# Cisco Nexus 2000 Series Fabric Extenders

Product Overview

The Cisco Nexus® 2000 Series Fabric Extenders comprise a category of data center products designed to simplify data center access architecture and operations. The Cisco Nexus 2000 Series uses the Cisco® fabric extender architecture to provide a highly scalable unified server-access platform across a range of 100 Megabit Ethernet, 1 and 10 Gigabit Ethernet, unified fabric, copper and fiber connectivity, and rack and blade server environments. The platform is well suited to support today's traditional 1 Gigabit Ethernet environments while allowing transparent migration to 10 Gigabit Ethernet, virtual machine-aware unified fabric technologies.

The Cisco Nexus 2000 Series Fabric Extenders behave like remote line cards for a parent Cisco Nexus switch. The fabric extenders are essentially extensions of the parent Cisco Nexus switch fabric, with the fabric extenders and the parent switch together forming a distributed modular system. This architecture enables physical topologies with the flexibility and benefits of both top-of-rack (ToR) and end-of-row (EoR) deployments (Figure 1).

Figure 1. Cisco Nexus 2000 Series Fabric Extenders Provide Highly Scalable Unified Server-Access Connectivity
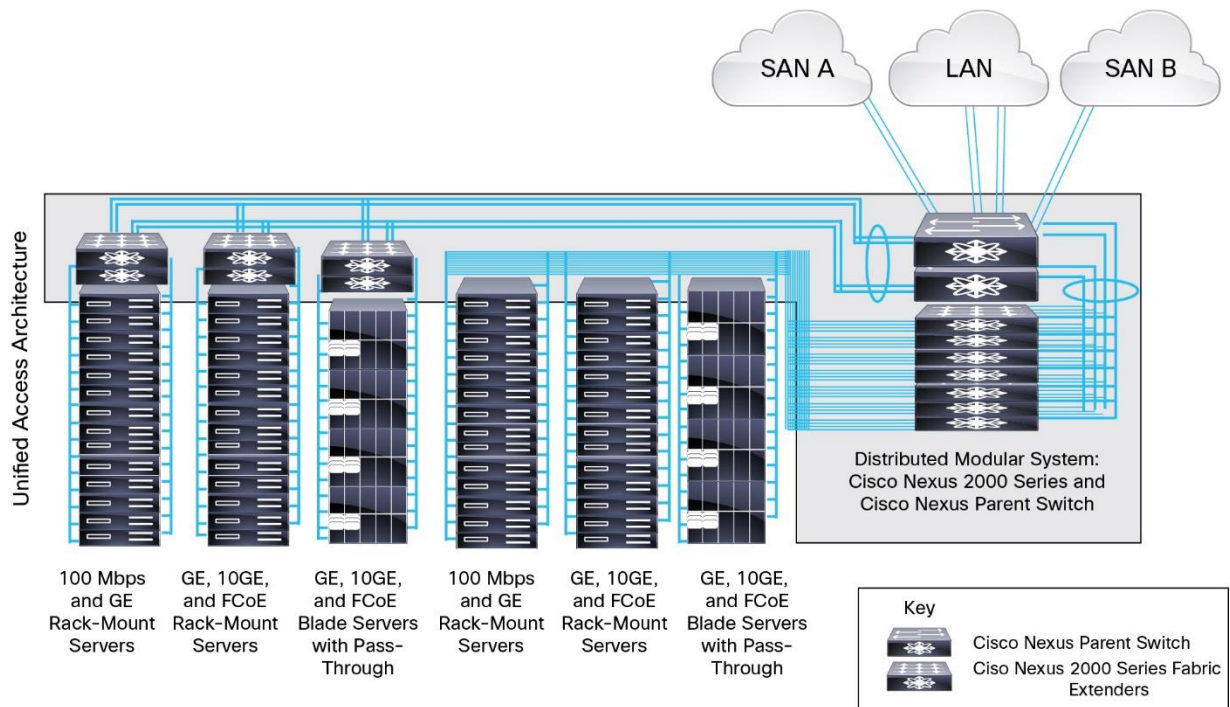
The Cisco Nexus 2000 Series architecture provides the following benefits:

- Architecture flexibility: A common, scalable, and adaptive architecture across data center racks and points of delivery (PoDs)[1] supports various server options, connectivity options, physical topologies, and evolving needs.

- Highly scalable server access: 1 and 10 Gigabit Ethernet server access is scalable, with no reliance on Spanning Tree Protocol.

- Simplified operations: One single point of management and policy enforcement using upstream Cisco Nexus switches eases the commissioning and decommissioning of server racks through zero-touch installation and automatic configuration of fabric extenders.

- Increased business benefits: Consolidation, cabling reduction, rack-space reduction, reduced power and cooling, investment protection through feature inheritance from the parent switch, and the capability to add functions without the need for a major equipment upgrade of server-attached infrastructure all contribute to reduced operating expenses (OpEx) and capital expenditures (CapEx).

The Cisco Nexus 2000 Series design aligns with that of servers. It offers front-to-back cooling, compatible with data center hot-aisle and cold-aisle designs, all switch ports at the rear of the unit in close proximity to server ports, and all user-serviceable components accessible from the front panel. It also offers back-to-front cooling, with switch ports in front of the chassis, aligned with the cold aisle, for optimized cabling in network racks. The Cisco Nexus 2000 Series is built for nonstop operation, with redundant hot-swappable power supplies and a hot-swappable fan tray with redundant fans. Its compact 1-rack-unit (1RU) form factor takes up relatively little space, making it easy to incorporate into rack designs. The fabric extenders are available in several models to provide speed, connectivity, and port-density options (Figure 2).

Figure 2.   Cisco Nexus 2000 Series Fabric Extenders from Bottom Right to Top Left: Cisco Nexus 2224TP GE, 2248TP GE, 2248TP-E GE, 2232TM 10GE, 2232TM-E 10GE, 2232PP 10GE, and 2248PQ 10GE; Cost-Effective Fabric Extender Transceivers for Cisco Nexus 2000 Series and Cisco Nexus Parent Switch Interconnect Are in Front of the Fabric Extenders

The Cisco Nexus 2000 Series provides two types of ports: ports for end-host attachment (host interfaces) and uplink ports (fabric interfaces). Fabric interfaces, differentiated with a yellow color, are for connectivity to the upstream parent Cisco Nexus switch.

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[1] A PoD is a module or group of network, computing, storage, and application components that work together to deliver a network service. The PoD is a repeatable pattern, and its components increase the modularity, scalability, and manageability of data centers.

Table 1 lists the Cisco Nexus 2000 Series Fabric Extenders. Fabric extenders can be mixed and matched to a parent switch to provide connectivity options.

Table 1. Cisco Nexus 2000 Series Fabric Extenders

Fabric Extender	Description
Cisco Nexus 2148T	48t 1000BASE-T host interfaces and 4 x 10 Gigabit Ethernet fabric interfaces (Enhanced Small Form-Factor Pluggable [SFP+])
Cisco Nexus 2224TP GE	24 x 100/1000BASE-T host interfaces and 2 x10 Gigabit Ethernet fabric interfaces (Enhanced Small Form-Factor Pluggable [SFP+])
Cisco Nexus 2248TP GE	48 x 100/1000BASE-T host interfaces and 4 x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2248TP-E	48 x 100/1000BASE-T host interfaces and 4 x 10 Gigabit Ethernet fabric interfaces (SFP+)
Cisco Nexus 2232PP 10GE	32 x 1/10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE) host interfaces (SFP+) and 8 x 10 Gigabit Ethernet and FCoE fabric interfaces (SFP+)
Cisco Nexus 2248PQ 10GE	48 x 1/10 Gigabit Ethernet and FCoE host interfaces (SFP+) and 4 Quad SFP+ (QSFP+) Gigabit Ethernet and FCoE fabric interfaces (QSFP+)
Cisco Nexus 2232TM 10GE	32 x 1/10GBASE-T host interfaces and uplink modules (8 x 10 Gigabit Ethernet fabric interfaces [SFP+])
Cisco Nexus 2232TM-E 10GE	32 x 1/10GBASE-T host interfaces and uplink modules (8 x 10 Gigabit Ethernet fabric interfaces [SFP+]); FCoE support up to 30m with Category 6a and 7 cables

The Cisco Nexus 2248TP-E (Figure 3) is a general-purpose 1 Gigabit Ethernet fabric extender with enhancements that target workloads such as large-volume databases, distributed storage, and video editing. Like the Cisco Nexus 2248TP, the Cisco Nexus 2248TP-E supports 48 x 100/1000BASE-T host-facing ports and four 10 Gigabit Ethernet fabric interfaces. It also supports 32-MB shared buffers.

