2:1 Leaf-2:VV/53 Leaf-3:1 Leaf-3:1/V/24	
	MTU 1500 1500-5000 Leaf-4:1 Leaf-4:1/0/12, Leaf-4:1/0/13	
	DETAIL CONFIGURATION Leaf-5: 1 Leaf-5: V/24	
	Leaf-6: 1 Leaf-6: 1/1/24	
	Leaf-7 : 1 Leaf-7 : 1/1/24	
	Leaf-8 : 1 Leaf-8 : 1/1/24	
		4
	close	
	BACK CLEAR	EXT

Define host networking

You are now ready to specify the parameters to be used by SFD to generate the configuration for host facing ports, inter-VLAN routing, and host dual-homing. This screen also indicates the IP or DNS address of the vCenter (VMware Manager) used to manage the VMs on the hosts that are connected to this fabric.

1. Select **System Settings** from the left column, then select **VMware Manager Integration**. A list of vCenter Server connections previously configured display. If there are no existing vCenter Server connections, this table is blank.

DELLEMC	SmartFabric Director 🛆 administrational ~
Fabric Intent Definition Select Fabric Template Define Leaf-Spine Networking Submit for Approval	Define Host Networking for US-WEST-DC2-POD5 - Layer 2 VLT Leaf Spine Fabric X Vibure Manager(8)

2. Click Add VLAN to add the configuration for each port group used by the vCenter, select the VLAN type, select the leaf pairs, enter an optional description, then click Save.

D&LL HMG	k			
× Create	Add Vlan			ayer 2 VLT
Image: Constraint of the select F Im	VLAN ID	101 2 - 4093		
S Define	Host Type	Workload VLAN	<u> </u>	- 1 82 *
 4 Define 5 Submit 		11.1.1/8		3/24 101.1.1.
	IP2	1.3.1.1/8		53/24 102.1.1. 53/24 103.1.1
	Description (optional)			53/24 104.1.1.
				53/24 105.1.1.
				53/24 106.1.1.
			CANCEL ADD	128 ille no
				BACK

SFD creates a virtual interface on each spine, and associates it to the VLAN ID. Each virtual interface obtains an SVI IP, and each VLAN in the VLT pair obtains a VRRP virtual ip in the same subnet as the VLAN.

3. (Optional) Delete any VLAN ID row by selecting the checkbox to the left of each row.

LLEMC						SmartFabric Dire	ector [ධ admi	
Fabric Intent Definition	Define Host Net	working for	US-WES	T-DC2-POD5	5 - Layer 3	2 Leaf Spine F	abric		:
1 Select Fabric Template 2 Define Leaf-Spine Networking	VMware Manager(s) + ADD VLAN RP	OVE VLAN(S)	Virtual IP Y	Virtual Interface 1 Y	IP of VIF1 Y	Virtual Interface 2 T	IP of VIF2 Y	Description	
3 Define Host Networking	. : 107	Management	10.1.1.0/24	Spine-1 : vlan107	10.1.1.1/24	Spine2 : vlan107	10.1.1.2/24		
4 Submit for Approval	1206	Workload	10.1.2.0/24	Spine-1 : vlan1206	10.1.2.1/24	Spine-2 : vlan1206	10.1.2.2/24		
	: 1230	Workload	10.1.3.0/24	Spine-1 : vlan1230	10.1.3.1/24	Spine-2 : vlan1230	10.1.3.2/24		
	1400	Workload	10.1.4.0/24	Spine-1 : vlan1400	10.1.4.1/24	Spine-2 : vlan1400	10.1.4.2/24		
	1500	Workload	10.1.5.0/24	Spine-1 : vlan1500	10.1.5.1/24	Spine-2 : vlan1500	10.1.5.2/24		

- 4. Navigate between pages by using the arrows; click **Back** to go to the previous step, or click **Next**.
- 5. Select **eBGP Settings** to enable BFD on the edge link, if needed.

DØ	LLEMC				SmartFabric Director	admin@std.local -
>	Create New Fabric	Define Edge Netwo	rking for US-WEST-DC2-PO	D5 - Layer 3 BGP Leaf Spine Fabric		
© R	1 Select Fabric Template	Edge Links eBGP Settings				
81.	2 Define Leaf-Spine Networking	Edge BFD				
2	3 Define Host Networking		Tx Interval (ms)	200		
۲	4 Define Edge Networking		Rx interval (ms)	200		
•	5 Submit for Approval		Missed Packets	3		
					l	BACK

Define edge networking

Edge leaf switches provide external connectivity to the fabric. Edge leaf switches connect to upstream devices using a routing protocol to exchange reachability information. SFD supports the BGP routing protocol. The edge networking screens allow you to specify the required parameters to establish connectivity with an external device.

i NOTE: The external device, typically a router, is not part of the fabric that is managed by SFD.

- 1. This optional step is required to configure the edge leaf networking. Click **Back** to return to the previous step.
- 2. Select Edit to configure an edge link.

LEMC						SmartFabric Director	admin@std.lo
Create New Fabric	Define Edge Networking for US-V	WEST-DC2-POD5 - La	er 3 BGP Leaf Spine Fabric				
1 Select Fabric Template	A incomplete Edge Networking configuration						
2 Define Leaf-Spine Networking	Edge Links elliop Settings						
3 Define Host Networking	EdgeLinks	τ γ Local ASN	T Local IF	y Local P	 Renote ASN 	y Renote P	
	st-sp-s40481-03 ethemet/V53 to external	64309	ethemet/1/53	© Emoty	@ Empty	@ Empty	
4 Define Edge Networking	st-gc-s4048-d3 ethemet/V54 to external	64808	ethemet2254	@ Emoty	(5 Empty	(t) Empty	
1 Scient for Approval	st-gip-s40481-08 ethemet0/053 to external	64803	ethemet3/0/53	@ Empty	@ Empty	@ Empty	
	st-sjc-s4048t-OB.ethemetl/U/54 to external	64503	etternet3V54	@ Empty	@ Empty	@Ensty	
							4

3. Enter the IP address for local, enter the remote ASN and IP address, then click Save.

KELL EMC							SmartFabric	Director 🗘	
	Edit Edgoli	ak			~	- Transfer			
	Edit Edgelli	IK.			^	Courses			
	Name	Edge-11	/1/20 to external			Franta			
	Local	ASN 6	4609 e Edge-11/1/20						
		υP	Required						
	Remote	ASN	public ASN						
		IP	Required						
				[cancer]	# 411#				
				Contract					

