



# Network Station Manager Version 2

## Configuring the IBM Network Station

### Using the Boot Monitor



Network Station Education  
IBM Network Computer Division  
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# Objectives

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- **Understand the parameters required by the Network Station**
- **Configuration Methods - Network vs NVRAM**
- **The differences with the V1R3 boot monitor**
- **Understand how to use the NVRAM SETUP utility**
- **Network Parameters**
- **Boot Server Parameters**
- **Configuration Server Parameters**
- **Authentication Server Parameters**
- **Service Aids Menu**

# Notes

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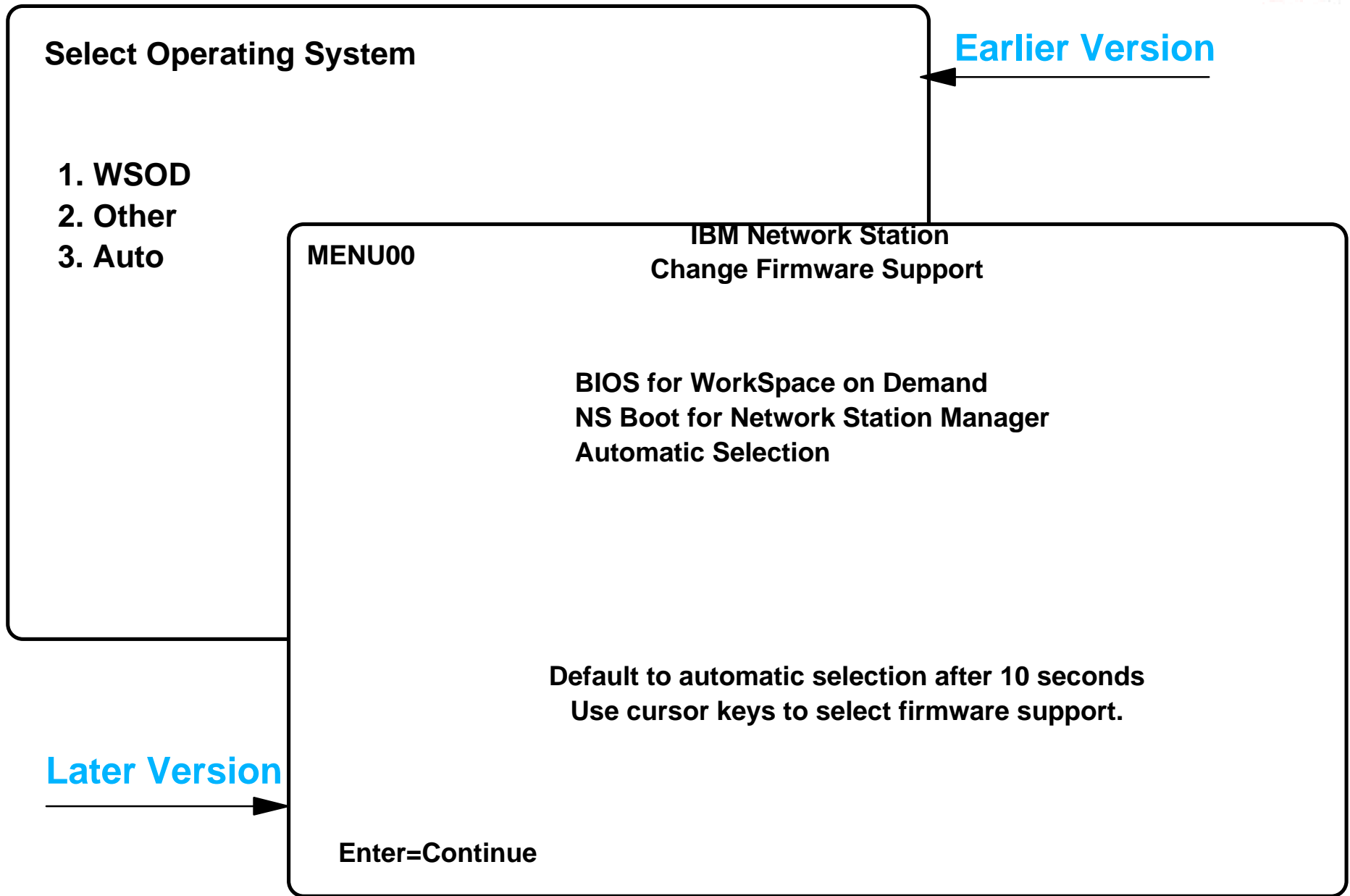


The objective of this presentation is to understand the configuration parameters that a Network Station needs in order to be able to initiate and complete its boot process.

