

Overview of Cisco WAN and Voice Interface Cards

This chapter provides an overview of Cisco WAN and voice interface cards used in Cisco modular routers, and includes these sections:

- Cisco 3600 Series Routers on page 1-1
- Cisco 2600 Series Routers on page 1-10
- Cisco 1720 Router on page 1-15
- Cisco 1600 Series Routers on page 1-17
- Safety and Regulatory Compliance Information on page 1-19

Cisco 3600 Series Routers

The Cisco 3600 series is a multifunction, modular platform that combines dial access, routing, LAN-to-LAN services, and multiservice integration of voice, video, and data in the same device. The Cisco 3600 series includes the Cisco 3660 (see Figure 1-1), Cisco 3640 (see Figure 1-2), and Cisco 3620 routers (see Figure 1-3).

The Cisco 3660 has six network module slots, the Cisco 3640 has four slots, and the Cisco 3620 has two slots. Each network module slot accepts a variety of network module interface cards, supporting a variety of LAN and WAN technologies.

Figure 1-1 Cisco 3660 Router Rear View

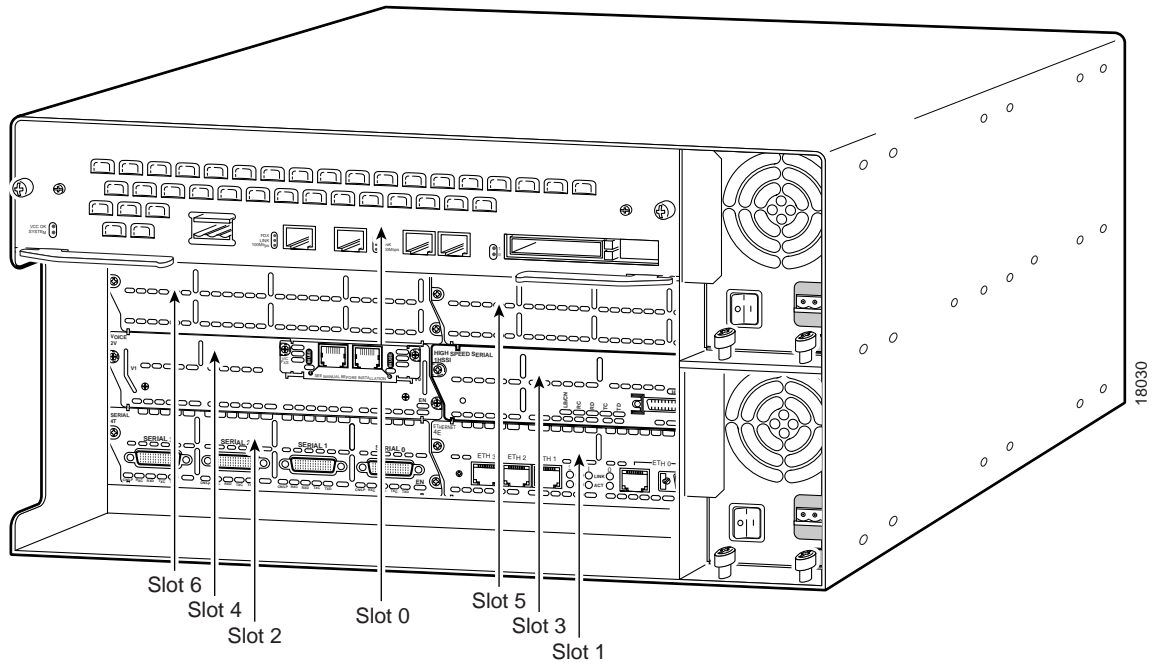


Figure 1-2 Cisco 3640 Router Rear View

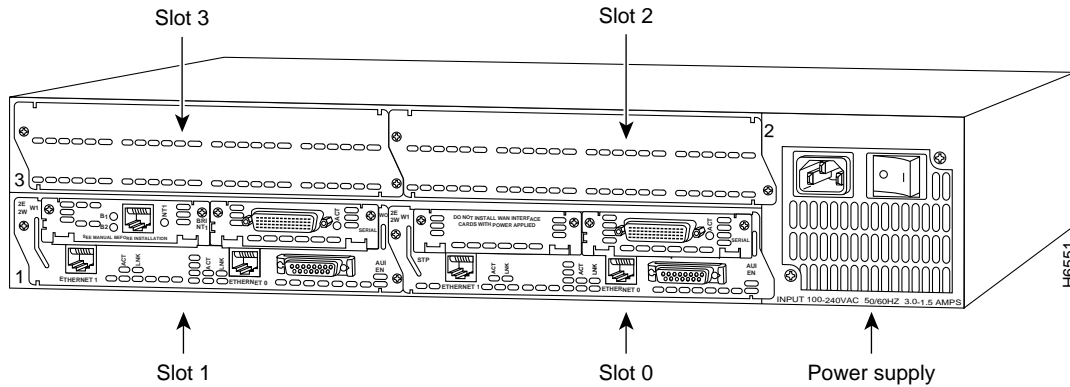
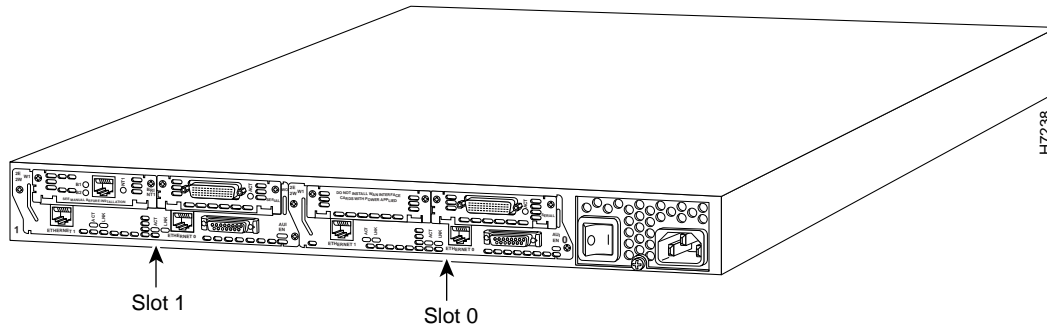


