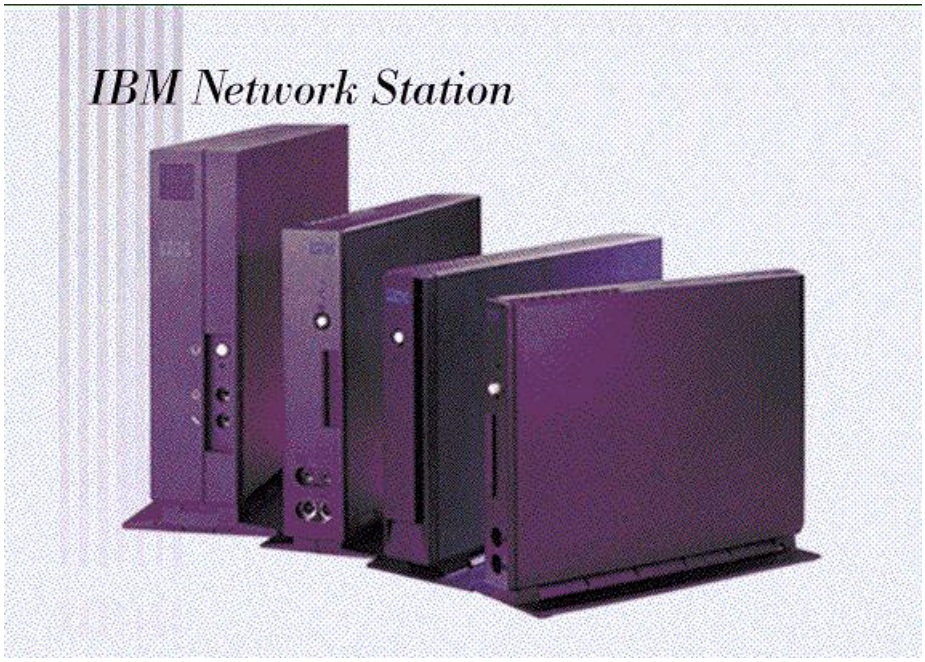
IBM Network Computer



Kiosk Flash Boot for IBM Network Station Manager Version 2

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IBM Network Computer Division

Introduction

The flash card booting solution is best employed to provide boot capabilities where a local server is not available. A typical application is in a wide-area network where a few Network Stations are located in a remote site and it is not cost effective to provide a boot server.

This document addresses the setup of a Network Station to boot from a CompactFlash (CF) card containing a kiosk image. Kiosk mode is a special mode of operation wherein the Network Station boots to an application (or the desktop) without the end user having to explicitly login. This would be a typical scenario in kiosks or other environments where no user-specific identification or application preferences are required.

A complete discussion of kiosk mode can be found in Chapter 3 of the *IBM Network Station Advanced Information V2R1* document and in the Redbook *IBM Network Station Manager V2R1*.

For kiosk setup, there are a variety of sample files provided in the *$ServBase*/**defaults** directory. These files, suffixed with ".ksk", are copied to the appropriate configuration directory and modified to reflect the proper parameters for the environment. While this is not automated, it is straightforward. The ".ksk" file can be saved as either *$UserBase*/**profiles/allkiosk.nsm** if it is to apply to all workstations or in a *$UserBase*/**profiles/ncs/***nc-id***.nsm** file, where *nc-id* is the hostname, MAC address, or IP address of the booting Network Station.

The enabling code for the functions described herein was released with V2R1M0 PTF 4.

Peer Boot

A CF flash card in one Network Station can be used to boot other Network Stations on a local area network (LAN) using the NFS protocol. This is known as "peer booting." The other Network Stations need only be set up as if they were booting from any other server.

The peer booting capability is enabled through the NSM Flash Manager tool when the flash card is created. Using this tool is discussed in the product publications.

Note that a Series 1000 (PowerPC) systems can only be peer booted from Series 1000 systems. They cannot be peer booted from the S/2200 or S/2800 (x86 models). Similarly, the x86 models cannot be peer booted from the S/1000 PowerPC systems.