There are two ways of specifying these parameters, one of which is to use the graphical interface of the boot monitor to enter the parameters into the station's NVRAM, which is the subject of this discussion.

We take a look therefore at a few of the boot monitor panels, concentrating only on the main ones. We also take a look at the Service Menu and at the differences with the V1R3 boot monitor.

# Selection of Firmware Support



# Notes

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If you unpack a brand new Network Station, and power it on, the first panel that appears will likely be one of these two panels. If you have an early model, you might see the panel at the top left hand corner; for a later model, you might see the one at the bottom right hand corner.

In the first (earlier model) case, select number 2. Other, and in the second case, select NS Boot for Network Station Manager and press Enter. From that point on, you will not be presented with this panel anymore.

If you do not take action within 10 seconds, it will first try to use DHCP/BOOTP. If that fails, it will try BIOS. The operation that completes without error is the one that is selected.

If nothing succeeds, and you have trouble with the firmware selection that was done, press either the ESC key when the IBM logo displays in the top left hand corner or the F1 key when the IBM logo displays in the top right hand corner. If you get an administrator password prompt, use IBMNCD as the password, which should get you into the setup menu where you can access the Change firmware support menu entry and select the NS Boot for Network Station Manager as the default.

For more detailed information, see the Appendix C in the Using Network Station Manager product publication (SC41-0690).

# Change Language Menu

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**MENU01**

**IBM Network Station  
Change Language setting**

**English  
French  
German  
Italian  
Japanese  
Spanish**

**Language defaults to English after 1 minute.  
Use cursor keys to select language.**

**Enter=Continue**

# Notes

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This might be the first panel that gets displayed if you did not get a firmware selection panel.

A reminder that the ESC key stops the boot process and gets you back to the main boot monitor menu and that F9 toggles between verbose and no-verbose mode.

Verbose mode displays text messages as the boot process takes place whereas non-verbose mode only displays a picture showing that activity is taking place.

# Configuration Data Required



## • What data is needed by the boot monitor?

- The station's own IP address (**mandatory**)
  - A network station is an IP host and needs an IP address to operate
- The boot server IP address (**mandatory**)
  - Where to go to get its operating system
- The kernel file name and path
  - Where (on the boot server) is the kernel located and its name
- The boot protocol
  - to use when contacting the boot server

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- The configuration server
  - What server to contact for configuration files
- The configuration file path
  - Where (on the configuration server) are the configuration files located
- The configuration protocol
  - to use to retrieve the configuration files

