



## IBM Network Station QuickOn for Running Windows

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*IBM Network Computer Division*

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### 1. Introduction

#### Overview

You can configure the IBM Network Station to support a variety of standard applications. These application include 3270, 5250, and VT emulators as well as the NC Navigator browser and a Java Virtual Machine (JVM). You can access Windows-based applications from a multi-user Windows NT Server that runs either Citrix' MetaFrame, WinFrame, or WinCenter from NCD, Inc.

This document explains how to install a QuickOn for Running Windows flash card. This card, which is a bootable PC Card (PCMCIA), allows a Network Station to function like a Windows-based Terminal. The QuickOn for Running Windows flash card uses the ICA client to connect to a Citrix MetaFrame or WinFrame server, or a WinCenter server.

Typically, a Network Station boots from a server that runs IBM Network Station Manager (NSM).

The Network Station accesses its operating system and terminal configuration files from one or more servers. The user logs in to an authentication server which provides access to the applications and preferences for each user.

When you use QuickOn for Running Windows, you do not need an NSM server. The Network Station boots from a flash memory card in the PC Card drive that contains the operating system, minimal configuration information, and the ICA client application. It then connects over the network to a MetaFrame, WinFrame, or WinCenter server. When the user powers on the Network Station a MetaFrame, WinFrame, or WinCenter login screen appears instead of the normal Network Station login screen.

## Peer Booting

You can use one QuickOn for Running Windows flash card to boot multiple Network Stations. All of the Network Stations must be on a local area network and run the NFS protocol for peer booting.

The number of Network Stations that can boot from a single Network Station that you installed with a QuickOn for Running Windows flash card depends on the environment. LAN traffic and peer boot timing are the major performance factors.

The QuickOn for Running Windows flash card is pre-configured to allow peer booting. Look for setup instructions below.

## The QuickOn for Running Windows Environment

### System Requirements

The QuickOn for Running Windows flash card is an 8 MB PC Card. The QuickOn for Running Windows flash card is designed for a Series 300 Network Station Ethernet or token-ring model. You need a minimum of 16 MB of memory in your Network Station.

### Keyboards and Locales

The QuickOn for Running Windows flash card contains keyboard setup information files and other setup information for the locales in the following table.

List of supported keyboards for the QuickOn for Running Windows flash card

English US	English UK	French
French Canadian	German	Italian
Spanish	Swedish	

### Startup

The ICA client is configured to automatically start when the network Station is powered on. It provides a single, full screen WindowsNT desktop. The desktop is automatically restarted when you logoff from WindowsNT.

## Load Balancing

Citrix Load Balancing Services allows you to group multiple MetaFrame servers into a unified server farm to meet the needs of a growing user base. As the size of your organization increases, you can simply add additional MetaFrame servers to expand your Network Station resources. The load balancing function determines which MetaFrame server is doing the least amount of work and connects the Network Station to that server.

The QuickOn for Running Windows flash card is configured to automatically connect to a single published application when load balancing is used. This published application is the *desktop*, which is the familiar WindowsNT desktop. You need to publish the *desktop* (case sensitive) before you can use QuickOn for Running Windows and load balancing. Look for details about published applications in the MetaFrame documentation.

You can specify load balancing either by explicitly indicating the server to connect to or by using the broadcast capability of the ICA client. The broadcast capability will work only if the ICA Master Browser (server farm) is on the same subnet as the Network Station. A separate configuration file is provided, as detailed below, for each method.

## Encryption

The QuickOn for Running Windows flash card is configured to only use the basic level of ICA encryption. You need to configure your MetaFrame server for the simple encryption driver.

## Ordering and Support Information

Contact your IBM Network Station Partner to obtain your pre-loaded QuickOn for Running Windows PC Card(s) as well as service and support. IBM does not sell or support this card directly.

Network Station Partners should refer to the IBM Network Station web site at <http://www.pc.ibm.com/us/networkstation>. Choose **Support** from the left-hand side and then choose **QuickOn Support** under **Additional Information**. You will need to register for a userid and password to access this information.

Hardware support for the flash cards should be obtained from the flash card vendor.

## Related Information

For more information on installing, configuring, and using the IBM Network Station, consult the following:

- [IBM Network Station Manager Installation and Use](#) (SC41-0664).  
Order this publication in the US or access this information on the web at the following URL:  
<http://www.ibm.com/nc/pubs>
- [IBM Network Station Printing Guide](#) (SG24-5212).  
Order this publication in the US or access this information on the web at the following URL:

<http://publib.boulder.ibm.com/pubs/pdfs/redbooks/sg245212.pdf>.