Figure 1-3 Cisco 3620 Router Rear View



Cisco 3600 Series Interface Numbering

Each individual network interface on a Cisco 3600 series router is identified by a slot number and a unit number.

Slot Numbering

The Cisco 3600 series router chassis contains two, four, or six slots in which you can install modules. You can install any module into any available slot in the chassis.

For the Cisco 3660 router (see Figure 1-1), the slots are numbered as follows:

- Slot 0 contains fixed Fast Ethernet ports and is located at the top of the chassis.
- Slot 1 is at the bottom right (as viewed from the rear of the chassis), near the power supply.
- Slot 2 is at the bottom left.
- Slot 3 is at the right, above slot 1.
- Slot 4 is at the left, above slot 2
- Slot 5 is at the right, above slot 3.
- Slot 6 is at the left, above slot 4.

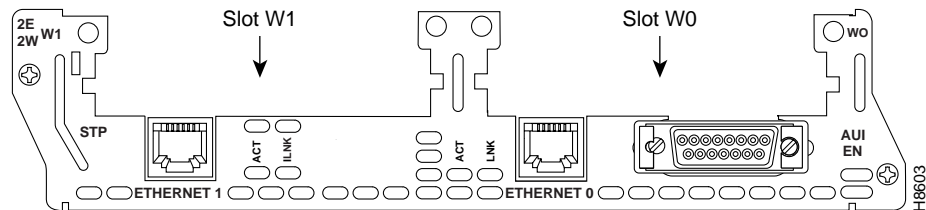
For the Cisco 3620 and Cisco 3640 routers shown in Figure 1-2 and Figure 1-3, the slots are numbered as follows:

- Slot 0 is at the bottom right (as viewed from the rear of the chassis), near the power supply.
- Slot 1 is at the bottom left.
- Slot 2 is at the top right, above slot 0.
- Slot 3 is at the top left, above slot 1.

Some modules have two small slots, labeled W0 and W1, for WAN interface cards.

Figure 1-4 shows the W0 and W1 slots of the 2 Ethernet 2 WAN card slot (2E 2-slot) module. You can install WAN interface cards into the small module slots (W0 and W1). Serial WAN interface cards can be installed into either slot, W0 or W1.

Figure 1-4 WAN Interface Card Slots



Unit Numbering

Cisco 3600 series routers have unit numbers that identify the interfaces on the modules and WAN interface cards installed in the router. Unit numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top. Modules and WAN interface cards are identified by interface type, slot number, followed by a forward slash (/), and then the unit number; for example, Ethernet 0/0.

Note In the Cisco 3660 router, the fixed Fast Ethernet ports are located in chassis slot 0, and are identified by:

interface type chassis slot/ unit number

For example: Fast Ethernet 0/0

Figure 1-5 shows a router with a 2E 2-slot module in slots 0 and 1. Two serial WAN interface cards are installed in the module in slot 0. One serial and one ISDN BRI WAN interface card are installed in the module in slot 1.

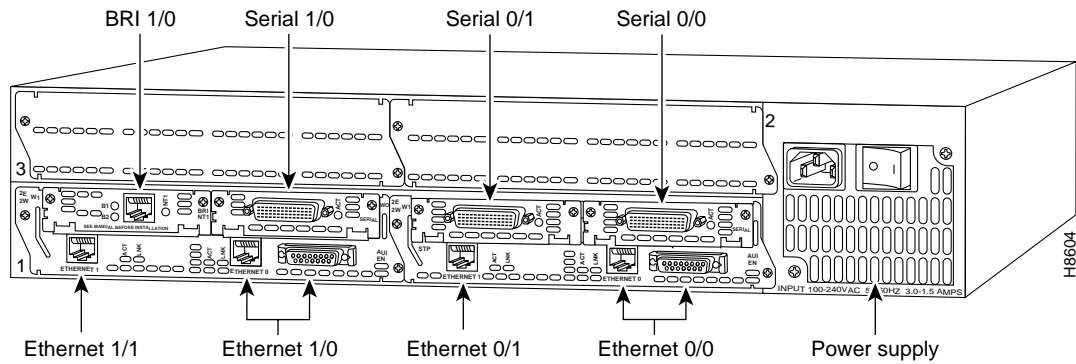
As shown in Figure 1-5, the unit numbers are as follows:

- Slot 0, Ethernet interface 0, referred to as Ethernet 0/0
- Slot 0, Ethernet interface 1, referred to as Ethernet 0/1
- Slot 0, serial interface 0, referred to as serial 0/0

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- Slot 0, serial interface 1, referred to as serial 0/1
- Slot 1, Ethernet interface 0, referred to as Ethernet 1/0
- Slot 1, Ethernet interface 1, referred to as Ethernet 1/1
- Slot 1, serial interface 0, referred to as serial 1/0
- Slot 1, BRI interface 0, referred to as BRI 1/0

Figure 1-5 Cisco 3600 Series Unit Numbers



Voice Interface Numbering in Cisco 3600 Series Routers

Voice interfaces are numbered differently from WAN interfaces described in the previous section, “Unit Numbering.” Voice interfaces are numbered as follows:

interface type chassis slot/voice module slot/voice interface

If you have a four-channel voice network module installed in slot 1 of your router, the voice interfaces will be:

- Slot 1, voice network module slot 0, voice interface 0, referred to as voice 1/0/0 (closest to chassis slot 0)
- Slot 1, voice network module slot 0, voice interface 1, referred to as voice 1/0/1
- Slot 1, voice network module slot 1, voice interface 0, referred to as voice 1/1/0
- Slot 1, voice network module slot 1, voice interface 1, referred to as voice 1/1/1 (farthest from chassis slot 0)

WAN and Voice Interface Card Options for Cisco 3600 Series Routers

Table 1-1 lists the WAN and voice interface card options available for Cisco 3600 series routers with their minimum software requirements for supported Cisco IOS releases.

Note Voice interface cards can only be used in voice network modules (NM-1V, NM-2V, and NM-HDV).

Cisco 3600 Series Routers

Table 1-1 WAN and Voice Interface Card Options with Cisco IOS Releases for Cisco 3600 Series Routers

WAN Interface Card	Cisco IOS Release 11.1	Cisco IOS Release 11.2	Cisco IOS Release 11.3	Cisco IOS Release 11.3T	Cisco IOS Release 12.0	Cisco IOS Release 12.0T
1-Port Serial (WIC-1T)	11.1(7)AA	11.2(5)P	11.3(1)	11.3(3)T	12.0(1)	12.0(1)T
2-Port Serial (WIC-2T)	–	–	–	–	12.0(7)XK	–
2-Port Asynchronous/Synchronous (WIC-2A/S)	–	–	–	–	12.0(7)XK	–
1-Port ISDN BRI S/T ¹ with NT1 (WIC-1B-S/T)	–	11.2(4)XA 11.2(5)P	11.3(1)	11.3(3)T	12.0(1)	12.0(1)T
1-Port ISDN BRI U ² (WIC-1B-U)	–	11.2(4)XA 11.2(5)P	11.3(1)	11.3(3)T	12.0(1)	12.0(1)T
1-Port ISDN BRI S/T ³ Leased Line (WIC-1B-S/T-LL)	11.1(7)AA	11.2(9)P	–	11.3(3)T	–	12.0(1)T
1-Port 56/64-kbps CSU/DSU (WIC 1DSU-56K4)	–	11.2(12)P	–	11.3(3)T	–	12.0(1)T
1-Port T1 (WIC-1DSU-T1)	–	11.2(12)P	–	11.3(3)T	–	12.0(1)T
2-Port FXS voice/fax interface (VIC-2FXS)	–	–	–	11.3(1)T	12.0(1)	12.0(1)T
2-Port FXO voice/fax interface (VIC-2FXO)	–	–	–	11.3(1)T	12.0(1)	12.0(1)T
2-Port E&M voice/fax interface (VIC-2E/M)	–	–	–	11.3(1)T	12.0(1)	12.0(1)T

WAN and Voice Interface Card Options for Cisco 3600 Series Routers

Table 1-1 WAN and Voice Interface Card Options with Cisco IOS Releases for Cisco 3600 Series Routers (continued)

WAN Interface Card	Cisco IOS Release 11.1	Cisco IOS Release 11.2	Cisco IOS Release 11.3	Cisco IOS Release 11.3T	Cisco IOS Release 12.0	Cisco IOS Release 12.0T
2-Port FXO voice/fax interface for use in Europe (VIC-2FXO-EU)	–	–	–	11.3(6)T	–	12.0(1)T
2-Port E&M voice/fax interface (VIC-2FXO-M1)	–	–	–	–	12.0(7)XK	–
2-Port E&M voice/fax interface for use in Europe (VIC-2FXO-M2)	–	–	–	–	12.0(7)XK	–
2-Port E&M voice/fax interface for use in Australia (VIC-2FXO-M3)	–	–	–	11.3(6)T	–	12.0(1)T
2-Port ISDN BRI voice interface (VIC-2BRI-S/T-TE)	–	–	–	–	12.0(2)XD	–
1-Port T1 multiflex trunk interface (VWIC-1MFT-T1)	–	–	–	–	–	12.0(4)T
1-Port E1 multiflex trunk interface (VWIC-1MFT-E1)	–	–	–	–	–	12.0(4)T
2-Port T1 multiflex trunk interface (VWIC-2MFT-T1)	–	–	–	–	–	12.0(4)T
2-Port E1 multiflex trunk interface (VWIC-2MFT-E1)	–	–	–	–	–	12.0(4)T