4. Continue editing edge links, then click Next.

										SmartFal	bric Director	admin@sh
Create New Fabric	Define Edge Networking for US-V	WEST-DC2-	POD5 - Layer 3	BGP Lea	f Spine Fabric							
1 Select Fabric Template	Edge Links eBGP Settings											
2 Define Leaf-Spine Networking	Edge Unio	÷. y	Local ASN	Ŧ	Local IF	Ŧ	Local IP	Ŧ	Remote ASN	Ŧ	Rettola IP	
3 Define Host Networking	3 st-gc-s4048t-03 ethemet//VS3 to external		64806		ethernetl/1/53		172.16.100.1/24		64999		172 16:100-2/24	
4 Define Fride Networking	1 st-sp-s4048t-03 ethemet/V/54 to external		64000		ethernett/V54		0236301924		64999		172 10 101 2/24	
a centre coge rendoning	st-sp-s4048t-08 ethemet//VS8 to external		64803		ethernetVV53		172363021/24		64099		172 16:102 2/24	
 Submit für Approvid. 	this stage s4048t-08 ethernet/1/54 to external		64803		ethernetVV54		172.96.103.1/24		64999		172.16 103.2/24	

Define overlay networking

This optional step is required to configure the interface with NSX-T which performs the overlay switching, and the VLAN configuration to allow proper NSX-T operation. If the data center deploys overlay networking using NSX-T, SFD provides the ability to integrate with NSX-T, and install the necessary VLANs on switches in the fabric (underlay).

1. Click Add VMware Manager(s). The NSX-T Manager details can also be added in the VMware Manager Integrations tab under Settings and Administration.

DELLEMC	SmartFabric Director admini@sfd.local~
» Create New Fa	Define Host Networking for NSX - Layer 3 BGP Leaf Spine Fabric with NSX-T Overlay
1 Select Fabric Template	A No VMware Manager connection is defined.
2 Define Leaf-Spine Ne	VMware Manager(s) ADD
a 3 Define Host Network a 4 Submit for Approval	+ ABO VLAN REMOVE VLANSS
	O Sama BACK NEXT

2. Select the Type, enter the Username and Password, enter an optional description, then click Add.

Add	d VMware M	anager		×		
Type Type Page Desc	stress/PGDN name word ziption (optional)	NSX Manager 10.173.225.33 admin NSX Manager				
			CANCEL	100		

- 3. Select the VMware Manager, then click Add VLAN.
- 4. Enter the VLAN ID, then select the VLAN Type.

Add Vlan		
VLAN ID	100	
Type Leaf Pair(s) Description (optional)	Salect a VLAN troe Vighere Mangement VLAN Videor VLAN Storage VLAN Treesport VLAN Orige	

5. Assign Leaf pair(s) to each VLAN; repeat until you have assigned all leaf pair switches to the corresponding VLAN.

Dell			
ie E	Add Vlan		
12	14.4		
	VLAN ID	2 - 4093	tatan a set a trans
	Туре	vMotion VLAN	×
2	Leaf Pair(s)	√ Seinet pai/(s) All ceaf pair(s)	
	Description (optional)	sc2-t1-s5224-l1: sc2-t1-s5224-l2 sc2-t1-s5224-l3: sc2-t1-s5224-l4	
		CANCEL	ACD
			- direct

6. Specify the VRRP IP address and the IP addresses for the corresponding VLAN.

tine Host Networking for	NSX - Layer 3 BGP1	Leal Spine Fabric with NSX+T (ovenay	
Add Vlan				
VIANID	100			
	2 - 4093		Contractor of	
Туре	vMotion VLAN		· •	
Leaf Pair(s)	Leaf Pair VRRP VIP IP1 IP2 CLOSE	sc2+t1-s5224-t1: sc2+t1-s5224-t2 100.11.1/24 100.11.2/24 100.11.3/24	-	
Description (optional)		(cauce)		
		CANCEL	ADD	

7. Enter an optional description, then click Add.

Create New Fa	Define Host Networking for	NSX - Layer 3 BGP Leaf	Spine Fabric with NS	X-T Overlay		
1 Select Fabric Template	VMware Manager(s) (0 https://10.172.225.3	0				
2 Define Leaf-Spine Ne	+ ADD VLAN					
3 Define Host Network	VLANID † T Description	Y VLAN Type	T Leaf Pair	T VREP VIP T	Virtual Interface 1	τ IP1
4 Submit for Approval	100	vMotion VLAN	sc2-t1-s5224-0.sc2-t1-s52	24- 100.1.1.1/24	sc2-t1-s5224-i1: vian100	100.1.1.2/2

8. (Optional) Repeat the steps for all VLANs needed for NSX-T support.

Submit for approval

You are now ready to submit your L3 or L2 fabric intent for approval. The fabric intent must be approved before it can be deployed on the physical switches by SFD. Each fabric intent is associated with a wiring diagram.

1. The wiring diagram summary displays, along with a topology graph which corresponds to the wiring diagram. Click **Save for Later** to save the specified fabric intent as a draft in the SFD data store, or click **Back** to return to Define overlay networking.

The summary displays different depending on the type of fabric configured. The example shows a Layer 3 fabric intent.

i NOTE: BFD is disabled by default on links from Edge ports to the external peer router. You can enable Edge ports if the external router has BFD enabled.



- 2. Click **Submit for Approval** to submit the fabric intent, along with the associated wiring diagram for approval by the authorized approver.
- 3. (Optional) Click **Back** to go to the previous step, or click **Save For Later** to save the specified fabric intent as a draft. All drafts are saved in the SFD data store.

Any fabric intent pending approvals are listed in the fabric intent list which can be viewed by selecting the Intent icon on the left.

Approve fabric intent

This information describes how to approve a fabric intent. Only Authorized Approvers can approve a Fabric Intent that is submitted for approval.

(i) NOTE: In release of SFD 1.1.0, any user can approve an intent and the Fabric Intent is autoapproved and ready to deploy.

1. Select the checkbox to the left of the approved Fabric Intent to view details.



Deploy fabric intent

This information describes how to deploy the fabric intent. Deploying a Fabric Intent triggers configuration of individual switches of the fabric.

i NOTE: You can only deploy Fabric Intents that have an Approved status.

1. The Deploy screen displays including a summary of the wiring diagram and the Fabric Intent (for reference), along with the topology graph which corresponds to the wiring diagram. The topology graph is updated based on the switches and links that are discovered by SFD. If one or more switches or links are either not discovered or are down (unreachable), you must review the summary and decide if you would like to deploy the Fabric Intent. Review the topology fully, then click **Deploy**.

