Verified Scalability Guide for Cisco Nexus Dashboard Fabric Controller, Release 12.1.2e

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Cisco Nexus Dashboard Fabric Controller Verified Scalability

Verified Scale Limits for Release 12.1.2e

This section provides verified scalability values for various deployment types for Cisco Nexus Dashboard Fabric Controller, Release 12.1.2e.

The values are validated on testbeds that are enabled with a reasonable number of features and aren't theoretical system limits for Cisco Nexus Dashboard Fabric Controller software or Cisco Nexus/MDS switch hardware and software. When you try to achieve maximum scalability by scaling multiple features at the same time, results might differ from the values that are listed here.

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 1: Server Resource (CPU/Memory) Requirements to run NDFC on top of Nexus Dashboard

Deployment Type	Node Type	CPUs	Memory	Storage (Throughput: 40-50 MB/s)
Fabric Discovery	Virtual Node (vND) – app OVA	16 vCPUs	64 GB	550 GB SSD
	Physical Node (pND) (PID: SE-NODE-G2 and ND-NODE-L4)	2 x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4 x 2.4 TB HDDs 400 GB SSD 1.2 TB NVME drive
Fabric Controller	Virtual Node (vND) – app OVA	16 vCPUs	64 GB	550 GB SSD
	Physical Node (pND) (PID: SE-NODE-G2 and ND-NODE-L4)	2 x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4 x 2.4 TB HDDs 400 GB SSD 1.6 TB NVME drive

Deployment Type	Node Type	CPUs	Memory	Storage (Throughput: 40-50 MB/s)
SAN Controller	Virtual Node (vND) – app OVA (without SAN Insights)	16 vCPUs (with physical reservation)	64 GB (with physical reservation)	550 GB SSD
	App Node (rND) (without SAN Insights)	16 vCPUs (with physical reservation)	64 GB (with physical reservation)	550 GB SSD
	Data Node (vND) – Data OVA (with SAN Insights)	32 vCPUs (with physical reservation)	128GB (with physical reservation)	3 TB SSD
	Data Node (rND) (with SAN Insights)	32 vCPUs (with physical reservation)	128 GB (with physical reservation)	3 TB SSD
	Physical Node (pND) (PID: SE-NODE-G2 and ND-NODE-L4)	2 x 10-core 2.2G Intel Xeon Silver CPU	256 GB of RAM	4 x 2.4 TB HDDs 400 GB SSD 1.6 TB NVME drive

Scale Limits for NDFC Fabric Discovery

Table 2: Scale Limits for Fabric Discovery Persona and Nexus Dashboard

Profile	Deployment Type	Verified Limit
Fabric Discovery	1-Node vND (app OVA)	<= 25 switches (Non-Production)
Fabric Discovery	3-Node vND (app OVA)	150 Switches
Fabric Discovery	5-Node vND (app OVA)	1000 Switches
Fabric Discovery	3-Node pND	1000 Switches

Scale Limits for NDFC Fabric Controller

Table 3: Scale Limits for Fabric Controller Persona and Nexus Dashboard

Profile	Deployment Type	Verified Limit
Fabric Controller (Non-Production)	1-Node vND (app OVA)	<= 25 switches (Non-Production)
Fabric Controller	3-Node vND (app OVA)	80 Switches
Fabric Controller	5-Node vND (app OVA)	400 switches for Easy Fabrics[1] 1000 switches for External Fabrics[2]

Profile	Deployment Type	Verified Limit
Fabric Controller	3-Node pND	500 switches for Easy Fabrics[1] 1000 switches for External Fabrics[2]

[1] Easy Fabrics include Data Center VXLAN EVPN fabrics and BGP fabrics.

[2]External Fabrics include Flexible Network fabrics, Classic LAN fabrics, External Connectivity Network fabrics, and Multi-Site Interconnect Network fabrics. Both managed and monitored mode are supported.

Table 4: Scale Limits for Switches and Fabrics in Fabric Controller

Description	Verified Limit
Switches per fabric	200
Number of fabrics	25
Physical Interfaces per NDFC instance	30000

Table 5: Scale Limits For Provisioning New Data Center VXLAN EVPN Fabrics (also referred to as "Greenfield" Deployment)

Description	Verified Limit
Fabric Underlay Overlay	
Switches per fabric	200
Overlay Scale for VRFs and Networks	500 VRFs, 2000 Layer-3 Networks or 2500 Layer-2 Networks
VRF instances for external connectivity	500
IPAM Integrator application	150 networks with a total of 4K IP allocations on the Infoblox server
ToR and Leaf devices	A Data Center VXLAN EVPN fabric can manage both Layer-2 ToRs and Leafs. Maximum scale for such fabric is 40 Leafs and 240 ToRs.
Endpoint Locator	
Endpoints	100000
VXLAN EVPN Multi-Site Domain	
Sites	12
Virtual Machine Manager (VMM)	
Virtual Machines (VMs)	5500
VMware Center Servers	4

Description	Verified Limit
Kubernetes Visualizer application	Maximum of 159 namespaces with maxium of 1002 pods

Note Refer to the following table if you are transitioning a command line interface (CLI) configured Cisco Nexus 9000 series switches based VXLAN EVPN fabric to NDFC.

