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eNetwork Connection

IBM

THE IBM NETWORKING SOFTWARE NEWSLETTER

Inside

Enterprise-Class Universal Connectivity and Information Access

IBM eNetwork Software offers a full range of client and server networking software for cost effective network computing

The IBM eNetwork Software family, with its rich history of enterprise-class communications, is clearly poised to significantly expand its universal connectivity capabilities. Organizations looking for a leg up on their competition will be able to exploit the new, unfolding network computing model through the use of IBM eNetwork Software. eNetwork Software can help organizations build, maintain, and manage distributed networks of interconnected LANs, as well as provide the infrastructure needed for host access, network computing, and network integration.

IBM is widely known as the originator and leader in SNA networking, which is the basis for thousands of mission-critical business networks around the world. Today, IBM is emphasizing leadership in TCP/IP communications so that network users can be assured of enterprise-class connectivity regardless of their network protocol selection. SNA networking has evolved into an open standard with Advanced Peer-to-Peer Networking® (APPN®) and High Performance Routing (HPR), and IBM is committed to enhancing APPN/HPR.

With the integration of TCP/IP and SNA and continuous advances in APPN/HPR, eNetwork Software provides access to existing applications and data, along with the freedom to choose applications based on your business need, not on your network.

IBM eNetwork Software is focused on providing cost-effective solutions for:

Universal communication: IBM eNetwork Software offers end-to-end connectivity for accessing applications and data on your local or wide area network, host, corporate intranet, and the Internet—from any location. With eNetwork Software, you can leverage the value of information by more efficiently placing it in the hands of those who need it, when they need it.

Network computing: Through IBM eNetwork Software you get a networking infrastructure that lets you realize the cost-saving benefits of network computing. As new demands are placed on networks by "thin clients" and Java™-based applications, eNetwork Software solutions help ensure effective use of your network resources.

Mobile communication: IBM eNetwork Software leverages your existing applications and data by connecting your mobile workforce to the enterprise. eNetwork Software addresses the unique requirements of mobile employees by supporting continuous and disconnected computing environments, making information available when and where it is needed.

Networking technology: IBM eNetwork Software delivers enterprise-class TCP/IP solutions for the real business networks of today, along with next-generation technology as a

Continued on page 3

eNetwork Is Here

In this issue of *eNetwork Connection* we spotlight eNetwork Software: IBM's family of enterprise-class solutions for all the networking challenges your business faces. These challenges are many. Mobile and desktop-based employees need fast, easy access to mission-critical applications and data on hosts and servers. Applications have to run across large, heterogeneous networks. New decentralized networks—composed of interconnected LANs—require new ways of providing access to information and controlling the network. Network computing—in which components or Java applets are downloaded "on demand" from servers to clients—requires fast, available, secure access.

IBM eNetwork Software provides answers for all of these challenges. In this issue of *eNetwork Connection*, you will read about several exciting new eNetwork Software announcements. These announcements are not just plans for the future—they are solutions that you can deploy today to meet the needs of your business:

- **Communications Server**, available on Windows NT™, provides host and Internet access, along with end-to-end connectivity solutions across all major protocols and operating systems.
- **Communications Suite** combines the power of PCOMM, Lotus Notes® Mail, FTP Software® 32-bit TCP/IP protocol stacks and applications, and the Netscape Navigator™ Web browser to deliver complete, easy access to all your corporate intranets and host data, Lotus Notes, and the Internet.
- **ARTour™ and ARTour Web Express**, now generally available, give mobile users wireless connection to standard enterprise network applications.
- **IBM S/390®-based products** include enhancements that help provide a high-performance communications infrastructure for electronic commerce and other key applications.

As James Neiser, IBM's vice president of Networking Software Marketing, says, the bottom line is more cost-effective networking. For your business, that translates into both cost savings and new opportunities for success.

You can learn more about eNetwork Software by visiting our Web site (**http://www.networking.ibm.com/eNetwork**) or by attending our business seminars and shows. See for yourself how eNetwork Software can help you meet the needs of your business—both today and tomorrow.

I hope you enjoy this issue of *eNetwork Connection*. If you have comments or questions, I would be happy to hear from you. You can contact me any time by sending E-mail to appcnews@vnet.ibm.com or faxing to 919-254-9132 (U.S.).

Larry Kunz

Larry Kunz
Editor, *eNetwork Connection*

What customers using the S/390 as a Web server have to say:

Frank Robb, executive vice president, Wachovia® Operational Services Corp., Winston-Salem, North Carolina: "The System/390® is a vital part of our networking strategy. The OS/390™ Web server and Parallel Sysplex architecture will allow us to meet the tidal wave of transactions head on. S/390 ensures that five years from now, Wachovia will remain ahead of the technology curve."

Mark Krause, senior systems analyst, Commonwealth Edison®, Chicago, Illinois: "The Information Technology department at ComEd is taking the lead in demonstrating the advantages of an intranet service. Based on a successful five-month pilot of an S/390-based Web server, we intend to move to full-scale production and leverage the high performance, availability, and scalability that the S/390 platform offers. We will also take advantage of the S/390's Parallel Sysplex clustering technology."

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New Solutions for Your Business Needs

IBM's eNetwork Software promotes cost-effective networking

Recently IBM proudly unveiled eNetwork Software, representing our passion for providing enterprise-class solutions that meet our customers' business needs. An integral part of IBM's e-business initiative, IBM eNetwork Software offers something new in the networking software industry:

- **Enterprise-class dependability**—Setting high standards in reliability, availability, scalability, security, predictability, and performance for network computing
- **End-to-end universal access**—Providing data access from anywhere through multiple protocols, multiple platforms, multiple network technologies, multiple sources from multiple locations, and multiple application types
- **Easy implementation, configuration, and usage**—Leading the industry in ease of installation and configuration, and simplified operation, management, and programming
- **Effective utilization of network assets**—Offering significant savings in terms of network utilization, communication efficiency, operations flexibility, infrastructure exploitation, and network intelligence

The bottom line is more cost-effective networking. As IBM eNetwork Software evolves, you'll find that it addresses all of your key network computing challenges:

- **Enterprise networking**—Adding value to the current communications clients and servers to give you universal connectivity, host-to-Internet/intranet information access, network integration, and more effective interconnected LANs
- **On-demand networking**—Providing efficient, robust solutions for server-driven network computing solutions and more generalized Java application usage
- **Advanced mobile networking**—Using both wireless and wireline remote access to boost network efficiency and reliability in low-bandwidth or disconnected environments
- **Networking technology leadership**—Developing the enterprise-class TCP/IP connectivity required for your mission-critical business applications and enabling you to run any application with the same level of services, regardless of the network type

IBM eNetwork Software is much more than just a new name. Here's proof: as we unveiled our new eNetwork Software brand, we also rolled out significant new products like the eNetwork Communications Suite (profiled on page 12), Windows NT versions of our Personal Communications (PCOMM) and Communications Server emulators (see page 8), and major enhancements to our Communications Server and VTAM® products for the S/390 environment (see page 10).

