Network Station Manager Version 2

RS/6000 Installation

RS/6000 Advanced Technical Support
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Objectives/Contents

- **Understanding AIX requirements and prerequisites**

- **Planning the type of Network Station Server**

- **Installing V2R1 Network Station code on AIX.**

- **AIX User, Network and DNS Setup**

- **Migrating V1R3 settings to V2R1**

- **Running AIX applications on the Network Station**

- **Simple problem determination tips**

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Notes

This topic is RS/6000 installation of the Network Station, migration from earlier releases, and getting started with Version 2 Release 1 (V2R1) code.

The objective of this presentation is to provide information for the system administrator in planning and installing the IBM Network Station Version 2 Release 1 code on the RS/6000.

Topics that will be covered in this presentation include
1. "Understanding AIX requirements and prerequisites" for the code including operating system programs, supporting server code, and disk sizing;
2. "Planning the role of the RS/6000 in serving network configuration, boot code, authentication, and applications for the Network Station;
3. An overview of the code installation process;
4. Additional AIX setup for supporting the network station, such as configuring normal and administrative users and setting up network addresses and host names for the Network Station;
5. Migrating existings settings from version 1 release 3 AIX installations;
6. Suggestions for running AIX applications from the Network Station; and
7. Some hints for determining problems with the installation or when running problems.

This should be considered as an introduction only as we are just beginning to understand some of the tools and capabilities of the Network Station version 2 code and AIX.

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Network Station requirements on AIX

- **Operating System Requirements**
  - AIX 4.2.1 or later server code.
  - X server (bos.net.tcp.server 4.2.1 or later) required for full installation
  - bos.iconv (all language sets)
  - bos.net.nfs.client 4.2.1 or later
  - Netscape.nav.rte 4.0.4 or later (for NSM)

- **Web Server Requirements**
  - Lotus Domino GO web server 4.6.2.2 or later for NSM support.
  - Provided on AIX Network Station installation V2R1 CDROM.

- **Disk Space Requirements**
  - Server Type Dependent 50-500 Megabytes
  - Extra 150 Mbytes for coexistance with V1R3
  - See: http://www.pc.ibm.com/networkstation/support/memrec_data.html

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Notes

The AIX operating system must be at least at AIX 4.2.1 server code including the TCP/IP, NFS, and X server code. When using Network Station Manager you will have to install the bos.iconv filesets for all languages even ones you don't plan to use. Netscape should also be installed for using Network Station Manager.

When using Network Station Manager, the Lotus Domino GO web server at level 4.6.2.2 or later should be installed. If you plan to use the command line tools, Java JVM 1.1.6 or later must also be installed. Because the Domino GO server is no longer available from the download site, it is included on the Network Station code CDROM.

The disk space requirements are depending on the features of the RS/6000 server that will be used, the models of Network Stations that will be supported, and the applications that will be used on the Network Station. They range from no additional disk requirement for use as a DHCP server, to up to 500 megabytes when using mixed models of Network Stations, coexistance with earlier Network Station Manager code, and all of the applications are installed.

The latestest information on disk requirements is available at the web site listed on this slide.

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RS/6000 Network Station server types

- **Single full function server**

- **BOOTP or DHCP server**

- **Base-Code server**

- **User-Configuration server**

- **Authentication server**

- **Terminal Configuration server**

- **Application server**

- **DNS server**

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Notes

The RS/6000 server can perform all of the server functions listed on this slide or any one of the functions.

When used as a BOOTP or DHCP server, the RS/6000 provides the IP address to the Network Station along with the location of the boot code server. The functions performed here require not code to be installed as they are part of the base AIX code.

As a "base-code server", the RS/6000 uses NFS or TFTP to supply the basic kernel or operating system to the Network Station. This code installed on the RS/6000 includes the eNetstation.base code, the based code for the Network Station hardware type, and the messages code.   In addition, optional filesets will usually be installed for the different Network Station applications.

A "terminal-configuration server" provides only the files to configure a particular workstation. It contains profiles that provide information to the Network Station on how to act on bootup. This server requires only that the base code and messages be installed, but can include other functions. A base-code server and authentication server will normally be used in addition to this server.

A "user-configuration server" allows each user to have specific setup parameters defined and is similar in makeup to a terminal configuration server.

An "authentication server" contains the login daemon and can be used to verify the user and password. This requires the base code plus the eNetstation.login filesets.

The Network Station Manager code can be installed on the configuration servers to use either web based configuration tools or the command line interface to configure these servers.

AIX applications can be run from servers with no Network Station code installed using the NC as a display.   AIX also provides an excellent name server for Network Stations.

