

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

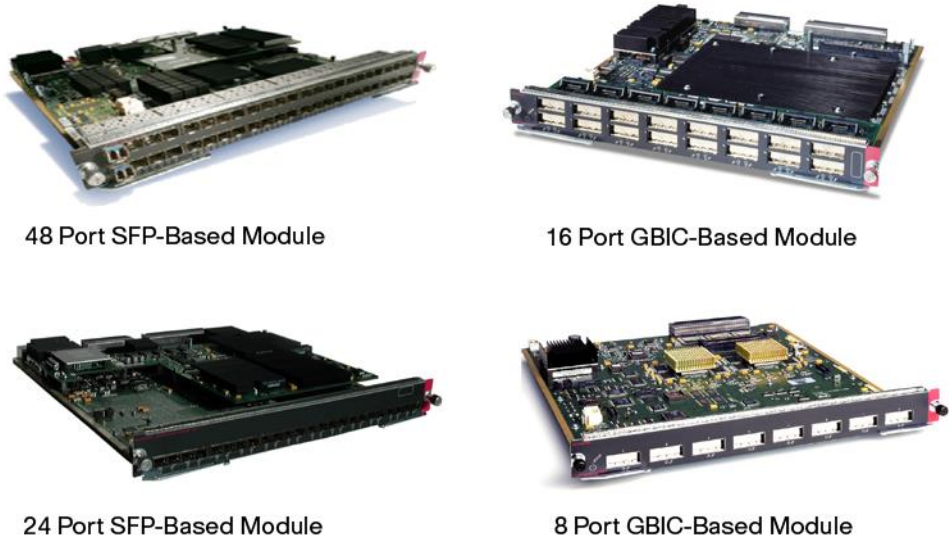
Visit our website - *Click HERE*

Cisco Catalyst 6500 Series Mixed Media Gigabit Ethernet Modules

Product Overview

The Cisco Catalyst® 6500 Series switch—the premier modular multilayer switch—delivers secure converged services from the wiring closet to the core, to the data center, to the WAN edge.

Figure 1. Cisco Catalyst 6500 Series Gigabit Ethernet Interface Modules



Designed to complement the many roles that the Cisco Catalyst 6500 Series plays in a network, Cisco Catalyst 6500 Series mixed media Gigabit Ethernet modules offer the broadest selection of media, densities, performance, interoperability, and chassis deployments for enterprises and service providers. These modules are ideal for gigabit Ethernet over fiber to the desktop, gigabit uplinks, aggregation of high-density 10/100 interfaces, Metro Ethernet, backbone and high-speed server farm or data center connections as well as mixed media environments supporting both fiber and copper cable connections. The Cisco Catalyst 6500 Series Gigabit Ethernet modules offer:

- **Flexible configurations for any deployment:** Range of port densities, media choices, and performance speeds for any deployment requirement
- **Choice of media and connector type:** Support multi-mode fiber or single-mode fiber using GBIC or SFP modules or MT-RJ fixed optics

Note: For Gigabit Ethernet over Copper requirements please refer to the Catalyst 6500 series 10/100 and 10/100/1000 Ethernet interface module data sheet.

- **High mixed media Gigabit Ethernet port densities:** From 8 up to 48 ports per module, and up to 410 mixed media/fiber Gigabit Ethernet ports per system
- **Scalable and predictable system performance:** Provide a selection of switch fabric connections and throughput options: 32 Gbps, 256 Gbps and 720 Gbps bandwidth with

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

system throughput of: 15 Mpps, 30 Mpps, 210 Mpps and up to 400 Mpps

- **Operational consistency:** Configurations available for Catalyst 6500 3-, 6-, 9-, and 13-slot chassis running Cisco IOS® Software and Cisco Catalyst Operating System Software; interoperable with all other interfaces and services modules; and forward-compatible with all Catalyst 6500 supervisor engines
- **Maximum network uptime and resiliency:** Support Cisco enhanced Per-Virtual LAN (VLAN) Spanning Tree Plus (PVST+) protocol, IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) and IEEE 802.1s Multiple Spanning Tree (MST) protocol, Per-VLAN Rapid Spanning Tree (PVRST) protocol, Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), Gateway Load Balancing Protocol (GLBP), Cisco EtherChannel®, and IEEE 802.3ad link aggregation for fault-tolerant connectivity
- **Superior traffic management:** Available with large per-interface buffers and multiple-priority queues for traffic prioritization and policing, allowing for tight service-level agreement (SLA) enforcement
- **Extensive management tools:** Support CiscoWorks network management platform, Simple Network Management Protocol (SNMP) versions 1, 2, and 3 and four RMON groups (statistics, history, alarms, and events)