I invite you to learn more about eNetwork Software. Attend our business seminars and shows, and read our white paper on the Web at **http://www.networking.ibm.com/eNetwork/whitepaper.html**. You'll see that, now more than ever, IBM is dedicated to providing you with the networking solutions you need to solve real business problems.

James Neiser

James Neiser
IBM Vice President, Networking Software Marketing

(continued from page 1)

foundation for future growth.

IBM eNetwork Software delivers solutions for the most cost-effective network computing by providing:

- Enterprise-class dependability
- End-to-end universal access
- Easy implementation and use
- Effective utilization of network assets

IBM eNetwork Software combines IBM's expertise in providing industrial-strength solutions for the enterprise environment with the latest networking technologies of today and tomorrow.

For more information

Visit **http://www.networking.ibm.com/eNetwork** and **http://www.networking.ibm.com/eNetwork/whitepaper.html**

Insurance Company Streamlines Connections with PCOMM

Easy-to-use software improves agent productivity

Located in Raleigh, North Carolina Farm Bureau Mutual Insurance provides property and casualty insurance services, as well as health and life insurance policies underwritten by other companies. A $400 million (U.S.) net-premium written company, North Carolina Farm Bureau Mutual Insurance is the third largest property and casualty insurance writer in North Carolina. To remain competitive, the company seeks out new technology that can help it meet a variety of customer requirements more efficiently.

The company uses a central computer-based policy management application and E-mail for processing insurance policies. According to Todd Knower, telecommunications manager at North Carolina Farm Bureau Mutual Insurance, the company needed to connect more than 800 agents, scattered across North Carolina, to both the central computer and the North Carolina State Department of Motor Vehicles (DMV) database.

The agents needed to be able to quickly and accurately quote insurance rates at either the office or a customer's home. For example, to quote an auto insurance rate, agents had to connect to the main computer at the DMV to verify their customers' driving record. Using this information, the agents could accurately quote insurance rates to their customers. Fast, reliable response was critical to maintaining customer satisfaction.

These agents had been using DOS-based Toshiba® T1600s, and connecting to the DMV often tied up those laptops for as much as five minutes—much too long for a customer to wait for a response. Knower realized that the delays were threatening customer satisfaction and decided to seek out a more efficient way to connect the agents with the DMV.

Application

Remote access to state motor vehicles records database

Software

PCOMM 3270 for OS/2® and either OS/2 Warp™ or OS/2 1.2 or higher

THINKPADS AND PCOMM PROVIDE A MOBILE SOLUTION

Knower turned to IBM for help in finding a way to increase the agents' mobility and productivity. IBM recommended that North Carolina Farm Bureau Insurance install OS/2 as its new operating system and use the IBM ThinkPad® 701C as the agents' laptop computer. The laptop immediately gave agents the mobility they needed. From their offices, agents can now use ThinkPads configured with a Personal Communications (PCOMM) 3270 emulator to access central computer applications and to download client and policy information.

One of the major benefits of PCOMM is that it masks the complexity of information management. The agents have found PCOMM easy to use, and faster response times have increased their productivity. A key factor in this success is the PCOMM utility called CM Mouse, which automates mouse clicks and uses a unique screen recognition technology to know which "hotspot" to select on a given screen. For example, agents can easily check a driving record just by clicking on a folder and entering a customer's license number. Behind the scenes, PCOMM navigates nine screens across two systems.

FASTER RESPONSE SAVES TIME AND MONEY

So far, the new system has resulted in much faster response time for connecting to the DMV. What once required up to five minutes now takes less than two minutes. Meanwhile, OS/2's multitasking capability enables agents to switch away and perform other work, such as using PC-based programs to obtain insurance quotes. The agents can now write higher quality insurance policies faster, which saves North Carolina Farm Bureau Mutual Insurance time and money. Knower states, "Our agents couldn't tell you specifically how PCOMM helps them, but it's what they don't have to do that helps us serve our customers better."

With PCOMM, the connections are seamless, so agents are now free to concentrate on their applications—not on the mechanics of accessing them. Knower concludes,"PCOMM and IBM are helping us be more competitive. Our operation is growing from 100 to 170 offices, and our IBM solution is at the center of making that work."

For more information

Visit **http://www.networking.ibm.com/pcf/pcfprod.html**

Wireless Network Connection for Mobile Workers

ARTour software extends application use to wireless networks

IBM has recently enhanced its Advanced Radio Communications on Tour (ARTour) client/server middleware and added two new members to the ARTour family of products. A universal platform for mobile communications, ARTour helps organizations extend their wired-network applications to mobile users who increasingly need anywhere/anytime information access. New enhancements to ARTour include international language support, expanded network coverage, and broader client support. In addition, there are two new products in the ARTour family: ARTour Web Express and ARTour Emulator Express.

ARTour enables mobile users to access corporate databases and information over wireless networks directly from their laptops—by using the same desktop tools available in their office. Consisting of a client for the laptop and a gateway, ARTour provides a robust networking solution with extensive security features and an easy-to-use interface. With ARTour's wireless TCP/IP connections, users can run existing IP-based applications over wireless radio frequency networks and cellular technology, without having to modify those applications. This capability greatly reduces the cost, complexity, and amount of time required to develop and deploy computing solutions for remote mobile users.

A WIDE RANGE OF CONNECTIVITY OPTIONS

ARTour is now available for Windows™ 3.1, Windows 95, and OS/2. With support for 12 languages and Kanji characters, ARTour is an ideal solution for global mobile workforces. ARTour also supports multiple connectivity options for wireless networks. In addition to cellular technology, ARDIS® DataTac, and RAM Mobile Data Mobitex radio frequency networks, ARTour now supports GSM, PCS, and Motorola™ Private Mobile Radio networks.

To protect data privacy during transmissions, ARTour includes data encryption, along with authentication to ensure the validity of user access. In addition, data compression and traffic-reduction features help reduce file sizes, improve transmission times, and lower overall network costs.

EMULATOR AND WEB ACCESS FOR MOBILE USERS

Two new members of the ARTour software family, ARTour Emulator Express and ARTour Web Express, are designed especially for organizations that deploy forms-based applications to their mobile workers.

- **ARTour Emulator Express**—Optimizes wireless access to 3270 and 5250 applications by reducing data traffic by up to 50 percent. It also improves user productivity by employing the same familiar screens and commands that users see when directly connected to the enterprise network. The software is available by special request from your IBM representative.

