

IBM Communications Server Family Overview Presentation Script

Chart 1: Energize your business network

This presentation is an overview of IBM Communications Server Family product line with focus on the Communications Server for Windows NT.

Chart 2: Abstract

Chart 3: Trademarks

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Chart 6: Old Solutions are no longer sufficient...

Networking today offers a number of challenges. Network administrators need to leverage their investment in existing applications with the flexibility to add new applications like Internet access and support for mobile and multimedia. You can't afford to be limited by previous networking decisions and all of this must be done while controlling management and operational costs.

It is critical that you have a network that lets you get ahead of emerging applications and technology so you are ready for whatever the future has to offer.

Chart 7: IBM Software Servers

Before we get started with our overview of the Communications Server family of products, I'd like to spend a moment explaining how this product family relates to the IBM Software Server announcements. First, let me make it clear that the Communications Servers for OS/2 Warp, Windows NT, and AIX are proud members of the IBM Software Servers.

The IBM Software Servers today offer integrated offerings for the OS/2 Warp and AIX platforms with a statement of intent to offer IBM Software Servers on the NT platform. Some of the servers are available on NT today, with others delivering code to customers within the next year. The Software Servers are integrated offerings including these servers: Communications, DB2 Database, Directory and Security, Transaction, Lotus Domino, Tivoli Management, and Internet Connection.

With the IBM Software Servers we simplified a large number of stand-alone products into a set of integrated offerings that offer the greatest depth and breadth of application services for the OS/2, AIX, and NT operating environments. The Software Servers are based on open technologies available on all leading server platforms. They have been tested for compatibility with IBM and

non-IBM systems. The Software Servers are easy to buy, install and use, with built in growth paths for the future.

Chart 8: Networking Evolution

We've seen the evolution from host-centric networks supporting mission critical SNA applications to client/server networks supporting distributed applications running over a variety of networking protocols. Distributed applications are typically bound to the underlying protocol. This means that multiple protocols need to be run in parallel in order to support of mix of applications. This can be an expensive and time consuming venture, as both protocols need to be configured fully and managed separately.

As the evolution continues through client/server to network-based computing, the demands on the network increase. Emerging applications like multimedia and collaborative computing place higher demands on the network. Users want to be able to access information running on different networks and from different platforms. This can only be accomplished with a well controlled network that allows networks, operating systems, and applications to truly interoperate.

Our Enterprise Communications products were designed to answer these problems, giving you the flexibility to support all your end user applications while keeping costs down.

Chart 9: Enterprise Communications for these requirements

These products should be of interest to customers who want to run multiple protocols in their network. Or for people who plan to consolidate or change their wide area backbones. You can extend the reach of your SNA applications like IMS or DB2 to your TCP/IP users, or run Sockets based applications like Web browsers on your SNA desktops. These products should also be considered by customers who want to improve network availability and performance, or who are interested in running new resource demanding applications like multimedia or collaborative processing.

Chart 10: What is a Communications Server?

IBM has long been a leader in communications software. Customers need reliable and powerful networking support to enable workstations to communicate with other workstations and with host computers over today's leading networking technologies.

IBM's Communications Server provides a powerful multifunction gateway function for any product using industry standard 3270 display and printer protocols. It also delivers the capability to integrate SNA and TCP/IP networks, enabling SNA and sockets applications on any platform and from any vendor to be transported across connected SNA and TCP/IP networks. NetBIOS and IPX LANs can also be integrated into either SNA or TCP/IP environments. And TN3270E server function provides SNA 3270 access to host systems for TCP/IP users with TN3270 emulators.

The Communications Server product line includes solutions for OS/2, AIX, Windows NT, OS/390 and NetWare server environments, and is fully interoperable with OS/400 networks.

Leading open, industry standard, network technologies are incorporated to enable the integration of diverse network types, optimize performance, and facilitate the use of 3270 displays and emulators in APPN networks.