Cisco 2600 Series Routers

Table 1-1 WAN and Voice Interface Card Options with Cisco IOS Releases for Cisco 3600 Series Routers (continued)

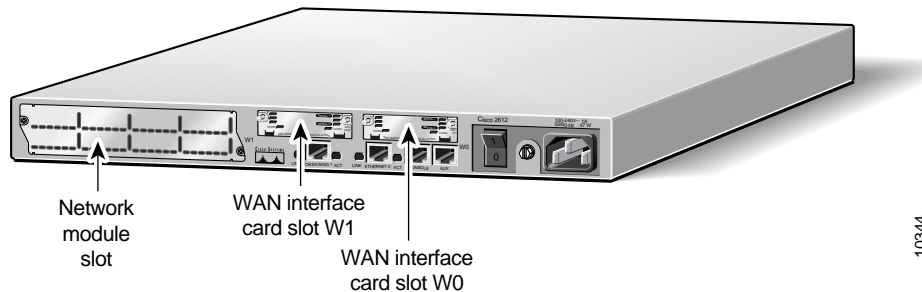
WAN Interface Card	Cisco IOS Release 11.1	Cisco IOS Release 11.2	Cisco IOS Release 11.3	Cisco IOS Release 11.3T	Cisco IOS Release 12.0	Cisco IOS Release 12.0T
2-Port T1 multiflex trunk interface with drop and insert (VWIC-2MFT-T1-DI)	–	–	–	–	–	12.0(4)T
2-Port E1 multiflex trunk interface with drop and insert (VWIC-2MFT-E1-DI)	–	–	–	–	–	12.0(4)T

- 1 Some ISDN service providers require an external Network Termination 1 (NT1) device to connect an ISDN S/T port to the ISDN line. If your service provider requires this, you must provide the NT1.
- 2 The BRI U module does not require an external NT1.
- 3 Some ISDN service providers require an external Network Termination 1 (NT1) device to connect an ISDN S/T port to the ISDN line. If your service provider requires this, you must provide the NT1.

Cisco 2600 Series Routers

The Cisco 2600 series is a multifunction platform that combines dial access, routing, LAN-to-LAN services, and multiservice integration of voice, video, and data in the same device. The Cisco 2600 series provides a low-entry price for medium-sized businesses. The Cisco 2600 series has built-in LAN connections that provide a single or dual Ethernet ports (depending on model), one Ethernet, and one Token Ring port. Cisco 2600 series routers also include one network module slot and two WAN slots that accept a variety of network modules and interface cards. Figure 1-6 illustrates a Cisco 2612 router showing the network module slot and WAN interface card slots.

Figure 1-6 Cisco 2600 Series Rear View



Cisco 2600 Series Interface Numbering

Each individual network interface on a Cisco 2600 series router is identified by a slot number and a unit number.

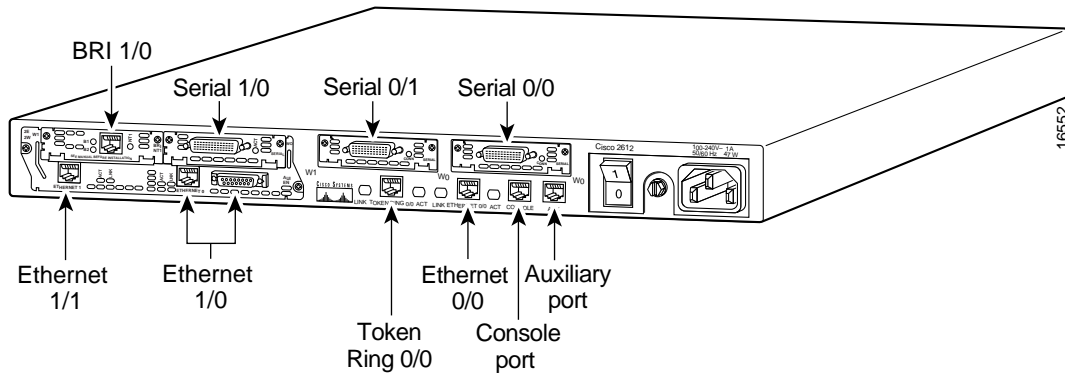
Slot and Unit Numbering

The Cisco 2600 series router chassis contains one slot in which you can install a network module. This is always slot 1.

Unit numbers identify the interfaces on the modules and WAN interface cards installed in the router. Unit numbers begin at 0 for each interface type, and continue from right to left and (if necessary) from bottom to top. Modules and WAN interface cards are identified by interface type, slot number, followed by a forward slash (/), and then the unit number; for example, Ethernet 0/0.

Figure 1-7 shows a router with a 2E 2-slot module in slot 1. One serial and one ISDN BRI WAN interface card are installed in the module.

Figure 1-7 Cisco 2600 Series Unit Numbers



Note WAN interface card slots (built into the chassis) are always numbered as slot 0, even if the interface card is installed in the slot labeled W1.