The setup for peer boot is also discussed in this document.

Configure the Server

Set up to Install/Update Flash

Use the Network Station Manager program to set the check for flash image updates and to specify which flash image is to be loaded/updated on the card. This is done through the `Hardware->Workstation` panel of NSM using the `Check for Flash Image update:` and `Flash Image directory:` settings. Be sure to remember the name of the flash image directory as it must be the same as the name of the flash image tht is created via the Flash Manager utility.

Note: The name of the directory must be specified *before* the flash image is created. The name of the directory is imbedded in the configuration files that are copied onto the kiosk flash card. If it is not specified ahead of time, then the configuration files will not point to any (or the correct) update image.

Create the Flash Image

Creating a CompactFlash card for kiosk mode is straightforward. The Flash Manager tool in NSM has an option to create a card in kiosk mode. The workstation configuration files (if any), the **allkiosk.nsm** file (if any), **allncs.nsm** file, and **shipped.nsm** file are automatically picked up by the Flash Manager when a kiosk mode card is built.

Start NSM and the start the Flash Manager. Choose `Kiosk Files` from the `NSM Configuration` dropdown list on the first panel. Then choose the applications to put on the flash card using the `Applications` panel. Naturally, these should match the applications that were selected when the Desktop

Launch Bar was configured.

Return to the `Setup/Create` screen and click on the `Create Image` button. A new card image will be created that contains the kiosk files. Note: as of PTF 4, the **allkiosk.nsm** file is **not** automatically copied to the flash image directory. The workaround is to manually copy *$UserBase*/**profiles/allkiosk.nsm** to *$UserBase*/**flash/Images/***Image_Name*/{x86|ppc}/**termbase/profiles/allkiosk.nsm**. You will also have to edit the flash BOM file in *$UserBase*/**flash/Images/***Image_Name*/{x86|ppc}/**BOM** to add an entry for **allkiosk.nsm**. This entry will look identical (save for the filename) to the **allncs.nsm** entry. You can use WordPad on NT as this is not a UNIX system file.

More information on creating a flash image using the Flash Manager tool in NSM is available in Chapter 5 of the *IBM Network Station Advanced Information V2R1*.

Configure DNS

When building a flash image, the *$ProdBase*/**etc/resolv.conf** directory is copied to the flash image directory on the server in *$UserBase*/**flash/Images** and ultimately to the flash card itself. The **/etc/resolv.conf** file contains the domain name and DNS server(s) that are used during netstation boot. It is created based on what the server's domain and DNS entries are when NSM is installed. If the flash card is destined for an environment different from the one that server is in, the DNS will most likely be incorrect and cause very long boot times for the Network Station.

There is a way to create a flash card so that the **/etc/resolv.conf** file is dynamically generated from information in NVRAM. By creating a symbolic link from **/etc/resolv.conf** to **/tmp/resolv.conf**, the file gets created dynamically at boot time from the NVRAM DNS information. This also works when using DHCP to set the DNS server. The resultant file will contain just a **nameserver** entry; there is no way in this scenario to specify the defult domain name, as is done with the **domain** directive in the standard /etc/resolv.conf file. This generally does not pose a problem, as few users enter unqualified host names.

The steps are as follows:

1. Create the flash image as usual using the Flash Tool in NSM.

2. Edit the *$UserBase*/**flash/Images/***Image_Name*/{x86|ppc}/**BOM** file (you can use WordPad on NT as this is not a UNIX system file) and change the line for **/etc/resolv.conf** as follows, using the current date/time for the timestamp. (The line above may display as multiple lines when viewed. It must be all one line in the BOM file.)

   ```
   F - P lrwxrwxrwx 0 0 1024 Feb 15 05:49:29 2000 etc/resolv.conf ->
   /tmp/resolv.conf
   ```

   Note: the first letter of the mode bits, `lrwxrwxrwx`, is a lowercase 'L' and there is no '/' before 'etc'. There is a space on either side of the `->`. There are other symlink entries like this in the BOM file; use them for comparison.

