IBM eNetwork Communications Server for Windows NT Presentation Script

Chart 1: Title page

This presentation is an overview of IBM eNetwork Communications Server for Windows NT Version 6.0, the premiere multifunction gateway for the Windows NT environment.

Chart 2: Abstract

Chart 3: What our partners are saying....

Here are some quotes from our business partners, explaining the success that they have had with Communications Server for Windows NT.

Chart 4: What our customers are doing...

Here are some examples of how our customers are using Communications Server for Windows NT to make their network better.

Chart 5: Agenda

This presentation answers the question "What is a Communications Server?", overviews Communications Server for Windows NT, describes the theory behind "Host Integration", looks at solutions for network integration, discusses RAS issues, and concludes by covering application development and support tools.

Chart 6: 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 SNA gateway function for any product using industry standard 3270 display and printer protocols, a great solution for integrating your LANs with your hosts. It also delivers the capability to integrate SNA, TCP/IP, and IPX/SPX networks, enabling SNA and sockets applications on any platform and from any vendor to be transported across connected SNA, TCP/IP, and IPX/SPX networks. And TN3270E server function provides SNA 3270 access to host systems for TCP/IP users with TN3270 emulators.

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.

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

Chart 7: Industry Trends

As Internet growth continues at exponential rates, companies who were once considered to be leading edge by virtue of having a Web site are now scrambling to implement Web-to-host strategies and solutions to either gain competitive advantage in their marketplace, or in some cases simply to remain competitive within their marketplace. Web-to-host is a broad term that refers to extending or integrating existing enterprise applications with the Web in order to exploit the investment in these existing applications for competitive advantage. Within an intranet environment this may mean end-user support costs, extending an application to a new class of users, or end-user productivity improvements through implementation of composite applications. Within an Internet context competitive advantage can be realized through integration of existing application systems within the Web in order to drive new revenue by reaching out to new customers across the Web, through the expense reduction realized by enabling customers to self-serve their information technology needs directly via the Web rather then serving these customers manually with a call center, and improved customer retention as a result of improved customer satisfaction realized by making your services easily available twenty-four hours a day seven days a week.

Chart 8: Communications Server for Windows NT

Communications Server for Windows NT will be of interest to customers who wish to integrate existing host data from multiple sources onto a single web page. Also of interest is the ability to provide secure access to mission-critical host applications to all users from any location. Or for people who want to have the freedom to make application decisions based on business needs, instead of network protocols. You can extend the reach of your SNA applications like IMS or DB2 to your TCP/IP and IPX/SPX users, or run Sockets based applications like Web browsers on your SNA desktops, all without updating your network, or building parallel networks. Communications Server for Windows NT 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 9: eNetwork Communications Server for Windows NT

In response to customer demands for an industrial strength server to provide host integration, allowing End to End universal access, IBM introduces Communications Server for Windows NT Version 6.0, a member of the Communications Server product line, IBM's premier solution for your network computing needs. Communications Server for Windows NT provides Host Publisher, to give you integration of existing data on the web. It is also the most powerful multifunction gateway on Intel in the market, supporting diverse applications and network environments with enterprise-class dependability, backed by IBM's excellence in service and support.

The next several charts will explain the functions of Communications Server which back up these five key points.

Communications Server provides the extensible and shareable host integration infrastructure that our customers are demanding. It is the most advanced SNA gateway on the market, and it provides complete host integration.

Communications Server gives you flexible, open system architecture, whether it is in the TN Servers included, the multitude of connectivity options, or the client capabilities.

Communications Server allows you to maximize your return on your IT and business investment, by allowing you to keep your existing applications. You can provide your internal users, customers and partners with new ways to look at your data by creating custom composite applications on the web.

Communications Server gives you an integrated, secure, end-to-end solution from the reliability and availability of hot standby and load balancing, to the security enhancements allowing session level/ or link level encryption.

Communications Server provides a powerful AD infrastructure with the new Host Access Class Library (HACL) and a slew of other applications programming interfaces.