Figure 3. Cisco Nexus N2248TP-E

The Cisco Nexus 2248PQ 10 Gigabit Ethernet fabric extender (Figure 4) is the newest member of the Cisco Nexus fabric extenders. It supports high-density 10 Gigabit Ethernet environments and has 48 x 1 and 10 Gigabit Ethernet SFP+ host ports and 4 QSFP+ fabric ports (16 x 10 Gigabit Ethernet fabric ports). QSFP+ connectivity simplifies cabling while lowering power and solution cost. The Cisco Nexus 2248PQ 10GE Fabric Extender supports FCoE and a set of network technologies known collectively as Data Center Bridging (DCB) that increase the reliability, efficiency, and scalability of Ethernet networks. These features allow support for multiple traffic classes over a lossless Ethernet fabric, thus enabling consolidation of LAN, SAN, and cluster environments.

Figure 4. Cisco Nexus N2248PQ

The Cisco Nexus 2232PP 1 and 10 Gigabit Ethernet fabric extender (Figure 5) is an excellent platform for migration from 1 Gigabit Ethernet to 10 Gigabit Ethernet and unified fabric environments. It supports FCoE and DCB.

Figure 5.   Cisco Nexus N2232PP

The Cisco Nexus 2232TM-E fabric extender (Figure 6) supports scalable 1/10GBASE-T environments, ease of migration from 1GBASE-T to 10GBASE-T, and effective reuse of existing structured cabling. It comes with an uplink module that supports eight 10 Gigabit Ethernet fabric interfaces. It is a superset of the Cisco Nexus 2232TM with the latest generation of 10GBASE-T PHY, enabling lower power and improved bit error rate (BER). The Cisco Nexus 2232TM-E supports DCB and LAN and SAN consolidation. FCoE support distances of up to 30 meters with Category 6a and 7 cables from the adapter to the fabric extender.

Figure 6.   Cisco Nexus N2232TM-E

Cisco Nexus 2000 Series Fabric Extenders connect to a parent Cisco Nexus switch through their fabric links using CX1 copper cable, short-reach or long-reach optics, and the cost-effective Cisco Fabric Extender Transceivers. Fabric Extender Transceivers are optical transceivers that provide a highly cost-effective solution for connecting the fabric extender to its parent switch over OM3 or OM4 multimode fiber.

The fabric extenders behave like remote line cards for a parent Cisco Nexus 5000, 6000, or 7000 Series Switch. Working in conjunction with Cisco Nexus switches, the fabric extenders extend the capabilities and benefits offered by the parent Cisco Nexus switch while providing flexible, scalable, and cost-effective server access. Table 2 summarizes the Cisco Nexus 2000 Series parent switch support matrix.

Table 2.   Cisco Nexus Fabric Extender Parent Switch Support Matrix

Cisco Nexus Parent Switch				
	Cisco Nexus 5000 Series	**Cisco Nexus 6000 Series**	**Cisco Nexus 7000 Series**	**Cisco Nexus 9000 Series**
Cisco Nexus Fabric Extender Models	• Cisco Nexus 2224TP • Cisco Nexus 2248TP • Cisco Nexus 2248TP-E • Cisco Nexus 2232PP • Cisco Nexus 2248PQ[*] • Cisco Nexus 2232TM • Cisco Nexus 2232TM-E	• Cisco Nexus 2224TP • Cisco Nexus 2248TP • Cisco Nexus 2248TP-E • Cisco Nexus 2232PP • Cisco Nexus 2248PQ • Cisco Nexus 2232TM • Cisco Nexus 2232TM-E	• Cisco Nexus 2224TP • Cisco Nexus 2248TP • Cisco Nexus 2248TP-E • Cisco Nexus 2232PP • Cisco Nexus 2248PQ • Cisco Nexus 2232TM • Cisco Nexus 2232TM-E	• Cisco Nexus 2224TP • Cisco Nexus 2248TP • Cisco Nexus 2248TP-E • Cisco Nexus 2232PP • Cisco Nexus 2248PQ • Cisco Nexus 2232TM • Cisco Nexus 2232TM-E
Cisco Nexus Parent Model	• Cisco Nexus 5010P or 5020P Switch[*] • Cisco Nexus 5548P Switch • Cisco Nexus 5548UP Switch • Cisco Nexus 5596UP Switch	• Cisco Nexus 6001P Switch • Cisco Nexus 6001T Switch • Cisco Nexus 6004EF Switch	• Cisco Nexus 7000 Series 32-port 10 Gigabit Ethernet SFP+ I/O module (N7K-M132XP-12) • Cisco Nexus 7000 Series 32-port 10 Gigabit Ethernet (XL) SFP+ I/O module (N7K-	• Cisco Nexus 9372PX Switch • Cisco Nexus 9396PX Switch • Cisco Nexus 9564PX I/O module • Cisco Nexus 9464PX I/O module

Cisco Nexus Parent Switch				
	• Cisco Nexus 5596T Switch • Cisco Nexus 5672UP Switch • Cisco Nexus 56128P Switch • Cisco Nexus 5696Q Switch • Cisco Nexus 5648Q Switch • Cisco Nexus 5624Q Switch		M132XP-12L) • Cisco Nexus 7000 Series line-rate 48-port 1/10 Gigabit Ethernet, SFP/SFP+ I/O module (N7K-F248XP-25) • Cisco Nexus 7000 Series 24-port 10 Gigabit Ethernet SFP+ I/O module (N7K-M224XP-23L) • Cisco Nexus 7000 Series 6-port 40 Gigabit Ethernet QSFP+ I/O module (N7K-M206FQ-23L) • Cisco Nexus 7000 Series enhanced 48-port 1/10 Gigabit Ethernet SFP+ I/O module (N7K-F248XP-25E) • Cisco Nexus 7700 platform 48-port 1/10 Gigabit Ethernet SFP+ I/O module (N77-F248XP-23E) • Cisco Nexus 7000 F3-Series 48-port 1/10 Gigabit Ethernet SFP+ I/O module (N7K-F348XP-25) • Cisco Nexus 7000 F3-Series 12-port 40 Gigabit Ethernet QSFP+ I/O module (N7K-F312FQ-25) • Cisco Nexus 7700 F3 Series 48-port 1/10 Gigabit Ethernet SFP+ I/O module (N77-F348XP-23)	
Scalability	• Up to 24 fabric extenders per Cisco Nexus 5600 platform switch in both Layer 2 and Layer 3 configurations; up to 1152 x 1 Gigabit Ethernet servers and 1152 x 10 Gigabit Ethernet servers per switch • Up to 24 fabric extenders per Cisco Nexus 5548P, 5548UP, or 5596UP Switch (16 fabric extenders for Layer 3 configurations); up to 1152 x 1 Gigabit Ethernet servers and 1152 x 10 Gigabit Ethernet servers per switch • Up to 12 fabric extenders per Cisco Nexus 5010P and 5020P Switch: up to 576 x 1 Gigabit Ethernet servers and 384 x 10 Gigabit Ethernet servers per switch	• Up to 48 fabric extenders in Layer 2 configurations and up to 24 fabric extenders in Layer 3 configurations; up to 2304 x 1 Gigabit Ethernet servers and 2304 x 10 Gigabit Ethernet servers per switch	• Up to 64 fabric extenders per Cisco Nexus 7000 Series Switch with Cisco Nexus 7000 Series Supervisor 2E Module and Cisco NX-OS Software Release 6.2 • Up to 15 fabric extenders in active-active mode per Cisco Nexus 7000 Series Switch with Cisco Nexus 7000 Series Supervisor 2E Module and Cisco NX-OS Software Release 7.2.0D1(1). • Up to 3072 x 1 Gigabit Ethernet and 3072 x 10 Gigabit Ethernet servers per Cisco Nexus 7000 Series Switch with Cisco Nexus 7000 Series Supervisor 2E Module and Cisco NX-OS Software Release 6.2	• Up to 16 fabric extenders per Cisco Nexus 9300 or 9500 platform switch with Cisco NX-OS Software Release 7.0(3)I1(2)

Benefits

Architecture Flexibility

- Unified server access architecture: The Cisco Nexus 2000 Series offers a highly cost-effective access-layer architecture for 100 Megabit Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, mixed Gigabit Ethernet, and 10 Gigabit Ethernet servers; Ethernet or unified fabrics; physical or virtual servers; and rack or blade server environments.

- Flexible physical topologies: The Cisco Nexus 2000 Series architecture allows the Layer 1 and 2 topologies to be decoupled, therefore providing flexibility in physical architecture designs, including ToR, middle-of-row (MoR), and EoR deployments, while allowing quick expansion of network capacity and remote line-card portability across multiple parent switches. It is also space optimized for all these architectures.

Highly Scalable Access Layer

Today's data centers must have massive scalability to manage the combination of an increasing number of servers and a higher demand for bandwidth from each server. The Cisco Nexus 2000 Series increases the scalability of the access layer to accommodate both sets of demands without increasing management points within the network.

- Massive scalability: A deployment of Cisco Nexus 2000 Series Fabric Extenders connected to a Cisco Nexus 5000, 6000, or 7000 Series Switch supports highly scalable 1 and 10 Gigabit Ethernet environments, as shown in Table 2.