- [\*Flash Memory Card Support for the IBM Network Station Release 3.0.\*](#)  
Access this information on the web at the following URL:  
<http://www5.pc.ibm.com/us/me.nsf/Technical+Information%5cNetwork+Station>.

## 2. Setup

### Introduction

This section explains how to use the flash card to boot the Network Station with ICA.

### Network Station Setup

You only need to perform the instructions below once for each Network Station. After you configure the system, the Network Station NVRAM saves the configuration parameters for future use.

### Network Configuration Information

You need the following information in order to boot a Network Station with QuickOn for Running Windows:

- The IP address of the Network Station.
- The IP address of the MetaFrame, WinFrame, or WinCenter server.
- The subnet mask, gateway, and other network setup parameters.

### Boot Monitor

If the Network Station boot monitor is below V3.0.7.3, the QuickOn for Running Windows flash card automatically updates the boot monitor to V3.0.7.3.

### Installing the Flash Card

Before you power on the Network Station, insert the QuickOn for Running Windows flash card into the PC Card drive. Do not insert the flash card when the Network Station is powered on.

### Clearing NVRAM

You need to clear NVRAM the first time that you boot from the QuickOn for Windows flash card. This clears any residual setting in the Network Station NVRAM.

1. Power off your Network Station.
2. Power on your Network Station.
3. Press the `Esc` key when you see the `Search for Host System...` message. You will now be on the Setup Utility screen.
4. Use `<LeftCtrl>-<LeftAlt>-<LeftShift>-F1` to enter the Boot Monitor. The Boot Monitor responds with

IBM Network Station model xxxx-xxx 8-bit Color Boot Monitor

>

5. Enter the following commands in order to reset the NVRAM settings to their factory defaults:
6. > nv
7. ->> 1
8. ->> s
9. Are you sure? y
10. ->> q
11. > se

The Setup Utility screen appears.

## Booting Using NVRAM

### *Setting the Boot Parameters in NVRAM*

From the Setup Utility, complete the following steps. If you are unsure about a particular entry, look for more information in Chapter 10 of the *IBM Network Station Manager Installation and Use* manual.

### *Setting NVRAM for Boot Monitors 3.0 and Above*

If you are running boot monitor version 3.0 and above, proceed with the following steps. If you have an earlier version, proceed to the [Setting NVRAM for Boot Monitors Prior to 3.0](#) section.

1. Choose F2 = View Hardware Configuration.
  - a. Verify that the flash card has been successfully configured. The type of flash card will be listed under PCMCIA Card:. If you do not see a PCMCIA Card entry then the card has not been configured: see the [Troubleshooting](#) section.
  - b. Press Enter to return to the Setup Utility screen.
2. Choose F3 = Set Network Parameters.
  - a. Set the IP Addressed from to NVRAM.
  - b. Set the Network Station IP Address to reflect the IP address of the Network Station.
  - c. Under Boot Host IP Address: section, leave the First Host and Second Host values as 0.0.0.0. Set the Third Host value to the IP address of your MetaFrame, WinFrame, or WinCenter server. If you are using broadcast load balancing, you may leave this field as 0.0.0.0.
  - d. Leave the Configuration Host IP Address values as 0.0.0.0.
  - e. Set the Gateway IP Address, Subnet Mask, and Broadcast IP Address parameters as appropriate for your network.
  - f. Press Enter to return to the Setup Utility screen.
3. Choose F4 = Set Boot Parameters.
  - a. Leave the Boot File value blank.
  - b. Leave the TFTP Boot Directory and NFS Boot Directory entries blank.
  - c. Set the TFTP Order and NFS Order under Boot Host Protocol to D.
  - d. Set LOCAL Order to 1.
  - e. Press Enter to return to the Setup Utility screen.

4. Choose F5 = Set Configuration Parameters.
  - a. Set Configuration File to flash.nsm if your MetaFrame server is not configured for load balancing. If you are using load balancing, set this field to flashlb.nsm or flashbc.nsm depending on whether you want the direct connection or broadcast capability.
  - b. Set the First entry under Configuration Directory to /local/configs/.
  - c. Set the First and Second entries under Configuration Host Protocol to Default. Leave the other entries blank.
  - d. Press Enter to return to the Setup Utility.
  
