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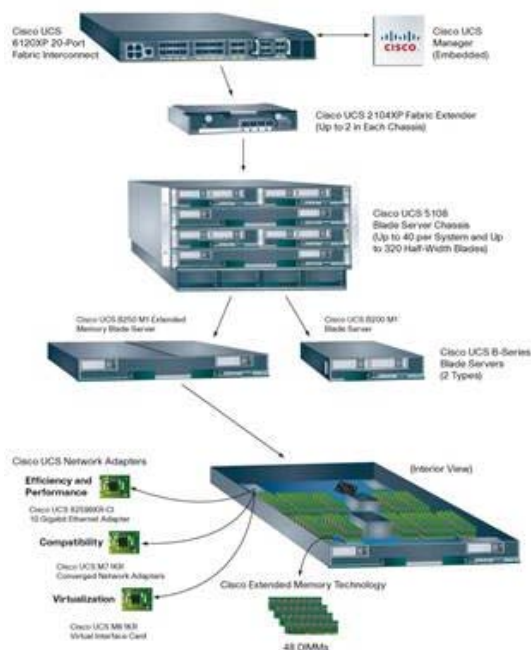
Welcome to the Cisco UCS 6120XP Fabric Interconnect
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 Technical Information & Data Sheet for the Cisco UCS
 6120XP

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Cisco Unified Computing System Overview

The Cisco Unified Computing System™ is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce total cost of ownership (TCO) and increase business agility. The system integrates a low-latency, lossless 10 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



Product Overview

The Cisco ® UCS 6100 Series Fabric Interconnects are a core part of the Cisco Unified Computing System, providing both network connectivity and management capabilities for the system (Figure 2). The Cisco UCS 6100 Series offers line-rate, low-latency, lossless 10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE) functions.

The Cisco UCS 6100 Series provides the management and communication backbone for the Cisco UCS B-Series Blade Servers and UCS 5100 Series Blade Server Chassis. All chassis, and therefore all blades, attached to the Cisco UCS 6100 Series Fabric Interconnects become part of a single, highly available management domain. In addition, by supporting unified fabric, the Cisco UCS 6100 Series provides both the LAN and SAN connectivity for all blades within its domain.

From a networking perspective, the Cisco UCS 6100 Series uses a cut-through architecture, supporting deterministic, low-latency, line-rate 10 Gigabit Ethernet on all ports, independent of packet size and enabled services. The product family supports Cisco low-latency, lossless 10 Gigabit Ethernet 1 unified network fabric capabilities, which increase the reliability, efficiency, and scalability of Ethernet networks. The fabric interconnect supports multiple traffic classes over a lossless Ethernet fabric from the blade through the interconnect. Significant TCO savings come from an FCoE-optimized server design in which network interface cards (NICs), host bus adapters (HBAs), cables, and switches can be consolidated.

Figure 2. Cisco UCS 6100 Series Fabric Interconnects



Unified Fabric with FCoE: I/O Consolidation

The Cisco UCS 6100 Series is built to consolidate LAN and SAN traffic onto a single unified fabric, saving the capital and operating expenses associated with multiple parallel networks, different types of adapter cards, switching infrastructure, and cabling within racks. Fibre Channel expansion modules in the interconnect support direct connections from the Cisco Unified Computing System to existing native Fibre Channel SANs. The capability to connect FCoE to native Fibre Channel protects existing storage system investments while dramatically simplifying in-rack cabling.

Cisco UCS Manager

The Cisco 6100 Series hosts and runs the Cisco UCS Manager in a highly available configuration, enabling the fabric interconnects to fully manage all Cisco Unified Computing System elements. Connectivity to the Cisco UCS 5100 Series blade chassis is maintained through the Cisco UCS 2100 Series Fabric Extenders in each blade chassis. The Cisco 6100 Series interconnects support out-of-band management through a dedicated 10/100/1000-Mbps Ethernet management port as well as in-band management.

