

Dell Connectrix[®] Cisco Nexus Dashboard Fabric Controller

Version 12.1.2e

Release Notes

Rev 03
May 1, 2023

The Dell Connectrix Cisco Nexus Dashboard Fabric Controller (NDFC) Release Notes contains information that is exclusive to NDFC Storage (SAN) functionality as a management tool for NX-OS MDS 9000 Family switches. Use this document in conjunction with related Nexus Dashboard Fabric Controller documentation located on <http://cisco.com>.

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Revision history

The following table presents the revision history of this document.

Revision	Release	Date	Description
Rev 03	12.1.2e	May 1, 2023	New Release
Rev 02	12.1.1e	June 27, 2022	New Release
Rev 01	12.0(2f)	February 07, 2022	New Release

Product description

Cisco Data Center Network Manager (DCNM) is renamed as Cisco Nexus Dashboard Fabric Controller (NDFC) from Release 12.0.1a.

Cisco Nexus Dashboard Fabric Controller is the comprehensive management solution for all NX-OS deployments spanning LAN Fabric, SAN, and IP Fabric for Media (IPFM) networks in data centers powered by Cisco. Cisco Nexus Dashboard Fabric Controller also supports other devices, such as IOS-XE switches, IOS-XR routers, and non-Cisco devices. Being a multi-fabric controller, Cisco Nexus Dashboard Fabric Controller manages multiple deployment models like VXLAN EVPN, Classic 3-Tier, Routed based fabrics for LAN while providing ready-to-use control, management, monitoring, and automation capabilities for all these environments. In addition, Cisco NDFC when enabled as a SAN Controller, automates Cisco MDS Switches and Cisco Nexus Family infrastructure in NX-OS mode.

Nexus Dashboard Fabric Controller primarily focuses on Control and Management for three primary market segments:

- ◆ LAN networking including VXLAN, Multi-site, Classic Ethernet, and External Fabrics supporting Cisco Nexus switches running standalone NX-OS, with additional support for IOS-XR, IOS-XE and adjacent Host, Compute, Virtual Machine, and ContainerManagement systems.
- ◆ SAN networking for Cisco MDS and Cisco Nexus switches running standalone NX-OS, including support for integration with storage arrays and additionally Host, Compute, Virtual Machine, and Container Management systems.
- ◆ Media Control for Multicast Video production networks running Cisco Nexus switches operated as standalone NX-OS, with additional integrations for 3rd party media control systems.

Previously, DCNM was an application server running on a VM deployed via OVA or ISO, a physical appliance deployed via ISO, or software installed on a qualified Windows or Linux machine.

Cisco Nexus Dashboard Fabric Controller, Release 12 is available as an application running exclusively on top of the Cisco Nexus Dashboard Virtual or Physical Appliance.

Virtual Nexus Dashboard deployment with OVA is also referred to as virtual Nexus Dashboard (vND) deployment, while deployment of Nexus Dashboard on physical appliance (Service Engine) is known as physical Nexus Dashboard (pND) deployment. To deploy Nexus Dashboard based on your requirement, refer to [Cisco Nexus Dashboard Deployment Guide](#).

Beginning with Release 12, Cisco Nexus Dashboard Fabric Controller has a single installation mode. Post installation, it supports selection from multiple personas at run-time. After the Nexus Dashboard Fabric Controller Release 12.1.2e is installed, you can choose from one of the following personas:

- ◆ Fabric Discovery-Discover, Monitor, and Visualize LAN Deployments.
- ◆ Fabric Controller-LAN Controller for Classic Ethernet (vPC), Routed, VXLAN, and IP Fabric for Media Deployments.
- ◆ SAN Controller-SAN Controller for MDS and Nexus switches. Enhanced SAN Analytics with streaming telemetry.

All features/services are modularized, broken into smaller microservices, and the required microservices are orchestrated based on the feature set or feature selections. Therefore, if any feature or microservice is down, only that microservice is restarted and recovered, resulting in minimal disruption.

In contrast to the previous DCNM Active-Standby HA model, Cisco NDFC introduces Active-Active HA deployment model utilizing all three nodes for deploying microservices. This has significant improvement in both latency and effective resource utilization.

For NDFC to run on top of virtual Nexus Dashboard (vND) instance, you must enable promiscuous mode on port groups associated with Nexus Dashboard interfaces where External Service IP addresses are specified. vND comprises of Nexus Dashboard management interface and data interface. By default, for LAN deployments, 2 external service IP addresses are required for the Nexus Dashboard management interface subnet. Therefore, you must enable promiscuous mode for the associated port-group. If inband management or EPL is enabled, you must specify External Service IP addresses in the Nexus Dashboard data interface subnet.

The promiscuous mode also needs to be enabled for the Nexus Dashboard data/fabric interface port-group. For NDFC SAN Controller, promiscuous mode only needs to be enabled on the Nexus Dashboard data interface associated port-group. For more information, refer to [Cisco Nexus Dashboard Fabric Controller Deployment Guide](#).

For more information, see [Cisco Nexus Dashboard Fabric Controller](#) (Formerly DCNM).

As always in a Dell environment, refer to the Dell Support Matrix available through E-Lab™ Interoperability Navigator at: <https://elabnavigator.dell.com/eln/elnhome> for the latest information on supported configurations.

The answers to many DCNM or NDFC related questions can be found in the Dell Knowledgebase located at Dell Online Support at:

<http://www.dell.com/support>.

New features and changes

New Features and Enhancements in Cisco NDFC, Release 12.1.2e

The following preview features are available in Cisco NDFC Release 12.1.2e for Fabric Controller persona:

Table 1 Preview Features for Fabric Controller Persona in Cisco NDFC Release 12.1.2e

Product Impact	Features	Description
Ease of Use	Private VLAN support for VXLAN EVPN fabrics	NDFC can now be used to easily provision private- VLANs in a Data Center VXLAN EVPN fabric. The overlay network deployment workflow has been enhanced to support flexible provisioning of primary and secondary VLANs on appropriate VTEPs. All provisioning options supported for the private-VLAN feature on NX-OS, are available in NDFC.
	Enhanced Classic LAN Fabric support	A new fabric has been introduced for automated provisioning of 3-tier Access-Aggregation-Core related vPC deployments. This includes easy provisioning of FHRP and VRF Lite connectivity on the Aggregation-Core tiers. Current support is for greenfield deployments of Nexus 7000 and 9000 switches. The LAN Classic, Enhanced Classic, and External Connectivity Network fabrics can be part of a Fabric Group.

Common Enhancements to all Personas

The following features are new in Cisco NDFC Release 12.1.2e for all personas in Cisco Nexus Dashboard Fabric Controller.