Chart 11: SNA Gateway to Host 3270 Applications

Communications Server delivers industrial strength SNA gateway function, supporting both SNA, TCP/IP and NetWare IPX/SPX client/server applications. Communications Server uses standard open interfaces and protocols between client and server, unlike some communications servers or gateways on the market today. It does not rely on proprietary interfaces and protocols, so it does not lock the customer into a restricted set of products and platforms, and can be used by any client on any platform that supports SNA or TCP/IP. Supported clients include:

- SNA based 3270 or 5250 emulators, such as IBM Personal Communications products which run on OS/2, Windows 3.1, Windows 95 and Windows NT, as well as virtually any emulator product from other vendors.
- TCP/IP based 3270 emulators, conforming to the TN3270 and TN3270E standards, also available in the IBM Personal Communications products and from many other vendors
- SNA gateways, including any workstation gateway that uses SNA for its upstream connection, and including the IBM 3174 range and other SNA terminal controllers
- any SNA client/server application, together with application servers such as the IBM Transaction Server and Database Servers
- TCP/IP client/server applications, including Telnet, FTP, NFS, and many others
- NetWare IPX/SPX applications, supported with Novel NetWare for SAA

The number of clients and applications that can be supported concurrently is equally impressive. Communications Server for OS/2 Warp, for example, can support 2000 simultaneous downstream workstations, with up to 20,000 sessions to as many as 16 central computers; the number of independent sessions (APPC) is limited only by the memory available in the server workstation. In addition, due to the scalability characteristics of the RS/6000 and AIX platform, Communications Server for AIX is capable of supporting an even greater number of sessions. The sessions are limited by memory and processor capacity of the underlying system, up to a maximum of 50,000 sessions per server.

Chart 12: Multiprotocol Gateway

Communications Server is also a powerful multiprotocol gateway, enabling the integration of diverse network types in many flexible configurations. SNA, TCP/IP, NetBIOS, and IPX applications can communicate from remote offices or branch LANs over either an SNA or TCP/IP backbone network. Later in the presentation we'll get into some specific multiprotocol scenarios so you'll be able to better see the various options. No other vendors offers multiprotocol support as diverse as IBM's solutions for LAN to LAN internetworking over SNA or IP, Internet and intranet communications over SNA and TCP/IP. or LAN to host communications.

Chart 13: Communications Servers plus Personal Communications Equals Solutions

In April 1996 we launched a new line of Communications Servers and Personal Communications clients. In October we announced enhancements to these products that improve multiprotocol connectivity, system availability, and performance, including Windows NT beta versions of these products.

The Communications Server is a multi-function gateway that supports integration of diverse networks and applications. The Personal Communications client provides connectivity and emulation for a broad range of client platforms.

These products span the enterprise from desktop to mainframe with solutions for OS/2, Windows, NetWare, NT, AIX, and OS/390 operating environments.

These products give you the flexibility to choose applications without regard for the underlying network, providing seamless integration of current and new business applications, regardless of whether the underlying network is SNA or TCP/IP. For example, you can use these products to provide connectivity for SNA and TCP/IP users to access corporate information on an internal intranet server, or on the Internet.

These products are based on open technologies, designed to interoperate. We've incorporated advanced routing technology that ensures maximum throughput and efficiency.

All of this is provided while eliminating the need to run parallel networks and while reducing management and operational costs.

Chart 14: The IBM Enterprise Communications Family

These are the members of the Enterprise Communications product line. The Communications Server is available on OS/2, AIX and OS/390, and a beta program is in progress for Windows NT. In addition, the NetWare for SAA product is jointly developed between IBM and Novell for communications in a NetWare environment. Common to all of our servers is the move from SNA gateways to multi-function gateways supporting a mix and match of SNA and TCP/IP applications and networks.

The Personal Communications client is a suite of application development, communication, connectivity and emulation software all provided on a single CD ROM. With PCOMM, users are guaranteed the same interface whether they are in the office, at home, or on the road.

And a new commercial strength TCP/IP client, Internet Connection for Windows, provides TCP/IP users an easy and inexpensive entry into the world of TCP/IP networks and the benefits of electronic communications, information access, and resource sharing.

Chart 15: Enterprise-wide Communications

These products cover the spectrum from desktop to host, giving you the flexibility to choose your configuration, choose your network type, and choose your applications independently. Remote branch configurations are supported, as are centralized and distributed. We can provide communications within your enterprise, or between enterprises - as well as connectivity between your internal network and the Internet. More and more customers are building internal intranets for information sharing within the enterprise. These products can be the basis of connectivity for this intranet, allowing rapid deployment of new intranet applications quicker and cheaper. We've got industry leading support for remote or mobile connections, so users can be supported whether they are in the office, at home, or on the road on a wide variety of platforms.

Chart 16: Yes! IBM Supports It!

We're not going to go through this chart in detail. But I want to draw your attention to the broad array of network connectivity that is available with these products. Pretty much whatever you want, you've got it. All major LAN and WAN protocols are supported. All major platforms and operating systems. All major APIs and connectivity types -- even channel attachment.

Both Sockets and SNA applications are supported over the network of your choice -- whether SNA or TCP/IP. And you can have ready access to the Internet for all of your users, even those running only SNA - without requiring multiple protocols to do it.