D∜	LLEMC			SmartFabric Director	admin⊜sfd.local	÷
>>	Configurations					
0	intent					
3. II. 5. 8. 0	Active Fabric Configurations No active configuration is found. Get start with a saved fabric configuration file or use wizard to create a new fabric. Cet STARTED	CREATE COPY	Y Type Y Wring Diagram Layer 3 25PNE-0-LEAV	Y Status Y U	polited by ♥ Lest Updated ↓ pprover@ Just now	
					$K \leftarrow 1 / 1 \rightarrow H$	

SFD starts configuring each discovered (and reachable) switch with the wanted configuration that is derived from the chosen approved Intent. SFD interfaces with each switch through the gNMI protocol for configuration, and the switches are configured simultaneously.

The SFD dashboard shows the progress of deployment using the progress bar located near the top of the screen. The switch in the topology graph turns green when configuration is successful. If all switches specified in the wiring diagram are discovered, reachable, and configured (and also the discovered topology matches the fully to the wiring diagram), the Fabric is deployed.





Add newly discovered switch to fabric

If a switch comes online or is discovered later and becomes reachable, SFD starts configuring the Fabric based on the wanted configuration—generated based on the deployed Intent.

The switch status is updated in the Topology graph but may not have more devices and/or links which are not specified in the Wiring Diagram (see Define fabric intent). A switch may discover a device such as an LLDP neighbor when that device is connected to an interface that is enabled.

Discovered devices that display in the discovered Topology but are not specified in the Wiring Diagram will not be shown in SFD. You must add newly discovered devices to the Wiring Diagram before you deploy the Fabric Intent.

Select the device then choose Add to go to defining a fabric wiring diagram. If you update the wiring diagram, you may need an update of the fabric Intent and associated approval, followed by deployment.

Discovery process

Once the Fabric Intent deploys, SFD starts the Fabric Discovery process. As part of the discovery process, SFD starts establishing a gNMI session with all the switches specified, using the IP address and credentials specified in the active wiring diagram.

Once a gNMI session is established, it uses the Openconfig objects to obtain details about the switch (service tag, hardware version, software version, and so on), and updates the switch and topology information in SFD.

The LLDP process on each switch is enabled and the LLDP table from each switch is read and used by the SFD to build a topology graph. This graph is referred to as discovered graph. If the gNMI session fails, then the switch state is updated accordingly.

The SFD is periodically notified by the gNMI Agent on the switch with its LLDP table information. The state of the switch (node) and the links (edges) between the switches are constantly updated based on the latest LLDP table infomation that is obtained, and the Discovery process is continuous.



As the switches are discovered, SFD begins configuration of each switch. The progress can be viewed in the Job Activities pane at the bottom of the screen.



On successful configuration of a switch, the switch changes to green on the dashboard.



Once a fabric is deployed, the wiring diagrams table shows the corresponding deployed wiring diagram as Active.

D&LLEMC		SmartFabric Director	۵	ి
>> Wiring Diagrams (1)				
C C C C C C C C C C C C C C C C C C C	DEFINE INTENT DELETE Name Y Description Y Type Y Su i SETUP-5-2-SPINE-8 Layer 3 Leaf 5 AC	tus Y Updated by Y	Last Updated Oct. 4, 2019.	•
		K <	1 /1 →	н

Reimport a wiring diagram

This information explains how to reimport a wiring diagram. You may update the fabric to add or remove switches, or add or remove links.

1. Create an updated JSON wiring diagram, then reimport it.

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102						
-						Card Contrained _
5						1955 10 1997
0		IMPOR1	FABRIC ETUPS-25PINES-28-LEAV	ES-2EDGES.json		

2. Define and associate a Fabric Intent. You can also clone or copy an existing Fabric Intent, then make any necessary changes by going through the Fabric Intent Wizard.

SETUP-5-2-SPINE-30-LEAF Active This solup consists of 2 Spine and 8 Leaf switches. Leaf Modified Ori 4.209 B02MAM Type Care 2 Load Sone Flore Type Care 2 Load Sone Flore Spine 0 Leaf OEFINE INTENT DEFINE DEFINE INTENT User 2 Load Sone Flore 0 VLT links 2	Wiring Diagrams		
	Wring Diagrams	BARCAT GORINAL KITENT BELETE BELETE BERNEINTENT BELETE COPY ACTIVE INTENT US-PA-SCDC (Layer 3 Fabric) US-PA-SCDC (S74200259321 COPY OTHER INTENTS Layer 3 Fabric)	st Updated ov. 22, 201 ct. 4, 2019

3. See Approve fabric Intent and Deploy fabric intent.

Monitoring

8

This information explains how to monitor the fabric, viewing switch level details. Monitoring data is the last information streamed by the switch to SFD. The switch streams telemetry information to SFD every 60 seconds. The streaming status of a network device is available in the switch profile under monitoring.

- 1. From the SmartFabric Director dashboard, select a switch to open up the switch profile panel to view a summary of the switch.
 - DELLEMC administd.local Dashboard O Oct 3, 2019 11:36:00AM 0 Switch Profile • 13 Hostname: Leaf 2 Switch Status: Main 8. Role: LEAF Model Number: 54048-ON -Service Tag: XYZ123456 0 Management IP: 10.175.18.59 OS Version: 10.5 Switchgroup(s): 1 Uptime: 8min Streaming Status: Active CPU Ultization: 58% BGP Peer(s): 4 active VLT Peer: 1 active CLOSE 0 0 0 Switch Log Events Alerts Job Activities T Job Type T Status Y Start Time T End Time Ŧ Job Nam T Info ate Job A LCM - Image Update Oct 3, 2019 11:36:00AN In Progress Completed: 1 Switch In Progress: 1 Switches Completed with Error(s): 0 Switch(es) Leaf-1: Download In Progress - Oct 3, 2019 11:36:00AM Details:

be adjusted or lowered to get a granular view of the CPU data.

2. Select the **Monitoring** icon from the left to view the fabric health.



3. Select any interface to view the switch profile and details.

DOLLEMC												SmartFabri	c Director	
<	Monitoring > nlo-29100-05								(LABITERY -	Start Jan	8, 2020, 23226 PM	fee Jan 9, 202	0, 33226 PM
Deshboard														
Configurations	Switch Profile	Interfaces												
Monitoring	Hostname: Ho 2900-05		Interior y	Advis II. Y	Op. State y	In Outwise	a y hOsen	Ŧ	n Dran	¥ 04	ouers	Y Out Decards	Y Out By	un y
Is SFO Notification	One 1141		etremet/20	UP	UP.	16.26 GB	O pitts		0 pkts	82	D M B	54242373 j#ts	0 (85	
A mining Diagrams	Model Auriber:	10	ethernet//A	40	UP	5524.08	0 pkts		0 pkts	0.1	MB	9040404.jkts	0 pkt	
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D petropi and Administrati-	Service Tag: 45,0002 Management (P. 10,11243,308		404140205	42	UP.	15.84.08	0.0404		0.0455	8.2	IND.	14242240 (485	0.040	
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	Switch-Group 03 1													12 April
	Uptime: 2days:3hr12vin Streaming Status: Connected													
	CPU Utilization: 7%	BGP												
	Memory Utilization: 34%	Nalation	 Annine links 		· Parlian lant			Parlam Inc.	alari			Bufues Indeled		
	LAG00: 5	100.1110.0	157476-000		1 100			225				225		
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		potcharvel		10	enet//J.atvenet//B					UP.				
		port-channel65		-	150/1921					UP.				
														6.187
		System												

4. Scroll down to view additional details.



Topics:

• SFD notifications

SFD notifications

This information explains how to use the job activities, events, alerts, and the switch log to manage SmartFabric Director.