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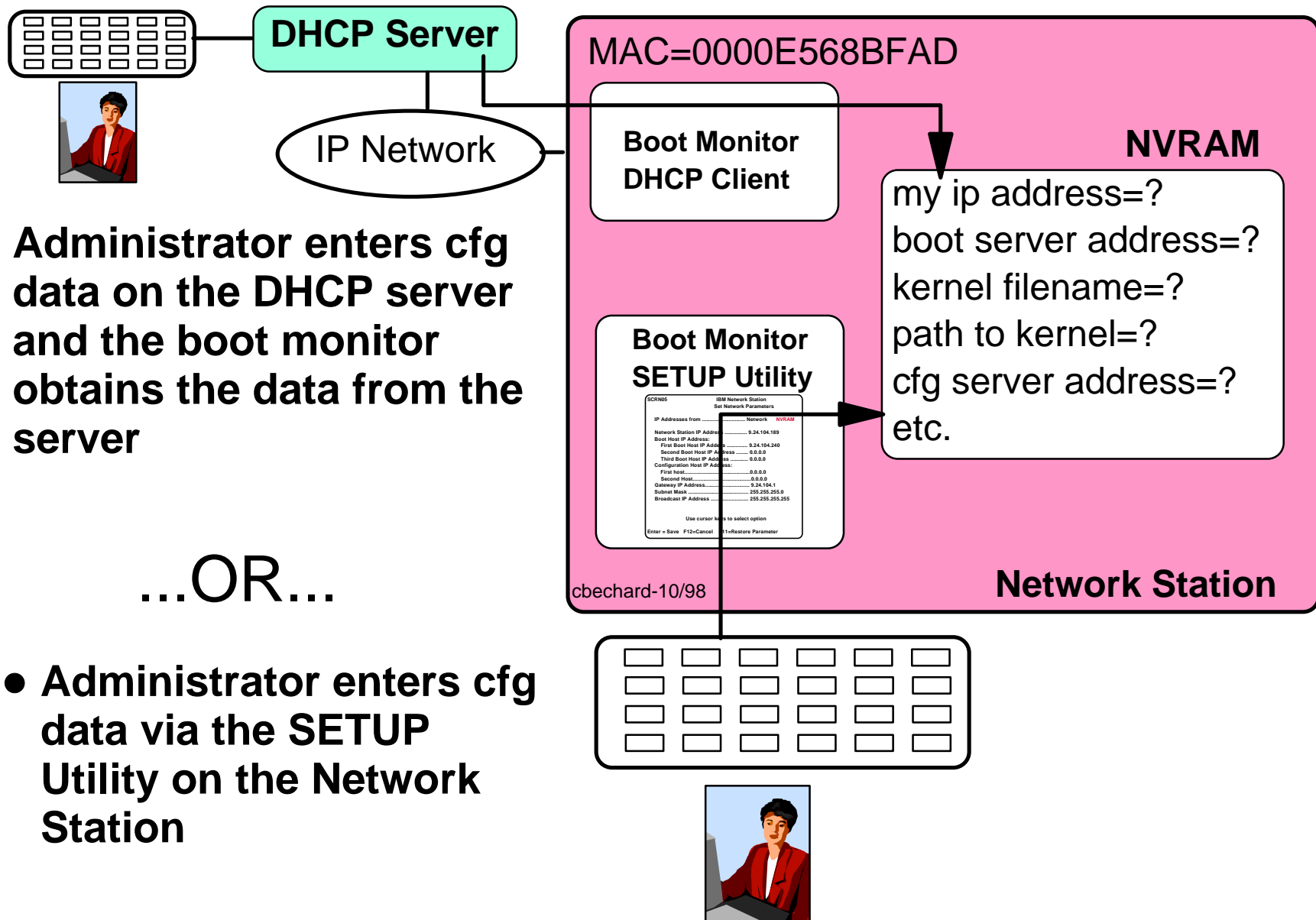
Before we look at any other panels, it might be good to review the type of configuration information that is required by the boot monitor in order to initiate its boot process.

The basic data that a station needs is first IP configuration data, the most important of which is an IP address. There is also a subnet mask and a default gateway which we have not indicated here for simplicity.

Then there is the address of a boot server, the name and location of a kernel (operating system file) and the protocol to use to download the kernel file, which is the essential first process to be performed by the boot monitor.

Finally, there are other optional (because they can default to the boot server values) parameters such as the address of a configuration server, and path to the files and protocol to use, and others than we will discuss in a moment.

# How is Data Configured?



- Administrator enters cfg data on the DHCP server and the boot monitor obtains the data from the server

...OR...

- Administrator enters cfg data via the SETUP Utility on the Network Station



There are two ways that the boot monitor can get this configuration data:

- Represented at the bottom of the chart, it is either entered manually by the administrator in the station's NVRAM using the keyboard of the station and the SETUP utility of the boot monitor. When the boot monitor initiates, it then reads its configuration values from NVRAM where they were stored by the administrator
- Or, as represented at the top of the chart, the administrator enters the (same) configuration values in a DHCP server's configuration files. The boot monitor is then triggered to contact a DHCP server on the network instead of reading from NVRAM and these same values are obtained from the DHCP server and stored in NVRAM.

The DHCP method is the recommended method because it allows centralized management of the configuration values and avoids having to have a physical presence at the station's site in order to enter the configuration values in NVRAM.

# V2R1 Boot Monitor - Differences with R3

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- **More extensive menus**
- **No command prompt**
- **Service aids functions selectable in a menu**
- **More service LAN trace functions**
- **Better protection against update failures**
- **Supports newer level of DDC type monitors**
- **Does not upload dump files (done by the kernel)**
- **Has DNS capability during boot**
- **Removed from memory after kernel is operational**
- **DHCP client accepts only valid responses**



From a base function perspective, the V1R3 and V2R1 boot monitors are similar since they carry out the same functions. However, there are quite a lot of differences in many aspects. For example:

- The menus are more extensive
- There is no command prompt
- The Service aids functions are selectable in a menu and there are a lot more service LAN trace functions provided
- There is a better protection against update failures
- the V2R1 boot monitor supports the newer level of DDC type monitors
- Dump files are now uploaded by the kernel
- The boot code has DNS capability during the boot phase
- It removes itself from memory after the kernel is operational
- The DHCP client in the boot monitor now accepts only valid responses from a DHCP server (meaning that if options 66 and 67 are not present in the offer for example, the offer is rejected).