Chart 17: Built on Advanced Technologies

We've integrated several key technologies with a focus on consistency across the product line. AnyNet technology, which was previously available separately, has been integrated in to the Communications Server and Personal Communications product line. AnyNet separates the choice of application (whether Sockets or SNA) from the choice of network (whether SNA or TCP/IP), expanding the reach of your applications and offering greater flexibility.

The AnyNet gateway support in Communications Server connects two or more unlike networks and causes them to function as a single network. SNA applications such as CICS, IMS, DB2, DDOS, emulator, or printer programs can run over SNA and TCP/IP. TCP/IP sockets applications such as FTP, SAP R/3, SNMP, Lotus Notes, and web browsers can run over SNA and TCP/IP.

For example, the Communications Server can be the communications gateway between your internal network and the Internet, bringing Internet connectivity to all of your users, whether they are running SNA or TCP/IP. Networks can be integrated and new applications added without impacting your existing users, and without requiring any new hardware.

High Performance Routing is the next generation of APPN and brings together the best qualities of SNA and TCP/IP. HPR is geared to provide exceptionally high throughput and availability with automatic routing around failures and no impact to the end user or application.

Dependent LU Requester, or DLUR, allows older SNA LU types (such as LU0 and LU2) to have their control sessions routed across the APPN network.

And all of our enterprise communications products are designed to take advantage of their operating environment. For example, the Communications Server takes advantage of the Parallel Sysplex and SMP hardware in the OS/390 and AIX environments for the ultimate in performance and capacity.

Chart 18: Advanced Multiprotocol Support

As we talked about briefly before, distributed applications are typically bound to the underlying protocol. This either limits your choice of application to those running on currently installed protocols, or requires that you run multiple networks in parallel to support all the applications required. This increases network complexity as well as management and operational costs. Under heavy traffic conditions, the different protocols have different procedures for handling congestion. In addition, traffic prioritization becomes more difficult in a multiprotocol environment.

Communications Server and PCOMM eliminate the need to run parallel networks by allowing Sockets applications to run over SNA networks and SNA applications to run over TCP/IP networks.

AnyNet, based on the Multiprotocol Transport Networking (MPTN) technology, an open industry standard, has been integrated into our Communications Server and Personal Communications product line. Communications Server and PCOMM eliminate the need to run parallel networks by allowing Sockets applications to run over SNA networks and SNA applications to run over TCP/IP networks. NetBIOS and IPX applications are also supported in LAN to LAN internetworking configurations over either an SNA/APPN or TCP/IP backbone.

AnyNet access nodes (top graphic) let new types of applications run on your existing network, without adding communications lines and equipment and without rewriting applications. You can run all your SNA and TCP/IP applications over the protocol of your choice.

The Communications Server gateway can connect two or more unlike networks and cause them to function as a single network, allowing a variety of configuration options for LAN/WAN internetworking.

A single gateway (middle graphic) allows any vendor's native system on one network to communicate with a matching application on a different network. For example, using a Sockets over SNA gateway configuration, which connects SNA and TCP/IP networks, users on SNA workstations with access node software can access the World-Wide-Web (WWW) using Sockets applications such as popular Web browsers.

Paired gateways (bottom graphic) allow users in remote branch offices to communicate over an existing backbone network. For example, an SNMP agent on a TCP/IP network can communicate across an SNA network to an SNMP manager on another TCP/IP network through AnyNet gateways. Or, an IPX or NetBIOS application could run over an SNA or IP backbone to a similar application on another LAN. Similarly, an SNA based application, such as CICS or DB/2, running on an SNA network can communicate across a TCP/IP network to a like application on another SNA network. All of this is accomplished without requiring any new hardware and without re-writing your applications, so you can roll out new applications quicker. The number of protocols can be reduced, saving you time and money because there are fewer networks to maintain and your network is easier to configure.

This multiprotocol support offers a number of advantages:

For the end user:

Communications Server and PCOM expand the scope of existing applications and gives the end user a wider choice of new applications. Now an application can be chosen based on its merits, since the choice is no longer restricted to the set of applications that can run over the installed protocols.

For the administrator:

Selection of the protocol can be based on the merits of the protocol, not the applications available for that protocol. Networks can be consolidated, and the number of protocols to be managed reduced, while still supporting all user applications. It is less expensive to maintain one network, compared to the cost of maintaining parallel networks. Configurations are less complicated, and maintenance costs are reduced.

