

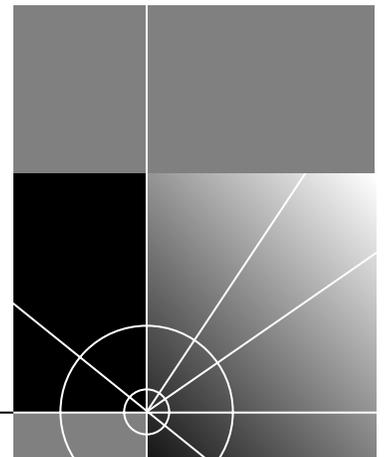


# New Installation for NETBuilder II<sup>®</sup> Software

Software version 9.3

<http://www.3com.com/>

Part No. 09-0860-003  
Published May 1997



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## **3COM CORPORATION LIMITED WARRANTY**



# ABOUT THIS GUIDE

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## Introduction

This guide describes how to get started with your new NETBuilder II® bridge/router. It describes how to install NETBuilder software version 9.3 and perform the initial system boot. It also explains how to access and use the command-line interface to establish basic settings.

If you are upgrading software from an earlier version, refer to *Upgrading NETBuilder Family Software*.



*If the information in the release notes shipped with your product differs from the information in this guide, follow the release notes.*

Before you use the information in this guide, you must first install the bridge/router according to your hardware installation guide.

### *Additional Information*

When you have completed the procedures in this guide, you will find valuable information in *Using NETBuilder Family Software*, which will help you configure your software for bridging, routing, and wide area protocols, according to the particular needs of your network. For a comprehensive description of NETBuilder software commands, refer to *Reference for NETBuilder Family Software*.

### *Audience Description*

This guide is intended for network administrators who have experience in planning, maintaining, and troubleshooting local or wide area networks, who are familiar with network protocols, bridging and routing, and network management, and who will be responsible for configuring and operating NETBuilder II bridge/routers.

---

## How to Use This Guide

The chapters in this guide include the following information to help you install and configure NETBuilder software:

- **Chapter 1** briefly describes the NETBuilder II systems that can use software version 9.3. It also provides one checklist for getting started with a system with a Dual Processor Engine (DPE) module and another checklist for getting started with a system with a Communications Engine Card (CEC) 20 module.
- **Chapter 2** describes how to install software and boot a NETBuilder II system with a DPE module.
- **Chapter 3** describes how to change the primary boot source on a NETBuilder II system with a DPE module.
- **Chapter 4** describes how to install software and boot a NETBuilder II system with a CEC 20 module. Several software installation options are described.
- **Chapter 5** describes how to change the primary boot source on a NETBuilder II system with a CEC 20 module.

- **Chapter 6** describes how to log on to the system, obtain Network Manager privileges, set passwords, time, date, and system administrator information, assign Internet addresses, set NETBuilder security, and verify system operation.
- **Appendix A** describes how to boot a NETBuilder II with a CEC 20 from the network using TFTP and **Appendix B** has instructions on how to obtain technical support.

## Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

**Table 1** Notice Icons

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

**Table 2** Text Conventions

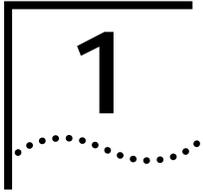
Convention	Description
Syntax	<p>The word "syntax" means you must evaluate the syntax provided and supply the appropriate values. Placeholders for values you must supply appear in angle brackets. Example:</p> <p>Enable RIIIP by using the following syntax:</p> <pre>SETDefault !&lt;port&gt; -RIPIP CONTrol = Listen</pre> <p>In this example, you must supply a port number for &lt;port&gt;.</p>
Commands	<p>The word "command" means you must enter the command exactly as shown in text and press the Return or Enter key. Example:</p> <p>To remove the IP address, enter the following command:</p> <pre>SETDefault !0 -IP NETaddr = 0.0.0.0</pre> <p> <i>This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only the uppercase letters and the appropriate value. Commands are not case-sensitive.</i></p>
Screen displays	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
[Key] names	<p>Key names appear in text in one of two ways:</p> <ul style="list-style-type: none"> <li>■ Referred to by their labels, such as "the Return key" or "the Escape key"</li> <li>■ Written with brackets, such as [Return] or [Esc].</li> </ul> <p>If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example:</p> <p>Press [Ctrl]+[Alt]+[Del].</p>

(continued)

**Table 2** Text Conventions (continued)

<b>Convention</b>	<b>Description</b>
<i>Menu commands</i> and <i>buttons</i>	Menu commands or button names appear in italics. Example: From the <i>Help</i> menu, select <i>Contents</i> .
Words in <i>italicized</i> type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in <b>bold-face</b> type	Bold text denotes key features.





# OVERVIEW

This chapter is an overview of how to get started with your new NETBuilder II system. This chapter provides you with two checklists: one describes the basic steps for starting a NETBuilder II system with a Dual Processor Engine (DPE) module and the other describes the basic steps for starting a NETBuilder II system with a Communication Engine Card (CEC) 20 module.

---

## NETBuilder II Systems

The NETBuilder II bridge/router consists of a 4-Slot, 8-Slot, or 8-Slot Extended chassis, the main processor module (either a DPE or CEC 20), and NETBuilder II software version 9.3.

Your new bridge/router is either an EZBuilt preassembled NETBuilder II system or a NETBuilder II system that you assembled from components.

### EZBuilt Preassembled NETBuilder II System

If you have an EZBuilt NETBuilder II system, it was preassembled before delivery. This guide assumes that you have followed the instructions in the hardware installation guide to:

- Set up the system
- Attach the network and power cables
- Install a local terminal, PC (with a terminal emulation application), or modem to the CONSOLE port of the main processor module

### Component System

If you have a NETBuilder II system that you have assembled yourself from components, this guide assumes that you have followed the instructions in each hardware installation manual to:

- Install the system components
- Attach the network and power cables
- Install a local terminal, PC (with a terminal emulation application), or modem to the console port of the main processor module

### NETBuilder II Chassis with a DPE Module

The DPE module has two versions; the DPE 40 and the DPE 80. This manual applies to both of these versions.

There are two flash memory drives built into the DPE module. The upper drive is drive A, and the lower drive is drive B. The DPE module does not support a floppy disk drive or flash drives used with the CEC 20 module.

### NETBuilder II Chassis with a CEC 20 Module

The CEC 20 module has an internal flash memory drive. The flash memory drive is designated as drive A.

**Version 9.3 Software**

The NETBuilder software version 9.3 is available from 3Com on a 20 MB PCMCIA flash memory card or on CD-ROM. 3Com recommends that you buy the preinstalled flash memory card.

Refer to the *NETBuilder II Software Version 9.3 Release Notes* for information about the different software packages that are available for your NETBuilder II system. The procedures in this guide apply to all software packages.

---

**Installation Checklists**

This section contains a checklist for installing software and booting a NETBuilder II with a DPE module and a checklist for installing software and booting a NETBuilder II with a CEC 20 module.

When using the checklists, refer to the chapters that apply to your system:

- **Chapter 2** and **Chapter 3** apply only to NETBuilder II systems that have a DPE module.
- **Chapter 4** and **Chapter 5** apply only to NETBuilder II systems that have a CEC 20 module.
- **Chapter 6** applies to all NETBuilder II systems.

**Checklist for  
NETBuilder II Systems  
with a DPE Module**

Use the following checklist to install software, boot, and configure basic settings on a NETBuilder II system with a DPE module.

**Install System Software and Boot** — Refer to Chapter 2.

- Install software from a PCMCIA flash memory card.

**Change the Primary Boot Source**— Refer to Chapter 3

- Change the primary boot source default as needed.

**Configure Basic Settings** — Refer to Chapter 6.

- Log on to the system.
- Familiarize yourself with the command-line or menu-driven user interface (UI), storing configuration parameter values, and getting help.
- Obtain Network Manager privilege level.
- Change the Network Manager password.
- Adjust the time and date as required. Time and date are preset by manufacturing and may need to be adjusted for your time zone.
- Set system administrator information.  
Information you need:
  - System name and location
  - System contact name and phone number
- Assign IP addresses/subnet masks to individual ports or one address to the system.
- Set up the bridge/router for SNMP.
- Set up NETBuilder II system security.
- Use the Quick Installation Utility for further configuration.

**Configure Specific Services for Your Network** — See *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software*.

## Checklist for NETBuilder II Systems with a CEC 20 Module

Use the following checklist to install system software, boot the system, and configure basic settings on a NETBuilder II system that has a CEC 20 module.

### Install System Software and Boot— Refer to Chapter 4

- Select an installation option and proceed to appropriate installation section:
  - Load files from a local PC using Zmodem file transfer and boot the system.  
or
  - Install software from PCMCIA flash memory card and boot the system.  
or
  - Install software from CD-ROM on UNIX or PC-based network management station and boot the system.

### Change the Primary Boot Source — Refer to Chapter 5

- Change the primary boot source default as needed.

