

# Dell Connectrix® Cisco Nexus Dashboard Fabric Controller

Version 12.1.3b

## Release Notes

Rev 04

October 23, 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>.

Topics include:

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## Revision history

The following table presents the revision history of this document.

| Revision | Release  | Date              | Description |
|----------|----------|-------------------|-------------|
| 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, 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 12.1.3b 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/elab/elhome> 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 12.1.3b

The following preview features are available in Cisco NDFC Release 12.1.3b for Fabric Controller persona:

**Table 1** Preview Features for Fabric Controller Persona in Cisco NDFC Release 12.1.3b

| Product Impact              | Features                                                                                                                                      | Description                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance and Scalability | Layer 4 to Layer 7 service load balancing, and traffic steering and redirection for a single site using enhanced policy-based redirect (ePBR) | Support is available for Layer 4 to Layer 7 service load balancing, and traffic steering and redirection for a single site using enhanced ePBR. |

### Common Enhancements to all Personas

The following features are new in Cisco NDFC Release 12.1.3b for all personas in Cisco Nexus Dashboard Fabric Controller.

**Table 2** Features in Cisco NDFC Release 12.1.3b

| Product Impact     | Features                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ease of Use        | Enhanced License Management workflow | The workflow for the License Management feature has been enhanced to make it easier to configure license management in the NDFC. With 12.1.3b, you can configure switched-based licenses, NDFC smart licenses, or a combination of both in a streamlined manner.                                                                                                                                                              |
| Base Functionality | IPv6 support                         | Prior releases of Nexus Dashboard supported either pure IPv4 or dual stack IPv4/IPv6 (for management network only) configurations for the cluster nodes. With release 3.0(1), Nexus Dashboard supports pure IPv4, pure IPv6, or dual stack IPv4/IPv6 configurations for the cluster nodes and services.<br>For more information about IPv4 and IPv6 Support, see the <a href="#">Cisco Nexus Dashboard Deployment Guide</a> . |

## Fabric Controller Enhancements

The following features are new in Cisco NDFC Release 12.1.3b for the Fabric Controller:

**Table 3** Fabric Controller Enhancements in Cisco NDFC Release 12.1.3b (page 1 of 2)

| Product Impact     | Features                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Base Functionality | Private VLAN support in Data Center VXLAN EVPN Fabric                            | NDFC supports provisioning of private VLANs in Data Center VXLAN EVPN, BGP with EVPN VXLAN enabled, VXLAN EVPN Multi-Site and External fabrics. The overlay network deployment workflow is enhanced to support flexible provisioning of primary and secondary VLANs on Virtual Tunnel End Points (VTEPs).                                                                                                                         |
|                    | Shared Group Policy                                                              | You can now create group policies for switches that share common configurations. Policy groups provides a method of configuring and managing switches collectively.                                                                                                                                                                                                                                                               |
|                    | VXLANv6 support in BGP fabrics                                                   | BGP fabric now supports EVPN VXLAN fabric with IPv6 as the underlay. VXLANv6 BGP fabric supports IPv6 link local address for intra-fabric links and eBGP unnumbered peering between the switches.                                                                                                                                                                                                                                 |
|                    | Super-Spine support in BGP fabrics                                               | BGP fabric now supports Super-Spine and Border Super-Spine roles on VXLAN EVPN fabrics with BGP as the underlay protocol.                                                                                                                                                                                                                                                                                                         |
|                    | Unique IP address allocation for Virtual Routing and Forwarding (VRF) extensions | Support is available for automatically allocating a unique IPv4 address for the source and the destination interfaces for VRF extensions using VRF Lite Inter-Fabric Connection (IFC).                                                                                                                                                                                                                                            |
|                    | Loopback IP address allocation on VTEPs for VRF attachment                       | NDFC automatically allocates an IPv4 address from the IP address pool assigned to the loopback interfaces on VTEPs for each VRF instance.                                                                                                                                                                                                                                                                                         |
| Ease of Use        | Single-node virtual Nexus Dashboard (vND) deployment                             | NDFC now supports single-node vND deployment (Production Deployments) for Fabric Controller and Fabric Discovery modes for up to 50 switches.                                                                                                                                                                                                                                                                                     |
|                    | Enhanced Classic LAN Fabric support for greenfield and brownfield deployments    | A new fabric template is available 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, with support for greenfield and brownfield deployments of Nexus 7000 and 9000 switches. The Classic LAN, Enhanced Classic LAN, and External Connectivity Network fabrics can be part of a Fabric Group. |
|                    | Ability to export multiple templates                                             | You can now export multiple template configuration files to a local directory.                                                                                                                                                                                                                                                                                                                                                    |
|                    | One view for multi-cluster NDFC deployments                                      | When you federate multiple NDFC-managed fabric clusters in Nexus Dashboard, you can view their aggregated status information in the One View Dashboard for NDFC LAN. This allows a remote user to monitor a multi-cluster network from one screen.                                                                                                                                                                                |
|                    | Ability to clear invalid alarms                                                  | You can now clear fabric discovery-related invalid alarms from Event Analytics.                                                                                                                                                                                                                                                                                                                                                   |

