Real-World Internet Solutions

IOC leverages IBM Firewall and VPN technology to keep its customers securely connected

Located in Southfield, Michigan, Internet Operations Center (IOC^{SM}) is a leading Internet technology company that provides a broad base of Internet products and services to a wide variety of corporate customers. These services range from providing high-speed Internet connectivity and commercial Web site hosting to offering advanced Web application development, electronic commerce, and other consulting services.

According to Michael Marquardt, president of Operations at IOC, "Our mission is to help corporations take advantage of Internet technologies that can help them address specific business needs. Firewalls and security concerns are two issues that thread across all of our product areas, especially as our customers begin to deploy e-commerce applications."

Since it was one of the first IBM business partners to implement net.commerce and IBM Firewall offerings, IOC should be well acquainted with these issues. Marquardt states, "We've been involved with the Internet and security from the beginning. We are really focused on helping our customers get a high return on their investment in Internet solutions."

GROWING CONCERNS INCREASE SECURITY AWARENESS

As the Internet matures, so does IOC's role as a consultant and provider of new technologies. Marquardt notes that today's corporations are demanding reliable connectivity with the highest levels of security. To protect their business assets, corporations are choosing application-layer

e-business: Winning Against the Competition

The entire world was caught up in the excitement last summer as the blue-clad team from France, with outstanding defense and thrilling offense, defeated the best teams in the world to win the World Cup.

After a few exhilarating days of celebration, the players and coaches returned to their conditioning and hard work, knowing that there will be another World Cup tournament in four years. The challenge for France will be great: not since 1962 has any team won two consecutive World Cup titles.

In business, as in sports, the level of competition is constantly rising. What was good enough four years ago, or even last year, doesn't necessarily guarantee success today. As the World Cup players and coaches understand, you often have to do extraordinary things to stay ahead of your competition.

That's where IBM's e-business application framework comes into play. It provides the tools your business needs to succeed today, and it positions your business for continued success.

Our cover story in this issue of *eNetwork Connection* describes how the Internet Operations Center (IOC) uses IBM eNetwork™ Firewall software to provide new services to its customers and position itself as a leader in the exploding Internet services field.

On page 10, you can read how Microsemi Corporation Colorado uses IBM's WorkSpace On-Demand product to streamline its operations and increase the quality and efficiency of its manufacturing processes. These kinds of gains can help Microsemi keep pace in the highly competitive semiconductor industry.

No matter what business you're in, you probably face more intense competition than ever. By helping your employees work more effectively and serve your customers better, IBM's e-business solutions give you an advantage over your competition today. They also position you to succeed tomorrow, when technologies like Java™ will open up even greater opportunities for success.

As an IBMer, I like the color blue. I salute the victorious team from France—and all of the other teams that played so well in this year's World Cup.

Larry Kunz

Larry Kunz
Editor, *eNetwork Connection*

Making e-business a Reality

In a moment I'm going to ask you to use your imagination. Before I do, though, I'll tell you that what you're about to imagine is already reality for enterprises that use IBM eNetwork Software to meet their business objectives. Maybe your enterprise is one of them.

Imagine your business as an e-business. You're taking advantage of new opportunities to reach customers and interact with partners and suppliers. They all have secure, controlled, reliable access to data and applications on your enterprise network, without threatening the integrity of your enterprise data. Everyone considers your enterprise responsive, innovative, and easy to do business with.

Imagine all of your employees, customers, and business partners accessing your enterprise network from anywhere—even from home offices and mobile locations. Because your mission-critical applications are written in Java, they can run on a wide variety of server platforms and can be accessed through a standard Web browser.

Imagine your IT staff rapidly deploying new Java applications in hours, rather than days or weeks. The time they save enables them to focus on developing and implementing a strategy to make your enterprise network even more powerful and more effective. And because they're working with Java, a popular and powerful programming language, their morale is higher than it has ever been.

Now, you can stop imagining and start making this a reality, because all of these results are well within your reach.

The IBM eNetwork Host Integration Solution can be the key to turning your business into an e-business—combining the power of the Internet with your legacy systems to create new opportunities and establish new ways of communicating with customers and business partners. We recently strengthened the Host Integration Solution by shipping new releases of eNetwork Host On-Demand and eNetwork Communications Server for Windows NT™.

The new On-Demand Server extends the power of Java to your enterprise network while slashing cost of ownership and protecting your investment in your existing computing infrastructure. A perfect complement to any server-side Java implementation, On-Demand Server is the safest, most reliable way to deliver Java applications to client desktops. Look for news about On-Demand Server on page 5.

At the beginning of this letter I said that these images are reality for many e-businesses today. They can be reality for you, too. For more information, call on the global leader in e-business solutions: IBM.

Jeff Jaffe
IBM General Manager
eNetwork Software and Security

eNetwork Connection PDF Files Are Now Online

If you're looking for something in a previous issue of *eNetwork Connection* and can't find your copy, you can go online to find all the information you need. *eNetwork Connection* is now available in both HTML and downloadable PDF format for viewing or printing. Just go to: *http://www.software.ibm.com/enetwork/connection.*

eNetwork Software Services

IBM can help you design and implement e-business solutions today

Embracing an e-business strategy is an easy decision to make, but actually implementing an e-business framework can be a little more complicated. Because enterprises like yours might need help in positioning themselves for e-business, IBM now offers a variety of eNetwork Software Services designed to help you understand, plan for, implement, and manage e-business solutions.

With its team of highly skilled experts, IBM can provide the analysis, advice, mentoring, resources, and training you need for today and tomorrow. The IBM eNetwork Software Consulting Group are experienced in host integration, network design and security, and mobile and wireless implementations—all of the services you need to enter the world of e-business. Following are just some of the eNetwork Software Services available today.

Web-to-Host Services

eNetwork Software Services has a new proof-of-concept solution to help you analyze whether any of your enterprise applications are already suitable for Web enablement. If they are, IBM can help you begin delivering enterprise applications through the Web.