### Configure Basic Settings — Refer to Chapter 6

- Log on to the system.
- Familiarize yourself with the command-line or menu-driven user interface (UI), storing configuration parameter values, and getting help.
- Obtain Network Manager privilege level.
- Change the Network Manager password.
- Set the time and date. Time and date are preset by manufacturing and may need to be adjusted for your time zone.
- Set system administrator information.  
Information you need:
  - System name
  - System location
  - System contact name and phone number
- Assign IP addresses/subnet masks to individual ports or one address to the system.
- Set up the bridge/router for SNMP.
- Set up NETBuilder security.
- Use the Quick Installation Utility for further configuration.

**Configure Specific Services for Your Network** — See *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software*.

# 2

## INSTALLING SOFTWARE AND BOOTING A DPE NETBUILDER II SYSTEM

This chapter contains the following procedures:

- Installing and booting NETBuilder software version 9.3
- Making a backup copy of the software version 9.3 flash memory card

The DPE module has two different models: 40-megabyte DPE 40 and 80-megabyte DPE 80. This chapter applies to both models.

---

### Installing Software and Performing Initial Boot

NETBuilder II version 9.3 software is available from 3Com on a preinstalled 20 MB PCMCIA flash memory card or on CD-ROM. 3Com recommends buying the flash memory card.

#### Prerequisites

Before you install software version 9.3 and boot your new NETBuilder II system, you need to complete the procedures that apply to your system in the hardware installation guide. These procedures include the following:

- Unpacking the EZBuilt system or system components
- Installing components or setting up the EZBuilt system
- Attaching network and power cables
- Attaching a terminal, PC (with a terminal emulation application), or a modem to the CONSOLE port on the DPE module



*The following procedure applies to all NETBuilder II systems including systems you have assembled yourself from components and the EZBuilt NETBuilder II preassembled system.*

#### Procedure

To install the software and boot a new NETBuilder II system, follow these steps:

- 1 Make sure the NETBuilder II power is off.
- 2 Insert the NETBuilder software version 9.3 flash memory card into drive A of the DPE module.



*The NETBuilder software version 9.3 flash memory card is already installed in the EZBuilt NETBuilder II system.*

- 3 Turn the NETBuilder II power on.

When you turn the power on, the NETBuilder II system boots from the flash memory card in drive A. The default primary boot source is a:/93/boot.29k. The bridge/router takes a few minutes to complete the boot and initialization process. Startup messages appear on your console display.

When you see the following message:

```
System Initialized and Running  
the bridge/router has finished booting.
```

- 4 Verify the operation of the attached console by pressing the Return key.

The following prompt is displayed:

```
NetLogin:
```

If the console is not operating properly, refer to the setup instructions in the hardware installation guide.

- 5 To log on as root, enter:

```
root
```

- 6 Press the Return key.

- 7 When prompted for the password, press the Return key.



*Pressing the Return key when prompted for the password enters a null string, which is the default local password. Later in this chapter, you will be instructed on how to change the password. Once you have done so, you must enter the new password each time you are prompted.*

The bridge/router system prompt is displayed:

```
NETBuilder #
```

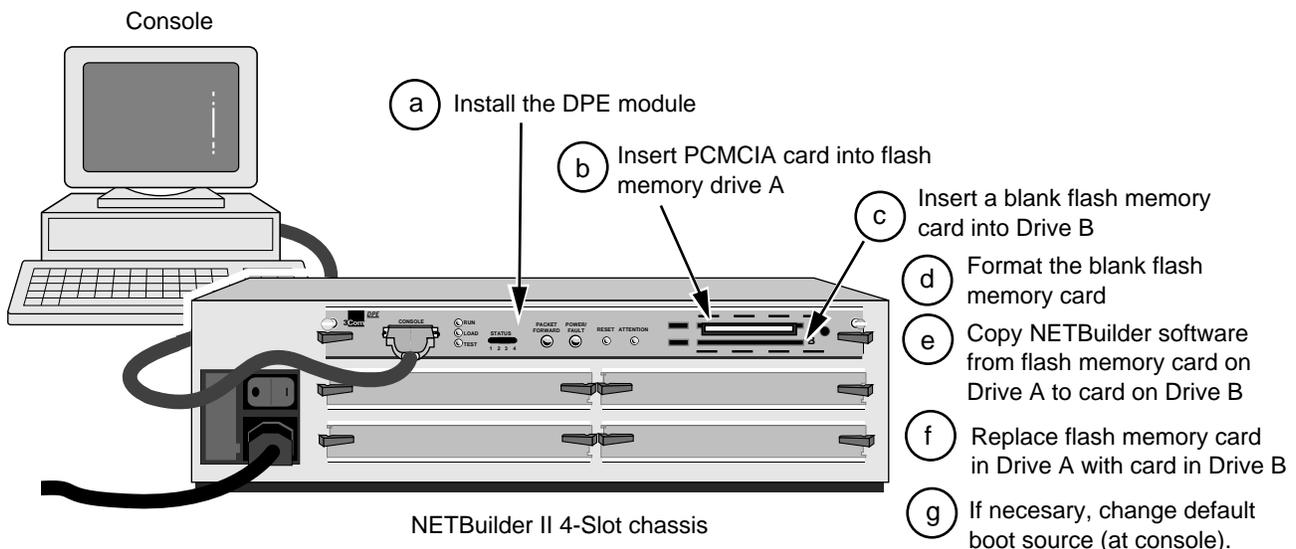
You are ready to establish the basic settings on your system. Go to Chapter 6 for more information.

If you want to change the primary boot source from the default, go to Chapter 3 for instructions. For more information about configuring system parameters, see the SysconF appendix in *Reference for NETBuilder Family Software*.

## Making a Backup of the Flash Memory Card

As part of the installation procedure, 3Com recommends that you create a backup of your NETBuilder software on a blank flash memory card. See the release notes for software version 9.3 for a list of flash memory cards that can be used with the DPE module.

Figure 2-1 shows how to make a backup copy of the flash memory card.



**Figure 2-1** Making a Backup Copy of the Flash Memory Card

- Prerequisites** Before you back up the software, complete these tasks:
- Boot your NETBuilder II system with software version 9.3 on a flash memory card inserted into drive A of the DPE module.
  - Log on to the system as root.
- Procedure** To make a backup copy of the NETBuilder software version 9.3 flash memory card, follow these steps:
- 1 Insert a supported blank flash memory card into drive B of the DPE module.  
See the release notes for software version 9.3 for a list of flash memory cards that can be used with the DPE module
  - 2 Format the blank flash memory card in drive B by entering:  
**FORMAT b:**  
Type Y for yes to the formatting confirmation message.
  - 3 Create a directory on the formatted flash memory card by entering:  
**MakeDir b:93**
  - 4 Copy the software from the NETBuilder software version 9.3 flash memory card in drive A to the formatted flash memory card in drive B by entering:  
**copy a:/93/\* b:/93/**
  - 5 After you have copied the software, replace the original NETBuilder software version 9.3 flash memory card in drive A with the backup copy from drive B.  
Keep the original NETBuilder software version 9.3 flash memory card in a safe place and protect it from accidental damage. The original is your backup in the rare event that the NETBuilder software or the backup flash memory card becomes corrupted. Go to "Using the Backup Flash Card" in this chapter for instructions on installing the backup flash memory card.
  - 6 The NETBuilder software boot files for a DPE module are factory shipped with a:/93/boot.29k as the default primary boot source. If you have installed the NETBuilder software into drive A, and you want to keep the same boot file as the boot source, use the Reboot command to reboot your NETBuilder II bridge/router by entering:  
**ReBoot**
  - 7 If you want to configure your primary boot source to a drive and file other than the default, refer to Chapter 3 for instructions on configuring the boot source for the NETBuilder II bridge/router.

---

### Using the Backup Flash Card

If the NETBuilder software is corrupted and you need to reboot, you can use your original NETBuilder II software version 9.3 flash memory card to reset your system by following these steps:

- 1 Remove the corrupted flash memory card from the DPE module.
- 2 Insert the original NETBuilder software version 9.3 flash memory card into drive A on the DPE module.
- 3 Reboot the NETBuilder II bridge/router by pressing the two outer buttons on the LCD control panel.

The system boots from the NETBuilder II software version 9.3 flash memory card in drive A.

- 4 Make a copy of the flash memory card in drive A by following the steps in the previous procedure.



*You will need to either obtain an additional flash memory card or reformat the corrupted flash memory card. If you choose to reformat a corrupted flash memory card, inspect the card to make sure that it is not damaged. Always keep the original NETBuilder II software version 9.3 flash memory card in a safe place and protect it from accidental damage.*

# 3

## CHANGING THE BOOT SOURCE ON A DPE NETBUILDER II SYSTEM

This chapter describes how to change the boot source from the default on a NETBuilder II bridge/router with a DPE module.

The NETBuilder software boot files for a DPE module are factory shipped with a:/93/boot.29k as the default primary boot source. If you have installed the NETBuilder software flash memory card into drive A, and you want to keep the default boot source, skip this chapter and go to Chapter 6 to configure your basic settings.

If you want to adjust system configuration settings, refer to the SysconF Appendix in *Reference for NETBuilder Family Software* for details on how to make the changes.

