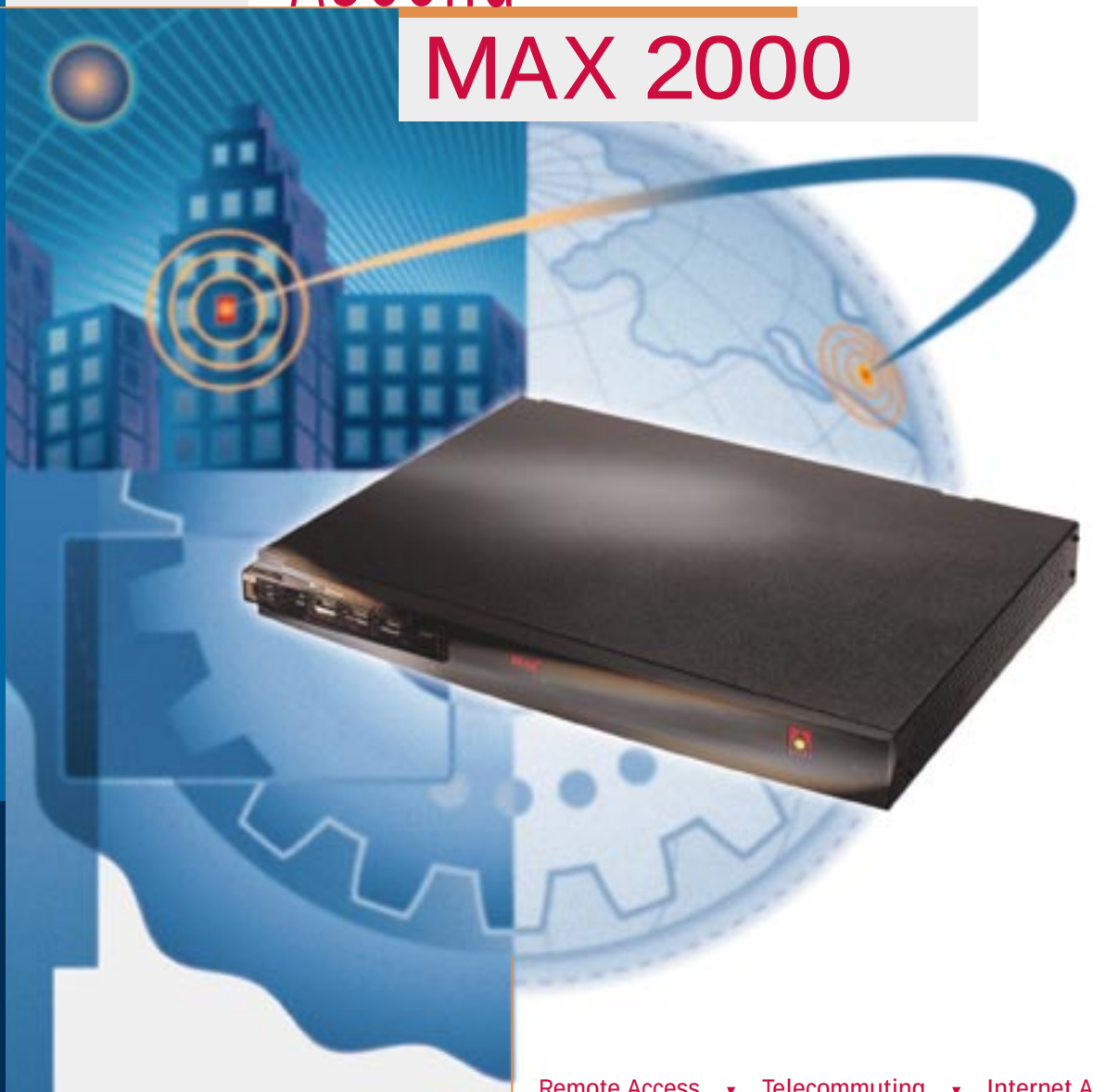
product information

# Ascend MAX 2000



Your long-term success depends on your ability to keep up with an evolving networking environment. The MAX 2000 protects your investment with a scalable solution that grows with your business.