On-Site and Remote Consulting Services

IBM can customize its services to help solve your unique problems and assist you in meeting your schedules—all of which enables you to focus on running your business. Skilled consultants will work with you to understand your requirements in detail and create the most effective services package, including:
◆ Design and architectural reviews
◆ Assistance with technical skill building
◆ Security reviews
◆ Installation and migration planning

Prototyping and Proof-of-Concept Services

IBM provides prototyping and proof-of-concept services in the following areas:
◆ **Mobile and wireless**—Consultants knowledgeable about all carriers and with expertise in mobile and wireless implementation can design prototypes to demonstrate the capabilities of a solution as well as its performance in your environment.
◆ **eNetwork Host On-Demand**—This service is designed for ISVs that need help in prototyping applications or demonstration code developed with Host On-Demand or the Host Access Class Libraries.
◆ **Intelligent agents**—Consultants with expertise in developing agent software and applying it to real-world applications can help you prototype knowledge management solutions and intelligent agents.

◆ **Host integration**—Experienced programmers can work with you to quickly extend your existing host applications to the Web by using either Host On-Demand or host publishing capabilities.

Design and Implementation Services

IBM can help you design and implement solutions in the following areas:
◆ **Host integration**—IBM can help you extend your host information to the Web over any IBM server and client. Services include planning, project management, Host Access Class Library and Web tool training, and prototyping.
◆ **eNetwork Personal Communications**—IBM can review, document, recommend, and implement Personal Communications solutions for your terminal emulation environment.
◆ **Intelligent agents**—IBM can build agent-based applications to help you, for example, manage records, build knowledge systems, improve turnaround times, and provide online services.

Custom Programming Services

IBM provides a complete range of customized programming services for:
◆ Intelligent agents
◆ Java applets and beans
◆ eNetwork Personal Communications
◆ eNetwork Communications Server for OS/390™
◆ eNetwork Communications Server for OS/2 Warp™

Installation and Migration Services

The IBM eNetwork Software Services team can address several migration scenarios for products such as eNetwork Communications Manager, eNetwork Communications Server, eNetwork Personal Communications, IBM Firewalls and security products, eNetwork Dispatcher, and eNetwork Host On-Demand.

Mobile and Wireless Implementation Services

IBM can help your organization accelerate its ability to leverage a variety of eNetwork mobile solutions, including: Wireless Gateway and Mobile Client, Mobile Equalizer, Emulator Express Server and Client, and Web Express Server and Client.

For more information

Visit **http://www.software.ibm.com/enetwork/services**

Easier Java Deployment

eNetwork On-Demand Server can help you develop and manage e-business application networks

While the business potential of the Internet, Java, and similar technologies is extremely promising, actually deploying and managing applications in a production environment can be quite challenging. As your enterprise begins to rely on e-business applications, you need to manage them in a way that provides the same level of security, reliability, and availability as your mission-critical legacy systems. This involves creating an infrastructure that supports the unique characteristics of e-business applications and simplifies the deployment and management of Java and other Internet technologies.
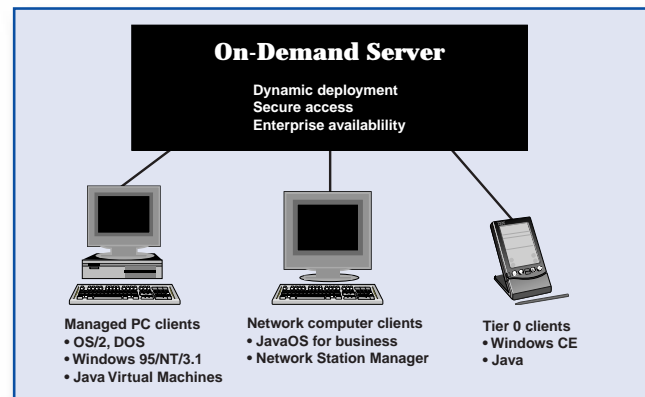
To help you take advantage of e-business applications, IBM has developed eNetwork On-Demand Server—a Java application management software product designed for maintaining control and minimizing risk as your enterprise transforms itself into an e-business. On-Demand Server helps manage your devices so you can focus on rapidly deploying the right Java applications at the right time—and give employees and customers secure access to applications, information, and data from anywhere in the enterprise.

On-Demand Server lets you manage Java client applications from a server while keeping IT support costs under control. The server acts as the single point of access, administration, and end-to-end control for all applications deployed across the enterprise in a secure production environment. In this way, On-Demand Server provides access to applications regardless of where they reside—on the PC, LAN server, or even an enterprise server. Using On-Demand Server, you can:

◆ Rapidly deploy new Java, Windows™, DOS, or OS/2® applications on demand
◆ Manage access by individual users, groups, machine types, or a combination of these areas
◆ Provide consistent, customizable desktops to end users— no matter how they log on
◆ Reduce management tasks from thousands of clients to just a few servers
◆ Manage deployment and operations from the Tivoli® console

END-TO-END MANAGEMENT AND CONTROL

On-Demand Server works in conjunction with existing systems management tools to identify when e-business applications are not working correctly, providing advance notice of potential problems. By collecting event and alarm information from Java client and server processes, On-Demand Server can help ensure that mission-critical applications stay up and running. Using these sophisticated end-to-end control

On-Demand Server
Dynamic deployment
Secure access
Enterprise availablility

Managed PC clients
• OS/2, DOS
• Windows 95/NT/3.1
• Java Virtual Machines

Network computer clients
• JavaOS for business
• Network Station Manager

Tier 0 clients
• Windows CE
• Java

mechanisms, administrators can easily manage a very large number of clients at a single central location—from anywhere in the network.

On-Demand Server also controls access to e-business applications, keeping unauthorized users out of protected applications. In turn, it simplifies access by providing users with a single sign-on for multiple applications. On-Demand Server also increases productivity by keeping track of user preferences to help eliminate redundant information entry.

By enabling you to manage a few servers rather than hundreds or thousands of individual workstations, On-Demand Server also simplifies application deployment. Managing the client desktop and applications from the server provides better control for administrators. In addition, On-Demand Server includes a tool kit that lets developers add full systems management support to any Java application.