Note: You must make this change in the BOM prior to flashing the card. If you make this change and then attempt to update an existing card, you will get an error when the flash manager tries to remove the existing **/etc/resolv.conf** file. Any changes made to files in the flash image directory are lost if the flash image is updated via the Flash Manager tool.

Configure the Network Station

Flash Boot Setup

To install and configure a Network Station to boot from a flash card, perform the following steps, depending on the Network Station model.

S/2200 and S/2800 (Type 8363 or 8364)

1. Completely power off the Network Station. This is accomplished via the switch in the rear of the S/2800 or by unplugging the S/2200. The power must be completely disconnected in order to insert the flash card. For safety before working inside the system, it is recommended that you unplug the machine from the power outlet.

2. Remove Network Station cover and install the flash card in the flash connector. (See the book that came with your Network Station for information on how to install the flash card.)

3. Power the Network Station back on and use the `Esc` key to interrupt the boot process and enter the NS Boot Utility.

4. On the `NS Boot Main Menu`, cursor down to the `Configure network settings` entry and press `Enter` to go to the menu.

5. On the `Configure network settings` menu and the other menus to follow, the `PageUp`/`PageDown` keys are used to choose values (those not enclosed by `[ ... ]`). The cursor keys are used to move between and within fields.
   a. Set the `DHCP` and `BOOTP` values to `Disabled`.
   b. Set the `Local (NVRAM)` value to `First`.
   c. Set the `Boot File Source` to `Flash`.
   d. Set the other fields on this screen to the appropriate values for the Network Station's IP address, gateway, subnet mask, etc.
   e. Press `Enter` when you are finished.

6. On the `Change boot file server settings` menu:
   a. Set the `First Boot file server IP address:` and `Third Boot file server IP address:` to `0.0.0.0`.
   b. Set the `Second Boot file server IP address:` to the IP address of the NSM server where the flash image has been created or updated.
   c. Set the `First Boot file server directory and file name:` to `/kernel.`*xxxx* where *xxxx* is the appropriate Series number for your Network Station (i.e. `2200` or `2800`).
   d. The second `Boot file server directory and file names` should be set to the value apprpriate for the NSM server where the flash image has been created or updated.
   e. The third `Boot file server directory and file names` should be set to blank.
   f. The `Boot file server protocol:` values should be set to `NFS` as `First` and `TFTP` as `Disabled`.
   g. Press `Enter` when you are finished.

7. On the `Change workstation configuration server settings` menu:
   a. Set the `First Workstation configuration server IP address:` value to `0.0.0.0`.

   b. Set the `Second Workstation configuration server IP address:` to the IP address of the NSM server where the flash image has been created or updated.
   c. Set the `First Workstation configuration server directory:` value to `/termbase/profiles`.
   d. Set the `Second Workstation configuration server directory:` value to to the appropriate value for the NSM server where the flash image has been created or updated.
   e. Set the `First Workstation configuration server protocol:` to `Flash`.
   f. Set the `Second Workstation configuration server protocol:` to `NFS`.
   g. Press `F3=Save and return` when you are finished.

8. Press `F10=Reboot IBM Network Station` to boot from the flash card.

The Network Station will boot and, if this is a new card, the card will be formatted and the flash image will be downloaded. The system will then reboot and use the flash card. If the card already contains a flash image, the specified NSM server will be checked to determine if the flash card needs to be updated. If it does not, booting from the flash card will continue. If there is an update on the NSM server, the system will reboot itself from the NSM server and the changes will be downloaded. the system will then reboot from the card.

Note that the flash card initialization/update process will not be visible unless the `Change verbose diagnostic setting` on the `NS Boot Main Menu` has been set to `Enabled`.

S/1000 (Type 8362)

Note: The capability to use CompactFlash on the S/1000 became available as of V2R1M0 PTF 5. You must be at boot monitor levevl v3.1.0.1 to use CompactFlash with the S/1000.