- **ARTour Web Express**—Provides mobile users with access to World Wide Web and Internet applications over wireless radio frequency networks and cellular technology. By decreasing Web data traffic by up to 70 to 95 percent, ARTour Web Express significantly reduces connect time and network charges. The asynchronous operation of ARTour Web Express also enables users to continue browser tasks while pre-selected Web pages are being downloaded. Users can also store frequently accessed Web pages for off-line access.

SOLUTIONS FOR A VARIETY OF INDUSTRIES

Many organizations in the public safety, health care, retail, insurance, transportation, distribution, and financial services industries are already using ARTour to integrate wireless communications and portable computers into their applications. Public safety is one key area where wireless mobile data is facilitating real-time information sharing in the field (see **http://www.networking.ibm.com/atp/atphome.htm**). According to Tom Wheeler, president and CEO of the Cellular Telecommunications Industry Association (CTIA), "IBM's commitment to wireless technology can help achieve greater productivity in many industries. The focus on public safety is extremely important, because we are talking about technology that can help save the lives of law enforcement officers and firefighters and can assist them in preserving life and property in their community."

For more information

Call 1-800-735-7638 or visit
http://www.networking.ibm.com/art/artprod.htm

The Ins and Outs of High Performance Routing

HPR performance testing reveals significant improvements in network throughput

With the need for optimized network uptime and reliability continuing to swell in large organizations, network managers are increasingly looking for ways to better handle congestion, dynamic rerouting, traffic prioritization, and classes of service in their enterprise networks.

IBM developed High Performance Routing (HPR) to help them do just that. HPR accelerates network throughput in ways that capitalize on advances in new, efficient transport mechanisms, such as Frame Relay and Asynchronous Transfer Mode (ATM), while retaining the SNA class of service and priority mechanisms to meet each application's special requirements.

An evolutionary superset of Advanced Peer-to-Peer Networking (APPN), HPR allows migrating SNA shops to take advantage of modern networking technologies. These technologies require less error checking overhead, but they also reduce the time a node can spend on routing and pacing functions. Using HPR requires no complex configuration or hardware upgrades to existing APPN or SNA networks.

HOW HPR IMPROVES NETWORK PERFORMANCE

In HPR networks, sessions are carried over Rapid Transport Protocol (RTP) connections between the source and the destination endpoints. RTP connections provide several enhancements to enterprise networks. For example, RTP allows high-speed data transport by using a low-level routing mechanism, called Automatic Network Routing (ANR), which performs end-to-end recovery of lost packets in a network. ANR routes network-layer packets in a way that minimizes cycles and storage consumption at intermediate nodes.

What is HPR?

High Performance Routing, or HPR, is a routing algorithm that adds end-to-end non-disruptive rerouting and preemptive, rate-based congestion avoidance to SNA and APPN networks. HPR is an option to IBM's Communications Server and PCOMM software; on mainframes, it is implemented in VTAM Version 4, Release 4.

APPN and HPR-capable nodes can coexist in the same network. An RTP connection will be set up between the source and destination only if the source and destination are both RTP-enabled, and the intermediate nodes are RTP- or ANR-capable. If the network consists of a mixture of APPN and HPR nodes, a separate RTP connection will be established for every segment of the path from source to destination where the endpoints of the segment are RTP-capable.

In contrast to the way ANR works, each hop in subarea SNA and traditional APPN networks performs recovery of lost packets. With improvements in link error rates, however, ANR's end-to-end recovery mechanism is more efficient for today's networks. In addition to supporting end-to-end recovery, HPR also provides for the selective retransmission of lost packets.

To regulate the flow of data over RTP connections, HPR uses the ATM Forum-standard Adaptive Rate Based (ARB) flow/congestion control mechanism. ARB is more suited for high-speed data transport than existing pacing mechanisms in APPN, because it preemptively detects and avoids congestion. By contrast, APPN pacing reacts to congestion that might have already affected some packets in transit.

In addition to rate-adapting, HPR can non-disruptively reroute the path of an RTP connection when it detects a failure in a node or link along the transmission path.

TESTS SHOW HPR'S BIGGEST GAINS ARE IN INTERACTIVE APPLICATIONS

IBM recently tested the actual and normalized performance of HPR relative to APPN and subarea SNA in two configurations. Normalized results represent actual measurements of protocols doing different amounts of work (such as supporting unequal volumes of users) adjusted for the differences so that accurate comparisons can be drawn.

The first configuration was a host-to-host setup, with a 10 MB/sec ESCON® channel between hosts, used to evaluate HPR performance at high data transfer rates in a file transfer application. We tuned VTAM parameters such as pacing, buffer sizes, and request and response unit sizes to achieve maximum throughput. A file size of 4 MB traveled from the client to the server.

The second configuration examined the performance of HPR for interactive workloads in a typical enterprise network (see Figure 1).

In this configuration, a "client host"—simulating a set of user terminals—was connected to a host (the server) over a Frame Relay network. The "client host" simulated 200 concurrent active sessions. The intermediate nodes communicated using two T1 Frame Relay links. For each session, the client sent 256 bytes to the server, which responded with 256 bytes.

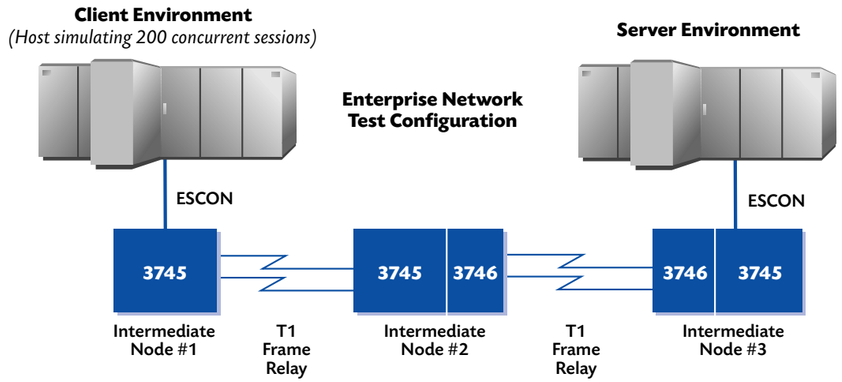


Figure 1. **Depending on which protocol was being tested, the 3745/3746 intermediate nodes performed ANR, intermediate-session, or subarea SNA routing in an interactive test application. No bottlenecks occurred in intermediate nodes.**

We performed transactions repeatedly for each session for the duration of the test.

All measurements were made on standalone systems and links with no external factors impacting testing. All tests lasted a duration of 10 minutes at steady state to obtain statistically valid measurements of throughput (MB/sec), client and server utilization, and client and server storage use. We measured HPR performance parameters in terms of end-to-end throughput as well as CPU cycles and storage used at RTP endpoints and intermediate ANR nodes.

