Bay Networks *Where Information Flows.*™

EXTRANETS EMERGE

ACCESS

Opportunity and competition are driving corporations to more effectively conduct business, and the Internet enables them to do just that.

This ubiquitous, public network lets companies better communicate with customers, partners, and employees. It lowers the cost of doing business, provides new opportunities, and creates a competitive edge.

Extensions of basic Internet technology—intranets and extranets—further improve the cost, quality, and manageability of internal and external communications.

One of the first powerful applications to leverage these extensions is Extranet Access— the use of the Internet for private communication among corporate employees and partners. In addition to matching or exceeding the quality of current dial-up remote access technologies, it dramatically lowers communication and management costs, frees Information Technology (IT) resources for other tasks, and provides end users with improved services. Plus, corporations can

Companies are rushing to build extranets to reach out to employees and partners while they reduce costs and IT hassles.

easily bring partners and customers into the network to provide seamless interaction.

THE INTERNET IS CHANGING BUSINESS

The Internet enables corporations to profoundly transform the way they conduct business. Through its vast reach, the Internet helps companies to communicate better with employees, customers, suppliers, and distributors. Corporations that use this network experience lower business costs and forge closer relationships with partners and customers. In an era of heightened competition, those companies with the best partner communications win in the marketplace.

The Internet provides a robust foundation on which business applications can be built. Four building blocks provide the benefits.

Cross-Platform Web browsers. Every device has a browser. Netscape Navigator and Microsoft Internet Explorer run on PCs, Macintoshes, UNIX workstations, and other alternative computing devices— including palmtops, televisions, and cellular phones.

A single network protocol. The TCP/IP protocol extends beyond the Web as the standard networking platform for all applications—such as mainframe access, database queries, and file and print services.

Ubiquity. Users can access data and services from any worldwide location. Employees telecommuting from home can just as easily obtain corporate data as they can while at the office.

Security. Technology advances in encryption, authentication, and firewalls now make it possible to construct an Internet-based network that is more secure than a private legacy network.

Corporations have discovered the benefits of the Internet, and are now expanding the use of its component technologies in two new directions:

Intranets. These are corporate networks constructed on open, public standards, allowing organizations to quickly deploy internal applications without the barriers of costly proprietary implementations.

Extranets. Using the Internet for private communications, extranets open up designated parts of a corporate intranet to remote employees and external partners. They provide scalable, secure, managed access over the Internet to interconnect individuals and companies. And this access can be personalized based on the unique requirements of individual users.

During the last two years, Netscape, Sun Microsystems, Microsoft, and others developed intranet technologies and products. New products are just coming to market that will let corporations and their telecommunication partners build extranets.

CORPORATIONS WILL REAP BIG BENEFITS FROM EXTRANETS

Extranets provide key benefits to corporations.

Speed of communication. Extranets increase the efficacy with which partners collaborate by linking intranets for immediate access to critical information. A traveling salesperson no longer calls a distributor for product information. Instead of wasting time waiting for a return call, or searching for the appropriate contact at the distributor, information is accessed quickly and securely over the extranet.

Cost Savings. An extranet provides immediate access to information in a cost-efficient way. Companies spend small fortunes creating and printing information for suppliers, distributors, and customers. Posting material to extranets cuts those costs significantly.

Hassle reductions. Managing traditional remote access is a losing proposition for an IT professional. Maintaining equipment and connections, while trying to stay ahead of the access technology churn, is impossible. Extranets eliminate these frustrations by allowing the IT manager to outsource the cumbersome part—modems and physical infrastructure— while retaining control of the critical part—security and user management.

Corporations will quickly build extranets to extend their trusted internal networks to employees and partners.

The need to connect employees and partners continues to grow at an unprecedented rate. Large corporations are faced with a two- to five-fold increase in the number of remote users they will need to support over the next two years.

Legacy remote access products, with difficult to manage hardware and high operating costs, are not up to the new extranet challenge.