- Layer 2 scalability: Reliance on Spanning Tree Protocol is eliminated between the fabric extender and the parent switch, thus enabling a large, multipath, loop-free topology. Use of a single management entity to support a large server domain allows policy to be enforced more efficiently and enhances Layer 2 data center access scalability. Use of the virtual PortChannel (vPC) feature also allows fast convergence and effective use of bandwidth in Layer 2 environments.

Simplified Operations

- Single point of management: The Cisco Nexus 2000 Series Fabric Extenders are remote line cards for a Cisco Nexus parent switch. All device configurations are managed on the parent switch, and configuration information is downloaded to the fabric extender using in-band communication.

- Software maintenance simplification: The Cisco Nexus 2000 Series software is embedded in the Cisco Nexus parent switch software. The fabric extender is a ready-to-use device that automatically downloads the software image from the parent switch in the same way that a line card downloads software from the supervisor engine in a modular chassis. In-Service Software Upgrade (ISSU) on the fabric extenders provides the capability to perform transparent software upgrades, reducing downtime and allowing customers to integrate the newest features and functions with little or no negative effect on network operation for Ethernet, storage, and converged network environments.

- Switch feature consistency across a large number of servers: The Cisco Nexus 2000 Series forwards all traffic to the parent Cisco Nexus switch over 10 Gigabit Ethernet fabric uplinks. Passing all traffic to the parent switch allows traffic to be shaped according to policies established on the parent switch with a single point of management. Standardizing on the Cisco Nexus switches allows data centers to support the same switch features across the entire access layer with a single point of management.

- Tenfold reduction in management points: The number of management points is significantly less than when discrete switches are used at the top of the rack. A traditional 12-rack design using a discrete, redundant pair of Gigabit Ethernet switches at the top of each rack has 24 management points. The equivalent architecture using the Cisco Nexus 2000 Series has only 2 management points: a tenfold reduction in management complexity.

Business Benefits

- Cost-effective 10 Gigabit Ethernet solution: The Cisco Nexus 2000 Series is an excellent platform for migration from 1 Gigabit Ethernet to 10 Gigabit Ethernet. Scalable 10 Gigabit Ethernet provides 10 times the bandwidth for approximately twice the price of Gigabit Ethernet.

- Consolidation: The Cisco Nexus 2000 Series protects an organization's investment into the future, supporting evolving data center needs by providing an easy migration path to low-latency 10 Gigabit Ethernet, high-performance computing (HPC), virtual machine-aware networks. In addition, the combination of the Cisco Nexus 5000 or 6000 Series and Cisco Nexus 2232PP or 2248PQ provides a unified network fabric that supports LAN and SAN consolidation. Another benefit of the Cisco Nexus 2000 Series architecture is the capability to collapse data center access and aggregation layers into one single layer.

- Investment protection: The Cisco Nexus 2000 Series Fabric Extenders can be mixed and matched with a common parent Cisco Nexus switch. New functions can be derived from upstream Cisco Nexus switches, resulting in the capability to add new functions without the need for a major equipment upgrade.

- Rack-space reduction: The Cisco Nexus 2000 Series consists of 1RU fabric extenders. The fabric extenders are not physically constrained by the position of the Cisco Nexus parent switch in the physical topology and are attached to the upstream Cisco Nexus switch through fabric links.

- Cabling reduction with optimal intra- and inter-rack cabling options: The Cisco Nexus 2000 Series supports ToR, EoR, and MoR deployment models. Placing the fabric extender at the top of the rack allows the use of short cables from the rack to the servers, reducing cable costs, air dams, complexity, and opportunities for error. The only inter-rack cabling required is for uplinks from the fabric extender to the parent switch. Placing the parent Cisco Nexus switch at the end or middle of a row of racks makes efficient use of powerful switching resources.

- The Cisco Nexus 2000 Series supports an optimal cabling strategy that simplifies network operations and prepares for future technologies:

  ◦ Short intra-rack runs of copper: Intra-rack cables connecting to Gigabit Ethernet servers can be Category 5e, 6, 6a, or 7 with the Cisco Nexus 2148T, 2224TP, 2248TP, and 2248TP-E fabric extenders. Category 6, 6a, or 7 can connect 10GBASE-T servers to the Cisco Nexus 2232TM and 2232TM-E. Twinax cables connect servers to ToR Cisco Nexus 2232PP fabric extenders. This model allows server racks and PoDs to be preconfigured by server vendors so that they can be rolled into place and put into service upon arrival.

  ◦ Longer inter-rack horizontal runs of fiber: Cisco Nexus 2000 Series Fabric Extenders in each rack are connected to parent switches that are placed at the end or middle of the row. For long reach between the fabric extender and the parent switch, you can use Fabric Extender Transceiver, SFP+ short-reach (SR), SFP+ long-reach (LR) optics over OM2 or OM3 cables, and QSFP+ optics for 40-Gbps connectivity. Fiber protects investments into the future because it will support upcoming Ethernet standards, including 40 and 100 Gigabit Ethernet. If the distance to the Cisco Nexus 5000, 6000, or 7000 Series Switch is less than 10 meters, you can use Twinax cables (CX1 direct attach). Alternatively, you can use copper cables to reach EoR or MoR 1GBASE-T or 10GBASE-T fabric extenders.

- Effective bandwidth utilization: Today's data center servers are either single- or dual-homed to the network. However, network designs almost always involve redundant deployment. Through the vPC feature support on the Cisco Nexus 5000, 6000, and 7000 Series, a server can be dually connected to a pair of fabric extenders, or each fabric extender can be connected to a pair of Cisco Nexus 5000, 6000, or 7000 Series Switches, thus giving customers both server and fabric extender connectivity redundancy and providing active-active connectivity with twice the bandwidth utilization as in active-standby or forwarding-blocking configurations.

- Reduced power and cooling needs: Cost-effective 10 Gigabit Ethernet solutions, optimal cabling, device consolidation, rack-space reduction, and efficient bandwidth use all contribute to a significant reduction in power and cooling needs in the data center.

Cisco Nexus 2000 Series Deployment Scenarios

The fabric extenders can be used in the following deployment scenarios:

- Rack servers with 100 Megabit Ethernet, 1 Gigabit Ethernet, or 10 Gigabit Ethernet network interface cards (NICs); the fabric extender can be physically located at the top of the rack and the Cisco Nexus parent switch can reside in the middle or at the end of the row, or the fabric extender and the Cisco Nexus parent switch can both reside at the end or middle of the row

- 10 Gigabit Ethernet and FCoE deployments, using servers with converged network adapters (CNAs) for unified fabric environments with the Cisco Nexus 2232PP, 2248PQ, and 2232TM-E.

- 1/10GBASE-T server connectivity with ease of migration from 1 to 10GBASE-T and effective reuse of structured cabling

- Server racks with integrated lights-out (iLO) management, with 100 Megabit Ethernet or 1 Gigabit Ethernet management and iLO interfaces

- 1 and 10 Gigabit Ethernet blade servers with pass-through blades

- Low-latency, high-performance computing environments

- Virtualized access

For more information, visit the Cisco Nexus 2000 Series case studies page: http://www.cisco.com/en/US/products/ps10110/prod_case_studies_list.html.

The Cisco Nexus 2000 Series can be used in conjunction with a Cisco Nexus parent switch in four main design scenarios (shown in Figure 7):

- Cisco Nexus 2000 Series Fabric Extenders single-connected to one upstream Cisco Nexus 5000, 6000, or 7000 Series Switch: In this deployment scenario, access-layer redundancy is achieved through redundant server connections to two upstream distributed modular systems using vPC (Cisco Nexus 5000, 6000, or 7000 Series) or server NIC teaming to two Cisco Nexus 2000 Series Fabric Extenders.

- Cisco Nexus 2000 Series Fabric Extenders dual-connected to two upstream Cisco Nexus 5000, 6000, or 7000 Series Switches (vPC): In this deployment scenario, access-layer redundancy is achieved through a combination of Cisco Nexus 2000 Series Fabric Extenders dual-connected to an upstream parent switch and server NIC teaming.

- Enhanced vPC (EvPC): In this deployment scenario, access-layer redundancy is achieved in two ways: through redundant connections between the Cisco Nexus 2000 Fabric Extenders and the Cisco Nexus parent switches using vPC, and through redundant server connections to two fabric extenders using vPC and active-active server NIC teaming. This scenario is supported only with the Cisco Nexus 5000 or 6000 Series Switches used as upstream switches. This scenario is not currently supported with the Cisco Nexus 7000 Series Switches.
- vPC+: In this deployment scenario, access-layer redundancy is achieved through server vPC, fabric extender vPC, and EvPC. In addition, a vPC+ domain allows the Cisco Nexus parent switch and the fabric extenders to be viewed as a single virtual switch in a Cisco FabricPath network.