The results indicate that HPR provides significant improvement in overall network performance in terms of end-to-end throughput and a reduction in intermediate node CPU utilization. There was, however, a reasonable increase in normalized CPU utilization with HPR compared to APPN and subarea SNA networks. This is because HPR flow control and recovery are between the endpoints of a session rather than on a hop-by-hop basis, causing endpoint storage requirements to increase.

Performance measurements for HPR in VTAM Version 4, Release 4 (V4R4) for MVS/ ESA™, in conjunction with the High Performance Data Transport (HPDT) feature within VTAM V4R4, indicate that VTAM with HPR can deliver throughput in excess of 1 Gbps. In this case, the speed of the network connection is likely to be the performance-limiting factor, rather than the routing mechanism.

MEASUREMENT RESULTS: THE STATISTICS

In the high-bandwidth, host-to-host configuration, there were no intermediate nodes, so there were no performance benefits due to ANR. The testing showed a difference of less than 1.6 percent in throughput between HPR and APPN implementations in VTAM V4R3 for MVS/ESA.

In CPU utilization, the comparative measurements of CPU consumption for HPR and APPN showed that HPR consumed slightly more cycles than APPN. For normalized throughput, the difference in actual CPU utilization between APPN and HPR translated into approximately 3.2 percent to 5.5 percent.

Measured in VTAM I/O buffers (IOBUFS), the maximum storage for HPR and APPN used during startup at the client increased by 28.7 percent and at the server by 291.3 percent. During steady state, the storage requirements were much smaller. The primary reason for the initial increases is end-to-end flow control and recovery. That mechanism necessitates buffering data until an acknowledgment arrives from the partner device to indicate that the data has been received successfully.

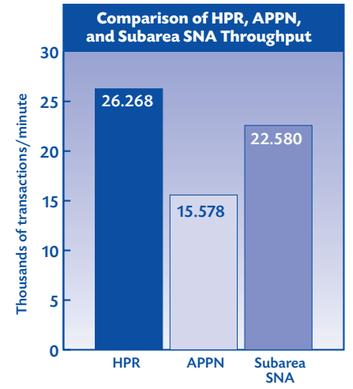


Figure 2. **Comparing end-to-end throughput for HPR, APPN, and subarea SNA revealed that HPR throughput is 16.3 percent greater than that of subarea SNA traffic and 68.6 percent greater than that of APPN.**

In the enterprise configuration, the performance benefits of HPR were more obvious, with HPR throughput testing significantly higher than that of its predecessors (see Figure 2).

Further, in the subarea SNA and APPN configurations, throughput is constrained by bottlenecks in the intermediate nodes. We saw no resource bottlenecks in the HPR network.

The overall network performance improvements yielded by using HPR make it an important evolutionary extension to APPN. HPR provides significant improvements in throughput and capacity in current networks. Scalable to many thousands of nodes, HPR is also poised to exploit the next generation of networking technology to support current and emerging applications.

For more information

Visit **http://www.networking.ibm.com/aac/aachpr.htm**

Increased Collaboration with Network Computing

Multifunction gateway connects people to the information they need with enterprise-class dependability and network computing support

Internet, intranet, electronic commerce, open standards: The latest buzzwords are probably all having an impact on your business.

In response to customer demands for an industrial-strength communications solution for the Windows NT environment, IBM has begun shipping Communications Server for Windows NT. A new member of the eNetwork Software family, Communications Server for Windows NT is a powerful multifunction gateway that supports diverse applications and network environments with enterprise-class dependability, security, and scalability.

The software gives you the freedom to choose applications based on your business needs—not on your network protocol. That is because Communications Server enables workstations to communicate with other workstations and host computers, regardless of platform and network configuration. Communications Server prepares your networks for the high-speed applications of the future with High Performance Routing (see page 6), which combines the best qualities of SNA and TCP/IP to provide high availability with maximum throughput and efficiency. And Communications Server for Windows NT leads the evolution to network computing by providing seamless integration between Web users and 3270 SNA applications with its Host On-Demand feature.

Communications Server for Windows NT

- ***Allows you to make application decisions based on business needs, unconstrained by network protocols***
- ***Serves as a powerful gateway server for SNA and TCP/IP clients***
- ***Provides access to both TCP/IP and SNA applications***
- ***Boosts network availability and performance with HPR***
- ***Enables you to offload critical applications from the host with parallel and ESCON channel attachments***
- ***Delivers easy access to 3270 applications from TCP/IP clients and Java-enabled Web browsers***
- ***Allows you to perform server administration functions remotely using the Web***

HELP FOR SORTING THROUGH NETWORK INTEGRATION CHAOS

Do your users have access to applications, data, and people, regardless of where they reside? The demands of adding more people and more applications to your network can leave you wondering if data will be available to all those who need it.

Communications Server solves that problem by integrating a variety of LANs and WANs so you can add new applications without updating or disrupting your current network or constructing parallel networks.

Communications Server offers several solutions for your diverse environment. IBM AnyNet® technology, based on the Multiprotocol Transport Networking architecture (an open industry standard), is designed to expand business solutions by allowing new applications to run on your existing network, unconstrained by network protocol. You can also add applications designed to run over different protocols without modifying the applications or changing hardware.

MIXING AND MATCHING SNA AND TCP/IP

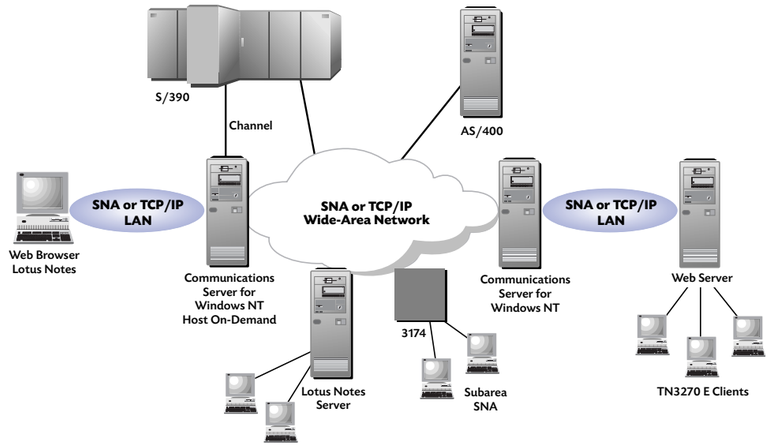
You can run TCP/IP protocols and applications over existing SNA networks without building a separate network. For example, you can run File Transfer Protocol (FTP), Telnet, Simple Network Management Protocol (SNMP), Lotus Notes, Web browsers, SAP™ R/3™, and TME™ 10 NetFinity™.

Likewise, with SNA over TCP/IP, you can extend SNA applications to TCP/IP users without adding an SNA network. This allows CICS™, DB2®, emulation software, and other SNA applications to natively communicate with centralized computers and workstations across a TCP/IP network (see diagram).