Table 3 Fabric Controller Enhancements in Cisco NDFC Release 12.1.3b (page 2 of 2)

| Product Impact              | Features                                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interoperability            | VXLAN EVPN Multi-Site across Data Center and Campus VXLAN fabrics                  | You can now deploy Campus EVPN VXLAN fabrics as member fabrics in VXLAN EVPN Multi-Site fabric.                                                                                                                                                                                                                                                                                                                   |
|                             | Layer 4 to Layer 7 Services support for Virtual Network Functions (VNF) attachment | You can now use remote peering for Virtual Network Functions (VNF) Layer 4 to Layer 7 service devices, which allows for the separation of a VNF service node's control plane peering from the physical port attachment. Support is also available for configuring per-VRF peering through the vPC peer-link so that you do not have to configure the vPC advertise-pip setting for all the vPC pairs in a fabric. |
|                             | Nexus 9000 Series switches supported on Campus VXLAN EVPN fabric                   | Existing Campus VXLAN EVPN fabric supports automating and managing enterprise Campus VXLAN BGP EVPN networks with Catalyst 9000 series switches. With this release, you can integrate a Nexus 9000 switch with border gateway functionality to connect remote Data Centers and Campus with VXLAN EVPN Multi-Site Layer 2 and Layer 3 extensions.                                                                  |
| Licensing                   | Licensing support for third-party devices                                          | Licenses for third-party devices are supported in the Data Center Networking (DCN) Essentials subscription. You can purchase the DCN Essentials subscription for Arista and Juniper devices onboarded on NDFC.                                                                                                                                                                                                    |
| Security                    | Intent-based change control management                                             | You can track configuration changes using a unique ticket that is associated with an action.                                                                                                                                                                                                                                                                                                                      |
|                             | Rollback capability of change control tickets                                      | This feature allows you to roll back deployed or undeployed change control tickets in situations where a change was started but then a decision was made to abandon that change.                                                                                                                                                                                                                                  |
| Performance and Scalability | Basic performance monitoring for Catalyst 9000 switches                            | You can monitor CPU utilization, inbound and outbound traffic, and temperature data of Catalyst switches.                                                                                                                                                                                                                                                                                                         |
| Upgrade/ Downgrade          | Cisco Catalyst 9000 Out-of-Band (OOB) Plug and Play (PnP)                          | This feature simplifies the process of onboarding new devices with a zero-touch deployment experience. PnP automates the day-zero provisioning of Cisco Catalyst 9000 Series switches using NDFC.                                                                                                                                                                                                                 |
|                             | Software Image Management and Return Material Authorization (RMA)                  | All functionalities of NDFC Image Management and RMA features are available for the Cisco Catalyst switches.                                                                                                                                                                                                                                                                                                      |

## Fabric Controller with IP Fabric for Media (IPFM) Enhancements

The following features are new in Cisco NDFC Release 12.1.3b for the Fabric Controller with IP Fabric for Media (IPFM).