1. Select the **SFD notification** icon from the left to view job activities for fabric intent deployment.

Job Activities Switch Log Events Alerts Job Activities With Log Events Alerts T Base T End Time T Batemation V Job Name V Job Type V Statu T Base Time T Bate Time T Batemation V US-WEST-CD3-FOOD with NSX Fabric Config-Fabric In Progress Jul 10, 2019 12:00.00PM Summary message strings- Completed: 2 Subtices Subtices Subtices Submary Progress Subtices Eee-7:::: Deployment Completed - from Aug. 7, 2819 31:38:01AM Progress : reprint completed - from Aug. 7, 2819 31:38:01AM Progress : reprint completed - from Aug. 7, 2819 31:38:01AM Additional Information: cessage strings Spline-1: Deployment failable Information: cessage strings Spline-2:: Deployment failable Information: cessage strings Multiceal Information: cessage strings Jul 10, 2019 10:30:00PM Summary message strings Spline-2:: Deployment failable Information: cessage strings Jul 10, 2019 10:30:00PM Summary message strings > US-WEST-CD3-FODE Fabric Config-Fabric Config-Fabric Config-Fabric Config-Fabric Config-Fabric Deversige Jul 10, 2019 12:00:00PM Jul		Notifications				LAST 1 D	AY - Start Jul. 10, 2019 11:10:23AM End .	Jul. 10, 2019 11:10:23AM
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2. Select the Switch Log tab to view the system log information.

«LL EMC				SmartFabric Director	Ċ,	
SFD Notifications			LAST 1 DAY Y	Start Jul. 10, 2019 11:10:23AM E	si Jul. 10,	2019 11:10:23AM
Job Activities Sv	itch Log Events Alerts					
Q Search syslog						
Switch						1
 Leaf-1 Leaf-1	Middfail Sis Jon Loging Ing-file no-mor- hoffed Sil77.72001-00180 (s2-10- hoffed Sil77.72001-00180 (s2-10- hoffed Sil77.79504-0018 (s2-10- d1/1/3 4-0706 (s1)7.79524+00108 (s2-10- d1/1/3 4-0706 (s1)8.80.7933+00180 (s2-10- at1/1/3 4-0706 (s1)8.80.79354+0018 (s2-10- at1/1/3 4-0706 (s1)8.80.79552+0018 (s2-10- at1/1/3 4-0706 (s1)8.80.79552+0018 (s2-10- at1/1/3 4-0706 (s1)8.80.79552+00188 (s2-10- at1/1/3 4-0706 (s1)8.80.79552+0018 (s2-10- at1/1/3 4-0706 (s1)8.80.79532+0018 (s2-10- 004).	9300-11 dn_lle 662 Node.I-Unit. 9300-11 dn_lle 662 Node.I-Unit.	1:PE [event], Doll DK (0518) XCM 1:PE [event], Doll DK (0518) X1P 1:PE [event], Doll DK (0518) X2P	LINIT_STATE: Init state enum sta LOSTATE_UP: Interface operations LOSTATE_UP: Interface operations	te 6 1 state 1 state 1 state 1 state 1 state 1 state 1 state 1 state	
> Leaf-2						
> Leaf-3						
> Leaf-4						
> Leaf-5					к	< 1 /

3. Select the **Events** tab to view all SFD events.

SFD Notifications		LAST 1 DAY - Start Jul. 10, 2019 11:10	23AM End Jul. 10, 2019 11:10:23AA
Job Activities Switch Log	Events Alerts		
Timestamp	Information	T Event Type	▼ Severity
✓ Jul. 10, 2019 12:00:00PM Additional Infe	Switch: 'sc2-t4-s4148-16' is not reachable	Interface Link Down	Warning
> Jul. 10, 2019 11:35:00AM	<event 2="" message=""></event>	High CPU Usage	Critical
> Jul. 10, 2019 11:00:00AM	<event 3="" message=""></event>	Interface Link Up	into
> Jul. 10, 2019 11:00:00AM	<event 4="" message=""></event>	<switch name=""> Deployment Failure</switch>	Error

4. Select the Alerts tab to view all SFD alerts.

SFD N	otifica	tions				LAST 1 DAY V	Start	Jul. 10, 2019	11:10:2	3AM End	Jul. 1	0, 2019 11:10:23AM
Job A	ctivitie	is Switch Log	Events	Alerts								
'≘ A4	KNOW	LEDGE (* REOPEN										
		Timestamp		Information	٣	Event Type	٣	Severity 1	r Sta	tus	٣	Updated By
		Events: <total <pre>cevent summary: <event summary:<br=""><event pre="" summary:<=""></event></event></event></event></event></event></event></event></event></event></event></pre></total 	number of 	events related to alert> 0.0295 2:20-004 0.0295 2:20-004 0.0295 2:00-004 0.0295 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0255 2:00-004 0.0055 2:000000000000000000000000000000000								
0	:	> Jul. 10, 2019 12:0	0:00PM	Switch unreachable alert is raised for Switch: 'sc2-t4-s4148-16'		Switch Unreachable		Critical	Ac	knowledged	1	admin@sfd.local
0	1	ACKNOWLEDGE	MAOC	<alert 2="" message=""></alert>		Switch Unreachable		Warning	Op	en		
	14	RESOLVE	00AM	<alert 3="" message=""></alert>		Switch Unreachable		Info	Op	en		
0	1	SNOOZE	MADO	<alert 4="" message=""></alert>		Switch Unreachable		Error	Ad	knowledged	1	admin@sfd.local

Switch lifecycle management

This information explains switch lifecycle management. Each switch in the data center fabric must have the same software image. You can upgrade or downgrade the switch image software using SmartFabric Director.

SFD is aware of all supported switch models and corresponding SmartFabric OS10 software images. This ensures that unsupported models and images are not deployed in the fabric.

Provide a file server (SFTP, FTP, SCP, TFTP, or HTTP) that is accessible through the Management port of switches, and reachable from SmartFabric Director. Download one or more relevant switch software images and manifest file to these servers.