Gigabit Ethernet Applications and Key Features

Cisco Catalyst 6500 series mixed media/fiber-based gigabit Ethernet interface modules are used in distribution and core layers, data-center and Metro Ethernet applications. These gigabit Ethernet interface modules deliver wire-speed switched connectivity and support several switch fabric connections and traffic forwarding options, these include: Classic, CEF256, dCEF256 and CEF720. With a range of port densities and modular physical layer interfaces, these modules also offer a choice of packet buffer depths for traffic shaping, and QoS granularity with varying number of queues and drop threshold options. These key features are important aspects to in determining best module for a given network application (Table 1).

Table 1. Cisco Catalyst 6500 Series Gigabit Interface Module Applications and Key Features

Primary Applications	Product Number	Interface Module Class	Ports/Optics Interface Type	Queues per Port (Tx = Transmit, Rx = Receive)*	Scheduler	Buffer Size per Port
High Performance Distribution, Core Layer and Data Center	WS-X6748-SFP	CEF720	48, SFP	• Tx-1p3q8T • Rx-1q8T (2q8T when using dCEF)	Deficit Weighted Round Robin (DWRR)	• Rx-166KB • Tx-1.17MB
High Performance Distribution, Core Layer and Data Center	WS-X6724-SFP	CEF720	24, SFP	• Tx-1p3q8T • Rx-1q8T (2q8T when using dCEF)	DWRR	• Rx-166KB • Tx-1.17MB
Data Center and Server Farm	WS-X6816-GBIC	dCEF256	16, GBIC	• Tx-1p2q2t • Rx-1p1q4t	Weighted Round Robin (WRR)	512 KB
Data Center and Server Farm	WS-X6516A-GBIC	CEF256	16, GBIC	• Tx-1p2q2t • Rx-1p1q4t	WRR	1 MB
Base Server Farm	WS-X6516-GBIC*	CEF256	16, GBIC	• Tx-1p2q2t • Rx-1p1q4t	WRR	512 KB
Base Server Farm	WS-X6416-GBIC	Classic	16, GBIC	• Tx-1p2q2t • Rx-1p1q4t	WRR	512 KB
Base Server Farm	WS-X6408A-GBIC	Classic	8, GBIC	• Tx-1p2q2t • Rx-1p1q4t	WRR	512 KB

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

* **Queues Legend:** 1p2q2t= 1 priority queue, 2 round robin queues, 2 thresholds

Superior Traffic Management and Queuing Characteristics of Catalyst 6500 series Gigabit Ethernet Modules

The Cisco Catalyst 6500 Series Gigabit Ethernet modules support multiple queues per port for Quality of Service. Each port supports Weighted Random Early Detection (WRED) for congestion avoidance within each queue, and Weighted Round Robin (WRR) for scheduling between queues and a strict priority queue for voice traffic. Additionally, multiple thresholds can be configured to manage differentiated levels of service.

Ideal for handling mission-critical, bursty, or low latency traffic such as enterprise resource planning (ERP) or voice applications, these interface modules, including the CEF720-based WS-X6724-SFP, scale network performance and intelligent services. These modules also feature transmit and receive packet buffers and a strict priority transmit queue.

Cisco EtherChannel Technology—Increases Link Resiliency and Provides Scalable Bandwidth Aggregation

The Catalyst 6500 can aggregate up to eight physical Fast Ethernet, Gigabit Ethernet or 10Gigabit Ethernet links into a single virtual link using Cisco's Port Aggregation Protocol (PAgP) or IEEE 802.3ad technology. This provides network managers a reliable high-speed solution for the campus network backbone.

The Cisco Catalyst 6500 Series also supports multimodule channeling technology, providing even greater resiliency by creating channels across ports on separate modules in the same chassis. As a result, connectivity is maintained even if one module (and corresponding ports) fails. This is ideal for deployments requiring scalable, flexible bandwidth within the network. An additional benefit of Cisco EtherChannel capabilities include automatic recovery and redistribution of loads across remaining links; easing management; and making the technology transparent to network applications. The same Cisco EtherChannel technology can be used across Cisco Systems industry-leading 10-Gigabit Ethernet modules, providing increased aggregation as well as resiliency against link failure.