Chart 10: What's New for Communications Server for Windows NT V6.0

In order to help our customers develop a more extensible and shareable Host Integration Infrastructure we have made enhancements to Communications Server for Windows NT, which is Designed for Microsoft BackOffice", including:

Web-to-host publishing with Host Publisher. Host Publisher is an advanced Internet integration server and deployment environment for the Web. Several pre-built System Integration Modules (SIMs) are available for accessing common data sources such as ActiveX servers and controls, Java classes, and ODBC databases. A SIM for 3270 and 5250 application access will be available soon.

TN3270E and TN5250 Servers that are built in to Communications Server, providing SNA access to client applications running anywhere in your TCP/IP network. The TN3270E server supports any TN3270/TN3270E compliant client and enables users to print from 3270 applications to locally attached printers or network printers. TN5250 Server complies with RFC 1205.

AS/400 Integration which includes OLE DB support and AS/400 Shared Folder Support. OLE DB support means application developers can now have record-level access to AS/400 databases. With Shared Folders, the Communications Server can provide access to the AS/400's Integrated File System to clients via the NET USE command.

Enterprise Extender, providing the ability to extend the reach of SNA applications over an IP network, without sacrificing the reliability, scalability, or control enjoyed by pure SNA users.

Branch Extender provides enterprises with hundreds to thousands of branch sites, having SNA applications in the data center and SNA clients in the branches, a way to save on network costs. Branch Extender Nodes work as Network Nodes to all the End Nodes within their branch and are

connected to the data center as an End Node, thereby reducing APPN traffic between the data center and the branch.

Enhanced Web Administration gives administrators the ability to perform server administration over an intranet or the Internet. Either from a remote or local workstation, the administrator can manage Communications Server through a Web Browser.

Chart 11: What's New for Communications Server for Windows NT V6.0 (cont.)

Communications Server gives you flexible, open system architecture

Communications Server for Windows NT is now enabled for Tivoli Plus Module Support allowing the customer to:
   Distribute, install and uninstall Communications Server
   Start, stop and query the server
   Display and modify server resources
   List configuration files
   Route error messages from Communications Server to Tivoli Enterprise Console
   Establish monitors and thresholds for key Communications Server attributes.

TN5250 server which supports industry standard 5250 clients, as mentioned previously.

Enterprise extender designed to meet AIW and IETF standards.

Directory Exploitation using LDAP reduces storage, memory, and processor requirements of your clients, and brings client configuration under the administrators control.

Customers can realize the benefits of a fully integrated host solution with out having to recreate their network or rewrite all of their applications, allowing them to maximize their return on IT and Business Investments.

Enterprise extender allows existing host applications to run across an IP backbone with the same HPR characteristics enjoyed by pure SNA users.

Host Publisher provides customers with a means of combining data from existing host applications onto one industry standard web page, without having to rewrite any of the host applications.

Multi-Path Channel + support for ESCON provides you with multiple subchannels between the S/390 and Communications Server. High availability can be achieved through non-disruptive recovery over alternate subchannels along with improved throughput. Shallow Adapter support allows vendors to create their own DLC dependent drivers that will work with Communications Server.

Chart 12: What's New for Communications Server for Windows NT V6.0 (cont.)

Communications Server for Windows NT ensures reliability and availability in an integrated secure end-to-end solution.

Customers can now use Hot Standby and Load balancing for all client APIs. Hot standby provides for the ability to have a backup server defined so that if a critical server crashes, all host sessions can be reestablished on the backup server, with the licenses transferring to the backup as well.   Load balancing allows SNA API clients, as well as SLP clients using any other supported protocol, to choose the server with the lowest load.

New security enhancements which provide for SSL security between TN clients and servers. Data encryption if the host is configured for it, and an IBM SecureWay 4758 PCI Cryptographic Coprocessor (the IBM4758) adapter is installed on the server. SNA Session Level Encryption (SLE) which supports Lempel-Ziv (LZ), LZ9 and LZ10.

The last of the key five points is Communication Servers' powerful application development infrastructure.

The Host Access Class Library (HACL) is a new API for Java that provides a way to easily develop critical applications for and across multiple operating environments.