Topics:

- Specify switch image server
- Define switch groups
- Define switch lifecycle job
- · Schedule switch lifecycle job

Specify switch image server

This information describes how to specify the Image Server where the switch software images are stored. See Download SFD image for more information about how to download a software image.

1. Select Settings and Administration > Switch Image Servers.

D∜						SmartFabric	Director 🔶	adminijisf	
»	Settings a	and Administration							
2	About	User Management	VMware Manager Integrations	System Settings	AD Server Switch Image Server	ers			
	+ ADD I	IMAGE SERVER	EMOVE						
		IP Address / FQDN	Т Туре	T Username	Base Directory	Y Description	T Last Up	dated	
					8				
					å.				
				We coul	dn't find any Switch Image Serve	ers.			

2. Click Add switch image server.

Add Switch Image Server × Yee #AllawsYSDR G124330 Red being

3. Select the image transport type (HTTP, TFTP SFTP, SCP, and FTP), enter the IP address/FQDN, username and password, enter an optional description, then click Add.

The new image server information displays.

LEMC				SmartFabric Director	📫 admin@sfd	
Settings and Administration						
About User Management VMwar	e Manager Integrations Sys	item Settings AD Serve	r Switch Image Servers			
IP Address / FODN	т Туре т	Username T	Base Directory	T Description T	Last Updated	4
del. digitallocker.com	SFTP		/user/home		Just now	
					K C 1 /1	> >

4. (Optional) Select the image server checkbox, then click **Remove** to delete the image server.

Define switch groups

This information describes how to create, edit, and delete switch groups to define an update job. To update a switch image, you must define an update switch lifecycle management job.

You can group switches into a switch group — SFD creates four default switch groups which are autopopulated based on the active fabric wiring diagram.

i NOTE: Default switch groups cannot be edited or deleted. These switch groups are automatically created to enable users to upgrade all switches in the predefined switch groups without severely impacting availability of the fabric.

1. Click **New switch group** to define a new switch group.

D%	LLEMC	SmartFabric Director 🚊 adr	min⊜sfd.local ∽
>>	Life Cycle Management	© Oct 3, 2019 11:35	00AM 💭
	Update Jobs Switch Groups Switch Image Info		
	+ NEW SWITCH GROUP		
×a.	□ Name ▼ Description ▼	Member Switches T Last Updated	4
&	Eeaf-Group1 Automatically updated per wiring digram update	😝 x2+5-4448-0) 😝 x2+5-4448-0) 😝 x2+5-4448-5) 😝 x2+5-4448-7) June 30, 20	19 12:13:10
۲	Spin-Group1 Automatically updated per wiring digram update	@ sc2-t5-29900-s1 June 30, 20	19 12:13:10
0	Euclif-Group2 Automatically updated per wiring digram update	B \$5215-5414812 B \$5215-5414814 B \$5215-5414816 B \$5215-5414816 June 30, 20	19 12:13:10
	Spin-Group2 Automatically updated per wiring digram update	0 sc2+t5+z9100-s2 June 30, 20	19 12:13:10
	Job Activities Switch Log Events Alerts	к (1	к < 1/

2. Enter the name for the new switch group, select the switches to add to the switch group from the active wiring diagram, enter an optional description, then click **Create**.

Dellemo	SimartFabric Director
The Cycla Management	- Eline la solutionenti. 30-
CTA	
New Switch Gr	roup ×
an Name	Update Subset &
D Manhar Suitchies	
menuer switch(es)	R K245-64886(X) B K245-648864 X
	9 x215-21100-12X
Description (optional)	Lindate single switch from VLT pair
	CANCEL CREATE

You are now ready to define a switch lifecycle job to create an update job.

Define switch lifecycle job

This information describes how to create an update job. As part of the update job creation, you can select a switch group from the list of available switch groups.

1. Select Create update job.

Update Jobs Switch Groups Switch Image Info + NEW SWITCH GROUP CREATE COPY IEMOVE CREATE UPDATE JOB EDT Description Y Mether Switcher Y EDT Description Y Mether Switcher Y Lait Updated 2 2-0-01 Oct.3, 2019 11263 CREATE UPDATE JOB Automatically updated per wiring digram update Ex215-44880 Ex215-44880 Ex215-44880 Ex215-44880 June 30, 2019 12133 Spines-Group2 Automatically updated per wiring digram update Ex215-44880 June 30, 2019 12133 Spines-Group2 Automatically updated per wiring digram update Ex215-44880 June 30, 2019 12133	Life Cycle	Management					C	Oct 3, 20	19 11:36:00AM
HEW SWITCH CROUP CREATE COPY ENDOVE EDIT EDIT EDIT CREATE COPY Update single switch from VLT par CREATE COPY ENDOVE Automatically updated per wiring digram update EDIT Spines-Group1 Automatically updated per wiring digram update EDIT Spines-Group2 EDIT EDIT Description EDIT Desc	Update J	lobs Switch Groups Sv	vitch Image Info						
EDIT Description V Member Stellsbes V Last Updated I CREATE COPY Update single switch from VLT pair Image: 205-5448.00	+ NEW 5		OPY 📋 REMOVE 📋 CREATE UPDATE JOB						
CREATE COPY Update single switch from VLT pair B 12/05-4488.01 B 12/05-4488.01 B 12/05-4488.01 B 12/05-4488.01 D 12/03 Image: CREATE UPDATE JOB Automatically updated per wiring digram update B 12/05-4488.01 June 30, 2019 02/03 Ju	0	EDIT	Description	T Member Switches				T Last	lpdated
PEMOVE Automatically updated per wiring digram update # 12/54448.01 <td>0 ;</td> <td>CREATE COPY</td> <td>Update single switch from VLT pair</td> <td>3c2-t5-s4548-t2</td> <td>ac2+15+s4148+14</td> <td>B sc2-t5-s4148-16</td> <td>a more</td> <td>Oct 3</td> <td>3, 2019 11 36:00/</td>	0 ;	CREATE COPY	Update single switch from VLT pair	3c2-t5-s4548-t2	ac2+15+s4148+14	B sc2-t5-s4148-16	a more	Oct 3	3, 2019 11 36:00/
Image: CREATE UPDATE JOB Automatically updated per wiring digram update Image: 215-5488 million Image: 215-5488 million June 30, 2019 12133 Image: Spines-Group 1 Automatically updated per wiring digram update Image: 215-5488 million June 30, 2019 12133 Image: Spines-Group 2 Automatically updated per wiring digram update Image: 215-5488 million June 30, 2019 12133 Image: Spines-Group 2 Automatically updated per wiring digram update Image: 215-5488 million June 30, 2019 02133	0 :	REMOVE	Automatically updated per wiring digram update	B \$12-15-14348-0	B 162-15-14140-0	C2-15-14148-15	B 1c2-15-14148-17	June	30, 2019 12:13:1
Spines-Group1 Automatically updated per wiring digram update (a) x235 (2500-61) June 30, 2019 12131 Spines-Group2 Automatically updated per wiring digram update (a) x235 (2500-62) June 30, 2019 02131	0:	CREATE UPDATE JOB	Automatically updated per wiring digram update	102-15-54348-12	B 102-15-54148-14	B xc2-15-s4148-16	sc2-05-54348-	June	30, 2019 12:13:1
Image: Spines-Group2 Automatically updated per wiring digram update Image: Spines-Group2 Automatically updated per wiring digram update	0 :	Spines-Group1	Automatically updated per wiring digram update	0 sc2-t5-z1100-st				June	30, 2019 12:13:1
	0 1	Spines-Group2	Automatically updated per wiring digram update	ac2+15+29100+s2				June	30, 2019 02:13:

2. Enter the job name, select the switch group, enter an optional description, then click Next.

3. Specify an OS10 image including the file extension (.bin). Verify the specified image name matches the name of the image file on the remote server, then click **Next**. All switches in a switch group are updated to the specified image when the Update job is run.

DØLLEMC		ž	SmartFabric Directo	r Q	administration -
. Die Cycle Management					
Create Update	Select Image f	for Day 0 Update A	×		
1 Select Switch Group(s)	Image Server	image.services.com	123		
2 Select Image	Base Directory	/user/home			
3 Submit for Approval	Extended File Path (optional) OS Image	If not defined, mage will be selected how base direct	56ry		
			BACK NEXT		

4. Review the image update information, then click Submit for approval. You can also click Save for later or Back to return to the previous screen.

DRALLEMC	
The Cycle Management	
Create Update 1 Select Switch Group(s) 2 Select Builds 3 Submit for Approval	Submit for Approval × Requesting approval to upgrade To /user/home/extended_path/ sovi0_6.ing. Day 0 Update A Switch Nume V V Model Svi2-15-44148-12 54148 Svi2-15-44148-14 44148 Svi0-6 5 Sv2-15-44148-14 54148 Svi0-6 5 Sv2-15-44148-14 54148 Sv10-6 5 Sv2-15-44148-14 54148 Sv10-6 5 Sv2-15-44148-14 54148 Sv10-6 5 Sv2-15-4416-18 54148 Sv10-6 5 Sv2-15-4700-11 2000 Sv10-6 5
	K < 1 /1 -> H

Schedule switch lifecycle job

This information describes how to schedule an Update job. You can schedule an approved job for execution now, or select a future date and time using the calendar.

1. Select Schedule Now.

LEN	ЛС						SmartFabric Dire	ector	Φ		
Life C	ycle Ma	nagement						00	ct 3, 2	019 11:35:00AM	
Upda	te Jobs	Switch Groups Swi	tch Image Info								
+ N	BOL WE		rs ~								
		VIEW	n	▼ Switch Group	▼ Desired OS ▼	Status	Ŧ	Updated by	Ŧ	Last Updated	
0	14	CREATE COPY		🚫 Update Subset A	10.6	APPROVED		admin@sfd.	local	Oct 3, 2019 11:36:0	OA
		SCHEDULE NOW									
		SCHEDULE FOR LATER									
		ARCHIVE									
									K	< 1/1 >	

You can also select to schedule the job for a future date and time. Select the date and time, then click Schedule.

	SmartFabric Director
	(© w€ 10.2019/010(22AM,
Schedule For Later x Schedule Byr Ubdør A at: NM - 00 - VYYY HellMM 'M Image: Color of the state of the st	K

When the job is run, SFD directs the switches to the Image Server to download the specified image. The switch downloads the image, installs the new image, and reboots.

2. Select View Activity to display the switch update job activities in the open window.

(i) NOTE: You can also create a copy of the update job to simplify making changes to an existing job.

Update Jobs Switch Groups Switch Image Info + NEW SMITCH GROUP CREATE COPY BENOVE CREATE UPDATE JOB I EDT Description Windle digram update BE2/55-64884) June 30, 2019 12/3 M I Spines-Group1 Automatically updated per wiring digram update BE2/15-648841) BE2/55-648841) BE2/55-648841) June 30, 2019 12/3 M I Spines-Group2 Automatically updated per wiring digram update BE2/15-648841) BE2/55-648841) June 30, 2019 12/3 M I Spines-Group2 Automatically updated per wiring digram update BE2/15-67800-22 June 30, 2019 02/3 M	Life Cycle Management				0	Oct 3, 2019 11:36:00AM
HANN SMITCH GROUP CARLE LOP CARLE LIPCATE JOB EDT EDT Decordion CREATE COPY REMOVE GREATE COPY REMOVE GREATE COPY REMOVE GREATE UPDATE JOB Automatically updated per wiring digram update @ 12-5-1488.0 @ 12-5-	Update Jobs Switch Groups S	witch Image Info				
EDIT Description V Member Suitbas V Last Updated CREATE COPY Update single switch from VLT park @ x2-55-448.0;		COPY 📋 REMOVE 🔛 CREATE UPDATE JOB				
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REMOVE Automatically updated per wring digram update Image: 2d-54488 million Image: 2d-54488 milli	CREATE COPY	Update single switch from VLT pair	😝 sc2+15+s4148+12) 😝 sc2+	15-54148-14	2 more	Oct 3, 2019 11:36:00.
Image: Construction of the co	CPEATE UPDATE IOR	Automatically updated per wiring digram update	😝 sc2+t5-s4148+11) 😝 sc2+	15-54148-13) 🥶 5C2-15-54148-15)	B \$62-85-54148-17	June 30, 2019 12:13:1
i Spines-Group1 Automatically updated per wring digram update Image: 10 - 100 -		Automatically updated per wiring digram update	102-15-14148-12 B 1c2-	15-54148-14) 🥫 512-15-54148-16	\$\$2-15-54148-18	June 30, 2019 12:13:1
Spines-Group2 Automatically updated per wring digram update 245-2500-32 June 30, 2019 02131	Spines-Group1	Automatically updated per wiring digram update	0 sc2+t5+29100-st			June 30, 2019 12:13:1
	Spines-Group2	Automatically updated per wiring digram update	8 562-15-29900-52			June 30, 2019 02:13:

3. Select **View** to display the update job.

×	ALLEMC			SmartFabric Directo	rΩ	
	Life Cycle Management				© Oct 3, 2019	11:35:00AM
)	Update Jobs Switch Groups Switch Image Info					
	+ NEW JOB 🖹 REMOVE : ACTIONS ~					
	Job Name T Description T Switc	ch Group 🔻	Desired OS ¥ Status	▼ Upda	ed by Y Last	Updated
	Day O Update A	Update Subset A	10.6 IN PROGR	ESS since Oct 3, 2019 11 admi	n@sfd.local Oct	3, 2019 11:36:00#
					C (1 /1 >
					ic c	1 /1 →
	Job Activities Switch Log Events Alerts				K ¢	1 /1 →
	Job Activities Switch Log Events Alerts	Start Time 🔻 En	d Time T	Information	K ¢	1 /1 →
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The view displays lifecycle job activities.

