# Chapter 1
# Terminal Server Product Overview

1

This chapter provides an overview of the Cisco Systems terminal server product line. You will find the following information in this chapter:

- Terminal server capabilities
- Protocols and media supported
- Protocol translation option
- Configuration options
- The Cisco Systems Terminal Server/Router (TRouter) product

## Capabilities of the Terminal Server

The Cisco Systems terminal servers connect terminals, modems, and microcomputers over serial lines to local area networks (LANs) or wide area networks (WANs). They provide network access to terminals, printers, and computers that have no built-in network support.

As part of their software capability, Cisco terminal servers provide distributed network management facilities to assist in performance monitoring, runtime error logging, and the Simple Network Management Protocol (SNMP). These features allow the network manager to examine and adjust the terminal servers for optimum performance.

Full network access control helps the network manager ensure effective system use. Remote configuration is also available through Telnet and MOP connections to virtual ports on the terminal servers.

Security features allow restrictions to resources on the network. The network manager can specify access lists to establish which users have access to which computers. A user-name-and-password-pair authentication scheme is also supported.

The terminal servers are network-compatible with the Cisco Systems routers, which you can use to extend your network to any size you need. Additionally, protocol translation capability can be added as an option to the terminal server software, thereby providing connection service between different hosts and resources running different protocols

Cisco Systems designs the terminal servers to be an integral part of any distributed systems application. Although communications servers may be used as a distributed data switch or PBX, the Cisco Systems terminal servers can provide direct communication to hosts that support LAT, SLIP, TCP/IP, and TN3270 protocols in their system operating software.

*Note:* The STS-10x does not support TN3270 connections.

## *Supported Transmission Protocols and Services*

Cisco Systems terminal servers provide a flexible set of capabilities providing connection service using different media and (with the protocol translation option) between different hosts and resources running different protocols. The following descriptions summarize the protocols and connection services supported by the Cisco Systems terminal servers.

- TCP/IP protocols, the most widely implemented protocol suite on networks of all media types. TCP/IP is today's standard for internetworking, and is supported by most computer vendors, including all UNIX-based workstation manufacturers.
- Serial Line Internet Protocol (SLIP), an inexpensive means of connecting a personal computer or workstation to a network using asynchronous dial-up modems. The terminal server can support any combination of SLIP lines and lines dedicated to normal asynchronous devices, such as terminals and modems.
- DEC Local Area Transport (LAT) protocol, Digital Equipment's proprietary terminal connection protocol used with DEC minicomputers. Cisco products support bridging and protocol translation of LAT to X.25, Telnet, or TN3270.
- X.25 specification, which permit cost-effective, as-needed access to major public networks in the United States and Europe. Cisco Systems protocol translators support both the X.25 and the X.3/X.28/X.29 packet assembler/disassembler (PAD) specifications.
- IBM 3278 terminal emulation, providing TN3270-based connectivity to IBM hosts over serial lines.
- Network Computing Devices Inc. XRemote terminal facility, allowing for remote X Window operation using their NCD terminal.

## *Media Support*

The Cisco Systems terminal servers handle multiple device interfaces. They multiplex asynchronous RS-232 serial lines onto a high-speed network interface. ASCII terminals, modems, printers, and host serial ports are among the devices you can connect to the terminal servers. You can use a number of methods to connect serial devices, including RJ-11, and 50-pin Telco connectors.

The Cisco Systems network interfaces for the terminal servers provide easy connectivity. The network interface is typically to Ethernet, but can also be synchronous serial lines and Token Rings.

Using terminal servers, any RS-232-compatible device—serial laser printer, film recorder, plotter, and the like—can become a shared resource to your organization over a local network. For customer convenience, Cisco Systems markets a broad line of media adapters, including RS-232, V.35, X.21, and RS-449.

## Configuration Options

Part of the power and flexibility of Cisco Systems' product components is derived from their physical configuration options. Customers can choose from single-board systems, or card-based chassis configurations that offer processor, back panel connector mountings, and communications interfaces best suited to their network.

### Cisco Terminal Server Models

The following terminal server models are available from Cisco Systems:

- The ASM™ model is built on the 9-slot A chassis and can support from 16 to 96 asynchronous lines. Network interfaces include synchronous serial, Ethernet, or Token Ring. The capability offered by the ASM makes it an ideal choice for terminal server connectivity in a campus or corporate environment.
- The MSM™ model is built on the M chassis, a mid-sized four-slot chassis. It can support from 16 to 32 asynchronous serial lines. Network interfaces include synchronous serial, Ethernet, or Token Ring. The MSM provides a flexible and cost-effective approach to terminal connectivity for the medium-sized business environment.
- The STS-10x™ model is a single-board system providing a single Ethernet interface connection and 10 asynchronous serial ports. The low-cost STS-10x is ideal for installing a few terminals or modem lines in an office. It is also useful in environments where clusters of devices require a more distributed topology.

### The Protocol Translation Option

The protocol translation option for the terminal server allows users of X.25, DEC Local Area Transport (LAT), and TCP/IP networks to make virtual terminal connections between each of these environments. Access to IBM hosts via TN3270 terminal emulation is also available through the protocol translator. XRemote connections are also supported.

Example uses of protocol translation: A TCP user can make a connection to the protocol translator using TCP/Telnet; the protocol translator then makes an outgoing connection using the X.25 PAD protocols (X.3 and X.29). Similarly, an X.25 PAD user can establish a connection to the protocol translator, which then uses TCP/Telnet to make a connection to a TCP host.

The protocol translator automatically establishes the appropriate connections and converts between X.3 option negotiations and Telnet option negotiations. If you prefer, you can use the protocol translator commands to customize connection parameters that will supersede the X.3 parameters. The protocol translator can conduct up to 100 concurrent translation sessions.

### *Microprocessors*

Cisco Systems uses the MC68010, MC68020, or MC68030 microprocessors for high-speed operation in their terminal server products. All Cisco System microprocessors contain onboard RAM, system ROM holding all operating system, bootstrap, and diagnostic software, and hardware and software support for a control console.

Cisco Systems also offers optional nonvolatile memory that retains configuration information despite power losses or system reboots. With the nonvolatile memory option, the terminal and network servers need not rely on other network servers for configuration and boot service information.

## *The TRouter*

The Cisco Systems TRouter, a combination terminal server and router, is ideal for providing a small number of asynchronous serial lines to remote "leaf" networks that have low traffic.

The TRouter includes IP terminal server capabilities. Its routing support includes TCP/IP, DECnet, XNS, AppleTalk, Novell, ISO CLNS, Banyan Vines, and Apollo Domain. You can add X.25, which permits attachment to commercial public data networks and the Defense Data Network (DDN). However, bridging support is not available.

The TRouter hardware system includes a processor, the nonvolatile configuration memory, a 16-line asynchronous serial card, and two network interfaces (Ethernet and/or high-speed serial) on a single MCI controller card. This configuration is available only in the M chassis and cannot be expanded or modified. No other interfaces or peripherals can be added.

The complete TRouter software documentation consists of the Cisco *Router Products Configuration and Reference* publication as well as this publication.