1. Completely power off the Network Station. This is accomplished via the the front white power button on the S/1000.

2. Insert the CompactFlash card into a CompactFlash PC Card adapter and insert it into the PCMCIA slot in the rear of the S/1000.

3. Power the Network Station back on and use the `Esc` key to interrupt the boot process and enter the Setup Utility.

4. 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` and `Third Host` values under `Boot Host IP Address:` to `0.0.0.0`.
   d. Set the `Second Host` under `Boot Host IP Address:` to the IP address of the NSM server where the flash image has been created or updated.
   e. Set the `First Host` value under the `Configuration Host IP Address:` to `0.0.0.0`.
   f. Set the `Second Host` value under the `Configuration Host IP Address:` section to the IP address of the NSM server where the flash image has been created or updated.
   g. Set the `Gateway IP Address`, `Subnet Mask`, and `Broadcast IP Address` parameters as appropriate for your network.
   h. Press `Enter` to return to the Setup Utility screen.

5. Choose `F4 = Set Boot Parameters`.

a. Set the `Boot File` value to `kernel.1000`.
b. Set the `TFTP Boot Directory` to blank.
c. Set the `NFS Boot Directory` to the path name for the NSM server where the flash image has been created or updated:
   - AIX: `/usr/NetworkStationV2/prodbase/ppc/`
   - NT: `/NetworkStationV2/prodbase/ppc/`
   - AS/400: `/QIBM/ProdData/NetworkStationV2/ppc/`

   The trailing / is required at the end of the NFS Boot Directory path.
d. Set the `TFTP Order` under `Boot Host Protocol:` to `D` (`Disabled`).
e. Set the `NFS Order` under `Boot Host Protocol:` to `2`.
f. Set `LOCAL Order` under `Boot Host Protocol:` to `1`.
g. Press `Enter` to return to the Setup Utility screen.

6. Choose `F5 = Set Configuration Parameters`
   a. Set the `Configuration File` to blank.
   b. Set the `First` entry under `Configuration Directory:` to `/termbase/profiles/`
      The trailing / is required at the end of the Configuration Directory path.
   c. Set the `Second` entry under `Configuration Directory:` to the appropriate value for the NSM server where the flash image has been created or updated:
      - AIX: `/usr/NetworkStationV2/userbase/profiles/`
      - NT: `/NetworkStationV2/userbase/profiles/`
      - AS/400: `/QIBM/UserBase/NetworkStationV2/profiles/`

      The trailing / is required at the end of the Configuration Directory path.
   d. Set the `First` entry under `Configuration Host Protocol:` to `Local`.
   e. Set the `Second` entry under `Configuration Host Protocol:` to `NFS`.
   f. Press `Enter` to return to the Setup Utility.

7. Press `Enter` again to start the boot process.

DHCP

Due to limitations in the existing DHCP options, there is no way to specify the second boot server path that is required for building/updating a flash card. Until this problem is resolved or a workaround is provided, it is only possible to use NVRAM settings to set up a kiosk flash card.

Booting From a Peer Network Station

A flash-based Network Station can act as a boot server for other Network Stations by performing the following steps depending on the type of Network Station.

All of the necessary peer boot parameters can be set via DHCP. The Network Station which contains the CF card acts just like any other boot/configuration server. The DHCP options corresponding to each NVRAM setting are shown in parentheses in the setup instructions below.

S/2200 and S/2800 (Type 8363 or 8364)

1. Power on the Network Station and use the `Esc` key to interrupt the boot process and enter the NS Boot Utility.

2. On the `NS Boot Main Menu`, cursor down to the `Configure network settings` entry and press `Enter` to go to the menu.

3. On the `Configure network settings` menu and the other menus to follow, the `PageUp`/`PageDown` keys are used to choose values (those not enclosed by `[ ... ]`). The cursor keys are used to move between and within fields.
   a. Set the `DHCP` and `BOOTP` values to `Disabled`.
   b. Set the `Local (NVRAM)` value to `First`. (If using DHCP, enable it here instead of `NVRAM`).
   c. Set the `Boot File Source` to `Network`.
   d. Set the other fields on this screen to the appropriate values for the Network Station's IP address, gateway, subnet mask, etc.
   e. Press `Enter` when you are finished.

