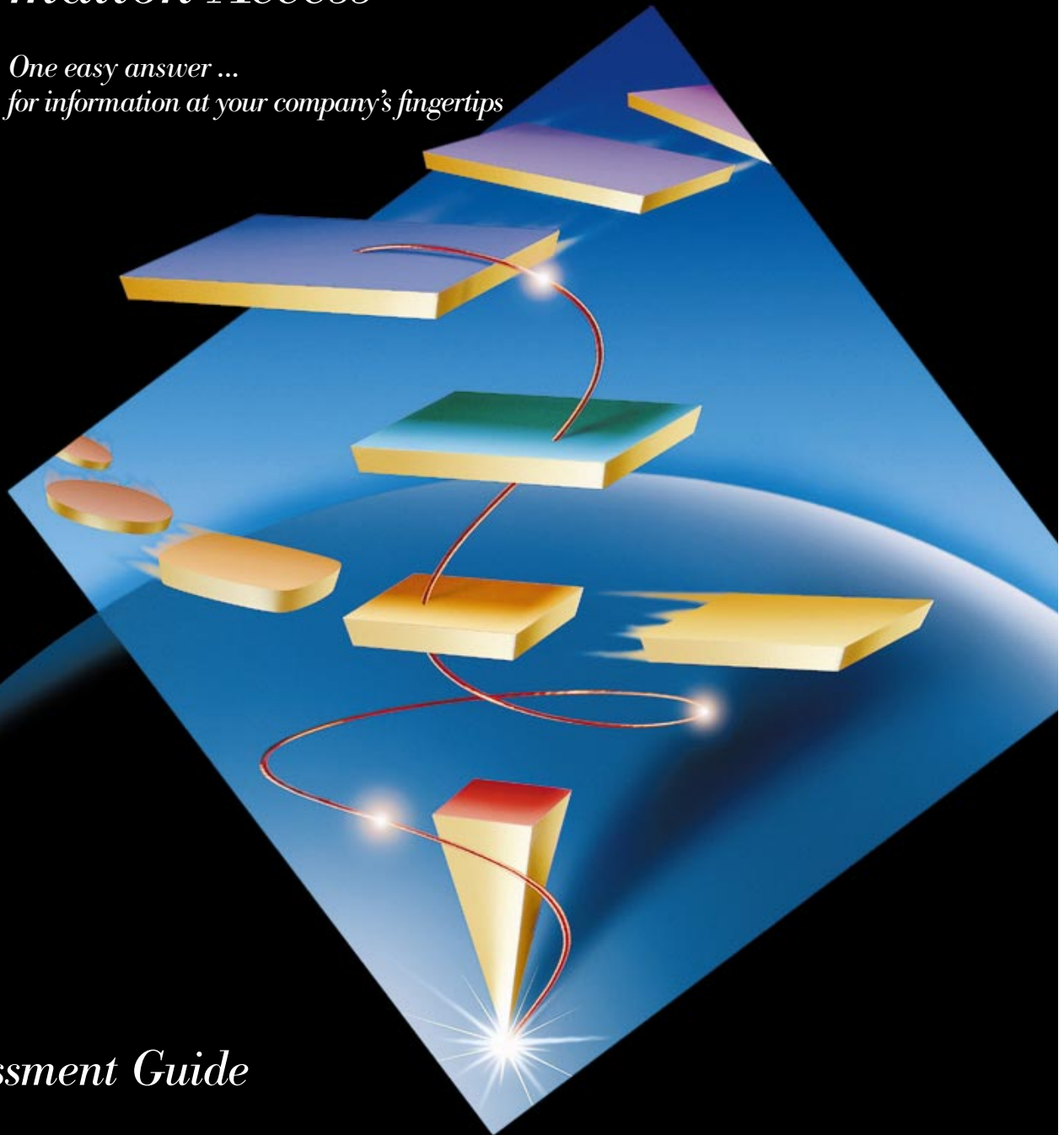


IBM eNetwork™ Software



Solutions for Any-to-Any Information Access

*One easy answer ...
for information at your company's fingertips*



Assessment Guide

Introduction

Knowledge is power, as the saying goes. And, if it's at the fingertips of people who need it, when they need it, where they need it, knowledge is productivity. In this era of widespread information and advanced communication, all that's needed to provide fingertip access is "a way to get there from here."

That's where IBM's any-to-any solutions come in. They provide a capability for information access from anywhere, to anywhere, for many network environments.

This guide provides a conceptual understanding of IBM any-to-any solutions. The guide also describes and illustrates typical uses of the solutions to solve various customer problems. The guide includes feature and function descriptions, cost/benefit estimates, and competitive information. It provides the facts and figures that will help to engineer solutions, quantify benefits, and respond to competition.

Because this guide addresses new and exciting trends in information access, it provides fresh insights into customer requirements and solution opportunities.

This document contains hypothetical estimates of the potential cost savings to a business enterprise resulting from the proper use of certain IBM software. It is not a promise or guarantee on the part of IBM that any associated savings will result. The hypothetical estimates are based on assumed costs and/or business practices for "average" businesses, and assume proper installation, use, and maintenance of IBM software, and do not take into account potential negative interaction with hardware or software provided from non-IBM sources, or different personnel costs and needs.

Customers or potential customers of IBM should perform an independent estimate of the potential costs and savings to their enterprises which might result from implementation of IBM software or an IBM solution and should not rely on anything in these business cases as a guarantee of performance or costs/savings. IBM representatives who deal with customers should not use these charts to make any performance or savings promise or guarantee, and should provide each customer with whom these charts are discussed with the assumptions underlying such IBM estimates.

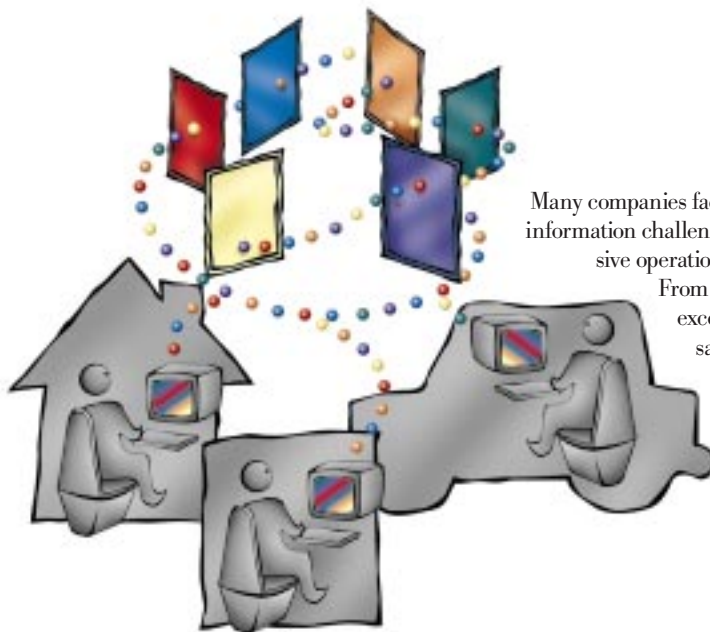
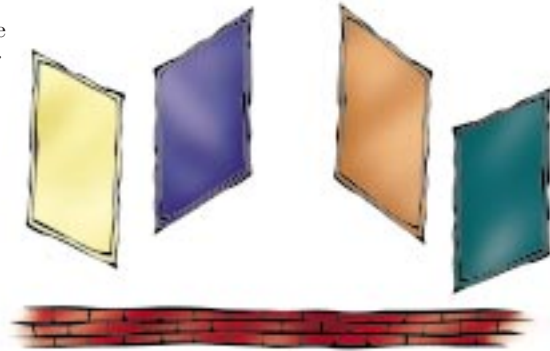
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The conceptual view

Despite a decade of efforts to streamline operations, cut costs, and improve productivity, today's businesses continue to face serious challenges to their competitiveness. Many challenges arise from the need to put up-to-date, accurate information in the hands of employees who need it to be effective in their jobs. Several changes to traditional business operations have elevated this need to a high-priority problem.

First, much of the information that needs to be accessed is often outside the control of the businesses that need it. For example, some information is available on the Internet, while other information is managed and made available by proprietary software applications. Second, information that is controlled by a business may exist in different types of networks. This situation most often results from the coexistence of familiar and new applications, but it can also be the result of, for example, mergers and acquisitions, or the consolidation of previously separate organizations in an enterprise. Third, usually the information is needed much more quickly than was necessary in the past, because information is now on the critical path of a business' responsiveness to its customers, vendors, partners, and suppliers. And fourth, employees are no longer considered to be stationary, single-purpose adjuncts to a business information systems environment. Indeed, employees are now expected to be highly versatile contributors to the success of a business, drawing upon multiple information resources from multiple locations, both on company premises and off.



Many companies face costly problems because of an inability to meet today's information challenges. Typical problems from a business perspective are excessive operational and administrative costs, as well as productivity impacts. From an information technology perspective, the problems are excessive operational costs, sub-par service levels, and poor user satisfaction.

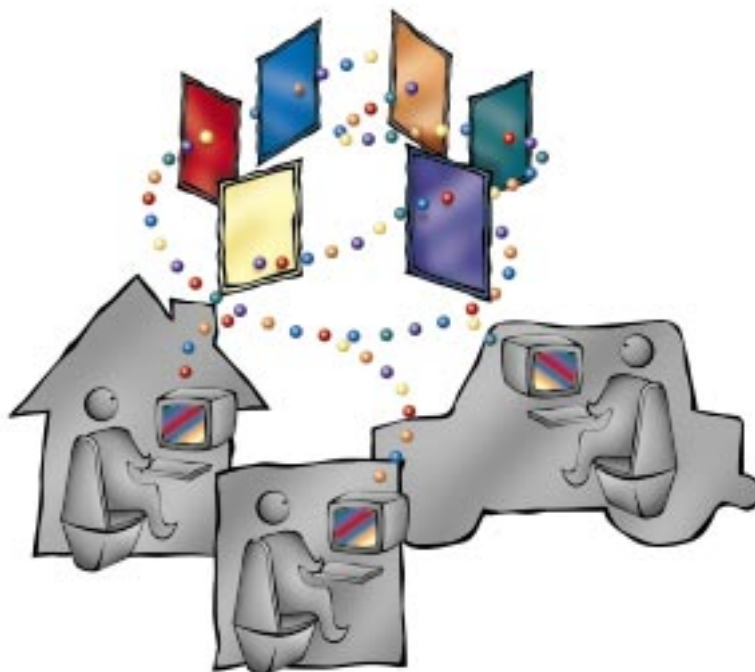
IBM provides a comprehensive solution to the information access needs of enterprises, organizations, or institutions whose dependency on up-to-date information when it's needed, where it's needed, and by whom it's needed, is paramount.

The IBM eNetwork Software solutions for any-to-any information access address the connectivity aspects of universal communication requirements. These requirements arise from the rapidly growing use of network computing to achieve maximum commercial success. Enterprises that need to connect their customers, partners, vendors, suppliers, and employees to any source of information in the world can rely on IBM to have the products to do the job. It doesn't matter what types of networks are involved in network computing, because wherever there is a need for information, and no matter where that information is, IBM any-to-any information access solutions will make the connection between them.

The key components of IBM eNetwork Software solutions for any-to-any information access include:

- Communications Server functions
- Communication over wireless networks
- Desktop clients and emulation
- Groupware applications
- World Wide Web (WWW) and Internet access

Make the most of this information era by providing employees the information content and collaboration tools they need to achieve new heights in the world of commerce. When the right information is put at the fingertips of those who can turn it into profits, success is inevitable. IBM's any-to-any solutions make it happen.



Customer scenarios

In the sections that follow, you'll find four hypothetical scenarios that will help you understand how IBM eNetwork Software solutions for any-to-any information access can help move your business forward. These particular scenarios were chosen for their broad applicability across industries. Each scenario includes:

- The critical business issues faced by a specific department or division
- A description of the networking environment, including a diagram of the solution that resolved the customer's problems
- A cost/benefit estimate worksheet, showing the approximate cost of the solution compared to an estimate of the cost savings, productivity gains, or other benefits derived

Regardless of your business, you should be able to relate the general requirements, configurations, and cost/benefit estimate worksheets to your own environment.

... *people left out in the cold*

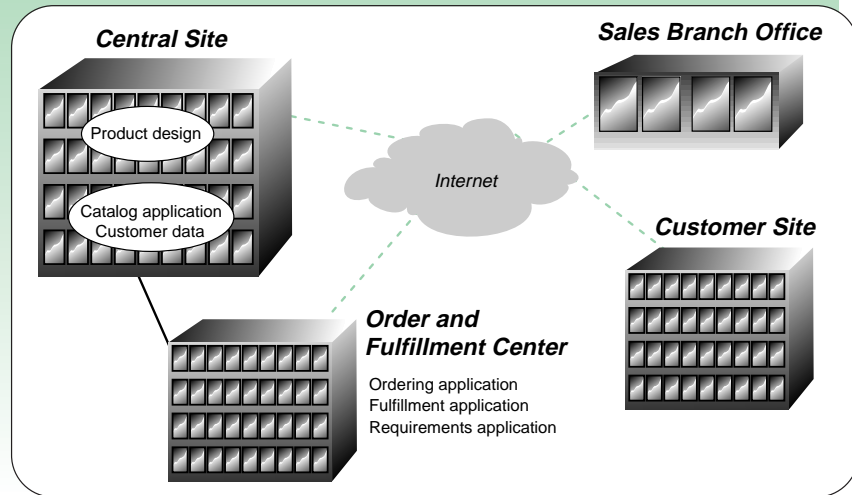
We learned the hard way that speeding up the product design cycle isn't the only thing that's required to meet the competition head-on!

– Vice President of Sales

Sales were slumping badly in the face of fierce competition for this producer of industrial heating and cooling systems. The products were good, the sales people were good, but the market had begun moving so fast that the sales force, order processing, and product designers seemed unable to coordinate their efforts.

Last year the Vice President of Sales had provided incentives to the inside- and outside-sales representatives for collecting customer requirements that would help improve the company's product line. Thanks to that effort, the product designers were now making changes that resulted in impressive new features being added to nearly every model each month. Rather than impressing customers with these new features, the outside-sales force now appeared uneducated about the very product lines they had positively influenced. Although product catalogs were printed quarterly, they still did not reflect the availability of the rapidly emerging new features. Inside-sales agents who handled direct sales of the product and also placed the outside-sales representatives' phone orders had easy access to the up-to-date online catalog. But the outside-sales representatives who sold equipment to the largest accounts – where new features were in greatest demand – had no way of checking the availability of requested features from a customer site. Both the inside- and outside-sales agents also complained about the mistakes and delays introduced by having orders and new product requirements pass through an intermediate party before being processed. Ready availability of competitive products meant that customers often canceled orders if an error or delay occurred.

Sales solution



The outside-sales force already had Internet access to support e-mail with customers and product designers, to learn more about their customers' businesses, and to investigate competitive products. Ironically, the outside-sales representatives even had online access to information about a key competitor's major product line, but didn't have similar up-to-date information about their own product lines. More competition in the marketplace meant that long-standing organizational boundaries must be eroded – but at what cost? The disparity between the networks used to support the 37 sales branch offices and the corporate network seemed to be the crux of the corporate communication problem. Would it require a major network overhaul, large increases in line costs, or costly rewrites to the corporate applications?

Within two months this company's crucial business need for comprehensive any-to-any connectivity had been resolved. Every outside-sales representative had received essential application training and access. Using a ThinkPad in the office or on location, any representative can view historical records of a customer's equipment purchases, see exactly what products are available using the online catalog, place an online order or get an estimated fulfillment date, and provide detailed information when submitting new product requirements. After only six months, the difference in sales efficiency and in order accuracy had noticeably affected the company's bottom line.

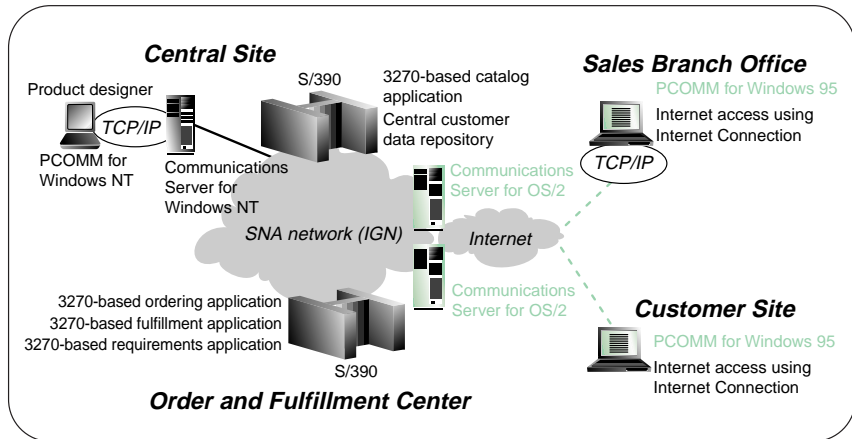
With the simple installation of new client software on their ThinkPads and installation of Communications Servers, the sales representatives became active participants in the corporate network.

Previous environment

- The company's SNA backbone network, connecting the central site to the remote order and fulfillment center, is provided by IBM Global Network (IGN). The applications at the central site and at the fulfillment center are 3270-based applications. Product designers are on a TCP/IP network, but are able to access all S/390 applications through the Communications Server for Windows NT.
- The 37 sales branch offices use TCP/IP LANs to let representatives share and coordinate information about regional customer contacts and follow-ups. The representatives use IBM ThinkPads whether in the office or on the road to keep the branch's contact-management records current. They use IBM Internet Connection for Internet access to obtain up-to-date information about their competition and to enable corporate e-mail communication.
- Branch offices normally communicate with other groups in the company using the telephone. Outside-sales representative make inquiries about customer history and place their orders by calling an inside-sales representative at the order and fulfillment center.

Customer requirements

- Support 370 outside-sales representatives with branch office and mobile access to the applications that provide the latest catalog of products and information about previous customer purchases.
- Provide the outside-sales representatives with the capability to perform their own order-entry and tracking.
- Improve the quality and speed of the product requirements process by providing outside-sales representatives access



The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2 systems. IBM eNetwork Software clients are available for Windows NT, Windows 95, Windows 3.1, and OS/2 systems. See page 16 for more specific information.

- to the product requirements application. (Additional requirement details are currently being obtained by follow-up e-mail correspondence between the representatives and the product designers.)
- Provide a scalable and secure solution that can be deployed across the entire enterprise.

Solution

- Give outside-sales representatives the ability to use 3270-based applications by installing Personal Communications AS/400 and 3270 (PCOMM) for Windows 95 on their ThinkPads.
- Install a Communications Servers for OS/2 at the central site and at the order and fulfillment center to provide the TN3270E support that lets outside-sales representatives access the needed corporate applications.
- Provide secure access to applications using the existing corporate backbone network and IBM Internet Connection to attach to that backbone network. Local calls from nearby customer sites will provide representatives access to the applications; toll-free access is available at hourly rates for remote customers sites.

Major advantages

- Efficient use of existing equipment and networks in branch offices
No hardware upgrades or network changes were required in the branch office. PCOMM was installed to provide transparent access to existing S/390 corporate applications in another type of network.
- Efficient use of existing business applications
Using Internet connectivity with which they were already familiar, the sales representatives now use PCOMM to access the existing corporate network and applications they need to make them more effective.
- Easy-to-use interface to corporate applications
PCOMM provides an easy-to-use interface to 3270-based applications that requires little or no training.
- Cost savings
See the Cost/benefit estimate on the next page!

Cost/benefit estimate¹

The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2, and clients for Windows 3.1, Windows NT, Windows 95, and OS/2. Although products may be substituted based on operating system preference, prices may vary.

The benefits and implementation costs² associated with this scenario are defined below. The savings associated with the benefits were calculated for a two-year period, although the benefits and this implementation will endure far beyond that period of time. This estimate does not include the costs or the savings associated with document conversion, network integration, line costs, or maintenance.

Total benefits savings	\$13,430,000
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- Increased productivity
While the sales representatives could conceivably make additional calls now, the number of calls did not seem to increase significantly. Rather, the agents spent more time on calls that were resulting in actual orders.
(See projected revenue benefits.)
- Projected revenue benefits7,400,000
Closure rate on outside sales increased resulting in 2 percent increase in revenue
 $2 \text{ percent} \times \$185,000,000 \text{ per year} \times 2 \text{ years} = \$740,000$
- Other benefits6,030,000
Recovery of 50 percent of forfeited revenue resulting from customers' cancellation of inaccurate orders
 $50 \text{ percent} \times \$6,000,000 \text{ forfeited revenue/year} \times 2 \text{ years} = \$6,000,000$
Savings from printing catalogs on annual, rather than quarterly, basis
 $3 \text{ quarterly catalogs/year} \times \$5,000 \text{ per catalog} \times 2 \text{ years} = \$30,000$

Total implementation costs	\$417,208
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- Hardware implementation costs20,000
Two OS/2 Warp Servers
 $2 \times \$10,000 = \$20,000$
- Software implementation costs³104,648
Two Communications Servers for OS/2
 $\$699 + (\$669 \times 1 \text{ additional server}) = \$1,368$
PCOMM for Windows 95 on 370 sales representatives' ThinkPads
 $\$329 + (\$279 \times 369) = \$103,280$
- Other implementation costs292,560
Increased ISP costs to cover occasional toll-free access needs from customer sites in remote areas
 $\$6/\text{hour} \times 2 \text{ hours/month} \times 24 \text{ months} \times 370 \text{ representatives} = \$106,560$
Application training costs for sales representatives
 $8 \text{ hours/representative} \times \$37.50/\text{hour} \times 370 \text{ representatives} + \$75,000 \text{ instructor and travel fees} = \$186,000$

Savings (Benefits - Implementation Costs) =	\$13,012,792
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¹ This estimate is hypothetical and based on assumed IT and personnel costs and needs, which may be different for each customer. Each potential customer should perform an independent estimate of the costs and benefits for any particular installation. This is not a promise or guarantee of costs or savings for any particular business and should not be so construed.

² All figures provided in this estimate are in U.S. dollars.

³ The IBM Software Advantage Program for Workstations can be applied to this purchase. Discounts of up to 55 percent are available. Contact your IBM sales representative or reseller for more information.

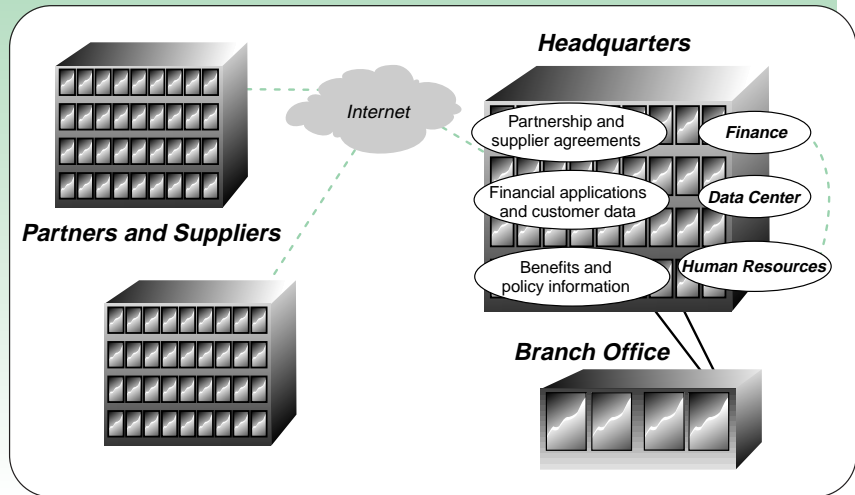
... knowledge, knowledge everywhere, but mostly out of reach

While our staff managed to drive effective branch banking implementations, we seemed to be doing too little, too late, and with too much expense in our headquarters operations.

– Chief Financial Officer

The Chief Financial Officer of this bank was concerned not so much about information technology costs for branch operations, but about the inefficiencies within the headquarters organization itself. The information technology (IT) budget that supported the 200 headquarters employees continued to grow, but the bank's standing slipped against the competition. The problem stemmed from its inability to effectively use or apply information that was already available within the company or from public sources.

It seemed odd that the same building that housed the data center also housed more information access problems than any other part of the bank's operations. Problems that had already been solved for the branch offices remained problems within the central location. For example, the finance groups still depended on printed editions of corporate policy and employee benefits programs, although the Human Resources department had developed an intranet to make that information accessible to 500 branch locations six months ago. In addition, there was another funding request from one financial department for creating a separate intranet to promote the internal and external collaboration that would support rapid development of new partnership and supplier agreements. And a different financial department, responsible for competitive surveillance, had requested Internet access.



Anxious to find a solution that would solve his organization's needs but control the long-term spending, the CFO wondered if he would have to revoke some of the autonomy he had granted the different departments. Was it that autonomy that was causing information access problems to be addressed in an unplanned and wasteful manner? The CFO called in the IT team which had designed quick, but long-lasting branch office solutions for the bank. What he needed was a way to put business-critical information at the very fingertips of anyone and everyone in headquarters. The necessary information would include internal data sources as well as any relevant external source. And the solution must work no matter what networks had to be traversed to get employees the knowledge they required.

When the IBM any-to-any solution was implemented, employees, working faster and more effectively with the best and latest information, began to deliver important cost reductions in all areas of the bank's operations and administration. The bank now formed essential partnerships more quickly, and shopped more efficiently for its supplies. While the short-term result was a reduction in headquarters' IT expenses, the long-term result would be the development and implementation of a new range of services to all the bank's customers – results that would make any CFO smile.

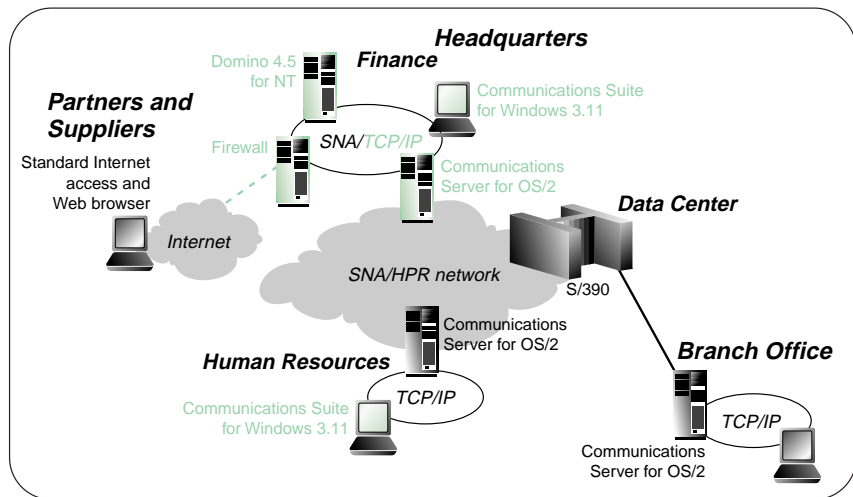
This any-to-any solution was achieved by giving employees at headquarters the versatile Communications Suite and by providing additional servers to support Internet and intranet access.

Previous environment

- An SNA/High-Performance Routing (HPR) backbone network provides access to core banking and financial applications.
- Financial specialists who establish bank partnerships and supplier agreements use applications on their SNA LAN for internal document collaboration.
- Human resources personnel are on a TCP/IP LAN, and most daily activities revolve around the departmental intranet. Occasional access to SNA-based applications is supported by the Communications Server for OS/2.
- Branch offices rely on Communications Servers to provide SNA connectivity to S/390 banking applications, as well as a gateway to the Human Resources intranet that provides corporate policy and benefits information.

Customer requirements

- Provide all headquarters employees access to the Internet and to the Human Resources intranet that provides corporate policy and employee benefits information.
- Provide consistent e-mail support for all headquarters employees to facilitate internal and external communication.
- Expedite the creation of new services by providing potential partners and suppliers with the ability to review agreements online.
- Employee access to applications and data must be quick and easy and independent of the different systems and networks that must be traversed – now or in the future.



The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2 systems. IBM eNetwork Software clients are available for Windows NT, Windows 95, Windows 3.1, and OS/2 systems. See page 16 for more specific information.

Solution

- Upgrade every headquarters employee's desktop by installing Communications Suite for Windows 3.11 to support Internet and intranet access and to provide consistent e-mail support using Lotus Notes Mail.
- Install Domino 4.5 for NT for Finance, enabling it to become the vehicle for internal and external collaboration on partnership agreements as well as the server supporting Lotus Notes Mail for all headquarters employees. Install Communications Server for OS/2 on the SNA LAN in Finance to support TCP/IP communication.
- Install a firewall to support secure partner and supplier access to the new intranet and to provide secure employee access to the Internet.

Major advantages

- Single client solution
A single Communications Suite client provides headquarters personnel access to existing and new applications with familiar interfaces and allows the IT staff to support a single solution in a diversified environment.
- Scalable solution
This solution supports the simple addition of more clients, as well as the addition of new SNA or TCP/IP applications.
- Cost savings
See the Cost/benefit estimate on the next page!

Cost/benefit estimate¹

The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2, and clients for Windows 3.1, Windows NT, Windows 95, and OS/2. Although products may be substituted based on operating system preference, prices may vary.

The benefits and implementation costs² associated with this scenario are defined below. The savings associated with the benefits were calculated for a two-year period, although the benefits and this implementation will endure far beyond that period of time. This estimate does not include the costs or the savings associated with network integration, line costs, document conversion, training, or maintenance.

Total benefits savings	\$4,001,920
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- Increased productivity
Savings from providing Internet access not readily quantifiable, but expected to be a contributing factor in obtaining the additional revenue from partner services.
(See projected revenue benefits.)
- Projected revenue benefits 4,000,000
2 percent and 5 percent annual increase in services revenue from earlier implementation of services through partnership formation
(2 percent x \$50,000,000 first year) + (5 percent x \$60,000,000 second year) = \$4,000,000
- Other benefits 1,920
Document distribution savings from online access to policy and benefit information
\$0.04/page x 150 pages/employee/year x 160 employees x 2 years = \$1,920

Total implementation costs	\$115,024
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- Hardware implementation costs 70,000
Windows NT server for Web server
1 x \$10,000 = \$10,000
OS/2 Warp Server
1 x \$10,000 = \$10,000
Firewall server, including operating system
1 x \$50,000 = \$50,000
- Software implementation costs³ 45,024
Communications Suite for Windows 3.11 upgrade for 200 desktops
\$199 base + (199 x \$169) = \$33,830
Domino 4.5 for NT to create a Web server
1 x \$495 = \$495
Communications Server for OS/2
1 x \$699 = \$699
Firewall
1 x \$10,000 = \$10,000
- Other implementation costs _____

Savings (Benefits – Implementation Costs) =	\$3,886,896
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¹ This estimate is hypothetical and based on assumed IT and personnel costs and needs, which may be different for each customer. Each potential customer should perform an independent estimate of the costs and benefits for any particular installation. This is not a promise or guarantee of costs or savings for any particular business and should not be so construed.

² All figures provided in this estimate are in U.S. dollars.

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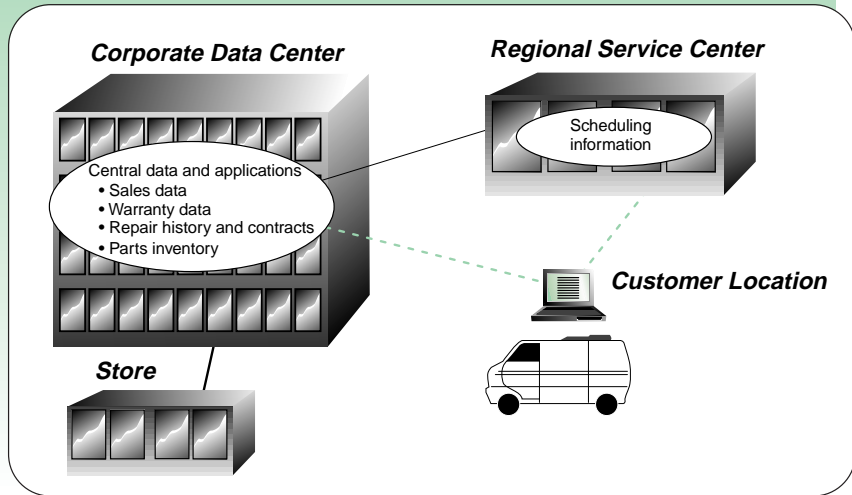
... *the more you know, the more you grow*

Sometimes adversity means it's time to take a big step forward. But this big step was not painful, and it put us several paces ahead of our competitors.

- Regional Director of Service

Customer surveys indicated that this major appliance retailer's lagging sales were not a result of the product lines they provided their customers. Nor was the problem in showroom appearance, in the sales staff, or in product pricing. Customers were pointing their fingers at disappointing service after the sale. Indeed, it was smaller companies, with a smaller product line but more timely service, that seemed to be picking up the company's eroding market share. The company had experienced rapid growth, having found a niche in providing a diverse product line at very economical prices. Having expanded to sixty stores and five regional service centers, the company needed to quickly address its recent slip in consumer popularity.

The company's board of directors had issued an ultimatum demanding that each Regional Director of Service shape up his or her staff. The Regional Director of Service with the worst regional survey results used focus groups to determine that the problem was not the repair representatives' expertise or training, but simply the inability to be in touch with information about parts availability, warranties, maintenance contracts, and emergency customer service calls. This problem was compounded by an inconvenient ordering process. Repair personnel picked up daily schedules each morning and depended on supervisors at the regional office to perform much of the parts ordering, warranty validation, and maintenance contract verification at the beginning or the end of the day. The focus groups also revealed that customers



were annoyed by lengthy use of their personal phone service when a repair representative tried to expedite the process by contacting the regional service center while on a customer's premises. Rather than propose a simple cellular phone service solution, the director requested a wireless solution that would give the repair representatives *direct* access to the applications and data they needed *when* they needed it. The board of directors authorized a pilot program for that regional office.

Soon after this IBM eNetwork Software solution for any-to-any information access was implemented, the repair representatives began to make one-visit repair calls with greater frequency. Supervisors, relieved of their ordering and validation responsibilities, could focus on responding to emergency customer calls by quickly revising nearby repair representatives schedules. A regional advertising campaign that focused on the customer service improvements, along with word-of-mouth advertising from many newly satisfied customers, helped reverse the sales slump less than a year after it began. The pilot program was a success, and implementation for all the regional centers was planned. With this new information edge over its competitors, the company saw the resurgence of growth it so sorely needed. The new growth augured well for increased dividends, new investors, and reestablishment of the company as a major competitor in its field.

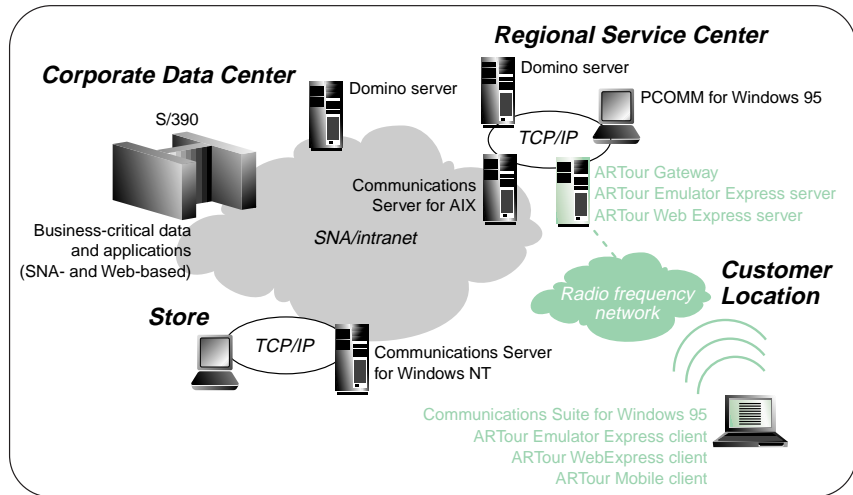
A wireless solution for any-to-any information access enhanced one regional service center's image with customers and paved the way for improving the company's overall image in the marketplace.

Previous environment

- The data center is primarily an SNA network, where core business applications and databases contain sales data, warranty data, maintenance contracts, and customer purchase and repair history. Some applications at the data center, including the parts ordering and inventory applications, are Web-based and supported by the corporate intranet.
- A Domino server at the main site is used to synchronize and mirror service-related information from 60 stores and the 5 regional service centers. Domino servers in the regional service centers are used in preparing daily schedules.
- The pilot program regional service has approximately 45 repair representatives who obtain daily schedules each morning from a supervisor. They depend on their supervisors or other service center personnel to perform warranty validation, parts ordering, and more on their behalf.
- The on-site staff in the regional service centers uses PCOMM, a Domino server, and Communications Server for AIX to access critical local and corporate information sources.

Customer requirements

- Allow repair personnel to directly access the information they need – without contacting an intermediate party at the service center and without imposition to the customer for phone access.
- Allow immediate reprioritization of service calls to handle customer emergencies.
- Reduce inaccuracies and omissions caused by use of handwritten records, miscommunication with intermediate parties, and lack of up-to-date record keeping.



The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2 systems. IBM eNetwork Software clients are available for Windows NT, Windows 95, Windows 3.1, and OS/2 systems. The ARTour products will include the AIX Gateway, Emulator Express and Web Express servers for Windows NT, AIX, and OS/2, and clients for Windows 3.1, Windows 95, Windows NT, and OS/2. See page 16 for more specific information regarding availability.

Solution

- Provide each repair representative with an IBM ThinkPad with a wireless modem and access to a wireless network, ARTour Mobile client, ARTour Web Express client, ARTour Emulator Express client, and Communications Suite.
- Install an RS/6000 with ARTour Gateway, ARTour Emulator Express server, and ARTour Web Express server to support the repair representatives. Use the existing Communications Server for AIX in the regional service center to support access to the SNA applications and data needed by the repair representatives.

Major advantages

- Faster and more effective repairs
Repairs are made faster and with fewer visits because service personnel have access to the corporate network. Time and transportation costs are saved when the service people access their electronic messages and mail to manage normal and emergency service calls.
- Minimal impact to the network
No changes are required to the service applications, management applications or the corporate network, because ARTour product line optimizes their existing applications.
- Cost savings
See the Cost/benefit estimate on the next page!

Cost/benefit estimate¹

The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2, and clients for Windows 3.1, Windows NT, Windows 95, and OS/2. The ARTour products will include the AIX Gateway, Emulator Express and Web Express servers for Windows NT, AIX, and OS/2, and clients for Windows 3.1, Windows 95, Windows NT, and OS/2. Although products may be substituted based on operating system preference, prices may vary.

The benefits and implementation costs² associated with this scenario are defined below. The savings associated with the benefits were calculated for a two-year period, although the benefits and this implementation will endure far beyond that period of time. This estimate does not include the costs or the savings associated with network integration or maintenance.

Total benefits savings	\$1,350,000
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- Increased productivity
 Support by existing supervisory and administrative personnel for additional volume caused by increased sales because they no longer act as intermediaries in repair personnel transactions
No additional personnel = \$0
- Projected revenue benefits 1,350,000
 Increased sales during second year in stores supported by this regional service center result in 6 percent increase in revenue.
6 percent x \$22,500,000 revenue = \$1,350,000
- Other benefits

Total implementation costs	\$361,716
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- Hardware implementation costs 141,500
 ThinkPads with wireless modems for repair representatives
45 x (\$2,000 + \$700) = \$121,500
 RS/6000 for ARTour Gateway, ARTour Emulator Express server, and ARTour Web Express server
1 x \$20,000 = \$20,000
- Software implementation costs³ 69,736
 ARTour Gateway with 45 client access and clients
(1 x \$15,000) + (45 x \$159) + (45 x \$30) = \$23,505
 ARTour Emulator Express server with 45 clients
(1 x \$5,000) + (45 x \$249) = \$16,205
 ARTour Web Express server with 45 client access and clients
(1 x \$3,000) + (45 x \$109) + (45 x \$30) = \$9,255
 SNA Client Access on Communications Server for AIX to support up to 45 additional concurrent users
\$395 base + (45 x \$59) = \$3,050
 Communications Suite for 45 repair representatives
\$449 base + (4 x \$3,899/ ten pack) + (4 x \$419/one pack) = \$17,721
- Other implementation costs 150,480
 Wireless access costs
\$1,200 leased line setup + (\$1,595/month for line and modem x 24 months) + (\$50/month air time x 45 x 24 months) = \$93,480
 Application training costs for repair representatives
16 hours/representative x \$37.50/hour x 45 representatives + \$30,000 instructor and travel fees = \$57,000

Savings (Benefits – Implementation Costs) =	\$988,284
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¹ This estimate is hypothetical and based on assumed IT and personnel costs and needs, which may be different for each customer. Each potential customer should perform an independent estimate of the costs and benefits for any particular installation. This is not a promise or guarantee of costs or savings for any particular business and should not be so construed.

² All figures provided in this estimate are in U.S. dollars.

³ The IBM Software Advantage Program for Workstations can be applied to this purchase. Discounts of up to 55 percent are available. Contact your IBM sales representative or reseller for more information.