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Gigabit Ethernet Interface Module Switch Fabric and Forwarding Characteristics

The Cisco Catalyst 6500 Classic, CEF256, dCEF256 and CEF720 interface modules provide Gigabit Ethernet with a choice of speeds and forwarding rates.

Feature	WS-X6416-GBIC, WS-X6408A-GBIC	WS-X6516A-GBIC, WS-X6516-GBIC	WS-X6816-GBIC	WS-X6748-SFP, WS-X6724-SFP
Supervisor Engine Supported	• Supervisor Engine 1A • Supervisor Engine 2 • Supervisor Engine 32 • Supervisor Engine 720	• Supervisor Engine 1A • Supervisor Engine 2 • Supervisor Engine 32 • Supervisor Engine 720	• Supervisor Engine 2, (with SFM or SFM2) • Supervisor Engine 720	Supervisor Engine 720
Performance/ Forwarding Rate (Mpps)	• 32 Gbps • 15 Mpps per system	• 256 Gbps using CEF: Up to 30 Mpps per system • Using dCEF upgrade: 15 Mpps per slot for slots equipped with DFC or DFC3 to support distributed forwarding)	256 Gbps using dCEF: 24 Mpps per slot for slots equipped with DFC or DFC3 to support distributed forwarding)	• 720 Gbps using CEF; Up to 30 Mpps per system • Using dCEF upgrade: up to 48 Mpps sustained per slot for modules equipped with DFC3 to support distributed forwarding*
Forwarding Engine Architecture	Supervisor engine CPU makes forwarding decision	• Centralized CEF engine located on supervisor's PFCx makes forwarding decision • Upgradeable to dCEF switching with optional WS-F6K-DFC or WS-F6K-DFC3	Installed dCEF using WS-F6K-DFC or WS-F6K-DFC3	• Centralized CEF engine located on supervisor's PFCx makes forwarding decision • Upgradeable to dCEF switching with optional WS-F6700-DFC3
Optional DFC Upgrade Support	Not supported	• Use WS-F6K-DFC with Supervisor Engine 2 and SFM(2); • Use WS-F6K-DFC3 with Supervisor Engine 720	Selection of: • WS-F6K-DFC with Supervisor Engine 2 and SFM(2); • Use WS-F6K-DFC3 with Supervisor Engine 720	Use WS-F6700-DFC3 with Supervisor Engine 720
Backplane/ Switch Fabric Connections	32 Gbps shared bus connection (on Supervisor Engine1A, Supervisor Engine 2, Supervisor Engine 32, and Supervisor Engine 720)	Single 8 Gbps channel connection to switch fabric (on Supervisor Engine 720 or Supervisor Engine 2-MSFC2 with Switch Fabric Module {SFM]) and 32 Gbps shared bus connection	Dual 8 Gbps channel connection to switch fabric [on Supervisor Engine 720 or Supervisor Engine 2-MSFC2 with Switch Fabric Module (SFM)]	Dual 20 Gbps (40 Gbps total) channel connection to switch fabric on Supervisor Engine 720**
Chassis/Slot Support Requirements	Any slot in any chassis	Any slot in any chassis	• Any slot in any Catalyst 6500 chassis except 6513. • Slots 9 through 13 on 6513	6503 not supported at current time
Forwarding Engine Architecture	Supervisor engine CPU makes forwarding decision	• Centralized CEF engine located on supervisor's PFCx makes forwarding decision • Upgradeable to dCEF switching with optional WS-F6K-DFC or WS-F6K-DFC3	Installed dCEF using WS-F6K-DFC or WS-F6K-DFC3	• Centralized CEF engine located on supervisor's PFCx makes forwarding decision. • Upgradeable to dCEF switching with optional WS-F6700-DFC3.

* WS-X6724-SFP achieves 26Mpps sustained per slot for modules equipped with DFC3 to support distributed forwarding)
** WS-X6724-SFP supports a single 20-Gbps channel connection to switch fabric on Supervisor Engine 720; all other 67xx interface modules feature dual 20-Gbps channel connections (40Gbps total) to the switch fabric
Legend: 1p2q2t = one strict priority queue, two round-robin queues, and two different thresholds

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Figure 2. Cisco Catalyst 6500 Series Gigabit Ethernet Interface Module WS-X6748-SFP