Application developers will now have record level access to AS/400 databases, allowing client applications to use AS/400 data seamlessly.

Many new enhancements make Communications Server Version 6.0 easier to use than ever.

Chart 13: Host Integration - A Complete Story

Make your job easier with the eNetwork Software solution for host integration The IBM eNetwork Software solution for host integration provides all of the software necessary to enable secure access for every user, regardless of platform or network environment, to your mission-critical business systems. It is not only a great technical solution, but also a smart business solution. These benefits include improved productivity, creation of competitive advantage, and maximizing return on investment. IBM is the only company that can provide this complete solution, and also offer a wide range of services to help you design, plan, and roll out your solution.

The solution for host integration enables you to tie diverse networks together for seamless communication across the enterprise. Whether you currently have an SNA network, a TCP/IP network, or both, the eNetwork Software solution for host integration can be easily implemented, working with what you have today. It will also provide you with the open, standards-based networking capabilities required to build the foundation for your future e-business infrastructure.

Chart 14: Host Integration Overview

These next seven items are keys to the Host Integration Solution. They move us much closer to
our goal of being able to run any application, over any network, on any client, any where.

Chart 15: 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, Windows NT, MAC, and UNIX 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 data
stream. 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 data stream 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 16: AS/400 Host Integration - TN5250 Server

The TN5250 server function enables TN5250 clients conforming to RFC1205 on TCP/IP
networks to
communicate with one or more SNA-connected AS/400s using the 5250 Display Station
Pass-through
datastream on LU 6.2 sessions.

TN5250 server enables the user to specify at the server the clients, based on IP address or
hostname, that can access the AS/400 servers that have been configured for the TN5250 server.
This allows controlled access to AS/400s without modifying the client configurations.

This support enables you to exceed the 512 maximum session limit between a single LU and the
AS/400 by using additional dynamically defined local LUs.

You can enable the server to connect to multiple AS/400s by configuring the server to listen on more than one IP port and specifying the AS/400 that corresponds to each port. The client specifies a port to be used for the connection, using a common configuration parameter. The server then uses the port value to identify the specific AS/400. Clients can connect to multiple hosts by specifying different ports for each emulator session.

You can configure specific ports to support Secure Sockets Layer-based (SSL-based) encryption. Communications Server provides a utility that generates certificate requests and manages existing keys and certificates used by SSL Version 3.

Chart 17: Enterprise Extender

Communications Server now provides HPR connections on IP networks, using UDP/IP packets. To the HPR network, the IP backbone appears to be a logical link. To the IP network, the SNA traffic appears to be UDP datagrams. These datagrams are routed without changes to the IP backbone. Because there is no protocol transformation and because packaging takes place at the routing layer without the
overhead of additional transport layers, this results in efficient use of the intranet infrastructure for IP clients that access SNA-based data (TN3270 clients or Web browsers using IBM Host on Demand, for example), as well as for SNA clients.

Chart 18: Host Publisher

The **Host Publisher** product on CS/NT 6.0 provides integration of legacy data in various formats with a web browser. HostPublisher consists of a number of software components that can be distributed on various machines to provide improved performance and tolerance to failures. Some of the components are used at "config" time to build web pages with dynamic content, whereas others are used at runtime to query various sources of back end data that is used to generate the dynamic page content.

The HostPublisher product consists of the following components:

> an **Integrator**, a tool used at "config" time to develop web pages with dynamic content. The Integrator is used to configure an *integration object*, which can be thought of as a "transaction" that accesses a specific type of back end data. Special-purpose HTML tags called "**dynatags**" can refer to these integration objects, and are used to specify how the data returned from the back end data source is to be used to generate HTML tags.
> a **Page Server**, which serves web page requests directed to it. It expands any dynatags in that page by executing the referenced integration object, and generating vanilla HTML from the data returned by running the resulting transaction on the back end data source.
> a **Dispatcher**, which directs web page requests to a Page Server that can service that request. It provides load balancing and redundancy in multiple web server configurations.