---

### Using the Boot Command

The Boot Monitor utility Boot (BT) command allows you to reboot or to override the default boot path. The BT command is useful if the boot path has a typing error or if you have a malfunctioning drive. If you enter a new boot path, the Primary Boot Source parameter is updated to reflect the new path.

**Procedure** To reboot the NETBuilder II bridge/router using the Boot Monitor utility Boot command, follow these steps:

- 1 Press the two outer buttons on the LCD control panel.

The console displays the following startup message:

```
Do you want to enter the boot monitor? (y/n)
```



*Entering Y within five seconds enters the boot monitor. If you enter N or enter nothing, the NETBuilder II system begins booting the software.*

For more information about the Boot Monitor utility, refer to the Firmware Appendix in *Reference for NETBuilder Family Software*.

- 2 To enter the Boot Monitor utility, enter:

```
y
```

- 3 Enter a boot path using:

```
BT <drive>: /<path>/<filename>
```

If you do not enter the <drive> value, drive A will be used. To boot from drive A, enter:

```
BT a:/93/boot29.k
```

The system attempts to boot from the specified image file. If there is an error, a message is sent to the console and you are returned to the boot monitor.

For more information about the Boot Monitor utility refer to Appendix B in *Reference for NETBuilder Family Software*.

## Configuring the Primary Boot Sources

This section contains an example of how to change the default boot source setting. In this procedure, drive B is established as the primary boot source.

**Prerequisites** Before changing the boot source, complete these tasks:

- Install system software and boot the NETBuilder II system according to the instructions in “Installing Software and Booting a DPE NETBuilder II System.”
- Attach a terminal, PC with a terminal emulation program, or a modem for using a remote PC to the CONSOLE port on the DPE module and make sure that this terminal is operating properly. If your terminal is not operating properly, refer to the hardware installation guide for setup instructions.

**Procedure** To change the primary boot source to a drive or file other than the default or the current setting, follow these steps:

- 1 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

- 2 Log on as root:

```
root
```

- 3 Press the Return key.



*Pressing the Return key when prompted for the password enters a null string, which is the default local password.*

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to enter software commands.

- 4 At the NETBuilder prompt, enter:

```
SysconF 2
```

The Primary Boot Source menu is displayed:

```
Primary Boot Source:
1. Boot Filename:                a:/93/boot.29k
2. Config File Source           a:/93
3. IP Addresses                  Client:none
                                   Subnet Mask:none
4. FTP Login Parameters
Enter parameter number or press Q to quit:
```

- 5 Enter 1 to select a boot filename.

Information similar to the following is displayed:

```
Current Boot Filename: a:/93/boot.29k
Enter Boot Filename (CR = no change):
```

- 6 Enter a new boot filename (such as b:/93/boot.29k) and press the Return key.

The configuration files must reside on the same drive as the boot source. If the drive you specify is different from the configuration source drive, you receive a message asking whether you want to change the configuration file source to the same drive.

If the boot drive you specify conflicts with the one set in the Dump Destination parameter, you are prompted for a different drive.

- 7 Enter q to quit the menu.

The System Configuration menu showing the new entries is displayed:

```
System Configuration
1. Serial Ports           Console:  9600
2. Primary Boot Source   b:/93/boot.29k, b:/
3. Secondary Boot Source b:/boot.29k, b:/
4. Test Boot Source      a:/boot.29k, a:/:
5. Boot Sources          Primary and Secondary
6. Dump Destination     Partial dump only
7. Recovery Procedure
8. MP Boot Source
9. Boot Statistics       Booted:  1 Exceptions:  0
Enter parameter number or press Q to quit:
```

- 8 Enter q to quit the configuration program.

- 9 At the prompt, enter:

#### **ReBoot**

The NETBuilder II bridge/router reboots using the newly established drive B as the primary boot source.



*For drive B to function as the boot source, there must be a flash memory card with software version 9.3 installed in drive B.*



# 4

## INSTALLING SOFTWARE AND BOOTING A CEC 20 NETBUILDER II SYSTEM

This chapter describes how to install and boot NETBuilder software version 9.3 on a NETBuilder II system with a CEC 20 module.

NETBuilder software version 9.3 can be installed on a NETBuilder II system with a CEC 20 module in the following ways:

- From a PCMCIA flash memory card
- From CD-ROM on a PC using Zmodem file transfer
- From CD-ROM on a UNIX-based or PC-based network management station using TFTP

The following sections in this chapter describe each of these installation options.

---

### Installing Software and Booting the Flash Memory Card

NETBuilder II software version 9.3 is available from 3Com on a preinstalled 20 MB PCMCIA flash memory card or on CD-ROM. 3Com recommends using the flash memory card.

#### Prerequisites

Before you install software version 9.3 and boot your new NETBuilder II system, you need to complete the procedures that apply to your system in the hardware installation guide. These procedures include the following:

- Unpacking the EZBuilt system or system components
- Installing components or setting up the EZBuilt system
- Attaching network and power cables
- Attaching a terminal, PC (with a terminal emulation application), or a modem to the CONSOLE port on the CEC 20 module

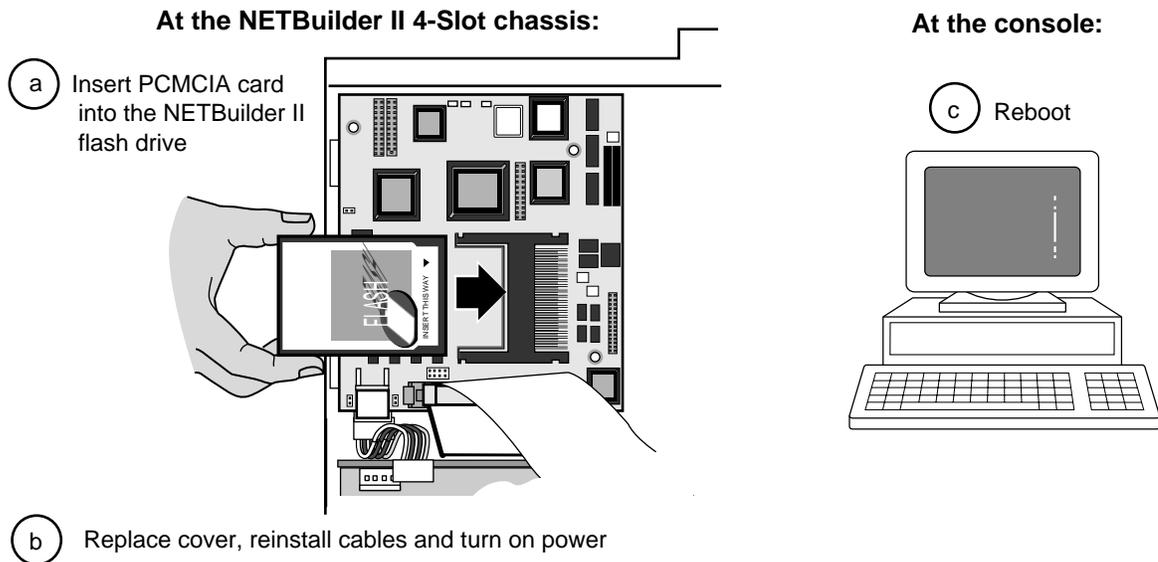


*The following procedure applies to all NETBuilder II systems including systems you have assembled yourself from components and the EZBuilt NETBuilder II preassembled system.*

#### Procedure

The default boot source for the NETBuilder II system with a CEC 20 module is drive A. When you install a flash memory drive on the system, it automatically becomes drive A.

The EZBuilt system has the flash memory drive and flash memory card already installed.



**Figure 4-1** CEC 20 Flash Memory Card Installation

To install software and boot the NETBuilder II system from a flash memory card, follow these steps (see Figure 4-1):

- 1 If you have a components system, insert the flash memory card containing the NETBuilder software into the flash memory drive.

For instructions on installing the flash memory drive and inserting the preinstalled flash memory card, refer to the *NETBuilder II Flash Memory Drive Installation Guide*.

The NETBuilder software version 9.3 flash memory card is preinstalled in the EZBuilt NETBuilder II system. Go to step 2 of this procedure.



*To install the flash memory card, you need to turn off the power to the NETBuilder II bridge.router, disconnect the cables, and remove the cover. Install the flash memory drive hardware. If necessary, insert the PCMCIA card into the flash memory drive before you reinstall the cover. When you have completed the installation, reinstall the cover, reconnect the power cord and other cables before continuing with the next step of this procedure.*

- 2 Turn on the power to the NETBuilder II system.  
The NETBuilder II system boots from the default boot source a:/93/boot.29K (the flash memory drive).
- 3 When the boot operation completes, press the Return key on the attached console.

The NETBuilder console prompt should appear on the screen.

If the console is not operating properly, that is, you see incorrect characters (or no characters) on the display, refer to the setup instruction in the hardware installation guide.

You are ready to establish basic settings on your system. Refer to Chapter 6 for more information.