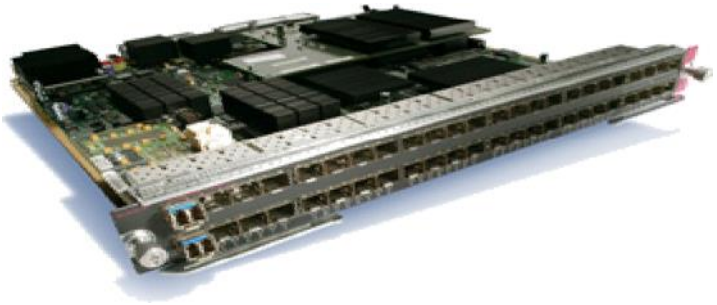
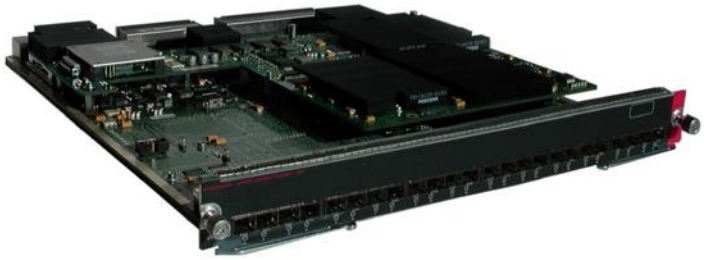


Figure 3. Cisco Catalyst 6500 Series Gigabit Ethernet Interface Modules WS-X6724-SFP



Cisco Catalyst 6500 Series CEF720 Gigabit Ethernet Mixed Media Modules

Designed for high performance Enterprise and Service Provider distribution, core layers, data-center, Web-hosting and Metro Ethernet applications, CEF720 mixed media interface modules provide line-rate gigabit Ethernet forwarding using twisted pair or fiber optic cabling with the following operational advantages:

- **Backplane connection:** Connects to the switch fabric using dual full duplex 20 Gbps switch fabric channels (40 Gbps total), a single 20 Gbps channel is supported by the WS-X6724-SFP
- **Chassis/slot support:** Can occupy any slot in Cisco Catalyst 6503E, 6504E, 6506, 6506E, 6509, 6509E, and 6509-NEB-A and slots 9 through 13 in Catalyst 6513; the WS X6724-SFP module is supported in all slots of the Catalyst 6513
- **Supervisor engine:** Supported by all versions of Supervisor Engine 720
- **Base forwarding mode and performance:** Uses the central CEF engine located on the supervisor engine to forward packets up to 30 Mpps per system in its base configuration
- **Distributed forwarding upgrade option and performance:** When equipped with the optional field-upgradeable WS-F6700-DFC3 dCEF forwarding daughter cards, the interface module delivers optimal performance, up to a sustained 48 Mpps per slot (26 Mpps per slot for WS X6724-SFP)
- **Optics:** Support hot-pluggable modular small form-factor pluggable (SFP)

Note: Inline power support is not supported on mixed media Gigabit Ethernet interface modules.

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Table 2. CEF720 Gigabit Ethernet SFP Interface Modules

Product	Transceiver Type	Ports/Interface/ Connectors	Port Density/Chassis Model	Maximum Frame Size*	Queues per Port (Tx = Transmit, Rx = Receive),**
WS-X6748-SFP	Small Form-factor Pluggable (SFP)	48 port; 1000BASE-SX, LX/LH, -ZX, -T; 1000BASE-CWDM; LC connecter	240 ports (410 GbE max)/6513; 384 ports (386 GbE max)/6509	Up to 9216 bytes/frame	• Tx-1p3q8T • Rx-1q8T (2q8T when using dCEF)
WS-X6724-SFP	Small Form-factor Pluggable (SFP)	24-port; 1000BASE-SX, LX/LH, -ZX, -T; 1000BASE-CWDM; LC connecter	• 288 ports/6513 • 192 ports/6509	Up to 9216 bytes/frame	• Tx-1p3q8T • Rx-1q8T (2q8T when using dCEF)

* Jumbo Frame Support
** **Queues Legend:** 1p3q1t = 1 priority queue, 3 round robin queues, 1 threshold. For optimal performance, Cisco recommends using a distributed forwarding card

Figure 4. The Optional Field-Upgradeable for use with CEF720 Class Interface Modules



Cisco Catalyst 6500 Series DCEF256 Gigabit Ethernet Mixed Media Interface Modules

Designed for distribution and core layers and for data-center and Web-hosting applications, Cisco Catalyst 6500 series dCEF256 optical interface modules provide line-rate Gigabit Ethernet forwarding with the following operational advantages:

- **Backplane connection:** Uses dual 8-Gbps (16Gbps) full-duplex serial channel connections to the switch fabric on a Supervisor Engine 720 or a SFM/SFM2 module
- **Slot requirements:** Can occupy any slot in any Cisco Catalyst 6500 Series chassis except the 6513 chassis which requires installation in slots 9 through 13 (the only slots on the chassis with dual fabric connections)
- **Supervisor engine:** Supports Supervisor Engine 2 with a SFM or all versions of Supervisor Engine 720
- **Distributed forwarding mode and performance:** Equipped with the field-upgradeable WS-F6K-DFC or WS-F6K-DFC3 dCEF forwarding daughter cards; the interface module delivers optimal performance, up to a sustained 24 Mpps per slot, by using the dCEF engine and dCEF tables located on the DFC/DFC3 daughter card
- **Optics:** Supports hot-pluggable gigabit interface converters (GBICs)

Table 3. dCEF256 Gigabit Ethernet Optical Interface Modules

Product	Transceiver Type	Ports/Interface/Connectors	Port Density/ Chassis Model	Maximum Frame Size (Jumbo Frame) Support	Queues per Port (Tx = Transmit, Rx = Receive)*
WS-X6816-GBIC	GBIC	16 ports; 1000BASE-SX, LX/LH, -ZX, -T; 1000BASE-CWDM, -DWDM; SC connecter	90 ports/ 6513 128 ports/6509	Up to 9216 bytes/frame	Tx-1p2q2t Rx-1p1q4t

* **Queues Legend:** 1p3q1t = 1 priority queue, 3 round robin queues, 1 threshold

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Figure 5. dCEF256 Gigabit Ethernet Optical Interface Modules WS-X6816-GBIC



Cisco Catalyst 6500 Series CEF256 Gigabit Ethernet Mixed Media Interface Modules

Designed for data center and server farm applications, Cisco Catalyst CEF256 optical interface modules provide line-rate Gigabit Ethernet forwarding with the following operational advantages:

- **Backplane connection:** Connects to the switch fabric using one 8 Gbps full-duplex connection as well as supporting a connection to the 32 Gbps shared bus
- **Slot requirements:** Can occupy any slot in any Catalyst 6500 Series chassis
- **Supervisor engine:** Supported by the Supervisor Engine 1A, Supervisor Engine 2, Supervisor Engine 32, or Supervisor Engine 720
- **Base forwarding mode and performance:** Uses the central CEF engine located on the supervisor engine to forward packets up to 30 Mpps per system in the interface module's base configuration
- **Distributed forwarding upgrade option and performance:** When equipped with the optional field-upgradeable WS-F6K-DFC or WS-F6K-DFC3 dCEF forwarding daughter cards, the interface module delivers optimal performance, up to a sustained 15 Mpps per slot; requires a switch fabric equipped chassis using either the SFM/SFM2 with a Supervisor Engine 2 with MSFC2 or the Supervisor Engine 720
- **Optics:** Supports hot-pluggable gigabit interface converters (GBICs)

Note: Supervisor Engine 720 communicates with a CEF256 interface module in 256 Gbps mode. The SFM is not required when using the Supervisor Engine 720.

Table 4. CEF256 Gigabit Ethernet Optical Interface Modules

Product	Transceiver Type	Ports/Interface/Connectors	Port Density/Chassis Model	Maximum Frame Size (Jumbo Frame) Support	Queues per Port (Tx = Transmit, Rx = Receive)*
WS-X6516A-GBIC	GBIC	16 ports; 1000BASE-SX, -LX/LH, -ZX, T; 1000BASE-CWDM, DWDM; SC connecter	• 192 ports/6513 • 128 ports/6509	Up to 9216 bytes/frame	• Tx-1p2q2t • Rx-1p1q4t
WS-X6516-GBIC	GBIC	16 ports; 1000BASE-SX, -LX/LH, -ZX, -T; 1000BASE-CWDM, -DWDM; SC connecter	• 192 ports/6513 • 128 ports/6509	Up to 9216 bytes/frame	• Tx-1p2q2t • Rx-1p1q4t

* **Queues Legend:** 1p3q1t = 1 priority queue, 3 round robin queues, 1 threshold

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Figure 6. CEF256 Gigabit Ethernet Optical Interface Modules



WS-X6516A-GBIC



Optional field-upgradeable Distributed Forwarding Card (DFC)

Cisco Catalyst 6500 Series Classic Gigabit Ethernet Optical/Mixed Media Interface Modules

