Cisco Gigabit Ethernet High-Speed WAN Interface Card

Overview

Q. What is a Cisco® High-Speed WAN Interface Card (HWIC)?

A. The Cisco High-Speed WAN Interface Card (HWIC) is an updated and enhanced version of the current WIC for Cisco 2600 and 3700 series chassis. The HWIC offers greater speeds and higher port density than the current WIC. It also has a third row of pins for increased power to the cards, as well as support for both Power over Ethernet (PoE) and inline power based on Cisco Systems® technology. HWICs are available in single-wide and double-wide form factors.

Q. What is the HWIC-1GE-SFP?

A. The HWIC-1GE-SFP is a single-wide HWIC with one Small Form-Factor Pluggable (SFP) slot. The SFP slot can be populated with Cisco copper and optical Gigabit Ethernet SFPs to provide 1-port Gigabit Ethernet connectivity on all Cisco Integrated Services Routers. The HWIC does not come with any default SFP; it must be ordered separately. For a list of SFPs supported, please refer to Table 1.

Q. Which platforms are supported?

A. Please refer to the module datasheet at http://www.cisco.com/en/US/prod/collateral/routers/ps5854/prod_qas0900aecd80169bf0.html

Q. Is the HWIC-1GE-SFP supported on Cisco 1700, 2600, 3600, and 3700 series routers?

A. No. The HWIC-1GE-SFP is not supported on Cisco 1700, 2600, 3600, and 3700 series routers. The WIC slots on Cisco 1700, 2600, 3600, and 3700 cannot accommodate HWICs because the HWIC connector is different from that of a WIC.

Q. Are there differences between the on-board Gigabit Ethernet ports and the HWIC-1GE-SFP?

A. The feature set of the on-board Gigabit Ethernet ports and the HWIC-1GE-SFP is the same, except that Cisco EtherChannel® is not supported on the on-board Gigabit Ethernet interfaces.

Q. Is the Gigabit Ethernet Network Module (NM-1GE) also supported in Cisco 2800 and 3800 series integrated service routers?

A. The NM-1GE is only supported on Cisco 3800 series routers.

Q. Is online insertion and removal (OIR) supported for modules in the HWIC slots?

A. No. OIR of modules in the HWIC slots is not supported.

Q. Which Cisco IOS® Software Release and feature set is required?

A. Cisco IOS Software Release 12.3(8)T4 is required.

Q. What is the maximum throughput on the Gigabit Ethernet HWIC?

A. The HWIC bus interface is limited to 400 Mbps of full duplex. The actual throughput of the Gigabit Ethernet HWIC is limited by the throughput of individual platforms. Under bidirectional traffic of 1518 bytes or larger, the Gigabit Ethernet HWIC can support up to an aggregate of 350 Mbps on Cisco 2811 and 2821 routers, 400 Mbps on Cisco 2851 routers, and 500 Mbps on Cisco 3800 Series platforms.

Q. How many HWIC-1GE-SFPs are supported per chassis?

A. Please refer to the module datasheet at http://www.cisco.com/en/US/prod/collateral/routers/ps5854/prod_qas0900aecd80169bf0.html

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Q. Which SFPs are supported on the HWIC-1GE-SFP?

A. Only SFPs certified by Cisco are supported on the HWIC-1GE-SFP. Table 1 shows a list of all supported Cisco SFPs. SFPs from other vendors will not be enabled. A syslog message like the following reports that a nonsupported SFP is inserted.

```
%HWIC_1GE_SFP-3-VN_DATA_CRC_ERROR: SFP in interface Gi0/2/0 has bad crc
%HWIC_1GE_SFP-6-SFP_IN: Interface GigabitEthernet0/2/0 unknown SFP has been inserted
```

Table 1. SFP Part Numbers and Descriptions

Product Number	Description
GLC-T=	1000BASE-T SFP
GLC-LH-SM=	Gigabit Ethernet SFP, LC connector, LX/LH transceiver
GLC-SX-MM=	Gigabit Ethernet SFP, LC connector, SX transceiver
GLC-ZX-SM=	1000BASE-ZX SFP
CWDM-SFP-1470=	Coarse Wavelength Division Multiplexing (CWDM) 1470 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1490=	CWDM 1490 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1510=	CWDM 1510 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1530=	CWDM 1530 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1550=	CWDM 1550 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1570=	CWDM 1570 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1590=	CWDM 1590 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel
CWDM-SFP-1610=	CWDM 1610 NM SFP Gigabit Ethernet and 1G/2G Fibre Channel

Q. What is the maximum distance supported?

A. The cable distance depends on the medium and cables used. Please refer to Table 2.

Table 2. SFP Distances Supported

SFP	Wavelength	Maximum Distance
GLC-T	N/A	100 m: Category 5, 5e, or 6 unshielded twisted pair (UTP)
GLC-SX-MM	850 nm	275 m: 62.5 µm multimode fiber (MMF) 550 m: 50 µm MMF
GLC-LH-SM	1310 nm	550 m: 50 / 62.5 µm MMF 10 km: 9 / 10 µm single-mode fiber (SMF)
GLC-ZX-SM	1550 nm	70 km: 9 / 10 µm SMF 100 km: 8 µm disperson shifted fiber
CWDM	1470 to 1610 nm (as specified by the part)	100 km: 9/125 µm SMF

Q. Is OIR supported on the SFP module slot?

A. Yes. OIR is supported on the SFP module slot. When the SFP is inserted and removed when the system is operational, a syslog message like the following is generated.

```
%HWIC_1GE_SFP-6-SFP_IN: Interface GigabitEthernet0/2/0 1000BaseT SFP has been inserted
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2/0, changed state to
up
%HWIC_1GE_SFP-6-SFP_OUT: Interface GigabitEthernet0/2/0 SFP has been removed
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2/0, changed state to
down
```

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Features

Q. Are jumbo frames supported?

A. Yes. The maximum transmission unit (MTU) is user-configurable and can be set from 64 to 9576 bytes. The MTU specifies the size of the Ethernet packet payload, excluding the Ethernet header.

Q. Is Cisco EtherChannel supported?

A. Yes. Cisco EtherChannel is supported for link redundancy, and can only be set up manually. Negotiation protocols such as Link Aggregation Control Protocol (LACP) (802.ad) and Port Aggregation Protocol (PAgP) are not supported.

Q. Is flow control supported?

A. Yes. The HWIC supports 802.3x PAUSE frames operation for transmit and receive control.

Q. What trunking protocols are supported?

A. Only 802.1Q is supported. Inter-Switch Link (ISL) is not supported; it is proprietary to Cisco and is not commonly deployed.

Q. What modes of loopback are supported?

A. Gigabit Ethernet HWIC supports loopback at the transceiver level and the MAC controller level.

```
Router(config-if)#loopback ?
driver Loopback at the transceiver level
mac Loopback at the MAC controller level
<cr>
```

Q. Does HWIC-1GE-SFP support 10/100BASE-T by using 1000BASE-T SFPs?

A. No. HWIC-1GE-SFP only supports 1000 Mbps in full duplex. "Speed" or "duplex" commands are not supported under the interface.

Application

Q. What are possible applications of the HWIC-1GE-SFP?

A. The HWIC-1GE-SFP is intended for:

- Low-cost, high-speed, and long-distance connectivity for all Cisco Integrated Services routers into metropolitan backbones
- Gigabit Ethernet uplink for WAN gateways as an upgrade from Fast Ethernet
- Access link between customer premises equipment (CPE) and service provider POPs; this will target metro-area applications where Gigabit Ethernet-based services are available from service providers.
- VLAN access trunk supporting multiple customers and multiple VLANs from the same CPE
- High-speed short- or long-distance connectivity in the wiring closet or in the same building
- Interoffice connectivity to avoid expensive leased lines

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Printed in USA C67-562711-00 10/09

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