SIMPLIFIED ON-DEMAND COMPUTING

By combining the power of standard PCs, the low-maintenance costs of thin clients, and the flexibility of Java, On-Demand Server can give you simplified on-demand computing throughout the enterprise. On-Demand Server will eventually be available on servers of all sizes—from Intel®-based servers running OS/2 and Windows NT; mid-tier servers running AIX®, OS/400®, Sun Solaris®, and HP-UX; and the largest mainframes running OS/390.

For more information
Visit **http://www.software.ibm.com/enetwork/on-demand**

The Right Networking Choice

IBM is refocusing its networking efforts to provide the industry's most comprehensive solutions

During the past year, the IBM Networking Hardware Division (NHD) has realigned its development efforts and product line toward more innovative, customer-focused technologies and strategies. As part of this effort, NHD has addressed a wide range of customer concerns, misperceptions, misconceptions, and myths about IBM and its networking hardware business. Today, only IBM has the skills, expertise, and worldwide resources to be the leading participant in the global information infrastructure of the next century. Read on to learn how NHD is transforming itself and helping to redefine the networking arena.

A STRONG COMMITMENT TO NETWORKING HARDWARE

Networking and networking hardware represent a significant part of IBM. In 1997, networking accounted for 25 percent of the $750 billion (U.S.) IT marketplace. In 2000, it will account for 50 percent of a $1.2 trillion IT marketplace. As a subset, networking hardware revenues are expected to grow from nearly $34 billion to more than $45 billion.

Each year, IBM spends $4 to $5 billion on research and development, with networking one of the largest investment areas. In the past five years alone, IBM has been awarded nearly 800 networking patents in the U.S.—four times the number of patents awarded to the three largest networking vendors combined. Today, IBM has more networking-specific resources—including products, services, and solutions—than any other vendor in the world.

A FOUNDATION FOR e-business

e-business and e-commerce are built on a foundation of networking hardware products, and NHD is the preferred provider of the network infrastructure for IBM e-business solutions, such as Web hosting, host access, and high-speed technologies. IBM's simplified, integrated e-business solutions provide significant advantages over more complex "mix-and-match" offerings from different vendors. IBM solutions include:
◆ Assured performance and function versus a "best effort" policy, which might not be enough to meet an organization's needs
◆ A standards-based approach to help ensure compatibility
◆ Investment protection for existing network and IT infrastructures
◆ Evolutionary growth rather than "fork-lift" upgrades
◆ Year 2000-ready products

IBM ETHERNET AND TOKEN-RING OFFERINGS

IBM intends to be a leader in the Ethernet™, Fast Ethernet and—beginning in 1998—Gigabit marketplace. NHD offers several adapters, bridges, hubs, servers, and switches that enable users to interconnect and manage diverse LAN and WAN traffic: Ethernet, Fast Ethernet, Token-Ring, FDDI, ISDN (in Europe and Japan), Frame Relay, ATM, and Gigabit Ethernet. Unlike adapters from many major competitors, IBM's Ethernet adapters include the innovative "Wake on LAN" feature that enables network administrators to access

and turn on a PC from the network at any time, from any site, for software and application updates.

IBM continues to enhance its Token-Ring offerings, especially with solutions that provide higher bandwidth and migration paths to IP and other networks. For example, this year IBM already has announced new High-Speed Token-Ring PCI adapters; new adapter cards supporting High-Speed Token-Ring for IBM's multiprotocol intelligent switching hub, ATM backbone switch, and LAN switches; and a Fast Token-Ring solution for high-speed connections to IBM S/390® servers.

IBM'S SWITCHING PHILOSOPHY

When routers were first introduced, IBM positioned them at the periphery of the network, believing that their rigid routing routines and methodologies were most appropriate for smaller groups and organizations. IBM held then that switching offered much more viable, flexible, and longer lasting solutions as more networks were interconnected and as the number of users inevitably increased. Recently, major router vendors and many users have begun turning away from routers and embracing switching technology to get the type of solutions that IBM thinks will best serve the networking marketplace.

A SOLUTIONS-BASED STRATEGY

Because IBM views networking as a technological prerequisite for its e-business strategy, it has integrated networking into the core of that strategy. As a result, NHD has worked with other IBM organizations to develop ready-to-deploy solutions that integrate IBM Netfinity™ and AS/400® servers, NHD hardware, and Lotus Domino™ software.

For example, IBM recently announced the industry's first and most comprehensive Virtual Private Network (VPN) security offering that enables mobile users, branch offices, suppliers, and business partners to use the Internet as a secure, encrypted, and authenticated connection to corporate servers. This secure VPN solution can help organizations reduce the cost of dedicated lines, enhance their remote connection strategy, and further integrate their SNA investment over IP.

For S/390 users, a new sysplex-like network approach combines the flexibility and reach of IP and the Web—with the proven strength, reliability, and predictability of SNA—to achieve new levels of availability, scalability, and access. The framework's initial focus is to extend the benefits of the S/390 environment across the network. Application areas that benefit from this approach include:
◆ Web hosting
◆ Enterprise resource planning
◆ E-mail and collaboration
◆ Traditional transaction-oriented applications
◆ Business intelligence
◆ Server consolidation
◆ E-commerce

IBM Networking Solutions Pass the Test

When organizations need results—regardless of how challenging their requirements might be—they turn to IBM. Following are just two examples where IBM networking solutions have not only met, but surpassed, such challenges.

Some of the most complex and mission-critical networks are those that support networking trade shows. They must be built and implemented quickly, support hundreds to thousands of different booths, and be as fail-safe as possible. For these reasons, IBM's Networking Hardware Division (NHD) was selected to provide, install, and support Fast Ethernet networks for the Internet World trade shows in Toronto, Los Angeles, Chicago, and New York. For these shows, NHD provides Ethernet LAN switches, multi-access connectors, routers, multi-protocol switching hubs, and network management software. Each show's network includes approximately 900 switched connections, 2000 IP addresses, and 50 miles of multistrand fiber-optic and copper cabling.

During the 16 days of the 1998 Winter Olympic Games, IBM's networking products were also a major success—supporting unheard of network traffic. The IBM-sponsored Nagano Web site received as many as 56 million hits per day—with a high of 103,429 hits per minute—and the network processed more than six million transactions among 82,000 users.