Designed for distribution and core layers and for data-center and Web-hosting applications, Cisco Catalyst 6500 series Classic Gigabit Ethernet interface modules provide line-rate forwarding with the following operational advantages and characteristics:

- **Backplane connection:** Provide a 32 Gbps shared bus connection
- **Slot requirements:** Can occupy any slot in any Cisco Catalyst 6500 Series chassis
- **Supervisor engine:** Supported by the Supervisor Engine 1A, Supervisor Engine 2, Supervisor Engine 32, or Supervisor Engine 720
- **Forwarding mode and performance:** Uses the central CEF engine located on the supervisor engine to forward packets up to 15 Mpps per system in the interface module's base configuration
- **Distributed forwarding upgrade:** None; Classic interface modules cannot be upgraded for distributed forwarding
- **Optics:** Supports hot-pluggable gigabit interface converters (GBICs)

Table 5. Classic Gigabit Ethernet Optical Interface Modules

Product	Transceiver Type	Ports/Interface/ Connectors	Port Density/ Cisco Catalyst Chassis Model	Maximum Frame Size (Jumbo Frame) Support	Queues per Port (Tx = Transmit, Rx = Receive)*
WS-X6416-GBIC	GBIC	16 ports; 1000BASE-SX, -LX/LH, -ZX, -T; 1000BASE-CWDM, -DWDM; SC connecter	• 192 ports/6513 • 128 ports/6509	Up to 9216 bytes/frame	• Tx-1p2q2t • Rx-1p1q4t
WS-X6408A-GBIC	GBIC	8 ports; 1000BASE-SX, -LX/LH, -ZX, -T; 1000BASE-CWDM, -DWDM; SC connecter	• 96 ports/6513 • 64 ports/6509	Up to 9216 bytes/frame	• Tx-1p2q2t • Rx-1p1q4t

* **Queues Legend:** 1p3q1t = 1 priority queue, 3 round robin queues, 1 threshold

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Figure 7. Classic Gigabit Ethernet Optical Interface Module WS-X6416-GBIC



Interface Distances

Table 6 summarizes the interfaces and distances supported by all the Gigabit Ethernet modules in the Cisco Catalyst 6500 Series.

Table 6. Interfaces and Distances Supported by Gigabit Ethernet Modules in the Cisco Catalyst 6500 Series

Module	SFP/GBIC	Wavelength (nm)	Fiber/Cable Type	CoreSize (micron)	Model Bandwidth (MHz/km)	Cable Distance
WS-X6748-SFP **WS-X6724-SFP** **WS-X6816-GBIC** **WS-X6516A-GBIC** **WS-X6516-GBIC** **WS-X6416-GBIC** **WS-X6408A-GBIC**	1000BASE-SX	850	MMF	• 62.5 • 62.5 • 50.0 • 50.0	• 160 • 200 • 400 • 500	• 220m (722 ft) • 275m (902 ft) • 500m (1640 ft) • 550m (1804 ft)
WS-X6748-SFP **WS-X6724-SFP** **WS-X6816-GBIC** **WS-X6516A-GBIC** **WS-X6516-GBIC** **WS-X6416-GBIC** **WS-X6408A-GBIC**	1000BASE-LX/LH	1300	• MMF* • SMF	• 62.5 • 50.0 • 50.0 • 9/10	• 500 • 400 • 500 • –	• 550 m (1804 ft) • 550 m (1804 ft) • 550 m (1804 ft) • 10 km (32,810 ft)
WS-X6748-SFP **WS-X6724-SFP** **WS-X6816-GBIC** **WS-X6516A-GBIC** **WS-X6516-GBIC** **WS-X6416-GBIC** **WS-X6408A-GBIC**	1000BASE-ZX	1550	SMF	9/10	–	43.4 to 62 miles (70 to 100 km)**
WS-X6748-SFP **WS-X6724-SFP** **WS-X6816-GBIC** **WS-X6516A-GBIC** **WS-X6516-GBIC** **WS-X6416-GBIC** **WS-X6408A-GBIC**	1000BASE-T	–	Category 5	–	–	100 m (328 ft)

* Mode-conditioning patch is required. Using an ordinary patch cord with MMF, 1000BASE-LX/LH SFP/GBICs, and a short link distance (10s of meters) can cause transceiver saturation resulting in an elevated bit error rate (BER). In addition, when using the LX/LH SFP/GBIC with 62.5 micron diameter MMF, you must install a mode-conditioning patch cord between the SFP and the MMF cable on both the transmit and receive ends of the link. The mode-conditioning patch cord is required for link distances greater than 300 m (984 ft).
** 1000BASE-ZX-SFP can reach up to 100 km by using dispersion-shifted SMF or low attenuation SMF; the distance depends on fiber quality, number of splices and connectors.

