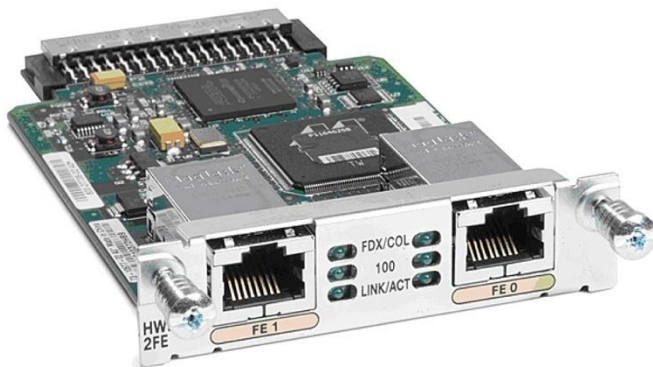


## 1- and 2-Port Fast Ethernet High-Speed WIC for Cisco Integrated Services Routers

The Layer 3 Cisco® 1- and 2-Port Fast Ethernet High-Speed WAN interface cards (HWICs) (see Figures 1 and 2) supported on Cisco Integrated Services Routers offer small-to-large-sized businesses and enterprise branch-office customers the option to add Layer 3 routed ports with many advanced features, including quality-of-service (QoS) and rate-limiting capabilities.

**Figure 1.** Cisco 2-Port Fast Ethernet Layer 3 HWIC for Cisco Integrated Services Routers



**Figure 2.** Cisco 1-Port Fast Ethernet Layer 3 HWIC for Integrated Services Routers

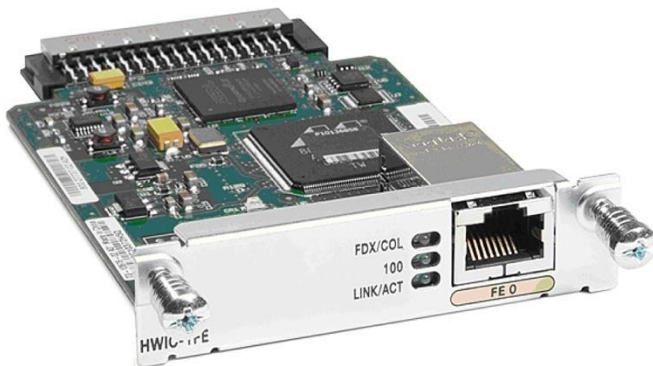


Table 1 provides router support information for the HWIC cards.

**Table 1.** Platform Support

Router Chassis	Maximum Number of 1 Port HWICs	Maximum Number of 2 Port HWICs
Cisco 1921	1	1
Cisco 1941	2	1
Cisco 1941W	2	1
Cisco 2901	2	2
Cisco 2911	2	2
Cisco 2921	2	2
Cisco 2951	2	2
Cisco 3925	4	4
Cisco 3945	4	4
Cisco 3925E	3	3
Cisco 3945E	3	3
Cisco 1841	1	1
Cisco 2801	2	1
Cisco 2811	2	1
Cisco 2821	2	1
Cisco 2851	2	1
Cisco 3825	4	2
Cisco 3845	4	4

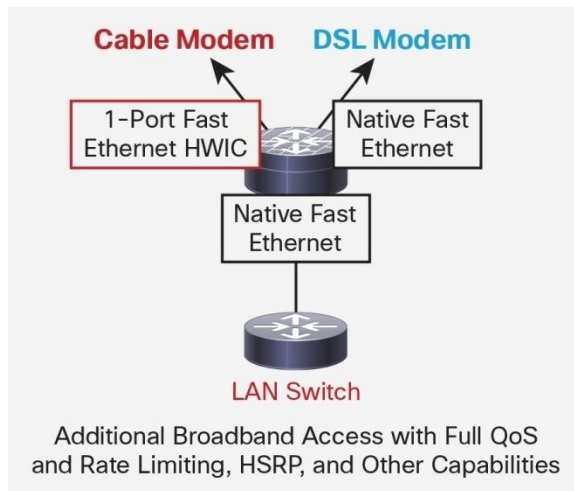
Table 1A provides relevant software information

Router Chassis	Software Release	Minimum Software Package
Cisco 1921	15.0(1)M2	IP Base
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 3925E	15.1(1)T2	IP Base
Cisco 3945E	15.1(1)T2	IP Base
Cisco 1841	12.4(20)T	IP Base
Cisco 1861	12.4(20)T	IP Base
Cisco 2801	12.4(20)T	IP Base
Cisco 2811	12.4(20)T	IP Base
Cisco 2821	12.4(20)T	IP Base
Cisco 2851	12.4(24)T	IP Base
Cisco 3825	12.4(20)T	IP Base
Cisco 3845	12.4(20)T	IP Base

## Applications

The new HWICs provide additional Layer 3 routed ports with features equivalent to those on the motherboard of the integrated services routers. These Fast Ethernet interfaces can be used for physical LAN segregation, creation of a demilitarized zone (DMZ), or as a WAN interface. Broadband customers can use them to connect to an alternate provider that delivers service on an Ethernet port.