Figure 7. Cisco Nexus 2000 Series Fabric Extenders Design Scenarios, from Left to Right: Server vPC, Fabric Extender vPC, EvPC, and vPC+
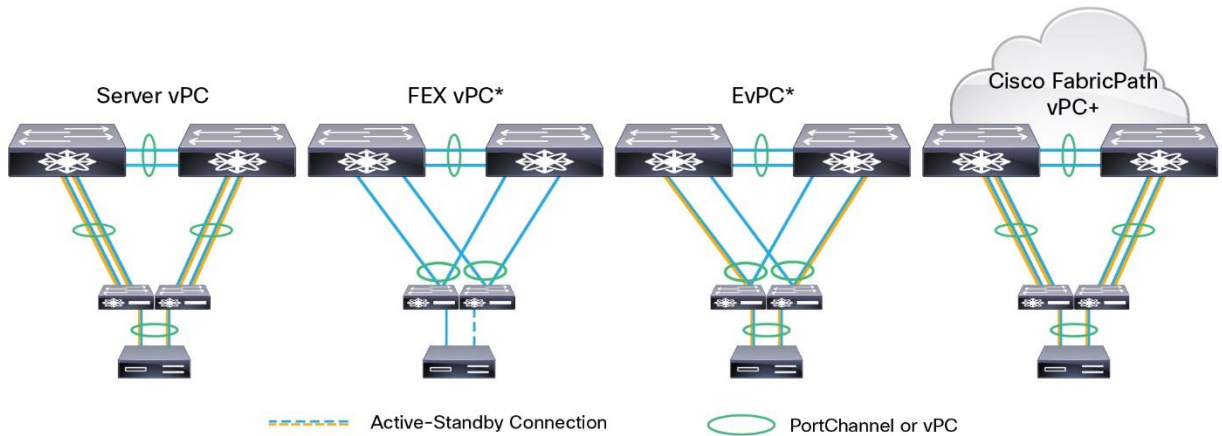
All topologies are supported with Cisco Nexus 5000 and 6000 Series parent switches.

The Cisco Nexus 7000 Series supports server vPC and fabric extender vPC scenarios.

The Cisco Nexus 9000 Series supports the server vPC scenario.

Product Specifications

Tables 3 through 9 provide product specifications and Table 10 lists standards support for the Cisco Nexus 2000 Series Fabric Extenders.

Table 3. Cisco Nexus 2000 Series Gigabit Ethernet Fabric Extenders Product Specifications

Description	Cisco Nexus 2148T	Cisco Nexus 2224TP	Cisco Nexus 2248TP	Cisco Nexus 2248TP-E
Fabric extender host interfaces	• 48	• 24	• 48	• 48
Fabric extender host interfaces type	• 1000BASE-T ports: RJ-45 connectors	• 100BASE-T/1000BASE-T ports: RJ-45 connectors	• 100BASE-T/1000BASE-T ports: RJ-45 connectors	• 100BASE-T/1000BASE-T ports: RJ-45 connectors
Fabric extender fabric interfaces	• 4	• 2	• 4	• 4

Description	Cisco Nexus 2148T	Cisco Nexus 2224TP	Cisco Nexus 2248TP	Cisco Nexus 2248TP-E
Fabric extender fabric interfaces type	• Fiber: SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000Series Switch: Up to 3 km	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or Nexus 6000 Series Switch: Up to 3 km • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 7000 Series Switch: Up to 10 km	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or Nexus 6000 Series Switch: Up to 3 km • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 7000 Series Switch: Up to 10 km	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or Nexus 6000 Series Switch: Up to 10 km • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 7000 Series Switch: Up to 10 km
Fabric speed	• 40 Gbps in each direction (80 Gbps full duplex)	• 20 Gbps in each direction (40 Gbps full duplex)	• 40 Gbps in each direction (80 Gbps full duplex)	• 40 Gbps in each direction (80 Gbps full duplex)
Oversubscription	• 1.2:1	• 1.2:1	• 1.2:1	• 1.2:1
Performance	• Hardware forwarding at 176 Gbps or 131 million packets per second (mpps)	• Hardware forwarding at 88 Gbps or 65 mpps	• Hardware forwarding at 176 Gbps or 131 mpps	• Hardware forwarding at 176 Gbps or 131 mpps
Cisco parent switch	• Cisco Nexus 5000 Series	• Cisco Nexus 5000 Series • Cisco Nexus 6000 • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series	• Cisco Nexus 5000 Series • Cisco Nexus 6000 • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series	• Cisco Nexus 5000 Series • Cisco Nexus 6000 • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series

Description	Cisco Nexus 2148T	Cisco Nexus 2224TP	Cisco Nexus 2248TP	Cisco Nexus 2248TP-E
Minimum software	• Cisco NX-OS Software Release 4.0(1A)N2(1) (Cisco Nexus 5000 Series)	• Cisco NX-OS Software Release 4.2(1)N2(1) (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series Switches running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Software Release 5.2 on the Cisco Nexus 7000 Series • Cisco NX-OS Software Release 6.1 on the Cisco Nexus 9000 Series	• Cisco NX-OS Software Release 4.2 (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series Switches running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Software Release 5.1 on the Cisco Nexus 7000 Series • Cisco NX-OS Software Release 6.1 on the Cisco Nexus 9000 Series	• Cisco NX-OS Software Release 5.1(3)N(1)1 (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series Switches running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Software Release 6.1(1) on the Cisco Nexus 7000 Series • Cisco NX-OS Software Release 6.1 on the Cisco Nexus 9000 Series
Dimensions (H x W x D)	• 1.72 x 17.3 x 20.0 in. (4.37 x 43.94 x 50.8 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)
Weight	• 18 lb (8.2 kg) • *Systems are fully loaded with two power supplies and one fan tray	• 16.6 lb (7.53 kg) • *Systems are fully loaded with two power supplies and one fan tray	• 17.7 lb (8.0 kg) • *Systems are fully loaded with two power supplies and one fan tray	• 17.7 lb (8.0 kg) • *Systems are fully loaded with two power supplies and one fan tray
Indicator and port specification	• System status: Green (operational), amber (fault), flashing amber (POST boot up), and off (no power) • Locator LED: Bright blue locator • Port status: Green (link established), amber (administratively disabled), and flashing amber (fault) • Fan status: Green (operational) and amber (fault) • Power status: Green (operational) and amber (fault)			
Environment	• Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 158°F (-20 to 70°C) • Humidity: 5 to 95 percent (noncondensing) • Altitude: 0 to 10,000 ft (0 to 3000m)			
Power supply	• N2K-PAC-200W	• N2200-PAC-400W, N2200-PAC-400W-B, N2200-PDC-400W, and N2200-PDC-350W-B	• N2200-PAC-400W, N2200-PAC-400W-B, N2200-PDC-400W, and N2200-PDC-350W-B	• N2200-PAC-400W, N2200-PAC-400W-B, N2200-PDC-400W, and N2200-PDC-350W-B
Fan tray	• N2K-C2148-FAN	• N2K-C2248-FAN and N2K-C2248-FAN-B	• N2K-C2248-FAN and N2K-C2248-FAN-B	• N2K-C2248-FAN and N2K-C2248-FAN-B
Typical input operating power	• 150W (max 165W)	• 80W (max 95W)	• 95W (max 110W)	• 95W (max 110W)
Input current	• 1.5A/2.2A (typical/maximum) • Note: Input currents listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 0.75A/0.90A (typical/maximum) • Note: Input currents listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 1.0A/1.2A (typical/maximum) • Note: Input currents listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 1.0A/1.2A (typical/maximum) • Note: Input currents listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating
Output current	• 11.5A/16.7A (typical/maximum)	• 5A/7A (typical/maximum)	• 8A/10A (typical/maximum)	• 8A/10A (typical/maximum)
Heat dissipation	• 670 BTU/hr	• 201/282 BTU/hour (typical/maximum)	• 322/403 BTU/hour (typical/maximum)	• 322/403 BTU/hour (typical/maximum)

Table 4. Cisco Nexus 2000 Series 10 Gigabit Ethernet Fabric Extender Product Specifications