Cisco UCS Manager typically is deployed in a clustered active-passive configuration on redundant fabric interconnects connected through dual 10/100/1000 Ethernet clustering ports.

Optimization for Virtualization

For virtualized environments, the Cisco 6100 Series supports Cisco VM-FEX architecture. Cisco VM-FEX architecture allows the interconnects to provide policy-based virtual machine connectivity, mobility of network properties with the virtual machine, and a consistent operational model for both physical and virtual environments.

Cisco UCS 6120XP 20-Port and UCS 6140XP 40-Port Fabric Interconnects

The Cisco UCS 6100 Series interconnects are compared in Table 1 and shown in Figure 3.

Table 1. Comparison of Cisco UCS 6120XP and UCS 6140XP Fabric Interconnects

Item	Cisco UCS 6120XP	Cisco UCS 6140XP
Description	20-port fabric interconnect	40-port fabric interconnect
Form factor	1 rack unit (RU)	2RU
Number of fixed 10 Gigabit Ethernet and FCoE Small Form-Factor Pluggable Plus (SFP+) ports	20	40
Throughput	520 Gbps	1.04 terabits per second (Tbps)
Expansion slots	1	2
Fan modules	1+1	4+1

Figure 3. Cisco UCS 6120XP 20-Port Fabric Interconnect (Top) and Cisco UCS 6140XP 40-Port Fabric Interconnect (Bottom)



Expansion Module Options for Cisco UCS 6100 Series Fabric Interconnects

The Cisco UCS 6100 Series is equipped to support a number of expansion module options (Figure 4). Ports on any UCS Expansion Modules cannot be used for server facing connections.

- Ethernet module that provides 6 ports of 10 Gigabit Ethernet using the SFP+ interface
- Fibre Channel plus Ethernet module that provides 4 ports of 10 Gigabit Ethernet using the SFP+ interface; and 4 ports of 1/2/4-Gbps native Fibre Channel connectivity using the SFP interface
- Fibre Channel module that provides 8 ports of 1/2/4-Gbps native Fibre Channel using the SFP interface for transparent connectivity with existing Fibre Channel networks
- Fibre Channel module that provides 6 ports of 1/2/4/8-Gbps native Fibre Channel using the SFP or SFP+2 interface for transparent connectivity with existing Fibre Channel networks

Figure 4. From Left to Right: 8-Port 1/2/4-Gbps Native Fibre Channel Expansion Module; 4-Port Fibre Channel plus 4-Port 10 Gigabit Ethernet Module; 6-Port 10 Gigabit Ethernet Module; and 6-Port 1/2/4/8-Gbps Native Fibre Channel Expansion Module



Features and Benefits

Table 2 summarizes the features and benefits of the Cisco UCS 6100 Series.

Table 2. Features and Benefits

Feature	Benefit
Management by Cisco UCS Manager	<ul style="list-style-type: none"> • Enables all elements connected to the interconnects to participate in a single, highly available management domain
Unified fabric	<ul style="list-style-type: none"> • Decreases TCO by reducing the number of NICs, HBAs, switches, and cables needed • Transparently encapsulates Fibre Channel packets into Ethernet
Fabric extender architecture	<ul style="list-style-type: none"> • Scales to 20 chassis without adding complexity by eliminating the need for dedicated chassis management and blade switches and by reducing the number of cables needed • Provides deterministic latency for optimized application performance
Performance	<ul style="list-style-type: none"> • Provides high-speed, low-latency connectivity to the chassis
Lossless fabric	<ul style="list-style-type: none"> • Provides a reliable, robust foundation for unifying LAN and SAN traffic on a single transport
Priority flow control (PFC)	<ul style="list-style-type: none"> • Simplifies management of multiple traffic flows over a single network link • Supports different classes of service, enabling both lossless and classic Ethernet on the same fabric
Systemwide bandwidth management	<ul style="list-style-type: none"> • Enables consistent and coherent quality of service (QoS) throughout the system
	<ul style="list-style-type: none"> • Enables a consistent operational model between virtual and physical