EXTRANETS ROLL OUT IN STAGES

The use of extranets will evolve from simple public information sharing to critical transactions between business partners.

The first stage of extranet development involves companies furnishing general information on external Web sites with some special information reserved for registered users.

The next wave of extranet activity will center on opening up the internal network to employees. Traveling executives and salespeople will gain secure access to corporate databases, mail servers, and file servers using the Internet rather than premises-based remote access servers.

Partners will also access these extranets. Suppliers, customers, and other vital partners will connect through a national Internet Service Provider (ISP) to quickly garner critical information contained on an extranet. For instance, an automobile manufacturer and a parts supplier will collaborate on the design of a new component by jointly viewing and editing computer-aided design (CAD) files over the Internet.

Commerce takes off as extranet links between suppliers and buyers improve supply-chain management. Direct links between retailers and suppliers ensure more precise inventory control. Incidences of a retailer running out of a product or a supplier overdistributing its products into the channel are eliminated. By creating open procedures between business partners, extranets extend electronic commerce beyond online transactions.

Figure 1   The need for remote access is booming.

Size of Remote Access Equipment Market
Source: Dell'Oro Group

$2.7 B

Partners
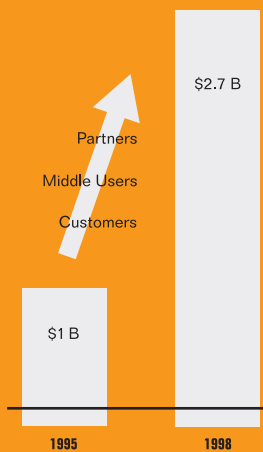
Middle Users

Customers

$1 B

1995   1998

Figure 2   Legacy remote access is a morass.

THE DEMAND FOR ACCESS IS BOOMING

As shown is Figure 1, the demand for access is booming, driven by two key factors:

The need to be closer to customers. Businesses are using access to create an "electronic embrace" around their partners and suppliers. This electronic embrace increases service and loyalty, and strengthens relationships.

The demand for constant employee connectivity when away from the office—for traveling professionals, day-extenders, and telecommuters.

Until now there have been no significant advances in the equipment or services to address this explosive growth. These applications require a new level of dependable, readily available access that ensures employees receive critical information
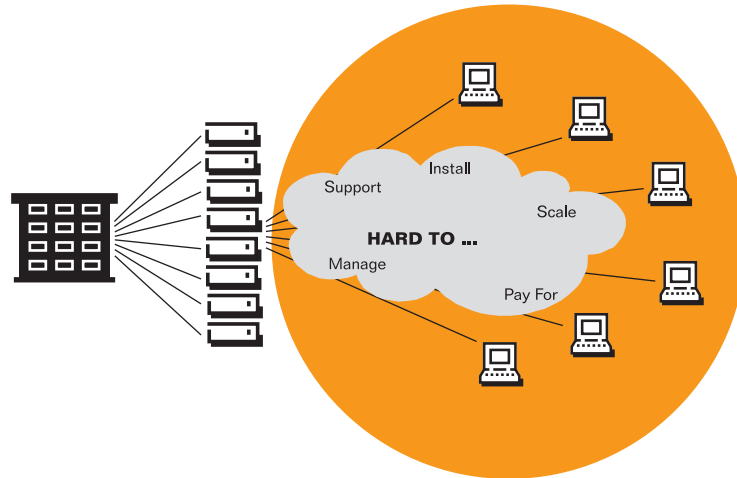
whenever and wherever necessary. Corporations that attempt to keep up with the unrelenting demand by pouring more money into their existing access infrastructures will fail.

TRADITIONAL PRODUCTS CANNOT SUPPORT EXTRANETS

Scaling up traditional remote access solutions to support current users is difficult and expensive. When a company suddenly finds itself with the need to connect 1,000 traveling salespeople, an upgrade is required. Costly hardware, increased management costs, and long-distance and toll-free dial-in charges for each user can quickly wipe out a corporate remote access budget (see Figure 2).