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RS/6000 Single Server Installation

- **eNetstation.base**

- **Model specific base code**
  - eNetstation.S2x00.base*
  - eNetstation.S300_1000.base*

- **eNetstation.msg.en_US****

- **eNetstation.nsm**

- **eNetstation.nsm.EN_US****

- **eNetstation.login**

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Notes

The filesets shown on this slide are required for a single server setup.

The model specific code need only be installed based on the type of Network Stations. If you have both the series 300 or 1000 Network Stations as well as the S2 base machines, you will have to install both sets of code.

In addition to the US messages, other languages can be installed based on your locale.

The NSM code will be needed for configuration servers, while the login code will be a requirement for authentication.

See the RS/6000 V2R1 guide for fileset requirements for each server type.

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RS/6000 Optional Filesets

- **eNetstation.Sxxx.emul**
  - nsterm, 3270 and 5250 capabilites

- **eNetstation.Sxxx.ica**
  - ICA protocol support

- **eNetstation.Sxxx.java**

- **eNetstation.Sxxx.netscape**

- **eNetstation.Sxxx.fonts_typ**
  - Only typical fonts

- **eNetstation.Sxxx.fonts_all**

- **eNetstation.Sxxx.lang**

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Notes

The filesets shown on this slide are optional depending on how the Network Station will be used.

The "xxx" in the fileset names designates the series 300/1000 hardware or the new S2 series hardware. This will be replaced with S2x00 or S300_1000. For example to install the terminal emulation software to run on the Series 1000 install the eNetstation.S300_1000.emul fileset.

The emulation package contains code for all three terminal emulation modes.

Browser support is loaded separately. For 128-bit encryption in the United States, there is also a 128-bit version of this code.

Since fonts can take a large amount of space, you can install either the typical set of fonts that uses the ones needed for the desktop and most applications that run on the Network Station, or you can install all the available fonts which will provide more fonts for ICA and X applications. Another alternative is to use an X font server to provide the fonts.

For non-US English installations, you should install both the US english language sets and the desired local filesets.

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Installing the Network Station Code

- **Verify the prerequisites are installed**

- **Put the CDROM in the drive or the code in an install directory**

- **Install with "smitty install_all"**
  - Select the CDROM, or type the directory where the code is installed.
  - Press the "F4" key to get a list of the filesets available.
  - Select the filesets for the type of server installation using the "F7" key.
  - Press the enter key to return to the install screen
  - Change to "PREVIEW only?" to Yes and press enter to test installability
  - If "OK" is returned, change "PREVIEW only?" to No and proceed.
  - If "FAILED" is returned, view the log and fix the prerequisites.

- **Exit smit and use "lslpp -h eNetstation.base.rte" to verify code**

- **Proceed to verification, customization and setup.**

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Notes

First verify that the correct AIX level is installed wtih "lslpp -h bos.rte" and make sure you are at level 4.2.1. Then use the lslpp command to verify the other software levels listed on the prerequisites chart earlier in the talk. Once the requirments are confirmed proceed with the installation.

Check that you have enough space available using the "df", "lsvg", and "lspv" commands and the charts provided on the internet.

Software can be obtained from the Network Station Download site or on CDROM.

The software is distributed in standard "INSTALLP" format and can be installed using the "smit install_all" command.

The first prompt will be for the location of the software. Use F4 to select the CDROM, or enter the name of the directory where you have placed the software and press the enter key to proceed. Press the F4 key to select the filesets to install. Select the filesets for the type of functions the server will be used for, and the languages using the F7 key, and press enter to return to the main install screen.

At this point, I would recommend selecting to "PREVIEW only" and press enter. This will confirm that all the prerequisites have been installed and that you have enough disk space. If you have met the requirements, this will return "OK". If not, the log will give you information on additional requirments that need to be met before you can complete the installation. PREVIEW provides a must faster method of determining readiness than a failed install attempt.

Once the PREVIEW returns OK, change to no longer preview and press the enter key to complete the software installation. After installation is complete, the screen should once again show a return of OK. This should happen in less than 30 minutes and much shorter depending on the system speed and modules installed. Take a moment to browse though the log window to confirm that the filesets you wanted have been installed. You can also verify this by looking at the /smit.log file.

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Verifying the installation

- **Look at the smit.log file to see which filesets were installed.**

- **Use "df" to see that the /usr/NetworkStationV2/userbase logical volume was created.**

- **Use "exportfs -v" to verify these filesets are exported:**
  - /usr/NetworkStationV2/userbase -rw
  - /usr/NetworkStationV2/prodbase -ro,anon=0

- **Use "grep V2 /etc/httpd.conf" to verify Web server configured.**

- **Use "lssrc -s nfsd" to make sure NFS is active.**

- **Verify that nsld is running on authentication server**

Notes

The installation does more than install the filesets, it also sets up certain daemons, exports the user directory and configures the web server.

