

Communications Server for UnixWare 7, Version 5.0

Presentation Speaker Notes

Chart 1: Title Page

Chart 2: Abstract

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Chart 5: 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 provides the benefits provided by advanced SNA capabilities such as APPN and high performance routing (HPR). The SNA API Client/Server (split-stack) capability enables you to integrate SNA and TCP/IP networks, by providing SNA support for Win95 and Windows NT TCP/IP clients. And the TN3270E server function provides SNA 3270 access to host systems for TCP/IP users running TN3270 emulators.

The Communications Server product line includes solutions for UnixWare 7, OS/2, AIX, Windows NT, OS/390 and NetWare server environments, and is fully interoperable with OS/400 networks.

Chart 6: Communications Server for UnixWare 7

Communications Server for UnixWare 7 will be of interest to customers who want to provide enterprise host access to SNA and TCP/IP users. This includes the capability for UnixWare 7 systems to take advantage of advanced SNA networking capabilities such as APPN networks and high performance routing (HPR). CS/UnixWare 7 will support either the hierarchical subarea or peer-to-peer networking environments. CS/UnixWare 7 should also be considered by customers who need to provide SNA access to TN3270 users through its powerful TN3270E Server function.

Chart 7: eNetwork Communications Server for UnixWare 7

Communications Server for UnixWare 7 provides enterprise-class communications and networking capabilities that ensures higher reliability and performance than the competition. Communications Server provides end-to-end universal access, integrating both SNA and TCP/IP users into a single network. In addition to a powerful SNA gateway, it also provides a TN3270E

Server to provide SNA 3270 application access to TCP/IP users running TN3270 emulators. The SNA API Client/Server (split-stack) function enables SNA on Windows95 and Windows NT TCP/IP clients. Communications Server also provides a broad range of connectivity options including Ethernet, Token Ring, FDDI, SDLC, X.25 and frame relay.

The easy-to-use graphical user interface simplifies configuration and systems management, reducing the time required by administrators. A rich set of application programming interfaces (APIs) is available to assist in development of transaction programs.

Communications Server offers the most advanced implementation of SNA on the UnixWare 7 platform. Features such as full APPN end node and network node support, high performance routing (HPR), dependent LU requester (DLUR), and assigned priorities to different transmission types (such as batch versus interactive), all contribute to the effective utilization of the network and increased reliability.

Chart 8: Key Features of Communications Server for UnixWare 7

The integrated TN3270E server provides access to 3270 host applications for any standard TN3270 emulator on any computer. It supports the standards as defined by RFCs 1123, 1576, 1646, 1647, and 2355. It includes support for the ATTN (attention) and SYSREQ keys and SNA response handling. For ease of configuration, you can define pools of LUs to support groups of similar users, or for security reasons, you may define specific LU names. Communications Server supports SNA print applications to printers attached to your client or any TCP/IP defined printer in the network.

SNA API Client/Server (split-stack support) allows TCP/IP attached clients to access SNA APIs without requiring SNA on the client. It reduces the burden of configuration as most of the configuration takes place on the server. It can provide support for smaller clients as this feature reduces the hard disk and processor requirements on the client since the SNA processing is done on the server. Multiple servers can be configured in a single domain providing increased availability and load sharing of clients across all the available servers. Any server in the domain can be used to perform configuration. Communications Server for UnixWare 7 is designed to support any application written to run with Microsoft SNA Server clients on both Windows95 and Windows NT.

The advanced SNA/APPN capabilities include High Performance Routing (HPR) Rapid Transport Protocol (RTP). This feature will allow Communications Server to automatically reroute sessions around route failures or congestion, without disrupting the user's session. This function is supported over all link types. Communications Server also provides Dynamic Definition of Dependent LUs (DDDLU), which enables you to dynamically define LUs to VTAM systems, reducing the need for host configuration. This function is sometimes known as SDDL (Self-Defining Dependent LUs). Dependent LU Requester (DLUR) enables sessions between dependent LUs and hosts to be routed over APPN networks.