For the application provider:

Application writers can select the API they use based on the functions the API provides, not the API supported by currently installed protocols. Existing applications can be run over additional network types, expanding the market for those applications. This way, application providers can concentrate on improving their product rather than on developing different versions of their product to run on different protocols.

Communications Server and PCOM break the binding between application and protocol, reducing the number of protocols installed while supporting existing applications, unchanged. This simplifies application selection, network design, and operation, while reducing maintenance costs by eliminating the need to maintain parallel networks.

SNA applications rely on SNA functions that are lacking in an IP network, such as Session Outage Notification, pacing, and expedited data. The AnyNet technology available in Communications Server and PCOM provides compensations for these functions that are missing in IP. Similarly, AnyNet provides compensations for Sockets applications running across an SNA network.

Chart 19: High Performance Routing

As I said before, High Performance Routing really brings together the best qualities of SNA and TCP/IP. Geared to provide 100% network availability with maximum throughput and efficiency, HPR prepares SNA networks for the high speed applications of the future.

Non-disruptive rerouting automatically reroutes around a network failure, without impact to the end user or application.

Application-specific prioritization insures that interactive sessions take precedence over batch traffic. As a result, response times are minimized while link utilization is kept high.

Adaptive, rate-based congestion control throttles incoming data in the case of congestion while at the same time, ensuring maximum link utilization by keeping the throughput at the knee of the congestion curve.

Dynamic, deterministic routing means that the data flow between two end points always takes the same pre-determined path. This is required to guarantee the quality and performance of network demanding applications like multimedia. ATM was designed to be connection oriented. HPR's deterministic routing is complementary to ATM's architecture, and while HPR picks up some of the connectionless features of IP routing, it retains the deterministic nature of SNA, and is thus well positioned to take advantage of ATM networking down the road.

In fact, HPR has been endorsed by Cisco, Bay Networks, and 3Com and was selected by the 41-vendor APPN Implementor's workgroup for SNA over ATM.

APPN/HPR has *plug-and-play* capability. A user can literally pick up his workstation, move to another location across the country or the world, plug into the network, and have immediate access to other users and applications across the network. This is in contrast with TCP/IP where the domain name server must be manually updated to reflect the user's new network address before he can be reached by another application or user.

HPR is capable of running efficiently on a wide variety of platforms, coexisting with other protocols, and exploiting existing and newly emergent technologies, such as ISDN, frame relay, and ATM.

Chart 20: Dependent LU Requester

Dependent LU Requester is an architecture that provides dependent LU support in an APPN network. It provides a migration strategy for dependent LU devices from a subarea environment to APPN.

Communications Server for OS/2 Warp and Communications Server for AIX provides Dependent LU Requester (DLUR) end-node and network-node support for workstations, allowing them to take advantage of the enhanced SSCP support provided by a Dependent LU Server (DLUS). The DLUS function is provided by VTAM V4R2 and later releases. With the use of this support, traditional SNA dependent LUs, such as emulators and printers, can gain the many advantages of an APPN network.

A few of these benefits are:

- dependent LUs (LU0, LU1, LU2, LU3, independent LU6.2) can reside on nodes that are non-adjacent to the host
- APPN search logic is used to provide the best path for LU-LU sessions

The DLUR and DLUS nodes establish an LU6.2 pipeline that SSCP-PU and SSCP-LU sessions are setup over. The LU-LU sessions are then routed independently of the location of the owning SSCP thereby taking advantage of APPN search logic.

In this chart, the DLUS function is provided by the owning SSCP VTAM A at the top left. The dependent LUs are supported by the DLUR function in the EN at the bottom. The primary LU is in VTAM B. Note that the LU-LU session is setup over a different route than the SSCP-LU session. That is, the LU-LU session is not setup via the owning VTAM A, but rather by connecting directly with the target VTAM B over the APPN cloud. This has several benefits:

- increased speed (only goes over one link)
- decreased cost (one NCP traversed, not two)
- increased reliability (if VTAM A goes down, the LU-LU session with VTAM B is unaffected).

Several other DLUR benefits:

- with CS/2, SNA over TCP/IP support allows dependent LU sessions serviced by DLUR/DLUS to be established over a TCP/IP network.
- backup DLUS support: When the connection to the primary DLUS fails or does not become active, Communications Server will automatically try to establish a connection with the backup DLUS.
- Multi-subnet support: This support allows the DLUR, DLUS, and node containing the application all to be in different APPN subnetworks.

Chart 21: Communications Server Family Technology Highlights

This chart summarizes the industry-leading SNA and multiprotocol support delivered in the Communications Server family.