... a WAN for all reasons

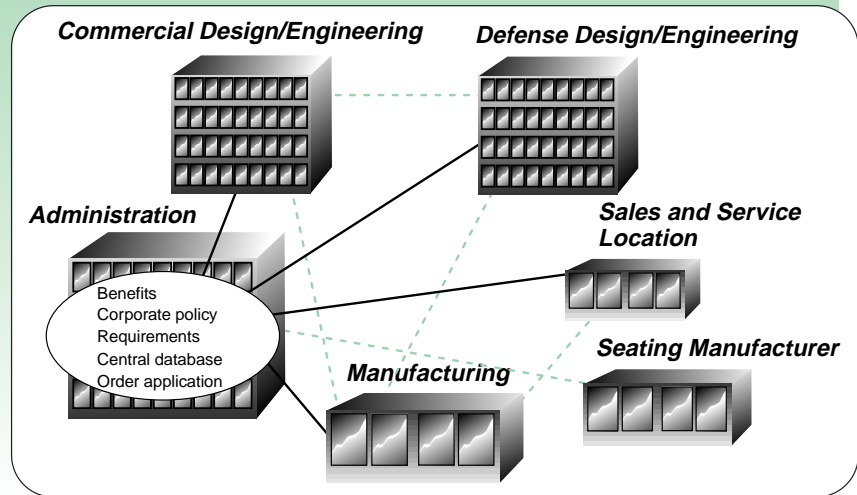
We were battling with several divisions who thought that the corporate backbone network needed to be overhauled to achieve our CEO's mandates. But we listened to their concerns and provided the interfaces and applications they needed using our existing networks!

– Vice President, Information Technology

From the perspective of the IT vice president of this aircraft manufacturer, the tables suddenly had turned. The previous CEO had encouraged the separate divisions to explore new ways of doing things, and challenged IT to support them in their application and network needs. IT had experienced a long, hard struggle keeping up with the diverse and independent demands of each division. They were proud of their achievements, and the divisions had generally been satisfied with their support.

Within three months of his arrival, the new CEO had completed his assessment of the business. The autonomy that had been granted to the divisions had helped them advance, each in their own way. For example, when the company had expanded to produce defense aircraft, the newly-formed Defense Design/Engineering division was permitted to select and use totally different applications to develop its designs. That flexibility had led to key advances in wing design. But the new CEO had a vision of *integrating* the independent advances to help the company leap ahead of its competition – in the defense and commercial markets. The CEO believed that the autonomy had outlived its initial value. He observed that none of the divisions were effectively using applications and information that resided in other divisions.

Information technology solution



The CEO had challenged the company to introduce the next commercial aircraft and defense product lines three months earlier than the current plan. To do this, the designers in the two divisions would need to share applications, proprietary technology, and designs. Engineers would need a way to transfer the proprietary designs into production at the remote manufacturing site without having to travel to the remote site and temporarily relocate key staff members. The CEO already instructed the sales staff to solicit future orders consistent with the accelerated schedule. Manufacturing had been told to outsource the seat manufacturing to accelerate production. The IT mandate was simple: support everyone getting to any information or application that they needed to meet the new schedules. New policies and improved employee benefits were being provided as an incentive to meet the new corporate objectives. Still more information that everyone would be demanding to see!

The immediate reaction of each division was to clamor for the rest of the corporate network to conform to meet its needs. But the IT staff knew that any massive network overhaul would delay rather than accelerate schedules. A quick but careful evaluation of the existing network showed that most of the needed infrastructure was already in place. The real challenge was to provide each division easy access

to old and new information, with special attention to user-preferred interfaces. With an IBM any-to-any information access solution, the IT vice president was able to respond to that challenge. More importantly, the company launched two new product lines four (not three!) months earlier than the original plan.

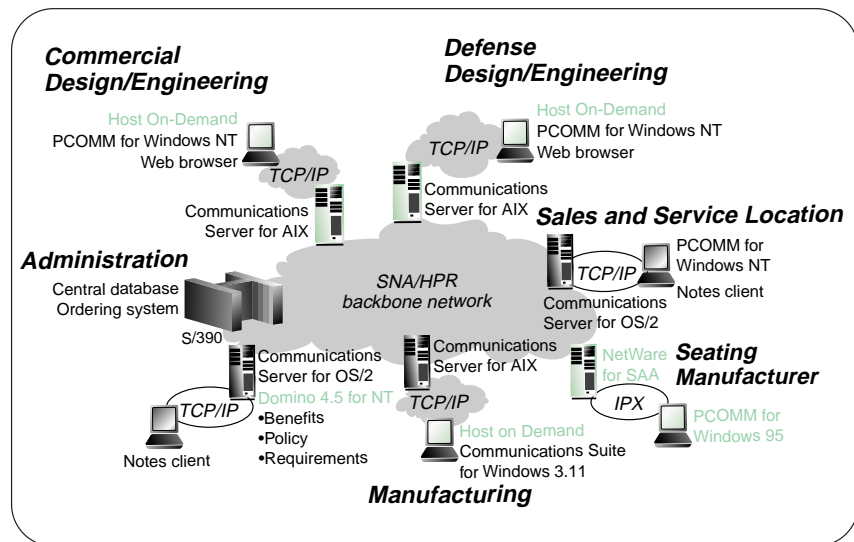
The broad range of capabilities of the communications servers and diverse client support enabled all employees to access new and existing information using preferred interfaces. Internetworking was possible using the same infrastructure that supported access to the central applications and data.

Previous environment

- An SNA/HPR backbone network provides access to core business-critical applications and data.
- Commercial Design/Engineering, Defense Design/Engineering, and Manufacturing sites are supported by relatively autonomous TCP/IP networks. Sales and Service locations are relatively small and are supported by TCP/IP LANs.
- Each separate corporate entity that relies on TCP/IP is supported by a Communications Server to facilitate access to business-critical 3270-based applications. Passing proprietary designs over the Internet is not permitted.
- Benefits, corporate policy, and product requirement information resides on a Domino server at the central site. Employees in Design/Engineering groups and Manufacturing have access to this information, but have not used this information frequently because of their preference for Web-based interfaces.

Customer requirements

- Provide 2000 engineers and 2000 manufacturing employees access to benefit, policy, and requirements information using the Web-based interfaces they prefer. In addition, provide these same employees access to business-critical 3270-based applications using a Web browser.
- Provide secure sharing of applications and design information between the two different Design/Engineering groups. Support the secure sharing of completed designs with Manufacturing to speed the production start date.



The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2 systems. IBM eNetwork Software clients are available for Windows NT, Windows 95, Windows 3.1, and OS/2 systems. See page 16 for more specific information.

- Provide sales representatives in 20 locations the ability to access Manufacturing's production applications to obtain detailed information about aircraft production schedules.
- Integrate the external seating manufacturer into the production process by providing secure access to the 3270-based order application.

Solution

- Upgrade Administration's Domino server to Domino 4.5 for NT to instantaneously create a Web server.
- Install Host On-Demand on the three Communications Servers for AIX that support Manufacturing and the two Design/Engineering groups so that engineers and manufacturing employees can access 3270-based applications using their Java-enabled Web browsers.
- Increase the number of sessions on the Communications Server for AIX in Manufacturing to support additional communication with Design/Engineering and Sales and Service locations. Increase the number of sessions that are supported by the Communications Servers for AIX in Design/Engineering groups to support application sharing and interaction with Manufacturing.

- Install a NetWare for SAA server to enable the new seating manufacturing subcontractor to access the 3270-based order processing application. (The seating manufacturer will install PCOMM for Windows 95 for client support.)

Major advantages

- Single corporate backbone
By using the existing SNA/HPR backbone, IT can support and manage the entire secure corporate network using the NetView program.
- Support for existing and new applications
This network allows easy growth by supporting the existing 3270 applications and newer TCP/IP-based applications.
- User-preferred interfaces
Users in various groups have been provided more than simple information access; they have been provided the interface of choice!
- Cost savings
See the Cost/benefit estimate on the next page!

Cost/benefit estimate¹

The IBM eNetwork Software product line includes communications servers for Windows NT, NetWare, AIX, OS/390, and OS/2, and clients for Windows 3.1, Windows NT, Windows 95, and OS/2. Although products may be substituted based on operating system preference, prices may vary.

The benefits and implementation costs² associated with this scenario are defined below. The savings associated with the benefits were calculated for a two-year period, although the benefits and this implementation will endure far beyond that period of time. This estimate does not include the costs or the savings associated with document conversion, network integration, line costs, or maintenance.