The /smit.log file will contain the information from your installation. Verify that there are no failed components.

The logical volume /usr/NetworkStationV2/userbase should be created when you setup a NSM or user configuration server. Use the AIX "df" command to display the logical volumes.

A boot server must export the prodbase directory as read only. When used, the userbase directory must be exported read/write. You can verify that install has added these to the export list with the "exportfs -v" command.

When using Network Station Manager for control, the configuration to access NSM will be added to the /etc/httpd.conf file used by the Domino GO web server. Grep for V2 to verify that lines have been added to this file. The smit log will also show that the httpd daemon has been stopped and restarted.

Installation will also start the bootpd, tftpd, and nfsd daemons. Use lssrc to verify that they are active after installation. If you are not using bootp, you may want to comment out the bootp deamon from the /etc/inetd.conf file to reduce connections. When the RS/6000 is used as an authentication server, the Network Station Login Daemon will also be started. Verify this with "ps -ef | grep nsld".

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AIX User, Network and DNS setup

- **Add NSM administrator users to the "NSMAdmin" group**

- **Assign a IP address and hostname to each Network Station**

  - Add to /etc/hosts or the Domain Name Server

  - Check forward and backward name resolution

    - host nc01
    - host 129.24.32.55

- **Setup NVRAM, BOOTP, or DHCP to server addresses.**

  - For BOOTP or DHCP you will need the MAC address

Notes

Using DNS is highly recommended. Check with your network administrator for IP addresses and host names. If you do not choose to use DNS, you can add the Network Station names to the /etc/hosts file on AIX.   The "host" command can be used to check for name resolution, however if you are using DNS, I would recommend that you use the "nslookup" command as this will provide more information if there are name resolution problems. Name resolution must work in both the forward direction (given the host name, it will return the address), or the reverse direction (given the ip address, the host name will be returned).

Once names and addresses have been established, you must choose some way of assigning the IP address to the Network Station. Most people just starting out or with only a few Network Stations use the NVRAM setup where the address and boot hosts are assigned manually on the Network Station. When more Network Stations are added, it usually becomes more efficient to add them using the BOOTP daemon on AIX which assignes a hostname and server address based on the MAC address of the Network Station. For more complex scenerios, where IP addresses are limited and need to be assigned dynamically, DHCP with DDNS provides an excellent way of managing Network Station addresses.

For more detail see AIX documentation and the IBM Network Station Manager V2R1 redbook.

Initial testing

- **Turn on the Network Station**
  - Does the login screen appear?

- **Login using an AIX user ID on the authentication server**
  - Does the desktop appear?

- **Choose "Host Access", and select the "ASCII" emulation client**
  - Can you telnet to the RS/6000 server?

- **Choose "Advanced Diagnostics"**
  - Type "xhost +"
  - Type "telnet <aix_server_name>"
  - Login
  - Type "xclock -display <network_station_name>:0.0
  - Does a clock display to the Network Station?
  - Close the clock and type "exit"

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Notes

This chart shows some of the tests that can be run to verify that the Network Station is working properly with an RS/6000 server. All of these tests can be run without customizing the Network Station with NSM.

Once the address's have been assigned, simply turning on the Network Station should boot the Network Station to a login screen. If this doesn't happen, then you will have to move to problem determination procedures as described later in this talk and in the problem determation presentation.

Verify that you can login to the Network Station, using the user name and password of a normal AIX user This will be verified using the nsld daemon running on AIX.

Once you are logged into the Network Station and the standard desktop appears, it is time to test AIX as an application server.

If you are using ASCII text based applications, then start the nsterm application from the hosts menu, enter the hostname or IP address of the RS/6000 host, login to AIX and run some minimal tests. Some customization of TERM type and function keys may be necessary to run certain applications.

If you are using X based applications, then to verify that they are working, you can use the advanced diagnostics shell.   Simply enable the Xserver to display from the AIX host, telnet to AIX and start the X application using the -display flag to point back to the Network Station.

Once you have verified that your Network Station works with AIX, you can move to customization of the desktop to have the applications start automatically on bootup, or when an ICON is selected.

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Migrating from V1R3 to V2R1

- **Migration is only provided from Version 1 Release 3 (V1R3).**

- **Both V2R1 and V1R3 can coexist on the same server.**

- **Migration is one way to V2R1.**

- **Migration must be run while both V2R1 and V1R3 are installed.**

- **Use the nsmmigr script to migrate configurations.**

- **You can select to migrate users, system, groups, terminals or all**

- **Only NSM information is migrated.**
  - Manual changes may not be migrated

- **The migration utility cannot handle client migration**
  - NVRAM, BOOTP, or DHCP is not changed automatically
  - Change to /usr/NetworkStationV2/prodbase

Migration is a process that can be run from the AIX command line by a Network Station administrator to move the configuration information that has been setup in Version 1 release 3 to the new version 2 release 1 platform. It does not apply to any NSM releases prior to V1R3.

