

Concepts and Descriptions

This chapter provides technical explanations of many of the features of the Cisco 700 series router. Although this information is not required to successfully install the router, it might be of interest and assist with troubleshooting efforts.

Definition of Terms and Acronyms

This section defines some networking terms you will encounter when gathering required information and using Cisco 700 series router manuals to configure the router.

Access code

A number that must be dialed preceding the telephone number to dial outside of a specific telephone system, such as a Centrex system.

AT commands

Attention commands (used for modem communications)

BT

British Telecom

Challenge Handshake Authentication Protocol (CHAP)

A form of PPP authentication that requires an exchange of user names and secrets (encrypted passwords) between two devices. This security feature is supported on lines using PPP encapsulation. CHAP passwords are called *secrets* because they are sent encrypted. Both devices must support PPP.

Directory numbers

The equivalent of telephone numbers. This is the number the router dials to connect to a remote router. ISDN BRI lines are generally assigned two local directory numbers, one for each B channel.

EPOS

Electronic Point of Sale

IE

Information Element of a Q.931 message

Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI)

A digital communication medium that operates over existing analog telephone lines. The BRI provides two 64-kbps B channels (for voice and data) and one 16-kbps D channel (for customer and call information). This channel combination is sometimes denoted as 2B+D.

Internet Protocol (IP) address

A network address that uniquely identifies a device on an IP network. This type of address consists of 4 bytes, represented as decimal values, separated by periods, as in 123.45.67.89.

Media Access Control (MAC) address

Also known as a hardware address. This address is assigned by the device manufacturer, for example, 1234.5678.9000.

Point-to-Point Protocol (PPP)

A direct connection between two nodes; a connection without any intervening nodes or switches. In an internetwork, the term refers to a direct connection between two networks.

Password Authentication Protocol (PAP)

A form of PPP authentication that requires an exchange of user names and clear-text passwords between two devices. PAP passwords are sent unencrypted. Both devices must support PPP.

PAT

Port Address Translation

PSTN

Public Switched Telephone Network

RIP

Routing Information Protocol

Service Profile Identifiers (SPIDs)

Numbers assigned by the ISDN service provider that identify the ISDN B channels. They are assigned only in North America. The SPID format is generally the ISDN telephone number with several numbers added to it. Depending on the switch type supporting your ISDN BRI line, your ISDN line might be assigned none, one, or two SPIDs.

TCP

Transmission Control Protocol

TPAD

Terminal Packet Assembler and Disassembler

ISDN Ports

Cisco 700 series routers provide one basic rate interface (BRI). The ISDN BRI service provided by your telephone service provider offers two bearer channels (B channels) and one data channel (D channel). The B channel operates at 64 kbps and carries user data. The D channel operates at 16 kbps and carries control and signaling information, although it can support user data transmission under certain circumstances.

Outside North America, telephone service providers typically provide an S/T interface. The S/T interfaces are four-wire (two pairs of two wires) interfaces that supports full-duplex data transfer over two pairs of wires.

Inside North America, telephone service providers typically provide a U interface. The U interface is a two-wire (single pair) interface that supports full-duplex data transfer over a single pair of wires.

NT1 and the ISDN Ports

Commonly, telephone carriers use a four-wire network within their system. The wiring in your home or business is a two-wire local loop. A Network Termination 1 (NT1) device connects the telephone carrier four-wire network to a two-wire local loop.

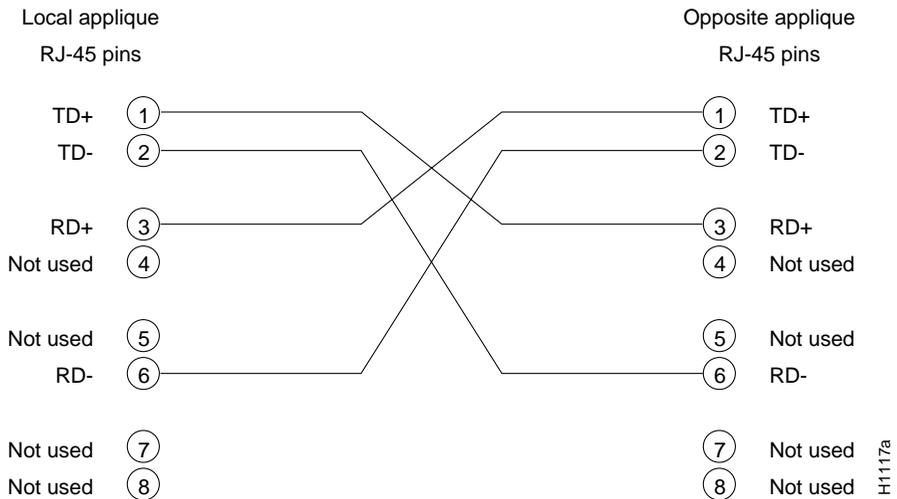
Inside North America, it is common to find an NT1 built into a network device. Outside North America, the telephone carrier or the user must provide an external NT1. To use the internal NT1, the telephone carrier line is connected to an ISDN U port. If an external NT1 is required, the telephone carrier line is connected the ISDN U port on the NT1, and the router's ISDN S/T port is connected to the ISDN S/T port on the NT1.

HUB/NODE Switch

The Ethernet ports on hubs are wired differently than the Ethernet ports on nodes. This allows the devices to communicate with a straight-through Ethernet cable. Basically, transmitted data must be sent from the transmit pin on one device to the receive pin on the other device, and vice versa. Nodes connected to hubs handle this crossover internally. If the signal does not cross over, the transmitted data is sent from the transmit pin on the sending device to the transmit pin on the receiving device, and communications fails.

To connect two nodes or two hubs, the signal must be crossed externally. Usually this is accomplished using an Ethernet crossover cable. The pins of a crossover cable have been rewired so the transmit pins are connected to the receive pins, as shown in Figure 6-1.

Figure 6-1



Your Cisco 761, Cisco 762, Cisco 765, Cisco 771, Cisco 772, or Cisco 775 router can be either a hub or a node. The HUB/NODE switch eliminates the need for a crossover cable. When the switch is in NODE position, the router is seen as a node and connects to a hub with a straight Ethernet cable. When the switch is in HUB position, the router can connect to a network interface card (NIC) installed in a PC.

Cisco 766 and Cisco 776 routers have an unmanaged 4-port Ethernet hub. If you are connecting a Cisco 766 or Cisco 776 router to another Ethernet hub, you must use a crossover cable.

For additional information on standard cabling specifications, use the following paths:

On CCO use

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/cismc/mchim/22048.htm.

On the Documentation CD-ROM use

http://127.0.0.1:8080/cc/td/doc/product/access/acs_mod/cismc/mchim/22048.htm.