Remote Access ▾ Telecommuting ▾ Internet Access

The MAX™ 2000 is a WAN access switch that gives service providers and small businesses an ideal platform for managing remote access applications. The low-entry cost of the MAX 2000 makes it an attractive solution for connecting remote users to their networks via an T1/E1/PRI, serial port or Ethernet interface. The MAX 2000 consolidates a dynamic mix of analog and digital traffic as well as videoconferencing access over a single digital line.

By eliminating the need for separate lines, the MAX 2000 minimizes excessive network equipment and transmission costs and delivers the lowest price per port available. Adding users to the network is cost-effective via the Hybrid Access™ software included on MAX 2000 WAN access switches. It also gives small office workers, mobile users and telecommuters (teleworkers) support for e-mail, Internet access, videoconferencing access and file transfer capabilities—directly from their remote sites. The MAX 2000 is the ideal WAN access switch developed to provide a cost-effective, single solution for managing a growing wide area network.

ASCEND

# Networking Solutions for Corporations and Service Providers

## Consolidation drives down the total cost of network ownership

By eliminating the need for separate modem banks, terminal servers and routers, the MAX saves network equipment and transmission costs. With Hybrid Access, the MAX 2000 consolidates a dynamic mix of access lines over high-speed digital trunks for 24 simultaneous (T1) connections or up to 30 (E1) connections.

- T1 with integrated CSU
- ISDN PRI
- E1
- Supports up to 24 modems per system

## High-speed Series56 digital modems enhance call performance and reduce operating costs

Integrated high-speed Series56™ Digital Modems provide full access to analog callers that dial into the MAX over digital access lines such as channelized T1 or PRI. The MAX 2000 uses the 12-port Series56 Digital Modem module to ensure reliability and eliminate the noise, downtime and operating costs that can be present with stand-alone analog modem technology.

- 12-port K56flex-compatible and V.34-compatible digital modem expansion module
- MNP and MNP10-EC error correction for cellular connections
- V.110 for GSM cellular access
- V.42bis data compression
- Data throughput up to 115.2 Kbps
- K56flex (56 Kbps*), V.34 (33.6 Kbps), V.FC, V.32bis, V.32, V.22, V.22bis, V.21, Bell 212A and Bell 103 compatible
- Group 3 fax support with MAXDial™ software
- Remote downloadable modem firmware

## Hybrid Access delivers state-of-the-art digital service connectivity

Hybrid Access provides integrated digital sessions via the E1/T1 or ISDN PRI interface. It gives users integrated remote network access for ISDN and Frame Relay, and it supports other networking devices that use ISDN and Frame Relay (TAs, FRADs).

- 56 or 64 Kbps B-channels for ISDN
- 56 or 64 Kbps Frame Relay
- Up to 24 remote sessions (T1)/30 sessions (E1)

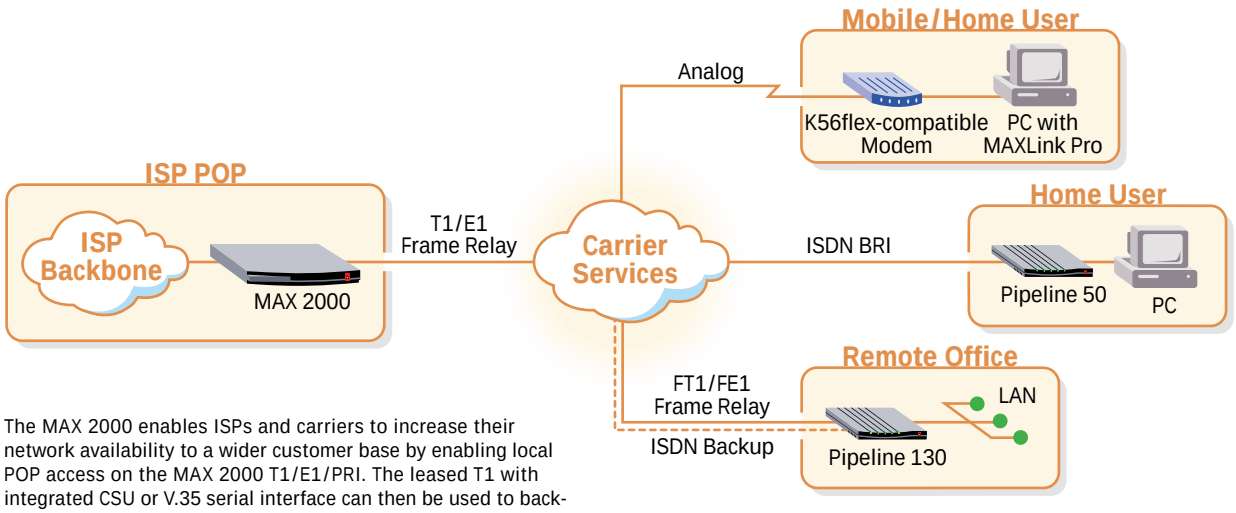
## Seamlessly connects to backbone network services over a variety of interfaces