Description	Cisco Nexus 2232PP	Cisco Nexus 2248PQ	Cisco Nexus 2232TM	Cisco Nexus 2232TM-E
Fabric extender host interfaces	• 32	• 48	• 32	• 32
Fabric extender host interface type	• 1/10 Gigabit Ethernet ports SFP/SFP+ (supported transceiver and cables include Twinax SFP-H10GB-CU1M, SFP-H10GB-CU3M, SFP-H10GB-CU5M, SFP-H10GB-ACU7M, and SFP-H10GB-ACU10M; SFP+ SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR, and SFP-10G-LR-S; and SFP GLC-T, GLC-SX-MM, GLC-LH-SM, SFP-GE-T, SFP-GE-S, and SFP-GE-L) • AOC cables: FP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, and SFP-10G-AOC10M	• 1/10 Gigabit Ethernet ports SFP/SFP+ (supported transceiver and cables include Twinax SFP-H10GB-CU1M, SFP-H10GB-CU3M, SFP-H10GB-CU5M, SFP-H10GBACU7M, and SFP-H10GB-ACU10M; SFP+ SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR, and SFP-10G-LR-S; and SFP GLC-T, GLC-SX-MM, GLC-LH-SM, SFP-GE-T, SFP-GE-S, and SFP-GE-L) • AOC cables: FP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, and SFP-10G-AOC10M	• 1/10GBASE-T ports: RJ-45 connectors	• 1/10GBASE-T ports: RJ-45 connectors
Fabric extender fabric interfaces	• 8	• 4x 40 Gigabit Ethernet QSFP (16 x 10 Gigabit Ethernet)	• Uplink module: 8 SFP+ (N2K-M2800P)	• Uplink module: 8 x 10 Gigabit Ethernet SFP+ included
Fabric extender fabric interface type	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR, and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, and SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, and QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or 6000 Series Switch:	• Fiber: QSFP-40G-SR4, QSFP-40G-SR4-S and QSFP-40G-CSR4 • Copper: 40 Gigabit Ethernet QSFP+ passive Twinax cables (QSFP-H40G-CU1M, QSFP-H40G-CU3M, and QSFP-H40G-CU5M) and active Twinax cables (QSFP-H40G-ACU7M and QSFP-H40G-ACU10M • AOC cables: QSFP-H40G-AOC1M, QSFP-H40G-AOC2M, QSFP-H40G-AOC3M, QSFP-H40G-AOC5M, QSFP-H40G-AOC7M, QSFP-H40G-AOC10M and QSFP-H40G-AOC15M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, and QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR, and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, and SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-4X10G-AOC7M, and QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M	• Fiber: Cisco Fabric Extender Transceiver (FET-10G) and SFP+ optics (SFP-10G-SR, SFP-10G-SR-S, SFP-10G-LR, and SFP-10G-LR-S) • Copper: 10 Gigabit Ethernet SFP+ passive Twinax copper cables (SFP-H10GB-CU1M, SFP-H10GB-CU3M, and SFP-H10GB-CU5M) and active Twinax copper cables (SFP-H10GB-ACU7M and SFP-H10GB-ACU10M) • AOC cables: SFP-10G-AOC1M, SFP-10G-AOC2M, SFP-10G-AOC3M, SFP-10G-AOC5M, SFP-10G-AOC7M, and SFP-10G-AOC10M • AOC breakout cables: QSFP-4X10G-AOC1M, QSFP-4X10G-AOC2M, QSFP-4X10G-AOC3M, QSFP-4X10G-AOC5M, QSFP-

Description	Cisco Nexus 2232PP	Cisco Nexus 2248PQ	Cisco Nexus 2232TM	Cisco Nexus 2232TM-E
	Up to 10 km (300m for FCoE traffic)	CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or 6000 Series Switch: Up to 10 km (300m for FCoE traffic)	• Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or 6000 Series Switch: Up to 10 km	4X10G-AOC7M, and QSFP-4X10G-AOC10M • Copper breakout cables: QSFP-4SFP10G-CU1M, QSFP-4SFP10G-CU3M, QSFP-4SFP10G-CU5M, QSFP-4x10G-AC7M, and QSFP-4x10G-AC10M • Distance between Cisco Nexus 2000 Series Fabric Extender and Cisco Nexus 5000 or 6000 Series Switch: Up to 10 km
Fabric speed	• 80 Gbps in each direction (160-Gbps full duplex)	• 160 Gbps in each direction (320-Gbps full duplex)	• 80 Gbps in each direction (160-Gbps full duplex)	• 80 Gbps in each direction (160-Gbps full duplex)
Oversubscription	• 4:1	• 3:1	• 4:1	• 4:1
Performance	• Hardware forwarding at 560 Gbps or 595 mpps	• Hardware forwarding at 960 Gbps or 952 mpps	• Hardware forwarding at 560 Gbps or 595 mpps	• Hardware forwarding at 560 Gbps or 595 mpps
FCoE	• FCoE supported	• FCoE supported	• FCoE not supported	• FCoE supported up to 30m with Category 6a or 7 cables
Cisco parent switch	• Cisco Nexus 5000 Series • Cisco Nexus 6000 Series • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series	• Cisco Nexus 5500 Series • Cisco Nexus 6000 Series • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series	• Cisco Nexus 5000 Series • Cisco Nexus 6000 Series • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series	• Cisco Nexus 5000 Series • Cisco Nexus 6000 Series • Cisco Nexus 7000 Series • Cisco Nexus 9000 Series
Minimum software	• Cisco NX-OS Software Release 4.2 (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Software Release 5.2 (Cisco Nexus 7000 Series) • Cisco NX-OS Software Release 6.1 (Cisco Nexus 9000 Series)	• Cisco Nexus OS Release 6.0(2)N1(1) (Cisco Nexus 5000 and 6000 Series) • Cisco NX-OS Release 6.2(2) (Cisco Nexus 7000 Series) • Cisco NX-OS Software Release 6.1 (Cisco Nexus 9000 Series)	• Cisco NX-OS Software Release 5.0(3)N2(1) (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Release 6.1(1) (Cisco Nexus 7000 Series) • Cisco NX-OS Software Release 6.1 (Cisco Nexus 9000 Series)	• Cisco NX-OS Software Release 5.2(1)N1(1) (Cisco Nexus 5000 Series) • Cisco Nexus 6000 Series running Cisco NX-OS Software Release 6.0 and later • Cisco NX-OS Release 6.2(2) (Cisco Nexus 7000 Series) • Cisco NX-OS Software Release 6.1 (Cisco Nexus 9000 Series)
Cisco Nexus 2000 Series 10 Gigabit Ethernet Fabric Extenders Environment				
Dimensions (H x W x D)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)	• 1.72 x 17.3 x 17.7 in. (4.37 x 43.94 x 44.96 cm)
Weight	• 18.3 lb[2] (8.3 kg2)	• 17.5 lb (8.0 kg)	• 18.5 lb2 (8.4 kg2)	• 18.5 lb2 (8.4 kg2)

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[2] Systems are fully loaded with two power supplies and one fan tray.

Description	Cisco Nexus 2232PP	Cisco Nexus 2248PQ	Cisco Nexus 2232TM	Cisco Nexus 2232TM-E
Indicator and port specification	• System status: Green (operational), amber (fault), flashing amber (POST boot up), and off (no power) • Locator LED: Bright blue locator • Port status: Green (link established), amber (administratively disabled), and flashing amber (fault) • Fan status: Green (operational) and amber (fault) • Power status: Green (operational) and amber (fault)			
Environment	• Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 158°F (-20 to 70°C) • Humidity: 5 to 95 percent (noncondensing) • Altitude: 0 to 10,000 ft (0 to 3000m)	• Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 158°F (-20 to 70°C) • Humidity: 5 to 95 percent (noncondensing) • Altitude: 0 to 10,000 ft (0 to 3000m)	• Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 158°F (-20 to 70°C) • Humidity: 5 to 95 percent (noncondensing) • Altitude: 0 to 10,000 ft (0 to 3000m)	• Operating temperature: 32 to 104°F (0 to 40°C) • Nonoperating temperature: -4 to 158°F (-20 to 70°C) • Humidity: 5 to 95 percent (noncondensing) • Altitude: 0 to 10,000 ft (0 to 3000m)
Power supply	• N2200-PAC-400W, N2200-PAC-400W-B, N2200-PDC-400W, and N2200-PDC-350W-B	• N2200-PAC-400W, N2200-PAC-400W-B, N2200-PDC-400W, and N2200-PDC-350W-B	• N2200-PAC-400W, N2200-PAC-400W-B, and N2200-PDC-400W	• N2200-PAC-400W, N2200-PAC-400W-B, and N2200-PDC-400W
Fan tray	• N2K-C2232-FAN and N2K-C2232-FAN-B	• NXA-FAN-30CFM-F and NXA-FAN-30CFM-B (N+1 redundancy = 4 fans)	• N2K-C2232-FAN and N2K-C2232-FAN-B	• N2K-C2232-FAN and N2K-C2232-FAN-B
Typical input operating power	• 210W (maximum 270W)	• 175W (maximum 234W)	• 280 to 350W (maximum 386W)	• 210W at 30M, 240W at 100M (maximum 300W)
Input current	• 2.5A (typical); 4.1A (maximum) **Note:** Input current listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 1.46A (typical); 1.95A (maximum) **Note:** Input current listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 3.18A (typical); 3.51A (maximum) **Note:** Input current listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating	• 2.15A (typical); 2.65A (maximum) **Note:** Input current listed for 110V; divide by 2 for 220V • Supply will surge on AC power-up for a fraction of a second beyond this rating
Output current	• 20A (typical); 33A (maximum)	• 13A (typical); 20A (maximum)	• 26A (typical); 28.9A (maximum)	• 17A (typical); 20.9A (maximum)
Heat dissipation	• 806 BTU/hour (typical); 1330 BTU/hour (maximum)	• 597 BTU/hour (typical); 798 BTU/hour (maximum)	• 1176 BTU/hour (typical); 1297 BTU/hour (maximum)	• 796 BTU/hour (typical); 981 BTU/hour (maximum)