Communications Server provides access to SNA applications for a wide range of TCP/IP clients. Communications Server works as a TCP/IP Telnet server, providing SNA network access service to client applications running anywhere in the TCP/IP network. The TN3270E server supports any TN3270- and TN3270E-compliant client. TN3270E enables users to print from 3270 applications to printers attached to their workstations or in their TCP/IP network.

The SNA API client support (split-stack) allows TCP/IP-attached clients, such as OS/2, Windows 3.1, Windows 95, and Windows NT, to access SNA APIs. This support reduces memory and processor demands on the client by moving SNA configuration and processing to the server.

Communications Server for Windows NT also includes Host On-Demand, which gives you fast and easy access to SNA-based information from intranets or the Internet. Host On-Demand is a Java-based solution that incorporates industry-standard Telnet 3270 protocols, providing a high-performance, low-cost solution for intranet and Web users who need only occasional access to their central computer applications or databases.



Communications Server for Windows NT enables SNA and TCP/IP users to access host and client/server applications across a single network.

ADVANCED SNA NETWORKING

Communications Server supports SNA connectivity in traditional hierarchical subarea networks and in peer-to-peer environments. In subarea networks, you can use Communications Server to enhance network performance and simplify configuration. In a peer-to-peer environment, Communications Server manages connectivity by using the Advanced Peer-to-Peer Networking (APPN) protocol.

The full-function APPN network node provides a low-maintenance, robust networking backbone that scales easily. APPN reduces your network administration and maintenance costs by leveraging dynamic and simplified configuration, dynamic logical unit (LU) 6.2 session routing, and powerful application programming features. APPN also provides improved reliability and performance through HPR. Dependent LU Requester allows optimal routing of dependent LUs and 3270 data over an APPN network.

LAN USERS ACCESS MULTIPLE HOSTS

Communications Server provides a full-function SNA gateway that allows LAN-attached workstations to access multiple hosts, such as System/370™ and System/390, through one or more physical connections. This helps reduce the cost per workstation of central computer connections.

The Communications Server gateway supports the SNA protocols LU 0, 1, 2, 3, and dependent LU 6.2 (APPC). The LUs defined in the gateway can be dedicated to a particular workstation or pooled among multiple workstations. Pooling allows workstations to share common LUs, which increases the efficiency of the LUs while reducing the configuration and startup requirements at the central computer.

You can also define multiple LU pools, with each pool associated with a specific application. And you can define common pools that are associated with multiple computers. When a link is defined through the gateway between a workstation and the central computer, the LU is activated when the session is established. It is returned to the pool for access by other workstations when the session is ended.

COMPLETE CONNECTIVITY AND POWERFUL PROGRAMMING SUPPORT

Whether you want to connect networks over a WAN or LAN running the protocol of your choice, Communications Server does the job. You can also connect multiple physical units (PUs) across a single physical adapter for Token Ring, Ethernet™, X.25, SDLC, FDDI, Frame Relay, and channel attachments.

Support for multiple PUs extends the number of supported LUs per adapter port available for all link types. This allows you to connect one or more centralized computers across the same adapter—saving you money.

A sophisticated platform for programming and application integration, Communications Server supports a wide range of 32-bit APIs. These APIs are easy to use and allow applications to address the communications needs of connections to both IBM and other computers.

The supported APIs include APPC, CPI-C, Conventional LU Application Interface (LUA) RUI, WinSock, Network Operator Facility, Management Services, and Common Services. On Windows clients, the EHNAPPC API is also provided.

Communications Server for Windows NT is designed to help you make application decisions based on your business needs, not on the network protocols you might have inherited—while improving your network availability and performance with HPR. Whatever the size of your organization, Communications Server can provide a scalable networking solution that can grow along with your business.

For more information

Visit **http://www.networking.ibm.com/cms/commserv.html** or **http://www.networking.ibm.com/cms/csnabt.html**

Communications Server for OS/390

A new release provides a high-performance communications infrastructure for electronic commerce and other key applications

Communications Server (CS) for OS/390 provides a powerful networking foundation for universal connectivity and information access for S/390 servers. Embedded in the OS/390 operating system, it connects diverse application and network environments to S/390s, providing the highest capacity and the fastest and most reliable infrastructure for network computing.

The universal connectivity and rock-solid availability provided by CS for OS/390 overcome many of the limitations of today's networks, giving IT professionals and users the freedom to choose the best applications independent of the installed network infrastructure. The results are lower costs and faster development of superior applications.

In addition, new rerouting and session-preserving enhancements to CS for OS/390 help you ready your infrastructure for electronic commerce and other applications that require uninterrupted network and system availability (see figure).

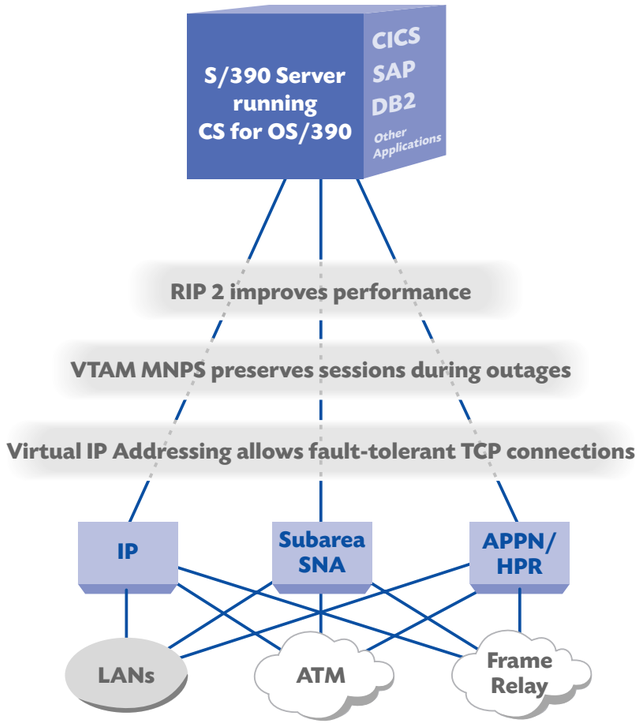
UNIVERSAL INFORMATION ACCESS

CS for OS/390 Release 3 provides the widest range of open connectivity of any single server system in the industry. With its leading-edge IP and SNA services, CS for OS/390 connects S/390 servers to nearly all types of LANs and WANs, as well as to intranets and the Internet.

CS for OS/390 enables Internet users with Sockets applications—such as Web browsers—to access S/390 applications and data. S/390 servers running the IBM Internet Connection Server software are excellent Internet and intranet sites because of their scalability, reliability, performance, and access to business information.

Multiprotocol capabilities enable network administrators to optimize their existing network and application environments. TCP/IP applications can be accessed over existing SNA networks, so network administrators do not have to create a separate IP network to handle Internet traffic. Enterprises with large SNA networks can also save the cost and manpower of rewriting SNA applications to access the Internet since this connectivity is provided by CS for OS/390.