# Main Setup Utility Panel (V1R3 vs V2R1)



SCRN02 IBM Network Station  
Setup Utility

F2 = View Hardware Configuration

F3 = Set Network Parameters

F4 = Set Boot Parameters

F5 = Set Configuration Parameters

F6 = Set Monitor Parameters

F7 = Set Language Parameters

F10 = Set Verbose Diagnostic Mode

Enter = Reboot

## V1R3 Menu

## V2R1 Menu

```
MENU03 IBM Network Station
        NS Boot Main Menu

Change language setting
Change keyboard setting
Change display settings

Configure network settings
    Change boot file server settings
    Change workstation configuration server settings
    Change authentication server settings

Display hardware information
Display boot log

Change verbose diagnostic setting

Service aids

Use cursor keys to select task.

Enter=Continue F10=Reboot IBM Network Station
```

# Notes

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These two panels illustrates the visual difference between the main menus in V1R3 and V2R1.

The V2R1 panel is easier to use. Cursors keys are used to select entries instead of PF keys and the menus are better structured.

# Main Setup Utility Panel



MENU03

IBM Network Station  
NS Boot Main Menu

**Change language setting**

Change keyboard setting

Change display settings

Configure network settings

    Change boot file server settings

    Change workstation configuration server settings

    Change authentication server settings

Display hardware information

Display boot log

Change verbose diagnostic setting

Service aids

Use cursor keys to select task.

Enter=Continue    F10=Reboot IBM Network Station





This is the main menu.

The first three entries at the top are for the language, keyboard and display settings. Settings done here become the default values for this station but they can be overridden by settings in NSM.

The next 4 entries are the most important:

- The Network Settings is where the IP configuration data is entered
- Then come the three main servers, that is boot, configuration and authentication. The authentication server entry is new and did not exist in V1R3; it was configured through a configuration file parameter.
- Note that these three servers settings menus disappear if in the network setting, you specify that DHCP is to be the boot method used and NVRAM is not indicated and a second and third choice.

The hardware information displays a list of all the hardware characteristics.

The boot logs contains the last 20 messages that took place during the boot process and can be very useful when doing problem determination.

Finally the service aids entry provides a series of additional menus to perform many types of tests and traces.

# Network Settings



```
MENU06.3                                IBM Network Station                1 of 4
                                         Configure network settings

Network priority:
  DHCP ..... Disabled
  BOOTP ..... Disabled
  Local (NVRAM) ..... First ←

Boot file source ..... Network

IBM Network Station IP address ..... [0.0.0.0]
Domain name server IP address ..... [0.0.0.0]
Gateway IP address:
  First ..... [0.0.0.0]
  Second ..... [0.0.0.0]
Subnet mask ..... [255.255.255.0]

TFTP subnet broadcast ..... Enabled
Block size in bytes ..... [8192]+
Line speed automatic negotiation ..... Disabled
Line speed in megabits ..... 10
Duplex ..... Half
Ethernet standard ..... Version 2

      Use cursor keys to select task, page up or down to select option.

Enter=Continue    F3=Save and return    F11=Undo
F12=Cancel
```

} Toggled on and  
off by \_\_\_\_\_



This is the configure network settings panel.

Entries on these panels are selected by using the cursor keys, and the values of the selected entries changed by using the Page Up and Page Down keys to select possible values like in a drop down list.

When values need to be entered, such as an IP address for example, it is no longer necessary to use the backspace to erase the entry first, as was done in V1R3.

This panel specifies two primary settings:

- The first three entries specifies whether the boot monitor should use values from a BOOTP server, DHCP server or NVRAM when it initiates.
- If NVRAM is selected, as is done in this example by setting the value to first, the entries below indicated by a bracket then appear and must be specified by the administrator
- Note that you can specify to try DHCP first, then BOOTP then NVRAM, or any order you wish.

Notice that the network data includes a DNS server, which was not present in V1R3.