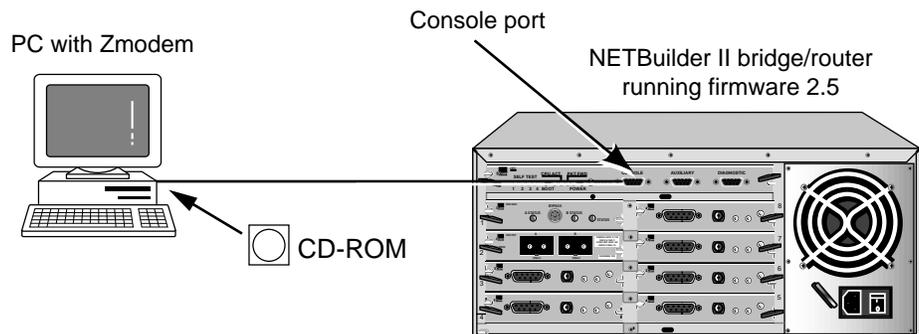
If you want to change the primary boot source from the default or adjust system configuration parameters, go to Chapter 5 for instructions. In addition, see the description in the SysconF appendix of *Reference for NETBuilder Family Software*.

## Installing Software from CD-ROM on a PC Running Zmodem

This section provides instructions for installing NETBuilder II software from a CD-ROM on a PC (running the Zmodem file transfer software) onto a NETBuilder II bridge/router with a flash memory drive and blank flash memory card (see Figure 4-2).



*This procedure applies to the NETBuilder II component system only.*



- a Insert and format a blank flash memory card in drive A
- b Insert CD-ROM with NETbuilder II software and set up Zmodem transfer on PC
- c Prepare the bridge/router to receive file transfer by entering **rz**
- d Transfer boot.29k file from CD-ROM at PC to bridge/router
- e Enter **bt a:/boot.29k** at monitor prompt to reboot the NETBuilder II bridge/router
- f Create a /93 directory on drive A
- g Copy bootfile to /93 directory

**Figure 4-2** Installing Software from CD-ROM on a PC Running Zmodem

### Prerequisites

Ensure that your PC is running a communications program that supports the NETBuilder II Zmodem protocol implementation. Packages that can be used successfully with the NETBuilder II Zmodem implementation include those shown in Table 4-1.

**Table 4-1** Supported Zmodem Packages

Operating System	Software Package	Version
Windows95	HyperTerminal	1.0
	CrossTalk for Windows	3.0
Windows 3.1	ProComm Plus for Windows	2.0
	CrossTalk for Windows	3.0
Windows NT 3.51	ProComm Plus for Windows	2.0
	Crosstalk for Windows	3.0
Windows NT 4.0	HyperTerminal	1.1

Before beginning the file transfer process, become familiar with your communications program. Check the documentation for your program if you need specific information about the steps involved.

You can install the NETBuilder II software files directly from the CD-ROM drive or you can copy the /93/boot.29k file to the hard drive of your PC and install it from there. The following procedure describes installing the /93/boot.29k file directly from the CD-ROM.

**Procedure** To install the NETBuilder II software onto a flash memory card in the NETBuilder II CEC 30 module, follow these steps:

- 1 Insert a blank flash memory card into drive A on the NETBuilder II bridge/router. See the release notes for software version 9.3 for a list of flash memory cards that can be used with the CEC 20 module.

For instructions on installing the flash memory drive, inserting a flash memory PCMCIA card, refer to the *NETBuilder II Flash Memory Drive Installation Guide*.



*To install the flash memory card, you need to turn off the power to the NETBuilder II, disconnect the cables, and remove the cover. Install the flash memory drive hardware. If necessary, insert the PCMCIA card into the flash memory drive before you reinstall the cover. When you have completed the installation, reinstall the cover, reconnect the power cord and other cables before continuing with the next step of this procedure.*

- 2 Turn on the power to the NETBuilder II system.
- 3 Attach a null-modem serial cable between the serial port of the PC and the CONSOLE port on the NETBuilder II bridge/router.

Refer to the *CEC Module Installation Guide* for cable pinouts.

- 4 Insert the CD-ROM into the PC CD-ROM drive.
- 5 On the PC, start your communications program and configure it to use the appropriate serial port.

Set the program for No Parity, 8 Data Bits, and 1 Stop Bit on the serial line. Set the Baud to match the setting on the NETBuilder II console port (9600 baud is the default). If the baud rate is incorrect, you may see incorrect characters as you type.

After you have finished this step successfully, you will see the NETBuilder II bridge/router monitor prompt (>) when you press the Return key.



*When you turn on the power to a NETBuilder II and there is no boot file available, the NETBuilder automatically enters monitor mode and the monitor prompt (>) appears on the terminal screen in response to pressing the Return key.*

- 6 If your communications package requires you to set the file transfer protocol, set it to ZMODEM.
- 7 Format the blank flash memory card in the flash memory drive by entering:

**FORMAT a:**

Enter Y at the format confirmation message and wait for the formatting operation to complete.

- 8 Prepare the bridge/router to receive files by entering:

**RZ**

- 9 On the PC, select the image file `\image\NBII\SW\93\FF\boot.29k` to transfer to the bridge/router and instruct your program to begin transfer.

Your PC program will inform you of progress during the file transfer.

When the file transfer is complete, you should receive a message indicating that the file transfer command has completed the file transfer. If the file transfer failed for some reason, or if you want to send additional files, you can repeat the process.

- 10 Make sure the file is located in the root directory (`/`) and that the file size matches the source file size by entering:

**DF**

- 11 Reboot the NETBuilder II bridge/router by entering:

**BT a:/boot.29k**

Wait for the bridge/router to boot.

When you see the following message:

```
System Initialized and Running
```

the bridge/router has finished booting.

- 12 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

- 13 Log on as root:

**root**

- 14 Press the Return key twice.



*Pressing the Return key when prompted for the password enters a null string, which is the default local password.*

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to begin entering software commands.

- 15 Create the `/93` directory on the flash memory card by entering:

**MakeDir a:/93**

- 16 Copy the file to the `/93` directory. Enter:

**COPY a:/\* a:/93/**

The primary boot source for the NETBuilder II bridge/router is `a:/93/boot.29k`. If you want to change the primary boot source, refer to Chapter 5 for instructions.

- 17 After copying the boot file, reboot the NETBuilder by entering:

**rb**

- 18 When the NETBuilder has completed booting, log in as root and delete the unused boot image in the root directory by entering:

**rf a:/boot.29k**

## Installing Software from a Network Management Station

This section describes how to install the NETBuilder II bridge/router software from CD-ROM on a UNIX-based or PC-based network management station with a CD-ROM drive.



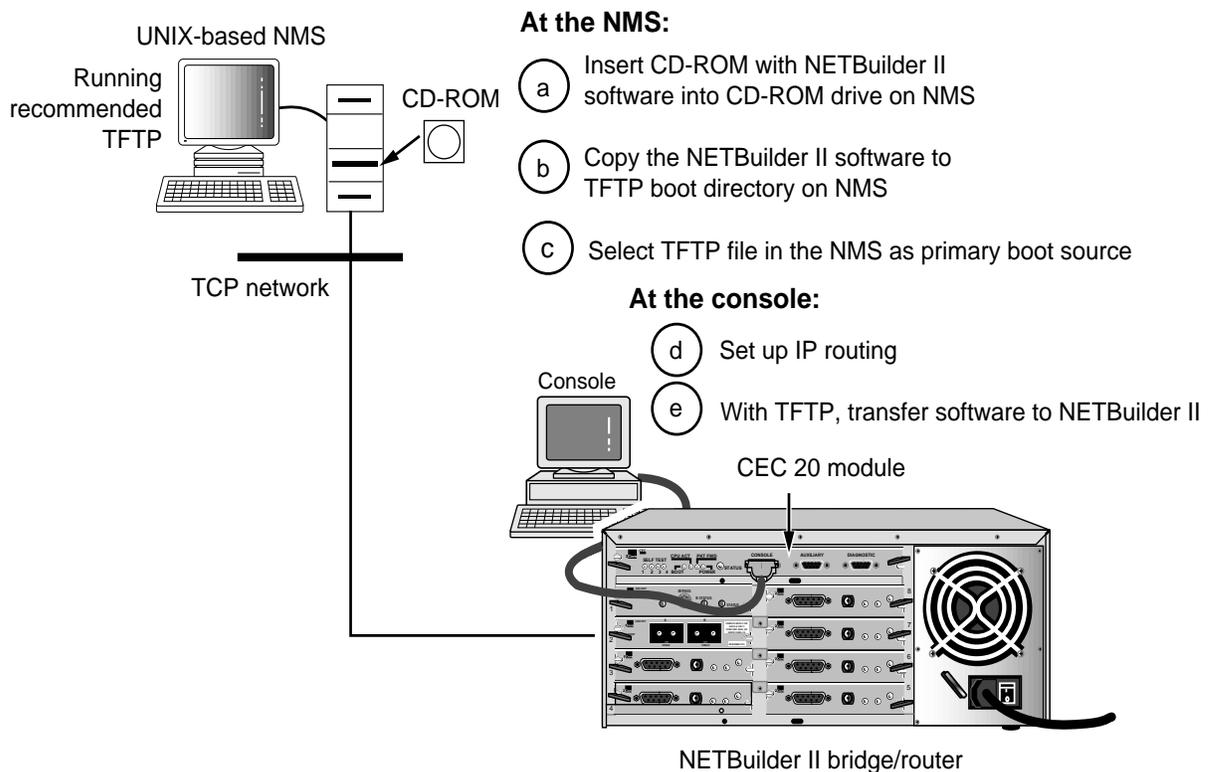
*The procedures in this section apply to the NETBuilder II component system only.*

This section contains the following procedures:

- Installing software on the UNIX-based network management station
- Installing software on the PC-based network management station
- Network booting a NETBuilder II image
- Setting up IP routing on the NETBuilder II bridge/router
- Copying image files to the local NETBuilder II bridge/router flash drive for local booting and rebooting

## Setting Up the UNIX-based Network Management Station

The following procedure provides instructions for setting up the UNIX-based network management station (see Figure 4-3).