**Figure 3.** The Fast Ethernet HWIC Enables Branch Offices to Cost-Effectively Use High-Speed Broadband Uplinks in Numerous Environments



In a branch office, the Cisco 1-Port Fast Ethernet HWIC provides a high-speed broadband uplink (Figure 4).

**Figure 4.** Broadband Access with Additional Layer 3-Port Fast Ethernet HWIC

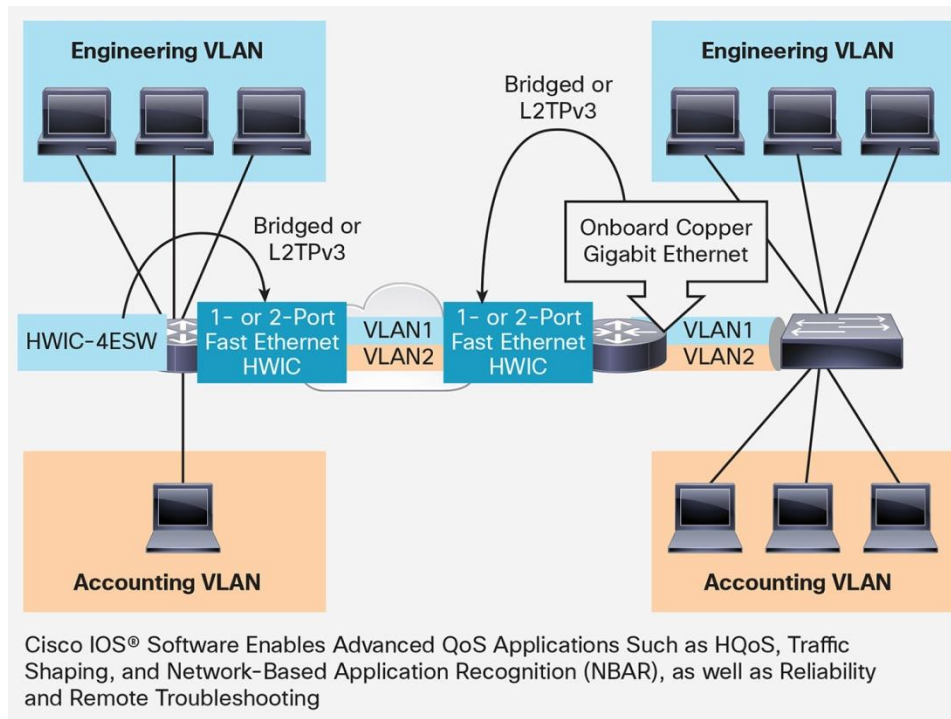
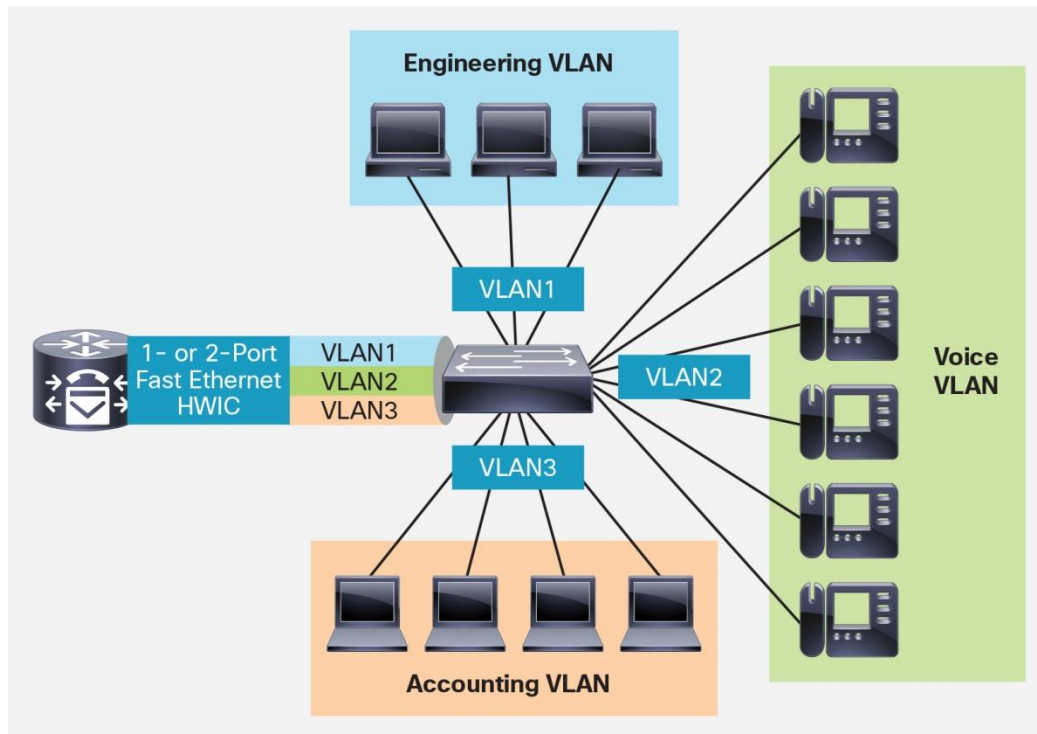


Figure 5 shows the HWIC being used to bridge non-routable protocols while providing Layer 3 connectivity. The HWIC is also useful in situations that require IEEE 802.1q inter-VLAN.

**Figure 5.** VLAN Trunking Application-LAN Segmentation with Layer 3 Fast Ethernet Switch HWIC



## Summary

The Cisco Fast Ethernet HWICs are singlewide interface cards, available as a 1-port HWIC (HWIC-1FE) and as a 2-port HWIC (HWIC-2FE), that provide Cisco modular and integrated services routers with additional Layer 3 routed ports.

## Specifications

### Feature Highlights

The Fast Ethernet routed ports on the HWICs have the same characteristics and features as the onboard LAN interfaces for the integrated-services-router platforms. Along with Layer 3 connectivity, such as per-port access control lists (ACLs), routing, and IP addressing, these HWICs provide functions equivalent to those of onboard Fast Ethernet routed ports. The following is a partial list of features supported in Cisco IOS<sup>®</sup> Software for the Fast Ethernet HWICs.

### 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
- Autosensing, autonegotiation, and automatic media-dependent interface crossover
- (Auto-MDIX)

- 
- Unique MAC address (not shared with any other interface on the router), assigned MAC address to interface, and subinterfaces
  - Network Management Features
  - CiscoWorks
  - Simple Network Management Protocol (SNMP) support
  - Cisco NetFlow accounting

#### **QoS Features**

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

#### **Additional Features**

- 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)
- MPLS features as supported by platform
- Generic routing encapsulation (GRE)
- IPv6
- IP Security (IPsec) (crypto map)
- Layer 2 Tunneling Protocol Version 3 (L2TPv3) tunnel termination
- Dynamic Host Configuration Protocol (DHCP) client and server
- Network Address Translation (NAT)
- Generic Traffic Shaping (GTS)
- Media Gateway Control Protocol (MGCP) bind
- IBM features
- Point-to-Point Protocol over Ethernet (PPPoE) client
- Bridging

#### **MIBs Supported by the HWIC-1FE and HWIC-2FE**

- ENTITY-MIB
- IF-MIB
- OLD-CISCO-CHASSIS-MIB
- RMON-MIB
- ETHERLIKE-MIB

- CISCO-ENT-ASSET-MIB
- CISCO-ENTITY-FRU-CONTROL-MIB

**Note:** These two HWIC modules do not support Jumbo Frames.

#### **Agency Approvals**

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

#### **Immunity**

- EN300386
- EN55024 and CISPR24
- EN50082-1

#### **Emissions**

- FCC Part 15
- Class A ICES-003
- Class AEN55022
- Class A CISPR22
- Class AAS and NZS 3548
- Class AVCCI
- Class A EN 300386 EN61000-3-3 EN61000-3-2

#### **Physical Specifications**

##### **Form Factor**

- Singlewide HWIC form factor

##### **Dimensions (W x D x H)**

- 3.08 x 4.74 x 0.76 in.

##### **Weight**

- 1-Port: 0.14 lbs or 2.24 oz.
- 2-Port: 0.16 lbs or 2.56 oz.

##### **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%, noncondensing

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