Chart 9: Key Features of Communications Server for UnixWare 7 (page 2)

Communications Server for UnixWare 7 provides a broad set of application programming interfaces (APIs) and development tools to assist in the development of communications applications. Some of the APIs are consistent with the APIs provided by products in the eNetwork Communications Server family running on other operating systems. The following APIs are available with Communications Server for UnixWare 7:

- Conventional LU Application Interface (LUA) Request Unit Interface (RUI) API
- Node Operator Facility (NOF) API
- APPC API
- Common Programming Interface for Communications (CPI-C) API at the 2.0+ level
- Common Service Verb API
- Management Services API.
- eNetwork Host Access Class Library (Host Access API)

In addition to the above APIs, Communications Server includes the APPC Application Suite which contains a collection of sample APPC programs which are useful for testing and problem determination as well as good examples of APPC applications. The applications include APING, AFTP, ATELL, ACPY, and ANAME.

Communications Server provides flexibility by supporting a broad range of connectivity options including Ethernet, Token ring, Fiber Distributed Data Interface (FDDI), X.25, SDLC, and frame relay (using an emulated token-ring interface).

Chart 10: Key Features of Communications Server for UnixWare 7 (page 3)

The easy-to-use Administration Tool simplifies the configuration and administration of Communications Server for UnixWare 7 and improves the productivity of system administrators. It provides complete configuration and management facilities for the server in an easy-to-use interface for graphical X-terminals, and provides online help for configuration and management tasks. You may also use command-line commands or programs written using the NOF API to perform configuration and administrative tasks. Configuration changes made using the administration program, the command-line administration program, and the NOF API are applied immediately to the node configuration file and can be done while the system is active.

In the US and Puerto Rico, we have included a 30 day trial license for a full function 3270 emulator from TPS Systems, Inc. This full-featured emulator runs on the UnixWare 7 operating system and includes printer emulation capabilities. It encompasses all the basic features of the 3270 terminal and printer and adds many additional features for ease-of-use and additional functionality. It supports EHLLAPI, macro support and is easy to install. The emulator can be useful for initial installation and host connectivity testing and verification.

Chart 11: IBM eNetwork Software

eNetwork Software intends to provide enterprise-class, universal connectivity and information access for cost effective network computing. To elaborate, the products need to exhibit enterprise-class dependability to support mission critical applications, end-to-end universal access to provide access from anywhere to anywhere, easy implementation and use to provide minimum disruption to the enterprise and effective resource utilization to minimize duplication and costs in network design and configuration. The IBM eNetwork Software family of products includes a wide range of client and server platforms that span the desktop to the mainframe. Regardless of your mix of OS platforms, you can get full capability and flexibility for your networking dollars.

The product family consists of Communications Servers supported on Windows NT, OS/2, AIX, UnixWare 7, NetWare, and OS/390. Common to all of our servers is the move from SNA gateways to multifunction gateways supporting a mix and match of SNA and TCP/IP applications and networks.

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

IBM eNetwork Software is a family of software that provides enterprise-class, universal connectivity and information access for network computing. This chart lists the primary eNetwork server and client products from IBM.

Chart 12: Industry Leading SNA Support

Now we'll start to look at the Communications Server SNA functions that are surpassed by no one in the industry.

Chart 13: Communications Server for UnixWare 7 SNA Function

Communications Server for UnixWare 7 provides industry leading SNA support including APPN Network Node and End Node capabilities. Our Communications Server product will provide high availability and great throughput through the use of technologies such as high performance routing (HPR). We can provide a migration strategy for emulator and printer devices from a subarea environment to APPN through our DLUR support.

All APPN load balancing and route calculations will provide the best path for your network traffic. Because Communications Server 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 UnixWare 7, 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 acts as a PU concentrator for downstream SNA devices. This allows many devices to share a common communications line to the network, thus saving the expense of hardware adapters and communications lines for each device. Typically this would include PCs running common emulators, actual 3270 terminals/controllers, another downstream server, or any supported SNA LU device.