Table 5.   Cisco Nexus Fabric Extender Transceiver Specifications

Cisco Fabric Extender Transceiver	Specification				
	Support Matrix	Form Factor	Cable	Distance	Power
Cisco Fabric Extender Transceiver (FET-10G)	• Supported for fabric links only (Cisco Nexus 2000 Series to Cisco parent switch) • Cisco Fabric Extender Transceiver must be connected to another Fabric Extender Transceiver • Supported on Cisco Nexus 2200 platform uplinks • Supported on Cisco Nexus 5000, 6000, and 7000 Series Switch fabric links	SFP	Multimode fiber (MMF)	• 25m (OM2) • 100m (OM3)	Approximately 1W per transceiver
Cisco Fabric Extender Transceiver (FET-40G)	• Supported for fabric links only (Cisco Nexus 2200 platform to Cisco parent switch) • Cisco Fabric Extender must be connected to another Fabric Extender Transceiver • Supported on Cisco 2200 platform uplinks • Supported on Cisco Nexus 5000, 6000, and 7000 Series Switch fabric links	SFP	MMF	• 30m (OM2) • 100m (OM3)	Approximately 1.5W per transceiver

Table 6.   Cisco Nexus 2000 Series Spare Weight Specifications

Cisco Nexus 2000 Series	Weight	
	Pounds	Kilograms
N2K-PAC-200W=	1.5 lb	0.7 kg
N2200-PAC-400W=	2.2 lb	1 kg
N2200-PAC-400W-B=	2.2 lb	1 kg
N2200-PDC-400W=	2.2 lb	1 kg
N2200-PDC-350W-B=	2.2 lb	1 kg
N2K-C2148-FAN=	0.5 lb	0.2 kg
N2K-C2248-FAN=	1.4 lb	0.64 kg
N2K-C2232-FAN=	1.8 lb	0.8 kg
N2K-C2248-FAN-B=	1.4 lb	0.64 kg
N2K-C2232-FAN-B=	1.8 lb	0.8 kg
NXA-FAN-30CFM-F	0.25 lb	0.11 kg
NXA-FAN-30CFM-B	0.25 lb	0.11 kg

Table 7.   Cisco Nexus 2000 Series Power Specifications

Cisco Nexus 2000 Series	Power Supply				
	N2K-PAC-200W	N2200-PAC-400W	N2200-PAC-400W-B	N2200-PDC-400W	N2200-PDC-350W-B
Platform	Cisco Nexus 2148T	Cisco Nexus 2224TP, 2248TP, 2248TP-E, 2232PP, 2232TM, 2232TM-E, and 2248PQ	Cisco Nexus 2224TP, 2248TP, 2248TP-E, 2232PP, 2232TM, 2232TM-E, and 2248PQ	Cisco Nexus 2224TP, 2248TP, 2248TP-E, 2232PP, 2232TM, 2232TM-E, and 2248PQ	Cisco Nexus 2224TP, 2248TP, 2248TP-E, 2232PP, and 2248PQ
Compatible fan tray	N2K-C2148-FAN	N2K-C2248-FAN, N2K-C2232-FAN, and NXA-FAN-30CFM-F	N2K-C2248-FAN-B, N2K-C2232-FAN-B, and NXA-FAN-30CFM-B	N2K-C2248-FAN, N2K-C2232-FAN, and NXA-FAN-30CFM-F	N2K-C2248-FAN-B, N2K-C2232-FAN-B, and NXA-FAN-30CFM-B

Cisco Nexus 2000 Series	Power Supply				
Compatible power supply	N2K-PAC-200W	N2200-PAC-400W	N2200-PAC-400W-B	N2200-PDC-400W	N2200-PDC-350W-B
Airflow	Port-side exhaust (front-to-back airflow)	Port-side exhaust (front-to-back airflow)	Port-side intake (back-to-front airflow)	Port-side exhaust (front-to-back airflow)	Port-side intake (back-to-front airflow)
Input voltage	90 to 264V AC	90 to 264V AC	90 to 264V AC	-40 to -72V DC	-40 to -72V DC
Frequency	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz	DC	DC
Efficiency	• 85% (110 to 240V input) at typical power draw • 81% (110 to 240V In) at maximum power draw	• 90/92% (110 to 240V input) at typical power draw • 88 to 91% (110 to 240V In) at maximum power draw	• 90/92% (110 to 240V input) at typical power draw • 88 to 91% (110to 240V In) at maximum power draw	• 88% (-48V input) at typical power draw • 85% (-48V In) at maximum power draw	• 88% (-48V input) at typical power draw • 85% (-48V In) at maximum power draw
RoHS compliance	RoHS-5 compliant	RoHS-6 compliant	RoHS-6 compliant	RoHS-6 compliant	RoHS-6 compliant
Hot swappable	Yes	Yes	Yes	Yes	Yes
Maximum rated output power	200W	400W	400W	400W	350W
Power-cord rating	3A at 100V input; 1.5A at 240V input maximum	6A at 100V input; 3A at 240V input maximum	6A at 100V input; 3A at 240V input maximum	• 15A at -48V input; 8A at -60V input maximum • Maximum 14AWG wire	• 15A at -48V input; 8A at -60V input maximum • Maximum 14AWG wire

Table 8.   Cisco Nexus 2000 Series Fan Specifications

Cisco Nexus 2000 Series	Fan Module						
	N2K-C2148-FAN	N2K-C2248-FAN	N2K-C2232-FAN	NXA-FAN-30CFM-F	N2K-C2248-FAN-B	N2K-C2232-FAN-B	NXA-FAN-30CFM-B
Platform	Cisco Nexus 2148T	Cisco Nexus 2224TP, 2248TP, and 2248TP-E	Cisco Nexus 2232PP, 2232TM, and 2232TM-E	Cisco Nexus 2248PQ	Cisco Nexus 2224TP, 2248TP, and 2248TP-E	Cisco Nexus 2232PP, 2232TM, and 2232TM-E	Cisco Nexus 2248PQ
Airflow	Port-side exhaust (front-to-back airflow), with power supplies of the chassis aligned with cold aisle, and port side aligned with hot aisle; color-coded blue for cold aisle: NXA-FAN-30CFM-F				Port-side intake (back-to-front airflow reversed), with port side of the chassis aligned with cold aisle, and power supplies aligned with hot aisle; color-coded red for hot aisle: NXA-FAN-30CFM-B		
Compatible power supply	N2K-PAC-200W	N2200-PAC-400W and N2200-PDC-400W	N2200-PAC-400W and N2200-PDC-400W	N2200-PAC-400W and N2200-PDC-400W	N2200-PAC-400W-B and N2200-PDC-350W-B	N2200-PAC-400W-B and N2200-PDC-350W-B	N2200-PAC-400W-B and N2200-PDC-350W-B

Table 9.   Cisco Nexus 2000 Airflow Optimization Accessories

Accessories	Airflow Extension Sleeve	Airflow Vent
Part number	NXA-AIRFLOW-SLV	NXA-ACC-KIT-BAV
Description	Cisco Nexus airflow extension sleeve: Optimizes airflow in port-side exhaust (front to back) airflow deployments for alignment of port in back of rack and extension of power-supply side of chassis to front of rack with airflow sleeve	Cisco Nexus airflow vent: Optimizes airflow in port-side intake (back to front) ToR deployments; airflow vent consists of metallic cover to place on the upper exhaust of the fabric extender port-side and mounting rails with snap-on holes for airflow vent
Compatibility	Cisco Nexus 2200 platform chassis	Cisco Nexus 2200 platform chassis
Dimensions (H x W x D)	• 1.72 (1RU) x 17.3 x 8.5 in. (fully retracted) or 12.9 in. (fully extended) • Adjustable depth for the fabric extender: 26 to 30 in.	Vent cover is part of the mounting hardware kit, and its size is meaningless to the overall form factor of the chassis: 0.42 x 17.53 x 2.56 in.
Weight	• 5.7 lb (2.6 kg)	• 0.42 lb (0.19 kg)

Table 10.   Cisco Nexus 2000 Series Compliance Information

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	• UL 60950-1 • CAN/CSA-C22.2 No. 60950-1EN 60950-1 • IEC 60950-1AS/NZS 60950-1GB4943
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	• EN50082-1 • EN61000-6-1 • EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The Cisco Nexus 2148T is RoHS-5 compliant, and the Cisco Nexus 2224T, 2248TP, 2232PP, 2248PQ, 2232TM, and 2232TM-E are RoHS-6 compliant.
Network Equipment Building Standards (NEBS)	The Cisco Nexus 2248TP, 2248TP-E, and 2232PP meet NEBS level-3 standards (hardware revision 3).

Feature support for the Cisco Nexus 2000 Series is mainly derived from the parent switch feature set. Therefore, consult the Cisco Nexus 5000, 6000, and 7000 Series data sheets for a comprehensive list of features supported. Table 11 lists the hardware capabilities of the Cisco Nexus 2000 Series.