Chart 22: Communications Server for Windows NT Overview

Now we'll start to look at the Communications Server functions and benefits on Windows NT. For functions and benefits on AIX, OS/390, and also NetWare, refer to the Enterprise Communications Server Family presentation.

Chart 23: Communications Server for Windows NT - Beta

Responding to customer demands for industrial strength communications solutions on Windows NT, IBM announced in October a beta program for its Enterprise Communications Server for the Windows NT operating system. Communications Server for Windows NT (CS/NT) will combine the industry's best SNA gateway with multiprotocol gateway support to allow a mix-and-match of SNA and TCP/IP applications and networks, plus LAN-to-host, LAN-to-LAN, and LAN-to-Internet communications -- all in one product. Product delivery is targeted for 1Q97.

Chart 24: Communications Server for Windows NT SNA Function - Beta

CS/NT will provide industry leading SNA support including full APPN Network Node and End Node capabilities. Our CS/NT product will provide high availability and great throughput through the use of technologies such as HPR. We can support all of your needs for Dependent LUs through our DLUR support. Our Discovery server allows CS/NT, which operating as an EN, to search for a Network Node Server over any LAN (802.2) connection. When CS/NT is operating as a NN, we will answer discovery requests from ENs looking for a Network Node Server. We also understand when we are configured as a gateway and will answer any request from an "IGOTOHOST" search.

All APPN load balancing and route calculations will provide the best path for your network traffic. Because CS/NT is a member of the Communications Server family, it can work as peer to our other servers. This means that your LAN workstations can be routed as easily through an AIX, OS/2, or NT gateway. These multiplatform servers can also provide alternative routes and share topology when configured as Network Nodes. Only IBM can deliver this kind of multiplatform support.

CS/NT will ship the leading SNA applets including APING, AFTP, and APPC3270. As always, these applets interoperate with SNA applets on all of the Communications Servers. We offer a wide range of connectivity options and client choices. We support a wide range of industry client stacks and emulators. Most existing SNA devices and emulators should attach to CS/NT with no configuration changes. (FMI emulator API is not supported on the server and will require a config change to the emulator to be supported. Also, existing Microsoft SNA Server clients will require a config change to the emulator to be supported.)

You can connect your server to the network or your clients to the server via SDLC, Token Ring, Ethernet, X.25, FDDI, ATM (LAN Emulation), frame relay, ISDN, channel, and twinax.

The industry standard APIs such as the common LUA interface: RUI and APPC and CPI-C. Our APPC and CPI-C APIs are binary compatible with Microsoft's APIs.

Chart 25: All-In-One Packaging

The Communications Server for Windows NT is available on CD-ROM only. The product CD contains the following:

- product files
- online documentation
- Adobe Acrobat Library Reader
- Clients for remote SNA API
- Remote administration and configuration clients
- Host-on-Demand
- Web Administration
- Entry-level Personal Communications Emulators

Chart 26: Simplified, Graphical Interface

The Communications Server for Windows NT provides several advanced graphical configuration aids. You can now configure and use Communications Server based on the task you are trying to accomplish. There is a list of common configuration types that you can select which walks you through the configuration. Examples include SNA Gateway, TN3270E server, APPN network node (including HPR), Anynet SNA over TCP/IP and Sockets over SNA gateways, SNA API clients, etc. Communications Server uses the SmartGuide technology to simplify complex server configurations with a simple question and answer application. The Node Operations Facility provides the managing and controlling of communication resources. With a simple click of the mouse, you can get information on the message and error logs, trace files, network resources, configurations, and other information.

Chart 27: SNA Gateway

The SNA Gateway enables multiple LAN or WAN attached OS/2, Windows 3.1, Windows 95, Windows NT workstations access to multiple S/390s through one or more physical connections to one or more hosts. The gateway is optimized to provide cost effective host connectivity by sharing communications resources such as adapters and physical connections.

The Communications Server gateway supports the SNA protocols LU 0, 1, 2, 3 and dependent LU 6.2 (APPC). With the SNA over TCP/IP function, downstream workstations can now communicate with SNA gateway over an IP network. The gateway also supports LU 0, 1, 2, or 3 to an AS/400 using SNA pass-through.

LUs defined in the gateway can be dedicated to a particular PC or pooled among multiple PCs. Pooling allows PCs to share common LUs, which increases the efficiency of the LUs and reduces the configuration and start up requirements at the host. You can also define multiple LU pools, each pool associated with a specific application. When a link is defined through the gateway between a PC and host, the LU is activated when the session is established and returned to the pool for access by other PCs when the session is ended.