5. Choose F7 = Set Language Parameters.
  - a. Choose F2 = Select Keyboard Language.
  - b. Set the appropriate language for your system using the cursor keys.
  - c. Press Enter to return to the Select Keyboard Language screen.
  - d. Press Enter to confirm your keyboard language (if correct). You will return to the Set Language Parameters screen.
  - e. Press Enter to return to the Setup Utility.
  
6. Press Enter again to start the boot process.

The Network Station should boot and display the message

```
NS0810 Booting from local device
```

and then load the kernel. The Network Station splash screen and MetaFrame, WinFrame, or WinCenter login screen will appear shortly. You may see a message in red:

```
NS0830 Boot from PCMCIA card failed
```

Ignore this message.

If the boot monitor is down-level, a screen that indicates a boot monitor refresh appears. **Do not touch the system during the boot monitor update.** The Network Station automatically reboots when the update completes.

After the reboot, if you get a blue screen with the Console window, something has been set up incorrectly. Clear NVRAM and re-enter the configuration information. If the problem continues, see the [Troubleshooting](#) section below.

### ***Setting NVRAM for Boot Monitors Prior to 3.0***

If the Network Station boot monitor level is lower than 3.0.x, proceed with the following steps.

1. Choose F4 = View Hardware Configuration.
  - a. Verify that the flash card has been successfully configured. The type of flash card will be listed under PCMCIA Card:. If you do not see a PCMCIA Card entry then the card has not been configured.
  - b. Press Enter to return to the Setup Utility screen.

2. Choose F5 = Set Network Parameters.
  - a. Set the IP Addressed from to NVRAM.
  - b. Set the Network Station IP Address to reflect the IP address of the Network Station.
  - c. Leave the First Boot Host IP Address and Second Boot Host IP Address values as 0.0.0.0. Set the Third Boot Host IP Address value to the IP address of your MetaFrame, WinFrame, or WinCenter server.
  - d. Set the Gateway IP Address, Subnet Mask, and Broadcast IP Address parameters as appropriate for your network.
  - e. Press Enter to return to the Setup Utility screen.
  
3. Choose F6 = Set Boot Parameters.
  - a. Leave the Boot File value blank.
  - b. Leave the TFTP Boot Directory and NFS Boot Directory entries blank.
  - c. Set Configuration File to flash.nsm if your MetaFrame server is not configured for load balancing. If you are using load balancing, set this field to flashlb.nsm or flashbc.nsm depending on whether you want the direct connection or broadcast capability.
  - d. Leave the Configuration Directory entry blank.
  - e. Set the TFTP Order, NFS Order, and MOP Order to D.
  - f. Set LOCAL Order to 1.
  - g. Press Enter to return to the Setup Utility screen.
  
4. Press Enter again to start the boot process.

The Network Station should boot and display the message

```
NS0810 Booting from local device
```

and then load the kernel. The Network Station splash screen appears. You will then see a screen indicating that the boot monitor is being refreshed. **Do not touch the system during the boot monitor update.** It automatically reboots when the update completes.

If you get a blue screen with the Console window, something has been set up incorrectly. Clear NVRAM and re-enter the configuration information. If you are still having problems, see the [Troubleshooting](#) section below.

## Peer Booting Using NVRAM

### *Setting the Boot Parameters in NVRAM*

To boot a Network Station from a QuickOn for Running Windows flash card on a different Network Station, you need to add the following additional configuration information:

- The IP address of the client Network Station
- The IP address of the host/server Network Station (the one with the flash card installed)
- The subnet mask and gateway for the network (if any).

First, configure the Network Station containing the flash card (the server) as per the section above.

## *Setting NVRAM for Boot Monitors 3.0 and Above*

If you are running boot monitor version 3.0 and above, proceed with the following steps. If you have an earlier version, proceed to the next section.

