Dell Connectrix® Cisco Nexus Dashboard Fabric Controller Release Notes

Current Release Version: 12.2.3
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Previous Release Version: 12.2.2

Topics:

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 with related Nexus Dashboard Fabric Controller documentation.

Revision history

The following table presents the revision history of this document.

Table 1. Revision history

Revision	Release	Date	Description
Rev 07	12.2.3	June 9, 2025	New Release
Rev 06	12.2.2	September 23, 2024	New Release
Rev 05	12.2.1	April 29, 2024	New Release
Rev 04	12.1.3b	October 23, 2023	New Release
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, and 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 Container Management systems.
- SAN networking for Cisco MDS and Cisco Nexus switches running standalone NX-OS, including support for integration with storage arrays and also 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 third-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 a Nexus Dashboard based on your requirement, see the Cisco Nexus Dashboard Deployment Guide.

The following table shows the compatible versions for Nexus Dashboard and services.

Table 2. Nexus Dashboard and Services Compatible Versions

Services	Compatible Versions
Nexus Dashboard	3.2.2f
Nexus Dashboard Fabric Controller	12.2.3

NOTE: Cisco will no longer support the deployment of Nexus Dashboard (ND) on Red Hat Enterprise Linux (RHEL) in any future releases. Cisco Nexus Dashboard release 3.0.1 and Cisco Nexus Fabric Controller (NDFC) 12.1.3b are the last releases that this form factor supports. Work with partners or a Cisco representative to leverage other supported form factors for future releases.

Co-hosting of NDFC-Managed mode with Nexus Dashboard Insights (NDI)

For information about supported scale for NDFC and NDI co-hosted on the same Nexus Dashboard Cluster, see the Verified Scalability Guide for Cisco Nexus Dashboard Fabric Controller.

For information about the supported scale for NDFC on Nexus Dashboard Cluster and Insights and Orchestrator services on a different Nexus Dashboard Cluster, see Verified Scalability Limits for Nexus Dashboard Insights.

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

As always in a Dell environment, see the Dell Support Matrix available through E-Lab™ Interoperability Navigator for the latest information about supported configurations.

The answers to many DCNM or NDFC-related questions can be found in the Dell Knowledge base in Dell Online Support.

New features and changes

New Features and Enhancements in Cisco NDFC, Release 12.2.3

None

New Hardware Feature

The following new hardware is supported with this release.

Cisco Unified Computing System (Cisco UCS) for SAN deployments

NDFC 12.2.3 supports Cisco UCS 64108 108-Port Fabric Interconnect - 10/25/40/100 Gigabit Ethernet, FCoE, and Fiber Channel switch offering up to 7.42 Tbps throughput and up to 108 ports.

NOTE: To view UCS FI 64108 vFC traffic in NDFC, the UCS FI NX-OS version must be 4.3(4a) or 4.3(4b) or later.

Supported upgrade paths

For supported upgrade paths, see the Cisco Nexus Dashboard and Services Deploymentand Upgrade Guide, Release 3.2(x).

Changes in Behavior

Changes in behavior for Nexus Dashboard

Beginning with ND release 3.2.2, there are updates to the behavior when deploying in Linux KVM (for example, only CLI-based procedures are supported when creating the VMs for the nodes). For more information, see the "Deploying in Linux KVM (Release 3.2.2 and Later)" chapter in Cisco Nexus Dashboard and Services Deployment and Upgrade Guide, Release 3.2.x.

Changes in behavior for Orchestrator

There are no changes in behavior in this release.

Changes in behavior for Fabric Controller

Common enhancements to all personas

Beginning with NDFC release 12.2(3), a behavior change is introduced where SSH host key verification is enforced in NDFC. This behavior is similar to any SSH client behavior where a new key is seen is trusted, but a new key that is seen afterwards for a given host causes a key verification failure.

For more information, see section "Server Settings" in Overview and Initial Setup of Cisco NDFC.

LAN controller enhancements

- For ToR switches, Easy Fabric will be out of sync with NX-API and SNMP trap configurations pending diffs after you upgrade to NDFC 12.2(2x) or later.
  - The old behavior: NX-API and SNMP trap host configurations are not generated for ToR switches.
  - The new behavior: NX-API and SNMP trap host configurations are generated for ToR switches.
- Beginning with NDFC release 12.2(3), for switches in Classic LAN or External Connectivity Network fabric types, a new Expected config/Generated config toggle switch is available. This switch displays the NDFC-generated configuration based on the intent in the NDFC policies. For more information, see the "Previewing Switches" section in Add Switches for LAN Operational Mode.
- Beginning with NDFC release 12.2(3), when editing a network attachment in a VXLAN fabric on a switch with border or border gateway shown in the Switch Role column, you can also provide comma-separated route targets to import or export at the switch level in the Import Route Target and Export Route Target fields. This is supported for both Nexus 9000 and Catalyst 9000 switches. For more information, see the "Network Attachments" section in About Fabric Overview for LAN Operational Mode Setups.
- Beginning with NDFC release 12.2(3), support is available for Type 6 for BGP authentication key encryption type for VXLAN EVPN, Enhanced Classic LAN, and BGP fabrics. For more information, see:
  - BGP Fabric

- Data Center VXLAN EVPN
- Enhanced Classic LAN

- Beginning with NDFC release 12.2(3), a new 'Set Allowed Vlan On Leaf-ToR Pairing' field is introduced when configuring ToR switches in Data Center VXLAN EVPN fabrics. For more information, see Configuring ToR Switches.
- Beginning with NDFC release 12.2(3), a new Freeform tab is introduced when creating or editing these fabric types: BGP fabric, Data Center VXLAN EVPN fabric, Enhanced Classic LAN, and IPFM. For more information, see:
  - BGP Fabric
  - Data Center VXLAN EVPN
  - Enhanced Classic LAN
  - IPFM and Classic IPFM
- Beginning with NDFC release 12.2(3), a new VRF Lite tab is introduced when creating or editing VRFs. For more information, see the “Creating a VRF” section in About Fabric Overview for LAN Operational Mode Setups.