A VAST ARRAY OF RESOURCES

Only IBM has the skills, expertise, and extended reach to be the leader in the global information infrastructure of the next century and to provide all the elements necessary for that infrastructure:
◆ Network, storage, and systems hardware
◆ Software and applications
◆ Services and support organizations
◆ Core technologies, such as semiconductors
◆ Research and development capabilities
◆ Global scope

No other company has the background and resources as comprehensive as IBM's. Keep watching for exciting and innovative new networking solutions in the months to come. As Lou Gerstner commented in IBM's 1997 Annual Report, "The rise of a globally connected world is changing everything. It's rewriting the basic assumptions of business, the economy, and global society—and the new text reads like an IBM playbook."
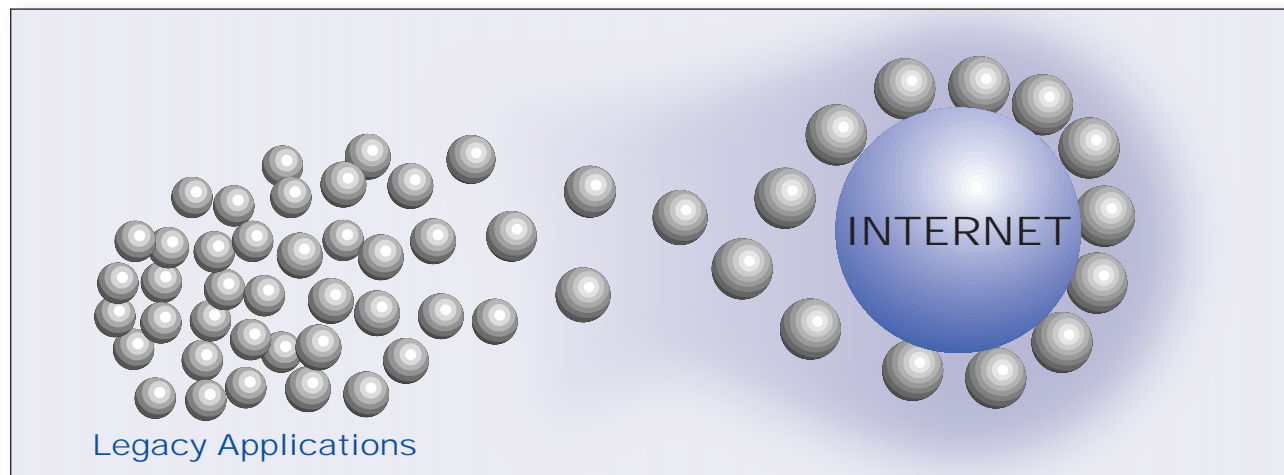
For more information

Visit **http://www.networking.ibm.com**

Flexible Web-to-Host Integration

eNetwork Communications Server for Windows NT Host Publisher function helps integrate existing applications with the Internet

Legacy Applications

INTERNET

As Internet growth continues at exponential rates, many companies that were once considered leading edge simply because they had Web sites are now scrambling to implement Web-to-host solutions that will give them a competitive edge or, in some cases, help them remain competitive in their market. These Web-to-host solutions involve the integration of a company's existing enterprise applications with the Internet or a company intranet.

To generate as much new revenue as possible, a Web-to-host solution for the Internet must be flexible enough to integrate the large variety of applications used by Web customers. When companies begin using the Internet to conduct business, they normally expect to reduce company overhead, for example, by easing call center loads. They also anticipate improved customer satisfaction and customer retention because of the ability to provide around-the-clock customer service.

The classic mistake many companies make in selecting a Web-to-host solution is to base their technology decision solely upon their needs for an internal intranet. When these companies later need to extend their applications across the Internet, they discover that the same solution does not necessarily meet the vastly different requirements of the Internet. For the Internet, security is an absolute requirement; volume rates are unpredictable, so scalability is critical; application usage characteristics are very different; and there is absolutely no control over client system capabilities.

A FLEXIBLE WEB-TO-HOST SOLUTION

To implement a comprehensive Web-to-host strategy, companies need a solution that is flexible enough to handle the significantly different intranet and Internet environments. IBM has a two-part Web-to-Host solution designed to provide complete intranet and Internet integration for existing applications. eNetwork Host On-Demand provides a reliable way to implement Web-to-host solutions within intranet environments, and the Host Publisher function of eNetwork Communications Server for Windows NT provides a secure Web-to-host solution across the Internet.

Using Host Publisher, you can easily integrate a wide variety of interactive host types with the Internet—without having to change existing applications. In addition, Host Publisher's load balancing, fault tolerance, and unique clustering technology help ensure the level of enterprise class scalability, availability, and performance required for extending business-critical applications across the Internet.

Connecting Host Applications with the Internet

According to Zona Research, Inc., a new generation of Web application server—the "host access Web server"—has emerged to bridge the technology gap between the Internet and the different technology of existing host applications. A new white paper by Zona, *The Emergence of the Host Access Web Server*, explores the business benefits of host access Web servers to IT managers and sheds light on the tradeoffs of current offerings of host access Web server vendors. To see this white paper in its entirety, visit *http://www.software.ibm.com/enetwork/library/whitepapers/ white_zona.html*.

ADVANCED SECURITY OPTIONS

Because Host Publisher integrates existing applications within HTML pages viewable by industry-standard Web browsers, all the typical security mechanisms available through the Web today can control authentication and access to existing applications. This includes using Secure Sockets Layer (SSL) technology to encrypt data transfers or using Secure ID cards to control access to your site. Host Publisher is treated as a native user of the system by existing applications.

Host Publisher also provides its own security options to help ensure the highest level of integrity for a secure network environment. For example, Host Publisher supports Web servers that are separate from the Host Publisher server. This enables you to place your Web server on the Internet (the unsecured side of a firewall) while Host Publisher—along with all of your applications, data, scripts, back-end connectivity, and user information—is kept securely behind the firewall. Internet end-users are never allowed to pass through the firewall and into the secured network. Instead, their application requests are forwarded to Host Publisher for processing.