**Figure 4-3** Installing NETBuilder II Software from CD-ROM on a UNIX NMS

### Prerequisites

To install the NETBuilder bridge/router software image from a CD-ROM, the CD-ROM drive must reside either locally on the network management station or on another system on the network.

Before installing version 9.3 software from CD-ROM, check that:

- Your network management station is running Solaris 2.4 or 2.5x, SunOS 4.1.4, HP-UX 9.0.5, 10.10 or 10.20, or IBM AIX 3.2.5, 4.1.4 or 4.2. To verify the operating system environment, enter:

```
uname -a
```

The version message refers to Solaris 2.5x as SunOS 5.5.

- You know the root password.
- There is sufficient disk space on the network management station for the amount of software you are installing. Minimal disk storage requirements are dependent on the number of NETBuilder systems being installed. Allocate 40 MB for the NETBuilder Upgrade Management Utilities and software image, 4 MB for each NETBuilder II system.
- The NETBuilder Upgrade Management Utilities released with this software package have been installed on the network management station. Refer to *Upgrading NETBuilder Family Software* for more information.
- A blank flash memory card has been installed in the NETBuilder II system. If not, install and format the card according to the instructions in the *NETBuilder II PCMCIA Flash Memory Card Installation Guide*.



*For a list of flash memory cards that can be used with the CEC 20 module, see the version 9.3 software release notes.*

### Procedure

To install the NETBuilder software on the UNIX network management station, follow these steps:

- 1 Ensure that the TFTP server on the network management station is running and has been correctly configured by confirming that the TFTP or inetd daemons are running.

To see if these daemons are running, enter:

```
ps ax |more
```

The resulting display shows every active process on the system.

- 2 Mount the version 9.3 software CD-ROM on the network management station. For mount instructions for your specific UNIX operating system, refer to *Upgrading NETBuilder Family Software*.
- 3 Set environmental variables with the location of NETBuilder Upgrade Management Utilities.

These variables depend on the UNIX shell that is installed at your site.

- If you are using a C-shell (csh), enter:

```
source /usr/3Com/common/data/.login-bcm
```

- If you are using a Bourne (sh) or Korn (ksh) shell, enter:

```
. /usr/3Com/common/data/.profile-bcm
```

- 4 Ensure that you are using the version of the NETBuilder Upgrade Management Utilities that shipped with your software.

To check the version you have installed, enter:

```
bcmdiagnose -h
```

The version of the installed utilities is displayed in the following message:

```
bcmdiagnose version 9.3. Copyright 3Com Corporation 1997
```

If the version of the utilities you installed differs from the version shipped with your software package, you must first install the utilities shipped with your software package.



*In the next step, the `bcminstall` utility extracts the files from the CD-ROM and installs them on the network management station hard disk in the `/tftpboot/image/<platform>/SW/FW/<version>/<pkg>` directory. For example, the software may be installed in the `/tftpboot/image/NBII/SW/93/FF` directory. If there is insufficient space on the disk, you can link `/tftpboot` to another disk.*

- 5 If necessary, mount the CD-ROM drive on your UNIX system. Refer to your system documentation for instructions.
- 6 Using the NETBuilder Upgrade Management Utilities, install the NETBuilder bridge/router software from the CD-ROM by entering:

```
bcminstall
```



*The optional `path` parameter may also be used to install the software on a network management station that has two or more drives connected as well as to install from a remote CD-ROM drive. You must explicitly specify the second CD-ROM drive.*

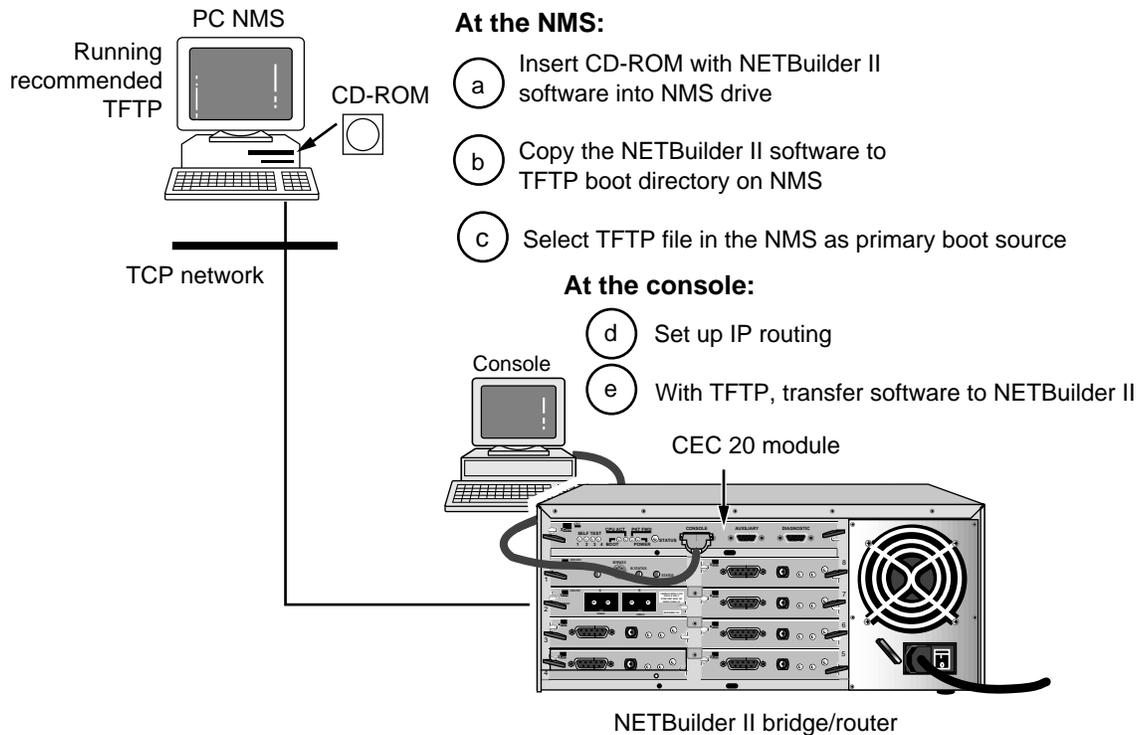
To install a NETBuilder package from a second CD-ROM drive on a Solaris machine, enter:

```
bcminstall -cdrom /cdrom/cdrom1/image
```

After the installation is complete, the screen shows an inventory of all NETBuilder packages installed, including previous versions you have installed. You are now ready to go to the procedure for booting the NETBuilder II image over the network.

## Setting Up the PC-based Network Management Station

This section describes how to install NETBuilder II software from a CD-ROM on a PC network management station (See Figure 4-4).



**Figure 4-4** Installing NETBuilder II Software from CD-ROM on a PC NMS

### Prerequisites

Before you install version 9.3 software and boot your new NETBuilder II system, you need to complete the procedures that apply to your system in the hardware installation guide. These procedures include installing components, setting up the system, attaching network and power cables, and attaching a terminal, PC (with a terminal emulation application) or a modem to the console port on the DPE module.

Determine which TFTP server product you will use for the installation. You can successfully use the following products to install software from a PC-based network management station:

- A PC network management station with TFTP server capability
- Transcend Enterprise Manager for Windows 5.0 or later
- NETManage Chameleon version 4.0 or later
- FTP Software PC/TCP tools
- Distinct Corporation TCP/IP tools
- Novell LAN WorkPlace 5.0 or later

If the blank PCMCIA flash memory card has not yet been installed in the NETBuilder II system, install and format the card according to the instructions in the *NETBuilder II PCMCIA Flash Memory Card Installation Guide*.

### Procedure

To install the bridge/router software, follow these steps:

- 1 Insert the version 9.3 software CD-ROM into the PC CD-ROM drive.
- 2 Ensure that your TFTP server is active and that it references the root directory of the CD-ROM.

Refer to the TFTP server documentation for information regarding procedures that you need to use to adjust the server's parameters.

You are now ready to go to the procedure for booting the NETBuilder II image over the network.

### Booting a NETBuilder II Image Over the Network

The following procedure boots the NETBuilder II image over the network. This procedure can be executed from either a UNIX-based or PC-based network management station.



*Network booting is supported over Ethernet, token ring, FDDI (but not FDDILink), and HSS ports using PPP.*

See Table 4-2 for additional boot source parameter settings, such as those related to booting over a token ring port, an HSS port using PPP, or a multiport Ethernet module. You may need to adjust these parameters based on your particular configuration.

