Cisco UCS 2408 Fabric Extender

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Cisco Unified Computing System overview

The Cisco Unified Computing System™ (Cisco UCS®) is a next-generation data center platform that unites computing, network, storage access, and virtualization resources into a cohesive system designed to reduce Total Cost of Ownership (TCO) and increase business agility. The system integrates a low-latency, lossless 25-Gigabit Ethernet unified network fabric with enterprise-class, x86-architecture servers. The system is an integrated, scalable, multichassis platform in which all resources participate in a unified management domain (Figure 1).

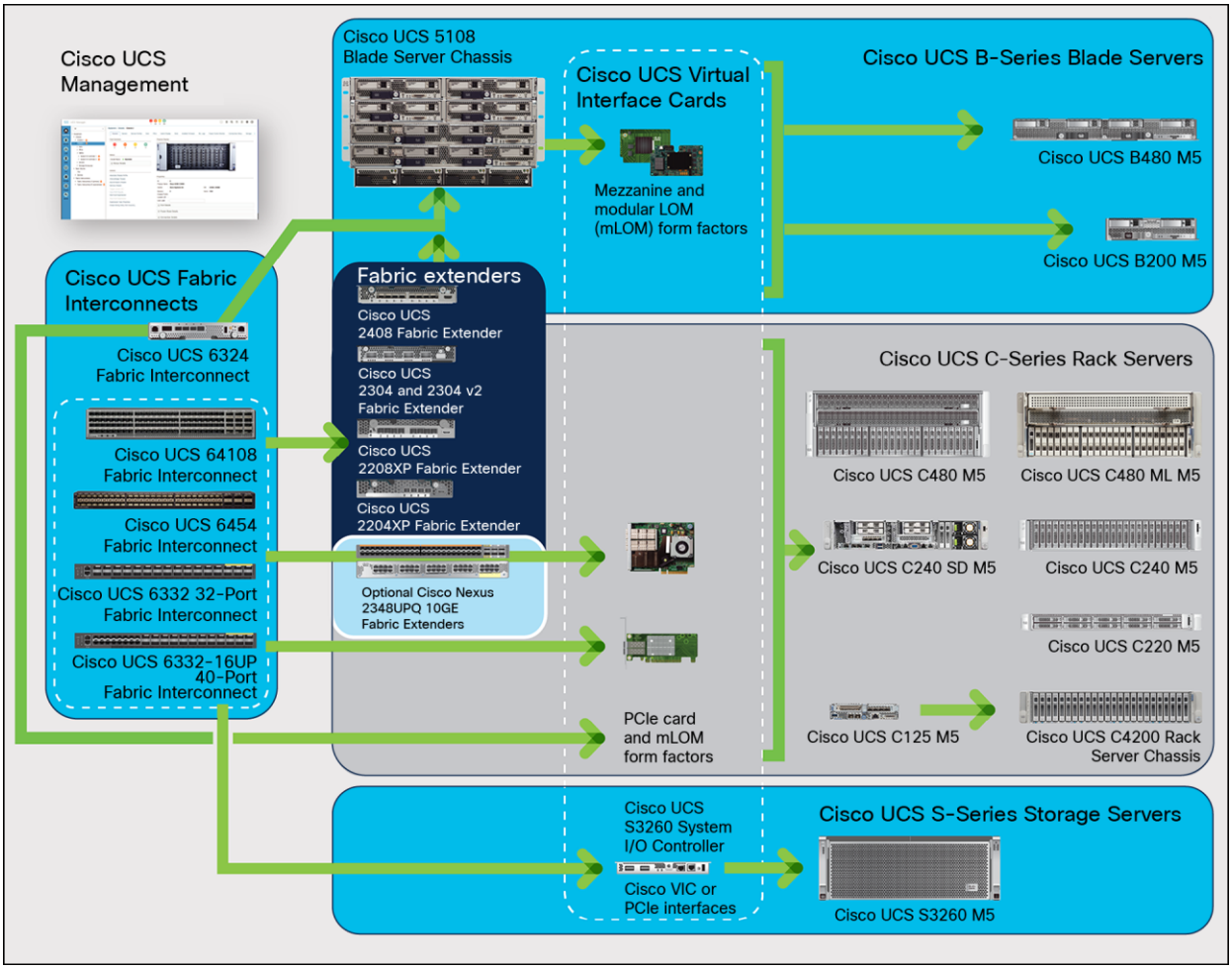


Figure 1.
The Cisco Unified Computing System is a highly available cohesive architecture

