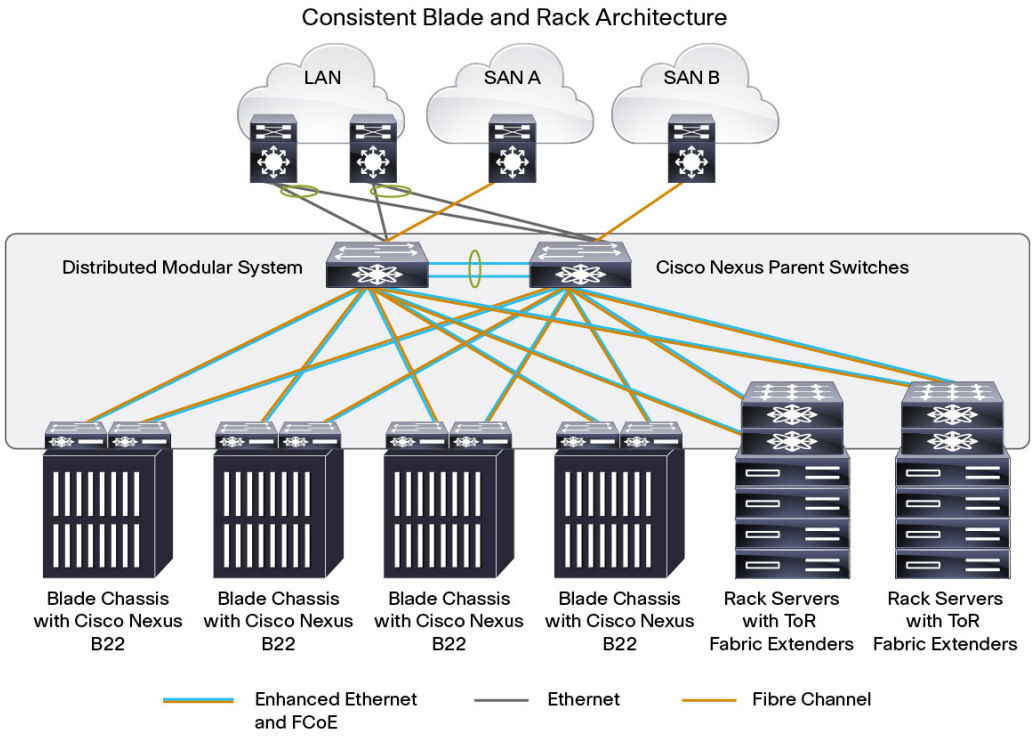
Cisco Nexus B22DELL Blade Fabric Extender

Product Overview

The Cisco Nexus® B22DELL Blade Fabric Extender is designed to simplify data center server access architecture and operations in environments in which third-party blade servers are used. The Cisco Nexus B22DELL provides a highly scalable unified server access platform supporting 100 Megabit to 10 Gigabit Ethernet over fiber and copper, and Data Center Bridging (DCB) protocol. The Cisco Nexus B22DELL Blade Fabric Extender behaves like a remote line card for a parent Cisco Nexus switch, together forming a distributed modular system. This architecture simplifies data center access operations and architecture by combining the management simplicity of a single high-density access switch with the cabling simplicity of integrated blade switches and top-of-rack (ToR) access switches (Figure 1).

Figure 1. Cisco Nexus Fabric Extenders Provide Highly Scalable Unified Server Access Connectivity



The Cisco Nexus B22DELL provides the following main benefits:

- Highly scalable, consistent server access: The distributed modular system creates a scalable server access environment with no reliance on Spanning Tree Protocol, providing consistency between blade and rack servers.
- Simplified operations: One single point of management and policy enforcement using upstream Cisco Nexus switches eases the commissioning and decommissioning of blades through zero-touch installation and automatic configuration of fabric extenders.

- Increased business benefits: Consolidation, cabling reduction, 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 B22DELL transparently integrates into the I/O module slot of an M1000e Blade Chassis, drawing both power and cooling from the M1000e Blade Chassis itself.