Table 2 Features in Cisco NDFC Release 12.1.2e

Product Impact	Features	Description
Ease of Use	Disable Promiscuous mode for virtual Nexus Dashboard (vND) deployments	From Release 12.1.2e, you can disable promiscuous mode on port groups associated with the vND management and data interface vNICs. All features that use persistent IP will continue to work even for Layer-2 adjacent vND deployments.
	Elasticsearch to Open Search database	From Release 12.1.2e, NDFC uses an OpenSearch database for storing time series data. As part of the upgrade process from prior NDFC releases, data is seamlessly migrated from Elasticsearch to OpenSearch.
	Inline Backup Restore	This feature enables you to perform a config-only restore on an existing NDFC system using a prior backup. The backup itself may be a full backup or a config-only backup. In prior releases, a restore from a backup file, could only be performed on a freshly installed NDFC, with no persona enabled. Now you can also restore the backup on an In-Service system where some persona has already been enabled.
Interoperability	NDFC with Nexus Dashboard QCOW2 deployments on KVM hypervisor on RHEL Release 8.6	NDFC can be installed on a virtual Nexus Dashboard cluster running on top of KVM hypervisor running on top of CentOS and RHEL operating systems. All 3 personas namely, Fabric Controller, Fabric Discovery, and SAN Controller are supported. For more information about deploying a cluster, see Cisco Nexus Dashboard Deployment Guide .
Performance and Scalability	Resource Utilization for MinIO and CockroachDB	NDFC Release 12.1.2e uses CockroachDB which is a distributed SQL database primarily for configuration data. It uses MinIO as an object store for storing blob files like switch images, patches, and so on. Both CockroachDB and MinIO export statistics that are collected and made available on Nexus Dashboard Web UI > Infrastructure > Resource Utilization , dashboards namely, CockroachDB and Minio Overview .
Licensing	NDFC Licensing for 3rd Party Devices	NDFC licenses for 3rd party devices will be supported in the DCN 3rd Party Essentials License tier. Customers can now purchase the DCN 3rd Party Essentials for Arista devices onboarded into NDFC.

Fabric Controller Enhancements

The following features are new in Cisco NDFC Release 12.1.2e for the Fabric Controller:

Table 3 Fabric Controller Enhancements in Cisco NDFC Release 12.1.2e (page 1 of 2)

Product Impact	Features	Description
Ease of Use	Configuring IP Prefix list	IP Prefix lists allow route filtering and/or redistribution of routes that are exchanged between routing domains. A prefix list contains one or more IPv4 or IPv6 network prefixes, the associated prefix length values, and various matching parameters. NDFC now allows users to create and manage IP prefix lists natively using pre-packaged best-practices prefix list templates.
	Configuring Native VLAN for ethernet interfaces without using freeform configuration	This feature allows you to configure native VLAN for trunk interfaces. A Native VLAN field has been added to the int_trunk_host template to allow users to set the field directly.
	Interface Group Support with Policy Inheritance	NDFC 12.1.2e allows you to now optionally associate a shared interface policy with an Interface Group. The same shared policy is automatically inherited by all the interfaces that are members of a given interface group. This functionality is currently supported for Ethernet trunk interfaces.
	Interface group support for Layer-2 ToRs	The Interface Group functionality has been extended to allow ToR switch trunk interfaces along with the leaf trunk interfaces, as members. This allows for easy deployment of overlay networks across any kind of leaf-ToR VXLAN EVPN deployments.
	Secure POAP	NDFC now allows touchless Day-0 bring-up of Nexus 9000 devices via secure POAP using HTTPs. To support interoperability scenarios, NDFC can simultaneously support POAP with some switches using the traditional HTTP transport option versus POAP for other switches using the secure HTTPS transport option.
	Support for additional DHCP relay servers for overlay networks	NDFC 12.1.2e supports a maximum of 16 DHCP relay servers for overlay networks in Data Center VXLAN EVPN fabrics.
	Support to specify and honor pre-provisioned links	Additional parameters such as MTU, speed, and so on. are introduced with the existing pre-provisioned link template that provisions planned fabric links in Data Center VXLAN EVPN fabrics. These parameters are preserved during subsequent Recalculate & Deploy after the device has completed bootstrap.

Table 3 Fabric Controller Enhancements in Cisco NDFC Release 12.1.2e (page 2 of 2)

Product Impact	Features	Description
Interoperability	Hybrid Cloud Connectivity	NDFC now provides hybrid cloud connectivity of VXLAN EVPN on-premises fabrics to the public cloud (AWS or Azure). NDFC also provisions the IPsec IPN devices (ASR 1000, Catalyst 8000V and so on) on the on-premises side. The public cloud connectivity is managed via the Cloud Network Controller. Nexus Dashboard Orchestrator is used to orchestrate connectivity between on-premises and cloud sites via the NDFC and CNC respectively. VXLAN over an optional IPsec tunnel is used as the data plane while BGP EVPN is used as the control plane.
Performance and Scalability	Scale Enhancements	The following enhancements are introduced with Release 12.1.2e: • Support for 500 switches in Easy Fabrics (Data Center VXLAN EVPN and BGP Fabrics) and 1000 switches in External Fabrics (Flexible Network fabrics, Classic LAN fabrics, External Connectivity Network fabrics, and Multi-Site Interconnect Network fabrics) • Supports 200 switches per fabric. • Enhanced VNI Scale (2500 Layer-2 only Networks or 500 VRFs and 2000 Layer-3 Networks), 4K Networks (VNIs) on a single switch. For more information, see Cisco NDFC Verified Scalability Guide .

Fabric Controller with IP Fabric for Media (IPFM) Enhancements

The following features are new in Cisco NDFC Release 12.1.2e for the Fabric Controller with IP Fabric for Media (IPFM).

Table 4 Fabric Controller with IPFM Enhancements (page 1 of 2)

Product Impact	Features	Description
Performance and Scalability	PTP monitoring in scaled deployments	This feature provides flexibility to enable or disable notifications when the system encounters high volume of correction events. By default, high correction notification is disabled. You can also configure the frequency for generating notifications.
Ease of Use	Dynamic allocation of host port IPs using defined switch level pool	NDFC allows you to export the selected interfaces with different types of policies. However, you can import many interfaces with the same policy, at one go.
Performance and Scalability	RTP flow monitoring enhancement	From Release 12.1.2e, a new hyperlink is introduced to switches in RTP/EDI Flow Monitor > Active Flows to view end-to-end flow topology for each fabric. If there are multiple receivers, you can choose a receiver from the Select Receiver drop-down list to view the topology for that receiver.

Table 4 Fabric Controller with IPFM Enhancements (page 2 of 2)

Product Impact	Features	Description
Performance and Scalability	NBM mode support changes in default and user-defined VRFs	Release 12.1.2e allows configuring and monitoring of both NBM active and passive VRFs in IPFM fabrics.

SAN Controller Enhancements

The following features are new in Cisco Nexus Dashboard Fabric Controller Release 12.1.2e for the SAN Controller.

