

## Cisco Gigabit Ethernet High-Speed WAN Interface Card

The Cisco® Gigabit Ethernet High-Speed WAN Interface Card (HWIC) brings Gigabit Ethernet connectivity to Cisco Integrated Services Routers routers to accelerate applications such as Metro Ethernet access, inter-VLAN routing, and high-speed connectivity to LAN switches.

### Overview

The single-port Cisco Gigabit Ethernet HWIC provides Gigabit Ethernet optical and copper connectivity in a compact form factor for all Cisco Integrated Service Routers (ISRs).

The Gigabit Ethernet HWIC enables branch offices to cost-effectively use high-speed uplinks in numerous environments (Figure 1). The enhanced performance of Gigabit Ethernet in Cisco ISRs to enable new applications and services, as well as provide greater capacity for existing inter-VLAN routing and bridging capabilities. Additionally, branch offices can now connect to metropolitan-area networks (MANs).

**Note:** The HWIC provides Gigabit Ethernet connectivity but will not support line rate since the throughput is limited by the platforms.

For flexibility, the HWIC includes one Small Form-Factor Pluggable (SFP) slot to carry any Cisco copper or optical SFP (Table 1), allowing customers to use different SFPs for special distance, cost, existing infrastructure, and future expansion requirements.

Cisco IOS® Software provides enhanced capabilities such as quality of service (QoS), Multiprotocol Label Switching (MPLS), IP Security (IPSec), and Layer 3 VPNs. Since this is a true routed port card, the user can configure an IP address directly on the HWIC-1GE-SFP interface and does not have to configure the port for VLAN trunking as is done in Switched Virtual Interface (SVI) configurations.

**Figure 1.** Cisco Gigabit Ethernet HWIC



## Product Summary

**Table 1.** Cisco Gigabit Ethernet HWIC Product Part Numbers and Descriptions

| Part Number  | Product Description                                       |
|--|---|
| HWIC-1GE-SFP   | Gigabit Ethernet HWIC with One SFP Slot                   |
| <b>SFPs</b>  |   |
| 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   |
| <b>Coarse Wavelength Division Multiplexing (CWDM) SFPs</b> |   |
| CWDM-SFP-1470=   | 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 |

## Features

### Ethernet and VLAN Features

- IEEE802.3 with IEEE802.2 Service Advertising Protocol (SAP)
- IEEE802.3 with IEEE802.2 and Subnetwork Access Protocol (SNAP)
- IEEE 802.1Q VLAN tagging
- Flow control (802.3x)
- Gigabit EtherChannel<sup>®</sup> for link redundancy

### Network Management Features

- CiscoWorks
- Simple Network Management Protocol (SNMP) support
- Remote Monitoring (RMON) support
- Cisco NetFlow accounting

### QoS Features

- Weighted Random Early Detection (WRED)
- Precedence setting and mapping (802.1p)
- Committed access rate (CAR)
- Access control lists (ACLs)
- MAC address filtering
- Extended ACLs
- Voice and remaining QoS features, per platform and per Cisco IOS Software release

### Additional Features

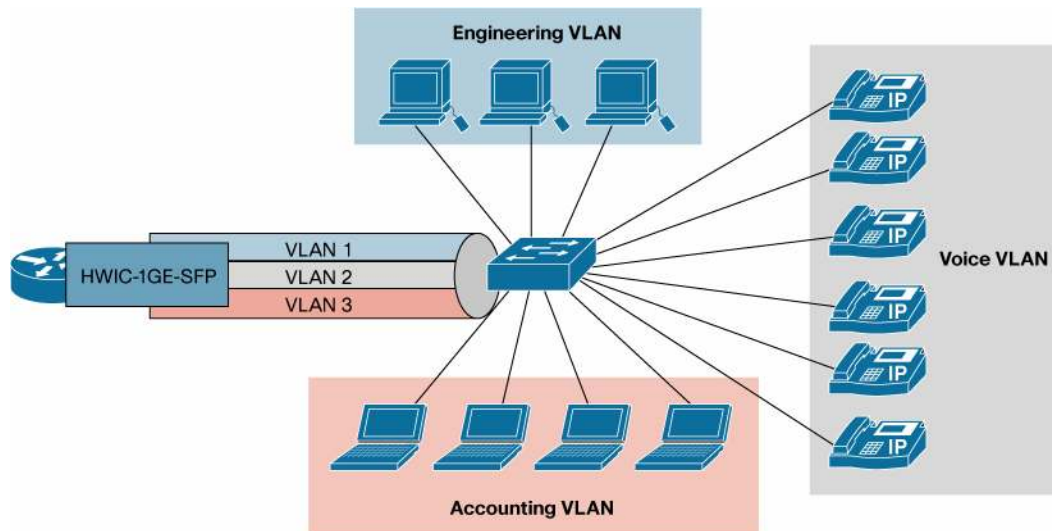
- Jumbo frame support up to 9576 bytes
- Cisco Group Management Protocol and Internet Group Management Protocol (IGMP) for multicasting
- High availability, supporting Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), and Gateway Load Balancing Protocol (GLBP)
- Hot insertion and removal for SFPs on all platforms
- Media or SFP type display through a command-line interface (CLI)

### Gigabit Ethernet Applications

#### Gigabit Ethernet in the Branch Office

In a branch office, the Cisco Gigabit Ethernet HWIC provides a high-speed uplink. Figure 2 shows the HWIC being used to bridge non-routable protocols, while providing Layer 3 connectivity. The HWIC is also useful in situations that require IEEE 802.1q inter-VLAN routing and in any LAN requiring fiber connectivity.

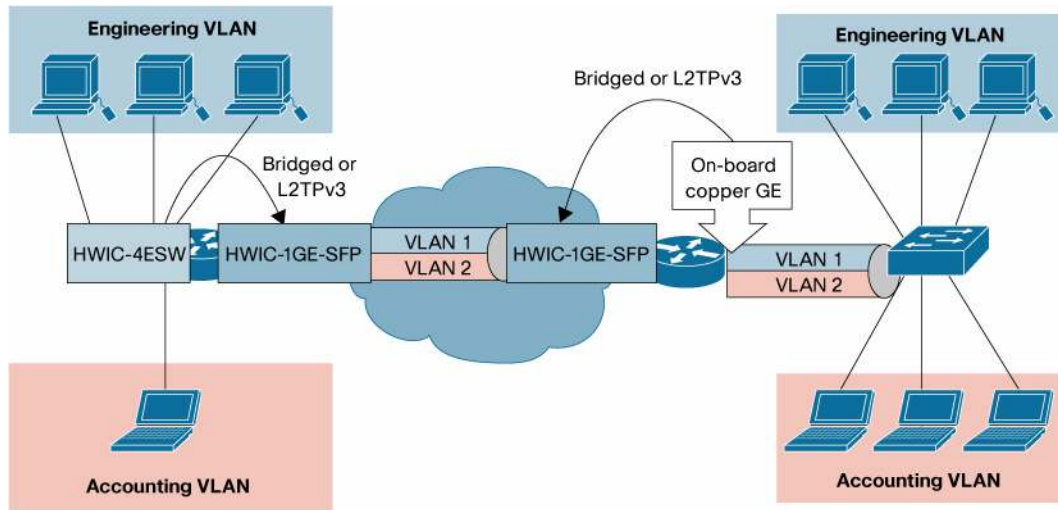
**Figure 2.** VLAN Trunking Application



#### Gigabit Ethernet in MANs

Figure 3 shows the Cisco Gigabit Ethernet HWIC used to connect Layer 3 VPNs over a MAN. Cisco IOS Software enables QoS applications such as traffic shaping and Network-Based Application Recognition (NBAR). As with VLAN trunking, this is ideal for situations in which fiber connectivity is desirable.

**Figure 3.** Metro Ethernet Application



**Specifications**

**Software Support**

Table 2 gives the Cisco IOS Software requirements for the Cisco Gigabit Ethernet HWIC, and Table 3 lists the platforms supported.

**Table 2.** Minimum Cisco IOS Software Requirements for Cisco Gigabit Ethernet HWIC

| Supported Platforms | Minimum Software Image | Minimum Software Package |
|---------------------|------------------------|--------------------------|
| Cisco 1941          | 15.0(1)M               | IP Base                  |
| Cisco 1941W         | 15.0(1)M               | IP Base                  |
| Cisco 2901          | 15.0(1)M               | IP Base                  |
| Cisco 2911          | 15.0(1)M               | IP Base                  |
| Cisco 2921          | 15.0(1)M               | IP Base                  |
| Cisco 2951          | 15.0(1)M               | IP Base                  |
| Cisco 3925          | 15.0(1)M               | IP Base                  |
| Cisco 3945          | 15.0(1)M               | IP Base                  |
| Cisco 1841          | 12.4(15)T9             | IP Base                  |
| Cisco 1861          | 12.4(20)T3             | IP Base                  |
| Cisco 2801          | 12.4(15)T9             | IP Base                  |
| Cisco 2811          | 12.3(8)T4              | IP Base                  |
| Cisco 2821          | 12.3(8)T4              | IP Base                  |
| Cisco 2851          | 12.3(8)T4              | IP Base                  |
| Cisco 3825          | 12.3(8)T4              | IP Base                  |
| Cisco 3845          | 12.3(8)T4              | IP Base                  |

**Table 3.** Cisco Gigabit Ethernet HWIC Support Comparison

| Supported Platforms | Number of Modules Supported |
|---------------------|-----------------------------|
| Cisco 1941          | 1                           |
| Cisco 1941W         | 1                           |
| Cisco 2901          | 1                           |
| Cisco 2911          | 1                           |

|            |   |
|------------|---|
| Cisco 2921 | 1 |
| Cisco 2951 | 1 |
| Cisco 3925 | 2 |
| Cisco 3945 | 2 |
| Cisco 1841 | 1 |
| Cisco 1861 | 1 |
| Cisco 2801 | 1 |
| Cisco 2811 | 1 |
| Cisco 2821 | 1 |
| Cisco 2851 | 1 |
| Cisco 3825 | 2 |
| Cisco 3845 | 2 |

### Minimum Memory Requirements

For information regarding memory requirements, please refer to the hardware-software compatibility matrix or the Cisco IOS Software release notes.

### Ethernet Specifications

- IEEE 802.3 with 802.2 SAP
- IEEE 802.3 with 802.2 and SNAP
- IEEE 802.1p
- IEEE 802.1q VLAN
- Gigabit Ethernet IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab

### Agency Approvals

- UL 1950 (United States)
- CSA-C22.2 #950 (Canada)
- EN60950 (Europe)
- TUV GS (Germany)
- IEC 950 (International)

### Immunity

- EN300386
- EN55024/CISPR24
- EN50082-1

### Emissions

- FCC Part 15 Class A
- ICES-003 Class A
- EN55022 Class A
- CISPR22 Class A
- AS/NZS 3548 Class A
- VCCI Class A
- EN 300386

- EN61000-3-3
- EN61000-3-2

### Physical Specifications

- Single-wide HWIC, no slot restrictions
- Dimensions (H x W x D) 0.8 x 3.1 x 4.8 in. (2.1 x 7.9 x 12.2 cm)

### Environmental Specifications

- Operating temperature: 32 to 104°F (0 to 40°C)
- Storage temperature: -4 to 149°F (-20 to 65°C)
- Relative humidity: 10 to 90 percent, non-condensing

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