An **Adaptor**, which runs as a CGI/NSAPI/ISAPI program on a web server machine, and redirects specific web page requests to a Dispatcher for Page Server processing. A page request is sent to an adapter if the URL contains a preconfigured string that is specified at install time.

One or more **System Integration Modules (SIMs).** A SIM can be thought of as a piece of code that provides, to the Page Server and Integrator, a black box front end to a *specific type of back end data source*. The following SIMs currently exist for the various types of back end information sources:

Java SIM - allows methods of Java classes to be invoked

ActiveX SIM - allows ActiveX controls to be invoked

ODBC SIM - allows various databases to be accessed via SQL, as long as the database client has an ODBC driver.

A Host Access SIM for accessing 3270 and 5250 hosts will soon be made available on the web.

Chart 19: Host On-Demand V3.0 Entry Level Web-to-Host Solution

This new version offers much more functionality than Release 1.
Host On-Demand Version 2 uses the power of Java to open the doors of your enterprise data whenever you need it, wherever you need it, straight from your browser. A single click launches a distinct Java applet that gives you broad access to your intranet data, with TN3270, TN5250, and VT 52/100/220 emulation in a single package. This new version adds these new features: use of up to two concurrent sessions; a graphical tool bar; the ability to remap the keyboard; convenience print; cut/copy/paste to the clipboard, file transfer and Year 2000 Readiness.

Chart 20: Host On-Demand V2.0

Host On-Demand's single-click access is the simplest way for users to reach critical Host-based data because the user is not required to load or configure any software. Users just click on a hyperlink that launches a session to the host. Any number of sessions can be launched with multiple hosts, so users can operate at maximum efficiency. Also, Host On-Demand launches in its own window, so the user can continue to access Web-based data while connected to the host!
Host On-Demand also extends enterprise data access across the Internet by communicating with SSL, Version 3.0. Mobile workers can simply access the secure Web site, be authenticated, and establish communication with your enterprise hosts. If access to multiple hosts is needed, the redirector function maintains the secure link across the Internet and establishes sessions with other hosts.

Chart 21: AS/400 Host Integration - Shared Folders

You can create disk devices on the server that access AS/400-based data through the AS/400 Integrated File System (IFS). If the server shares these disk devices, clients can connect to and use these devices to get access to datasets on AS/400 without additional configuration or code installation on the client machine. Multiple clients can connect to folders on the AS/400 system as if they were drives
on their workstations.

Chart 22: AS/400 Host Integration - OLE DB access to AS/400 data

Applications that use OLE DB or ActiveX can communicate through Communications Server for record-level access to datasets on an AS/400. This support is based on proven technology provided by IBM's Client Access/400 product.

Documentation for this function, as well as information about developing these applications using Client Access, is provided in the csnt\sdk\as400_oledb directory.

Chart 23: Remote API client Support (Split Stack)

The Communications Server SNA API client support allows TCP/IP- and IPX-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 the industry standard CPI-C, APPC, EHNAPPC, SLI, RUI APIs and new JAVA based JCPI-C, and HACL API interfaces, while providing the actual SNA processing at the server. These clients are delivered as part of the server but are actually installed and configured at the client.

To ensure availability and security , the Win32 API clients now support load balancing across multiple Communications Servers as well as 40-bit RC2 data encryption.

Chart 24: Enterprise Intranet - Sockets over SNA Gateway

Intranets are a very popular way for enterprises to streamline communications internally. Here's an example of how the Sockets over SNA technology in Communications Server for Windows NT can be used to build an intranet in an enterprise that has an SNA/APPN/HPR backbone!

The enterprise can choose the web server platform based on the scalability of their requirements. Communications Servers on OS/390, AIX, Windows NT, OS/2, as well as OS/400 all have integrated Sockets over SNA support which allows a web server to run over SNA, with no need for TCP/IP!

Once the web server is established, web browsers on branch IP LANs can easily get information from the web server on the SNA central site through Communications Server for Windows NT Sockets over SNA gateway function.

Once the Communications Server for Windows NT gateway is implemented, it can convert most any TCP/IP sockets-based applications from the branch IP LANs to run over the central site SNA network.