The MAX 2000 provides users with options for connecting into a local or remote backbone network. Users can connect to switches or to backbone routers over any of the following transport options:

- Ethernet (AUI or 10Base-T) for connecting to the backbone network at up to 10 Mbps
- Frame Relay over a V.35 serial port for high-speed connections at up to 8 Mbps
- E1/T1/PRI ports for making remote connections to the backbone network

*Current FCC restrictions, line conditions and other external factors will reduce data transmission rates and may reduce them significantly.

## Extending Backbone Network Capabilities to Smaller POPs




The MAX 2000 enables ISPs and carriers to increase their network availability to a wider customer base by enabling local POP access on the MAX 2000 T1/E1/PRI. The leased T1 with integrated CSU or V.35 serial interface can then be used to backhaul the sessions on a Frame Relay to the ISP backhaul network.

## Bandwidth on demand maximizes performance and decreases costs

Dial-up connections are automatically set up and torn down for transparent client-server computing across the WAN. Dynamic Bandwidth Allocation™ aggregates multiple calls for greater bandwidth and lower costs.

- Dial-on-demand bandwidth based on packet address
- Increase or decrease bandwidth dynamically during an active session
- 56/64 Kbps to 4 Mbps selectable bandwidth per call
- Bandwidth is controlled manually, automatically, or by time-of-day profile
- Supports inverse multiplexing protocols—MultiLink PPP (MP), MultiLink Protocol Plus™ (MP+), BONDING, AIM
- Industry-standard STAC compression
- RFC 1144 TCP header compression

## Multiprotocol routing, bridging and terminal server functions ensure network interoperability

Robust support for multiprotocol routing and bridging functions enables users to connect to a variety of resources within corporate networks. The proven technology in routing and terminal server protocols permits service providers to extend their network to offer a broad range of services to users.

- RIP2 and OSPF routing protocols
- TCP/IP and IPX routing protocols
- Bridging all protocols (BCP standard bridging)
- PPP, SLIP and C-SLIP terminal service
- Telnet, ARA
- Dynamic IP address assignment
- V.120 asynchronous rate adaption
- V.110 asynchronous rate adaption (optional)

## Integrated management features provide end-to-end network control

Manage all functions of the MAX 2000 through your choice of interface, either locally or remotely, using intuitive graphical configuration software.