1. Clear NVRAM as explained earlier in the [Clearing NVRAM](#) section.
2. From the Setup Utility screen, choose F3 = Set Network Parameters.
  - a. Set the IP Addressed from to NVRAM.
  - b. Set the Network Station IP Address to reflect the IP address of the Network Station.
  - c. Set the First Host entry under Boot Host IP Address to the IP address of the Network Station containing the flash card.
  - d. Set the Third Host value to the IP address of your MetaFrame, WinFrame, or WinCenter server.
  - e. Leave the entries under the Configuration Host IP Address section as 0.0.0.0.
  - f. Set the Gateway IP Address, Subnet Mask, and Broadcast IP Address parameters as appropriate for your network.
  - g. Press Enter to return to the Setup Utility screen.
3. Choose F4 = Set Boot Parameters
  - a. Leave the Boot File value blank.
  - b. Set the NFS Boot Directory to /peerboot/  
The trailing / is required at the end of the /peerboot/ path.
  - c. Set the TFTP Order and LOCAL Order under Boot Host Protocol to D.
  - d. Set NFS Order to 1.
  - e. Press Enter to return to the main Setup Utility screen.
4. Choose F5 = Set Configuration Parameters
  - a. Set Configuration File to peer.nsm if your MetaFrame server is not configured for load balancing. If you are using load balancing, set this field to peerlb.nsm or peerbc.nsm depending on whether you want the direct connection or broadcast capability.
  - b. Set the First entry under Configuration Directory to /peerboot/configs/.  
The trailing / is required at the end of the Configuration Directory path.
  - c. Set the First and Second entries under Configuration Host Protocol to Default.
  - d. Press Enter to return to the Setup Utility.
5. Press Enter again to start the boot process.

The Network Station should boot and display the message

```
NS0910 Attempting to use the NFS protocol
```

and then load the kernel. The Network Station splash screen and MetaFrame, WinFrame, or WinCenter login screen will appear shortly. You may see a message in red:

```
NS0784 NFS failed file 'kernel.Z' not found
```

Ignore this message.

If you get a blue screen with the Console window, something has been set up incorrectly. Check the Configuration Directory settings using F5 on the Setup Utility. If you are still having problems, see the [Troubleshooting](#) section below.

### ***Setting NVRAM for Boot Monitors Prior to 3.0***

If you are running boot monitor prior to 3.0, proceed with the following steps.

1. Clear NVRAM as explained in the [Clearing NVRAM](#) section.
2. Choose F5 = Set Network Parameters.
  - a. Set the IP Addressed from to NVRAM.
  - b. Set the Network Station IP Address to reflect the IP address of the Network Station.
  - c. Set the First Boot Host IP Address to the address of the to the IP address of the Network Station containing the flash card.
  - d. Leave the Second Boot Host IP Address values as 0.0.0.0. Set the Third Boot Host IP Address value to the IP address of your MetaFrame, WinFrame, or WinCenter server.
  - e. Set the Gateway IP Address, Subnet Mask, and Broadcast IP Address parameters as appropriate for your network.
  - f. Press Enter to return to the Setup Utility screen.
3. Choose F6 = Set Boot Parameters.
  - a. Leave the Boot File value blank.
  - b. Leave the TFTP Boot Directory value blank.
  - c. Set the NFS Boot Directory to /peerboot/  
The trailing / is required at the end of the /peerboot/ path.
  - d. Set Configuration File to peer.nsm if your MetaFrame server is not configured for load balancing. If you are using load balancing, set this field to peerlb.nsm or peerbc.nsm depending on whether you want the direct connection or broadcast capability.
  - e. Set the Configuration Directory to /peerboot/configs/.  
The trailing / is required at the end of the Configuration Directory path.
  - f. Set the TFTP Order, MOP Order, and LOCAL Order to D.
  - g. Set NFS Order to 1.
  - h. Press Enter to return to the Setup Utility screen.
4. Press Enter again to start the boot process.

The Network Station should boot and display the message

```
NS0910 Attempting to use the NFS protocol
```

and then load the kernel. The Network Station splash screen appears followed by a screen that indicates a boot monitor refresh. **Do not touch the system during the boot monitor update.** The Network Station automatically reboots when the update completes. You may see a message in **red**:

NS0784 NFS failed file 'kernel.Z' not found

Ignore this message.

If you get a blue screen with the Console window, something has been set up incorrectly. Check the Configuration Directory settings using F5 on the Setup Utility. If you are still having problems, see the [Troubleshooting](#) section below.

## Booting Using DHCP

There is no DHCP option to pass the `Third Boot Host` parameter which is what the ICA client uses to determine which MetaFrame, WinFrame, or WinCenter server to connect to. You must set this value NVRAM. Set up the Network Station as described above for NVRAM booting, then from the `F3 = Set Network Parameters` menu choose DHCP.

There is also no option to pass in the `Configuration File` value. Again, you must set this option (`flash.nsm`, `flashlb.nsm`, `flashbc.nsm`, `peer.nsm`, `peerlb.nsm`, or `peerbc.nsm`) directly in NVRAM.

DHCP provides a Network Station that boots from the QuickOn for Running Windows flash card with an IP address and other limited DHCP options. These DHCP options, when entered correctly, do not interfere with QuickOn for Running Windows. These options include:

- Option 1: Subnet Mask
- Option 3: Router
- Option 6: DNS Server
- Option 15: Default Domain

Do not set any other options at the MAC, Class, Subnet, or System level for a Network Station that boots from the QuickOn for Running Windows flash card.