Chart 25: Netware 3270 emulator (QEL/MU) support

Communications Server supports Novell NetWare for SAA clients using either TCP/IP or SPX/IPX on
Windows 95, Windows NT, Windows 3.1, and OS/2 to directly attach and utilize Communications Server for 3270 access.

Chart 26: Access to Application Server Mission Critical Data

In addition to access provided directly by the Communications Server product, it is the foundation for all of IBM's Enterprise middleware as well as premier Enterprise-proven third party applications for accessing mission critical data residing on enterprise servers such as S/390 and AS/400.

Chart 27: Applications Integration

IBM DB2 Client Application Enabler provides the client access to DB2 databases or DB2 Connect servers via an SNA Gateway such as eNetwork Communications Server for Windows NT over a local TCP/IP SPX/IPX, or Net BIOS Network. This client provides a DB2 ODBC driver for standardized access to DB2 databases. You can install DB2 CAE on a client machine running Windows 3.1, Windows 95, Windows NT, or OS/2.

With IBM CICS Clients you can take the same applications that you use in your enterprise computing today and bring them into the new world of e-business, extending their reach to the rapidly growing number of network connected end-users. Think of CICS Clients as versatile connectors. They'll connect end users at workstations running popular platforms or (using the CICS Gateway for Java or the CICS Internet Gateway) at Web browsers to CICS servers, including IBM TXSeries and CICS Transaction Servers running on a wide range of IBM and non-IBM systems.

IBM MQSeries Clients provide the client side access to an MQSeries Server. IBM's MQSeries simplifies the task of connecting your applications across unlike environments. Programs communicate using the MQSeries API, an easy-to-use, high-level program interface which shields your programmers from complexities of different operating systems and underlying networks.

You focus on the business logic, while MQSeries manages your connections to the computer systems.

Chart 28: Web Access to Mission Critical CICS Data

With the explosion of the Internet and intranets in your business, this solution shows how a user with a Java-enabled browser can now access existing CICS applications on the host without any modifications to the CICS 3270 application using Communications Server for Windows NT as the networking infrastructure. Adding intranets to extend your reach of your enterprise network has never been easier.

Chart 29: Volusia County Criminal Justice Information System

Volusia County Criminal Justice Information Systems (CJIS) piloted an IBM e-business solution with astounding implications to the legal and judicial system. In an effort to support the growing demand for e-business made by the legal and judicial agencies that they support, CJIS has partnered with IBM to extend the reach of their criminal justice network. The pilot system will deliver new database access points and a new graphical user interface (GUI) and is built upon a broad array of IBM software including IBM eNetwork Software, Transaction Systems Software, and Application Development Software.

CJIS was faced with the need to extend the reach of their network to deliver information in new ways and through new sources. Judges, sheriff's deputies, and other users are relying more and more heavily on having information at their fingertips. Researching and paging through layers of green screens is a slow, cumbersome, and costly process. Parole officers are relying on their laptops while visiting parolees in order to write thorough and accurate status reports. But without a means of automatically downloading that information from the laptop to the mainframe database, the information must be reentered at the office from a 3270 session a considerable waste of effort.

The PC revolution has only exacerbated the problem. "Judges and attorneys bought PCs and laptops and they all had Windows and they all had mouses and they sat in front of these dumb terminals [3270 terminals] and couldn't understand why this fancy criminal justice system couldn't do what their PC could", noted John Stumberger.

Additional pressure is anticipated in the near future with the development of a nationwide e-business network where the National Crime Information Center will transmit fingerprints and mug shots to police departments all over the country. Without a graphical user interface, that information is useless. As John Stumberger explained, "We are going to have to have the right hardware and software to display these graphical images and make them useful to local law enforcement agencies."

The pilot consists of a user workstation running Windows 3.11, IBM CICS client, and a VisualAge Generator GUI application. The server is a Windows NT 4.0 system with IBM eNetwork Communications Server and CICS Transaction Server. When the user requests data from the database using the VisualAge GUI application, a call is made to the CICS client on the workstation. The CICS client sends a TCP/IP request out over the token ring to CICS Transaction Server. Transaction Server generates an ECI call and sends it out to the host using eNetwork Communications Server for Windows NT. The results of the database query are sent

back to the user over the same communication path and the data is displayed in GUI format on the workstation. All of this occurs in sub-seconds and the user is unaware of the communications path.