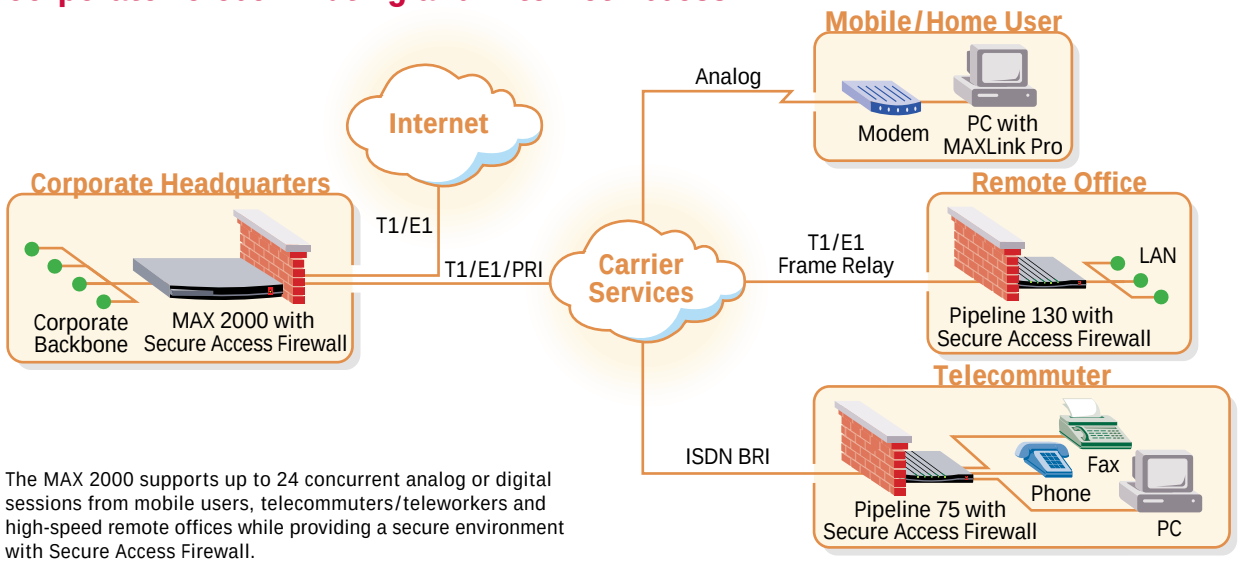
- SNMP MIBs
- Password protected Telnet remote management
- Local management via VT-100 terminal
- PPP Link Quality Monitoring (LQM)
- Annex D Frame Relay link monitoring
- FLASH memory for easy software download
- ISDN event log and Syslog support
- Optional NavisAccess™ network management software for end-to-end network control

## Expandable bandwidth on demand server for high-powered video and data applications

The MAX 2000 has been designed to integrate audio and videoconferencing across the same wide area network interfaces. By utilizing the bandwidth on demand technology and the Ascend Inverse Multiplexer (AIM) slot card, users can leverage the existing data network to support videoconferencing between two or more sites.

- Two- and six-port AIM slot cards
- Compatible with Multiband inverse multiplexers for greater density and specialized multimedia networks
- Port-to-port local switching
- Up to 24 channels per system (T1)/30 channels (E1)
- Call routing by port, group or called number

## Corporate Telecommuting and Internet Access




The MAX 2000 supports up to 24 concurrent analog or digital sessions from mobile users, telecommuters/teleworkers and high-speed remote offices while providing a secure environment with Secure Access Firewall.

## Iron-clad Security

### Comprehensive security for iron-clad remote networking

Support for standard user-authentication systems fits into your current network security architecture. Networked, server-based authentication makes it easy to manage large-scale remote access applications from a central site. Extended RADIUS functionality allows service providers and network managers to integrate the accounting, authentication and authorization capabilities needed to manage their remote network.

- PAP and CHAP
- Ascend Access Control™ (extended RADIUS), RADIUS, TACACS and TACACS+
- Encrypted token-card security
- Callback (digital connections)
- Calling Line ID (CLID)
- Password protected terminal server access
- Transmit and receive packet filtering
- Secure Access™ Firewall (optional)

### Protect corporate resources with Ascend's Secure Access Firewall

Ascend's Secure Access™ Firewall is a software option that uses state-of-the-art firewall technology and delivers a comprehensive, fully integrated security system for corporate networks. It protects your company's information assets at the corporate LAN, remote offices and telecommuters' home offices. The standard security features that are offered on your Ascend remote networking system are integrated with comprehensive security features such as transparency, dynamic firewall, and monitoring and logging.

Secure Access Firewall provides a cost-effective single vendor solution for securing your company's remote network against attacks on sensitive data. See the Secure Access Firewall datasheet for more information.

## Enhanced Software Capabilities

The software for the MAX family allows corporations, carriers and service providers to use the scalable MAX architecture to optimize their networks. The MAX software enhances connectivity by providing a single solution for users with Hybrid Access, Frame Relay and ISDN.

### Frame Relay software

Optional Frame Relay software integrates incoming Frame Relay traffic from Ascend's Pipeline® and other Frame Relay access devices with analog and digital dial-in traffic. A high-speed synchronous V.35 port connects directly to a Frame Relay switch at 8 Mbps.