Table 5 SAN Controller Enhancements (page 1 of 2)

Product Impact	Features	Description
Interoperability	Support for NDFC with Nexus Dashboard on RHEL 8.6	From Release 12.1.2e, NDFC is supported with Nexus Dashboard deployed on Red Hat Enterprise Linux (RHEL) 8.6 version. NDFC SAN Controller is supported with without SAN Insights.
Performance and Scalability	Enhancements to SAN Insights	- Enhanced scale supports up to 1M ITLs/ITNs. - You can modify, activate, or utilize data of SAN Insights anomaly policies which are in inactive state. - VM information from VMware vCenter discovery is combined with SAN Insight Data to provide end-to-end visibility from - VM to LUNs.
Ease of Use	Enhancements to Zoning	- From Release 12.1.2e, you can click Topology icon next to the Zone name to view Zone Topology. The topology is displayed in a hierarchical left-right layout by default. - A column is introduced to display the port status.
Ease of Use	FC Name Server	Name Server stores name entries for all hosts in the FCNS database. The Name Server tab displays name server entries for the selected Fabric. Note that this data is pulled from the Switches discovery, and therefore, the duplicate entries are removed.
Ease of Use	DIRL Congestion management enhancements	- From Release 12.1.2e, DIRL is supported with NPV switches also. - DIRL specifies the interface on which the analysis is collected. You can view the trend, which provides information about Ingress, Egress, DIRL counter(s) values of the current DIRL with event timestamps for the selected DIRL interface.

Table 5 SAN Controller Enhancements (page 2 of 2)

Product Impact	Features	Description
Ease of Use	Host and Storage Dashboard display discovery source information	On the Host and Storage Dashboards, a new icon is introduced next to the host name and storage name that displays the type of discovery. It displays if the enclosure is from a VMware vCenter or storage or FC discovery.
Ease of Use	Configuration Drift	A new monitoring job is executed daily to check for differences in baseline configuration and current configuration. Configuration Drift feature displays Yes when there is a difference between baseline and current configuration and an appropriate alarm is raised.
Ease of Use	UCS discovery	From Release 12.1.2e, NDFC allows you to discover switches using UCS credentials.

New Hardware Features

The following new hardware is supported with Cisco Nexus Dashboard Fabric Controller Release 12.1.2e:

- ◆ N9K-C9808 – Cisco Nexus 9800 Series 8 Slot Chassis switch
- ◆ N9K-C9348D-GX2A – Cisco Nexus 9348D-GX2A Switch with 48p 400/100-Gbps QSFP-DD ports and 2p 1/10 SFP+ ports
- ◆ N9K-C9408 – 4RU 8-slot LEM-based modular Cisco Nexus 9408 switch
- ◆ DS-C9124V-K9 - Cisco MDS 9124V 64-Gbps 24-Port Fibre Channel Switch
- ◆ DS-C9148V-K9 - Cisco MDS 9148V 64-Gbps 48-Port Fibre Channel Switch

Licensing Model

Two types of Cisco DCNM-SAN licenses are available:

- ◆ Cisco DCNM-SAN Essentials Edition (comparable to Cisco Fabric Manager) is included at no charge with every Cisco MDS 9000 hardware purchase. No license is required to use these features because they are unlocked with the image.
- ◆ Cisco DCNM-SAN Advanced Edition (comparable to Cisco Fabric Manager Server) provides additional capabilities and is required to use the Virtual Machine Topology and Performance feature and the Performance Forecasting Charts feature. The Advanced Edition licenses have the following part numbers:

Product Name	Part Number
DCNM for SAN Advanced Edition for MDS 9700	DCNM-SAN-M97EK9
DCNM for SAN Advanced Edition for MDS 9500	DCNM-SAN-M95EK9

DCNM for SAN Advanced Edition for MDS 9200	DCNM-SAN-M92EK9
DCNM for SAN Advanced Edition for MDS 9100	DCNM-SAN-M91EK9

For a description of the license differences between Fabric Manager and Data Center Network Manager, refer to the following tech note:

<https://www.cisco.com/c/en/us/td/docs/dcn/ndfc/1201/licensing/smart-licensing-using-policy-for-cisco-ndfc-1201.html>

Fixed problems

Cisco-specific caveats for resolved problems can be found in the Cisco release-noted documentation at the following Cisco website:

http://www.cisco.com/en/US/products/ps9369/tsd_products_support_series_home.html

Environment and system requirements

The following sections describes the various system requirements for the proper functioning of your Cisco Nexus Dashboard Fabric Controller, Release 12.1.2e:

- ◆ “Cisco Nexus Dashboard Version Compatibility” on page 10
- ◆ “Nexus Dashboard Server Resource (CPU/Memory) Requirements” on page 10
- ◆ “Nexus Dashboard Networks” on page 11
- ◆ “Virtual Nexus Dashboard (vND) Prerequisites” on page 12
- ◆ “Supported Latency” on page 13
- ◆ “Cisco Nexus Dashboard Version Compatibility” on page 10

Cisco Nexus Dashboard Version Compatibility

Cisco Nexus Dashboard Fabric Controller (NDFC) requires Nexus Dashboard version 2.3.2b or higher. If you try to upload NDFC 12.1.2e on a Nexus Dashboard version earlier than 2.3.2b, you will not be allowed to upload the application. To download the correct version of Nexus Dashboard, visit Software Download - Nexus Dashboard.

Nexus Dashboard Server Resource (CPU/Memory) Requirements

The following table provides information about Server Resource (CPU/Memory) Requirements to run NDFC on top of Nexus Dashboard. Refer to Nexus Dashboard Capacity Planning to determine the number of switches supported for each deployment.

Cisco Nexus Dashboard can be deployed using number of different form factors. NDFC can be deployed on the following form factors:

- ◆ pND - Physical Nexus Dashboard
- ◆ vND - Virtual Nexus Dashboard
- ◆ rND - RHEL Nexus Dashboard

Table 6 Server Resource (CPU/Memory) Requirements to run NDFC on top of ND

Deployment Type	Node Type	CPUs	Memory	Storage (Throughput: 40-50MB/s)
Fabric Discovery	Virtual Node (vND) - app OVA	16vCPUs	64GB	550GB SSD
	Physical Node (pND) (PID: SE-NODE-G2)	2x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4x 2.4TB HDDs 400GB SSD 1.2TB NVME drive
Fabric Controller	Virtual Node (vND) - app OVA	16vCPUs	64GB	550GB SSD
	Physical Node (pND) (PID: SE-NODE-G2)	2x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4x 2.4TB HDDs 400GB SSD 1.2TB NVME drive
SAN Controller	Virtual Node (vND) - app OVA (without SAN Insights)	16vCPUs	64GB	550GB SSD
	Data Node (vND) - Data OVA (with SAN Insights)	32vCPUs	128GB	3TB SSD
	Physical Node (pND) (PID: SE-NODE-G2)	2x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4x 2.4TB HDDs 400GB SSD 1.2TB NVME drive

Nexus Dashboard Networks

When first-configuring Nexus Dashboard, on every node, you must provide two IP addresses for the two Nexus Dashboard interfaces—one connected to the Data Network and the other to the Management Network. The data network is typically used for the nodes' clustering and north-south connectivity to the physical network. The management network typically connects to the Cisco Nexus Dashboard Web UI, CLI, or API.