SAN controller enhancements

There are no changes in behavior in this release.

Changes in behavior for Insights

There are no changes in behavior in this release.

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:

Table 3. Licensing Model

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, see the Smart Licensing Using Policy for Cisco NDFC, Release 12.1.x technical note.

Fixed problems

Cisco-specific caveats for resolved problems can be found in the Nexus Dashboard and Services Release Notes, Release 3.2.2.

Environment and system requirements

The following sections describe the various system requirements for the proper functioning of your Cisco Nexus Dashboard Fabric Controller, Release 12.2.3:

- "Cisco Nexus Dashboard Version Compatibility" on page 11

Cisco Nexus Dashboard Version Compatibility

NDFC 12.2.3 is bundled with the ND 3.2.2f image. There is no longer any separate option for upload of applications into the Nexus Dashboard. Nexus Dashboard is now a single unified product.

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 4. 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 configuring Nexus Dashboard for the first time, 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 applications 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. See the Cisco Nexus Dashboard Deployment Guide for more information.

Table 5. 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 two interfaces or vNICs. The Data vNIC maps to bond0 (also known as bond0br) interface, and the Management vNIC maps to bond1 (also known as bond1br) interface. The requirement is to enable/accept promiscuous mode on the port groups that are associated with the Nexus Dashboard Management and/or Data vNICs where IP stickiness is required. The Persistent IP addresses are given to the pods (for example, SNMP Trap/Syslog receiver, Endpoint Locator instance per Fabric, SAN Insights receiver, and so on.). 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.

Also, 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 that is 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, you must enable the required settings on the VMware side to allow this traffic to flow smoothly 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, see the 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 12.2.3.

Table 6. Other software supported by Cisco Nexus Fabric Controller Release 12.2.3

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 12.2.3 supports.

Table 7. Hardware features supported by Cisco NFDC Release 12.2.3

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

Table 7. Hardware features supported by Cisco NFDC Release 12.2.3 (continued)

Product/Component	Part Number
Cisco MDS 9148 48-Port Multilayer Fabric Switch	DS-C9148-K9
Cisco MDS 9148S 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
Cisco MDS 9220i Multilayer Fabric Switch	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 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

Table 7. Hardware features supported by Cisco NFDC Release 12.2.3 (continued)

Product/Component	Part Number
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
Cisco MDS 9396V 64-Gbps 96-Port Fibre Channel Switch	DS-C9396V-K9

Compatibility with Cisco MDS 9000 Family Switches

The following table shows the Cisco NDFC Compatibility Matrix for Release 12.2.3.

Table 8. 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), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)
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), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)
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), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)
Cisco MDS 9220i	9.2(1), 8.5(1), 9.2(2), 8.4(2d) 8.4(2f), 9.3(1), 9.3(2), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)
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), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)

Table 8. Cisco NDFC Compatibility Matrix (continued)

Switches	Supported Switch Releases
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), 9.4(1), 9.4(1a), 9.4(2a), 9.4(3a)

Known problems and limitations

For a list of problems with this release, please refer to the Nexus Dashboard and Services Release Notes, Release 3.2.2.

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. 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 networkingpub.feedback@dell.com.

Location of Cisco NDFC documentation

The Cisco NDFC documentation is available on the Cisco Nexus Dashboard Fabric Controller page.

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

- Release Notes:
  - Cisco NDFC Release Notes, Release 12.2.3
  - Cisco NDFC Release Notes, Release 12.2.2
  - Cisco NDFC Release Notes, Release 12.1.3b
  - 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 12.2.3
- Cisco NDFC Fundamentals Guide

    - Cisco NDFC Configuration, Release 12.2.3
- Cisco NDFC REST API Guide
    - Cisco NDFC REST API Guide, Release 12.2.3
- Cisco NDFC Troubleshooting Guide

For more information, see the Cisco Nexus Dashboard Fabric Controller page.

Software media, organization, and files

For information about related software environment and system requirements, see the Dell Support Matrix that is located in the E-Lab Interoperability Navigator, under the **PDFs and Guides** tab.

To download the latest Nexus Dashboard Fabric Controller software, go to Dell Online Support and 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: 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 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 three Nexus Dashboard control nodes. In the 5-node deployment, the additional two nodes serve as worker nodes. The 3-node or 5-node cluster deployment is an active/active solution, that is, all nodes are used to run microservices of Nexus Dashboard Fabric Controller. When a node fails, microservices running on the node are moved to the other nodes. Nexus Dashboard Fabric Controller performs normally under one-node failure scenarios. However, a brief disruption to services is expected 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 are disrupted.

For virtual Nexus Dashboard OVA deployments on ESXi environments, the promiscuous mode must be enabled on the port groups that are 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 about Installation, see the Cisco Nexus Dashboard Fabric Controller (NDFC) Deployment Guide.

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).

Technical support

Dell offers a variety of support options.

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.

Notes, cautions, and warnings

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.