- Route to multiple Frame Relay PVCs over single or multiple interfaces
- Supports up to 4096 PVCs with RADIUS authentication software
- Dial-in PPP to Frame Relay gateway function with PVC selected on a per user basis
- RFC 1490 encapsulation
- ANSI Annex D and ITU Annex A management
- PVC switching
- Frame Relay forum UNI and NNI

### ISDN software

Optional ISDN signaling software supports incoming ISDN signaling from Ascend's Pipeline, MAX products or other ISDN access devices. The ISDN signaling supports ISDN connections for analog modem and digital services dial-in traffic.

- PRI
- D4 to ESF conversion
- D-channel multiplexing
- Frame Relay over ISDN B-channels
- X.25 over ISDN B-channels
- Calling Line Identification (CLID)
- Signaling homologation in over 30 countries worldwide

# MAX 2000

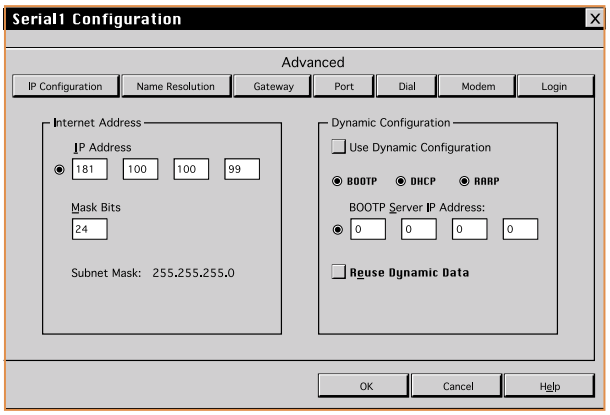
# MAXLink Pro and MAXDial Client Software

## Client Software

MAXLink Pro™ and MAXDial™ client software are provided with the MAX 2000 at no charge. However, the host software is available as an option.

Use of MAXLink Pro and MAXDial client software assures complete interoperability between users and the MAX 2000 and provides an easy way to add users to your growing network.

## MAXLink Pro

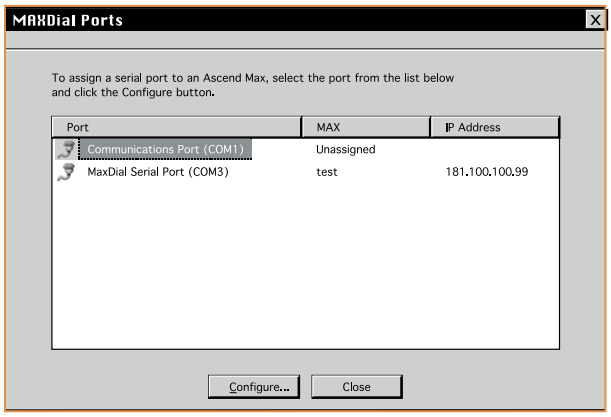



### MAXLink Pro software connects remote users with their offices

MAXLink Pro client software runs on a Macintosh or Windows platform, and allows a user to establish a connection to Novell and IP networks. It supports multiple applications including WebSurfer, FTP client, FTP server, TFTP, Telnet and includes both a TCP/IP and IPX stack. Through MAXLink Pro, users can do the following:

- Connect to a remote LAN using Macintosh or Windows (95, 3.1x, or NT)
- Access network resources such as file servers, printers and electronic mail
- Define multiple dial-in connections to different LANs while saving them in a list
- Choose the frequency and number of attempts to redial a busy phone line
- Request dial-back from the server

## MAXDial




### MAXDial software eliminates the need for stand-alone modems

Users on the LAN can access the outside world through MAX 2000 and MAXDial software, which create a “virtual modem” at the desktop. MAXDial eliminates the need to install a direct line and a desktop modem in every office by providing the same functionality without the added expense. The software enables users to dial up modem calls or send out faxes via the modem cards in the MAX 2000.