Table 4 Fabric Controller with IPFM Enhancements

| Product Impact     | Features                                                                    | Description                                                                                                                                                                                                              |
|--------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Base Functionality | Sub-interface support                                                       | A new fabric template is added to support sub-interfaces with Non-Blocking Multicast (NBM) active and passive mode. You can use the same sub-interfaces to create intra-fabric links between switches in an IPFM fabric. |
| Base Functionality | Ability to manage interface and sub- interface multicast bandwidth capacity | Using IPFM interface templates, you can manage and distribute multicast bandwidth capacity among physical and sub-interfaces.                                                                                            |
| Security           | Real-time PTP notifications                                                 | You can subscribe to switch-related real time events to get additional notifications for PTP grandmaster clock, parent clock or PTP port status changes.                                                                 |

## SAN Controller Enhancements

The following features are new in Cisco Nexus Dashboard Fabric Controller Release 12.1.3b for the SAN Controller.

Table 5 SAN Controller Enhancements (page 1 of 3)

| Product Impact     | Features                                                                                       | Description                                                                                                                                                                                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Base Functionality | Automatic registration of syslogs                                                              | Support is available for switches to automatically configure syslog and send syslog messages to the NDFC server.                                                                                                                                                                                                                 |
|                    | Enhancements to Feature Management                                                             | Fibre Connection (FICON) in Feature Management enables switch communication with IBM z Systems Mainframes. When enabled, NDFC provides details about the FICON interfaces on the switches.                                                                                                                                       |
|                    | Integration of Fabric-Device Management Interface (FDMI) and Read Diagnostics Parameters (RDP) | NDFC introduces additional monitoring features for Host and Storage Devices. FDMI retrieves management information about the attached Fibre Channel HBAs and host operating systems. RDP provides diagnostic data from the switch and the connected end devices which you can use for analyzing and troubleshooting link issues. |

Table 5 SAN Controller Enhancements (page 2 of 3)

| Product Impact   | Features                                           | Description                                                                                                                                                                                                                                                                                           |
|------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ease of Use      | Enhancements to SAN Controller Dashboard           | SAN Controller Dashboard now displays details about the top 10 congested end devices and Inter Switch Links (ISL).                                                                                                                                                                                    |
|                  | Navigation changes to Hosts and Storage Devices    | With this release, the configuration pages for Hosts and Storage Devices are available from SAN > Hosts and SAN > Storage Devices. Prior to this release, these features were available in the SAN Dashboard.                                                                                         |
|                  | Optics alerts with alarm policies                  | You can configure alarm policies to monitor Rx/Tx power, current and voltage for a switch interface.                                                                                                                                                                                                  |
|                  | Zone migration                                     | You can migrate SAN zones from a Brocade switch to an MDS switch using the Zone Migration wizard. NDFC also provides an option to view the list of unzoned end devices in a fabric.                                                                                                                   |
|                  | Execute CLI feature                                | The Execute CLI feature has been updated with the following enhancements: <ul style="list-style-type: none"> <li>Includes a Session Timeout field.</li> <li>Has additional options when providing the CLI commands to be executed on the switches and when viewing the Execute CLI output.</li> </ul> |
|                  | Enabling or disabling switch interfaces            | You can run the shutdown or no shutdown commands on a switch interface. NDFC also supports adding a description for an interface.                                                                                                                                                                     |
|                  | Ability to download Device Manager application     | With this release, you can download and install a standalone Device Manager application on your local system.                                                                                                                                                                                         |
| Interoperability | New and improved NPV configuration workflow        | The NPV configuration wizard simplifies configuring NPV links.                                                                                                                                                                                                                                        |
|                  | Support for app node deployments with SAN Insights | Prior to the NDFC 12.1.3b release, SAN Insights was supported on physical and data nodes. With this release, the SAN Insights feature is also supported on app node deployments for Nexus Dashboard; however, the app node supports SAN Insights at the Initiator-Target (IT) flow level only.        |

Table 5 SAN Controller Enhancements (page 3 of 3)

| Product Impact              | Features                                                          | Description                                                                                                                                                                                                                                                                                                  |
|-----------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Performance and Scalability | Support for management and data interfaces in a single subnet     | With this release, for SAN deployments, the management and data interfaces on a Nexus Dashboard node can now be in a single subnet.                                                                                                                                                                          |
|                             | Performance monitoring and slow drain data collection with NX-API | For Cisco MDS 9000 Series switches using NX-OS release 9.x and later, performance monitoring data is polled using NX-API for fibre channel. In addition, the slow drain job is integrated with performance monitoring and runs together with the performance monitoring collection for 24 hours, by default. |