In addition, the costs associated with frequent hardware upgrades to support new access technologies frustrates corporations. For instance, the emergence of 56K modem technology requires corporations to overhaul their hardware and contend with competing standards.

Further, corporations are unable to benefit from new high-speed technologies looming on the horizon. Cable modems and x Digital Subscriber Line (xDSL) technologies are terminated at a central office and cannot be used for direct connections to corporate networks.

EXTRANET ACCESS FIXES THE PROBLEM

Extranet Access eliminates end-user frustrations of busy signals, crackly phone lines, and faulty modems. Users enjoy ubiquitous access due to global service providers. Moreover, IT management burdens are eased (see Figure 3). For example, when an executive editing a presentation in the middle of the night cannot get online, the executive calls MCI or Sprint to solve the problem—rather than paging the sleeping IT manager for help.

Figure 3 An extranet gives users safe and personalized access to corporate data over the Internet.

IT departments will be freed from building and supporting traditional remote access equipment by adding Extranet Access to Internet service plans. Extranet Access affords the following key management advantages to IT administrators:

Scaling up is no longer an issue. When the call center manager announces that the 500-person division is being moved from the corporate offices to their homes, the IT manager simply orders up another block of accounts from the service provider—no additional modems need to be added to the corporate infrastructure.

Network managers will not be inundated by technology churn. Switching out old modems, struggling with new and sometimes incompatible technologies, and being locked out of the latest high-speed technology will be a thing of the past. In the Extranet Access model, the carriers—not the IT manager— are responsible for staying on track with technology advances.

IT managers do not have to manage multiple points of presence. In an effort to combat long-distance charges, IT managers often drop remote access gear around the country to take advantage of free local calls. This results in a distributed management nightmare. With an extranet, local connectivity is already available globally through telcos and ISPs.
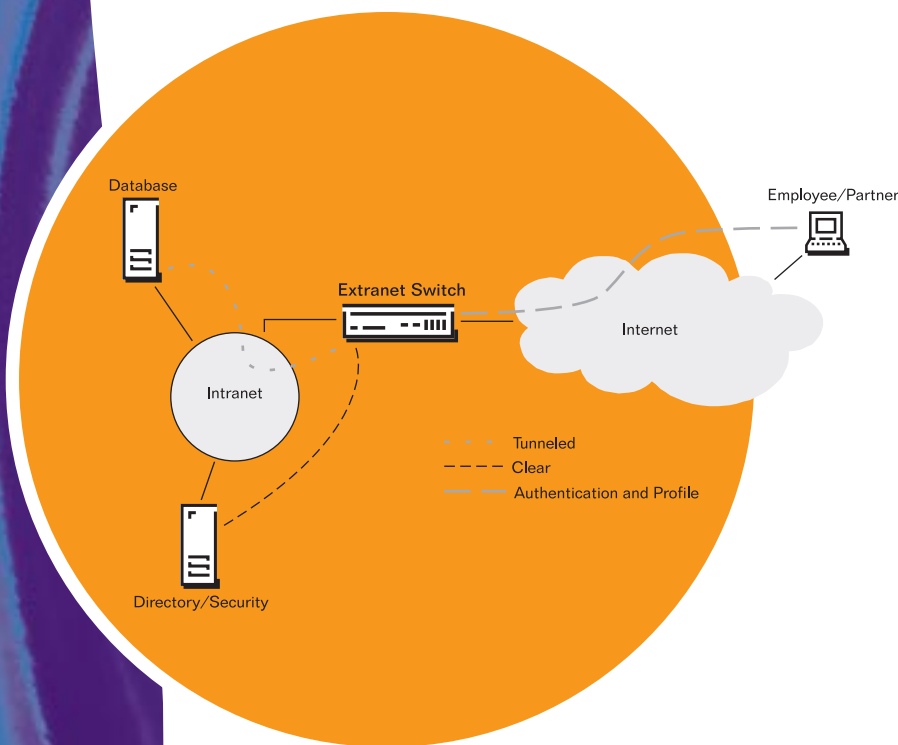
Users get personalized service.
There is growing demand for the network to meet the business requirements of its users. The CEO, sales manager, and external suppliers all need access to the extranet, but the specifics of that access differ based on the relationship between the corporation and the individual. The extranet can be built to respond dynamically to the user.