Chart 28: Browse WWW from Your SNA Workstation

Here's an example that I think is on everyone's mind. How can I get access to the Internet for my users - even those connected via an SNA network? Current options require that you run TCP/IP on everyone's desktop to run a web browser. But with Communications Server Sockets over SNA

gateway capability, you can connect your internal SNA network to the Internet. Clients running PCOMM can run a sockets-based web browser and access information on the Internet. Your users on the Internet can access a Web Server in the SNA network. In this scenario, TCP/IP applications benefit from the performance advantages of SNA such as Class of Service and congestion control.

Chart 29: SNA over TCP/IP

SNA over TCP/IP multiprotocol combination allows all SNA applications including APPC, emulator, and printer applications to communicate across TCP/IP networks without any modification. With this function, existing LU 2 terminal emulator applications or LU 1/LU 3 Printer applications can be used across TCP/IP networks. The dependent LU SNA application support is provided by the VTAM DLUS function and by Communications Server DLUR functions.

Examples of SNA applications which can now run over TCP/IP networks, include CICS, DB2, IMS, DCAF, and TSO. APPC and SNA applications which were primarily confined to SNA networks are able to communicate with end users in a TCP/IP network, and the application does not need to be changed. With APPC over TCP/IP, the engineer or scientist at a workstation in a TCP/IP network now has easy access to database applications in SNA hosts.

In this configuration, SNA over TCP/IP combination in the client is provided by PCOMM. The DLUR is provided by Communications Server gateway.

Chart 30: Remote API Client Support

The Communications Server SNA API client support allows TCP/IP attached clients to access SNA APIs without requiring SNA protocols to flow between the clients and the server. This allows most SNA configuration to take place at the central server

Communications Server supports SNA API clients on Windows 95, Windows NT, Windows 3.1, and OS/2. The SNA clients provide support for CPI-C APPC, ENHAPPC, and LUA RUI API interfaces. These clients are shipped as part of the server but are actually installed and configured at the client.

Chart 31: TN3270E Server

Communications Server now provides TCP/IP users easy access to 3270 applications with its new TN3270E server function. Customers can connect TCP/IP clients on OS/2, DOS, Windows, Windows 95, and Windows NT to their SNA or APPN network.

TN3270E support will allow TN3270 or TN3270E clients on a TCP/IP network to access host 3270 SNA applications. With the new extensions of TN3270E, users can print to their workstations or printers in their TCP/IP network. Also, requesting a resource (LU or pool of LUs), responses, Attention and System Request keys are supported. TN3270E support is compliant with industry standard Request for Comments (RFCs) 1576, 1646, and 1647. Any TN3270 or TN3270E client which adheres to these RFCs are supported.

The TN3270E server enables SNA/APPN connectivity to the host and TCP/IP connectivity to the clients. TCP/IP connections are mapped to SNA sessions and passed through the 3270 datastream.

Since the TCP/IP connections are mapped to SNA sessions, the customer can take full advantage of SNA/APPN on the host side of the network, with no TCP/IP required on the mainframe. The 3270 datastream that comes out of the TN3270 client can be transported using Dependent LU Requester (DLUR). By using DLUR/DLUS, the customer can benefit from APPN networking. Also, the customer can use high performance routing (HPR) from the TN3270E server all the way to the mainframe, delivering non-disruptive session routing.

Chart 32: Prerequisite Hardware/Software

The following chart indicates the prerequisite hardware and software required to run Communications Server for Windows NT. Depending upon your Communications Server workload, you may require more resources. Communications Server requires 10MB disk space on the startup drive for temporary files used during installation.

Chart 33: Installation Considerations

Communications Server provides an interactive interface for installing the product. Communications Server should be installed on an Intel-based computer running either Windows NT 3.51 or 4.0. To install the Communications Server, you must have a Windows NT administrator user ID with local authority.

Before beginning to install Communications Server, close other application programs that you are running. Communications Server should be installed prior to installing any version of PCOMM (including the entry-level emulator). If PCOMM is already installed on your server, remove it prior to installing Communications Server. If you have any version of Communications Server for Windows NT, uninstall the product before starting to install the new version.

Chart 34: Host-on-Demand - Internet-to-SNA

Host on-Demand is an Internet- to- SNA connectivity solution that provides 3270 application discovery and access via the World Wide Web. Communications Servers are leading the evolution to network computing by being the first multiprotocol gateway to provide seamless integration between 3270 SNA applications and web-centric end-users.