ELLEMC				SmartFabric Director 🛛 🕰	admin@sfd.local +
SFD Notifications			LAST 1 DA	v v start Jul. 10, 2019 11:10:23AM End Jul. 1	0, 2019 11:10:23AM 🛛 💭
Job Activities Switch Log Events Alerts					
Job Name 🛛 Job Type 🏹	Status Y	Start Time 🛛 🔻	End Time Y	Information	Ŧ
US-WEST-CD3-POD5 Fabric Config - Fabric with N\$X Intent	In Progress	Jul. 10, 2019 12:00:00PM		<summary message="" string=""></summary>	
US-WEST-CD3-POD5 Fabric Config - Fabric with vCenter Intent	Completed with Error	Jul. 9, 2019 12:00:00PM	Jul. 10, 2019 10:30:00PM	<summary message="" string=""></summary>	
 Day O Update Job A LCM - Image Update Completed: 2 Switches In Progress: 1 Switch Completed with Error(s): 1 Switch 	In Progress	Jul. 9, 2019 12:00:00PM		<summary message="" string=""></summary>	
Leaf-1: Download In Progress - J Error: error m Ostalis: osto.s.bin - Transfer Rat Progress: - Additional I	kug. 7, 2019 11:30:01 issage string> file size> e: <transfer rate=""> ercentage> nformation: <message< td=""><td>AM string></td><td></td><td></td><td></td></message<></transfer>	AM string>			
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Leaf-3: Download Failed - Aug. 3 Error: cerror m Details: os10.5.bin < Additional	r, 2019 11:30:01AM rssage string> file size> nformation: <message< td=""><td>string></td><td></td><td></td><td></td></message<>	string>			
Leaf-4: Install In Progress - Au Error: cerror mu Details: os10.5.bin < Progress: Q Additional I	ng. 7, 2019 11:30:01A rssage string> file size> ercentage> nformation: <message< td=""><td>M string></td><td></td><td></td><td></td></message<>	M string>			
Leaf-5: Install Completed - Aug. Error: <error mu<br="">Details: os10.5.bin < Additional I</error>	7, 2019 11:30:01AM ssage string> file size> nformation: <message< td=""><td>stringo</td><td></td><td></td><td></td></message<>	stringo			
Leaf-6: Install Completed with 0 Error: «error mo Details: 9510.5.bin < Additional I	rrors - Aug. 7, 2019 issage string> file size> nformation: <message< td=""><td>11:30:01AM string></td><td></td><td></td><td></td></message<>	11:30:01AM string>			
Spine-1: Reboot in Progress - An Error: serror m Details: osl0.5.bin c Additional I	ng. 7, 2019 11:30:01A rssage string> file size> nformation: <message< td=""><td>M string></td><td></td><td></td><td></td></message<>	M string>			
> Day 0 Update Job B LCM - Image Update	Unsuccessful	Jul. 9 2019 12:00:00PM	Jul. 10 2019 10:35:00PM	<summary message="" string=""></summary>	
> Day 0 Update Job C LCM - Image Update	In Progress	Jul. 9 2019 12:00:00PM		<summary message="" string=""></summary>	
> Day 0 Update Job D LCM - Image Update	Completed	Jul. 9 2019 12:00:00PM	Jul. 10 2019 12:00:00PM	<summary message="" string=""></summary>	



This information explains how to access the command-line interface (CLI), and the available commands.

Access the CLI

1. SSH to the IP address configured for SFD.

```
login-srv-05-user%:~> ssh username@sfd.local@ip_address
admin@sfd.local@10.12.124.125's password:
Last login: Mon Oct 17 18:00:59 2019 from 10.12.1.9
```

2. Enter sfd to access the SmartFabric Director CLI.

```
admin@sfd.local@SFD-R5:~$ sfd
DellEMC SmartFabric Director CLI
sfd>
```

Command help

To view a list of available options or arguments, enter -h or --help after any command.

```
sfd> backup --help
usage: backup [-h] {list,create,delete,restore} ...
SFD backup operations - create, delete, list, restore
positional arguments:
   {list,create,delete,restore}
optional arguments:
   -h, --help show this help message and exit
```

Topics:

- backup
- ftp
- log_level
- service
- support_bundle
- system
- upgrade

backup

Backs up SFD data including the fabric intent.

Command	<pre>backup [list createname backup_name deletename backup_name restorename backup_name]</pre>
Options	 list — Displays all current backup files create — Creates a backup

- delete Removes a backup
- restore Restores a backup
- · --name backup name -- Name of the backup

Usage

Proper backup of SFD is crucial to restore the system to its working state in the event of failure. This feature ensures that all configuration data is backed up. We recommend regular backups — backup frequency and schedule depend on your business needs and operational requirements. At a bar minimum, it is recommended taking backups after any successful deployment, prior to any software upgrades, and after any major Day 2 change. Once you have defined a fabric, configured it and verified that it behaves as expected, use this command to back up all data including the fabric intent. If SFD reaches an undesirable state, you can restore the backup to a golden configuration at any time.

(i) NOTE: The backup and restore versions must match. If you upgrade the software and do not create a backup, you cannot restore an older version backup over a new version. Any configuration changes made between the time a backup was taken, and a restore was performed will be lost. Backup should only be restored on a fresh SFD instance.

1. Log in to the VM to perform restore operations.

\$ ssh <uname>@<SFD IP>

2. Copy the backup files into the backup directory.

\$ cp -r <backup files> /data/sfd backup/<version backup>/

3. Access the SFD CLI, then view all current backups.

```
$ sfd
sfd> backup list
```

4. Restore the backup file.

sfd> backup restore --name sfd backup

5. Close the SFD browser session, then log back into SFD after two to five minutes to start all services.

(i) NOTE: It is recommended to configure FTP (see ftp) to support periodic uploads of backup files.