If you have an in-place IP network, SNA applications can run on it while still retaining the benefits of the SNA protocol. For example, SNA provides consistent performance even when interactive and batch applications coexist on the same network. Large batch file jobs will not interrupt the consistent response time needed by the interactive applications.



The new release of Communications Server for OS/390 adds features for fault tolerance and connectivity, providing industrial-strength support for electronic commerce and other mission-critical applications.

CS for OS/390 supports a wide variety of programming interfaces. Supported applications include those written to use APPC, CPI-C, OpenEdition® DCE remote procedure calls, and BSD Sockets interfaces, including ported UNIX® applications through MVS/OpenEdition. The CS for OS/390 IMS™ Sockets Interface is enhanced in CS for OS/390 Release 3 to support the Open Transaction Manager Access Facility (OTMA). This makes it easier to deploy IMS/OTMA applications across TCP/IP networks, because the same application commands can communicate with a client or a server.

ENTERPRISE-CLASS AVAILABILITY AND PERFORMANCE FOR TCP/IP TRAFFIC

CS for OS/390 now includes several features that contribute to network performance and uptime. High-Performance Native Sockets (HPNS) reduces CPU utilization for TCP/IP users. HPNS exploits MVS® functions to improve cross-memory communication, reduce context switches, decrease data movements, and improve reliability and recovery. This leads to less CPU utilization for the Sockets layer, transport medium, and TCP/IP stack protocols. All new applications written to any one of the existing Sockets application programming interfaces can benefit. In a test environment, 16,000 concurrent TN3270 sessions have run on a single MVS TCP/IP system.

CS for OS/390 now supports Routing Information Protocol (RIP) Version 2, which enables administrators to more efficiently route traffic around network failures. It accelerates network performance and improves routing control with multicasting, variable subnetting, immediate next hop, and packet authentication functions.

Virtual IP Addressing (VIPA) is also part of CS for OS/390. VIPA, with the dynamic route update server Route D, can be used to implement fault-tolerant TCP connections by defining an IP interface and address that is not associated with any physical network interface. It defines primary and alternative interfaces for the same subnet and switches dynamically to the alternative if the primary interface fails.

HIGH AVAILABILITY WITH THE S/390 PARALLEL SYSPLEX

With VTAM Multinode Persistent Sessions (MNPS), CS for OS/390 can now preserve sessions across application outages where hosts are connected through the S/390 coupling facility. Because session information is preserved, the workload and extra network traffic to reestablish connections is avoided. Network availability is increased to 100 percent with High Performance Routing's (HPR) ability to route around any failing component in the network. Together, HPR and MNPS enable you to build fault-tolerant networks and applications.

TSO users can now easily take advantage of the high availability of the S/390 Parallel Sysplex. CS for OS/390 VTAM generic resource support has been extended to support TSO/E. The Sysplex appears as a single system to the TSO user. Multiple TSO instances can be accessed using the generic name, making it possible for one processor to take over for another failed processor without affecting users.

NATIVE ATM CONNECTIVITY ON S/390

Now you can add an Asynchronous Transfer Mode (ATM) network without affecting applications. CS for OS/390 Release 3 (including VTAM Version 4 Release 4), along with Open System Adapter-2 (OSA-2), supports native ATM communication for S/390. Two features—best-effort virtual circuits and reserved-bandwidth virtual circuits—optimize link capacity and bandwidth utilization.

IMPROVED USE OF HIGH-SPEED NETWORKS

To better capitalize on high-speed networking, CS for OS/390 Release 3 includes High-Performance Data Transfer (HPDT) services and new interfaces to optimize performance for VTAM APPC applications—especially those that transfer large data objects.

HPDT services are available to applications written to the VTAM APPC COMMAND (APPCCMD) interface without modification. A session can connect two intra-host applications or applications connected over high-speed networks, such as ATM via OSA-2 attachments. Other attachments include the cross-system coupling facility in a Parallel Sysplex, the 3746 Nways™ Multiprotocol Controller Model 900 or 950, and the 2216 Multiaccess Connector Model 400.

VTAM contains a new channel protocol, Multipath Channel (MPC), which has been enhanced to include HPDT MPC (also referred to as MPC+) connections. This provides a more efficient data transfer because HPDT services enable data packing without data movement and improved scheduling of channel programs. Both data packing without data movement and improved scheduling of channel programs reduce CPU cycles used for communication by as much as two-thirds.

The amount of improvement will vary, depending on system configuration, size, and type of data objects. Measurements in some configurations have shown that S/390 throughput increased by as much as 40.7 percent and that CPU utilization decreased by as much as 63.2 percent.

CS FOR OS/390: THE ESSENTIAL FOUNDATION

The features in CS for OS/390 Release 3 provide enterprise-class performance and networking capability. They demonstrate why the S/390 can be a premier foundation for network computing and electronic commerce. IBM plans to continue extending the capabilities of CS on S/390 to meet the expanding needs for enterprise-class solutions, universal network access, and premier support for e-business solutions.

For more information

Visit **http://www.networking.ibm.com/cms/commserv.html** and **http://www.networking.ibm.com/cms/cs3abt.html**

Enterprise-Wide Information Access

IBM eNetwork Communications Suite provides one easy answer for accessing your data

To remain competitive in today's dynamic business environment, you need immediate access to a wide variety of information—information about your business, your markets, and your competitors. Once you have access to your information, you need to be able to share it with your colleagues, suppliers, and customers—delivering the information quickly and in an understandable format, regardless of its source. Finally, you need these capabilities 24 hours a day, 7 days a week from anywhere in the world.

As information becomes increasingly important to your organization's competitiveness and profitability, you need a simpler, easier way to handle your information access requirements. Today, IBM offers all the tools you need to accomplish this—and more—in a single, integrated solution: the IBM eNetwork Communications Suite, a member of IBM's eNetwork Software product family.

INDUSTRY-LEADING PRODUCTS IN A SINGLE PACKAGE

eNetwork Communications Suite is designed to provide anywhere/anytime information access to corporate intranets and hosts, Lotus Notes, and the Internet from a single source in a Windows environment. eNetwork Communications Suite addresses the requirement for global information access by offering four industry-leading products in a single package—you can install everything at once or select just the products you currently need.

eNetwork Communications Suite supports Windows 3.1, Windows 95, and Windows NT 4.0 so you can focus on your application needs and not your operating system requirements. As you migrate from Windows 3.1 to Windows 95 or Windows NT, you do not need to make another purchase when you upgrade operating systems. eNetwork Communications Suite provides a total desktop communications solution for the Windows environment by combining the power of the following products:

- **IBM Personal Communications (PCOMM)**—Enables access to 3270 and 5250 host applications and data
- **Lotus Notes Mail®**—Helps you communicate and share information with colleagues, customers, and suppliers
- **Next-generation TCP/IP protocol stacks and applications from FTP Software**—Provides unequaled TCP/IP applications, connectivity, and security
- **Netscape Navigator**—Delivers fast, efficient intranet and Internet access

With eNetwork Communications Suite, you can standardize on a common networking client for the desktop while offering users the latest proven networking applications and technologies. Best of all, eNetwork Communications Suite offers an unparalleled range of connectivity options to provide secure access to data whether users are in the office, on the road, or at home.