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Product overview

The Cisco UCS 2408 Fabric Extender brings the unified fabric into the blade server enclosure, providing connectivity between the blade servers and the fabric interconnect, simplifying diagnostics, cabling, and management. It is a fourth-generation I/O Module (IOM) that shares the same form factor as the third-generation Cisco UCS 2304 Fabric Extender, which is compatible with the Cisco UCS 5108 Blade Server Chassis.

The Cisco UCS 2408 connects the I/O fabric between the Cisco UCS 6454 Fabric Interconnect, Cisco UCS 64108 Fabric Interconnect, Cisco UCS 6536 Fabric Interconnect and the Cisco UCS 5100 Series Blade Server Chassis, enabling a lossless and deterministic converged fabric to connect all blades and chassis together. Because the fabric extender is similar to a distributed line card, it does not perform any switching and is managed as an extension of the fabric interconnects. This approach removes switching from the chassis, reducing overall infrastructure complexity and enabling Cisco UCS to scale to many chassis without multiplying the number of switches needed, reducing TCO, and allowing all chassis to be managed as a single, highly available management domain.

The Cisco UCS 2408 also manages the chassis environment (power supply, fans, and blades) in conjunction with the fabric interconnect. Therefore, separate chassis-management modules are not required.

The Cisco UCS 2408 Fabric Extender fits into the back of the Cisco UCS 5100 Series chassis. Each Cisco UCS 5100 Series chassis can support up to two fabric extenders, allowing increased capacity and redundancy (see Figure 2).

Cisco UCS 2408 Fabric Extender

The Cisco UCS 2408 Fabric Extender has eight 25-Gigabit Ethernet, FCoE-capable, Small Form-Factor Pluggable (SFP28) ports that connect the blade chassis to the fabric interconnect. Each Cisco UCS 2408 provide 10-Gigabit Ethernet ports connected through the midplane to each half-width slot in the chassis, giving it a total 32 10G interfaces to UCS blades. Typically configured in pairs for redundancy, two fabric extenders provide up to 400 Gbps of I/O from FI 6400 series or FI 6536 to 5108 chassis.



Figure 2.
Rear of Cisco UCS 5108 Blade Server Chassis with two Cisco UCS 2408 Fabric Extenders

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Cisco SingleConnect Technology

Cisco® SingleConnect Technology provides an easy, intelligent, and efficient way to connect and manage computing in the data center. SingleConnect unifies LAN, SAN, and systems management into one simplified link for rack servers, blade servers, and virtual machines.

SingleConnect is an end-to-end I/O architecture. It incorporates Cisco UCS Virtual Interface Cards (VICs), Cisco UCS fabric interconnects, and Cisco Fabric Extender Technology (FEX Technology) to connect every server on a single network fabric and on a single network layer. SingleConnect innovations dramatically simplify IT operations and reduce data center costs and are exclusive to Cisco UCS.

SingleConnect provides one connection for:

- Rack servers and blade servers
- LAN, SAN, and systems management
- Physical servers and virtual machines

Features and benefits

Table 1 summarizes the main features and benefits of the Cisco UCS 2408 Fabric Extender.