Examples

```
sfd> backup list
__+____+
| Backup Name | Backup Status | Start Time
| End Time | Start Time (ms) | End Time(ms) |
   _____+
+--
--+----+
| backup 17-09-2019 08:49:00 | SUCCESS | 17-09-
2019_08:49:00 | 17-09-2019_08:49:01 | 1568710140682 |
1568710141911 |
| test_backup | SUCCESS | 17-09-
2019 14:01:25 | 17-09-2019 14:01:27 | 1568728885977 |
1568728887348 |
| sfd_backup | SUCCESS | 17-09-
2019 14:03:34 | 17-09-2019 14:03:34 | 1568729014086 |
1568729014779 |
----+
```

```
sfd> backup create --name sfd_backup
```

Creating backup sfd_backup

```
sfd_backup has been created with status: SUCCESS
```

Releases

1.1.0 or later

ftp

Configures remote server operations.

Command	<pre>ftp configurehost host_ipuser userpassword passwordbackupdir remote_dir_pathprotocol {ftp, sftp} [port port] [overwrite {True, False}] ftp list [frequency {hourly, daily, weekly, monthly}interval interval]</pre>
Options	 configure — Configures the FTP server name and credentials host host_ip — Host IP address user user — Username password password — Password backupdir remote_dir_path — Remote directory path to store the file protocol ftp, sftp — Either FTP or SFTP for the protocol port port — Port number overwrite True, False — Either True or False to overwrite the existing file list — Displays the FTP configuration backup_file — Name of the backup file to upload frequency — Sets the frequency to upload backup files to hourly, daily, weekly, or monthly interval interval — Interval value
Usage	This command moves any backup, log, or service pack to an external storage or file server. You must first configure the FTP server name and credentials before uploading files to it from the SFD instance. SFD supports FTP and secure FTP (SFTP) as file transfer protocols. It is recommended that you use periodic upload to optimally use the storage space on the SFD instance. Available frequencies to upload files include hourly, daily, weekly, and monthly.
Example	<pre>sfd> ftp configurehost 10.196.207.12user ftpuserpassword vmwarebackupdir publicprotocol ftp Configuring FTP server Saving FTP parameters Verifying connection Creating temp file to verify upload Connecting to FTP host Successfully uploaded file to ftp server Successfully verified connection Successfully configured ftp server</pre>
	<pre> Parameter Value ++ host 10.196.207.12 protocol sftp remote_file_path public user ftpuser ++ sfd> ftp upload backup_filefrequency daily Adding cron job for periodically uploading sfd backups file Successfully configured periodic upload for backup files</pre>
Palaaaa	110 or later

1.1.0 or later

log_level

Sets the log-level for internal events and debug messages.

--level *log_level*

Command

Options

--service service_name — Lists log-levels for a specific service name

- \cdot $\,$ all Lists log-levels for all available services
- --level log_level Sets the specified service to the wanted log-level (error, warn, info, debug, trace)

log_level list --service service_name all log_level set --service service_name

Use the all option to list all service levels.

Usage Example

sfd> log_level list --service all

SERVICE LOG LEVELS	
Service Name	Log Level
<pre>config-builder-service fabric-orchestrator-service host-network-service notification-service rest-api switch-manager-service system-controller-service topology-service telemetry-collector-service telemetry-service</pre>	INFO INFO INFO INFO INFO INFO INFO INFO INFO

sfd> log_level set --service notification-service --level error

SET LOG LEVEL OPP	ERATION STATUS
Service Name	Status
notification-serv	vice success

Releases

```
1.1.0 or later
```

service

Provides service operations including health and statistics.

Command	service [list healthname <i>service_name</i> statsname <i>service_name</i> restartname <i>service_name</i>]
Options	 list — List all internal services health — Status of internal services stats — Metrics including memory and CPU usage of internal services restart — Restarts the specified service name service_name — Service name
Usage	This command provides information about services, performance, and state which can be used for monitoring to diagnose possible problems.

Examples

Releases

1.1.0 or later

support_bundle

Creates a support bundle to be used for debugging purposes.

Command	<pre>support_bundle createname bundle_name</pre>
Options	 create — Creates a support bundle name bundle_name — Name of the support bundle
Usage Example	This command takes a snapshot of current internal states including health, debug messages, and logging. Verify you have enough local storage before running this command as the file size is large. INOTE: Do not attempt any SFD operations while the support bundle is being created. Generating a support bundle is CPU intensive, could result in momentary CPU spikes, and may impact the performance of SFD.
	sfd> support_bundle createname test Starting creating support bundle. It will take few minutes to collect data Successfully created support bundle test.tar.gz at /data/nfc_support_bundle/ path

Releases

```
1.1.0 or later
```

system

Displays the overall software health.

Command	system health		
Options	None		
Usage	None		
Example	+ SFD-System-Resource + Name	+ + Value Unit	
	+ CPU Usage Memory - Available Memory - Available - %	+ 14.87 % 2540158976 bytes 30.34 %	
Available Disk (partition = / Available Disk (partition = / Network Rate 146.76 bps	/) 86.44 /) - % 89.34	Gb %	
---	--	---	
+ SFD-System-Health		++ 	
SFD-Service	Service-Status	++ Pod-Status	
<pre>config-builder-service elasticsearch external_syslog_collector fabric-orchestrator-service host-network-service infra-processors kube-state-metrics nfc.host nats nats-exporter nats-streaming prometheus prometheus-pgw nginx-exporter nginx-gw node_exporter notification-service rest-api switch-manager-service topology-service telemetry-collector-service</pre>	RUNNING - RUNNING RUNNING - - RUNNING - - - - RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING RUNNING	RUNNING RUNNING - RUNNING RUNNING	
+ System Overall Health		+	
++ DOWN ++			

Releases

1.1.0 or later

upgrade

Upgrades the SFD software to the specified image.

Command	upgrade
Options Usage	 bundle_path — Path to the bundle host server server_name — IP address of the SCP upgrade bundle host username username — Username of the remote upgrade bundle host password password — SCP password of the remote upgrade bundle host This command is used to upgrade SFD software by preserving the fabric intent and other configurations across software versions. It is recommended that you create and save a backup of SFD prior to upgrading the software (see backup). NOTE: The SmartFabric Director software cannot be downgraded to a lower version.
Example	sfd> upgrade
Releases	1.1.0 or later

Frequently asked questions

11

This information contains answers to frequently asked questions about SmartFabric Director.

Configuration

Do I need to configure the Management interface on each switch?

The Management interface must be configured and enabled on each switch in the fabric (see Management interface).

How do I view switch port profile configuration?

Lifecycle

How do I add a switch group?

See Define switch group for complete information.

Where can I view the status of my image update job?

See Schedule switch lifecycle job for complete information.

Administration

I cannot connect to my image server.

See Specify image servers for complete information.

Maintenance

How can I backup and restore SmartFabric Director?

SmartFabric Director supports back and restore to allow the software to return to a golden configuration at any time. Once the fabric has been defined, configured, and the behavior is verified the operator can use <code>backup</code> create to backup the SFD data including the fabric intent. See backup for complete information.

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