For enabling the Nexus Dashboard Fabric Controller, the Management and Data Interfaces on a Nexus Dashboard node must be in different subnets. The interfaces between different nodes that belong to the same Nexus Dashboard cluster, must be within the same Layer-2 Network and Layer-3 subnet.

Connectivity between the Nexus Dashboard nodes is required on both networks with the round-trip time (RTT) not exceeding 50ms. Other application running on the same Nexus Dashboard cluster may have lower RTT requirements and you must always use the lowest RTT requirement when deploying multiple applications in the same Nexus Dashboard cluster. We recommend consulting the [Cisco Nexus Dashboard Deployment Guide](#) for more information.

Table 7 Network Requirements for NDFC on Nexus Dashboard

Management Interface	Data Interface	Persistent IPs
Layer 2 adjacent	Layer 2 adjacent	One of the following for LAN: • 2 IPs in management network if using the default LAN Device Management Connectivity setting • 2 IPs in data network if setting LAN Device Management Connectivity to Data Plus one IP per fabric for EPL in data network Plus one IP for Telemetry receiver in data or management network if IP Fabric for Media is enabled. For SAN: • 2 IPs in data network Plus one IP per node in data network for SAN Insights receiver if enabled.
Layer 3 adjacent	Layer 3 adjacent	For LAN: • LAN Device Management Connectivity on NDFC must be set to Data • 2 IPs for SNMP/Syslog and SCP/POAP services • Plus one IP per fabric for EPL These IPs must be part of a subnet that is different from Nexus Dashboard management and Nexus Dashboard data subnets associated with any of Nexus Dashboard nodes. These IPs must belong to the Layer-3 External Persistent Service Pool. Note: SAN Controller and IP Fabric for Media modes are not supported in this deployment.

Virtual Nexus Dashboard (vND) Prerequisites

For virtual Nexus Dashboard deployments, each vND node has 2 interfaces or vNICs. The Data vNIC maps to bond0 (also known as bond0br) interface and Management vNIC maps to bond1 (also known as bond1br) interface. The requirement is to enable/accept promiscuous mode on the port groups associated with the Nexus Dashboard Management and/or Data vNICs where IP stickiness is required. The Persistent IP addresses are given to the pods (e.g., SNMP Trap/Syslog receiver, Endpoint Locator instance per Fabric, SAN Insights receiver, etc.). Every POD in Kubernetes can have multiple virtual interfaces. Specifically for IP stickiness, an extra virtual interface is associated with the POD that is allocated an appropriate free IP from the external service IP pool. The vNIC has its own unique MAC address that is different from the MAC addresses associated with the vND virtual vNICs. Moreover, all North-to-South communication to and from these PODs go out of the same bond interface. By default, the VMware ESXi systems check if the traffic flows out of a particular VM vNIC matches the Source-MAC associated with that vNIC. In the case of NDFC pods with an external service IP, the traffic flows are sourced with the Persistent IP addresses of the given PODs that map to the individual POD MAC

associated with the virtual POD interface. Therefore, we need to enable the required settings on the VMware side to allow this traffic to flow seamless in and out of the vND node.

When vND nodes are deployed with the new Layer-3 HA feature, you need not enable Promiscuous mode on the vND vNIC interfaces. Promiscuous mode is required only for vND deployments when the vNDs are layer-2 adjacent from each other.

For more information, refer to [Cisco Nexus Dashboard Deployment Guide](#).

Supported Latency

As Cisco Nexus Dashboard Fabric Controller is deployed atop Cisco Nexus Dashboard, the latency factor is dependent on Cisco Nexus Dashboard. Refer to [Cisco Nexus Dashboard Deployment Guide](#) for information about latency.

Supported Web Browsers

Cisco Nexus Dashboard Fabric Controller is supported on the following web browsers:

- ◆ Google Chrome version 109.0.5414.87 (64 bit)
- ◆ Microsoft Edge version 109.0.1518.61 (64 bit)
- ◆ Mozilla Firefox version 108.0.1 (64 bit)

Other Supported Software

The following table lists the other software that is supported by Cisco Nexus Dashboard Fabric Controller Release 12.1.2e.

Table 8 Other software supported by Cisco Nexus Fabric Controller Release 12.1.2e

Component	Features
Security	• ACS versions 4.0, 5.1, 5.5, and 5.8 • ISE version 2.6 • ISE version 3.0 • Telnet Disabled: SSH Version 1, SSH Version 2, Global Enforce SNMP Privacy Encryption. • Web Client: HTTPS with TLS 1, 1.1 and 1.2 • TLS 1.3

In addition, Cisco NDFC supports the following types of events: Dell Call Home events, fabric change events, and events that are forwarded by traps and email.

Hardware supported

The following table lists the products and components that Cisco NDFC Release 12.1.2e supports.

Table 9 Hardware features supported by Cisco NDFC Release 12.1.2e (page 1 of 2)

Product/Component	Part Number
Cisco MDS 9718 Supervisor-1E Modules	DS-X97-SF1-K9
Cisco MDS 9710 Crossbar Fabric-3 Switching Module	DS-X9710-FAB3
Cisco MDS 9700 Series Supervisor-4 Module	DS-X97-SF4-K9
MDS 9706 Crossbar Switching Fabric-3 Module	DS-X9706-FAB3
Cisco MDS 9396T 32 Gbps 96-Port Fibre Channel Switch	DS-C9396T-K9
Cisco MDS 9148T 32 Gbps 48-Port Fibre Channel Switch	DS-C9148T-K9
Cisco MDS 9700 48-Port 32-Gbps Fibre Channel Switching Module	DS-X9648-1536K9
Cisco MDS 9700 64-Gbps 48-port Fibre Channel Switching Module	DS-X9748-3072K9
Cisco MDS 9250i Multilayer Fabric Switch	DS-9250I-K9
Cisco MDS 9124 24-Port Multilayer Fabric Switch	DS-C9124-K9
Cisco MDS 9134 34-Port Multilayer Fabric Switch	DS-C9134-K9
Cisco MDS 9148 48-Port Multilayer Fabric Switch	DS-C9148-K9
Cisco MDS 9148 48-Port Multilayer Fabric Switch	DS-C9148S-K9
Cisco MDS 9216i Multilayer Fabric Switch	DS-C9216i-K9
Cisco MDS 9222i Multilayer Fabric Switch	DS-C9222i-K9
Hardware features supported by Cisco NDFC Release 12.0.(2f)	DS-C9220I-K9
MDS 9506 Multilayer Director	DS-C9506
Cisco MDS 9509 Multilayer Director	DS-C9509
Cisco MDS 9513 Multilayer Director	DS-C9513
Cisco MDS 9706 Multilayer Director	DS-C9706
Cisco MDS 9710 Multilayer Director	DS-C9710
Cisco MDS 9718 Multilayer Director	DS-C9718
Cisco MDS 9000 32-Port 2-Gbps Fibre Channel Switching Module	DS-X9032
Cisco MDS 9000 32-Port Storage Services Module	DS-X9032-SSM
Cisco MDS 9000 12-port 4-Gbps Fibre Channel Switching Module	DS-X9112
Cisco MDS 9000 12-port 4-Gbps Fibre Channel Switching Module	DS-X9112