EXTRANETS DELIVER BIG SAVINGS

As illustrated in Figure 4, business managers recognize significant cost savings by building an extranet:

Reduction of long-distance phone charges. Remote users dial in to a local ISP rather than running up long-distance charges. Hourly access fees charged by ISPs are up to 50% cheaper than the best negotiated toll-free rates. Unlimited use plans from the ISP demolish the access cost equation.

Curtailing IT management costs.
As the number of users rise, port density must be increased to maintain service, throwing IT into an endless struggle to keep up.

Rather than letting IT bear the brunt of heightened access demands, carriers strengthen their capabilities. Corporations can further save money through integrated products that control access and security.

Fewer T-1 lines into the building.
A T-1 line for traditional remote access only supports 24 connections, but can handle between 100 and 200 Extranet Access users because the traffic is aggregated.

Decreased capital spending. With the costly physical network moved to the carrier cloud, Extranet Access equipment costs will be reduced up to 80%.

EXTRANETS REQUIRE NEW SOLUTIONS

There are two components of Extranet Access:

An Extranet Service Provider. Only Tier 1 providers will supply the high-performance and low-latency network, dial-in port availability, and service guarantees necessary to become an Extranet Service Provider.

An Extranet Switch. The Extranet Switch will integrate virtual private network (VPN) services, authentication, routing, bandwidth management, firewall, accounting, and simplified management on a user-centric platform.

The Annual Cost to Support 1,000 Remote Access Users
Source: Forrester Research

T1 Lines
Capitol Expense
Users Support
Phone and ISP Charges

Extranet Access $596,600
- $34,200
- $22,400
- 0 (*included in users' access cost)
- $540,000

Traditional Remote Access $1,508,000
- $24,000
- $104,000
- $300,000
- $1,080,000

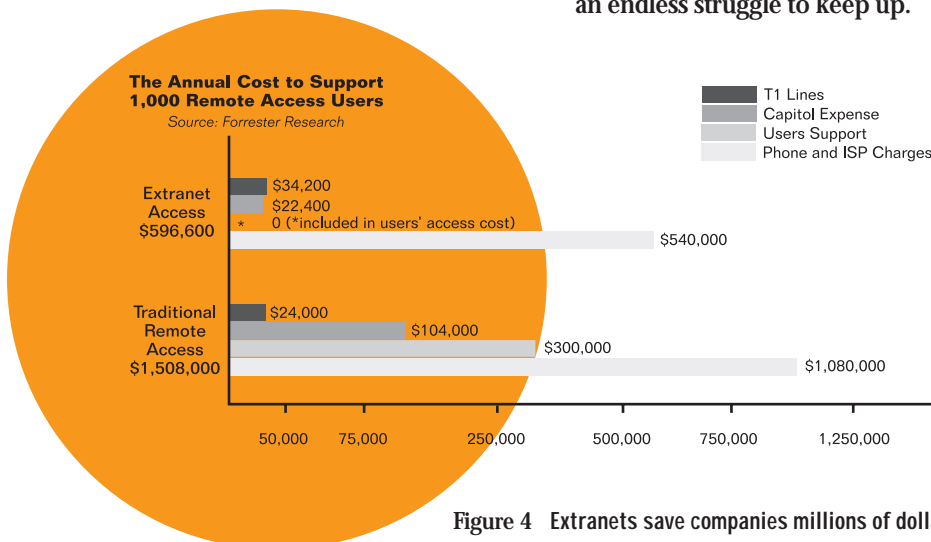50,000 75,000 250,000 500,000 750,000 1,250,000

Figure 4   Extranets save companies millions of dollars every year.