**Table 4-2** TFTP Primary Boot Source Parameter

Parameter	Configuration
Boot Device: Network	Interface number.  You are prompted with this field only if an Ethernet 2-Port or Ethernet 6-Port module resides in the slot. Make sure this parameter is set to the appropriate interface (A or B or A-F). The default is A.
MP Module Parameters	You need to configure this parameter only if the TFTP server is reachable through an HSS port running PPP or a token ring port.
<p><b>HSS port running PPP</b> If your boot source is reachable through an HSS port running PPP, you are prompted to configure the following fields:</p> <ul style="list-style-type: none"> <li>■ HSS Baud Rate This setting must correspond to your serial line setting.</li> <li>■ HSS Clock Source Set this parameter appropriately (the default setting is external).</li> <li>■ HSS Connector Type Set this parameter to the connector that the server is reachable through (the default is V.35).</li> <li>■ HSS Protocol Select PPP.</li> <li>■ HSS WAN Password Leave this field empty.</li> </ul>	

(continued)

**Table 4-2** TFTP Primary Boot Source Parameter (continued)

Parameter	Configuration
	<p><b>Token ring port</b></p> <p>If your boot source is reachable through a token ring port, you are prompted to configure the following field:</p> <ul style="list-style-type: none"> <li>■ Token Ring Speed This setting must correspond to the token ring line setting (the default is 4 Mbps).</li> <li>■ Token Ring Baud Rate Make sure the setting of this field corresponds to that of your token ring line.</li> </ul>
Boot Protocol	<p>Make sure the Boot Protocol is set to TFTP.</p> <p>If you are configuring your bridge/router to use TFTP only, set the Address Discovery Protocol to Local Configured Addresses.</p> <p>If you are configuring your bridge/router to use TFTP and BOOTP, set the Address Discovery Protocol to BOOTP.</p>
Boot Sources	Make sure the Boot Sources are set to Primary and Secondary.
MAC Address	Make sure this parameter is set to the CEC MAC address.
ARP Format	If your boot source is reachable through a token ring port, make sure that the setting of this parameter agrees with the Address Resolution Protocol (ARP) format used on your token ring network: noncanonical.

### Procedure

To boot the NETBuilder II image over the network, follow these steps:

- 1 Turn on the NETBuilder II system power or press the two outer buttons on the front LCD panel.
- 2 Enter Y when the system asks if you want to enter the monitor.
- 3 From the NETBuilder monitor prompt (>), enter:
 

**SF**

The System Configuration menu is displayed.
- 4 Ensure that the System Configuration entry number 3, Start-Up Action, is set to Try boot once.
 

If Start-Up Action is not set to Try boot once, follow these steps:

  - a From the System Configuration menu, enter 3.  
The Start-Up Action menu is displayed.
  - b Enter 3 to select Try boot once and press the Return key.  
The System Configuration menu showing the Start-Up Action as Try boot once is displayed.



*TFTP is a UDP-based function. It is possible that frames may be lost in transit. If this occurs, and the Start-Up Action is not set to Try boot once, lost frames may cause the boot process to continuously retry without success. Set the Start-Up Action to Try boot once to avoid this situation.*

- 5 From the System Configuration menu, enter 4 to select Primary Boot Source.  
The Primary Boot Source menu is displayed.

- 6 Enter 1 to select the Boot Device option, and enter 2 to set the Boot Device to Network.

You are then prompted to set the slot number and boot filename.

- 7 Enter the slot number of the module that is used to reach your TFTP server.

If you have a 4-Slot chassis, your options are 1 through 4. If you have an 8-Slot chassis, your options are 1 through 8.

- 8 Enter the image filename by entering the directory path and the filename relative to the tftpboot directory where the CEC boot image resides.

For example:

```
/image/NBII/SW/93/FF/boot.29k
```



*You do not need to specify the /tftpboot directory because the TFTP server assumes the /tftpboot directory by default.*

- 9 Enter Q to return to the Primary Boot Source menu.
- 10 Enter 5 to select the Boot Protocol option, and set the Primary Boot Protocol to TFTP.

You are then prompted to set the TFTP Address Discovery Protocol.

- 11 Set the TFTP Address Discovery Protocol to Local Configured Addresses.
- 12 Enter Q to return to the Primary Boot Source menu.
- 13 Enter 6 to select IP Addresses, and enter the primary IP addresses assigned to your TFTP client, TFTP server, gateway, remote file server, and subnet mask.
- 14 Enter Q repeatedly to return to the System Configuration menu.
- 15 Ensure that Boot Sources is set to Primary and Secondary.  
If Boot Sources is not set correctly, follow these steps:
  - a From the System Configuration menu, enter 7.
  - b From the Boot Sources menu, enter 2.
- 16 Exit the menu system by typing Q repeatedly.
- 17 To boot the software image from the network management station, enter:

**NB**

The bridge/router obtains its software image from the network management station and boots.

When you see the following message:

```
System Initialized and Running
```

the bridge/router has finished booting.

## Copying the Software to a PCMCIA Flash Memory Card

In order to boot locally, the software image boot file must be copied to the flash memory card in drive A.

### Configuring IP

You must configure the port that the NETBuilder II bridge/router can be accessed through for IP before copying the software to the NETBuilder II bridge/router flash memory drive.

The following procedure assumes that you have just booted the NETBuilder bridge/router over the network.

To configure IP on the NETBuilder II bridge/router, follow these steps:

- 1 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

- 2 Log on as root:

```
root
```

- 3 Press the Return key.



*Pressing the Return key when prompted for the password enters a null string, which is the default local password.*

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to begin using the software and entering software commands.

- 4 Set up an IP address and subnet mask by using:

```
SETDefault !<port> -IP NETaddr = <IP address> [<subnet mask>]
```

For more information on IP configuration, refer to *Reference for NETBuilder Family Software*.

- 5 Enable IP routing by entering:

```
SETDefault -IP CONTROL = RO
```

- 6 Enter a routing protocol.

For example, enable RIP by using:

```
SETDefault !<port> -RIPIP CONTROL = (Listen, Talk)
```

- 7 Confirm your configuration by verifying that the NETBuilder II bridge/router can reach the network management station using:

```
PING <IP address>
```

where <IP address> is the IP address of the network management station.

### Copying Software to the NETBuilder II Using TFTP

To copy the software from the network management station to the NETBuilder II bridge/router using TFTP, follow these steps:

- 1 If you have not already done so, insert a blank flash memory card in drive A.  
See the release notes for software version 9.3 for a list of flash memory cards that can be used with the CEC 20 module.  
For instructions on installing the flash memory drive and inserting a flash memory card, refer to the *NETBuilder II Flash Memory Drive Installation Guide*.
- 2 Format the blank flash memory card by entering:  
**FORMAT a:**  
Type Y at the formatting confirmation message.
- 3 Create a destination directory on the flash memory card.  
**MakeDir a:/93**
- 4 Copy the NETBuilder II software images from the network management default directory (tftpboot) into the /93 directory on the flash memory card.

For example:

```
COPY 192.65.74.10:image/NBII/SW/93/FF/boot.29k a:/93/boot.29k
```

where 192.65.74.10 is the IP address of the network management station.

The software images to copy to the NETBuilder II bridge/router may include the following files:

- boot.29k – Image file that boots the CEC20 module
- ccsmacro – File that contains predefined user macros
- sys – File that is used during the upgrade process to determine the source and target software versions
- mp6e.29k – Image file that boots the multiprocessor Ethernet module
- mpatm.29k – Image file that boots the multiprocessor ATM module

To change your bridge/router primary boot source, refer to Chapter 5.

# 5

## CHANGING THE BOOT SOURCE ON A CEC 20 SYSTEM

This chapter describes how to change the primary boot source on a NETBuilder II bridge/router with a CEC 20 module.

The NETBuilder software boot files for a CEC 20 module are factory shipped with `a:/93/boot.29k` as the default primary boot source. If you have installed the NETBuilder software flash memory card into drive A, and you want to keep the default boot source, skip this chapter and go to Chapter 6.

If you want to adjust system configuration settings, refer to the SysconF appendix in *Reference for NETBuilder Family Software* for details on how to make the changes.

---

### Configuring Your Primary Boot Sources

This section contains an example of how to change the default boot source setting. In this procedure, the initial boot source is set to drive A. This procedure shows how to set Network and slot 7 as the primary boot source.

#### Prerequisites

Before you change the boot source, complete these tasks:

- Install system software and boot the NETBuilder II system according to the instructions in Chapter 4.
- Attach an operational terminal, PC with a terminal emulation program, or modem to the CONSOLE port on the CEC 20 module.

#### Procedure

To change the primary boot source or the current setting, follow these steps:

- 1 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

- 2 Log on as root:

```
root
```

- 3 Press the Return key.



*Pressing the Return key when prompted for the password enters a null string, which is the default local password.*

The bridge/router system prompt is displayed:

```
NETBuilder #
```

You are now ready to enter software commands.