EMULATION BEYOND EXPECTATION WITH PCOMM

You can access corporate host data through eNetwork Communications Suite by using PCOMM, IBM's premier solution for terminal emulation and desktop connectivity. PCOMM provides 5250 and 3270 terminal emulation with an easy-to-use interface and a common look and feel, regardless of the operating environment. You can use macros to automate repetitive tasks and add or change sessions dynamically. Industry-leading mouse support (CM Mouse) lets users dynamically and interactively define mouse buttons to perform everyday tasks such as printing, file transfers, and file deletions. And ZipPrint provides one-button capability to print notes, calendars, and documents.

Whether you are in your office or on the road, PCOMM offers the broadest range of LAN and WAN connectivity options, including the latest in asynchronous and wireless connectivity. A 32-bit implementation under Windows NT enables simultaneous access to data and applications across AS/400® and S/390 host systems.

PCOMM provides a comprehensive application development platform that streamlines the development and deployment of client/server solutions. Developers building customized end-user applications can dynamically link data from Lotus SmartSuite®, CICS, and DB2, for example. After the applications are written, they can be deployed without change.

INFORMATION SHARING WITH LOTUS NOTES MAIL

eNetwork Communications Suite streamlines communication and information sharing with your colleagues, customers, and suppliers with the Lotus Notes Mail messaging system. When used with your Lotus Domino™ Server, Notes Mail offers unprecedented Internet integration, integrated document libraries and workflow, enterprise calendaring and scheduling, and distributed replication and synchronization.

Notes Mail makes it easy to organize, navigate, locate, and preview your mail and documents. Notes Mail also features field-level replication to reduce network traffic, excellent mobile support, SNMP-based management, support for phone and pager clients, public key (RSA) encryption, and digital signature. Lotus Notes Mail also provides best-of-breed messaging with manageability and reliability at every level of the messaging system, making it an ideal choice for organizations that depend on efficient enterprise-wide communications and collaboration.

LEADING-EDGE TCP/IP APPLICATIONS AND CONNECTIVITY

For complete access to your corporate intranets and the Internet, eNetwork Communications Suite provides unequaled TCP/IP applications, connectivity, and security with FTP Software 16- and 32-bit TCP/IP protocol stacks and applications.

With eNetwork Communications Suite's TCP/IP capability, you receive a suite of applications designed to access and share information on corporate intranets, the Internet, and legacy systems. Terminal emulation support for VT52-420, Wyse® 50/60, SCO® ANSI, and IBM PC means you can reach a full range of remote applications and systems. With the Network File System (NFS) client, FTP Software seamlessly integrates file sharing into your Windows environment. With the click of a mouse button, you can map remote file systems to your PC drive and even identify mount points that you want to connect each time you reboot your PC. In addition, there are many more applications, including easy-to-use File Transfer Protocol (FTP) client/server and print client/server.

For Windows 95, eNetwork Communications Suite also includes a TCP/IP protocol stack featuring industry-leading technology—such as IP version 6 (IPv6), IP Multicast, WinSock 2.0, and IPSEC security standards—to provide you with a solid foundation for continued growth. IPv6 updates the current version of IP (IPv4) and includes expanded addressing, autoconfiguration to simplify IP address configuration and mobility, expanded security, and enhanced support for multimedia applications. The IPv6 function provided by FTP Software makes it possible for you to be IPv6-ready today.

ONE-STOP WEB ACCESS WITH NETSCAPE NAVIGATOR

eNetwork Communications Suite also enables you to navigate your corporate intranet and the Internet with the Netscape Navigator Web browser. Navigator provides fast, efficient, and secure Web browsing—and more. Using Navigator's state-of-the-art integrated E-mail and news services, you can send E-mail worldwide and share information with others on the Internet by using the Navigator newsreader. Navigator can even extend the richness of Web pages to your E-mail and newsgroup discussions—you can enhance messages with images, audio, video, plug-ins, Java applets, and electronic forms.

You can also increase your productivity and effectiveness on the Web by using eNetwork Communications Suite's plug-ins for Navigator, such as Smart Bookmarks™ from First Floor™ Software and Adobe Acrobat® Reader. Smart Bookmarks enable you to search the Internet and retrieve information, perform scheduled Web-site monitoring and updating, and manage your Web site bookmarks. The Acrobat Reader lets you seamlessly view, search, and download Portable Document Format (PDF) files without ever leaving Navigator.

AN EXTENSIVE SET OF APIS

eNetwork Communications Suite supports a wide variety of APIs that can help software developers build applications that promote maximum user productivity. These APIs also enable developers to integrate enterprise data with leading-edge decision-support applications. The supported APIs include, but are not limited to, the following:

- WinSock 2.0
- Added Common ISDN-API (CAPI)
- OPEN Object
- OPEN Script
- Dynamic Data Exchange (DDE)
- Emulator High-Level Language Application Programming Interface (EHLLAPI)
- Advanced Program-to-Program Communication (APPC)
- Common Programming Interface for Communications (CPI-C)
- NetBIOS (over TCP/IP) RFC 1001, 1002
- WinSNMP API
- NetWare®/IP 2.1 (over TCP/IP)

UNIVERSAL INFORMATION ACCESS

eNetwork Communications Suite addresses your business needs by providing an extensive range of connectivity options that help you access your information from anywhere. You can communicate through any LAN or WAN by using eNetwork Communications Suite's SNA and TCP/IP protocol support. And when you are away from the office, eNetwork Communication Suite provides secure, remote dial-up support to your corporate intranet, host applications, and the Internet.

For more information

Visit **http://www.networking.ibm.com/ecs/ecshome.htm**

New Technical Education and Certification Programs

IBM Networking Hardware Division's NETeam Channel Partner Program now offers new education and certification programs for training on IBM networking products. The courses are designed for IBM Business Partners, end users, independent consultants, and IBM networking professionals. All courses will be taught by approved IBM NETeam education providers.

Initially, the NETeam Technical Education offerings include ten different courses about IBM networking products and technology. The courses are delivered in a classroom laboratory setting with an emphasis on hands-on product training. Upon completion of the courses, students should be able to install, configure, and support IBM networking products in a customer environment.

