Data Sheet

Cisco Systems **GigaStack Gigabit Interface Converter**

The Cisco Systems GigaStack® Gigabit Interface Converter (GBIC) is a versatile, low-cost, Gigabit Ethernet stacking GBIC that offers high-speed interconnectivity between Catalyst® 3550, 2950G, 3500 XL and modular Catalyst 2900 XL Switches.

The GigaStack GBIC is implemented in a standard GBIC form, which offers customers the highest level of deployment flexibility and scalability—using available Gigabit Ethernet GBIC ports for high-performance stacking today while preserving the option to migrate to standard Gigabit Ethernet uplinks tomorrow.

Figure 1 The two-port GigaStack GBIC delivers high-speed interconnectivity for stacking connections

The GigaStack GBIC offers wiring closet deployment flexibility through its dual operating modes. It delivers a 1-Gbps forwarding rate in a half-duplex cascade configuration or up to 2-Gbps full-duplex connectivity in a dedicated, switch-to-switch configuration. The two-port GigaStack GBIC allows customers to deploy the GigaStack GBIC with various performance and cabling options. Customers can initially deploy the low-cost GigaStack GBIC to create a 1-Gbps independent stack backplane in a cascade configuration. At any point, customers may increase stack performance to 12 Gbps using the same GigaStack GBICs in combination with the high-performance Catalyst 3550-12G Gigabit Ethernet aggregation switch.

Half-Duplex Configuration Options

Using both ports of each GigaStack GBIC, users can implement a half-duplex cascade of up to nine switches. In this configuration, the GigaStack GBIC will create a half-duplex repeater bus external to the switch fabric of connected switches. This means that traffic bound from one switch to another will not traverse the switch fabric of intermediate switches. Support for nine switches in a single GigaStack stack offers significant wiring-closet port growth opportunities up to a maximum of 432 10/100 ports per stack.

Customers can choose to implement various stackwide physical redundancy options to provide the highest levels of resiliency. For example, users can choose to deploy a 1-meter redundant loopback cable and a second GigaStack GBIC in the top and bottom stack members. This will create a secondary failover connection in the rare case that a stack member or stack cable fails. Alternatively, users can choose to deploy a 1-meter redundant loopback cable attached to the unused GigaStack ports in the top and

bottom stack members. New switch cluster command management redundancy features enable the switches to achieve the highest levels of system resiliency.

Figure 2 illustrates a switch stack combined with the GigaStack GBIC half-duplex cascade feature. This configuration depicts a stack of Catalyst 3550 switches and is suitable for those who recognize the need for Gigabit Ethernet uplinks today. In this scenario, connection redundancy is ensured via the redundant loopback cable attached to the top and bottom switches in the stack.

Figure 2 Half-Duplex GigaStack Cascade Configuration

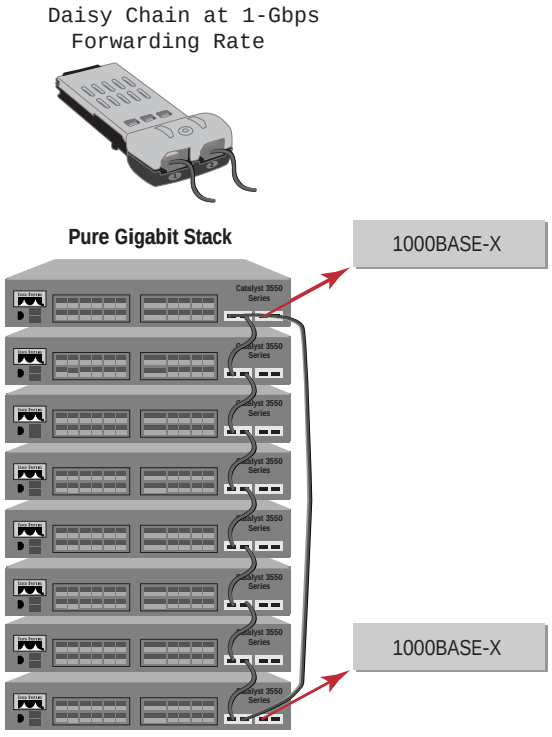
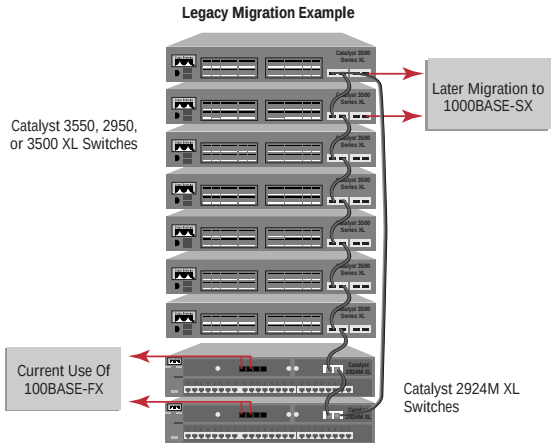


Figure 3 illustrates how the Catalyst 2912MF XL or Catalyst 2924M XL switch can be used in combination with Catalyst 3550, 2950G, or 3500 XL switches using the GigaStack GBIC half-duplex cascade feature. This configuration will provide the flexibility to implement a migration plan from legacy uplink connections to Gigabit Ethernet in the future. For example, each Catalyst 2924M XL switch may initially be used to support 100BASE-FX or ATM uplinks while still maintaining the full capabilities of Gigabit Ethernet stacking and compatibility with Cisco Switch Clustering Management. At any subsequent time, Catalyst 3550 or 2950G switches may be used to support a migration plan to Gigabit Ethernet fiber uplinks.

Figure 3 Half-Duplex GigaStack Cascade Configuration with Legacy Uplink Migration Flexibility



Full-Duplex Configuration Options

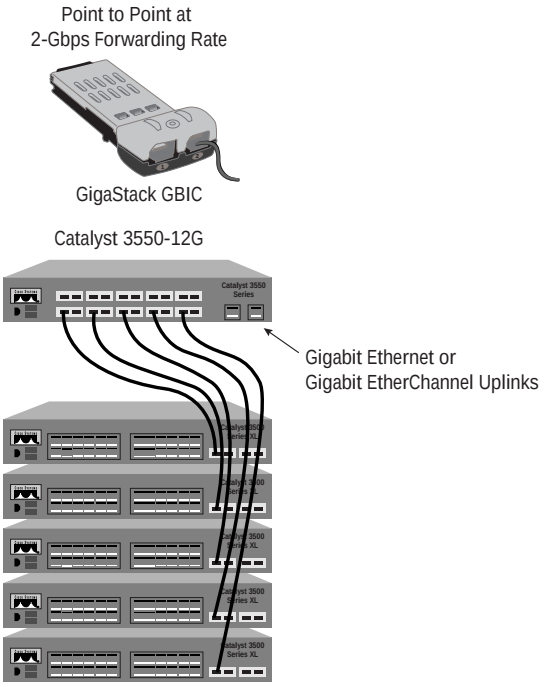
Customers can also use the GigaStack GBIC to create a low-cost dedicated Gigabit Ethernet connection between two stack members, providing a scalability option to increase overall stack bandwidth. When connecting two GigaStack GBICs with a single cable, the GBIC will autonegotiate to full-duplex and provide a 1-Gbps forwarding rate in each direction—or 2 Gbps. By simply changing the stack configuration from a cascade to a star configuration, customers can provide dedicated Gigabit Ethernet connectivity to each stack member. When combined with a Catalyst 3550-12G Gigabit Ethernet aggregation switch, this solution offers a very high-performance migration path. The Catalyst 3550-12G can provide stack aggregation with Gigabit Ethernet port connectivity.

Users can also choose to implement higher levels of resiliency in their full-duplex GigaStack configurations. High levels of redundancy can be implemented within the wiring closet stack and on the network core uplinks. Within the wiring closet, a second Catalyst 3550-12T or 3550-12G aggregation switch can be deployed with redundant links to each stack member. And, redundant uplinks can be deployed from the distribution layer to the network core. When deploying redundant gigabit uplinks, users can benefit from link failover times that are significantly shorter than standard Spanning Tree Protocols. By implementing the Cisco UplinkFast feature, failover can be minimized to as little as 1 to 2 seconds. In addition, the Cisco Per-VLAN Spanning Tree Plus (PVST+) feature can be deployed to ensure that all redundant uplinks perform load balancing. In other words, all redundant uplinks are active and carry traffic.

Users can achieve even higher levels of performance in their full-duplex stacks by configuring dual links from an aggregation switch to each stack member. The two Gigabit Ethernet ports on each Catalyst 3550 Series switch can be grouped together using Gigabit EtherChannel® technology to create a stack connection with a full-duplex 4-Gbps forwarding rate.

Figure 4 illustrates a switch stack configured with GigaStack GBICs operating in full-duplex mode. In this configuration, the Catalyst 3550-12G Gigabit Ethernet switch creates a high-performance option for switch aggregation using point-to-point links. Fault tolerance is implemented via a redundant Catalyst 3550-12G switch. High-speed uplinks from the Catalyst 3550-12G switch to the network core are provided via Gigabit EtherChannel technology.

Figure 4 Full-Duplex GigaStack Star Configuration



Full Compatibility with Cisco Switch Clustering Management Technology

Users can choose to deploy GigaStack GBIC stacking while benefiting from the powerful multidevice management technology available in Cisco Switch Clustering technology. Switch Clustering technology allows customers to manage a stack of devices within a wiring closet or a broadly dispersed set of devices across a campus as a single IP entity. Switch Clustering technology uses standard TCP/IP packets to distribute and collect management information for all switches in the cluster. Switch Clustering supports a broad range of physical interconnections, including the GigaStack GBIC.

Key Features and Benefits

- Delivers a hardware-based, independent stack bus with 1-Gbps forwarding bandwidth in a half-duplex, cascade configuration, or up to a 2-Gbps forwarding rate in a point-to-point, full-duplex configuration
- Allows up to nine switches to be interconnected in a half-duplex, cascade stack configuration, forming a highly scalable 1-Gbps independent stack bus
- When deployed in full-duplex in combination with a Catalyst 3550-12T or 3550-12G aggregation switch, provides a high-performance option for switch aggregation using point-to-point links
- Standard GBIC form factor provides customers unprecedented flexibility in installation and deployment
- Offers many redundancy and resiliency options to ensure network availability
- Delivers a hardware-based stacking solution to Catalyst 3550, 2950G, 3500 XL switches and gigabit-enabled Catalyst 2900 Series XL switches
- Full- and half-duplex autonegotiating automatically selects and optimizes bandwidth between interconnected switches

Technical Specifications

Performance

- 1 Gbps in half-duplex, cascade configuration;
  2 Gbps in point-to-point, full-duplex configuration

Supported Products

- Catalyst 3550 Series
- Catalyst 2950G Switches
- Catalyst 3500 Series XL
- Catalyst 2912MF XL
- Catalyst 2924M XL

Standards

- IEEE 802.3z, IEEE 802.3x 1000BASE-X half/full-duplex specification

Y2K

- Y2K compliant

Connectors and Cabling

- Switch connection: GBIC-compliant connector
- Stacking connection: copper-based Cisco GigaStack cabling

Indicators

- Link integrity, disabled, activity, speed, and full-duplex indications

Dimensions and Weight (H x W x D)

- 0.75 x 1.54 x 3.50 in. (1.90 x 3.91 x 8.89 cm)
- 1.8 oz (56 grams)

Environmental Conditions and Power Requirements

- Operating temperature: 32 to 113 F (0 to 45 C)
- Storage temperature: –13 to 158 F (–25 to 70 C)
- Operating relative humidity: 10 to 85% noncondensing
- Operating altitude: up to 10,000 ft (3000 m)
- Power consumption: 2W maximum; 6.8 BTU per hour
- MTBF 4.4 million hours

Safety Certifications

- UL 1950
- CSA 22.2 No. 950
- EN 60950
- IEC 950
- AS/NZS 3260, TS001
- CE

Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- EN 55022B Class A (CISPR 22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A
- BCIQ
- CE Marking

Warranty

- Lifetime limited warranty

Ordering Information

- Model Number: WS-X3500-XL (Cisco GigaStack GBIC and 50 centimeter cable for GigaStack GBIC)
- Cable: CAB-GS-1M (1 meter cable for GigaStack GBIC)

For More Information on Cisco Products, Contact:

- U.S. and Canada: 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: http://www.cisco.com

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

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