The Cisco Nexus B22DELL provides two types of ports:

- Ports for blade server attachment (host interfaces)
- Uplink ports (fabric interfaces)

Fabric interfaces, located on the front of the Cisco Nexus B22DELL module, are for connectivity to the upstream parent Cisco Nexus switch.

Figure 2. Cisco Nexus B22DELL Blade Fabric Extender for Dell M1000e Blade Systems

Table 1. Cisco Nexus B22DELL Fabric Extender Model

Model	Description
Cisco Nexus B22DELL Fabric Extender (blade fabric extender for Dell)	16 x 1/10GBASE-KR internal host interfaces and 8 x 10 Gigabit Ethernet fabric interfaces (SFP+)

Table 2. Cisco Nexus B22DELL Blade Fabric Extender Parent Switch Support Matrix

Cisco Nexus Parent Switch	Cisco Nexus 5000 Series Switches
Cisco Nexus blade fabric extender models	Cisco Nexus B22DELL
Cisco Nexus parent switch model or line card	• Cisco Nexus 5548P Switch • Cisco Nexus 5548UP Switch • Cisco Nexus 5596UP Switch
Scalability	• Up to 24 fabric extenders per Cisco Nexus 5548P, 5548UP, and 5596UP Switch (16 fabric extenders for Layer 3 configurations)

Features and Benefits

- Highly scalable, consistent access layer: Today's data centers must have massive scalability to manage the combination of an increasing number of blade servers and a higher demand for bandwidth from each server. The Cisco Nexus B22DELL increases the scalability of the blade access layer to accommodate both sets of demands without increasing management points within the network.
  - Massive scalability: A deployment of Cisco Nexus B22DELL Blade Fabric Extenders connected to a Cisco Nexus parent switch supports highly scalable 1 Gigabit Ethernet and 10 Gigabit Ethernet environments under a single managed entity. Scalability limits are shown in Table 2, in the Scalability row.
  - Layer 2 dependability: 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 allows fast convergence and effective utilization of bandwidth in Layer 2 environments.
- Simplified operations: The Cisco Nexus B22DELL simplifies operations and management.
  - Single point of management: Cisco Nexus B22DELL Blade Fabric Extenders are remote line cards for a Cisco Nexus parent switch. All device configurations are managed on the Cisco Nexus parent switch, and configuration information is downloaded to the Cisco Nexus B22 using in-band communication.
  - Software maintenance simplification: The Cisco Nexus B22DELL software is embedded in the Cisco Nexus parent switch software. The fabric extender is a “plug-and-play” device that automatically downloads the software image from the Cisco Nexus 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 effect on network operation for Ethernet, storage, and converged network environments.
  - Switch feature consistency across a large number of servers: The Cisco Nexus B22DELL 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 switched according to policies established on the parent Cisco Nexus switch with a single point of management. Standardizing on the Cisco Nexus switches for both blade and rack servers 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 in the blade chassis. A traditional 12-blade chassis design using a

