ELEMENTS OF EXTRANETS

Extranets are composed of a wide variety of components and participants and have several possible configurations. Extranet components include intranets, Web servers, firewalls, ISPs, tunneling technology, interface software, and business applications. The tunneling principle is the basic concept that makes extranets possible. Tunneling means that data transmissions across the Internet can be made secure by authenticating and encrypting all IP packets. Several tunneling protocols are available, but IP Security sponsored by IETF (Internet Engineering Task Force) is one of the more popular protocols.

Two basic methods are used to configure extranets:

1. An extranet can be implemented using a direct leased line, linking all intranets.
2. A secure link (tunnel) can be created across the Internet, which can be used by the participating companies as a VPN, usually at a much lower cost. (See Chapter 10 for details.)

The effectiveness of an extranet depends on the degree to which it is integrated with legacy systems and databases. In many instances, integrating with legacy systems involves integrating a System Network Architecture (SNA)—the backbone of legacy systems in many corporations—with TCP/IP, the Web backbone. The technical differences between the two systems are often sources of conflict. Security is also a key issue with extranets.

IMPLEMENTING EXTRANETS: COORDINATION AND SECURITY

Although extranets are easy to use, implementing an efficient extranet requires extensive coordination between the company and its business partners. Legacy systems, databases, and other corporate resources must be interconnected for outside access and protected from unauthorized intruders. Companies must approach extranet design and development with a needs analysis to identify the best business opportunities.

The success of the extranet depends on the security measures implemented. The extranet is useless if it is unable to securely transmit sensitive data between the intranet and authorized partners. Although 100 percent security is impossible, differentiating between actual threats and perceived threats, and then selecting appropriate measures to deter actual threats, will help secure the communication environment.

Is selecting the strongest possible security for the entire extranet and associated intranets the best strategy? Not necessarily, because the stronger the security
measures, the more hardware and software resources are required to maintain an acceptable performance level. A balance between security levels and return on investment analysis is an important component of an initial investigation into extranet development.

Once a thorough needs analysis is completed, the feasibility of outsourcing must be checked. For most companies, the best strategy is to acquire a complete extranet package from a vendor such as Nortel Communication, Microsoft, or Netscape Communications. Select an ISP that provides high performance, low-latency connectivity, dial-in availability, and written service-level guarantees.

EXAMPLES OF EXTRANET APPLICATIONS
There are a multitude of extranet applications in use. Here we look at four examples.

AMP CONNECTS BUSINESS CUSTOMERS TO SELL PARTS
AMP of Harrisburg, Pennsylvania, is a large electric-connectors distribution company with annual sales of over $5 billion, conducting business in 50 countries. The company sells nearly 80,000 different products, including fiber-optic connectors, printed wiring boards, splices, and switches. In 1996, AMP launched an extranet called AMP Connect, which is based on electronic catalogs with product descriptions, three-dimensional models, and comparative charts and tables of all its products. The company operates one of the most advanced portals. The information is available in eight languages, and the site receives 100,000 hits daily from approximately 15,000 business customers worldwide.

This application is an example of connecting a company with its customers through an extranet. AMP Connect is used to place orders and has given the company a forum for communicating with wholesalers, distributors, resellers, and customers, which is necessary for the creation of an exchange.

GM CONNECTS DEALERS BY KIOSK
General Motors (GM) wanted to change the way automobiles are marketed by using an extranet accessed in kiosks and through PDAs. The interactive kiosks are installed in dealerships and shopping malls. The extranet uses the GM-access network, which connects 8,600 North American dealers with GM factories. GM-access is implemented worldwide using the Pulsar satellite system, which is operated by Hughes Network Systems.

The goal is to link the interactive kiosks to GM’s legacy infrastructure. Ideally, kiosk information will be instantly updated whenever GM changes the configuration or price of a car.

VHA, INC., CONNECTS WITH SUPPLIERS FOR PROCUREMENT
VHA, Inc., an Irving, Texas, alliance of 18 hospitals and 1,400 health-care organizations, developed an extranet that supports collaboration and allows access to an electronic catalog of products for approximately 22,000 dial-up users. VHA
members purchase more than $8 billion in products annually under contracts from 350 suppliers.

Initial use of **VHA.com** was for access to VHA health-care organizations and the Internet. Since 2000, VHA members have been able to buy and sell merchandise and offer a wide range of medical, legal, and pharmaceutical research capabilities. The extranet allows all VHA members to purchase directly from suppliers.

**VHA.com** enables all VHA members to exchange information through a ubiquitous, secure environment. VHA chose IBM as its ISP because of its experience with data networking. Security is a particularly important issue because of the sensitive nature of clinical information. Hospitals, clinics, home health companies, and managed care facilities in numerous locations are involved, and patient information must remain private.

**CSX TECHNOLOGY TRACKS SHIPPING STATUS**

In 1996, CSX Technology, a railroad company, developed a highly publicized intranet for tracking cross-country train shipments from point to point. The company expanded this intranet to an extranet, named TWSNet Premium, which links more than 200 freight shippers and forwarders. The extranet allows CSX customers to track shipments, initiate work orders, and view pricing data over the Internet. TWSNet Premium includes large suppliers of transportation services such as railroads, trucks, container ships, and barges.

TWSNet Premium is also open to non-CSX customers who require Web-based solutions for managing inbound shipping or outbound delivery information as part of their supply chain management. The extranet allows tracking of shipments to the line-item level, simplifying identification of bottlenecks or problems. A global reporting system analyzes carrier performance and trends. It also allows users to perform precise demand forecasting, while a special programming interface enables integration with legacy systems.

For additional applications, see Riggins and Rhee (2000).

**REFERENCE**