SCALABILITY FOR RAPID GROWTH

Although it is relatively easy to predict usage over time for an intranet system, the Internet is well known for unpredictable growth and sudden spikes in site usage. To meet unexpected surges in demand, you can dynamically add servers to create clusters that group together individual Host Publisher servers so that they have a single system appearance. This enables you to handle additional usage without necessarily increasing management workload.

IMPROVED THROUGHPUT AND PERFORMANCE

Host Publisher's Dispatcher component provides dynamic and real-time load balancing across all of the Host Publisher servers within a cluster, helping to ensure maximum performance, throughput, and customer service. Host Publisher constantly monitors the workload of each server within the cluster and allocates new user requests as necessary to balance the system.

An additional feature of Host Publisher is its unique ability to multiplex multiple end-user requests across a single existing session to a back-end application—a capability that sets Host Publisher apart from similar products that were designed strictly for intranet use.

FAULT TOLERANCE FOR HIGH AVAILABILITY

Host Publisher provides a high-availability configuration option that enables you to specify a mirror image as a hot backup for the Dispatcher component. If the Dispatcher server becomes unavailable for any reason, the hot backup automatically assumes its function, preventing disruption to the Host Publisher cluster's operation.

WIDE-RANGING APPLICATION SUPPORT

The flexibility to integrate any of your existing applications with the Web is crucial for ensuring that the Web-to-host solution you implement today will support your current

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ForeSite Technology in Host Publisher

Founded in 1995, InfoSpinner, Inc. provides leading-edge software products designed to maximize the value of existing software systems through integration with new technologies. InfoSpinner's ForeSite™ integrates a variety of heterogeneous back-end systems—such as 3270 and 5250 sessions from IBM—with new mid-tier server components such as ActiveX from Microsoft® and Java from Sun Microsystems®, as well as with relational databases through ODBC. IBM plans to use ForeSite technology as the base for the Host Publisher function of IBM eNetwork Communications Server for Windows NT. For more information about ForeSite, visit *http://www.infospinner.com.*

business objectives as well as the objectives you might not realize until much later. Host Publisher supports a wide variety of host systems and applications, including:

◆ 3270 applications
◆ 5250 applications
◆ Virtual terminal applications
◆ ActiveX™ applications
◆ Java applications
◆ ODBC databases

Host Publisher includes a software development kit you can use to build access to additional application types. Host Publisher also makes it easy to consolidate multiple application screens into a single Web page to improve usability for novice Internet users. If you need to add specialized business logic to applications, you can use Host Publisher to transfer control to scripts that you write.

INVESTMENT PROTECTION FOR YOUR EXISTING ENVIRONMENT

With Host Publisher:

◆ No changes to your existing applications are required.
◆ A wide range of Web clients is supported, but Java-enabled clients are not required.
◆ Drag-and-drop techniques simplify customization, eliminating the need for programming to accomplish the most common Host Publisher functions.
◆ Integration within industry-standard HTML pages maximizes your investment in existing Web technologies and skills.
◆ Use of existing security mechanisms helps ensure secure operation.

By combining IBM's Host On-Demand and Host Publisher, you can have a Web-to-host solution that is optimized for both intranets and the Internet—helping you leverage your existing applications across these diverse environments to competitive advantage.

For more information

Visit **http://www.software.ibm.com/enetwork/commserver**

Putting WorkSpace On-Demand on the Line

Semiconductor manufacturer streamlines operations while improving the quality of its process control application

During the manufacture of electronic components, even the slightest deviation beyond a process control limit can cause defects that render an entire lot of chips useless. Deploying its process control application with IBM's WorkSpace On-Demand has enabled Microsemi Corporation Colorado to triple the number of process control workstations with virtually no capital outlay for client PCs and without incurring additional support costs.

Microsemi is a global supplier of high-reliability and commercial power semiconductors for the satellite, telecommunications, computers and peripherals, military/aerospace, industrial/commercial, and medical markets. Maintaining an advantage in the highly competitive semiconductor industry requires an extremely efficient operating environment—a fact that led Microsemi to find an innovative way to streamline its operations.

LOW COST OF OWNERSHIP

For a year, Microsemi had been working with a limited number of OS/2 workstations running a process control program to monitor its manufacturing line. While researching the most effective solution to handle the process control program, Mike Krueger, the programmer/analyst in charge of the deployment, found WorkSpace On-Demand to be the best of two worlds.

Krueger says that he was initially attracted to the easy-to-use PC-like environment that could be controlled and administered like the company's minicomputer system. He notes that perhaps the biggest factor in the decision to go with WorkSpace On-Demand was the significantly lower cost of ownership. In fact, Microsemi noticed an immediate cost reduction by making use of discarded PCs that had been replaced by newer ones.

A SMOOTH INTEGRATION

WorkSpace On-Demand has integrated well with Microsemi's reasonably complex server environment. In addition to the WorkSpace On-Demand server, the IT staff uses four OS/2 Warp Servers all running on low-cost single-processor systems—a domain controller and file server, a Lotus Domino server, an application and DB2/2™ server, and a secondary file server. The environment also includes an enterprise server that enables WorkSpace On-Demand clients to access the Windows NT process control application via a Warp Server.

WorkSpace On-Demand's centralized client control has helped Microsemi overcome the difficulty of rolling out additional OS/2 units. For example, WorkSpace On-Demand eliminates the need for a support person to enter a clean room environment for software maintenance and upgrades. It also significantly shortens installation time. Microsemi has found that what used to take three to four hours to prepare an OS/2 client takes only a half hour for a new WorkSpace On-Demand client.

WorkSpace On-Demand has also reduced the pressure on the support staff when a system goes down. If a WorkSpace client experiences a hardware failure, staff members need only swap in another thin client to get the system up and running. This process helps reduce the impact of repairs on the line.

