The IBM Network Station for AIX

By George Kraft IV

The IBM Network Station is a true network computer device. It commands the power of the Internet while reducing the total cost of ownership.

Today's Internet is the result of heterogeneous computing environments embracing and cultivating open systems standards for network computing. As the demand for network computing continually increases, many new technologies and potential standards will emerge.

The Internet was the impetus for the Network Computer Reference Profile (NCRP) initiative, introduced by Apple®, IBM, Netscape®, Oracle®, and Sun®. Its purpose is to facilitate a broad application base, interoperability among systems, simple and unified system administration, and end-user ease of use for a network computer device. The device itself should be architecturally neutral and secure; it should also have a low total cost of ownership.

The NCRP addresses the various markets for the network computer including the consumer, education, government, developer, manufacturer, and corporate markets. Specifically, it outlines the technologies and standards shown in Figure 1.

IBM Network Station

IBM's initial response to the NCRP is the IBM Network Station™. Architecturally, the IBM Network Station is server independent. It is deployed for various IBM platforms

NCRP Technologies and Standards

Resources
- Minimum 640 x 480 resolution (or equivalent)
- Pointing capability
- Text input capability
- Audio output
- Persistent local storage not required

Internet Protocol
- Internet Protocol (IP) Version 4
- Transmission Control Protocol (TCP)
- File Transfer Protocol (FTP)
- User Datagram Protocol (UDP)
- Domain Name Service (DNS)

World Wide Web
- HyperText Markup Language (HTML) Version 3.2
- HyperText Transfer Protocol (HTTP) Version 1.0
- Java™ Application Environment Version 1.0.2

Electronic Mail
- Simple Mail Transfer Protocol (SMTP)

Multimedia
- JPEG
- GIF
- WAV
- AU

Security
- Secure Sockets Layer (SSL) Version 2

Figure 1. Technologies and standards addressed by NCRP

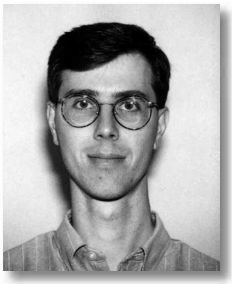

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Figure 2. The IBM Network Station off-loads work from the server distributively

running AIX®, OS/400®, OS/390™, and Microsoft® Windows NT™.

The IBM Network Station Models 8361-100 and 8361-200 provide Ethernet™ and Token-Ring access, respectively. The unit has a 33 MHz PowerPC™ processor, 1 MB of video RAM expandable to 2 MB, 8 MB of RAM expandable to 64 MB, AC/DC converter, mouse, and keyboard. The monitor is not included; however, PC monitors such as the IBM G-series and P-series are an optimal price-versus-performance choice.

The IBM Network Station has X-Terminal-like traits but with the advantage of running client applications locally, such as terminal emulators, the Java Virtual Machine, and World Wide Web browsers. The ability to run these tasks locally on the IBM Network Station is important because users receive better response time and it off-loads work from the server distributively.

In addition to displaying distributive X Window System® applications, the IBM Network Station can run server-resident Microsoft Windows™ applications by using WinCenter™ Pro from Network Computing Devices®, Inc. Native server applications run on the host, then display to the network computer device.

Terminal Emulators

Telnet, 5250, and 3270 terminal emulations support character-based input for UNIX®, AS/400®, and OS/390 respectively. Each emulator runs as a local application on the network computer device, which allows the end user to access multiple server applications simultaneously from a single IBM Network Station.

Java Virtual Machine

The Network Station also provides Java Virtual Machine (JVM) Version 1.0.2 and Java class libraries. The JVM runs Java applications and applets locally on the network computer device. The write-once-and-deploy-everywhere Java paradigm is an obvious advantage over writing for specific operating systems.

Web Browser

Later in 1997, the Network Station Browser (NSB) and Navio™ Navigator World Wide Web browsers will be available as local clients. Then, users will be able to surf the Web directly from the network computer device.

In AIX 4.2.1, Common Desktop Environment (CDE) users who are using the IBM Network Station now have new Netscape Navigator™ integration that has been added for URL data types in the CDE. Telnet, file, ftp, mailto, news, http, gopher, nntp, wais, and prospero are the new URL data types. URLs can be opened, printed, dragged and dropped, or added to the browser's bookmarks from the CDE File Manager, Mailer, Front Panel, Printer, and Workspace.

AIX Offering

Although the IBM Network Station is architecturally neutral, AIX adds value through its integrated installation and configuration.

Installation

For AIX 4.1.5 and AIX 4.2.1, the installation packages contain the IBM Network Station software: the base kernel and configuration, terminal emulators, JVM, and X-Server. The

software is available via a Program Temporary Fix (PTF) APAR 1X64800 for AIX 4.1.5, with the Base Operating System (BOS) for AIX 4.2.1, or via the World Wide Web for both. See "Surf's Up..." below. World Wide Web browsers will be available in the future.

AIX Services

To expedite the configuration of AIX to support the IBM Network Station, the software installation process configures and enables BOOTP, TFTP, NFS, and the X-Font server. The system administrator simply needs to define some trivial BOOTP device parameters.

SMIT

The installation packages include System Management Interface Tool (SMIT) support for BOOTP devices such as the IBM Network Station. The system administrator runs SMIT with the `bootp fastpath`, where the IBM Network Station devices are easily set up by naming the device, Media Access Control (MAC) and IP addresses, boot server, gateway, and subnet mask.

For specific system administration documentation for the IBM Network Station, see the URL file://usr/netstation/doc/SysAdminGuide.html on an AIX server after installation of the install packages.

X Integration

Users can X Display Manager Control Protocol (XDMCP) authenticate for the X Window System using `xdm` or `dtlogin` as they normally do for AIX. The IBM Network Station can integrate with CDE, the Motif® window manager, or it can run as a stand-alone with its own local window management. For specific user information, see the following URL file://usr/netstation/doc/UsersGuide.html.

The server capacity required to host the IBM Network Stations depends primarily on how much the local clients are used in place of the desktop services found on the server. Each function, such as a Web browser or Java application, that is moved to the client, reduces the load on the server and increases its capacity to host additional network computer devices.

Migration

The IBM Network Station opens a whole new world for AS/400 and S/390® users. They now can have multiple and distributive applications, and the World Wide Web in a Graphical User Interface (GUI) environment. The transition from "green screen" terminals with function-input to windows with menu bars is an evolutionary step forward.

On the other hand, AIX and IBM X-Station customers have been surfing the net from the beginning. The transition to the IBM Network Station is minimal due to support of open system standards and protocols.

The Java Virtual Machine and World Wide Web browser capabilities have made this network computer a new and exciting network computer device. Instead of just viewing applications, users can dynamically load and run Java applications and applets; they also can browse the World Wide Web. These new capabilities make the IBM Network Station a natural three-tier client/server solution.

Surf's Up...

The IBM Network Station total cost savings is real; it connects easily into existing AIX environments; and it bridges into the future of network computing.

For more information on the IBM Network Station, see the World Wide Web at http://www.internet.ibm.com/computers/netstation/ or call 1-800-CALL-IBM. For the latest IBM Network Station software, see http://rchas943.rchland.ibm.com/nc/swdist/.

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