Figure 1-7 shows the following unit numbers:

- First Ethernet interface, referred to as Ethernet 0/0
- Token Ring interface, referred to as Token Ring 0/0
- Slot W0, serial interface 0, referred to as serial 0/0
- Slot W1, serial interface 1, referred to as serial 0/1
- Slot 1, Ethernet interface 0, referred to as Ethernet 1/0
- Slot 1, Ethernet interface 1, referred to as Ethernet 1/1
- Slot 1, serial interface 0, referred to as serial 1/0
- Slot 1, BRI interface 0, referred to BRI 1/0

Voice Interface Numbering in Cisco 2600 Series Routers

Voice interfaces are numbered differently from WAN interfaces described in the previous section, “Slot and Unit Numbering.” Voice interfaces are numbered as follows:

interface type chassis slot/voice module slot/voice interface

If you have a four-channel voice network module installed in slot 1 of your router, the voice interfaces will be:

- Slot 1, voice network module slot 0, voice interface 0, referred to as voice 1/0/0 (closest to the chassis WAN interface card slots)
- Slot 1, voice network module slot 0, voice interface 1, referred to as voice 1/0/1
- Slot 1, voice network module slot 1, voice interface 0, referred to as voice 1/1/0
- Slot 1, voice network module slot 1, voice interface 1, referred to as voice 1/1/1 (farthest from the chassis WAN interface card slots)

WAN and Voice Interface Card Options for Cisco 2600 Series Routers

Table 1-2 lists the WAN and voice interface card options available for Cisco 2600 series routers with their minimum software requirements for supported Cisco IOS releases.

Note Voice interface cards can only be used in voice network modules (NM-1V and NM-2V).

Cisco 2600 Series Routers

Table 1-2 WAN and Voice Interface Card Options with Cisco IOS Releases for Cisco 2600 Series Routers

WAN Interface Card	Cisco IOS Release 11.3	Cisco IOS Release 11.3T	Cisco IOS Release 12.0	Cisco IOS Release 12.0T
1-Port Serial (WIC-1T)	11.3(2)XA	11.3(4)T	12.0(1)	12.0(1)T
2-Port Serial (WIC-2T)	11.3(2)XA	11.3(4)T	12.0(1)	12.0(1)T
2-Port Asynchronous/Synchronous Serial (WIC-2A/S)	11.3(2)XA	11.3(4)T	12.0(1)	12.0(1)T
1-Port ISDN BRI S/T ¹ (WIC-1B-S/T)	11.3(2)XA	11.3(4)T	12.0(1)	12.0(1)T
1-Port ISDN BRI U ² (WIC-1B-U)	11.3(2)XA	11.3(4)T	12.0(1)	12.0(1)T
1-Port 56/64-kbps CSU/DSU (WIC-1DSU-56K4)	11.3(2)XAT	11.3(4)T	–	12.0(1)T
1-Port T1/FT1 (WIC-1DSU-T1)	–	11.3(4)T	–	12.0(1)T
2-Port FXS voice/fax interface (VIC-2FXS)	–	11.3(1)T	12.0(1)	12.0(1)T
2-Port FXO voice/fax interface (VIC-2FXO)	–	11.3(1)T	12.0(1)	12.0(1)T
2-Port E&M voice/fax interface (VIC-2E/M)	–	11.3(1)T	12.0(1)	12.0(1)T
2-Port FXO voice/fax interface for use in Europe (VIC-2FXO-EU)	–	11.3(6)T	–	12.0(1)T
2-Port E&M voice/fax interface (VIC-2FXO-M1)	–	–	12.0(7)XK	–
2-Port E&M voice/fax interface for use in Europe (VIC-2FXO-M2)	–	–	12.0(7)XK	–
2-Port E&M voice/fax interface for use in Australia (VIC-2FXO-M3)	–	11.3(6)T	–	12.0(1)T

Table 1-2 WAN and Voice Interface Card Options with Cisco IOS Releases for Cisco 2600 Series Routers (continued)

WAN Interface Card	Cisco IOS Release 11.3	Cisco IOS Release 11.3T	Cisco IOS Release 12.0	Cisco IOS Release 12.0T
2-Port ISDN BRI voice interface (VIC-2BRI-S/T-TE)	–	–	12.0(2)XD	–
1-Port T1 multiflex trunk interface (VWIC-1MFT-T1)	–	–	–	12.0(4)T
1-Port E1 multiflex trunk interface (VWIC-1MFT-E1)	–	–	–	12.0(4)T
2-Port T1 multiflex trunk interface (VWIC-2MFT-T1)	–	–	–	12.0(4)T
2-Port E1 multiflex trunk interface (VWIC-2MFT-E1)	–	–	–	12.0(4)T
2-Port T1 multiflex trunk interface with drop and insert (VWIC-2MFT-T1-DI)	–	–	–	12.0(4)T
2-Port E1 multiflex trunk interface with drop and insert (VWIC-2MFT-E1-DI)	–	–	–	12.0(4)T

- 1 Some ISDN service providers require an external Network Termination 1 (NT1) device to connect an ISDN S/T port to the ISDN line. If your service provider requires this, you must provide the NT1.
- 2 The BRI U module does not require an external NT1.

Cisco 1720 Router

The Cisco 1720 router is a small, modular desktop router that links small- to medium-size remote Ethernet and Fast Ethernet LANs over one to four WAN connections to regional and central offices. (See Figure 1-8.)

The Cisco 1720 router includes one Fast Ethernet port and two WAN interface card slots.