Table 9 Hardware features supported by Cisco NFDC Release 12.1.2e (page 2 of 2)

Product/Component	Part Number
Cisco MDS 9000 12-port 4-Gbps Fibre Channel Switching Module	DS-X9112
Cisco MDS 9000 24-port 4-Gbps Fibre Channel Switching Module	DS-X9124
Cisco MDS 9000 48-port 4-Gbps Fibre Channel Switching Module	DS-X9148
Cisco MDS 9000 24-Port 8-Gbps Fibre Channel Switching Module	DS-X9224-96K9
Cisco MDS 9000 32-port 8-Gbps Advanced Fibre Channel Switching Module	DS-X9232-256K9
Cisco MDS 9000 48-port 8-Gbps Advanced Fibre Channel Switching Module	DS-X9248-256K9
Cisco MDS 9000 4/44-Port Host-Optimized 8-Gbps Fibre Channel Switching Module	DS-X9248-48K9
Cisco MDS 9000 48-Port 8-Gbps Fibre Channel Switching Module	DS-X9248-96K9
Cisco MDS 9000 Family 14-Port Fibre Channel and 2-port Gigabit Ethernet Module	DS-X9302-14K9
Cisco MDS 9000 18/4-Port Multiservice Module (MSM-18/4)	DS-X9304-18K9
Cisco MDS 9000 4-port 1-Gbps IP Storage Module	DS-X9304-SMIP
Cisco MDS 9000 8-port 1-Gbps IP Storage Module	DS-X9308-SMIP
Cisco MDS 9000 Family 16-Port Storage Services Node (SSN-16)	DS-X9316-SSNK9
Cisco MDS 9000 Family 24/10 SAN Extension Module	DS-X9334-K9
Cisco MDS 9000 48-port 16-Gbps Fibre Channel Switching Module with SFP LC connectors	DS-X9448-768K9
Cisco MDS 9500 Series Supervisor-1 Module	DS-X9530-SF1-K9
Cisco MDS 9500 Series Supervisor-2 Module	DS-X9530-SF2-K9
Cisco MDS 9500 Series Supervisor-2A Module	DS-X9530-SF2A-K9
Cisco MDS 9000 Family 4-Port 10-Gbps Fibre Channel Switching Module	DS-X9704
Cisco MDS 9000 8-port 10-Gbps Fibre Channel over Ethernet (FCoE) Module	DS-X9708-K9
Cisco MDS 48-Port 10-Gigabit Fibre Channel over Ethernet (FCoE) Module with SFP LC connectors	DS-X9848-480K9
Cisco MDS 9132T 32-Gbps 32-Port Fibre Channel Switch	DS-C9132T-K9
Cisco MDS 9148V 64-Gbps 48-Port Fibre Channel Switch	DS-C9148V-K9
Cisco MDS 9124V 64-Gbps 24-Port Fibre Channel Switch	DS-C9124V-K9

Compatibility with Cisco MDS 9000 Family Switches

The following table shows the Cisco NDFC Compatibility Matrix for Release 12.1.2e.

Table 10 Cisco NDFC Compatibility Matrix

Switches	Supported Switch Releases
Cisco MDS 9100	9.2(1), 8.4(2c), 8.5(1), 6.2(33), 8.4(2b), 8.1(1b), 6.2(31), 6.2(29), 8.4(2a), 8.4(2), 8.4.(1a), 6.2(29), 8.4(1), 6.2(27), 8.3(2), 8.3(1), 8.2(2), 8.2(1), 8.1(1a), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 6.2(11c), 6.2(11b), 6.2(11), 6.2(9c), 6.2(9b), 6.2(9a), 6.2(9), 6.2(7), 6.2(5a), 6.2(5), 6.2(3), 6.2(1), 5.2(8i), 5.2(8h), 5.2(8g), 5.2(8f), 5.2(8e), 5.2(8d), 5.2(8c), 9.2(2), 8.4(2d) 8.4(2f), 9.3(1), 9.3(2)
Cisco MDS 9200	8.5(1), 8.3(2), 8.3(1), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 6.2(11c), 6.2(11b), 6.2(11), 6.2(9c), 6.2(9b), 6.2(9a), 6.2(9), 6.2(7), 6.2(5a), 6.2(5), 6.2(3), 6.2(1), 5.2(8h), 5.2(8c), 5.2(8d), 5.2(8e), 5.2(8f), 5.2(8g), 9.2(2), 8.4(2d), 8.4(2f), 9.3(1), 9.3(2)
Cisco MDS 9250i	9.2(1), 8.4(2c), 8.5(1), 8.4(2b), 8.4(2a), 8.4(2), 8.1(1b), 8.4.(1a), 6.2(31), 6.2(29), 8.4(1), 6.2(27), 8.3(2), 8.3(1), 8.2(2), 8.2(1), 8.1(1a), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 6.2(11c), 6.2(11b), 6.2(11), 6.2(9c), 6.2(9b), 6.2(9a), 6.2(9), 6.2(7), 6.2(5a), 6.2(5), 9.2(2), 8.4(2d), 8.4(2f), 9.3(1), 9.3(2)
Cisco MDS 9220i	9.2(1), 8.5(1), 9.2(2), 8.4(2d) 8.4(2f), 9.3(1), 9.3(2)
Cisco MDS 9300	9.2(1), 8.4(2c), 8.5(1), 6.2(33), 8.4(2b), 8.1(1b), 6.2(31), 6.2(29), 8.4(2a), 8.4(2), 8.4(1a), 6.2(29), 8.4(1), 6.2(27), 8.3(2), 8.3(1), 8.2(2), 8.2(1), 8.1(1a), 8.1(1), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 9.2(2), 8.4(2d), 8.4(2f), 9.3(1), 9.3(2)
Cisco MDS 9500	6.2(33), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(31), 6.2(29), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 6.2(11c), 6.2(11b), 6.2(11), 6.2(9c), 6.2(9b), 6.2(9a), 6.2(9), 6.2(7), 6.2(5a), 6.2(5), 6.2(3), 6.2(1), 5.2(8h), 5.2(8c), 5.2(8d), 5.2(8e), 5.2(8f), 5.2(8g)
Cisco MDS 9700	9.2(1), 8.4(2c), 8.5(1), 6.2(33), 8.4(2b), 8.1(1b), 6.2(31), 6.2(29), 8.4(2a), 8.4(2), 8.4(1a), 6.2(29), 8.4(1), 6.2(27), 8.3(2), 8.3(1), 8.2(2), 8.2(1), 8.1(1a), 8.1(1), 7.3(1)DY(1), 7.3(1)D1(1), 7.3(0)DY(1), 7.3(0)D1(1), 6.2(25), 6.2(23), 6.2.(21), 6.2(19), 6.2(17), 6.2(15), 6.2(13b), 6.2(13a), 6.2(13), 6.2(11c), 6.2(11b), 6.2(11), 6.2(9c), 6.2(9b), 6.2(9a), 6.2(9), 6.2(7), 6.2(5a), 6.2(5), 6.2(3), 6.2(1), 9.2(2), 8.4(2d), 8.4(2f), 9.3(1), 9.3(2)