Although participants can simply use the Technical Education Program to improve their technical knowledge and gain hands-on experience, they can later validate their education through the NETeam Certification Program. NETeam Certification is part of IBM's Professional Certification Program, which includes nine exams administered at over 1,600 Sylvan Prometric™ Professional Testing Centers worldwide.

More than 175 networking professionals have already participated in the NETeam Certification Program through a variety of field tests, and over 250 certifications have been awarded to those who successfully completed the exams. Although the technical education courses are not a compulsory prerequisite for certification, a combination of the courses and field experience is a valuable preparation for the certification program.

For more information

Visit **http://www.networking.ibm.com/NETeam**
In North America, call 800-426-7472
Send E-mail to neteam@vnet.ibm.com

Enterprise Communications Certification for Windows NT

The Professional Certification Program from IBM now offers a new Windows NT Enterprise Communications test for technical professionals who want to become IBM Certified Enterprise Communications Specialists. The Windows NT Enterprise Communications test (Test 556) measures technical professionals' skills for planning, installing, configuring, using, and supporting the Communications Server for Windows NT and IBM PCOMM clients. The Enterprise Communications specialist certification is also available for OS/2 (Test 551) and AIX® (Test 552).

IBM provides a variety of methods to help you prepare for the test, and you can customize your education by selecting the methods that best suit your needs:

- **The Communications Server for Windows NT Study Guide** provides product information and self-study units on a variety of topics. This no-charge study guide is also available for OS/2 and AIX Communications Servers—as well as all the other IBM Software Servers—on the following Web site:
  http://www.software.ibm.com/sw-sell/besteam/studyguides

- **Test objectives and sample tests** are available on the following Web site:
  http://www.ibm.com/certify

- **A CD-ROM with marketing and technical content** is currently in development. Watch the eNetwork Software Web site for its availability:
  http://www.networking.ibm.com/eNetwork/train.html

- **An education course** is also in development. IBM will also announce its availability on the eNetwork Software Web site:
  http://www.networking.ibm.com/eNetwork/train.html

After you have completed your test preparation, you can enroll to take the test through Sylvan Prometric.

For more information

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

In North America, you can obtain the program guide *Roadmap to Success* by calling Sylvan Prometric at 800-959-EXAM (3926).

Upcoming Events

COMMON Europe Congress
Strasbourg, France
JUNE 1-5, 1997
http://www.common.org

COMDEX® Spring
Atlanta, GA
JUNE 2-5, 1997
http://www.comdex.com

Networld+Interop®
Tokyo, Japan
JUNE 2-6, 1997

COMMON Regional Conference
Chicago, IL
JUNE 4-6, 1997
http://www.common.org

GUIDE/SHARE Europe
Paris, France
JUNE 9-19, 1997
http://www.gse.org/confrenc.htm

Networks Expo
New York, NY
JUNE 17-19, 1997
http://www.networksexpo.com/newyork97/index.html

COMMON Latin America South
Argentina
JUNE 23-26, 1997
http://www.common.org

COMMON Regional Conference
Bellevue, WA
JUNE 25-27, 1997
http://www.common.org

COMDEX Canada
Toronto
JULY 9-11, 1997
http://www.comdex.com

APPN Implementers' Workshop (AIW 14)
San Jose, CA
JULY 14-17, 1997
http://www.networking.ibm.com/app/aiwhome.htm

Summer Internet World
Chicago, IL
JULY 21-25, 1997
http://events.iworld.com/summer97/

SHARE
Atlanta, GA
AUGUST 10-15, 1997
http://www.share.org

IBM TechCon, Building Networked Computing Solutions
Boston, MA
AUGUST 12-14, 1997
http://www.dciexpo.com/TechCon/

COMMON Australasia
Sydney
AUGUST 17-19, 1997
http://www.common.org

Australian SHARE/GUIDE
Sydney
AUGUST 17-20, 1997

COMDEX/Sucesu-SP Brazil '97
Sao Paulo
AUGUST 18-20, 1997
http://www.comdex.com

COMDEX Korea
Seoul
AUGUST 26-30, 1997
http://www.comdex.com

Networking Systems Technical Conference (NSTC) and APPC/APPN Technical Conference (AATC)
Miami Beach, FL
OCTOBER 20-24, 1997

These events represent select conferences and trade shows of potential interest to *eNetwork Connection* readers. IBM makes no claim as to the value of these events. To list an event that is not shown here, send E-mail to appcnews@vnet.ibm.com.

Displaying Adapter Bindings

This article introduces *Tech Talk*, a column in which IBM eNetwork Software specialists answer commonly asked technical questions about the use of our products.

Q: When I run Communications Server for Windows NT, I notice that the information displayed by the system about protocol adapters (Adapter 0, Adapter 1, etc.) does not match the actual physical location, port, and slot numbers being used.

A: IBM Communications Server for Windows NT assigns port numbers to adapter cards based on the order in which they are bound to the LLC2 protocol.

To find out which adapter coincides with a port number:

1. Go to the Control Panel
2. Select Network
3. Select the Bindings tab
4. Show bindings for: All Protocols
5. View the adapters listed under "IBM LLC2 Protocol"

The adapters are listed in the order (0,1,2,...) in which they are bound to the LLC2 (logical link control) protocol. This ordering represents the port number ordering, as shown below:

Register for the Networking Systems Technical Conference in Miami Beach

Be sure to mark your calendars for the premier networking event of the year: the 1997 Networking Systems Technical Conference (NSTC). This year's conference will be held from October 20-24 at the Fontainebleau Hilton in Miami Beach, Florida.

NSTC helps you explore the networking solutions you need to implement the latest technologies and keep your networking environment up to date. The conference includes:

- More than 100 in-depth elective sessions
- Four topical tracks: Systems Management, Networking Hardware and Software, Network Computing/Internet, and APPC/APPN
- One-on-one interaction with industry experts and discussion sessions with your industry peers
- An expanded Product Expo and demonstration labs where you can get hands-on experience

You will also be able to:

Discover valuable tips *on how to implement E-Commerce, VisualAge™ for Java, Tivoli® Management Environment (TME), Lotus Domino™, and IBM Net.Commerce to help you conduct business on the Internet*

Explore and exploit hot technologies and solutions *that can boost performance, including Switched Virtual Networks, Voiceover ATM, End-to-End Network Design, TCP/IP Products, Java Beans, TME, and Fast Ethernet*

Examine critical APPC/APPN topics*, including HPR migration, configuration (for NT, OS/2, OS/390, and CICS), and APPN high-performance experiences*

Complete your certification testing *for specific product areas*

For more information or to register:

In North America, call 1-800-IBM-TEACH (1-800-426-8322) and ask for "Conferences." From elsewhere, call 001.770.858.5902 or visit http://www.training.ibm.com/ibmedu/conf.htm/nstc

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