Migration requires that you install the new V2R1 software without first removing the V1R3 software.   Both must coexist at the same time on the same server.

You can only migrate configurations to the newer server and not back to the old software.

The script is run using the nsmmigr script and specifying the flag to determine the type of migration that you want to do. For example to migrate all confingeration preferences you would use: " nsmmigr -P /usr/netstation/nsm *ALL". To migrate only specific users, use the -U flag followed by the applicable user names. The -G flag is used for group only migration, while -S specifies the system file migration. For complete details and syntax, see the RS/6000 guide before starting the migration.

Information that you may have manually entered into pref files or other manual configuration files may not be migrated except in certain cases. See the advanced information guide for more information. When in doubt, assume that manual configurations will not be migrated.

When updating the NVRAM, BOOTP and DHCP information, the new kernel name and boot server directory need to be manually changed.

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Simple trouble shooting tips

- **Network Station won't boot**
  - Check NVRAM, BOOTP, or DHCP data
  - Use tcpdump or iptrace on AIX to look for errors
  - Run bootpd in debug mode
  - Use host and nslookup commands to verify hostnames and IP adddresses
  - Use the Network Station boot monitor

- **Post boot problems**
  - Use Advanced Diagnostics on Network Station
    - ► hostname: shows that name has been assigned to NS and resolved
    - ► domainname: shows that a domain name has been assigned.
    - ► ping <server_name>: confirms that you have network access to the server
    - ► traceroute <server_name>: confirms route to host
    - ► netstat -rn: shows Network Station routing table
    - ► vmstat 5 5: shows Network Station CPU and memory utilization
  - Use AIX trace and diagnostic tools
    - ► iptrace: shows exact data between AIX and the Network Station
    - ► tcpdump: shows packet size and type between AIX and the Network Station
    - ► syslog: monitors error activity on the server

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Problem determination can be divided into pre and post bootup type problems.

If the Network Station won't boot, then most of the problem determination will be performed from the RS/6000 using standard network trace and problem determination tools. Particular importance should be payed to network connectivity and name resolution. Is the Network Station contacting the AIX host? Does the file and directory requested match that on the AIX server? Are the nfs and bootp or dhcp daemons running on AIX?

The Network Station also provides boot monitor diagnostics as described in the problem determination talk.

Once the Network Station has booted, diagnostic tools can be run on both the client and the server.

From the Network Station side, there is an advanced diagnostic shell with diagnostic commands such as ping, hostname, and traceroute that should be familiar to the AIX administrator. This shell can even be accessed from RS/6000 over the network using the telnet command.   Many of the features of this shell are described in the Problem Determination talk on this education CD. From this shell, you can also enable the Xserver with the "xhost" command and then use rsh or rlogin to start applications on the RS/6000 server that are displayed back to the Network Station.

From the AIX side, network tracing can help solve problems such as problems starting AIX applications.

Known problems that can cause poor performance are name resolution and poor font resolution. Using a font server from AIX can often solve many font problems.

The syslog deamon can be setup to keep control of logins, boot, application startup and other events.

Where to Find Additional Information

- **SC41-0685**
  - Installing IBM Network Station Manager for RS/6000 V2R1

- **SC41-0690**
  - Using IBM Network Station Manager V2R1

- **SG24-5844 NSM V2R1 redbook**

- **IBM Network Station Advanced Information**
  - on the Network Station home Web site

- **AIX documentation**
  - http://www.rs6000.ibm.com/doc_link/en_US/a_doc_lib/aixgen/

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Notes

Installing IBM Network Station Manager for RS/6000 V2R1 provides a more complete overview of the roles of AIX as a server for the Network Station. It also provides a list of all the filesets that need to be installed for each type of server and detailed installation instructions.

Configuring the Network Station with Network Station manager is the same on AIX as on other server platforms and is covered in **Using IBM Network Station Manager V2R1**.

The **NSM V2R1 redbook** gives actual hands on experiences from IBM specialists working with the Network Station during pre-announcement. This type of information tends to fill the gaps in standard documentation and often provides more detailed examples.

For administrators who want to stretch the envelope when using Network Stations to provide kiosk and other non-standard environments, the **IBM Network Station Advanced Information** available from the internet provides additional examples and detailed information.

One of the most important aspects of success with the IBM Network Station with RS/6000 servers is a complete understanding of the AIX operating system and AIX networking. The URL shown here provides complete manuals for AIX.

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