For more information refer to Cisco GBICs and SFP datasheets.

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Ordering Information

Table 7. Catalyst 6500 Series Chassis Part Numbers

Product Number	Description
WS-X6748-SFP	48 port High Performance Mixed Media Gigabit Ethernet interface module, Requires SFP; CEF720
WS-X6724-SFP	24 port High Performance Mixed Media Gigabit Ethernet interface module, Requires SFP; CEF720
WS-F6700-DFC3BXL	Distributed Forwarding Card-3BXL Upgrade for WS-X67xx linecards using WS-SUP720-3BXL
WS-F6700-DFC3B	Distributed Forwarding Card-3B Upgrade for WS-X67xx linecards using WS-SUP720-3B
WS-F6700-DFC3A	Distributed Forwarding Card-3A Upgrade for WS-X67xx linecards using WS-SUP720
WS-X6816-GBIC	16 port dCEF256 Gigabit Ethernet interface module for the Cisco Catalyst 6500 Series switches with dual fabric channel interfaces and distributed forwarding; requires GBICs and distributed forwarding card
WS-X6516A-GBIC	16 port CEF256 Gigabit Ethernet interface module for the Cisco Catalyst 6500 Series switches with single fabric channel interface; requires GBICs; upgradeable to support distributed forwarding. Buffer Size of 1M per port
WS-X6516-GBIC	16 port CEF256 Gigabit Ethernet interface module for the Cisco Catalyst 6500 Series switches with single fabric channel interface; requires GBICs; upgradeable to support distributed forwarding. Buffer Size of 512K per port
WS-F6K-DFC3A	Distributed forwarding Card-3A for 65xx, 6816 Modules used with SUP720
WS-F6K-DFC	Distributed forwarding Card for 65xx, 6816 Modules used with SUP2
WS-X6416-GBIC	16 port Classic Gigabit Ethernet interface module for the Cisco Catalyst 6000 Series switches; requires GBICs
WS-X6408A-GBIC	8 port Classic Gigabit Ethernet interface module for the Cisco Catalyst 6000 Series switches with enhanced QoS; requires GBICs
GLC-SX-MM	1000BASE-SX SFP (multimode only) Dual LC connector
GLC-ZX-SM	1000BASE-ZX SFP (single mode only) Dual LC connector
GLC-LH-SM	1000BASE-LX SFP (single mode only) Dual LC connector
GLC-T	1000BASE-T SFP (copper twisted pair) RJ-45 connector
WS-G5487	1000BASE-ZX GBIC (single mode only)
WS-G5486	1000BASE-LX/LH GBIC (single mode or multimode)
WS-G5484	1000BASE-SX GBIC (multimode only)
WS-G5483=	1000BASE-T GBIC
CWDM-SFP-1470=*	Cisco CWDM SFP 1470 nm; Gigabit Ethernet and 1G/2G FC
CWDM-GBIC-1470=**	Cisco 1000BASE-CWDM GBIC 1470 nm
DWDM-GBIC-60.61***	1000BASE-DWDM 1560.61 Nm GBIC (100 GHz ITU grid)

* Also offered in 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm wavelengths. Specify desired wavelength by replacing 1470 with other wavelength, e.g. CWDM-SFP-1590= is the part number for the CWDM SFP module supporting 1590 nm wavelength.
** Also offered in 1490, 1510, 1530, 1550, 1570, 1590, 1610Nm wavelengths. Specify desired wavelength by replacing 1470 with other wavelength, e.g. CWDM-GBIC-1590= is the part number for the CWDM GBIC module supporting 1590Nm wavelength.
*** Also offered in a wide range of other wavelengths. Specify desired wavelength by replacing 60.61 with other wavelength, e.g. DWDM-GBIC-30.33 = is the part number for the DWDM GBIC module supporting 1530.33 Nm wavelength. See DWDM GBIC datasheet for additional information

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Specifications

Standard Protocols

- IEEE 802.1d, IEEE 802.1p, IEEE 802.1q, IEEE 802.1s, IEEE 802.1w, IEEE 802.3x, IEEE 802.3z, IEEE 802.3ab, and IEEE 802.3ad,
- 1000BASE-T, 1000BASE-X (GBIC), 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX, CWDM