REDUCED CYCLE TIME

Although it is still too early to cite precise statistics, the Microsemi team expects the increased knowledge of their line to result in higher quality end products as well as increased yields, which should in turn reduce cycle time and improve customer service. Based on the initial success of the project, Krueger foresees Microsemi using this type of server-managed client architecture in order entry and production control—areas where a fat client is not necessary. And, just having finished a Java class, he plans to take advantage of WorkSpace's Java capabilities in the very near future.
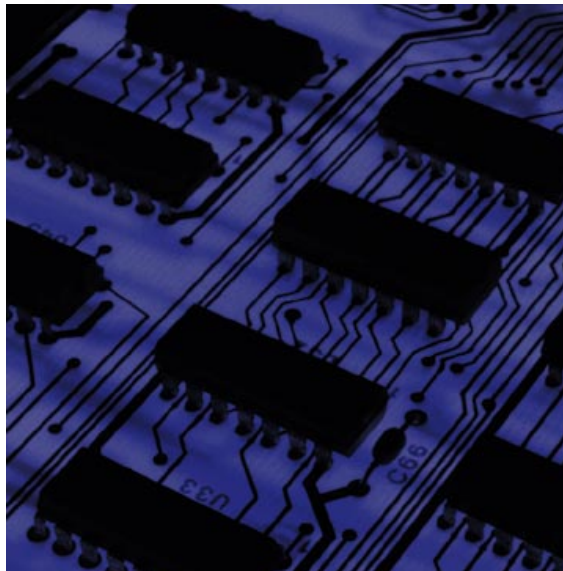
A Faster Path to e-business

eNetwork WorkSpace On-Demand can dramatically reduce network ownership costs as you implement e-business solutions

Enterprises around the world are embracing the e-business application framework to achieve some core business goals: to disseminate information, reduce costs, and attract new customers. Although most enterprises would like to enjoy these benefits across their entire enterprise, the cost of doing so has been prohibitive—until now. Today, IBM has a new way to help you implement an e-business framework while extending your existing technology investment: eNetwork WorkSpace On-Demand Version 2.
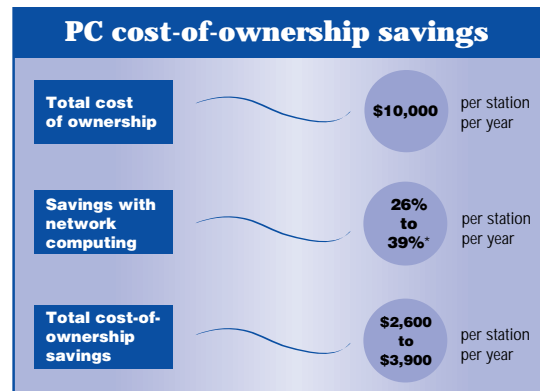
VERSION 2 HIGHLIGHTS

WorkSpace On-Demand is IBM's managed client operating system that uses optimized networking technology to help reduce overall computing costs for OS/2, Windows, and DOS application environments. Designed for new and existing PCs and network computers, WorkSpace On-Demand gives you the ability to download applications from your server to client machines on demand. The software contains all the server utilities you need to efficiently configure and manage your network clients. Best of all, WorkSpace On-Demand integrates into your existing network to help form a powerful infrastructure that supports e-business applications and lowers ownership and management expenses.

IBM has recently updated WorkSpace On-Demand with the following Version 2 enhancements:

◆ Support for Windows NT and Windows 95 (available 2Q 1999)
◆ Additional desktop customization features and an improved GUI
◆ Better Tivoli TME integration
◆ Open protocol support for TCP/IP connections
◆ Support for new technologies, such as Java Virtual Machine and Netscape™ Communicator

DRAMATIC COST SAVINGS

WorkSpace On-Demand can have a profound impact on your overall computing costs. For instance, a recent Gartner Group® study* (see figure) indicates that personal computers cost about $9,000 to $13,000 per user per year—yet hardware and programs account for only 14 percent of that figure. The majority of the sum is spent on administration, support, and user operations—all of which WorkSpace On-Demand can help you control. In fact, Gartner Group estimates that network computing can reduce the annual total cost of PC ownership as much as 39 percent.

PC cost-of-ownership savings

Total cost of ownership	$10,000	per station per year
Savings with network computing	26% to 39%*	per station per year
Total cost-of-ownership savings	$2,600 to $3,900	per station per year

*Source: Gartner Group and International Technology Group (figures are in U.S. dollars)

In addition to cost savings, WorkSpace On-Demand provides a variety of additional benefits, including:

◆ **Faster software updates**—In a network with a few thousand clients, it might take anywhere from six months to a year to upgrade software throughout the network. WorkSpace On-Demand lets network managers make software upgrades for many users all at once—from a single point of control right on the server.
◆ **Improved productivity**—Users no longer must wait as long to benefit from new and improved applications. As soon as your servers have been updated, users can access their new applications immediately—from any PC connected to the server. And because you have an operating system that embraces 100% Pure Java™, your organization can benefit from powerful Internet-based collaboration and transaction processing.
◆ **Longer hardware life**—WorkSpace On-Demand runs on the equipment you already own, helping to extend the life of your PCs and network computers and reducing overall hardware turnover.

Designed for flexibility, WorkSpace On-Demand Version 2 can turn users into roaming clients—enabling them to log onto any machine and access desktop layout and applications from any place that has a connection to the network. Through this type of increased access, WorkSpace On-Demand can help you transform your enterprise into an e-business—without having to revamp your existing network.

For more information

Visit **http://www.software.ibm.com/workspace**

firewalls—such as the IBM Firewall—that provide more flexibility than router-based firewalls. These corporations are asking for robust, industry-proven solutions to handle all their Internet requirements.

Because of rising security concerns, many of IOC's customers prefer to have some outside assistance when getting started with firewall technology and decide to take advantage of IOC's expertise. Although IOC usually trains these customers to maintain the firewall, many of them ask IOC to continue monitoring the implementation in case of emergency situations. "When a customer wants our help, we pride ourselves on being vendor-neutral and really understanding what that customer needs," Marquardt relates. "We analyze the specific situation and recommend what we think is the best solution for that particular customer—regardless of vendor. Often, the best solution turns out to be one from IBM."

One area where IOC currently uses the IBM Firewall is secure Internet connectivity, which it provides to other corporations, including the automobile manufacturing supply chain based in nearby Detroit. IOC is working with the big three United States automakers and their suppliers to help them leverage sophisticated intranet and extranet technology for the benefit of the entire industry. As part of this effort, IOC has been involved with the development of the Automotive Network eXchange.