Web-users needing host applications, such as public catalogs, software applications, databases, or other resources, can use Host on-Demand from inside their web browsers to access central computer data. For web users with occasional need to access central SNA computer applications or databases, Host on-Demand provides an alternative to installing a terminal emulation product on the desktop. Host on-Demand brings network computing to the web by enabling web users to seamlessly access non-web based content and services.

Host on-Demand uses the Java environment and native TN3270 and Internet protocols to provide platform independent host access from within a web browser window. Java-enabled Host on-Demand clients are dynamically downloaded from a standard web server on your intranet or in the Internet.

No programming is needed to implement Host on-Demand. Simply install it and specify a URL for the SNA application you wish to access. Host on-Demand function will be available on Communications Servers on OS/2 Warp V4.1, AIX 4.2, Windows NT, as well as NetWare V2.2. IBM intends to provide a follow-on release that will expand the types of host systems supported by providing 5250 support for AS/400 host access. IBM also plans to enhance the security capabilities of Host on-Demand with support for Secure Sockets Layer and to support additional product offerings, such as Communications Server for OS/390.

Chart 35: Web Administration

Communications Server provides an unique way to perform basic server administration functions remotely via the WWW with a simple click of a mouse. A simple graphical interface provides a convenient, at-a-glance status of Communications Server, as well as, convenient button for starting and stopping Communications Server, viewing configuration and trace data and other useful information.

This feature reduces the complexity and time associated with administering and managing distributed systems. By allowing flexible access over the Web, administrators can remotely track and manage Communications Servers from any browser which supports frames, Java, and JavaScript.

Chart 36: Multiprotocol Solutions

Chart 37: What kind of customer problems are solved with multiprotocol solutions?

This chart depicts key customer problems that are solved by our multiprotocol solutions.

Chart 38: Transportation Industry: Internet/intranet access using SNA

Here's an example that I think is on everyone's mind. How can I get access to the Internet or an internal SNA/APPN intranet for my users - even those connected via an SNA network? With the Communications Server Sockets over SNA gateway capability, you can connect your internal SNA network to the Internet.

In this example, a transportation corporation mandated that all departments reduce paper use by 25%. So the Director of Customer Service searched for ways to improve document distribution to the representatives, while maintaining their access to the reservations system at the SNA central site.

With the high visibility of Internet technology, the Director saw a corporate intranet as a logical distribution avenue. The company could publish documentation on a Web site at the central office. Communications Server for MVS/ESA would allow their mainframe to run TCP/IP based Web server over their SNA network. The interactive, searchable web site would improve access by the service reps and reduce their transaction time. The service reps at TCP/IP-based branches had access to the SNA intranet via Communications Server at their location. And customers on the Internet could access an external web site and avoid needless customer service calls. A Communications Server on the boundary of the SNA intranet and Internet provides this connectivity.

Using a corporate intranet enhanced productivity, reduced costs, and strengthened customer service.

SNA clients on the intranet could also access the mainframe server of the Internet. Clients running Communications Server OS/2 Access Feature or PCOMM OS/2 can run a Sockets-based web browser and access information on the Internet. Your users stay connected to their SNA networks. No TCP/IP is required.

In this scenario, TCP/IP applications benefit from the performance advantages of SNA like class-of-service and congestion control.

Chart 39: Zahid Tractors Implements Lotus Notes over SNA

Zahid Tractors and Heavy Machinery, Ltd. in Saudi Arabia is the leading supplier of equipment, machinery, and auxiliary products to a wide cross-section of industries in Saudi Arabia. Zahid had an enterprise-wide IBM AS/400 APPN network running business applications. They implemented a new quality system associated with ISO 9000 accreditation on a Lotus platform. Since Lotus Notes runs on NetBIOS or TCP/IP, they required a multiprotocol solution that could allow Notes to run over their AS/400 APPN network. This solution would enable Notes replication over their existing leased line SNA network.

Zahid Tractors installed Sockets over SNA Gateways (available in CS/2) in their central and branch offices. On the LANs, Notes clients communicated with Notes servers using NetBIOS.

Over the APPN backbone, Notes servers replicated data using the sockets over SNA gateways. to connect their remote and central offices.

The ability to use SNA's class of service for TCP/IP sockets applications running over SNA was used. a "batch" class of service was specified for Notes traffic so existing backbone 5250 interactive traffic was not impacted by the solution.

The primary benefit was savings in dial-up line costs. Another benefits: the ease of deployment. The solution was deployed without disruption to the existing network, without upgrading OS/400 software or disrupting the APPN network.

Zahid's entire APPN network is now Internet enabled, meaning that any TCP/IP sockets-based application, including Internet applications, can run from the branches over the backbone APPN network.