Total benefits savings	\$8,064,350
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- Increased productivity64,350
 50 percent reduction in phone calls to benefits and human resources coordinators regarding policy changes
 $250 \text{ calls/week} \times 50 \text{ percent} \times 0.25 \text{ hours/call} \times \$15/\text{hour} \times 104 \text{ weeks} = \$48,750$
 Administrative overhead avoidance by easy integration of seating manufacturer into existing order process
 $10 \text{ hours/week} \times \$15/\text{hour} \times 104 \text{ weeks} = \$15,600$
- Projected revenue benefits8,000,000
 Four months additional profit for two different aircraft
 $10 \text{ orders/month} \times 4 \text{ months} \times \$200,000 \text{ average profit/aircraft} = \$8,000,000$
- Other benefits

Total implementation costs	\$36,260
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- Hardware implementation costs10,000
 Novell server to support seating manufacturer
 $1 \times \$10,000 = \$10,000$
- Software implementation costs³26,260
 Upgrade to unlimited sessions for two Communications Servers for AIX in Design/Engineering groups
 $2 \times \$6,590 = \$13,180$
 Upgrade to unlimited sessions for Communications Server for AIX in Manufacturing
 $1 \times \$6,590 = \$6,590$
 Host On-Demand for three servers
no additional charge for users of IBM eNetwork Software communications servers, although additional user or session licenses may be required to support the specific needs of users in your network
 Upgrade one Domino server to Domino 4.5 for NT to create Web server
 $1 \times \$495 = \495
 NetWare for SAA to support 50 seating manufacturer users
 $1 \times \$5,995 = \$5,995$
- Other implementation costs

Savings (Benefits - Implementation Costs) =	\$8,028,090
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¹ This estimate is hypothetical and based on assumed IT and personnel costs and needs, which may be different for each customer. Each potential customer should perform an independent estimate of the costs and benefits for any particular installation. This is not a promise or guarantee of costs or savings for any particular business and should not be so construed.

² All figures provided in this estimate are in U.S. dollars.

³ The IBM Software Advantage Program for Workstations can be applied to this purchase. Discounts of up to 55 percent are available. Contact your IBM sales representative or reseller for more information.

Summary

Today, information is an exploding resource. All kinds of information, managed by all kinds of applications and protocols, is found in public and private systems around the world. With the explosion and expansion of the information era, there is no excuse to be without the most accurate information, and there is no way to compete effectively without it.

Just as important as the information itself, and its accuracy, is the ease and speed with which it can be retrieved. If it's difficult or time-consuming or costly to get up-to-date information, people will sometimes try to get by without it. That can be disastrous for any business, whose sales and service and customer satisfaction, for example, can be seriously impacted by erroneous or outdated information. When information is not readily available, employees will often employ costly methods to get it, perhaps telephoning associates who do have access to it (and impacting their work), or using overnight mail or faxes.

The perfect solution is any-to-any information access, allowing people to have at their fingertips, quite literally, any up-to-date and accurate information they need to do their jobs. But, even up to the very recent past, the concept of any-to-any information access has been a pipe dream. Now, IBM eNetwork Software any-to-any solutions have made it a reality.

Client and server software to meet the specialized needs of any user

The IBM eNetwork Software communications servers act as gateways for connecting diverse applications and network environments. Available on popular platforms that are appropriate for varying enterprise needs, these servers provide crucial business-to-business and business-to-customer communication across LANs, enterprise WANs, and intranets, as well as the Internet.

Likewise, IBM eNetwork Software clients have been specifically tailored to meet the demands of different types of users within the enterprise:

- PCOMM provides 3270 and 5250 emulation, data access, and communication functions, while resolving the incompatibilities of multiple protocols and multiple operating systems. It also provides important facilities for high performance, reliability, ease of use, and security.
- Internet Connection Corporate Kit can improve internal and external communication by giving users point and click connectivity to the Internet and your intranet using Netscape Navigator, along with file transfer and print capabilities, Adobe Acrobat Reader, First Floor Smart Bookmarks, and a variety of terminal emulators.
- Communications Suite brings together TCP/IP applications, Lotus Notes Mail, Internet and intranet connectivity, Netscape, and PCOMM to address information sharing and collaboration requirements.
- Host On-Demand offers Internet-to-SNA connectivity by providing access to 3270 applications from any Java-enabled Web browser.

To address the growing mobility needs of any business, ARTour server, gateway, and client products can extend the reach of new and existing business applications to the wireless environment.

Other complementary IBM eNetwork Software solutions

Any-to-any information access solutions are part of a comprehensive IBM strategy to provide customers with the best possible information tools in this burgeoning information age. The solutions described in this guide are only a few of the solutions available using the IBM eNetwork Software products. Other solutions include those described in *IBM eNetwork Software Solutions for Internet and Intranet Infrastructures Assessment Guide* and *IBM eNetwork Software Solutions for Network Integration Assessment Guide*. These solutions can play a major role in corporate strategies for maximizing productivity and expanding marketing opportunities.

The ultimate quest of business technology users today is interoperability. To be successful, users need the flexibility to move data and use critical applications across their organization without being concerned with the underlying networks. Users must have easy access to data from the office, home, or on the road – without sacrificing the familiar look and feel they know and understand.

With this line of servers and clients, interoperability is within the grasp of all technology users. These products allow users to choose applications that fit their business needs and to interconnect despite diverse platform and network configurations. Technology incompatibility is becoming obsolete with the IBM eNetwork Software products.

IBM eNetwork Software Communications Servers

With the introduction of the Communications Servers, IBM has integrated the broadest array of networking functions and connectivity available – based on industry standards and optimized for the platform of choice. Several key and open technologies have been integrated into a simplified set of products.

The Communications Server product line includes solutions for OS/390, AIX, OS/2, Windows NT, and NetWare and is fully interoperable with S/390 and AS/400 networks. Fundamental to today's client/server and network computing environments, the Communications Server builds on the leading peer-to-peer networking protocols of TCP/IP and Advanced Peer-to-Peer Networking (APPN).

Communications Server for AIX

As a powerful multiprotocol, multifunction gateway which can have extra-high capacity and performance with direct S/390 channel attachment, this product succeeds IBM SNA Server for AIX, Version 3.1. As a total enterprise networking solution, its UNIX application platform extends the communication capability of the AIX Base Operating System by acting as an enterprise server for AIX and SNA networks, as well as a connectivity platform. This server was designed specifically for AIX and RS/6000 networking environments and takes advantage of the AIX system facilities to integrate applications and protocols seamlessly.

Communications Server for OS/2 Warp

An advanced gateway providing flexible, reliable communication of networks for all sizes, this product enables OS/2, Windows, and DOS workstations to communicate with S/390 and AS/400 hosts and other workstations. A significant capability of this server is that it allows IPX, NetBIOS, SNA, and TCP/IP applications to run unchanged over both SNA and TCP/IP communication networks. Also, this server's rich 32-bit application programming interfaces are key to the dynamic growth of new business applications required by customers, as well as the client/server and distributed applications supported with the APPN network node and end node.

Communications Server for OS/390

A critical server for the enterprise, providing the highest availability, reliability, and security, this powerful communications server connects diverse applications and network environments, and it builds on the classic strength of S/390. It is a sensible solution to the real business need for integrating ever-increasing sets of new applications into an ever changing network without disrupting access to your mission-critical applications. The overall benefits are unmatched performance, availability, and investment protection for your S/390 applications, whether they are running on VTAM or TCP/IP.

new *Communications Server for Windows NT*

As the newest member of the communications server family, this industrial-strength server provides industry-leading SNA and multiprotocol gateways for TCP/IP and SNA network integration solutions. This powerful multifunction gateway supports diverse applications and network environments with enterprise-class dependability. High-Performance Routing technology integrated in Communications Server for Windows NT provides high availability with maximum throughput and efficiency, preparing your networks for the high-speed applications of the future. And with the integration of Host On-Demand, this server leads the evolution to network computing by providing seamless integration between Web users and 3270 SNA applications.

NetWare for SAA

A secure, reliable, and scalable platform for integrating IBM S/390 and AS/400 connectivity services with NetWare and IntranetWare, this server offers multiple LAN and WAN connectivity options for branch office and department users. This software, part of an IBM/Novell alliance, lets NetWare clients access IBM host applications and data with IPX/SPX, TCP/IP, and AppleTalk, and it provides administrators with access to Novell's industry-leading performance, as well as directory, security, and management services through NetWare Directory Services.