Cisco VM-FEX technology	<p>environments</p> <ul style="list-style-type: none"> • Provides the same level of network visibility for virtualized and nonvirtualized environments • Improves diagnostic and troubleshooting capabilities in a virtual environment • Simplifies network and security policy enforcement when migrating virtual machines from one host to another
Rear ports	<ul style="list-style-type: none"> • Helps keep cable lengths short and efficient
Redundant hot-swappable fans and power supplies	<ul style="list-style-type: none"> • Enables high availability in multiple configurations • Increases serviceability • Provides uninterrupted service during maintenance
Front-to-back cooling	<ul style="list-style-type: none"> • Supports efficient data center hot- and cold-aisle designs
SFP+ ports	<ul style="list-style-type: none"> • Increases flexibility with a range of interconnect solutions, including copper Twinax cable for short runs and fiber for long runs • Consumes less power per port than traditional solutions
SFP-compatible ports	<ul style="list-style-type: none"> • UCS 6120XP: The first 8 fixed ports can be configured to operate in 1 Gigabit Ethernet mode with the transceiver options specified for use with SFP-compatible ports in Table 3 below 1 • UCS 6140XP: The first 16 fixed ports can be configured to operate in 1 Gigabit Ethernet mode with the transceiver options specified for use with SFP-compatible ports in Table 3 below 3
Port-based licensing options	<ul style="list-style-type: none"> • Enables a pay-as-you-go model, enabling customers to add additional capacity as the networking needs of an individual system increase

1Support for 1 Gigabit Ethernet mode requires UCS 6100 Series operating software release 1.3 or higher.

Product Specifications

Transceivers

The Cisco UCS 6100 Series supports a wide variety of 10 Gigabit Ethernet connectivity options using Cisco 10GBASE SFP+ modules.

In addition, a subset of the ports on the Cisco UCS 6120XP (first 8 fixed ports) and 6140XP (first 16 fixed ports) support Gigabit Ethernet connectivity options using 1GBASE SFP modules. 8/4/1-Gbps Fibre Channel SFP+ and 4/2/1-Gbps Fibre Channel SFP interfaces are supported with expansion module options.

Table 3 lists the supported transceiver options.

Table 3. Cisco UCS 6100 Series Transceiver Support Matrix

Cisco SFP	Description
Cisco SFP-10G-SR	10GBASE-SR SFP+ module (MMF)
Cisco SFP-10G-LR	10GBASE-LR SFP+ module (SMF)
Cisco SFP-	

H10GB-CU1M	10GBASE-CU SFP+ cable 1m (Twinax cable)
Cisco SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3m (Twinax cable)
Cisco SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5m (Twinax cable)
SFP-H10GB-ACU7M	10GBASE-CU SFP+ cable 7m (Twinax cable)
SFP-H10GB-ACU10M	10GBASE-CU SFP+ cable 10m (Twinax cable)
Cisco FET-10G	10GBASE-FET SFP+ module (MMF)
Cisco GLC-T	1000BASE-T SFP (for SFP-compatible ports as defined in Table 2 only)
Cisco GLC-SX-MM	GE SFP, LC connector SX transceiver (MMF) (for SFP-compatible ports as defined in Table 2 only)
Cisco GLC-LH-SM	GE SFP, LC connector LX/LH transceiver (SMF) (for SFP-compatible ports as defined in Table 2 only)
Cisco SFP-GE-T	1000BASE-T SFP, extended temperature range (for SFP-compatible ports as defined in Table 2 only)
Cisco SFP-GE-S	GE SFP, LC connector SX transceiver (MMF), extended temperature range and digital optical monitoring (DOM) (for SFP-compatible ports as defined in Table 2 only)
Cisco SFP-GE-L	GE SFP, LC connector LX/LH transceiver (SMF), extended temperature range and DOM (for SFP-compatible ports as defined in Table 2 only)
Cisco DS-SFP-FC4G-SW	4-Gbps Fibre Channel SW SFP, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC4G-LW	4-Gbps Fibre Channel LW SFP, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW SFP+, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW SFP+, LC (for Fibre Channel expansion module ports)

Cabling

Table 4 provides 10 Gigabit Ethernet cabling specifications for the Cisco UCS 6100 Series.