## New Hardware Features

The following new hardware is supported with Cisco Nexus Dashboard Fabric Controller Release 12.1.3b:

- ◆ DS-C9396V-K9 – Chassis for 96 port 8/16/32/64G FC/SUP-4 switch
- ◆ DS-C9396V-K9 – SUP: Supervisor module for MDS-9396V 64G x 96 FC ports fabric switch
- ◆ N9K-C9348GC-FX3 – 48 10/100/1000M copper RJ45 downlink ports, 4 10-/25G SFP28 uplink ports, and 2 40-/100G QSFP28 uplink ports.
- ◆ N9K-C9348GC-FX3PH – 40 10M/100M/1G copper RJ45 downlink ports that support PoE/PoE+/PoE++ and 8 10M/100M copper RJ45 downlink ports that support PoE/PoE+/PoE++, 4 10-/25G SFP28 uplink ports, and 2 40-/100G QSFP28 uplink ports.
- ◆ N9K-C9804 – Cisco Nexus 9800 Series 4-slot chassis
- ◆ N9K-C9332D-H2R – Cisco Nexus 9300 series Leaf/Spine/TOR chassis with 32 400G ports and 2 1/10 ports
- ◆ N9K-X98900CD-A – Cisco Nexus 9800 34-port 100G and 14-port 400G Line Card

## 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](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 12.1.3b:

- ◆ [“Cisco Nexus Dashboard Version Compatibility” on page 10](#)
- ◆ [“Nexus Dashboard Server Resource \(CPU/Memory\) Requirements” on page 11](#)
- ◆ [“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 3.0.1f or higher. If you try to upload NDFC 12.1.3b on a Nexus Dashboard version earlier than 3.0.1f, 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)<br>(PID: SE-NODE-G2)            | 2x 10-core<br>2.2G Intel<br>Xeon Silver CPU | 256 GB of RAM | 4x 2.4TB HDDs<br>400GB SSD<br>1.2TB NVME drive |
| Fabric Controller | Virtual Node (vND) - app OVA                        | 16vCPUs                                     | 64GB          | 550GB SSD                                      |
|                   | Physical Node (pND)<br>(PID: SE-NODE-G2)            | 2x 10-core<br>2.2G Intel<br>Xeon Silver CPU | 256 GB of RAM | 4x 2.4TB HDDs<br>400GB SSD<br>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)<br>(PID: SE-NODE-G2)            | 2x 10-core<br>2.2G Intel<br>Xeon Silver CPU | 256 GB of RAM | 4x 2.4TB HDDs<br>400GB SSD<br>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 | <p>One of the following for LAN:</p> <ul style="list-style-type: none"> <li>• 2 IPs in management network if using the default LAN Device Management Connectivity setting</li> <li>• 2 IPs in data network if setting LAN Device Management Connectivity to Data</li> </ul> <p>Plus one IP per fabric for EPL in data network</p> <p>Plus one IP for Telemetry receiver in data or management network if IP Fabric for Media is enabled.</p> <p>For SAN:</p> <ul style="list-style-type: none"> <li>• 2 IPs in data network</li> </ul> <p>Plus one IP per node in data network for SAN Insights receiver if enabled.</p> |
| Layer 3 adjacent     | Layer 3 adjacent | <p>For LAN:</p> <ul style="list-style-type: none"> <li>• LAN Device Management Connectivity on NDFC must be set to Data</li> <li>• 2 IPs for SNMP/Syslog and SCP/POAP services</li> <li>• Plus one IP per fabric for EPL</li> </ul> <p>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.</p> <p><b>Note:</b> SAN Controller and IP Fabric for Media modes are not supported in this deployment.</p>                             |

## 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 12.1.3b.

Table 8

Other software supported by Cisco Nexus Fabric Controller Release 12.1.3b

| Component | Features                                                                                                                                                                                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security  | <ul style="list-style-type: none"> <li>• ACS versions 4.0, 5.1, 5.5, and 5.8</li> <li>• ISE version 2.6</li> <li>• ISE version 3.0</li> <li>• Telnet Disabled: SSH Version 1, SSH Version 2, Global Enforce SNMP Privacy Encryption.</li> <li>• Web Client: HTTPS with TLS 1, 1.1 and 1.2</li> <li>• TLS 1.3</li> </ul> |

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 12.1.3b supports.