If the bridge/router is unable to boot, enter Y at the monitor prompt, as shown in this screen display.

```

3Com Corporation          NETBuilder II          power-on
FW/NBII-FW,2.5
CEC*: 8 Mbytes IMEM, 8 Mbytes DMEM, 4 Mbytes SMEM
Booting from drive A ...
File - BOOT.29K - not found
Do you want to enter the monitor? (y/n) : y
3Com Corporation          NETBuilder II          Monitor
>

```

- 4 Access the System Configuration menu by typing SF at the NETBuilder command prompt or in the firmware monitor.

Information similar to the following is displayed:

```

System Configuration
1. Serial Ports          Console:  9600    Auxiliary:  9600
2. Self-Test            Skip
3. Start-Up Action      Try boot once
4. Primary Boot Source  Drive A:
5. Secondary Boot Source Local: Drive A:
6. Test Boot Source     Unknown boot source  Slot: 0
7. Boot Sources         Primary and Secondary
8. Dump Destination     Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics     Booted:   7       Exceptions:  3
Enter parameter number or press Q to quit:

```

- 5 Enter 3 to select Start-Up Action.

Information similar to the following is displayed:

```

Start-Up Action:          Try boot once
1. Enter monitor
2. Local
3. Try boot once
4. Try boot forever
Choose Start-Up Action or press Q to quit (CR=Try boot once):

```

- 6 Enter 4 to select Try boot forever.

Information similar to the following is displayed:

```

Start-Up Action:          Try boot forever
1. Enter monitor
2. Local
3. Try boot once
4. Try boot forever
Choose Start-Up Action or press Q to quit (CR=Try boot forever):

```

- 7 Press the Return key to confirm.

Information similar to the following is displayed:

```

Updating EEPROM. Please wait . . .

System Configuration
1. Serial Ports          Console:  9600    Auxiliary:  9600
2. Self-Test            Skip
3. Start-Up Action      Try boot forever
4. Primary Boot Source  Drive A
5. Secondary Boot Source Local: Drive A:
6. Test Boot Source     Unknown boot source  Slot: 0

```

```

7. Boot Sources                Primary and Secondary
8. Dump Destination            Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics             Booted: 7           Exceptions: 3
Enter parameter number or press Q to quit:

```

**8** Enter 4 to select Primary Boot Source.

Information similar to the following is displayed:

```

Primary Boot Source:
1. Boot Device:                Drive A:
2. Default file source         Local:
3. Maximum retries             0
4. I/O Module Parameters Ethernet
5. Boot Protocol               TFTP Local configured
                                addresses
6. IP Addresses                client:none
                                Subnet Mask:none
7. MAC Address System          08-00-02-05-1A-BE
8. ARP Format                   Canonical
9. FTP Login Parameters
Enter parameter number or press Q to quit:

```

**9** Enter 1 to select Boot Device.

Information similar to the following is displayed:

```

Primary Boot Device:
Local: Drive A:
1. Local
2. Network
Choose Primary Boot Device or press Q to quit:

```

**10** Enter 2 to select Network.

Information similar to the following is displayed:

```

Network Boot:
Choose a slot :

```

**11** Enter the slot number where the CEC 20 is installed.

For example, type 7 to specify slot 7.

Information similar to the following is displayed:

```

Boot Filename: boot.29k
Enter Boot Filename (CR=no change):

```

**12** Select the NETBuilder bridge/router software version 9.3 as the default boot source file by entering:

```
/93/boot.29k
```

Information similar to the following is displayed:

```

Primary Boot Device:
Network: Slot 7: /93/boot.29k
1. Local
2. Network

```

Choose Primary Boot Device or press Q to quit:

**13** Enter Q to quit the menu.

Information similar to the following is displayed:

```
Primary Boot Source:
1. Boot Device           Network: Slot: 7 /93/boot.29k
2. Default File Source   Boot Device:
3. Maximum Retries       0
4. I/O Module Parameters Ethernet
5. Boot Protocol         TFTP Local configured addresses
6. IP Addresses          client:none
                          Subnet Mask:none
7. MAC Address System    08-00-02-05-1A-BE
8. ARP Format             Canonical
9. FTP Login parameters
Enter parameter number or press Q to quit:
```

- 14** Enter 2 to select Default File Source.

Information similar to the following is displayed:

```
Current Default File Source: Boot Device
1. Boot Device
2. Local
3. Network
Choose a Primary Default File Source or press Q to quit:
```

- 15** Enter 2 to select Local.

Information similar to the following is displayed:

```
Current Default Directory for Files:
Enter Default Directory for Files (CR=no change):
```

- 16** Enter /93 to select NETBuilder software version 9.3.

Information similar to the following is displayed:

```
Current Default File Source: Local: /93
1. Boot Device
2. Local
3. Network
Choose a Primary Default File Source or press Q to quit:
```

- 17** Enter Q to quit the menu.

Information similar to the following is displayed:

```
Primary Boot Source:
1. Boot Device           Network: Slot: 7 /93/boot.2k
2. Default File Source   Local: /93
3. Maximum Retries       0
4. I/O Module Parameters not used
5. Boot Protocol         TFTP Local configured addresses
6. IP Addresses          client:none
                          Subnet Mask:none
7. MAC Address System    08-00-02-05-1A-BE
8. ARP Format             Canonical
9. FTP Login parameters
Enter parameter number or press Q to quit:
```

- 18** Enter Q to quit the menu.

Information similar to the following is displayed:

```
System Configuration
1. Serial Ports           Console:  9600   Auxiliary:  9600
2. Self-Test             Skip
3. Start-Up Action       Try boot forever
4. Primary Boot Source   Network: Slot: 7 /93/boot.29k
5. Secondary Boot Source Local:      /93
6. Test Boot Source      Unknown boot source   Slot: 0
7. Boot Sources          Primary
8. Dump Destination      Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics      Booted:  7   Exceptions:  3
Enter parameter number or press Q to quit:
```

**19** Ensure that Boot Sources are set to Primary. If the Boot Sources are set correctly, proceed to step 22. If the Boot Sources are not set to Primary and Secondary, proceed to the next step.

**20** Enter 7 to select Boot Sources.

Information similar to the following is displayed:

```
Boot Sources: Primary and Secondary
1. Primary
2. Primary and Secondary
3. Secondary
Choose Boot Sources or press Q to quit(CR=Primary and Secondary):
```

**21** Enter 2 to select Primary and Secondary.

Information similar to the following is displayed:

```
Boot Sources: Primary and Secondary
1. Primary
2. Primary and Secondary
3. Secondary
Choose Boot Sources or press Q to quit (CR=Primary):
```

**22** Press the Return key to confirm Primary.

Information similar to the following is displayed:

```
System Configuration
1. Serial Ports           Console:  9600   Auxiliary:  9600
2. Self-Test             Skip
3. Start-Up Action       Try boot forever
4. Primary Boot Source   Network: Slot: 7 /93/boot.29k
5. Secondary Boot Source Local:      /93
6. Test Boot Source      Unknown boot source   Slot: 0
7. Boot Sources          Primary and Secondary
8. Dump Destination      Do not dump
9. Recovery Procedure
10. MP Boot Source
11. Boot Statistics      Booted:  9   Exceptions:  6
Enter parameter number or press Q to quit:
```

**23** Enter Q to quit the firmware configuration program.

**24** At the monitor prompt, enter bt to reboot the NETBuilder II bridge/router from firmware, or enter rb to reboot the bridge/router from software.



# 6

## CONFIGURING BASIC SETTINGS

This chapter describes preliminary tasks for configuring basic bridge/router settings. Before you begin configuring ports and paths (described in Chapter 1 of *Using NETBuilder Family Software*), complete the following tasks:

- Log on to the system.
- Familiarize yourself with the user interface.
- Learn how to get help.
- Store configuration parameter values.
- Obtain Network Manager privileges.
- Change the Network Manager password.
- Set the time and date.
- Set system administrator information.
- Assign IP addresses and subnet masks to individual ports or one address for the bridge/router.
- Set up the Simple Network Management Protocol (SNMP).
- Set up NETBuilder security.
- Verify bridge/router operation.

---

### Logging on to the System

To log on to the bridge/router, follow these steps:

- 1 If you have not done so already, turn the bridge/router on or press the two outer buttons on the front panel LCD panel.

The bridge/router takes a few minutes to complete its initialization. Startup messages appear on your console display.

When you see the following message:

```
System Initialized and Running  
the bridge/router has finished booting.
```

- 2 Press the Return key.

The following prompt is displayed on your console:

```
NetLogin:
```

- 3 Log on as root:

```
root
```

- 4 Press the Return key.



Pressing the Return key when prompted for the password enters a null string, which is the default local password. Later in this chapter, you will be instructed on how to change the password. Once you have done so, you must enter the new password each time you are prompted.

The bridge/router system prompt is displayed as follows:

```
NETBuilder #
```

You are now ready to begin entering software commands.

---

## Learning About the User Interface

This section describes how to access the bridge/router user interface and provides an overview of the menu-driven and command-line interfaces.