Table 4. Cabling Specifications

Connector (Media)	Cable	Distance	Power (Each Side)	Transceiver Latency (Link)	Standard
SFP+ copper (CU)	Twinax	1, 3, and 5m	Approximately 0.1 watt (W)	Approximately 0.1 microsecond	SFF 8431

SFP+ fabric extender (FET)	MM OM2	25m 100m	1W	Approximately 0 microseconds	IEEE 802.3ae
	MM OM3				
	MM OM4				
SFP+ short reach (SR) and multimode fiber (MMF)	MM OM2	82m 300m	1W	Approximately 0 microseconds	IEEE 802.3ae
	MM OM3				
	MM OM4				
SFP+ long reach (LR)	SMF	300m over SMF	1W	Approximately 0 microseconds	IEEE 802.3ae

Performance

- Cisco UCS 6120XP: Layer 2 hardware forwarding at 520 Gbps or 386.9 million packets per second (mpps)
- Cisco UCS 6140XP: Layer 2 hardware forwarding at 1.04 Tbps or 773.8 mpps
- MAC address table entries: 16,000
- Low-latency cut-through design provides predictable, consistent traffic latency regardless of packet size, traffic pattern, or enabled features

Layer 2

- Layer 2 interconnect ports and VLAN trunks
- IEEE 802.1Q VLAN encapsulation
- Support for up to 1024 VLANs and virtual SANs (VSANs) per interconnect
- Rapid Per-VLAN Spanning Tree Plus (PVRST+)
- Internet Group Management Protocol (IGMP) Versions 1, 2, and 3 snooping
- Cisco EtherChannel technology
- Link Aggregation Control Protocol (LACP): IEEE 802.3ad
- Advanced EtherChannel hashing based on Layer 2, 3, and 4 information
- Jumbo frames on all ports (up to 9216 bytes)
- Pause frames (IEEE 802.3x)

QoS

- Layer 2 IEEE 802.1p (class of service [CoS])
- Eight hardware queues per port
- Per-port QoS configuration

- CoS trust
- Per-port virtual output queuing
- CoS-based egress queuing
- Egress strict-priority queuing
- Egress port-based scheduling: Weighted Round-Robin (WRR)

High Availability

- Hot-swappable field-replaceable power supplies, fan modules, and expansion modules
- 1+1 power redundancy
- N+1 fan module redundancy

Management

- Interconnect management using redundant 10/100/1000-Mbps management or console ports
- All management provided through Cisco UCS Manager; please refer to the Cisco UCS Manager data sheet for more information about management interfaces

Low-Latency, Lossless 10 Gigabit Ethernet Unified Network Fabric

- PFC (per-priority pause frame support)
- Data Center Bridging Exchange (DCBX) Protocol
- IEEE 802.1Qaz: Bandwidth management
- Layer 2 multipathing (future)

Industry Standards

- IEEE 802.1p: CoS prioritization
- IEEE 802.1Q: VLAN tagging
- IEEE 802.1s: Multiple VLAN instances of Spanning Tree Protocol
- IEEE 802.1w: Rapid reconfiguration of Spanning Tree Protocol
- IEEE 802.3: Ethernet
- IEEE 802.3ad: LACP
- IEEE 802.3ae: 10 Gigabit Ethernet
- SFP+ support
- RMON

Physical Specifications

SFP+ Optics

Cisco Unified Computing System products support 10 Gigabit Ethernet SFP+ copper Twinax cables for short distances and SFP+ optics for longer distances. SFP+ has several advantages compared to other 10-Gigabit Ethernet connectivity options:

- Small 10 Gigabit Ethernet form-factor
- Optical interoperability with XENPAK, X2, and 10 Gigabit Small Form-Factor Pluggable (XFP) interface types
- Low power consumption
- Hot-swappable device

Power Supply

Table 5 summarizes the power supply properties.