Figure 1-8 Cisco 1720 Router Rear View

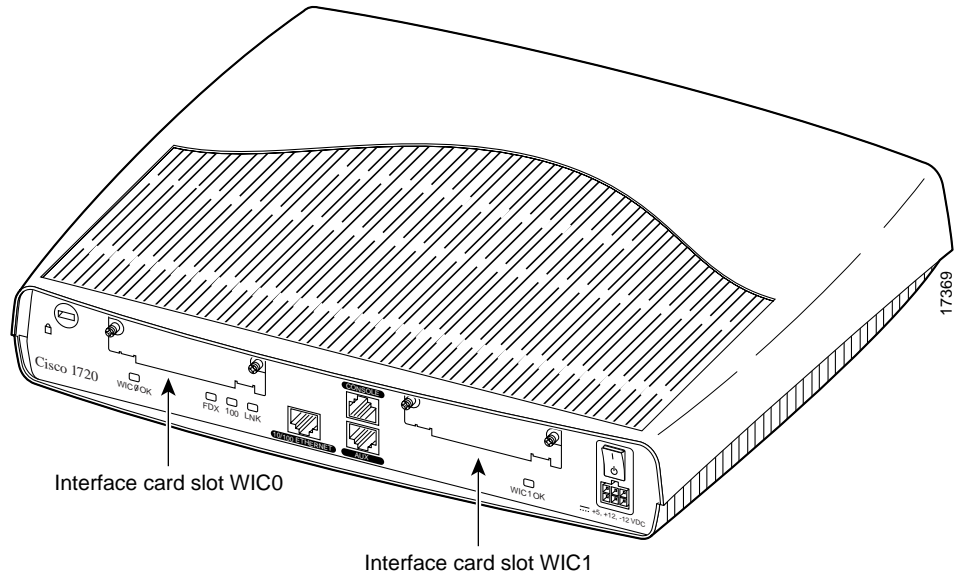


Table 1-3 lists WAN interface card options available for the Cisco 1720 router with their minimum software requirements for Cisco IOS Release 12.0.

Table 1-3 WAN Interface Card Options with Cisco IOS Releases for the Cisco 1720 Router

WAN Interface Card	Cisco IOS Release
1-Port Serial (WIC-1T)	12.0(1)XA3
2-Port Serial (WIC-2T)	12.0(1)XA3
2-Port Asynchronous/Synchronous Serial (WIC-2A/S)	12.0(1)XA3
1-Port ISDN BRI S/T (WIC-1B-S/T)	12.0(1)XA3

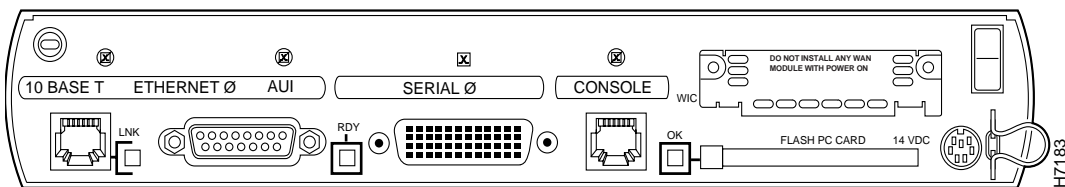
Table 1-3 WAN Interface Card Options with Cisco IOS Releases for the Cisco 1720 Router (continued)

WAN Interface Card	Cisco IOS Release
1-Port ISDN BRI U (WIC-1B-U)	12.0(1)XA3
1-Port 56/64-kbps CSU/DSU (WIC-1DSU-56K4)	12.0(1)XA3
1-Port T1/FT1 (WIC-1DSU-T1)	12.0(1)XA3

Cisco 1600 Series Routers

The Cisco 1600 series of access routers connect small offices with Ethernet LANs to the public Internet and to a company's internal intranet or corporate LAN through several WAN connections. The Cisco 1600 series routers include the following models: the Cisco 1601, Cisco 1602, Cisco 1603, Cisco 1604, and Cisco 1605-R. (See Figure 1-9 through Figure 1-13.)

All Cisco 1600 series models include one Ethernet port, one built-in WAN port, and one WAN interface card expansion slot for additional connectivity and flexibility.