# Boot File Server Settings



```
MENU08.3                                IBM Network Station                2 of 4
                                Change boot file server settings

Boot file server IP address:
  First ..... [0.0.0.0]
  Second ..... [0.0.0.0]
  Third ..... [0.0.0.0]

Boot file server directory and file name:
  First
  []+
  Second
  /QIBM/ProdData/NetworkStationV2/x86/kernel.2800
  Third
  /NetworkStationV2/prodbase/x86/kernel.2800

Boot file server protocol:
  TFTP ..... First
  NFS ..... Disabled

System root directory
  [0.0.0.0:/QIBM/ProdData/NetworkStationV2/x86/kernel.2800 ]

      Use cursor keys to select task, page up or down to select option.

      IP address in the form of d.d.d.d.

Enter=Continue   F3=Save and return   F7=Back           F11=Undo   F12=Cancel
```

# Notes

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This is where the boot server settings are done.

This panel is automatically presented after you have entered values in the Network Settings.

As in the previous release, up to three servers can be specified that will be tried in sequence in the case where the first one specified is not available.

The boot file directory and file name does not have to be entered manually but can be selected by using the Page Up/Down keys. However, the choices presented are the standard paths and filename. If a custom value is required, select the blank entry and type in the custom path and file name.

# Configuration Server Settings



```
MENU09          IBM Network Station
3 of 4

          Change workstation configuration server settings

Workstation configuration server IP address:
First ..... [0.0.0.0]
Second ..... [0.0.0.0]

Workstation configuration server directory:
First
  []+
Second
  [/QIBM/UserData/NetworkStationV2/profiles          ]+

Workstation configuration server protocol:
First ..... Boot file server
Second ..... Boot file server

          Use cursor keys to select task, page up or down to select option.

          IP address in the form of d.d.d.d.

Enter=Continue   F3=Save and return   F7=Back           F11=Undo   F12=Cancel
```

# Notes

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These are the configuration sever settings and this panel is also automatically presented after you hit enter on the previous boot server settings panel.

The parameters are similar and function the same way.

If no values are entered here, these values default to the boot server. IOn other words, it is assumed that the boot server is also the configuration server.

# Authentication Server Settings



MENU05 IBM Network Station 4 of 4

Change authentication server settings

Authentication server IP address:

First ..... [0.0.0.0]  
Second..... [0.0.0.0]

Authentication server protocol:

First ..... **RAP**  
Second ..... ] **RAP**

Use cursor keys to select task, page up or down to select option.

IP address in the form of d.d.d.d.

Enter=Continue    F3=Save and return    F7=Back    F11=Undo  
F12=Cancel



# Notes

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This panel for the authentication server is new in V2R1.

The protocol is Remote Access Protocol and cannot be changed.

Here also, entering nothing defaults to the boot server also being configured as the authentication server.

When you press enter after entering the data, you are taken back to the main boot monitor panel.

# Display Hardware Information



```
MENU41.1                                IBM Network Station
                                           Display hardware information

IBM Network Station type-model ..... 8363-EXX
Serial number ..... 10-123456
Video memory in megabytes ..... 4
Memory in megabytes:
  Slot 1 ..... 32
  Slot 2 ..... 0
NS Boot version ..... H1234567
Processor speed in megahertz ..... 266
Boot resolution ..... 640 by 480 at 60 Hz
Operating system:
  Monitor color palette ..... High color (16 bit)
  Monitor resolution ..... 640 by 480 at 60 Hz
  Monitor power management ..... Disabled
Monitor ID ..... 1 0 1 0
Keyboard language ..... English (US)
Keyboard ID ..... AB83
Startup language ..... English
Ethernet:
  MAC address ..... 00:00:A7:00:9E:00
  Line speed in megabits ..... 10
  Duplex ..... Full
Compact flash card:
  Manufacturer ..... Sandisk
  Size in megabytes ..... 20
```

Enter=Continue

F12=Cancel

# Notes

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This is to illustrate the type of hardware information that can be displayed from the main menu, as we indicated earlier.

Notice that you can find out the level of the boot monitor, the serial number of the station, the memory size, the processor speed, the display resolution and color palette setting, and so on.

# Service Aids Menu



**Menu70**

**IBM Network  
Station  
Service Aids**

**Change firmware support  
Change local MAC address  
Change fast boot setting  
Change retry settings  
Change NS boot themes  
setting**

**Load factory defaults**

**Use cursor keys to select  
task.**

**Enter=Continue F10=Reboot IBM Network Station  
F12=Cancel**

# Notes

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When the boot monitor is started on the Network Station and the ESC key is used, the main menu of the boot monitor is displayed.