Table 6: Scale Limits For Transitioning Existing Data Center VXLAN EVPN Fabric Management to NDFC (also referred to as "Brownfield Migration")

Description	Verified Limit
Fabric Underlay and Overlay	
Switches per fabric	100
Physical Interfaces	5000
VRF instances	100
Overlay networks	500
VRF instances for external connectivity	100
Endpoint Locator	
Endpoints	50000
IPAM Integrator application	150 networks with a total of 4K IP allocations on the Infoblox server
Virtual Machine Manager (VMM)	
Virtual Machines (VMs)	5500
VMware Center Servers	4
Kubernetes Visualizer application	Maximum of 159 namespaces with maxium of 1002 pods

Scale Limits for Cohosting NDFC and other Services

Table 7: Scale Limits for Cohosting Nexus Dashboard Insights and NDFC

Profile	Deployment Type	Verified Limit
NexusDashboard Insights and Nexus Dashboard Fabric Discovery	4-Node pND	50 switches, 10K Flows
NexusDashboard Insights and Nexus Dashboard Fabric Controller	5-Node pND	50 switches, 10K Flows

Scale Limits for IPFM Fabrics

Table 8: Scale Limits for Nexus Dashboard and IPFM Fabrics

Profile	Deployment Type	Verified Limit
Fabric Controller	1-Node vND	35 switches (2 Spines and 33 Leafs)
Fabric Controller	3-Node vND	35 switches (2 Spines and 33 Leafs)
Fabric Controller	1-Node pND	35 switches (2 Spines and 33 Leafs)
Fabric Controller	3-Node pND	120 switches (2 Spines and 100 Leafs and 18 Tier-2 Leafs)

Table 9: Scale limits for IPFM Fabrics

Description	Verified Limit			
	NBM Active Mode Only	NBM Passive Mode Only	Mixed Mode	
			NBM Active VRF	NBM Passive VRF
Switches	120	32	32	32
Number of flows	32000	32000	32000	32000
Number of End Points (Discovered Hosts)	5000	1500	3500	1500
VRFs	16	16	16	16
Host Policy - Sender	8000	NA	8000	NA
Host Policy - Receiver	8000	NA	8000	NA
Host Policy - PIM (Remote)	512	NA	512	NA
Flow Policy	2500	NA	2500	NA
NBM ASM group-range	20	NA	20	NA
Host Alias	2500	NA	2500	NA
Flow Alias	2500	NA	2500	NA
NAT Flows	3000	3000	3000	3000
RTP Flow Monitoring	8000	8000	8000	8000
PTP Monitoring	120 switches	32 switches	32 switches	32 switches

Scale Limits for NDFC SAN Controller

Table 10: Scale Limits for SAN Zones

Description	Verified Limits
Zone sets	1000
Zone	16000

Table 11: Scale Limits for Nexus Dashboard and SAN Controller Persona

Profile	Deployment Type	Verified Limit	
		Without SAN Insights	With SAN Insights
SAN Controller	1-Node vND (app OVA)	80 Switches, 20K Ports	NA
	1-Node vND (data OVA)	80 Switches, 20K Ports	1M ITLs/ITNs
	1-Node pND (SE)	80 Switches, 20K Ports	120K ITLs/ITNs
SAN Controller	3-Node vND (app OVA)	160 Switches, 40K Ports	NA
	3-Node vND (data OVA)	160 Switches, 40K Ports	240K ITLs/ITNs
	3-Node pND	160 Switches, 40K Ports	500K ITLs/ITNs
SAN Controller on Linux (rND) (Install Profile: Default)	1-Node vND	80 Switches, 20K Ports	NA
SAN Controller on Linux (rND) (Install Profile: Large)	1-Node vND	80 Switches, 20K Ports	1M ITLs/ITNs
SAN Controller on Linux (rND) (Install Profile: Default)	3-Node vND	160 Switches, 40K Ports	NA
SAN Controller on Linux (rND) (Install Profile: Large)	3-Node vND	160 Switches, 40K Ports	240K ITLs/ITNs

Note ITLs - Initiator-Target-LUNs

ITNs - Initiator-Target-Namespace ID

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