Although CJIS has only scratched the surface, the e-business story created by this pilot is compelling—a consolidated, friendly user interface, TCP/IP-based workstations accessing mainframe data over an SNA/APPN network, and a scalable client/server environment that will accommodate future growth and technology advancements.

The question is how does this vision translate into human value for the legal and judicial agencies of Volusia County? Well, imagine a streamlined courtroom process where a judge can instantly access all the information he needs to make an informed, effective decision about the person that stands before him.

Chart 30: Client Access to host DB2 Databases

Communications Server for Windows NT is the most cost effective high performance, SNA gateway server on the market. IBM DB2 Connect Enterprise Edition for Windows NT provides the most secure, feature rich service for workstation client access to host databases. Together, Communications Server and DB2 Connect provide the best combination of services for PC and UNIX client connections to databases on DB2 for AS/400, DB2 for OS/390, or DB2 for VM and VSE.

Together, DB2 Connect and Communications Server provide the best offering for customers wishing to implement a replicated branch office, departmental data mart, or a Web application delivering both host data and multimedia content. Insurance, Retail, Banking, and Health Care industries rich in data distributed across a mixture of hardware platforms queried from distributed sites would find this combination of products an indispensable foundation to their specific solutions. So tell your customers and business partners today IBM's winning combination of Communications Server and DB2 Connect on NT.

Chart 31: Communications Server and MQSeries - Finance Industry Pilot Scenario

IBM's MQSeries messaging software has earned industry leadership status for being the best solution to the business need to enable different IT systems to work together and achieve competitive advantage. The highly reliable, asynchronous communication of MQSeries connects application to application, business to business and ensures information flows through the enterprise, with delivery assured even across temporary network or system failures. MQSeries transforms the way networked applications are developed and deployed. It speeds the development of e-business applications by making it easier to connect Web applications to core business data, transaction systems and enterprise resources.

This finance customer is using MQSeries between DB2 mainframe databases and distributed data on remote Windows NT 4
workstations. They built an application with a Windows GUI to exchange data with the mainframe. It works on TCP/IP on the "remote" workstation LAN and

then SNA (LU 6.2) between CS/NT server and the mainframe. With the SNA communication they can get compression and/or encryption between
the mainframe and the remote site.

Chart 32: SNA Host Integration

IBM is the recognized industry leader in the arena of host integration from a SNA network, and we've been the leader for a long time. We invented SNA, the S/390, and the AS/400. Who better to trust for host integration in an SNA network?

In the SNA arena, IBM leads the way in providing the most robust solutions for mission-critical applications. For SNA networks, the eNetwork host integration solution means:

IBM is first to deliver new technologies. IBM has a long history of being first to market with new technologies -- using new technology in a way that enterprises can use to solve real business problems. APPN and HPR, for example, opened the door for major gains in scalability and efficiency in SNA networks. Recently-announced branch extender and enterprise extender technologies will carry those gains even farther.

IBM has shared its technology innovations with the appropriate standards bodies and industry consortiums, encouraging third-party vendors to develop applications that run with the eNetwork products and address industry-specific business needs.

Secure access. As an architecture, SNA provides the highest level of security available today. For 25 years, organizations have entrusted their most valuable information assets to SNA networks. The eNetwork host integration solution also provides IPSEC and SSL security for users who access the SNA network from TCP/IP networks, including the Internet. IBM has always made security one of its top priorities in the development of SNA solutions, and that emphasis will continue.

Cost-effective network utilization. The eNetwork host integration solution makes your network -- and, by extension, your business -- more versatile and productive. It lowers the cost of networking while delivering host data to anyone, anywhere, anytime. Employees, customers, and business partners are more productive because they can access up-to-date information, in a consistent format, whenever and wherever they need it.