On the main menu is an entry called Service Aids. Choosing this entry displays the panel shown in this chart.

Actually, this is only a small portion of the real Service Aid menu because the bulk of it is hidden. To gain access to the rest of the Service Aids, use Ctrl-F9 from this panel.

# Service Aids Main Hidden Menu (CTRL-F9)

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## Main Menu

1. Memory Test
2. Dump PCI Configuration Registers to serial port
3. Cache Control
4. Video test
5. Test all
6. I/O (serial and parallel)
7. Toggle auto test
8. Configuration menu
9. Misc menu
0. Exit

# Notes

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This is the main menu that you get when using Ctrl-F9 from the main Service Aids menu.

This is only a partial menu as nearly each item on this menu expands into further menus.

There are too many items for us to describe here, so we suggest that you explore this on your own.

We do want to point out however that the way to get to the network items is to choose the 9. Misc option, and on the next panel that appears, choose the Network entry.

# Service Aids Network Menus

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## MENU 1

- 1.Print ARP cache
- 2.Print routing table
- 3.Print boot configuration
- 4.Print card statistics
- 5.Print network statistics
- 6.**Packet log**
- 7.Bootp vendor specific/DHCP options
- 8.**DHCP responses**
- 9.More network menus=>MENU 2
- 0.Exit

## MENU 2

- 1.Print Ethernet EEPROM data
- 2.Display/set Ethernet Auto Negotiate/Speed/duplex
- 3.**Ping command**
- 4.Duplicate network packets
- 5.Host command
- 6.Display/set TRN auto selection/speed selection
- 7.Display subnet broadcast information
- 8.Display subnet broadcast bitmap
- 9.More network menus=>MENU 3
- 0.Exit

## MENU 3

- 1.RPL Server discover
- 2.Display/set boot protocol
- 3.TFTP subnet boot protocol retry count
- 4.TFTP retry and delay values
- 5.NFS retry and delay values
- 6.Menu interruption (Alt PF9)
- 0.Exit



# Notes

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These are the three network menus available from the first Network option.

There are a lot more tools and facilities here than were available in the V1R3 boot monitor.

Those are probably the main items that you would use to do problem determination if there is a problem for the station to connect over the network to a boot server.

Notice in particular the items we highlighted in red:

- The packet logs allows to see the last 20 or so packets that were issued or received so that one can see the latest activity
- The Ping command can be used to see if a destination can be successfully reached
- The DHCP responses can display the DHCP frame activity when attempting to use a DHCP server

# Service Aids Menu Functions

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- **Testing**

- Memory test
- Video test
- Serial wrap port test
- Parallel wrap port test
- Audio testing

- **Dumping PCI configuration registers**

- **Display network adapter information**

- **Alter MAC address**

- **Alter transfer block size**

- **Alter Ethernet line speed, duplex and auto negotiate mode**

- **Alter Token Ring speed and Auto detection mode**

- **LAN Trace/Test Functions**

- ARP Cache Display
- IP Routing Table Display
- Packet Log
- Remote Third Party Debug
- Display DHCP responses
- Ping

- **Host command (convert from name to IP and vice versa)**

# Notes

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This is a summary of the main functions that are available from the Service Aids menu of the V2R1 boot monitor.

The only way to get familiar with these is to explore yourself by trying each of these utilities.

# Where to Go for More Information

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- **Main Web Site**

- [www.ibm.com/nc](http://www.ibm.com/nc)

- **Current Network Station Redbook**

- **SG24-5844 Network Station Manager V2R1**

- **Previous Network Station Redbooks**

- **SG24-5187 AS/400 - Techniques for Deployment in a WAN**

- **SG24-5221 Windows NT - NSM Release 3**

- **SG24-5212 Printing**

- **SG24-2127 Windows NT/WinCenter**

- **SG24-4954 S/390, SG24-2016 RS/6000, SG24-2153 AS/400**

- **Product Publications**

- **SC41-0684 Installing NSM for AS/400**

- **SC41-0685 Installing NSM for RS/6000**

- **SC41-0688 Installing NSM for Windows NT**

- **SC41-0690 Using NSM**

- **IBM Network Station Advanced Information (On the Web Site)**

# Notes

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These are some of the publications and documents where you can find more information.

There isn't a specific document that we know of, at this time, on the boot monitor, but we will try to bring you additional information in the redbooks as we get more familiar with these new tools.

Thank you.