Table 11.   Feature Support for Cisco Nexus 2000 Series

Description	Specification
Layer 2 features	• Layer 2 VLAN trunks • IEEE 802.1Q VLAN encapsulation • Cisco EtherChannel technology on uplinks • PortChannel on server ports on Cisco Nexus 2200 platforms • Advanced PortChannel hashing • Jumbo frames on all ports (up to 9216 bytes) • Pause frames (Priority Flow Control [PFC] and IEEE 802.3x) • Private VLANs (promiscuous only on uplinks) • Local multicast replication on Cisco Nexus 2200 platform (8000 entries) • Autonegotiation to 1000BASE-T; full duplex on host interfaces
Enhanced Ethernet	• DCB (Cisco Nexus 2232PP)
Quality of service (QoS)	• Layer 2 IEEE 802.1p (class of service [CoS]) • 8 hardware queues per port (Cisco Nexus 2200 platforms), or 4 hardware queues per port (Cisco Nexus 2148T) • Per-port QoS configuration • Local policing on Cisco Nexus 2200 platform (64 policers) • CoS trust • Configurable tail-drop threshold on Cisco Nexus 2200 platforms • Egress strict-priority queuing • Egress port-based scheduling: Weighted Round Robin (WRR)

Description	Specification
High availability	• Hot-swappable field-replaceable power supplies and fan modules • 1:1 power redundancy • Uplink traffic management through Cisco EtherChannel hashing or static port pinning • vPCs for dual-homed active-active connectivity across two Cisco Nexus 5000 or 6000 Series Switches • vPCs for dual-homed straight-through NIC connectivity across two Cisco Nexus 2000 Series Fabric Extenders • ISSU
Security	• Local classification (256 access control list [ACL] entries)
Management	• Fabric extender management using in-band management • Locator and beacon LEDs on front and back of chassis (locator beacons on the front and rear of the chassis help reduce errors when the equipment is serviced) • Per-port locator and beacon LEDs • Syslog • Simple Network Management Protocol Versions 1, 2, and 3 (SNMP v1, v2, and v3) • Enhanced SNMP MIB support • XML (NETCONF) support • Remote Monitoring (RMON) • Cisco Discovery Protocol Versions 1 and 2 • Cisco Switched Port Analyzer (SPAN) source on server ports • Power-on self-test (POST) • Cisco Generic Online Diagnostics (GOLD): Ethernet • Comprehensive bootup diagnostic tests • CiscoWorks • Cisco Data Center Network Manager (DCNM); the Cisco Nexus 2000 Series is managed through the parent Cisco Nexus switch using DCNM and standard SNMP, XML interface, and command-line interface (CLI)
Configuration MIBs	• ENTITY-MIB • IF-MIB • FABRIC-EXTENDER MIB • CISCO-ENTITY-EXT-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENTITY-SENSOR-MIB • CISCO-ETHERNET-FABRIC-EXTENDER-MIB
Monitoring MIBs	• RMON-MIB
Industry standards	• IEEE 802.1p: CoS prioritization • IEEE 802.1Q: VLAN tagging • IEEE 802.3: Ethernet • IEEE 802.3ae: 10 Gigabit Ethernet • SFF 8431 SFP+ support • IEEE 802.3u 100BASE-TX specification • IEEE 802.3ab 1000BASE-T specification • IEEE 802.3an 10GBASE-T • 10GBASE-SR • 10GBASE-LR • RMON • SFF-8461

Cisco Nexus 2000 Series Ordering Information

Table 12 provides ordering information for the Cisco Nexus 2000 Series Fabric Extenders.

Table 12.   Ordering Information

Part Number	Description
Cisco Nexus 2000 Series Chassis	
N2K-C2224TP	Cisco Nexus 2224TP Series 1GE Fabric Extender, 2PS, 1 Fan Module, 24x100/1000Base-T + 2x10GE (req SFP+), choice of airflow and power supply
N2K-C2248TP	Cisco Nexus 2248TP Series 1GE Fabric Extender, 2PS, 1 Fan Module, 48x100/1000Base-T + 4x10GE (req SFP+), choice of airflow and power supply
N2K-C2248TP-E	Cisco Nexus 2248TP-E Series 1GE Fabric Extender, 2PS, 1 Fan Module, 48x100/1000Base-T + 4x10GE (req SFP+), 32MB buffer, choice of airflow and power supply
N2K-C2232PP	Cisco Nexus 2232PP Series 10GE Fabric Extender, 2PS, 1 Fan Module, 32x1/10GE (req SFP/SFP+) + 8x10GE (req SFP+), choice of airflow and power supply
N2K-C2248PQ	Cisco Nexus 2248PQ 10GE Fabric Extender, 2PS, 4 Fan Module, 48x1/10GE (req SFP/SFP+) + 4x40G QSFP+(req QSFP+), choice of airflow and power supply
N2K-C2232TM	Cisco Nexus 2232TM Series 10GBASE-T Fabric Extender, 2PS, 1 Fan Module, 32x1/10GBase-T + 8x10GE Module (req SFP+), choice of airflow and power supply
N2K-C2232TM-E	Cisco Nexus 2232TM-E Series 10GBASE-T Fabric Extender, 2PS, 1 Fan Module, 32x1/10GBase-T + 8x10GE Module (req SFP+), choice of airflow and power supply
N2K-C2224TP-1GE	Cisco Nexus 2224TP Series 1GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 24x100/1000Base-T + 2x10GE (req SFP+), same as N2K-C2224TP
N2K-C2248TP-1GE	Cisco Nexus 2248TP Series 1GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 48x100/1000Base-T + 4x10GE (req SFP+), same as N2K-C2248TP
N2K-C2232PP-10GE	Cisco Nexus 2232PP Series 10GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 32x1/10GE (req SFP/SFP+) + 8x10GE (req SFP+), same as N2K-C2232PP
N2K-C2232TM-10GE	Cisco Nexus 2232TM Series 10GBASE-T Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 32x1/10GBase-T + 8x10GE Module (req SFP+), same as N2K-C2232TM
Cisco Nexus 2000 Series Chassis with Fabric Extender	
N2K-C2224TF	Cisco Nexus 2224TP Series 1GE Fabric Extender, 2PS, 1 Fan Module, 24x100/1000Base-T + 2x10GE (includes 4 Fabric Extender Transceivers), choice of airflow and power supply
N2K-C2248TF	Cisco Nexus 2248TP Series 1GE Fabric Extender, 2PS, 1 Fan Module, 48x100/1000Base-T + 4x10GE (includes 8 Fabric Extender Transceivers), choice of airflow and power supply
N2K-C2248TF-E	Cisco Nexus 2248TP-E Series 1GE Fabric Extender, 2PS, 1 Fan Module, 48x100/1000Base-T + 4x10GE (includes 8 Fabric Extender Transceivers), 32MB buffer, choice of airflow and power supply
N2K-C2232PF	Cisco Nexus 2232PP Series 10GE Fabric Extender, 2PS, 1 Fan Module, 32x1/10GE (req SFP/SFP+) + 8x10GE (includes 16 Fabric Extender Transceivers), choice of airflow and power supply
N2K-C2248PQF	Cisco Nexus 2248PQ 10GE Fabric Extender, 2PS, 4 Fan Module, 48x1/10GE (req SFP/SFP+) + 4x40G QSFP+(includes "8 FET-40G" or "4 FET-40G and 16 FET-10G"), choice of airflow and power supply
N2K-C2232TF	Cisco Nexus 2232TM Series 10GBASE-T Fabric Extender, 2PS, 1 Fan Module, 32x1/10GBase-T + 8x10GE Module (includes 16 Fabric Extender Transceivers), choice of airflow and power supply
N2K-C2232TF-E	Cisco Nexus 2232TM-E Series 10GBASE-T Fabric Extender, 2PS, 1 Fan Module, 32x1/10GBase-T + 8x10GE Module (includes 16 Fabric Extender Transceivers), choice of airflow and power supply
N2K-C2224TF-1GE	Cisco Nexus 2224TP Series 1GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 24x100/1000Base-T + 2x10GE (includes 4 Fabric Extender Transceivers)
N2K-C2248TF-1GE	Cisco Nexus 2248TP Series 1GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 48x100/1000Base-T + 4x10GE (includes 8 Fabric Extender Transceivers)
N2K-C2232PF-10GE	Cisco Nexus 2232PP Series 10GE Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust, 32x1/10GE (req SFP/SFP+) + 8x10GE (includes 16 Fabric Extender Transceivers)
N2K-C2232TF-10GE	Cisco Nexus 2232TP Series 10GBASE-T Fabric Extender, 2 AC PS, 1 Fan Module (Standard Airflow/port side exhaust), 32x1/10GBase-T + 8x10GE Module (includes 16 Fabric Extender Transceivers)
Fan Modules	
N2K-C2148T-FAN=	Cisco Nexus 2148T FEX Fan Module (Std airflow, port side exhaust), spare
N2K-C2248-FAN=	Cisco Nexus 2224TP, 2248TP, and 2248TP-E FEX Fan Module (Std airflow, port side exhaust), spare