Physical Specification

- Occupies one slot in the Cisco Catalyst 6500 Series chassis
- Dimensions (H x W x D): 1.2 x 14.4 x 16 in. (3.0 x 35.6 x 40.6 cm)

Environmental Conditions

- Operating temperature: 32 to 104°F (0 to 40°C)
- Storage temperature: –40 to 167°F (–40 to 75°C)
- Relative humidity: 10 to 90%, noncondensing
- Operating altitude: –60 to 4000 m
- Mean time between failures (MTBF): seven years for system configuration

Safety Compliance

Cisco Catalyst 6500 Series Gigabit Ethernet interface modules, when installed in a system, comply with the following compliance and safety standards:

- UL 1950
- CSA C22.2 No.950
- EN 60950
- EN 60825-1
- IEC 60950
- IEC 60825-1
- TS 001
- CE marking
- AS/NZS 3260
- 21CFR1040

EMC Compliance

Cisco Catalyst 6500 Series Gigabit Ethernet modules, when installed in a system, comply with the following EMI standards:

- FCC Part 15 (CFR 47) Class A
- VCCI
- EN55022
- EN55024
- CISPR 22
- CE marking
- AS/NZS 3548

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Network Management

- ETHERLIKE-MIB (RFC 1643)
- IF-MIB (RFC 1573)
- Bridge MIB (RFC 1493)
- CISCO-STACK-MIB
- CISCO-VTP-MIB
- CISCO-CDP-MIB
- RMON MIB (RFC 1757)
- CISCO-PAGP-MIB
- CISCO-STP-EXTENSIONS-MIB
- CISCO-VLAN-BRIDGE-MIB
- CISCO-VLAN-MEMBERSHIP-MIB
- ENTITY-MIB (RFC 2037)
- HC-RMON
- RFC1213-MIB (MIB-II)
- SMON-MIB

Maximum Station-to-Station Cabling Distance

- 1000BASE-SX: 62.5 um multimode fiber: up to 275 m
- 1000BASE-SX: 50 um multimode fiber: up to 550 m
- 1000BASE-LX: 62.5 um multimode fiber: up to 550 m
- 1000BASE-LX: 50 um multimode fiber: up to 550 m
- 1000BASE-LX: 9/10 um single-mode fiber: up to 5 km[1]
- 1000BASE-LH: 62.5 um multimode fiber: up to 550 m
- 1000BASE-LH: 50 um multimode fiber: up to 550 m
- 1000BASE-LH: 9/10 um single-mode fiber: up to 10 km
- 1000BASE-ZX: 9/10 um single-mode fiber: up to 70 km
- 1000BASE-ZX: disposition shifted fiber: up to 100 km
- 1000BASE-T: Category 5 cable: up to 100 m

Indicators and Interfaces

- Status: green (operational); red (faulty); orange (module booting or running diagnostics)
- Link good: green (port active); orange (disabled); off (not active or not connected); blinking orange (failed diagnostic and disabled)
- 1000BASE-SX: GBIC (female, multimode)
- 1000BASE-LX/LH: GBIC (female, multimode)
- 1000BASE-LX/LH: GBIC (female, single mode)
- 1000BASE-ZX: GBIC (female, single mode)
- 1000BASE-ZX: GBIC (female, dispersion shifted)

[1] Cisco 1000BASE-LX/LH interfaces fully comply with the IEEE 802.3z 1000BASE-LX standard. However, their higher quality allows them to reach 10 km over single-mode fiber versus the 5 km specified in the standard.

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

- 1000BASE-SX: MT-RJ (female, multimode)
- 1000BASE-T: RJ-45

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, see Cisco Technical Support Services or Cisco Advanced Services.

For More Information

For more information about the Cisco Catalyst 6500 Series Switch, contact your local account representative or visit http://www.cisco.com/en/US/products/hw/switches/ps708/index.html.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCDE, CCSI, CCENT, Cisco Eos, Cisco HealthPresence, the Cisco logo, Cisco Lumin, Cisco Nexus, Cisco Nurse Connect, Cisco Stackpower, Cisco StadiumVision, Cisco TelePresence, Cisco WebEx, DCE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn and Cisco Store are service marks; and Access Registrar, Aironet, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, iQuick Study, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0903R)

Printed in USA C78-441689-01 06/09

All contents are Copyright © 2007-2009 Cisco Systems, Inc. All rights reserved. This document is Cisco Public Information.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP