Access Server and Communication Server Product Overview

This chapter provides an overview of the communication and access server platforms. You will find the following information in this chapter:

- Introduction to access servers and communication servers

- Supported protocols

- Supported interfaces and connections

- Supported platforms

- Configuration overview

Introduction

Access servers and communication servers connect terminals, modems, microcomputers, and networks over serial lines to local-area networks (LANs) or wide-area networks (WANs). They provide network access to terminals, printers, workstations, and other networks. Remote configuration is also available through Telnet and Digital Equipment Corporation's Maintenance Operation Protocol (MOP) connections to virtual ports on communication and access servers.

Throughout the remainder of this publication, access servers are referred to as communication servers. When there is a need to highlight specific access server features or capabilities, the term access server is used.

Four Services

Your communication server supports four types of server operation:

- Terminal services—Connecting asynchronous devices to a LAN or WAN through network and terminal-emulation software including Telnet, rlogin, Digital's Local Area Transport (LAT) protocol, and IBM TN3270. See Figure 1-2.

- Telecommuting services—Connecting devices over a telephone network using ARA, Serial Line Internet Protocol (SLIP), compressed SLIP (CSLIP), Point-to-Point Protocol (PPP), and XRemote (NCD's X Windows terminal protocol). See Figure 1-3 and Figure 1-4.

- Routing services—Full-featured Internet Protocol (IP) and Novell Internet Packet Exchange (IPX) routing. This is the same routing functionality found on router platforms. See Figure 1-5.

- Protocol translation services—Converting one virtual terminal protocol into another protocol. See Figure 1-6.

Figure 1-1 illustrates these four types of server functionality available on the communication server: terminal service is shown between the terminals and hosts running the same protocol (LAT-to-LAT or TCP-to-TCP); telecommuting service is demonstrated by the remote PC connection running SLIP, CSLIP, PPP, or XRemote; protocol translation service supported between the terminals and hosts running unlike protocols (LAT-to-TCP or TCP-to-LAT); asynchronous IP routing is shown by the PC running SLIP or PPP, and between the two communication servers.
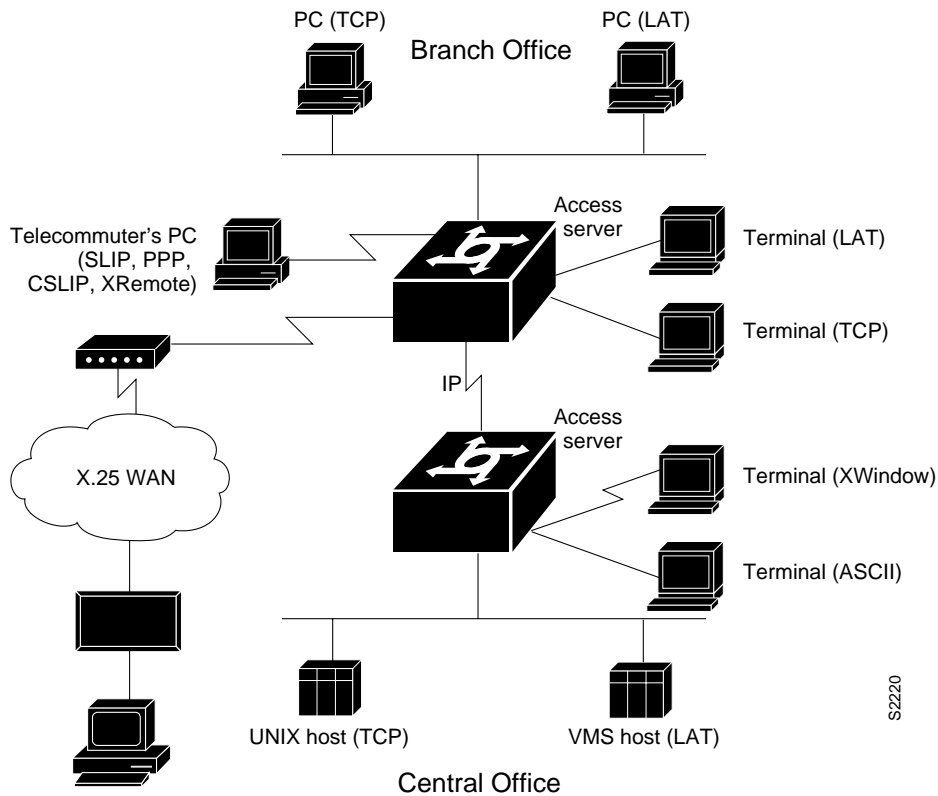