## Peer Booting Using DHCP

If you choose to peer boot your Network Stations and if you use DHCP, the Network Station(s) with the QuickOn for Running Windows flash card must have fixed IP address(es).

Set up the Network Stations and the DHCP server as described above in Booting Using DHCP. For the peer booting Network Stations, you must also add DHCP Option 66, TFTP Server, with the IP Address of the Network Station with the flash card.

If you have multiple Network Stations with flash cards in a given subnet, you have two choices. You may define Option 66 at the MAC level for every Network Station, or you may create multiple scopes in a given subnet, and group the scopes.

## Print

You can print using printers attached to the Terminal Server, Network Printers, or printers attached to

Network Stations. For instructions on how to configure these printing scenarios, refer to the *IBM Network Station Manager Installation and Use* manual. You can hook both serial and parallel printers to your Network Station, and print from your ICA session using ASCII, PCL, and PostScript.

Look in the *IBM Network Station Printing Guide* redbook for additional information on printing with your Network Station.

The queue names on the Network Station are always PARALLEL1 and SERIAL1 and you can send ASCII, PCL, or PostScript datastreams.

## Troubleshooting

Ensure that the Network Station recognizes the QuickOn for Running Windows flash card. In the Setup Utility press

F2 = View Hardware Configuration

to determine if the Network Station recognizes a valid card. If the card is not recognized, power off the Network Station and reseat the card. If it's still not recognized, check all of the NVRAM setup information. You must use trailing slashes ("/") on the Configuration Directory and NFS Boot Directory entries. It also helps to clear NVRAM and re-enter the settings if you have made any changes to the network or the server configuration.

If you see a light blue screen instead of the Windows NT logon screen the first time you start your QuickOn Network Station, your keyboard setting may be wrong or your keyboard may not be supported. If your keyboard works, you can check this through the Console diagnostics. The Console is a Network Station application that provides access to other local clients and to diagnostic messages.

If your keyboard does not work, power off the Network Station and make sure that the keyboard cable connection is tight. Power on your Network Station. If this does not help, read the problem resolution information in your hardware documentation. If your keyboard works, you may need to reconfigure your keyboard setting as indicated below.

The key combination to display or hide the Console window is Shift-Alt-Home. Check for the message,

```
ICA00000: ICA Client failed to start. < Keyboard > is not currently supported.
```

< Keyboard > indicates which type of keyboard that you use. For example, if you have a German keyboard, but the value in the < Keyboard > field says Traditional Chinese, you need to reconfigure your keyboard setting.

From the Setup Utility screen press or enter the following to reconfigure your keyboard setting:

1. F7
2. F2
3. Use the arrow keys to select your keyboard.
4. Press Enter four times to save your selection and restart the Network Station.

If resetting your keyboard to the correct setting does not solve the problem, you may need to select a supported keyboard such as German or English US.

To see the basic diagnostics messages while booting, enter the boot monitor by pressing 'Esc' during the startup sequence. Press

```
F10 = Set Verbose Diagnostic Messages Enabled
```

on the Setup Utility screen. This directs the system to output the same file access information on the screen that is captured in the Console log, until the ICA client starts.

You can view the Console log on the Network Station by bringing up the Console and then selecting the Messages button in the Console window. The Console log can also be viewed and saved remotely using **telnet**. The diagnostics port number is 5998 and a telnet session to this port will yield a log of the Console messages.

For example, with an AIX telnet session, type the following command and replace *0.0.0.0* with your Network Station IP address:

```
telnet 0.0.0.0 5998 | tee /tmp/console.out
```

From a Windows NT Command Prompt, type the following command and replace *0.0.0.0* with your Network Station IP address:

```
telnet 0.0.0.0 5998
```

These commands display the Console messages on the screen and also, in the AIX telnet session, capture the messages in file **/tmp/console.out**.

You can also view the Network Station settings, including the software version using telnet to port number 5999. To do this, from a Windows NT Command Prompt, type the following command and replace *0.0.0.0* with your Network Station IP address:

```
telnet 0.0.0.0 5999
```

You will be prompted for a password: enter `public`. From the resulting prompt, type the following command:

```
get pref-environment
```

This will list all the environment variable settings for the Network Station. The software version is given by these environment variables:

```
QFW_VERSION  
QFW_CLIENT  
QFW_DATE
```

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