Known problems and limitations

For a list of problems with this release, please refer to the Cisco release notes located at:

<https://www.cisco.com/c/en/us/support/cloud-systems-management/prime-data-center-network-manager/series.html>

Technical notes

This section contains technical notes.

Dell Email Home for Cisco MDS switches

Configuration and troubleshooting instructions, prerequisites, and other caveats can be found in the Dell Connectrix Procedure Generator. The Connectrix Procedure Generator can be downloaded from Dell Online Support, <https://www.dell.com/support>. Search for **Connectrix Procedure Generator**.

Customers requiring installation of this solution should contact their Dell EMC Customer Engineer to assist with the installation and provide the documentation.

Documentation

Send documentation comments to www.cisco.com.

Location of Cisco NDFC documentation

The Cisco NDFC documentation is available at the following URL:

<https://www.cisco.com/c/en/us/support/cloud-systems-management/prime-data-center-network-manager/series.html>

The documentation set for Cisco NDFC includes the following Cisco NDFC release 12.x documents:

- ◆ Release Notes:
 - Cisco NDFC Release Notes, release 12.1.2x
 - Cisco NDFC Release Notes, release 12.1.1x
 - Cisco NDFC Release Notes, Release 12.0.2.x
- ◆ Installation and Licensing
 - Cisco NDFC OVA Installation Guide, Release 12.1.2x
- ◆ Cisco NDFC Fundamentals Guide
 - Cisco NDFC Configuration, Release 12.1.2x
- ◆ Cisco NDFC REST API Guide
 - Cisco NDFC REST API Guide, Release 12.1.2x
- ◆ Cisco NDFC Troubleshooting Guide

<https://www.cisco.com/c/en/us/support/cloud-systems-management/prime-data-center-network-manager/series.html>

Software media, organization, and files

For information on related software environment and system requirements refer to the *Dell Support Matrix* located on E-Lab Interoperability Navigator at <https://elabnavigator.dell.com/eln/modernHomeSSM>, under the **PDFs and Guides** tab.

To download the latest Nexus Dashboard Fabric Controller software, navigate to Dell Online Support, <https://www.dell.com/support>. Search for **Nexus Dashboard Fabric Controller**.

Deployment Options

The following deployment options are available for Cisco Nexus Dashboard Fabric Controller

NDFC on Single node (non-HA Cluster)

On Single node Nexus Dashboard, you can deploy NDFC with the following personas:

- ◆ Fabric Discovery for lab/non-production environments (<= 25 switches)
- ◆ Fabric Controller for lab/non-production environments (<= 25 switches)
- ◆ Fabric Controller in IP Fabric for Media controller mode for production environments
- ◆ SAN Controller for production environments (<= 80 switches)

Note: Fabric Controller/Fabric Discovery deployment is for Lab purposes only. Do not deploy this in your production environment.

NDFC on a 3-node virtual (vND) or physical (pND) Nexus Dashboard Cluster (Active-Active HA mode)

On 3-Node Nexus Dashboard, you can deploy NDFC with the following personas:

- ◆ Fabric Discovery
- ◆ Fabric Controller
- ◆ SAN Controller with or without SAN Insights

Note: For NDFC deployments, the Nexus Dashboard node should have a different subnet on the management interface and the data/fabric interface. In addition, in a 3-node Nexus Dashboard cluster, all Nexus Dashboard nodes should be layer-2 adjacent. In other words, the 3 Nexus Dashboard nodes must all belong to the same management and data networks respectively. In summary, Nexus Dashboard Fabric Controller is not supported on Nexus Dashboard nodes that are deployed with management and data networks using overlapping subnets.

NDFC on a 5-node vND Cluster (Active-Active HA mode)

In release 12.1.1e and later, on 5-Node Nexus Dashboard, you can deploy NDFC with the following personas:

- ◆ Fabric Discovery
- ◆ Fabric Controller

NDFC on a 3-node virtual (vND) or physical (pND) Nexus Dashboard Cluster (Active-Active HA mode)

On 3-Node Nexus Dashboard, you can deploy NDFC with the following personas:

- ◆ Fabric Discovery
- ◆ Fabric Controller
- ◆ SAN Controller with or without SAN Insights

Note: For NDFC deployments, the Nexus Dashboard node should have a different subnet on the management interface and the data/fabric interface. In addition, in a 3-node Nexus Dashboard cluster, all Nexus Dashboard nodes should be layer-2 adjacent. In other words, the 3 Nexus Dashboard nodes must all belong to the same management and data networks respectively. In summary, Nexus Dashboard Fabric Controller is not supported on Nexus Dashboard nodes that are deployed with management and data networks using overlapping subnets.

NDFC on a 5-node vND Cluster (Active-Active HA mode)

In release 12.1.1e and later, on 5-Node Nexus Dashboard, you can deploy NDFC with the following personas:

- ◆ Fabric Discovery
- ◆ Fabric Controller

On a 4-node or 5-node Nexus Dashboard, you can deploy Nexus Dashboard Insights (NDI) along with NDFC with the following personas:

- ◆ NDI and NDFC in Fabric Discovery persona (NDFC-Monitored mode) – 4 pND nodes
- ◆ NDI and NDFC in Fabric Controller persona (NDFC-Managed mode) – 5 pND nodes

NDFC on a Nexus Dashboard running on top of Red Hat Enterprise Linux (RHEL)

From Release 12.1.2e, on a 1-node or 3-node Nexus Dashboard on the RHEL server, you can deploy NDFC with the following persona:

- ◆ SAN Controller with or without SAN Insights

NDFC on a virtual Nexus Dashboard (vND) with KVM hypervisor

NDFC on a virtual Nexus Dashboard (vND) with KVM hypervisor supports Fabric Controller, Fabric Discovery, and SAN Controller personas.