Companies cannot rely on a simple VPN box and any Internet Service Provider to provide extranet infrastructure. To reap all of the benefits extranets have to offer, an Extranet Switch—a comprehensive device that combines VPN services with authentication, bandwidth management, routing, firewall, and profile-based user access—must be paired with a top-tier carrier.

More than simply VPN devices, Bay Networks Extranet Switch products combine all the functionality needed to deliver Extranet Access to 200 to 2,000 concurrent users.

THE EXTRANET SERVICE PROVIDER

With the consolidation of the Internet Service Providers, corporations will look to a full-service telecommunications provider for extranet connectivity. The selection criterion will expand beyond price to focus on the business practices and technical merits of the network.

WHAT TO LOOK FOR IN AN EXTRANET SWITCH

Extranets require a new breed of product—the Extranet Switch. An Extranet Switch sits on the border between private and public networks, providing secure, robust access. To satisfy corporate needs, an Extranet Switch must enable scalable access combined with high security, bandwidth management, flexible client support, and full-featured management—all within a single device (see Figure 5). An Extranet Switch must be built on a user-centric architecture to create a Personal Extranet™.

A Personal Extranet is customized access to corporate resources and services based on the users identity and business role. This means the CEO gets a higher level of performance and greater access to sensitive corporate data than a college intern. The key features of the Extranet Switch include:

— Security and VPN

— Performance

— Scalability

— Bandwidth Management

— Management

— Client Software Support

Support of this critical functionality requires a purpose-built Extranet Switch, rather than new software added to a router, firewall, or remote access server. The software and hardware architectures of these older devices do not lend themselves to the task. Only a targeted device will allow corporations to build a safe, scalable, and manageable extranet.
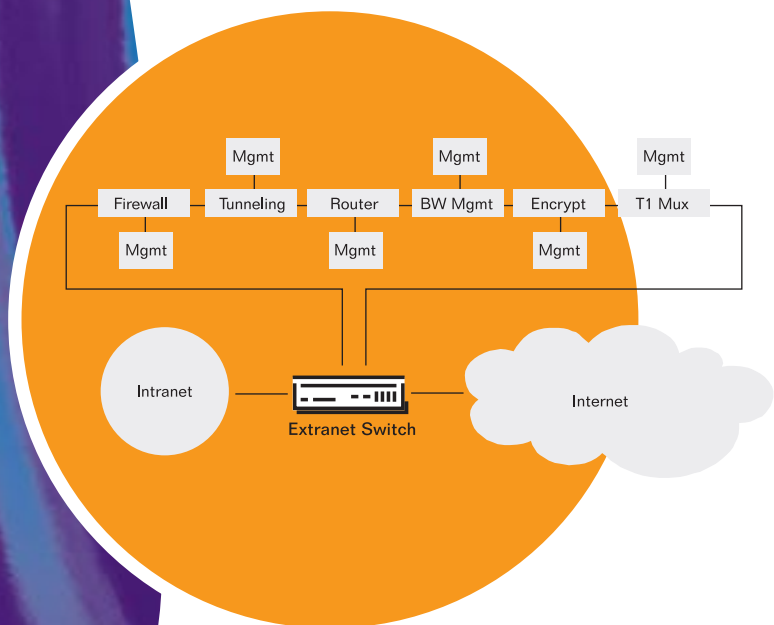

Figure 5   An Extranet Switch integrates key technologies into a scalable architecture.

COMPREHENSIVE SECURITY ARCHITECTURE

As a public data network, the Internet stirs up security issues that do not exist on private WANs. Corporations fear that hackers will break into their networks, or competitors will eavesdrop on their conversations. But the latest security technology—like strong encryption and authentication—guarantees that communication over the Internet is safer than traditional remote access. To alleviate security concerns, an Extranet Switch must include all of the following security features:

A VPN provides an encrypted pipe or tunnel between the user and the corporate network to ensure that no one can view the data as it crosses the Internet. There are a number of competing tunneling standards (Point-to-Point Tunneling Protocol (PPTP), Layer 2 Forwarding (L2F), Layer 2 Tunneling Protocol (L2TP), and Internet Protocol Security (IPsec)) and encryption standards (Data Encryption Standard (DES) and RC4) that have different characteristics and applications. There are even federal laws that restrict the export of encrypted data and devices.