Figure 1-1   Functions of the Communication Server

LANs and WANs

On LANs, terminal services support TCP/IP on UNIX machines with Telnet and rlogin connections, IBM machines with TN3270 connections, and Digital machines with LAT connections. You can use the communication server's protocol translation services to make connections between hosts and resources running different protocols including communication or access server connections to X.25 machines using X.25 PAD.

Telecommuting services support WAN connectivity with ARA, SLIP, PPP, or XRemote. Other WAN services include dial-on-demand routing (DDR) of IP and IPX, X.25, Frame Relay, and SMDS. Full IP and Novell IPX routing services are also supported. Communication and access servers are network-compatible with routers, which you can use to extend your network to any size you need.

Security Features

Full network access control features help to ensure system security and efficiency. Security features provide restrictions to resources on the network. The network manager can specify access lists to permit and deny users access to internetworked computers. A username and password-pair authentication scheme is also supported.

Terminal Services

Communication servers provide terminal-to-host connectivity using virtual terminal protocols including Telnet, LAT, TN3270, rlogin, and X.25 PAD (X.25 PAD connections can be made with the ASM-CS only). Modems can be configured for rotary connections, allowing users to connect to the next available modem.

A host can also connect directly to a communication server. In IBM environments, TN3270 allows a standard ASCII terminal to emulate a 3278 terminal and access an IBM host across an IP network.

In Digital environments, LAT support provides a terminal with connections to VMS hosts. X.25 PAD allows terminals to connect directly to an X.25 host over an X.25 network through the communication or access server. X.25 PAD eliminates the need for a separate PAD device. This connection requires a synchronous serial interface.

Figure 1-2 illustrates terminal-to-host connections using a communication server.
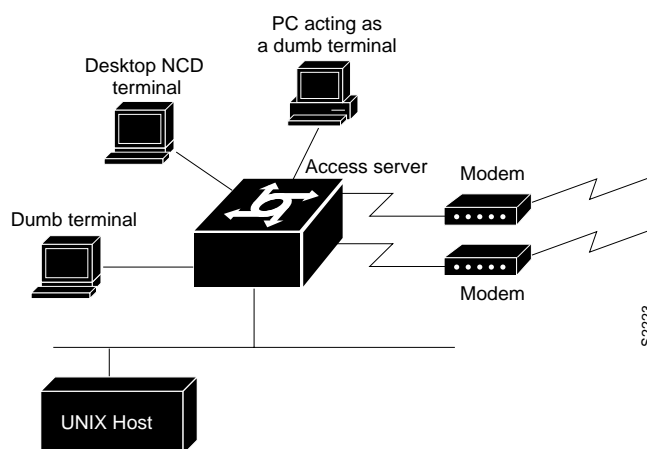

Figure 1-2   Terminal-to-Host Connectivity

Telecommuting

Using ARA, SLIP, or PPP, PC users can run TCP/IP applications and services including Telnet, Simple Mail Transfer Protocol (SMTP), and File Transfer Protocol (FTP) over serial lines. The user gets remote connectivity with the same functionality as a PC attached to a local network. Another telecommuting option is to use the XRemote protocol over asynchronous lines. The communication server provides network functionality to remote X display terminals.

Figure 1-3 illustrates an XRemote connection using a communication server. Refer to the chapter "Configuring XRemote" later in this publication for additional possible XRemote configurations.
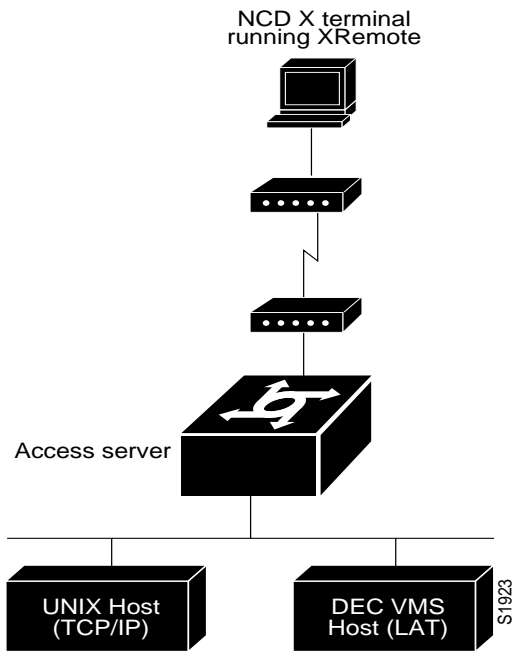
Figure 1-3   XRemote Connection

Figure 1-4 shows a generic telecommuting connection.
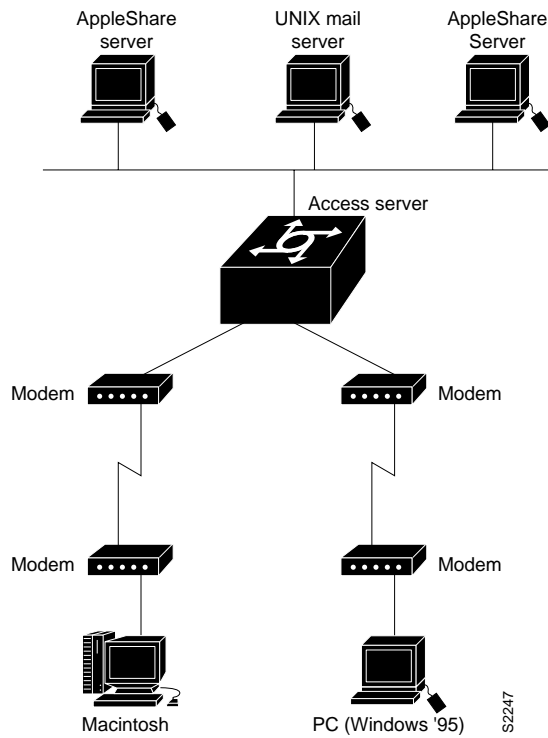

Figure 1-4   Telecommuting Connection

Remote Access Routing

Communication servers support full routing functionality, determining the most efficient path for sending data packets to a destination address outside the local network. The communication server gathers and maintains routing information to enable the transmission and receipt of such data packets. Routing information takes the form of entries in a routing table, with one entry for each identified route. The communication server can create and maintain the routing table dynamically to accommodate network-configuration changes when they occur.

Communication servers allow you to route IP and IPX packets over synchronous and asynchronous lines. DDR of IP and IPX packets is supported. A key feature of asynchronous routing is its ability to provide low-cost operation over normal dial-up telephone networks. The server's routing capabilities provide remote home and sales offices with cost-effective access to a central site. For example, traffic from PCs and UNIX workstations can be routed through the server product, eliminating multiple phone lines and modems. Routing over asynchronous lines also provides significant phone-line savings for small offices by allowing dial-up telephone lines to be used rather than more costly leased lines.

All of the IP and IPX routing protocols and special features that are implemented on our routers are available on your communication server. Routing protocols include Internet Gateway Routing Protocol (IGRP), Enhanced Internet Gateway Routing Protocol (Enhanced IGRP), Open Shortest Path First (OSPF), Routing Information Protocol (RIP), Border Gateway Protocol (BGP), Exterior Gateway Protocol (EGP), Gateway Discovery protocol (GDP), and ICMP Router Discovery Protocol (IRDP). Special routing features include route filtering, priority queuing, access lists, and more.

Figure 1-5 illustrates an IP routing configuration using communication servers. In this configuration, the host is connected to an Ethernet and forms a routing connection with communication servers at remote sites.
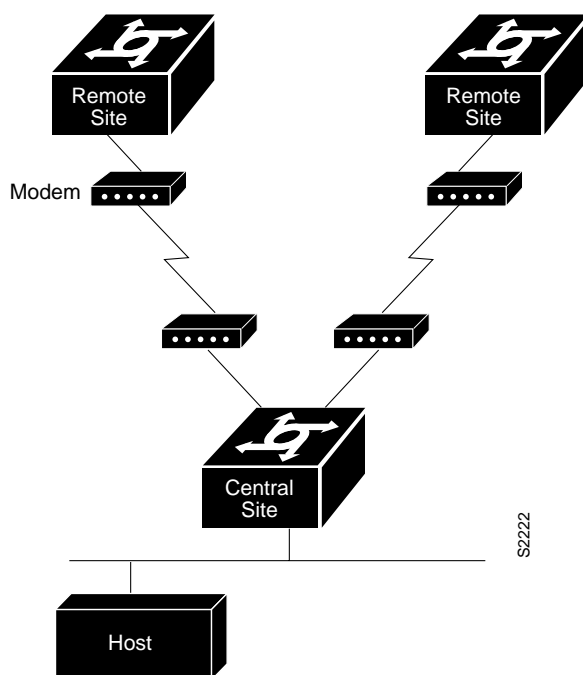

Figure 1-5   Asynchronous Remote Access Routing Connectivity

Protocol Translation

Communication servers translate virtual terminal protocols to allow communication between devices running different protocols. Protocol translation supports Telnet (TCP), LAT, and X.25. One-step protocol translation software performs bidirectional translation between any of the following protocols:

- X.25 and TCP (on the ASM-CS)

- X.25 and LAT (on the ASM-CS)

- LAT and TCP

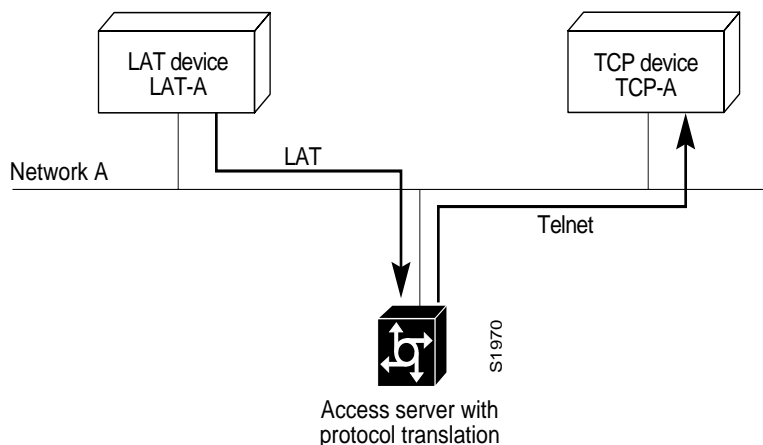Figure 1-6 illustrates LAT-to-TCP protocol translation.

Figure 1-6   LAT-to-TCP Protocol Translation

Connecting to IBM hosts from LAT, Telnet, rlogin, and X.25 PAD environments is accomplished with two-step translations. In other words, users must first establish a connection with the communication or access server, then use the TN3270 facility to make a connection to the IBM host.

Supported Protocols

A user can dial in and use a port for any of the following types of connections:

- Telnet and rlogin

- LAT—Local Area Transport (LAT) protocol, Digital's proprietary terminal connection protocol used with Digital minicomputers.

- TN3270—IBM 3278 terminal emulation provides TN3270-based connectivity to IBM hosts over serial lines.

- ARA—AppleTalk Remote Access (ARA) provides access to Macintosh computers on remote AppleTalk networks over standard telephone lines.

- SLIP and PPP connections to a single PC—SLIP is an inexpensive means of connecting a workstation to a network using asynchronous dial-up modems.