4. On the `Change boot file server settings` menu:
   a. Set the `First Boot file server IP address:` entry to the address of the Network Station that contains the flash card. (66)
   b. Set the `Second Boot file server IP address:` and `Third Boot file server IP address:` entry to `0.0.0.0` or to the address of a backup boot server. These server(s) can be other Network Stations with CompactFlash cards. (219)
   c. Set the `First Boot file server directory and file name:` to `/kernel.`*xxxx* where *xxxx* is the appropriate Series number for your Network Station (i.e. `2200` or `2800`). (67)
   d. The second and third `Boot file server directory and file names` should be left blank or set to the appropriate path name(s) for backup boot server(s). These servers can be other Network Stations with CompactFlash cards, in which case the value `/kernel.`*xxxx* would be used.
   e. Set the `NFS Boot file server protocol:` to `First`. (211)
   f. Press `Enter` when you are finished.

5. On the `Change workstation configuration server settings` menu:
   a. Set the `First Workstation configuration server IP address:` entry to the IP address of the Network Station with the flash card. (212)
   b. Set the `First Workstation configuration server directory:` value to `/termbase/profiles`. (213)
   c. The second and third `Boot file server directory and file names` should be left blank or set to the appropriate path name(s) for backup boot server(s). These servers can be other Network Stations with CompactFlash cards, in which case the value `/kernel.`*xxxx* would be used. (n/a)
   d. Set the `First Workstation configuration server protocol:` to `Flash`. (214) Do **not** leave this field set to the default value (`Boot file server`).
   e. Press `F3=Save and return` when you are finished.

6. Press `F10=Reboot IBM Network Station` to boot the Network Station.

S/1000 (Type 8362)

1. Power the Network Station back on and use the `Esc` key to interrupt the boot process and enter the Setup Utility.

2. Choose `F3 = Set Network Parameters`.
   a. Set the `IP Addressed from` to `NVRAM`. (If using DHCP, enable it here instead of `NVRAM`).

   b. Set the `Network Station IP Address` to reflect the IP address of the Network Station.
   c. Set the `First Host` value under `Boot Host IP Address:` to the IP address of the Network Station which contains the CF card. (66)
   d. Set the `Second Host` and `Third Host` values under `Boot Host IP Address:` to `0.0.0.0`.
   e. Set the `First Host` value under the `Configuration Host IP Address:` to the IP address of the Network Station which contains the CF card. (212)
   f. Set the `Second Host` value under the `Configuration Host IP Address:` section to `0.0.0.0`.
   g. Set the `Gateway IP Address`, `Subnet Mask`, and `Broadcast IP Address` parameters as appropriate for your network.
   h. Press `Enter` to return to the Setup Utility screen.

3. Choose `F4 = Set Boot Parameters`.
   a. Set the `Boot File` value to `kernel.1000`. (67)
   b. Set the `TFTP Boot Directory` to blank.
   c. Set the `NFS Boot Directory` to `/`. (67)
   d. Set the `TFTP Order` under `Boot Host Protocol:` to `D` (`Disabled`).
   e. Set the `NFS Order` under `Boot Host Protocol:` to `1`. (211)
   f. Set `LOCAL Order` under `Boot Host Protocol:` to `D` (`Disabled`).
   g. Press `Enter` to return to the Setup Utility screen.

4. Choose `F5 = Set Configuration Parameters`
   a. Set the `Configuration File` to blank.
   b. Set the `First` entry under `Configuration Directory:` to `/termbase/profiles/`. (213) The trailing / is required at the end of the Configuration Directory path.
   c. Set the `Second` entry under `Configuration Directory:` to blank.
   d. Set the `First` entry under `Configuration Host Protocol:` to `NFS`. (214)
   e. Set the `Second` entry under `Configuration Host Protocol:` to `Default`.
   f. Press `Enter` to return to the Setup Utility.

5. Press `Enter` again to start the boot process.