Bay Networks has licenses and procedures to ship the strongest encryption—128 bit—anywhere in the world.

Authentication is the identification of a user based on credentials—such as a password or the number from a hand-held token card or a digital certificate. Corporations are building directories to authenticate remote and local users with technologies such as Remote Authentication Dial-In User Services (RADIUS), Windows NT, and Lightweight Directory Access Protocol (LDAP).

Filtering determines which users can access particular network resources so the CFO can tap into financial data, but a salesperson only gets to the order database.

SCALABILITY IS KEY TO AN EXTRANET

Enormous computing power is needed to tunnel, filter, prioritize, route, and manage each individual user connection. Providing all this functionality to hundreds or thousands of users requires a high-performance device with large central processing capacity. Traditional networking gear—like routers and remote access servers—have been designed with inadequate CPUs and proprietary chips that cannot support Extranet Access. The foundation for an extranet must also include redundant hardware components and automatic system fail-over capabilities. When sales needs to send in end-of-quarter purchase orders, the Extranet Switch is up and running.

Bay Networks Extranet Switch products comprise high-performance software running on a dual-processor Intel Pentium architecture. These products have almost 300 MIPs, superior reliability, and a future tied to the inevitable increase in Pentium performance. The redundancy features include hot-swappable power and storage and support for backup authentication servers.

BANDWIDTH MANAGEMENT DELIVERS USER-BASED PRIORITIES

Within a company, individual employees or partners have different requirements. An Extranet Switch must be able to prioritize bandwidth based on the urgency of access. When a mutual fund manager needs to execute a block trade, everyone else should get out of the way. An Extranet Switch must also cooperate with other network gear to clear a path through the Internet.

Based on a user profile, the Bay Networks Extranet Switch products enable bandwidth management—prioritization through the switch—and external quality of service using the Resource Reservation Protocol (RSVP).

COOPERATIVE MANAGEMENT BETWEEN CORPORATIONS AND CARRIERS

The successful extranet will be built from devices that can be easily installed, managed, and monitored. This task becomes even more important if the management is split between the service provider and the IT department. Corporations want to take advantage of the capacity and ubiquity of the public data network, but will shy away from giving the carrier complete control and responsibility. The Extranet Switch must be able to be cooperatively managed so that the carrier configures low-level networking, the IT department controls security, and Human Resources adds new employees to groups.

CLIENT SOFTWARE FOR EVERY PLATFORM

Tunnels can be initiated by the client machine or the ISP's network access server. If the tunnel starts at the client, a small piece of software must reside on each machine. Microsoft is shipping PPTP software for Windows 95 and Windows NT. There is also PPTP available for the Macintosh and Windows 3.x. IPsec is expected to become the ultimate tunneling standard due to its superior security technology. Bay Networks Extranet Switch products work with the leading standards-based tunneling clients from Microsoft and other third parties. Bay Networks is providing, free of charge, an enhanced IPsec client for Windows 95 and Windows NT. An Extranet Switch must be able to support a wide range of client technologies.

LOOKING AHEAD

Extranet Access is just the first of many powerful extranet applications. It is the beginning of a stream of cost-saving and value-added services that will emerge as extranets become more prevalent. After remote access becomes Extranet Access, connectivity for branch offices, mainframes, transaction partners, and even voice and video will follow. This transition will have major implications for bandwidth, applications, and users.
Bay Networks is the leading provider of the infrastructure for extranets—enabling corporate partners and employees to use the Internet for private communication, commerce, and collaboration. Bay Networks, as an early entrant, will continue to define the development of extranets and will provide solutions ahead of the competition enabling customers to build and grow their extranets.

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