IBM FIREWALL PROVIDES CONNECTIVITY AND SECURITY

IOC also recently implemented the IBM Firewall for a credit union customer that wanted to enter the online financial arena in order to provide online transactions, smart cards, and other types of Internet-related services. One of the objectives was to extend secure Internet connections to its own employees. The credit union had been hesitant to provide connectivity to the outside world based primarily on its concerns that security might be breached. Secondly, the credit union wanted to provide online access for its members, 90 percent of whom worked for the same corporation.

Marquardt states, "The credit union wanted to replicate information from its internal networks to the other corporation's intranet—in a secure manner. The credit union had considered a router-based firewall but did not feel that it would provide enough security. In addition, that type of firewall would not have enabled the credit union to tie its content into the other corporation's intranet."

IOC recommended the application-layer IBM Firewall, which now provides secure Internet connectivity and access to the other corporation's intranet. Marquardt explains, "The credit union especially liked the strength of the IBM Firewall. They also wanted to work with a company that had a known reputation like IBM. As a result, they are extremely pleased, because they can now do everything they wanted to." He adds, "Implementing a single solution and accomplishing several goals is a major advantage."

Executive Summary

Problem

Internet service provider needs a comprehensive solution to ensure that its customers' Internet-based activities are secure

Solution

IBM Firewall and Virtual Private Network technology

Benefit

The company can now provide reliable global connectivity for individual customers and their partners through secure intranets and extranets

VPN TECHNOLOGY HELPS REDUCE OPERATING COSTS

Recently, IOC has been focusing heavily on another key technology—Virtual Private Networks (VPNs)—and beginning to host and manage VPN-based networks for corporations and groups of corporations. Marquardt notes that many corporations are considering both firewall-to-firewall VPNs and limited access VPNs to handle remote access in a more cost-effective manner. Because VPNs can be developed quickly by obtaining local Internet access—without requiring major changes to an existing IT infrastructure—they are ideal for corporations that need to communicate with satellite offices or suppliers around the world.

"We are working with an international manufacturing company that is currently using Frame Relay and dedicated lines to communicate globally," Marquardt says. "They wanted a more cost-effective way to provide connectivity and security, so we told them about the VPN capability of the IBM Firewall for AIX. They're very excited about the technology."

After the company expressed interest in seeing a live VPN, IOC developed a working prototype and demonstrated it to the company's CIO just a week later. IOC is now helping the company to design an enterprise-wide VPN solution to be implemented in the near future. "The fact that VPN technology is global in reach means that a company can start communicating with remote sites very quickly and cost-effectively," Marquardt notes. "That makes VPNs very attractive. The fact that the IBM Firewall is already designed to handle VPNs is a great advantage."

A RELIABLE VENDOR INSTILLS CONFIDENCE

Marquardt says that many of IOC's customers are hesitant to implement an unproven technology or work with an unproven vendor—a fact that plays into IBM's advantage. He points to IBM's worldwide presence and numerous partnerships as a major selling point for corporations with global requirements. "IBM has staying power with sound technology and solutions that will be supported over the long term," he states. "Many of today's smaller, specialized companies cannot offer that kind of peace of mind to our customers. Due to its strength and breadth in global resources, IBM can support its firewall products and VPN technology on a worldwide basis much more effectively than any other vendor. It is truly a global company."

The ability of IBM and IOC to understand real-world business issues has also helped both companies alleviate customer concerns. Marquardt explains, "IBM solutions are ideal for our customers because IBM isn't just selling to technologists—it is selling to decision makers who don't want to bet the company on a short-term solution. The products are designed to solve real problems in a real-world environment." He adds, "The IBM Firewall positions us to be where the marketplace is headed, so we are using our research and development resource to get ready ahead of time. We believe that should give us a major advantage over our competitors in the future."

IBM's AIX Operating System Receives Virtual Private Network Certification

IBM AIX V4R3.1 has become the first server operating system to receive International Computer Security Association (ICSA) Virtual Private Network (VPN) certification—joining the eNetwork Firewall for AIX V3.1 which was VPN-certified in December 1997. With the built-in security features of both AIX and the IBM Firewall, enterprises now have a reliable path for conducting secure e-commerce across the Internet.

The AIX operating system is a strategic part of IBM's eNetwork VPN solutions that are designed to provide safe, flexible, and affordable end-to-end-encrypted connections across the Internet and other public networks that otherwise would be vulnerable to hackers. AIX is also vital to IBM's ability to provide open, standards-based interoperability for VPN technology and the widest range of multiplatform offerings in the industry—including firewalls, clients, servers, routers, and consulting services.

VPNs enable secure private connections—essentially private "tunnels"—across public networks, such as the Internet or multi-company supply-chain networks. VPNs are often used by Internet service providers or enterprise departments within large companies to connect business partners/suppliers, remote users, and branch offices into secure extended corporate networks (also known as extranets).

Within IBM VPN solutions, AIX helps securely transport business-critical data over the Internet even when the relevant application has no security protection of its own. In addition, AIX 4.3.1 helps secure e-business applications through strong authentication and 3DES encryption in either the IPv4 or IPv6 environment (note that 3DES encryption is not available in all countries). In this way, AIX is an ideal operating system for firewall applications, supporting unlimited filter rules to control a company's internal network traffic.

For more information about the eNetwork VPN solution, visit http://www.software.ibm.com/enetwork/technology/vpn.

For more information

http://www.iocenter.net
http://www.software.ibm.com/enetwork/firewall

A Reliable e-business Foundation

IBM eNetwork Communications Server for OS/390 (CS OS/390) is a powerful, secure communications infrastructure designed to support e-business initiatives for S/390 Enterprise Servers. By securely extending the reach of S/390 servers to remote offices, customers, suppliers, and business partners—whether they are connected though TCP/IP, SNA, intranets, extranets, the Internet, or a mixture of these networks—CS OS/390 provides enterprise-class dependability, scalability, and performance, as well as more effective use of network assets. Now, with the new CS OS/390 Version 2 Release 7 planned for availability in March 1999, several enhancements can improve performance, security, scalability, and usability even further.