Figure 1-9 Cisco 1601 Rear View

Cisco 1600 Series Routers

Figure 1-10 Cisco 1602 Rear View

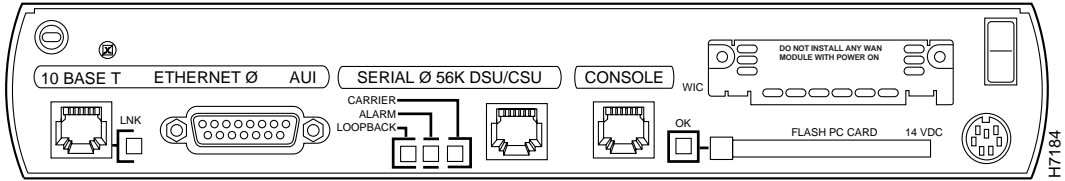


Figure 1-11 Cisco 1603 Rear View

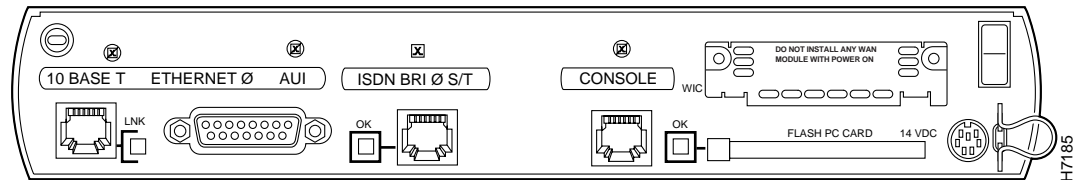


Figure 1-12 Cisco 1604 Rear View

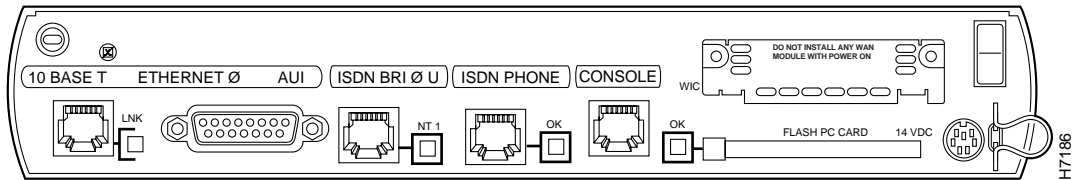


Figure 1-13 Cisco 1605-R Rear View

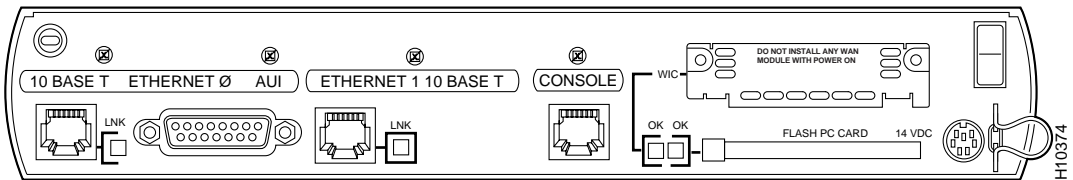


Table 1-4 lists the WAN interface card options available for Cisco 1600 series routers with their minimum software requirements for supported Cisco IOS releases.

Table 1-4 WAN Interface Card Options with Cisco IOS Releases for Cisco 1600 Series Routers

WAN Interface Card	Cisco IOS Release 11.1	Cisco IOS Release 11.2	Cisco IOS Release 11.3	Cisco IOS Release 11.3T
1-Port Serial (WIC-1T)	11.1(7)AA	11.2(5)P	11.3(1)	11.3(3)T
1-Port ISDN BRI U ¹ (WIC-1B-U)	11.1(7)AA	11.2(5)P	11.3(1)	11.3(3)T
1-Port ISDN BRI S/T ² (WIC-1B-S/T)	11.1(7)AA	11.2(5)P	11.3(1)	11.3(3)T
1-Port ISDN BRI S/T ³ Leased Line (WIC-1B-S/T-LL)	–	11.2(9)P	–	11.3(3)T
1-Port 56/64-kbps CSU/DSU (WIC-1DSU-56K4)	–	11.2(12)P	–	11.3(3)T
1-Port T1/FT1 (WIC-1DSU-T1)	–	11.2(12)P	–	11.3(3)T

- 1 1-Port ISDN BRI U card is not available with Cisco 1603 or Cisco 1604 routers. The BRI U module does not require an external NT1.
- 2 1-Port ISDN BRI S/T card is not available with Cisco 1603 or Cisco 1604 routers. Some ISDN service providers require an external Network Termination 1 (NT1) device to connect an ISDN S/T port to the ISDN line. If your service provider requires this, you must provide the NT1.
- 3 1-Port ISDN BRI S/T Leased-line card is only available with Cisco 1603 or Cisco 1604 routers. Some ISDN service providers require an external Network Termination 1 (NT1) device to connect an ISDN S/T port to the ISDN line. If your service provider requires this, you must provide the NT1.

Safety and Regulatory Compliance Information

This section lists safety warnings that you should be aware of before installing a network module or interface card in the router. To see translated versions of the safety warnings in this guide, refer to the *Regulatory Compliance and Safety Information* publication that accompanied your router.

Safety and Regulatory Compliance Information

This section includes:

- Safety Recommendations on page 1-21
- Safety with Electricity on page 1-22
- Preventing Electrostatic Discharge Damage on page 1-23
- FCC Class B Compliance on page 1-24
- FCC Part 68 on page 1-24
- Industry Canada CS-03 on page 1-26
- Australian Communications Authority Technical Standard 031 on page 1-27
- European Commission on page 1-27
- Call Progress Tone Settings on page 1-28

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Put the removed chassis cover in a safe place.
- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes equipment unsafe.

To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied your router.

Safety with Electricity



Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.



Warning To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Both LAN and WAN ports may use RJ-45 connectors. Use caution when connecting cables.



Warning Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first.



Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.



Warning Do not work on the system or connect or disconnect cables during periods of lightning activity.



Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is OFF and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. Then, if an electrical accident occurs, you can quickly shut the power OFF.
- Before working on the router, turn OFF the power and unplug the power cord.

- Disconnect all power before doing the following:
 - Installing or removing a router chassis
 - Working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:
 - Use caution; do not become a victim yourself.
 - Turn OFF power to the router.
 - If possible, send another person to get medical aid. Otherwise, determine the condition of the victim and then call for help.
 - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing cards. Ensure that the router chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.



Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohm (Mohm).

FCC Class B Compliance

The equipment described in this document generates and may radiate radio-frequency energy. If it is not installed in accordance with Cisco's installation instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device in accordance with the specifications in part 15 of the FCC rules. These specifications are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

Modifications to this product not authorized by Cisco Systems, Inc. could void the FCC approval and negate your authority to operate the product.

FCC Part 68

This equipment complies with Part 68 of the FCC rules. On the front panel of this equipment is a label that contains, among other information, the FCC registration number. If requested, you must provide this information to the telephone company.

An FCC-compliant cord and modular plug is provided with this equipment. This equipment is designed for connection to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant. See the installation instructions for details.

This equipment cannot be used on telephone company-provided coin service. Connection to party line service is subject to state tariffs.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that it may be necessary to temporarily discontinue service. If advance notice is not practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of this equipment. If this happens, the telephone company will provide advance notice for you to make the necessary modifications to maintain uninterrupted service.

This device does not include any upgradeable parts.

This equipment uses Universal Service Order Code (USOC) jacks as listed in Table 1-5.

Table 1-5 WAN Interface Card USOC Jacks

Cisco Product Number	Facility Interface Code	Service Order Code	Jack Type
WIC-1DSU-SW56K4	04DU5-56	6.0N	RJ-48S
WIC-1B-S/T WIC-1ST-CH	02IS5	6.0N	RJ-49C
VIC-2BRI-S/T	02IS5	6.0N	RJ-49C
WIC-1B-U WIC-U-CH	02IS5	6.0N	RJ-49C
WIC-1DSU-T1	04DU9-BN 04DU9-DN 04DU9-1KN 04DU9-1SN	6.0N 6.0N 6.0N 6.0N	RJ-48C RJ-48C RJ-48C RJ-48C
VWIC-1MFT-T1	04DU9-BN	6.0Y	RJ-48C
VWIC-1MFT-E1	04DU9-DN	6.0Y	RJ-48C
VWIC-2MFT-T1	04DU9-1KN	6.0Y	RJ-48C
VWIC-2MFT-E1	04DU9-1SN	6.0Y	RJ-48C
VWIC-2MFT-T1-DI	04DU9-1ZN	6.0Y	RJ-48C
VWIC-2MFT-E1-DI			

Industry Canada CS-03

The following information applies to models used in Canada.

Ringer Equivalence Number

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices, subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

Equipment Attachment Limitations

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirement Documents. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



Caution Users should not attempt to make connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

See Table 1-6 for additional information.

Table 1-6 Canadian Operating Information

Interface	Connecting Method	Ringer Equivalence Number
VIC-2FXO loop-start trunk interface	CA11, CA48	0.5
VIC-2FXO ground-start trunk interface	CA11, CA48	0.5
VIC-2FXS on-premises station interface	CA11, CA48	0.5
VIC-2E/M on-premises E&M interface	CA11, CA48	0.5
VIC-2BRI-S/T on-premises E&M interface	CB-1B	0.0

Australian Communications Authority Technical Standard 031

The following warning applies to the 2-Port ISDN BRI voice interface card (Cisco product number VIC-2BRI-S/T-TE).



Warning This equipment will be inoperable when main power fails.

European Commission

The VIC-2FXO-EU voice interface card and VIC-2FXO-M2 voice interface card have been approved to Common Technical Regulation (CTR) 21 for pan-European single-terminal connection to the PSTN. However, because of differences among the PSTNs in different countries, this approval does not, in itself, give unconditional assurance of successful operation on every PSTN network termination point. DTMF dialing is the default setting and is required for compliance to CTR21. Where pulse dialing is required for network compatibility, see the Pulse Dialing section for details.

In the event of problems, you should first contact your equipment supplier.

Call Progress Tone Settings

VIC-2FXO voice interface cards are available in several versions with interfaces intended for different geographical regions.

There are no hardware settings for connecting these voice interface cards to the public switched telephone network. To comply with national regulatory requirements, you must set call progress tones to the values shown in Table 1-7, using the Cisco IOS **cptone** command.

To set call progress tones for a voice port, enter the following commands in global configuration mode:

```
Router(config)# voice-port slot-number/subunit-number/port  
Router(config-voice-port)# cptone setting
```

Table 1-7 Call Progress Tone Settings

Country	Setting	Compliance
Australia	australia	ACA TS 002/TS 003
Canada	northamerica	Industry Canada CS-03
Denmark	dk	–
Germany	de	BAPT 223 ZV 5:July 1996
Great Britain	gb	PD 7020:1996
Hong Kong	hk	HK Telecom CR01 and CR02
Luxembourg	lu	–
Mexico	northamerica	NOM-036-SCT1-1993
Sweden	se	SS 63 63 39
Switzerland	ch	BAKOM 337/2.2
Thailand	th	PTT Subscriber Line Standards
United States	northamerica	FCC Part 68

Pulse Dialing

When it is necessary to switch the FXO port from DTMF to pulse dialing, enter the following commands in global configuration mode:

```
Router(config)# voice-port slot-number/subunit-number/port  
Router(config-voice-port)# dial-type pulse
```

Safety and Regulatory Compliance Information