- XRemote—The Network Computing Devices Inc. XRemote terminal facility allows for remote X Window operation.

- X.25 (ASM-CS and Cisco 2500 only)—X.25 specification permits cost-effective, as-needed access to major public networks in the United States and Europe.

- Frame Relay (ASM-CS and Cisco 2500 only)—Permits routing of IP and IPX traffic across major public networks in the United States and Europe.

- SMDS (ASM-CS and Cisco 2500 only)—Switched Multimegabit Data Service (SMDS) specification provides access through an SDSU (an SMDS CSU/DSU [Channel Service Unit/ Digital Service Unit]) to WANs using DS-1 or DS-3 high-speed transmission facilities.

- TCP/IP and IPX remote access routing—TCP/IP is 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. Our implementation of IPX provides the functionality of Novell's IPX.

This range of functionality is possible because multiple roles can be assigned to each asynchronous interface. Each asynchronous line can be used as a network interface for IP routing some of the time, as a source of data for terminal-server communications (using Telnet, LAT, rlogin, and so forth), for protocol translation, and for telecommuting (using XRemote and SLIP).

Supported Interfaces and Connections

Communication servers handle multiple device interfaces. Asynchronous RS-232 serial lines are aggregated onto a high-speed network interface. ASCII terminals, modems, printers, and host serial ports are among the devices you can connect to communication servers. Our communication server platforms provide a number of methods to connect serial devices, including RJ-11, RJ-45, and 50-pin Telco connectors. The 500-CS supports RJ-45 connectors only. The ASM-CS supports Telco and RJ-11 connectors. The Cisco 2500 Series supports RJ-45 connectors on "octopus" cable adapters that attach to high-density D-type connectors on the rear panel of the Cisco 2500 Series.

The network interfaces for communication servers provide easy connectivity. The network interface is typically Ethernet, but can also be synchronous serial lines and Token Rings (ASM-CS and Cisco 2500 Series only).

Using communication servers, any RS-232-compatible device, serial laser printer, film recorder, plotter, and so on, can become a shared resource to your organization over a local network.

Supported Platforms

Part of the power and flexibility of your communication server results from the range of possible physical configuration options. You 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.

The following access and communication server models are available:

- The ASM-CS is built on the 9-slot A chassis and can support from 16 to 112 asynchronous lines. Network interfaces include synchronous serial, Ethernet, or Token Ring. The ASM-CS offers a choice of an MC68020 microprocessor with 4 MB of memory or an MC68040 microprocessor with 16 megabytes (MB) of memory.

- The 500-CS has one Ethernet port and can support 8 or 16 asynchronous ports. The 500-CS is based on the MC68331 processor. The standard 2 MB of memory can be expanded to 4 or 10 MBs. The asynchronous ports support both RS-232 and RS-423 serial interface standards, as well as hardware and software flow control.

- The Cisco 2500 Series can support 8 or 16 asynchronous ports at speeds up to 115200 bps. Network interfaces include synchronous serial, Ethernet, or Token Ring. The standard 2 MB of memory can be expanded to 4 or 16 MBs. The Cisco 2500 Series is based on the 20 MHz MC60830 processor.

All our communication servers contain onboard RAM, system ROM holding all operating system software, bootstrap software, and diagnostic software.

Our systems also include 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.

Configuration Overview

This section provides a high-level overview of the tasks required to configure your communication server for the four server functions supported on this communication server.

Use the following process to configure your access or communication server:

Step 1 Attach an RS-232 ASCII terminal to the system console port located at the rear of the ASM-CS and Cisco 2500 Series, or to Port 1 on the 500-CS.

Step 2 Configure the terminal to operate at 9600 baud, 8 data bits, no parity, 2 stop bits.

Step 3 Power up the communication server. The **setup** command facility runs automatically for initial startup. See the *Access and Communication Servers Getting Started Guide* for documentation of the **setup** command facility.

Step 4 Perform general system configuration.

Step 5 Configure your system for one of the four server functions by referring to the appropriate part in the documentation.