Table 1. Features and benefits

Feature	Benefit
Management by Cisco UCS Manager or Cisco Intersight	• Reduces TCO by removing management modules from the chassis, making the chassis stateless • Provides a single, highly available management domain for all system chassis, reducing administrative tasks
Autoconfiguration	Simplifies operation by automatically synchronizing firmware levels between the fabric extenders and the interconnects
Unified fabric	• Decreases TCO by reducing the number of Network Interface Cards (NICs), Host Bus Adapters (HBAs), switches, and cables needed • Transparently encapsulates Fibre Channel packets into Ethernet
Automatic failover	Increases availability with an active/active data plane
Scalable bandwidth	Reduces TCO by optimizing overall system capacity to match actual workload demands
Environmental monitoring	Removes the need for chassis-management modules
Lossless fabric	Provides a reliable, robust foundation for unifying LAN and SAN traffic on a single transport
Priority Flow Control (PFC)	• Simplifies management of multiple traffic flows over a single network link • Supports different classes of service, allowing both lossless and classic Ethernet on the same fabric
Systemwide bandwidth management	Helps enable consistent and coherent Quality-of-Service (QoS) management throughout the system

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Feature	Benefit
SFP28 ports	• Increases flexibility with a range of interconnect solutions, including copper Twinax cable for short runs and fiber cable for long runs • Consumes less power per port than traditional solutions
Fabric port channel	• Provides flexibility to bundle fabric ports in a port channel

Product specifications

Performance

- Hardware forwarding at 1.04 Tbps
- Low-latency design, providing predictable, consistent traffic latency regardless of packet size, traffic pattern, or enabled features

Layer 2

- Layer 2 VLAN trunks
- IEEE 802.1Q VLAN encapsulation
- Support for up to 1024 VLANs and Virtual SANs (VSANs)
- Jumbo frames on all ports (up to 9216 bytes)
- Pause frames (IEEE 802.3x)

QoS

- Layer 2 IEEE 802.1p (Class of Service [CoS])
- CoS-based egress queuing
- Egress strict-priority queuing
- Egress port-based scheduling: Weighted Round Robin (WRR)
- Sixteen hardware queues per port

High availability

- Up to two fabric extenders can work in the Cisco UCS 5100 Series Blade Server Chassis
- Active/active data-plane operation with failover
- Capability to fail over from one fabric extender to another in the event of a failure
- Active/passive management-plane operation
- Support for nonstop management-plane functions; if the active fabric extender fails, the passive fabric extender takes over the chassis management functions

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Management

- Management of fabric extenders integrated into Cisco UCS Manager and Cisco Intersight (please refer to the Cisco UCS Manager or Cisco Intersight data sheet for more information)
- Capability to manage blade server chassis components such as power supplies, fans, and blades in conjunction with the fabric interconnect
- Firmware levels between the fabric extender and fabric interconnect always synchronized
- Low-latency, lossless 25 Gigabit Ethernet unified network fabric
- PFC (per-priority pause frame support)
- Data Center Bridging Exchange (DCBX) Protocol
- IEEE 802.1Qaz: Bandwidth management

Industry standards

- IEEE 802.1p: CoS prioritization
- IEEE 802.1Q: VLAN tagging
- IEEE 802.3: Ethernet
- IEEE 802.3ad: Link Aggregation Control Protocol (LACP)
- IEEE 803.3by: 25 Gigabit Ethernet
- SFP28 support

Physical specifications

SFP28 optics

Cisco UCS products support 25 Gigabit Ethernet SFP28 copper Twinax cables for short distances and SFP28 optics for longer distances. The 25-Gigabit Ethernet cables and transceivers qualified listed in this data sheet are qualified to work with both Cisco UCS 6454 and Cisco UCS 64108 Fabric Interconnect and Cisco UCS 2408 Fabric Extender.

Environment

- Physical (height x width x depth): 7.64 x 1.36 x 7.2 in. (19.4 x 3.54 cm)
- Maximum Power consumption: 160 W
- Operating temperature: 32 to 104°F (0 to 40°C)
- Nonoperating temperature: -40 to 158°F (-40 to 70°C)
- Humidity: 5 to 95% (noncondensing)
- Altitude: 0 to 10,000 ft (0 to 3000m)

Weight

- 2.8 lb (1.134 kg)

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Regulatory standards compliance: Safety and EMC

Table 2 summarizes Cisco UCS 2408 Fabric Extender regulatory compliance.