In the 3-node and 5-node deployment, there are 3 Nexus Dashboard master nodes. In the 5-node deployment, the additional 2 nodes serve as worker nodes. The 3-node or 5-node cluster deployment is an active-active solution, that is, all nodes are utilized to run micro-services of Nexus Dashboard Fabric Controller. When a node fails, microservices running on the node, are moved to the other nodes. Nexus Dashboard Fabric Controller will perform normally under one node failure scenarios. However, it is expected that there will be a brief disruption to services that must be migrated on node failure. After the migration of services is complete, the supported scale will continue to function albeit at degraded performance. To restore optimal NDFC performance, a system running with one failed node is not the desired situation and must be rectified at the earliest. A 3-node or 5-node cluster cannot tolerate failure of two nodes and all NDFC services will be disrupted.

For virtual Nexus Dashboard OVA deployments on ESXi environments, it is imperative that promiscuous mode is enabled on the port groups associated with Nexus Dashboard management and Nexus Dashboard data/fabric interfaces. Otherwise, some of the functionality such as SNMP trap, Image management, Endpoint Locator, SAN Insights and so on will not work.

For more information on Installation, refer to

<https://www.cisco.com/c/en/us/td/docs/dcn/ndfc/1202/installation/cisco-ndfc-inst-all-and-upgrade-guide-1202.html>

Deployment Profile Simplification

Deployment Profile Simplification Overview

Nexus Dashboard deployment profile simplification is intended to help streamline the onboarding of services against a given deployment scale and relieve the task of remembering the cross-connect of deployments.

Beginning with Cisco Nexus Dashboard Release 2.2.1h, resource profile selection has been reduced to several more intuitive parameters directly related to your deployment use case. These parameters, such as number of switches or flows describe the fabric size and use case intent, and allow the cluster to intelligently determine the resources needed for the service. The parameters are categorized as **Network Scale**.

NDFC selects an appropriate profile from among the predefined set of profiles to match the scale.

Note: You must restart the services on the Nexus Dashboard after modifying the network scale parameters.

To view or modify the Network Scale parameters on Cisco Nexus Dashboard, perform the following steps:

1. Choose Nexus **Dashboard > Cluster Configuration > Network Scale**.
2. Click the edit icon to modify the network scale parameters.

3. In the **Number of Sites** field, provide the target number of sites for your deployment that this Nexus Dashboard cluster manages.
4. In the **Number of Switches** field, provide the target number of switch nodes for your deployment.
5. In the **Flows per second** field, provide the target number of flows for LAN/IPFM/SAN-Insights deployments or scale that is supported by NDFC and Nexus Dashboard Insights cohosted setup.

The deployment profiles in NDFC Release 12.1.2e use a different naming convention for these deployment profiles which is more in line with the scale numbers that each profile supports.

On the fresh install of Nexus Dashboard, the "Network Scale" is empty. We recommend that you define the number of sites, switches, and flows per second in the Network Scale. In such a scenario, the service selects a default profile based on the number of cluster nodes.

If the available cluster compute capacity is less than the desired Network Scale, Cisco NDFC installation displays an error. You must resolve the network scale values on Nexus Dashboard and proceed to install NDFC. Note that the recommendations specified in the error message provide useful suggestions about remedial action.

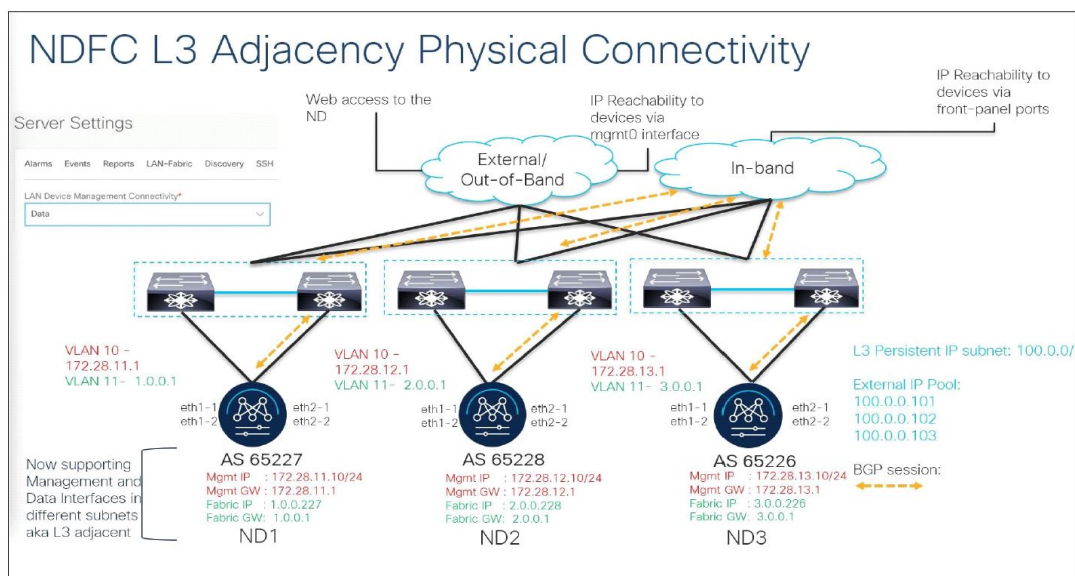
Nexus Dashboard assigns profile names for supported scale values with NDFC Release 12.1.2e. For validated scale numbers, refer to [Cisco NDFC Verified Scalability](#), Release 12.1.2e.

When you upgrade to NDFC 12.1.2e, the individual containers are restarted and the newly spawned 12.1.2e containers start with new resource requests and limit values.

Layer-3 Reachability between Cluster Nodes

From Release 12.1.2e, NDFC can be deployed as a service on Nexus Dashboard with Layer 3 adjacent nodes. A sample NDFC Layer3 adjacent Physical Connectivity topology is shown in the following image.

Figure 1 NDFC Layer3 adjacent Physical Connectivity



When using Layer 3 adjacency between the Nexus Dashboard nodes on which the NDFC service is running, the persistent IP addresses are advertised using the Nexus Dashboard Data or Fabric interface. The Layer 3 Persistent IP subnet pool must be unique and will be advertised to the fabric using BGP on Nexus Dashboard. Cisco NDFC container pods, such as EPL/SNMP Trap/SCP that requires Persistent IPs, are advertised as /32 BGP entries with the next hop of Nexus Dashboard Data Interface. Also, the BGP session between the Nexus Dashboard node and the uplink switches must be configured using directly connected links.