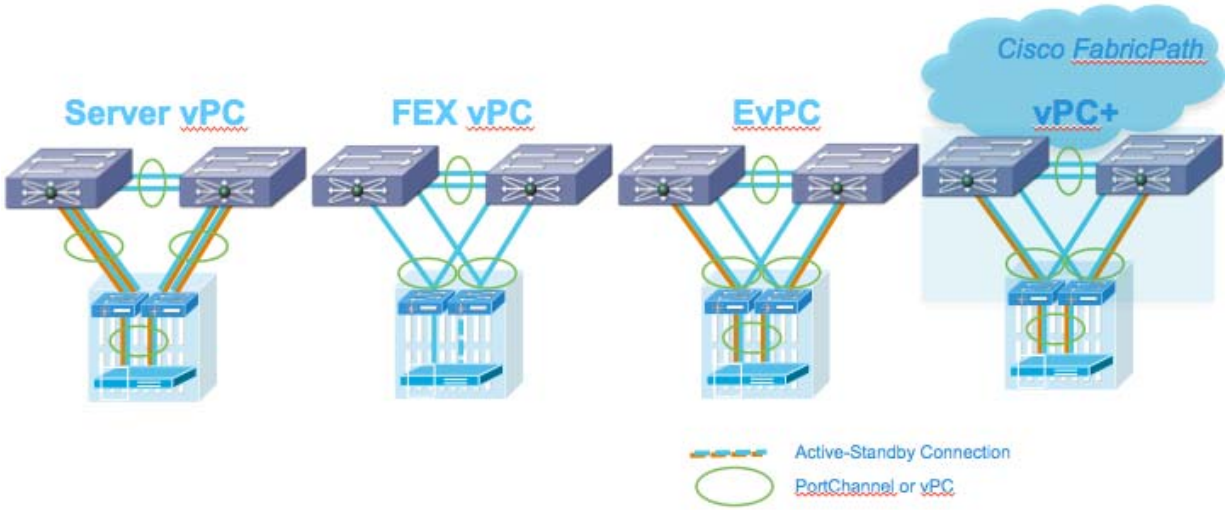
discrete, redundant pair of Gigabit Ethernet blade switches has 24 management points. The equivalent architecture using the Cisco Nexus B22DELL has only 2 management points: a tenfold reduction in management complexity.

Cisco Nexus B22 Deployment Scenarios

The Cisco Nexus B22 can be used in conjunction with a Cisco Nexus parent switch in four main design scenarios (shown in Figure 5):

- Server vPC: In this deployment scenario, access-layer redundancy is achieved through redundant server connections to two fabric extenders, using vPC and active-active server network interface card (NIC) teaming.
- Fabric extender vPC (FEX vPC): In this deployment scenario, access-layer redundancy is achieved through redundant connections between the Cisco Nexus B22 Blade Fabric Extenders and the Cisco Nexus parent switches using vPC.
- Enhanced vPC (EvPC): In this deployment scenario, access-layer redundancy is achieved in two ways: through redundant connections between the Cisco Nexus B22 Blade 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.
- vPC+: In this deployment scenario, access-layer redundancy is achieved through server vPC, FEX 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 3. Cisco Nexus B22 Design Scenarios, from Left to Right: Server vPC, Fabric Extender vPC, Enhanced vPC, and vPC+



Product Specifications

Tables 3 and 4 provide product specifications for the Cisco Nexus B22DELL. Table 5 lists standards support, and Table 6 lists feature support.

Table 3. Cisco Nexus B22 Fabric Extender Product Specifications

Description	Cisco Nexus B22DELL
Supported blade chassis	• Dell PowerEdge M1000e blade enclosure
Fabric extender host interfaces	16
Fabric extender host interfaces type	1/10GBASE-KR internal midplane connections
Fabric extender fabric interfaces	8
Fabric extender fabric interfaces type	• Fiber: SFP+ optics (FET-10G, SFP-10G-SR, and SFP-10G-LR, and SFP-10G-ER) • 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 B22 Blade Fabric Extender and Cisco Nexus parent switch: Up to 3 km (300m for FCoE traffic)
Fabric speed	80 Gbps in each direction (160-Gbps full duplex)
Oversubscription	2:1
Performance	Hardware forwarding at 400 Gbps or 297 mpps
Supported Cisco Nexus parent switch and version	Cisco Nexus 5000 Series Switch running Cisco NX-OS Software Release 5.2(1)N1(3)
Dimensions (L x W x D)	10.73 x 10.04 x 1.16 in. (272.50 x 255.20 x 29.45 mm)
Weight	4.4 lb (1.9 kg)
Indicator and port specification	• Power LED: green (enabled). • Health LED: blue (booted normal) and flashing amber (fault) • Port status LEDs: green (link established), amber (administratively disabled), and flashing amber (fault)
Environment	• Operating temperature: 50 to 104°F (10 to 40°C) • Storage temperature: –40 to 140°F (–40 to 60°C) • Humidity: 10 to 95 percent (noncondensing) Altitude: 0 to 10,000 ft (0 to 3000m)
Power supply	Provided by blade chassis
Fan tray	Provided by blade chassis
Typical operating power	56W
Maximum input power	70W
Power specifications	12V @ 6A