SNA has always been a leader in incorporating new technologies that make your network more efficient and cost-effective. For example, SNA class-of-service ensures that the most vital traffic is given priority as it moves across the network. APPN and HPR functions provide the most efficient routing for all data as well as enhancing network availability. SNA's data compression algorithm can reduce line costs by packaging data more efficiently.

Continued return on your current investment. There are 50,000 SNA backbone networks in the world today, and the eNetwork host integration solution doesn't require you to throw away your

investment in technology infrastructure. Rather, it builds on that infrastructure, adding new power and extending the reach of the network across intranets, extranets, and the Internet.

The eNetwork host integration solution is flexible. Using Communications Server for OS/390, users can connect to your host directly or through an intermediate server with the same software family. Our multiprotocol, "any-to-any" functions virtually eliminate barriers between different network protocols and operating systems. No other vendor offers that kind of flexibility.

The eNetwork host integration solution also positions you for growth: as your business needs change, and as new technologies come along, it will be easy to add additional functionality to your existing network.

Proven reliability for mission critical applications. IBM SNA has been the industry standard for more than 20 years. No one comes close to matching our proven reliability for serious business applications.

Connecting to the host via SNA affords a number of superior functions, including:

·   3270 and 5250 terminal emulation
·   APPN, HPR, and DLUR support for fast, reliable, sturdy network
·   Outstanding application programming support: CPI-C, LUA, and APPC
·   Efficiency, through functions like class-of-service and data compression
·   A broad range of connectivity options

Chart 33: Communications Server for Windows NT SNA Function

Communications Server for Windows NT provides industry leading SNA support including full APPN Network Node and End Node capabilities. Our Communications Server for Windows NT product will provide high availability and great throughput through the use of technologies such as HPR. We can provide a migration strategy for emulator and printer devices from a subarea environment to APPN through our DLUR support. Our Discovery server allows Communications Server for Windows NT, operating as an EN, to search for a Network Node Server over any LAN (802.2) connection. When Communications Server for Windows NT is operating as a NN, we will answer discovery requests from ENs looking for a Network Node Server.

All APPN load balancing and route calculations will provide the best path for your network traffic. Because Communications Server for Windows 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.

Communications Server for Windows 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, including Personal Communications, the industry's leading emulator as well as clients from WRQ, Eicon Technology, NetManage, and Wall Data.

For true networking flexibility, a wide range of connectivity options are provided, such as adapters and direct attached channel products, allowing customers to leverage their current hardware investments. 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), channel and twinax. Supported connectivity products include IBM's WAN and LAN adapters as well as Eicon Technology, MicroGate, Quadron, Interphase (Synaptel), and Bus-Tech's and Barr System's direct attached channel products for high performance environments.

Chart 34: More Effective Utilization of Available Bandwidth - Data Compression

SNA data compression optimizes network utilization and reduces network costs by achieving faster transmission speeds over links with lower line capacity, and by sending fewer packets into the network. Unlike competitive products on the Windows NT platform, Communications Server for Windows NT uses compression of data at the session level to increase throughput of data across communication links.

SNA data compression is compatible with the S/390 and AS/400 implementation and can be used with all LU types. Support includes:

> RLE compression for independent LU 6.2, RLE and LZ compression for LU types 0, 1, 2, and 3.
> Compression of data sent between a host and a downstream workstation where Communications Server for Windows NT is used as a gateway
> Compression of data sent between a host and Communications Server for Windows NT on behalf of downstream TN or SNA API clients.

Chart 35: Branch Extender for Large APPN Networks

The branch extender optimizes the peer-to-peer communication environment for administrators who want to connect LAN-based branches to one large WAN primarily based on a switched network. The branch extender enhances performance in large APPN networks. Specifically, it:
> Reduces the number of network nodes in large APPN networks, enabling you to add additional branch networks
> Hides branch topology information
> Enables peer-to-peer communication between branches connected to the same APPN connection network

Enables coexistence with PU gateway servers
Reduces uplink CP-CP session traffic (WAN traffic)
Isolates the branch network from backbone WAN traffic overhead

Chart 36: High-Performance Routing

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 predetermined 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 work group 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 37: Availability, Reliability, and Security

Now lets look at what Communications Server for Windows NT does for RAS. We will look at Load Balancing, Hot Standby, and security enhancements included with Communications Server for Windows NT Ver 6.0.