Communications Server for UnixWare 7 includes the APPC Application Suite, which is common to all of the communications servers in the eNetwork family. These applets are useful for testing and problem determination and are also good examples of APPC application programs. The applets provided include APING, ATELL, ANAME, AFTP and ACOPI. As always, these applets interoperate with SNA applets on all of the Communications Servers.

Communications Server provides several application programming interfaces (APIs) to assist in the development of SNA applications.

When multiple host links are defined, the Communications Server will balance the load across the available links. It will also provide hot backup by routing traffic across another available link should the primary link fail.

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. You can connect your server to the network or your clients to the server via SDLC, Token Ring, Ethernet, X.25, Fiber Distributed Data Interface (FDDI), or Frame Relay. Supported connectivity products include LAN adapters supported by the UnixWare 7 operating system as well as WAN adapter cards provided by vendors such as SBE, Inc.

Chart 14: 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). 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 15: TN3270E Server

Communications Server supports the industry standard TN3270E clients, including our own Personal Communications Family of products. This will allow you to provide SNA host access to TCP/IP clients without having TCP/IP on the host or SNA on your workstations. You can provide the advantages of HPR and DLUR to your TCP/IP clients.

Communications Server can be placed in your remote branch offices, or centrally located next to your host computer. So whether you have an SNA backbone network or a TCP/IP backbone, Communications Server for UnixWare 7 can provide the SNA connectivity for your TCP/IP users.

Our TN3270E Server supports traditional TN3270 and is compliant with RFC 1646 and 1647, providing support for LU1 and LU3 printers in addition to the traditional LU2 devices. It also supports the ATTN and SYSREQ keys, and supports SNA definite response which allows end-to-end printer confirmation. The printer needs to be associated with a TN3270E client. The printer does not need to be directly attached, it just has to be TCP/IP addressable to the TN3270E client.

Chart 16: TN3270E Printer Support

The TN3270E Server provides SNA print support to both locally attached printers as well as any TCP/IP addressable printer in your network. It provides LU1 and LU3 printer device emulation. A TN3270E client is used to provide the print queue for the supported printer. This TN3270E client can reside on the users workstation to support a locally attached printer, or it can reside on a server to support a network attached printer. You may direct output to a printer by specifying a specific LU name. We also support definite response so you can be informed when your output has been completed.

Chart 17: SNA API Client/Server (split-stack)

Communications Server for UnixWare 7 includes an SNA API Client/Server function which is commonly called “split-stack”. We offer a similar capability on our Communications Server for

Windows NT product, and both are designed to support applications written to the Windows Open System Architecture (WOSA) as defined by Microsoft.

This function allows TCP/IP-attached clients to access SNA APIs without requiring SNA on the client. SNA protocols do not flow between the client and the server and most SNA configuration takes place at the server. This reduces the hard disk and processor requirements of the client which could extend the life of your existing client hardware.

The Client/Server model uses the concept of a master configuration file for all servers and clients in the domain. This would include LU Pools, CPI-C side information profiles and emulator user records. Emulator user records are used to define which LUs (and LU Pools) can be used by which emulator user, providing another level of control and security. Users may be defined by User Name, Group, or fall into a default category. A user can connect to any server in the domain and be presented with the same list of available LUs because all servers are kept up to date with a copy of the master configuration file.

SNA API Client/Server supports clients on Windows95 and Windows NT workstations. Any application written to the following Microsoft WOSA APIs will work with the Communications Server for UnixWare 7 clients:

- Windows APPC
- Windows CPI-C
- Windows LUA
- Windows CSV
- 3270 Emulator Interface Specification (FMI)

Chart 18: SNA API Client/Server Hot Backup

Client/Server provides increased availability through hot backup servers. You define a master server and one or more backup servers in your domain. The master server maintains the master configuration file and sends a copy of this file to all servers in the domain when any changes are made. If the master server fails, then one of the backup servers will take over its role of maintaining the master domain configuration file (and send updates to all other servers in the domain). When the master server is restarted, it contacts the currently running master and updates its domain configuration file, and then takes over the role as master in the domain.