**Table 9** Hardware features supported by Cisco NDFC Release 12.1.3b (page 1 of 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     |
| 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        |

Table 9 Hardware features supported by Cisco NFDC Release 12.1.3b (page 2 of 3)

| Product/Component                                                                             | Part Number      |
|-----------------------------------------------------------------------------------------------|------------------|
| 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         |
| 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     |

Table 9 Hardware features supported by Cisco NDFC Release 12.1.3b (page 3 of 3)

| Product/Component                                    | Part Number  |
|------------------------------------------------------|--------------|
| 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 12.1.3b.

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), 9.4(1) |
| 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)                                                                                                                                                     |
| 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)                                                                                                  |
| 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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)                                                                                                                                                                 |
| 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)                                                        |

## 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 Customer Engineer to assist with the installation and provide the documentation.

## Documentation

Send documentation comments to [www.cisco.com](http://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 Note, 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 12.1.3x
- ◆ Cisco NDFC Fundamentals Guide
  - Cisco NDFC Configuration, Release 12.1.3x
- ◆ Cisco NDFC REST API Guide

- Cisco NDFC REST API Guide, Release 12.1.3x
- ◆ 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 12.1.3b 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.

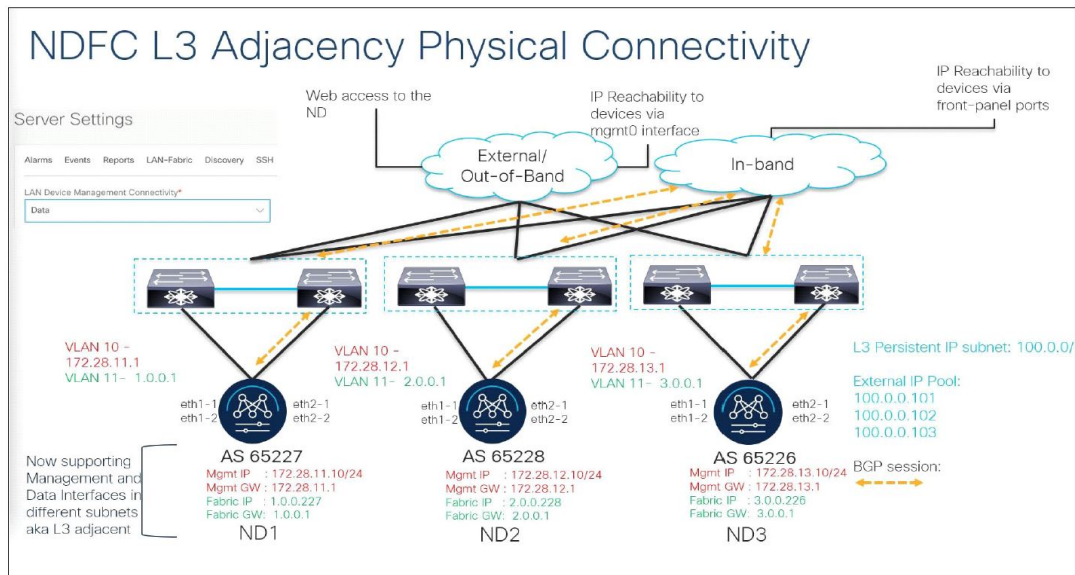
Nexus Dashboard assigns profile names for supported scale values with NDFC Release 12.1.3b. For validated scale numbers, refer to [Cisco NDFC Verified Scalability](#), Release 12.1.3b.

When you upgrade to NDFC 12.1.3b, the individual containers are restarted and the newly spawned 12.1.3b 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.