Part Number	Description
N2K-C2232-FAN=	Cisco Nexus 2232PP and 2232TM FEX Fan Module (Std airflow, port side exhaust), spare
N2K-C2248-FAN-B=	Cisco Nexus 2224TP, 2248TP, and 2248TP-E FEX Fan Module, Back-to-front airflow (Reversed airflow, port side intake), spare
N2K-C2232-FAN-B=	Cisco Nexus 2232PP and 2232TM FEX Fan Module, Back-to-front airflow (Reversed airflow, port side intake), spare
NXA-FAN-30CFM-F=	Cisco Nexus 2232PQ FEX Fan Module (Std airflow, port side exhaust; Color coding: Blue), spare
NXA-FAN-30CFM-B=	Cisco Nexus 2248PQ FEX Fan module (Reversed airflow, port side intake; Color coding: Red), spare
Power Supplies	
N2K-PAC-200W(=)	Cisco Nexus 2148T FEX 1GE 200W Power supply (Std airflow, port side exhaust), spare
N2200-PAC-400W=	Cisco Nexus 2200 AC Power supply (Std airflow, port side exhaust), spare
N2200-PAC-400W-B=	Cisco Nexus 2200 AC Power supply, Back-to-front airflow (Reversed airflow, port side intake), spare
N2200-PDC-400W=	Cisco Nexus 2200 DC Power supply (Std airflow, port side exhaust), spare
N2200-PDC-350W-B=	Cisco Nexus 2200 DC Power supply, Back-to-front airflow (Reversed airflow, port side intake), spare
N2K-P1-BLNK=	Cisco Nexus 2148T FEX 1GE Power supply Blank, spare
N2200-P-BLNK=	Cisco Nexus 2200 Power supply Blank, spare
1 Gigabit Ethernet Transceivers and Cables	
GLC-T(=)	1000BASE-T SFP
GLC-SX-MM(=)	GE SFP, LC connector SX transceiver
GLC-LH-SM(=)	GE SFP, LC connector LX/LH transceiver
SFP-GE-T(=)	1000BASE-T SFP, Extended Temperature Range
SFP-GE-S(=)	GE SFP, LC connector SX transceiver, with Digital Optical Monitoring (DOM) and Extended Temperature Range
SFP-GE-L(=)	GE SFP, LC connector LX/LH transceiver, with Digital Optical Monitoring (DOM) and Extended Temperature Range
10 Gigabit Ethernet Transceivers and Cables	
SFP-10G-SR(=)	10GBASE-SR SFP+ Module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-H10GB-CU1M(=)	10GBASE-CU SFP+ Passive Cable 1 Meter
SFP-H10GB-CU3M(=)	10GBASE-CU SFP+ Passive Cable 3 Meter
SFP-H10GB-CU5M(=)	10GBASE-CU SFP+ Passive Cable 5 Meter
SFP-H10GB-ACU7M(=)	10GBASE-CU SFP+ Active Cable 7 Meter
SFP-H10GB-ACU10M(=)	10GBASE-CU SFP+ Active Cable 10 Meter
40 Gigabit Ethernet Transceivers and Cables	
QSFP-40G-SR4	40GBASE-SR4 QSFP module, (multi-mode fiber, MMF at 100m)
QSFP-40G-CSR4	40GBASE Extended CSR4 QSFP module, (multi-mode fiber, MMF at 300m)
QSFP-H40G-CU1M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 1-meter, passive
QSFP-H40G-CU3M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 3-meter, passive
QSFP-H40G-CU5M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 5-meter, passive
QSFP-H40G-ACU7M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 7-meter, active
QSFP-H40G-ACU10M	Cisco 40GBASE-CR4 QSFP+ direct-attach copper cable, 10-meter, active
QSFP-4SFP10G-CU1M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 1-meter, passive
QSFP-4SFP10G-CU3M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 3-meter, passive
QSFP-4SFP10G-CU5M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 5-meter, passive
QSFP-4x10G-AC7M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 7-meter, active
QSFP-4x10G-AC10M	Cisco 40GBASE-CR4 QSFP+ to 4 10GBASE-CU SFP+ direct-attach breakout cable, 10-meter, active

Part Number	Description
AOC Cables	
SFP-10G-AOC1M	Cisco 10GBASE-AOC SFP+ Cable 1 Meter
SFP-10G-AOC2M	Cisco 10GBASE-AOC SFP+ Cable 2 Meter
SFP-10G-AOC3M	Cisco 10GBASE-AOC SFP+ Cable 3 Meter
SFP-10G-AOC5M	Cisco 10GBASE-AOC SFP+ Cable 5 Meter
SFP-10G-AOC7M	Cisco 10GBASE-AOC SFP+ Cable 7 Meter
SFP-10G-AOC10M	Cisco 10GBASE-AOC SFP+ Cable 10 Meter
QSFP-4X10G-AOC1M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 1-meter
QSFP-4X10G-AOC2M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 2-meter
QSFP-4X10G-AOC3M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 3-meter
QSFP-4X10G-AOC5M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 5-meter
QSFP-4X10G-AOC7M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 7-meter
QSFP-4X10G-AOC10M	Cisco 40GBase-AOC QSFP to 4 SFP+ Active Optical breakout Cable, 10-meter
QSFP-H40G-AOC1M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 1-meter
QSFP-H40G-AOC2M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 2-meter
QSFP-H40G-AOC3M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 3-meter
QSFP-H40G-AOC5M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 5-meter
QSFP-H40G-AOC7M	Cisco 40GBase-AOC QSFP direct-attach Active Optical Cable, 7-meter
QSFP-H40G-AOC10M	Cisco 40GBase-AOC QSFP direct-attach Active Optical, 10-meter
QSFP-H40G-AOC15M	Cisco 40GBase-AOC QSFP direct-attach Active Optical, 15-meter
SFP-10G-AOC1M	Cisco 10GBASE-AOC SFP+ Cable 1 Meter
Accessory Kit	
N2K-C2148T-ACC=	Cisco Nexus 2000 FEX 1GE Accessory Kit, spare
N2200-ACC-KIT=	Cisco Nexus 2200 FEX Accessory Kit, spare (includes rack mount kit, ground lug kit, and ESD strap)
NXA-AIRFLOW-SLV=	Nexus 2K/3K airflow extension sleeve
NXA-ACC-KIT-BAV=	Nexus 2K/3K airflow vent accessory kit
Power Cords	
CAB-N5K6A-NA(=)	Power Cord, 210/220V 30A North America
CAB-AC-250V/13A(=)	Power Cord for North America, 125VAC/13A
CAB-C13-C14-JMPR(=)	Recessed receptacle AC power cord 27
CAB-C13-C14-2M(=)	Power Cord Jumper, C13-C14 Connectors, 2 Meter Length
CAB-C13-C14-AC(=)	Power Cord Jumper, C13-C14 Connectors, 3 Meter Length
CAB-C13-CBN(=)	Cabinet Jumper Power Cord, 250 VAC 16A, C14-C13 Connectors
CAB-9K12A-NA(=)	Power Cord, 125VAC 15A NEMA 5-15 Plug, North America
SFS-250V-10A-AR(=)	SFS Power Cord - 250V, 10A - Argentina
CAB-9K10A-AU(=)	Power Cord, 250VAC 10A 3112 Plug, Australia
SFS-250V-10A-CN(=)	SFS Power Cord - 250V, 10A - PRC
CAB-9K10A-EU(=)	Power Cord, 250VAC 10A CEE 7/7 Plug, EU
SFS-250V-10A-ID(=)	SFS Power Cord - 250V, 10A - South Africa, UAE, India
CAB-IND-10A(=)	10A Power cable for India
SFS-250V-10A-IS(=)	SFS Power Cord - 250V, 10A - Israel
CAB-9K10A-IT(=)	Power Cord, 250VAC 10A CEI 23-16/VII Plug, Italy
CAB-9K10A-SW(=)	Power Cord, 250VAC 10A MP232 Plug, Switzerland
CAB-9K10A-UK(=)	Power Cord, 250VAC 13A BS1363 Plug (13 A fuse), UK

Warranty

The Cisco Nexus 2000 Series Fabric Extenders have a 1-year limited hardware warranty. The warranty includes hardware replacement with a 10-day turnaround from receipt of a return materials authorization (RMA).

Service and Support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco Nexus 2000 Series Fabric Extenders in your data center. The innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners and are focused on helping you increase operation efficiency and improve your data center network. Cisco Advanced Services use an architecture-led approach to help you align your data center infrastructure with your business goals and achieve long-term value. Cisco SMARTnet™ Service helps you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning resources. With this service, you can take advantage of the Cisco Smart Call Home capability, which offers proactive diagnostics and real-time alerts on your Cisco Nexus 5000, 6000, 7000, and 2000 Series Switches. Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise. For more information about Cisco Nexus services, visit http://www.cisco.com/go/nexusservices.

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For More Information

- Cisco Nexus 2000 Series Fabric Extenders: http://www.cisco.com/go/nexus2000
- Cisco Nexus 5000 Series Switches: http://www.cisco.com/go/nexus5000
- Cisco Nexus 6000 Series Switches: http://www.cisco.com/go/nexus6000
- Cisco Nexus 7000 Series Switches: http://www.cisco.com/go/nexus7000
- Cisco Nexus 9000 Series Switches: http://www.cisco.com/go/nexus9000
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