INCREASED WEB SERVING PERFORMANCE

A new fast-response cache accelerator increases Web serving performance to handle Web page requests more efficiently. This IBM-exclusive technology caches Web pages within the TCP/IP Services stack, potentially reducing response times by as much as 50 percent for static Web page requests.

MORE SECURE INTERNET ACCESS

To improve Internet security, IBM has significantly enhanced the firewall technologies integrated into CS OS/390. Performance and RAS improvements help minimize the overhead of critical network security technologies while maximizing their reliability and availability. Release 7 enhancements include the following:

◆ Virtual Private Network (VPN) support meets the latest draft level of the RFC for IPSec—including the addition of HMAC-MD5 and HMAC-SHA authentication algorithms, as well as replay protection.
◆ Triple DES support uses S/390's triple DES encryption hardware.
◆ Simple Network Management Protocol (SNMP) Version 3 support complies with the latest Internet Engineering Task

The new CS OS/390 Version 2 Release 7 provides an enterprise-class TCP/IP solution

Force (IETF) standards and RFCs for secure network management—including message security, user-based security, and view-based access control—to guard against requests from unauthorized network management sources.

ENHANCED TCP/IP SYSPLEX SUPPORT

Improved TCP/IP sysplex support can greatly increase overall usability, availability, and performance while lowering application overhead. For instance, XCF Dynamics provides non-disruptive horizontal growth for TCP/IP in a sysplex—enabling the addition of new TCP/IP images without requiring coordinated definitions for existing sysplex members. Because only a single definition for each new TCP/IP image is needed, it is easier to scale up to handle higher workloads without impacting existing systems and their users.

In addition, CS OS/390 reduces the number of definitions required for a TCP/IP stack in a sysplex by using system symbolics in the PROFILE.TCPIP and TCP.DATA configuration files. Sockets applications can use Sysplex Sockets to "learn" when a partner application is in the same MVS® image or sysplex. This capability enables applications to share information securely in the sysplex without the overhead of encryption.

SOPHISTICATED PRIORITY NETWORKING FOR TCP/IP

The Service Policy Agent in CS OS/390 now enables administrators to control the performance characteristics of IP data packets traveling through the network. This enables administrators to differentiate controls and services based on characteristics such as service level agreements, classes of users, and types of applications.

ENHANCED ADDRESSING FOR TN3270 SERVER

The CS OS/390 TN3270 Server can now take advantage of enhanced addressing in an APPN®/HPR environment to significantly reduce the consumption of network resources and simultaneously increase server capacity. Other session managers, such as TSO/VTAM®, can also benefit from this improvement.

For more information

Visit **http://www.software.ibm.com/enetwork/commserver**

Upcoming Events

NetWorld + Interop® Brazil
São Paulo
NOVEMBER 3-5, 1998
http://www.interop.com

Internet Expo DBCS World
Chicago, IL
NOVEMBER 4, 1998

NetWorld + Interop France
Paris
NOVEMBER 4-6, 1998
http://www.interop.com

GUIDE SHARE Europe
3rd Technical Symposium
Cannes, France
NOVEMBER 9-10, 1998
http://www.gse.org/cannes/cannes.html

COMDEX® Fall '98
Las Vegas, NV
NOVEMBER 16-20, 1998
http://www.comdex.com

NetWorld + Interop Australia
Sydney
NOVEMBER 24-26, 1998
http://www.interop.com

COMDEX/Enterprise &
Java Business Expo
New York, NY
DECEMBER 7-10, 1998
http://javaexpo.sbforums.com/
http://www.comdex.com

COMDEX Canada West
Vancouver
JANUARY 11-13, 1999
http://www.comdex.com

Internet Expo
San Jose, CA
FEBRUARY, 1999

Internet World Canada
Toronto
FEBRUARY 2-5, 1999
http://events.internet.com/

COMDEX IT France '99
Paris
FEBRUARY 8-12, 1999
http://www.comdex.com

SHARE Technical Conference
San Francisco, CA
FEBRUARY 21-26, 1999
http://www.share.org

Internet World Asia
Singapore
MARCH 3-5, 1999
http://events.internet.com/

COMMON
San Francisco, CA
MARCH 7-12, 1999
http://www.common.org

CeBIT™
Hannover, Germany
MARCH 18-24, 1999
http://www.messe.de/cb99/

COMDEX/China '99
Beijing
MARCH 23-26, 1999
http://www.comdex.com

NetWorld + Interop Singapore
Singapore
APRIL 7-9, 1999
http://www.interop.com

Spring Internet World
Los Angeles, CA
APRIL 12-16, 1999
http://events.internet.com/

GUIDE SHARE Europe
OS/390 and Storage Systems
Technical Conference
Madrid
MAY 3-7 1999
http://www.gse.org/confrenc.htm

NetWorld + Interop
Las Vegas, NV
MAY 11-14, 1999
http://www.interop.com

Internet World Berlin
Berlin
MAY 18-20, 1999
http://events.internet.com/

NetWorld + Interop Japan
Tokyo
JUNE 2-4, 1999
http://www.interop.com

Summer Internet World
Chicago, IL
JULY 19-22, 1999
http://events.internet.com/

SHARE Technical Conference
Chicago, IL
AUGUST 22-27, 1999
http://www.share.org

COMMON
San Antonio, TX
OCTOBER 3-8, 1999
http://www.common.org

This is a list of selected conferences and trade shows of potential interest to eNetwork Connection readers. The information listed here is subject to change, and IBM makes no claims as to the value of these events. To list an event that is not shown here, send e-mail to enetwork@us.ibm.com.

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When you need detailed answers to difficult technical questions, where do you go? If you want timely, reliable results, you can turn to *TCdigest OnLine*. An online publication of articles, news, tips, and technical Q&A, *TCdigest OnLine* is designed specifically to serve the Technical Community—people like you who put networks together and keep them running strong.

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IBM Network Technology Marketing
Department CLJA/501, P.O. Box 12195
Research Triangle Park, NC 27709 USA

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