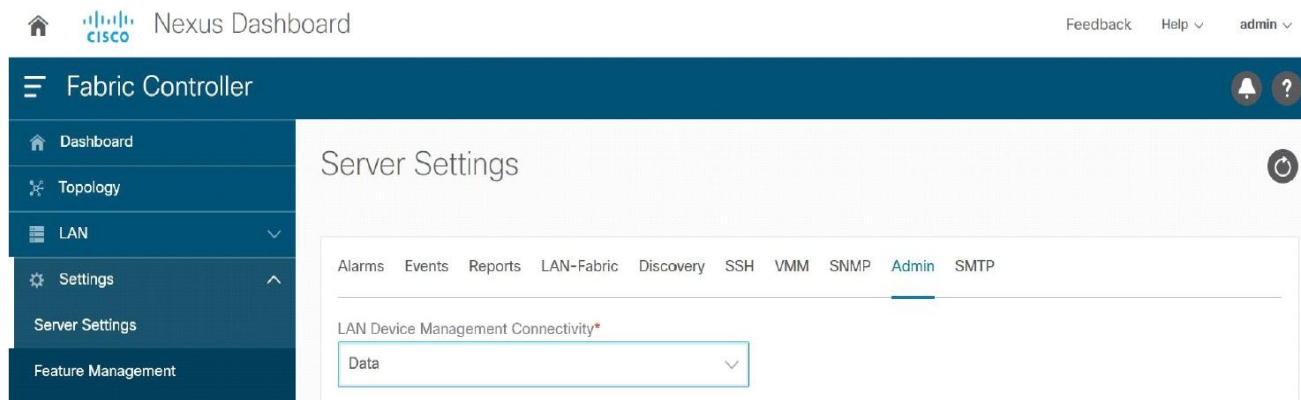
Nexus Dashboard uses BGP session to publish /32 routes for reaching NDFC features using external IPs obtained from the Persistent IP subnet. If a node or network fails, the external IPs are not reachable until recovery is complete (if the network can recover itself).

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.

- 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<br>Redeploy cluster if required. |
| Modify or upgrade from Layer 3 adjacency to Layer 2 adjacency | Not supported<br>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 12.1.3b

The following table summarizes the type of upgrade that you must follow to upgrade to Release 12.1.3b. Go to [Software Download](#) to download the Upgrade Tool scripts.

### Persona Compatibility for Upgrade

Table 13 Upgrade paths to release 12.1.3b

| Current Release Number | Deployment Type | Upgrade type when upgrade to Release 12.1.3b                                                                                                                            |
|------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.1.2e                | All             | Upgrade type when upgrade to release 12.1.3b:<br>1. Upgrade your Nexus Dashboard to release 3.0.1f<br>2. Upgrade NDFC service to release 12.1.3b                        |
| 12.1.1e                | All             | 1. Upgrade Nexus Dashboard version to 3.0.1f<br>2. Upgrade NDFC application to 12.1.3b                                                                                  |
| 12.0.1a                | All             | Direct upgrade is not supported                                                                                                                                         |
| 12.0.2f                | All             | Direct upgrade is not supported                                                                                                                                         |
| 11.5.4                 | All             | Backup using<br><b>DCNM_To_NDFC_Upgrade_Tool_LIN_WIN.zip</b><br>Restore on Nexus Dashboard Fabric Controller<br><b>Web UI &gt; Operations &gt; Backup &amp; Restore</b> |

### 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 12.1.3b.

Table 3 Caveats: Features restored from DCNM 11.5(x) backup after upgrade to NDFC (page 1 of 2)

| Feature in DCNM 11.5(x)                                                                                   | Upgrade Support                          |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------|
| Nexus Dashboard Insights configured<br>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 12.1.3b |
| Switch images/Image Management data                                                                       | Not carried over from 11.5(x) to 12.1.3b |

**Table 3**      **Caveats: Features restored from DCNM 11.5(x) backup after upgrade to NDFC (page 2 of 2)**

| Feature in DCNM 11.5(x)        | Upgrade Support                                                                                                                                   |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Slow drain data                | Not carried over from 11.5(x) to 12.1.3b                                                                                                          |
| Infoblox configuration         | Not carried over from 11.5(x) to 12.1.3b                                                                                                          |
| 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 12.1.3b                                                                                                          |
| 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.

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**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.

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### 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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Published October 23, 2023

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