IBM eNetwork Software Clients

IBM eNetwork Software clients can put interoperability within the reach of all technology users. Combined with communications servers, these clients optimize existing networks and platforms, while allowing for the addition of emerging high-performance applications. This line of products provides the broadest range of LAN and WAN and remote connectivity, offering the single communication source needed for home, office, and mobile use. The product line includes the following IBM eNetwork client software:

- Communications Suite for Windows 3.11, Windows for Workgroups 3.11, Windows 95, and Windows NT
- Personal Communications AS/400 for OS/2
- Personal Communications AS/400 for Windows
- Personal Communications AS/400 for Windows 95
- Personal Communications AS/400 for Windows NT
- Personal Communications AS/400 and 3270 for OS/2
- Personal Communications AS/400 and 3270 for Windows
- Personal Communications AS/400 and 3270 for Windows 95
- Personal Communications AS/400 and 3270 for Windows NT
- Personal Communications Toolkit for Visual Basic
- Internet Connection Corporate Kit for Windows 3.11
- Internet Connection Corporate Kit for Windows for Workgroups 3.11
- Internet Connection Corporate Kit for Windows 95
- Internet Connection Corporate Kit for Windows NT
- Host On-Demand for any Java-enabled Web browser

Communications Suite

The Communications Suite provides all the tools customers need to meet their enterprise communication needs. From Internet and intranet access to corporate communication and terminal emulation, the Communications Suite offers a single source for market-leading communication products.

The Communications Suite includes Netscape Navigator, Version 3.0, for Web browsing and Internet applications, PCOMM 4.1 for terminal emulation, Lotus Notes Mail 4.5 for corporate communications, and FTP Software TCP/IP protocol stacks and applications. This feature-rich, multifunction solution is easy to install, easy to configure, and easy to use. And, all the applications are fully supported by IBM. With the Communications Suite, you're only one click away from the information you need!

Personal Communications (PCOMM)

With the introduction of the Personal Communications AS/400 and 3270, Version 4.1 (PCOMM 4.1), product line, customers now have one easy answer to the problem of integrating multiple users on varying platforms from multiple locations. The PCOMM 4.1 consistent interface masks the complexity of information management and distribution, regardless of the underlying data source or network.

With a common look and feel across OS/2, DOS/Windows, Windows 95, and Windows NT, PCOMM 4.1 lets users move confidently from one environment to another. This can significantly lower training and application-migration costs while raising productivity.

Another significant benefit is the high-function development platform, which allows users to link application data dynamically with either custom desktop-based analysis applications or with standard decision-support suites — such as Lotus SmartSuite or Microsoft Office. Applications can be deployed across multiple diverse platforms without change and independent of transport. To obtain a no charge Personal Communications Evaluation Kit, call 1-800-901-2205, priority code 6C7ABD032.

Internet Connection Corporate Kit for Windows (Corporate Kit)

Whether you manage the networks for a large corporation or a small branch office, your company can benefit from the network computing advances made possible through the use of Internet standard communication. The Corporate Kit provides the essential applications you need for complete access to your intranet and the Internet. With the Corporate Kit, your organization can share information within a department, with branch offices, with remote sites, and with mobile personnel.

The Corporate Kit provides the industry-standard TCP/IP network types and leading-edge Internet applications needed to access these resources. The program comes with industry-leading Netscape Navigator, Adobe Acrobat Reader, First Floor Smart Bookmarks, and a wide variety of terminal emulators and file transfer and print capabilities — all to improve your organization's internal and external communication.

Easy to install and set up, the Corporate Kit includes procedures that allow you to select which applications to install on each user's desktop. And, it's even easier to get started. Simply point and click to get connected to the Internet. Prepared scripts are provided for many popular dial-up access providers and the launchpad design allows users to start a group of applications as needed to complete their tasks.

Host On-Demand

Host On-Demand is an Internet-to-SNA interconnectivity solution that provides 3270 application discovery and access through the WWW. Web users needing host applications, such as public catalogs, software applications, databases, or other resources, can use Host On-Demand from inside their Java-enabled Web browsers to access central computer data. For Web-oriented users with occasional

need for central computer access, Host On-Demand provides an alternative to installing a terminal emulation program on the desktop. Host On-Demand brings network computing to the Web by enabling Web browsers to seamlessly access non-Internet-based content and services.

Host On-Demand uses the Java environment and native TN3270 and Internet protocols to provide platform-independent host access from within a Web-browser window. Host On-Demand integrates existing central computer data and resources with intranet, Internet, and Web capabilities. The result is dramatically increased availability of host-based information for Web-oriented users. Host On-Demand is available for a wide range of major server platforms, including OS/2, AIX, NetWare, and Windows NT.

IBM eNetwork Software Wireless Products

Extending the reach of new and existing business applications to the wireless environment, the Advanced Radio Communications on Tour (ARTour) product line offers a competitive business advantage. ARTour gateways and servers work in tandem with ARTour clients to minimize data traffic, reduce network costs, enhance performance, and provide affordable and effective mobile solutions.

ARTour Gateway and Servers

The ARTour Gateway for AIX extends internet protocol (IP) connectivity across the leading international wireless packet data, cellular, and wireline networks, integrating them under a single (TCP/IP sockets) interface, enabling immediate and optimized use of existing IP applications. ARTour Web Express Server for Windows NT¹, ARTour Web Express Server for AIX, and ARTour Web Express Server for OS/2 enable wireless access to intranet and Internet applications using the Web browser of your choice – without requiring any application changes.

ARTour Emulator Express Server for Windows NT, ARTour Emulator Express Server for AIX¹, and ARTour Emulator Express Server for OS/2¹ enable wireless access to SNA 3270/5250 applications, with no application modifications, thereby enabling enterprises to extend and leverage their legacy applications into the wireless environment.

ARTour Clients

The ARTour product line includes the following client software:

- ARTour Mobile Client for OS/2
- ARTour Mobile Client for Windows 3.1
- ARTour Mobile Client for Windows 95
- ARTour Mobile Client for Windows NT¹
- ARTour Web Express Client for OS/2
- ARTour Web Express Client for Windows 3.1
- ARTour Web Express Client for Windows 95
- ARTour Web Express Client for Windows NT¹
- ARTour Emulator Express Client for Windows 95
- ARTour Emulator Express Client for Windows NT¹
- ARTour Emulator Express Client for OS/2¹

ARTour Mobile Clients offer a competitive business advantage, ensuring that *all* workers can have information when they need it, where they need it! The ARTour Mobile Clients work with the ARTour Gateway for AIX to minimize data traffic, reduce network costs, and enhance performance – providing an affordable and effective mobile solution.

ARTour Web Express clients provide wireless access to intranet and Internet applications using the Web browser of your choice. Working with an ARTour Web Express server, these clients dramatically reduce the amount of data transmissions and performs various optimizations, including file caching, forms differencing, and header reduction, to enable the creation of innovative wireless solutions in the network computing environment. In addition, mobile clients can perform asynchronous and disconnected operations to optimize productivity.

Similarly, the ARTour Emulator Express clients work with an ARTour Emulator Express server to provide mobile users access to SNA 3270/5250 applications. ARTour Emulator Express filters out unnecessary data transmissions to provide an efficient and optimized mobile solution.

¹ Available fourth Quarter 1997

The next step ...

- **To request assistance in your cost/benefit estimate** if you're considering an any-to-any solution:
 - Contact your local IBM representative
 - Or contact your preferred reseller
- **To order IBM eNetwork Software products:**
 - Contact your local IBM representative, or call
 - In Austria21145 2500
 - In Belgium02 225 2525
 - In Denmark80 311 010
 - In Eastern Europe21-145-6281
 - In Finland(90) 459 4224
 - In France36 63 36 43
 - In Germany0180-55090
 - In Greece30 1 6881460
 - In Ireland1850-205-205
 - In Israel03-1770223888
 - In Italy167 017 001
 - In Netherlands06-0220402
 - In Norway66 99 80 00
 - In Portugal791 5935
 - In Saudi Arabia1-405-6910
 - In South Africa27 11 3208 495
 - In Spain901 100 400
 - In Sweden8 793 1000
 - In Switzerland(01) 436 6111
 - In Turkey90 212 280 09 00
 - In United Kingdom01-705-49-2949
 - In United States1-800-IBM-CALL
 - Or contact IBM Direct
 - For North America at 1-800-426-2255
 - Outside North America, call 1-800-426-4968 in the United States and request IBM Direct (tolls may apply)
 - Or contact your preferred IBM reseller
- **To obtain more information** about the IBM eNetwork Software products, you can always find us on the Internet at

<http://www.networking.ibm.com/eNetwork>

With IBM any-to-any solutions, a wealth of information and collaboration will be at your fingertips....

IBM eNetwork Software is your one easy answer to making connectivity an accomplished fact!



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