Description	Cisco Nexus B22DELL
Heat dissipation	239 BTU/hour
Predicted mean time between failure (MTBF)	291,523 hours

Table 4. Cisco Nexus Fabric Extender Transceiver Specifications

Cisco Fabric Extender Transceiver	Specifications					
	Support Matrix	**Form Factor**	**Cable**	**Distance**	**Power**	**Latency**
Cisco Fabric Extender Transceiver (FET-10G)	Supported for fabric links only (Cisco Nexus B22 to Cisco parent switch) Cisco Fabric Extender Transceiver must be connected to another Cisco Fabric Extender Transceiver Supported on Cisco Nexus 5500 Series Switches fabric links	SFP	Multimode fiber (MMF)	• 25m (OM2) • 100m (OM3)	Approximately 1W per transceiver	Approximately 0.1 microsecond

Table 5. Cisco Nexus B22DELL 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 (NRTL) • CAN/CSA-C22.2 No 60950 • EN 60950 • IEC 60950 • TUV/VDE EN 60950 for B22DELL
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 • KN 61000-4 series
RoHS	RoHS 6 compliant

Feature support for the Cisco Nexus B22DELL is derived mainly from the parent switch feature set. Therefore, consult the Cisco Nexus 5000 Series data sheet for a comprehensive list of features supported.

Table 6. Feature Support for the Cisco Nexus B22DELL

Description	Specification
Layer 2 features	• Layer 2 VLAN trunks • IEEE 802.1Q VLAN encapsulation • Cisco EtherChannel technology on uplinks • PortChannel on server ports • 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 • Autonegotiation to 1 Gigabit Ethernet; full duplex on host interfaces
Enhanced Ethernet	DCB
Quality of service (QoS)	• Layer 2 IEEE 802.1p (class of service [CoS]) • 8 hardware queues per port • Per-port QoS configuration • Local policing • Class-of-service (CoS) trust • Configurable tail-drop threshold • Egress strict-priority queuing • Egress port-based scheduling: Weighted Round Robin (WRR)
High availability	• Uplink traffic management through Cisco EtherChannel hashing or static port pinning • vPCs for dual-homed active-active connectivity across two Cisco Nexus parent switches • vPCs for dual-homed straight-through NIC connectivity across two Cisco Nexus B22 Blade Fabric Extenders • ISSU
Security	Local classification (256 access control list [ACL] entries)
Management	• Fabric extender management using in-band management • UID and health 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 B22 is managed through the parent Cisco Nexus switch using Cisco DCNM and standard SNMP, XML interfaces, and the 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

Description	Specification
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 • IEEE 802.3ap: 10GBASE-KR • SFF 8431 SFP+ support • 10GBASE-SR • 10GBASE-LR • RMON • SFF-8461

Cisco Nexus B22DELL Ordering Information

Table 7 provides ordering information for transceivers and cables. Please refer to dell.com for chassis orderability.

Table 7. Ordering Information

Part Number	Description
Transceivers and Cables	
SFP-10G-SR(=)	10GBASE-SR SFP+ Module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-10G-ER(=)	10GBASE-ER 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

Service and Support

Technical support for the Cisco Nexus B22DELL Blade Fabric Extender can be obtained from either Cisco or Dell.

- Cisco Nexus B22DELL Blade Fabric Extenders: For software configuration or troubleshooting assistance, support is obtained through the vendor providing support for the upstream Cisco Nexus switch. If support is provided by Cisco, for information about obtaining documentation, submitting a service request, and gathering additional information, see the monthly “What’s New in Cisco Product Documentation,” which also lists all new and revised Cisco technical documentation, at http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html. Subscribe to “What’s New in Cisco Product Documentation” as an RSS feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service. Cisco currently supports RSS Version 2.0.
- For hardware troubleshooting or replacement of the Cisco Nexus B22DELL, contact Dell. Dell support contact information is available at http://support.dell.com/.

For More Information

- Cisco Nexus B22DELL Blade Fabric Extenders: http://www.cisco.com/go/nexusb22