If a client is configured to connect to a list of servers (or any server) in a domain, then if its connection fails because the server fails, it will reconnect through another server in the domain. The user's session will be ended and a new logon screen will be displayed.

Chart 19: SNA API Client/Server Load Sharing

In addition to the hot backup capabilities that the Client/Server function provides, it can also share the client load across multiple servers in the domain. LU Pools can be defined on multiple servers

in a domain to provide a pool of servers. A randomization algorithm is used to share the client sessions across all the servers in the domain. This, coupled with the hot backup capabilities, provides increased performance and availability for your SNA API clients.

Chart 20: Advanced Technologies

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

Chart 21: Built on Advanced Technologies

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. This simplifies design, installation, and operations.

Chart 22: High Performance Routing (HPR)

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 23: Dependent LU Requester (DLUR) in SNA Gateway

DLUR, in conjunction with VTAM's dependent LU server (DLUS) function, enables dependent LU applications (LU 0-3, and dependent LU6.2) to operate unchanged in an APPN network.

As a gateway, Communications Server provides Dependent LU Requester support for the downstream workstations that are using the services of the gateway for 3270 host access. The gateway depends on a VTAM to provide the Dependent LU Server (DLUS) portion of the client to server relationship.

When the DLUR gateway is located on the boundary of an APPN network, full 3270 support be delivered to downstream workstations over APPN.

DLUR protects your current investment in 3270 emulation and other dependent LU applications while migrating new applications to LU6.2 and APPN.

Chart 24: Application Programming Interfaces

Communications Server for UnixWare 7 provides a broad range of application programming interfaces (APIs) that are compatible with the APIs provided by products in the eNetwork Communications Server family running on other operating systems. Communications Server for UnixWare 7 includes the following (APIs):

The LUA API enables application programmers to write applications that communicate with host applications at the request unit and response unit (RUI) level, and supports LU 0, 1, 2, or 3 communication with the host. This API is common across the eNetwork family of communications servers.

The Node Operator Facility (NOF) API can be used to write applications that administer Communications Server configuration and management resources. The Administration tool was written using this API.

The Advanced Program-to-Program Communication (APPC) API enables peer-to-peer communications among programs in a Systems Network Architecture (SNA) environment

The Common Programming Interface for Communications (CPI-C) API is written to the 2.0+ level and is a portable application programming interface, or API, that enables peer-to-peer communications among programs in an SNA environment.

The Common Service Verb API provides utility verbs that enable you to perform functions such as character set conversion and trace file control.

The Management Services API supports network messaging functions.

The eNetwork Host Access Class Library (Host Access API) - is a new Java API that provides the ability for you to develop your own 3270, 5250, or VT Java applications.

The Host Access API for Java provides a core set of classes and methods that allow the development of platform-independent applications that can access host information at the data stream level.

Chart 25: Easy to use Administration Tool

Communications Server provides an Administration Tool that provides complete configuration and management facilities for Communications Server in an easy-to-use interface for graphical X-terminals. This program simplifies administration and provides online help for configuration and management tasks.

Configuration changes made using this Motif administration program, the command-line administration program, and the NOF (Node Operator Facility) API are applied immediately to the node configuration file and can be made while the system is active.

Chart 26: Summary

In summary, Communications Server for UnixWare 7 is the premier communications gateway for the UnixWare 7 environment. Key advantages include the most advanced implementation of SNA such as full APPN support, high performance routing, and DLUR; integration of TCP/IP users, both TN3270 and split-stack clients; a solid, reliable product to provide mission critical end-to-end solutions; better ease of use; and IBM's excellence in service and support.

Chart 27: Where to go for Additional Information

Information Resources