Table 5. AC Power Supply

Property	Cisco UCS 6120XP	Cisco UCS 6140XP
Typical operating power	350W	480W
Maximum power	550W	750W
Input voltage	100 to 240 VAC	100 to 240 VAC
Frequency	50 to 60 Hz	50 to 60 Hz
Efficiency	88 to 90%	82 to 88%
RoHS compliance	Yes	Yes
Hot-swappable	Yes	Yes
Heat dissipation	1536 BTU/hr	2561 BTU/hr

Cisco UCS 6100 Series Physical and Environmental Specifications

Table 6 summarizes the physical and environmental specifications for the Cisco UCS 6100 Series.

Table 6. Physical and Environmental Specifications

Property	Cisco UCS 6120XP	Cisco UCS 6140XP
Physical (height x width x depth)	1.72 x 17.3 x 30.0 in. (4.4 x 43.9 x 76.2 cm)	3.47 x 17.3 x 30.0 in. (8.8 x 43.9 x 76.2 cm)
Operating temperature	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)
Nonoperating temperature	-40 to 158°F (-40 to 70°C)	-40 to 158°F (-40 to 70°C)
Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	0 to 10,000 ft (0 to 300m)	0 to 10,000 ft (0 to 300m)

Weight

Table 7 summarizes presents the weights for the Cisco UCS 6100 Series.

Table 7. Weight

Component	Weight

Cisco UCS 6120XP with two power supplies, one expansion module, and two fan modules	35 lb (15.88 kg)
Cisco UCS 6140XP with two power supplies, two expansion modules, and five fan modules	50 lb (22.68 kg)

Regulatory Standards Compliance: Safety and EMC

Table 8 summarizes Cisco UCS 6100 Series regulatory compliance.

Table 8. Regulatory Standards Compliance

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC
Safety	<ul style="list-style-type: none"> • UL 60950-1 • CAN/CSA-C22.2 No. 60950-1 • EN 60950-1 • IEC 60950-1 • AS/NZS 60950-1 • GB4943
EMC: Emissions	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • EN50082-1 • EN61000-6-1 • EN55024 • CISPR24

	<ul style="list-style-type: none"> • 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

Warranty Information

Warranty information is provided at Cisco.com on the Product Warranties page.

Cisco Unified Computing Services

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 help 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 <http://www.cisco.com/go/dcservices>.

Why Cisco?

Cisco has significant experience in listening to customer requirements and providing solid technology innovation for the enterprise data center. Cisco delivers standards-based solutions backed by a broad partner ecosystem of industry leaders to provide end-to-end customer solutions. Unified computing elevates the traditional product classification of network, server, storage, operating systems, and applications to a data center-wide vision. Cisco, as one of the largest technology providers in the world, has the resources, expertise, and customer focus to deliver on this vision.

For More Information

For more information about the Cisco UCS 6100 Series Fabric Interconnects, visit <http://www.cisco.com/en/US/products/ps10276/index.html> or contact your local account representative.

1Some ports can be configured for 1 Gigabit Ethernet (See Table 2).

2Ports are fully compatible with the 8GFC standard and negotiate among 1, 2, 4, and 8 Gbps, constrained by optics compatibility. Ports support both 1/2/4-Gbps Cisco 4GFC optical transceivers using the SFP interface and 2/4/8-Gbps Cisco 8GFC optical transceivers using the SFP+ interface.

Cisco web site http://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-5100-series-blade-server-chassis/data_sheet_c78-524724.html

UCS B200 M2	UCS B420 M3	UCS B230 M2	UCS 6120XP	UCS 6140XP
UCS B250 M2				

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