- Supports AT command set for V.34 modems
- Supports TCP/IP and Novell IPX LANs
- Runs under MS-DOS, Windows 3.x. and Windows 95
- Graphical User Interface (GUI) for easy configuration

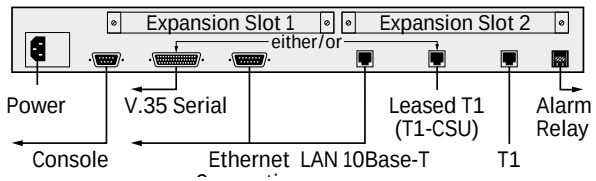
## Hardware Specifications

| | |
|---|---|
| Dimensions | 1.75 in x 17 in x 12 in/4.5 cm x 43.2 cm x 30.5 cm |
| Weight | 10 lbs/4.6 kg |
| LAN Interface | Ethernet 10Base-T via RJ-45 jack,<br>Ethernet AUI via DB-15 Connector |
| WAN Interfaces | 1 T1/PRI line with integrated CSU, serial port—or<br>1 E1 RJ-48 and BNC connectors, serial port |
| Software Upgrade | Via built-in flash RAM, remote downloadable |
| Power Requirements | 80 Watts, 47-63 Hz, 90-240 VAC, 270 BTU/hour |
| Operating Requirements | Temperature: 32-104˚F/0-40˚C<br>Altitude: 0-14,800 feet/0-4,500 meters<br>Relative Humidity: 5-90% (non-condensing) |
| Safety Certifications | CSA 950, NTRL/UL 1950, TUV, EN 60 950 |
| EMI/RF | FCC Part 68, FCC Part 15, E55022, EN50082-1 |

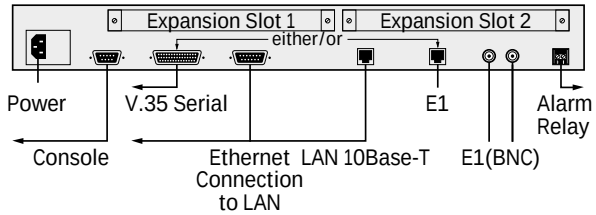
## Software Specifications

| | |
|---|---|
| LAN Protocols Supported | TCP/IP, IPX |
| Routing Protocols Supported | AppleTalk, BCP Bridging, RIP, RIP2, OSPF (IP only), IGMP multicast forwarding |
| WAN Protocols Supported | PPP, ARAP, SLIP, C-SLIP, Async PPP, Sync PPP, V.110 Async, HDLC, ARA, Async IPX, X.25 PAD, X.25 over B-channel, V.120, D4 framing (T1), G703/732 framing (R1), Frame Relay PVC, Hybrid Access, PPP-FR gateway, BONDING, AIM, FR NNI |
| Modem | K56flex, V.34, MNP 10-EC, MNP, V.42bis, fax modem send up to 14.4 Kbps |
| Multimedia/<br>Inverse Multiplexing | BONDING, local port to port switching,<br>56 or 64 Kbps adaption, AIM |
| Bandwidth Management | MP, MP+, TCP header compression, data compression (Ascend/Microsoft/STAC V9), AppleTalk Remote Access, compatible with ARA 1.0 and 2.0 |
| Security | Secure Access Firewall, Ascend Access Control (extended RADIUS), RADIUS, TACACS, TACACS+, Password Authentication Protocol (PAP), Challenge Authentication Protocol (CHAP), MS-CHAP, token card, Calling Line ID (CLID), packet filtering, SNMP, console management (VT-100), PPP callback, user authentication |
| Management | Console management software (runs on Windows 95 and Windows 3.x), Telnet, NASI, SNMP MIB2, PPP LQM, Frame Relay ITU Annex A, Frame Relay ANSI Annex D |
| Client Software | MAXLink Pro client software<br>MAXDial client software |

## MAX 2000 T1/PRI Back Panel




## MAX 2000 E1/PRI Back Panel

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### About Ascend Communications

Ascend Communications, Inc. develops, manufactures and sells wide area networking solutions for telecommunications carriers, Internet service providers, and corporate customers worldwide. For more information about Ascend and its products, please visit the Ascend web site at http://www.ascend.com, or e-mail info@ascend.com.

Ascend markets the B-STDX, CBX, GRF, IP, MAX, Multiband, MultiDSL, Navis, Pipeline, SA, SecureConnect and STDX families of products. Ascend products are available in more than 30 countries worldwide.




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