Table 2. Regulatory standards compliance: Safety and EMC

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. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
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 product is RoHS-5 compliant with exceptions for leaded Ball Grid Array (BGA) balls and lead press-fit connectors.

Fabric interconnect support

The Cisco UCS 2408 Fabric Extender is designed to work with both Cisco UCS 6454 and Cisco UCS 64108 Fabric Interconnect only at 25 Gbps.

Transceiver and cable support

The Cisco UCS 2408 Fabric Extender supports a variety of Ethernet connectivity options using Cisco 25-Gbps transceivers and 25-Gbps passive cables and active optical cables.

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Table 3. Cisco UCS 2408 Fabric Extender transceiver-support matrix

Product information	Description
SFP-25G-SR-S	25GBASE-SR SFP+, 850nm, MMF, 300m, S-Class
SFP-10/25G-LR-S	10/25GBASE-LR SFP28 Module for SMF
SFP-10/25G-CSR-S	10/25GBASE-CSR SFP28 Module for MMF
SFP-25G-SL	25GBASE-SL SFP module

Table 4. Cisco UCS 2408 Fabric Extender cable-support matrix

Product information	Description
SFP-H25G-CU1M	25GBASE-CU SFP28 direct-attached copper cable, 1M
SFP-H25G-CU2M	25GBASE-CU SFP28 direct-attached copper cable, 2M
SFP-H25G-CU3M	25GBASE-CU SFP28 direct-attached copper cable, 3M
SFP-H25G-CU5M	25GBASE-CU SFP28 direct-attached copper cable, 5M
SFP-25G-AOC1M	25GBASE-AOC SFP28 active optical cable, 1M
SFP-25G-AOC2M	25GBASE-AOC SFP28 active optical cable, 2M
SFP-25G-AOC3M	25GBASE-AOC SFP28 active optical cable, 3M
SFP-25G-AOC4M	25GBASE-AOC SFP28 active optical cable, 4M
SFP-25G-AOC5M	25GBASE-AOC SFP28 active optical cable, 5M
SFP-25G-AOC7M	25GBASE-AOC SFP28 active optical cable, 7M
SFP-25G-AOC10M	25GBASE-AOC SFP28 active optical cable, 10M
QSFP 100GBASE (supported with Cisco UCS 6536 Fabric Interconnects)	
QSFP-4SFP25G-CU1M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 1M
QSFP-4SFP25G-CU2M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 2M
QSFP-4SFP25G-CU3M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 3M
QSFP-4SFP25G-CU5M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 5M

Note: This is the list of supported transceivers and cables for Cisco UCS 2408 Fabric Extender only. Cross-reference this list against the supported transceivers and cables for the device on the opposing side of the link to confirm compatibility for both devices.

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Ordering information

Table 5 presents ordering information for the Cisco UCS 2408 Fabric Extender.

Table 5. Ordering information

Part number	Description
UCS-IOM-2408	Cisco IOM 2408 I/O Module (8 external 25G ports, 32 internal 10G ports)
UCS-IOM-2408=	Cisco IOM 2408 I/O Module (8 external 25G ports, 32 internal 10G ports); spare PID

Warranty information

Find warranty information at Cisco.com on the Product Warranties page.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

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Using a unified view of data center resources, Cisco and our industry-leading partners deliver services that accelerate your transition to a unified computing environment. Cisco Unified Computing Services helps you quickly deploy your data center resources and optimize ongoing operations to better meet your business needs. For more information about these and other Cisco Data Center Services, visit https://www.cisco.com/go/dcservices.

Cisco Capital

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For more information

For more information about the Cisco UCS 2408 Fabric Extender, visit https://www.cisco.com/c/en/us/solutions/data-center-virtualization/fabric-extender-technology-fex-technology/index.html or contact your local Cisco representative.

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Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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