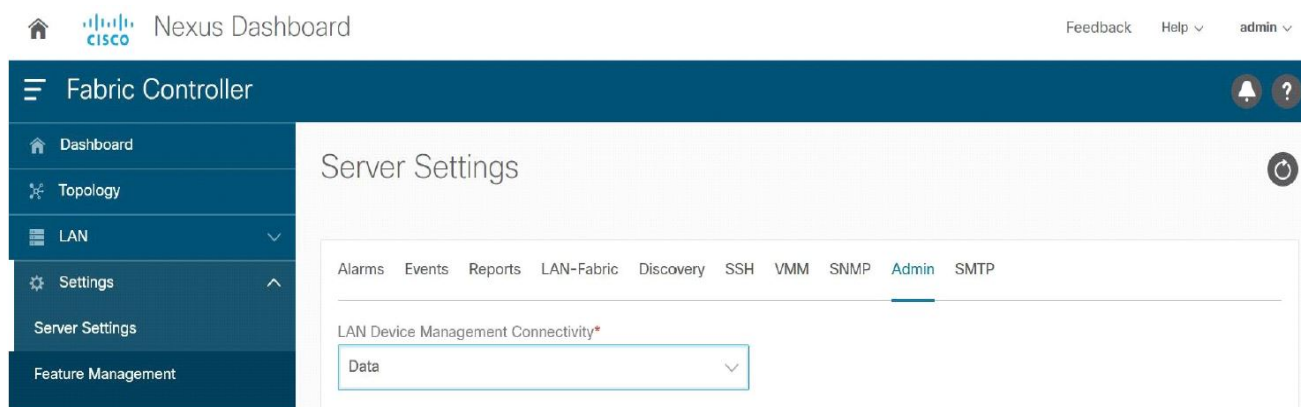
To deploy Layer 3 cluster connectivity, Nexus Dashboard nodes use BGP local and remote autonomous system configuration, along with Data Network gateway of the node to establish eBGP sessions with neighboring routers over the Data interface. As Nexus Dashboard nodes use gateway IPs to establish sessions, the neighboring BGP peers must be Layer 2 adjacent. Peers without Layer 2 adjacent connectivity are not supported. You must configure the BGP network correctly to ensure that the Nexus Dashboard routes are transmitted correctly.

Nexus Dashboard uses BGP session to publish /32 routes for reaching NDFC features using external IPs obtained from the Persistent IP subnet. If a node or network fails, the external IPs are not reachable until recovery is complete (if the network can recover itself).

Upgrade or modification from an existing Layer-2 adjacent Nexus Dashboard cluster to a Layer-3 adjacent cluster is not supported. When using Layer 3 adjacency, NDFC service is supported only when the switch connectivity is through the Nexus Dashboard Data interface.

1. Choose **NDFC UI > Settings > Admin** tab.
2. From the **LAN Device Management Connectivity** drop-down list, select **Data**.

Figure 2 LAN Device Management Connectivity



The following table provides information about different scenarios about Layer 3 adjacent cluster nodes connectivity.

Table 11 Layer 3 adjacent cluster nodes connectivity scenarios

Network Details	Support Provided
Modify or upgrade from Layer 2 adjacency to Layer 3 adjacency	Not supported Redeploy cluster if required.
Modify or upgrade from Layer 3 adjacency to Layer 2 adjacency	Not supported Redeploy cluster if required.
NDFC to Switch connectivity over the Management interface	Not supported

Table 12 NDFC connectivity scenarios

Network Details	Support Provided
NDFC to Switch connectivity over Data interface	Supported
Nexus Dashboard BGP traffic over Nexus Dashboard Management interface	Not supported
Nexus Dashboard BGP traffic over Nexus Dashboard Data interface	Supported
Nexus Dashboard BGP peer L2-Adjacent	Supported
Nexus Dashboard BGP peer L3-Adjacent	Not supported

Upgrade Paths to Release 12.1.2e

The following table summarizes the type of upgrade that you must follow to upgrade to Release 12.1.2e. Go to [Software Download](#) to download the Upgrade Tool scripts.

Persona Compatibility for Upgrade

Table 13 Upgrade paths to release 12.1.2e

Current Release Number	Deployment Type	Upgrade type when upgrade to Release 12.1.2e
12.1.1e	All	1. Upgrade Nexus Dashboard version to 2.3.1 2. Upgrade NDFC application to 12.1.2e
12.0.1a	All	Direct upgrade is not supported
12.0.2f	All	1. Upgrade Nexus Dashboard version 2.1.1e to version 2.3.2b 2. Upgrade NDFC application to 12.1.2e.
11.5.4	All	Backup using DCNM_To_NDFC_Upgrade_Tool_LIN_WIN.zip Restore on Nexus Dashboard Fabric Controller Web UI > Operations > Backup & Restore

Feature Compatibility Post Upgrade

The following table lists caveats associated with features that are restored from DCNM 11.5(x) backup after upgrade to NDFC, Release 12.1.2e.

Table 3 Caveats: Features restored from DCNM 11.5(x) backup after upgrade to NDFC

Feature in DCNM 11.5(x)	Upgrade Support
Nexus Dashboard Insights configured Refer to Nexus Dashboard Insights User Guide for more information.	Supported
Container Orchestrator (K8s) Visualizer	Supported
VMM Visibility with vCenter	Supported
Nexus Dashboard Orchestrator configured	Not Supported
Preview features configured	Not Supported
LAN switches in SAN installations	Not Supported
Switches discovered over IPv6	Not Supported
DCNM Tracker	Not Supported
SAN CLI templates	Not carried over from 11.5(x) to 12.1.2e
Switch images/Image Management data	Not carried over from 11.5(x) to 12.1.2e
Slow drain data	Not carried over from 11.5(x) to 12.1.2e
Infoblox configuration	Not carried over from 11.5(x) to 12.1.2e
Endpoint Locator configuration	You must reconfigure Endpoint Locator (EPL) post upgrade to Release 12.0.2f. However, historical data is retained up to a maximum size of 500 MB.
Alarm Policy configuration	Not carried over from 11.5(x) to 12.1.2e
Performance Management data	CPU/Memory/Interface statistics up to 90 days is restored post upgrade.

Troubleshooting and getting help

Dell support, product, and licensing information can be obtained on the Dell Online Support site as described next.

Note: To open a service request through the Dell Online Support site, you must have a valid support agreement. Contact your Dell sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Product information

For documentation, release notes, software updates, or for information about Dell products, licensing, and service, go to the Dell Online Support site (registration required) at:

<https://support.dell.com>

Technical support

Dell offers a variety of support options.

Support by Product — Dell offers consolidated, product-specific information on the Web at:

<https://support.dell.com/products>

The Support by Product web pages offer quick links to Documentation, White Papers, Advisories (such as frequently used Knowledgebase articles), and Downloads, as well as more dynamic content, such as presentations, discussion, relevant Customer Support Forum entries, and a link to Dell Live Chat.

Dell Live Chat — Open a Chat or instant message session with a Dell Support Engineer.

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