Chart 40: Customer Quotes

Chart 41: Filiadata: SAP R/3 over SNA

Filiadata is a large drugstore chain with sites throughout Europe. They needed to connect their remote IP LANs across an SNA backbone to access an AIX server running SAP R/3. The SNA backbone network is provided by IBM Global Network. In addition to SAP R/3, their users needed to share OS/2 print servers on the LANs.

The problem was that they have no IP skill and besides, they are convinced that SNA has better line utilization. This was a concern because they had low speed 9600 baud connections to eastern Europe.

They were able to install Communications Server Sockets over SNA gateways to connect their IP networks to the SNA backbone. Their TCP/IP applications now benefit from SNA by taking advantage of class-of-service and traffic prioritization.

They were able to use existing skills and roll out this new application quicker and cheaper than any other alternative. And they didn't have to install any new hardware to do it.

Chart 42: Customer Quotes

Chart 43: Additional capabilities with LAN internetworking over SNA/APPN/HPR

These capabilities apply to both the Zahid Tractors "Notes over APPN" and the Filiadata "SAP R/3 over SNA" scenarios.

Chart 44: Turner Broadcasting System: SNA over TCP/IP

TBS had the opposite problem. They had a goal to reduce cost and gain better management control of their network. They made a decision to consolidate to TCP/IP in their international locations but to maintain their central SNA network. They had a mission critical SNA application for order processing and inventory control that needed to be supported on all of their desktops.

The solution was to install a Communications Server SNA over IP gateway between their central site and their remote IP locations. The Communications Server OS/2 Access Feature on end user workstations allows the SNA based application to run unchanged on their TCP/IP workstations.

They were able to save \$8,000 per month by eliminating their private SNA lines to Europe. And their network is easier to manage because they are running a single protocol on everyone's desktop.

Chart 45: Customer Quotes

Chart 46: TN3270E Manufacturing Industry

This automobile manufacturer wanted to improve its "just-in-time" manufacturing processes by providing better ways for more workers at remote auto-parts manufacturing sites to coordinate timely delivery of parts to assembly sites. Mainframe applications at the central site maintain order information, assembly schedules, and bill-of-materials. By providing access to this information for many remote users, production cycle time has been reduced and employees now have the information they need to understand and resolve problems.

The solution used TN3270E server function provided by Communications Server for AIX with SNA Client Access to support 30,000 TN3270E users who needed access to central site applications and data. CS/AIX with SNA Client Access was installed on three RS/6000s located in the US central site and one RS/6000 located in Europe.

Load balancing across the four servers was used to provide the best possible service to all users. The load is balanced among the various servers based on all the critical factors: host LU availability, link speed, client/host connection load, overall system load, and processor speed.

The Response Time Monitoring feature allowed network administrators to easily trouble shoot performance problems all the way from the host to the TN3270E client - without relying on other applications!

Chart 47: Additional capabilities of TN3270E server solution

Major advantages to this solution include:

- *maximize mainframe application performance*
More MIPS are available on the mainframe for SNA and TCP/IP applications and data (transaction processing, FTP, etc.)

- *scalability*: As more TN3270E users are added, the capacity of this solution can be incrementally increased. When user growth warrants the addition of another RS/6000, the load-balancing

feature will automatically balance the workload from all user sessions, maximizing the performance and user satisfaction

Chart 48 - 50: Consultant and Customer Quotes

The next several charts are a number of quotes that have been offered in support of these new products. I think you will find as you look through them that people are really impressed with the flexibility and performance that we provide.

Chart 51: Communications Servers = Your Decision

We have now completed our discussion of the Communications Servers. The Communications Server is available today on OS/2, AIX, and OS/390 platforms, as well as the Windows NT beta. The Communications Server provides an exceptionally flexible solution which enables rapid applications deployment - regardless of whether your underlying network is SNA, TCP/IP or a combination. They can be the basis of connectivity for your internal intranet, or for connectivity to the Internet - again whether you are running SNA or TCP/IP.

Communications Server incorporates advanced routing technology which enables support for today's network demanding applications and migration to new ATM based applications of tomorrow.

All of this with the broadest array of connectivity, platform and applications support, based on open technologies and designed to interoperate. These products don't just meet requirements, they put you in a leadership position in anticipation of the future with a solution that is exceptionally flexible and complete.

These next charts contain pricing information for the Enterprise Communications products. You should see the product announcement letters for specific pricing and ordering information.

Charts 52 - 53 Home Page listings and Brochures