Charts 38 & 39: Load Balancing

Server load calculated via "load metric"
Two values per server
    LU0-3 value (for QEL/MU, TN3270, & SNA API clients)
    LU6.2 value (for TN5250, SNA API/APPC clients)
Clients and servers utilize advertisement template (defines criteria for available server)
    Service TYPE
        TN3270, etc
    Attributes
        Pool Name
        Load Value
        Device Types
Clients send multicast to all servers to determine their load
Based on advertisement template
Load Factor calculated on per session basis
Exception: client can cache load data and reconnect to same server

Chart 40: Hot Standby

For environments where it may be important to provide backup host connections to the primary connections in use by workstation emulator sessions, Communications Server provides you with options that enable configuration of host connections that are activated in response to failure conditions. Once a primary server failure is detected by the configured backup server (running in production itself or as a dedicated backup server), connections to the host application is established and advertised for emulator clients that attempt to find and reconnect to the host application.

Chart 41: Security enhancements: SSL, RC2, SLE

Communications Server offers the ultimate in data security for protecting sensitive data. In expanding its TN3270 and TN5250 support, Communications Server will now support SSL based client connections with SSL-enabled clients, such as IBM's Host On-Demand.

For emulators, third-party SNA applications, and in-house applications that utilize Communications Server's SNA API clients, data encryption is optionally available using RSA RC2 40-bit encryption.

For data security of the SNA backbone, Communications Server now provides support for Session Level Encryption (SLE) when use in conjunction with the IBM Secureway Cryptographic Adapter.

Chart 42: Development and Support Tools

Now let's look at what Communications Server for Windows NT offers for development and support tools. We'll look at API support, graphical interfaces, and a web-based administration tool.

Chart 43: Middleware

Communications Server for Windows NT supports a wide range of 32-bit APIs on the server for the applications developer. These APIs provide a convenient way for application programs to access Communications Server functions and allow applications to address the communications needs of connections to both IBM and other computers. This chart gives examples of API support included in Communications Server for Windows NT.

Chart 44: Tree-view administration and configuration

Through usability studies with several customers, IBM continues to improve on the ease of use and functionality of its configuration and administration facilities. Communications Server now provides a tree-view diagram of your configuration that enables you to select and modify resources in a hierarchical graphic interface.

Chart 45: Tree-view administration and configuration

For administrators that are accustomed to the look and feel of Windows, Communications Server provides Explorer-like interface for administering one or multiple servers from the same workstation. This can be done either from a system running Communications Server directly or through any Win32 client with TCP/IP addressability to discover and administer remote Communication Servers.

Chart 46: Web-Based Administration

Have you ever wanted to use the Internet for remote system administration? Well now you can! 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 47: All-In-One Packaging

The Communications Server for Windows NT is available on CD-ROM only. The product CD contains the following:
- product files
- Clients for remote SNA API
- Entry-level Personal Communications Emulators
- Development tools, APIs, and samples
- online documentation
- Host Publisher
- Host On-Demand V2.0 Restricted License
- Web Administration
- Remote administration and configuration clients
- Hot buttons for Communications Server Web pages

Chart 48: 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 49: Capacity Planning

A frequently asked question from potential customers is "How many users can the server support?" Another common question is "How many sessions can the server handle?" The answers to both of these questions will depend upon many things such as server hardware configuration, server software configuration, server workloads, and network environment.   The chart shows the server capabilities in terms of the designed maximum "sessions" a server can handle.

Chart 50: Communications Server Competitive Advantages

Reiterate the points on the chart

Chart 51: eNetwork Communications Server Technology Highlights

This chart shows the SNA and multiprotocol support capabilities of each of IBM's eNetwork Communications Servers.

Chart 52: For More Information

Here are some URLs that you can refer to if you would like more information on eNetwork Communications Server for Windows NT.