This section also includes the following information:

- How to specify values, set members, or addresses when using either the menu-driven or command-line interface
- How to use online help

### Accessing the User Interface

To access the user interface or to modify the configuration of the NETBuilder bridge/router, use one of the following methods:

- Access the bridge/router commands locally through the console port.
- Establish a Telnet session with the bridge/router using security passwords.
- Use a device (for example, a workstation) on the same extended network or internetwork to access the bridge/router through the Telnet protocol. NETBuilder software also supports outgoing Telnet.

The software supports TCP and UDP over Bigger Addresses (TUBA). This means you can Telnet to the bridge/router using an IP address or an OSI NSAP address from a PC or workstation. For more information about using Telnet on a workstation, refer to the manual that accompanies the workstation.

- View and configure a subset of bridge/router parameters from a remote host using SNMP. For information on preparing the bridge/router to run SNMP, refer to *Using NETBuilder Family Software*.

After accessing the user interface, you need to decide whether to use the menu-driven interface or the command-line interface.

### Menu-Driven Versus Command-Line Interface

After accessing the bridge/router user interface, you can issue a command in one of two ways:

- Use the menu-driven interface if you are unsure of the command syntax. For more information about the MMenu command, refer to *Reference for NETBuilder Family Software*. For information on how to use the menu-driven interface, see the next section.
- Enter the command at the system prompt if you know the exact syntax. For information about the command line and rules for entering commands, refer to "Using the Command-Line Interface" on page 6-3.

The syntax for each command and parameter is described in *Reference for NETBuilder Family Software*.

## Using the Menu-Driven Interface

The MEnu command allows you to perform the following operations:

- See the list of services available on the bridge/router.
- Choose a service and see the list of parameters available for the service.
- See a list of parameters in the current service.
- Choose a parameter and see the commands used with it.
- Check the active and default values of a particular parameter.
- See the online help syntax of a particular parameter.
- Enter the new value of a parameter.



*To use the menu-driven interface, you must have Network Manager privilege. When using the menu-driven interface, you cannot access some parameters; for example, you cannot alter the number of lines on the screen, or change privilege level. Accessing the NETBuilder bridge/router through the REMote command requires the command-line interface.*

To use the menu-driven interface, follow these steps:

- 1 Access the main menu by entering:

**MEnu**

The Main menu (Level 1) display appears.



*Depending on your software package, the number of services in your MEnu display may vary.*

- 2 Select the desired service.

For example, selecting 1 from the Main menu (Level 1) display generates a menu for the SYS Service.

- 3 Select the parameter you want to configure.

For example, if you select the NMPrompt parameter from the SYS Service menu (Level 2) menu, a display appears for that parameter.

The first part of the screen displays the value of the parameter; the second part lists the commands you can choose. For information on help menus, refer to "Getting Help" on page 6-17. For complete rules for entering commands and using aliases and history substitution, refer to "Using Aliases" on page 6-8, "Command History Substitution" on page 6-9, and "Command-Line Parameter Attributes" on page 6-10.

- 4 To return to the previous menu level, press the Return key.

If you are at the Main menu (level 1) and press the Return key, you return to the command-line interface.

## Using the Command-Line Interface

The steps in this section describe the actions to take when entering a command. Refer to the sections that follow for detailed information on using the command-line interface.

To use the command-line interface, follow these steps:

- 1 Type the command name.

If the command does not include a service name, parameter, or values, skip to step 3. If the command requires more information or if you want to include optional arguments, continue to step 2a.



If you need help identifying the parts of a command, see Figure 6-1.

- a If the command has additional options, such as a port or path number, include them after the command name.

Including a specific port or path number in the command focuses the command on that port or path. If the port or path number is not included, the command acts on all ports or paths.

For more information on ports and paths, refer to Chapter 1 in *Using NETBuilder Family Software*. For more information on commands, refer to Chapter 1 in *Reference for NETBuilder Family Software*.

- b If the command includes a parameter, type the service name (if necessary), the parameter name, and values.

The service name focuses the action of the command on a particular bridge/router service.

In some cases, you may not need to enter the service name. For example, if a parameter is unique to a service, the service does not need to be specified. If two or more services have parameters of the same name, you must include the service name in the syntax. For more information, refer to “Entering Service Names in Command Lines” on page 6-7.

The value part of the command specifies how you want the parameter to be set. Values include numerics, strings, or addresses, depending on the parameter. For additional information, refer to “Syntax for Assigning Values” on page 6-10.

- 2 After entering the complete command, press the Return key.

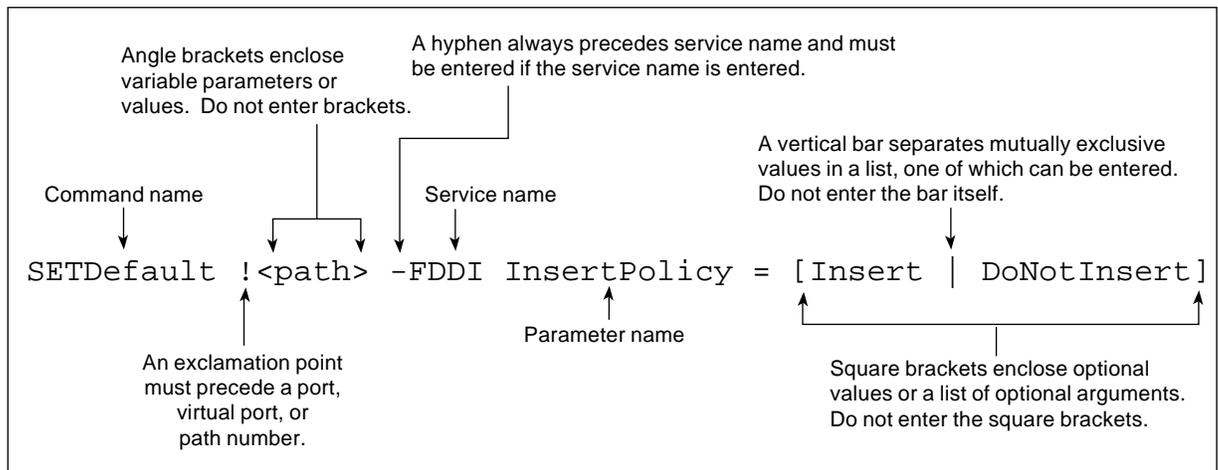
The bridge/router software includes online help for commands, services, parameters, and syntax, described in “Getting Help” on page 6-10. The syntax that appears in online help is the full-form syntax; it contains full names and visual cues for entering commands. You can also enter commands using an abbreviated version of the syntax.

For information on full-form and abbreviated syntax, read the following sections and refer to Figure 6-1 and Figure 6-2. For additional information on short cuts for entering commands, refer to “Using Aliases” on page 6-8 and “Command History Substitution” on page 6-9.

### Full-Form Syntax

You can see the full-form syntax provided by online help in NETBuilder software by typing a question mark (?) or a question mark with other options, as described in “Getting Help” on page 6-17.

Figure 6-1 shows the parts and symbols that make up command syntax. For more information on symbols, refer to “Symbols” on page 6-5.



**Figure 6-1** Full-Form Syntax

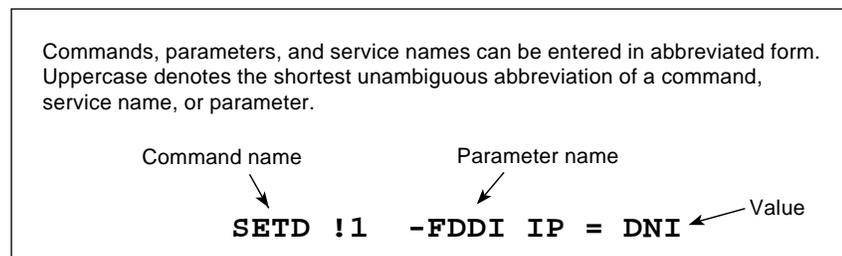


*NETBuilder family bridge/router guides and online help use upper- and lowercase letters to distinguish the full form of commands and command syntax from the abbreviated form. You can enter a command in abbreviated form by typing only the uppercase portion. It does not matter whether you type the command in upper- or lowercase letters.*

### Abbreviated Syntax

Abbreviated syntax is the shortest unambiguous abbreviation of a command, parameter, or value that can be entered. You can enter the abbreviated form in lower- or uppercase letters at the NETBuilder prompt.

Figure 6-2 shows the abbreviated syntax corresponding to the full-form syntax of Figure 6-1.



**Figure 6-2** Abbreviated Syntax

Additional syntax examples are provided in "Full and Abbreviated Syntax Examples" on page 6-7.

### Symbols

You may see a variety of symbols shown as part of the command syntax. These symbols usually explain how to enter the command, and you do not type them as part of the command itself. The exceptions to this rule are parentheses, the hyphen, and the exclamation point, which you do type as part of the command. Table 6-1 summarizes command syntax symbols.

**Table 6-1** Command Syntax Symbols

Symbol	Description
angle brackets < >	<p>Enclose a variable or value. You must specify the variable or value; for example, in the syntax:</p> <pre>DELeTe -IP ADDRess &lt;IP address&gt;</pre> <p>you must supply an address for &lt;IP address&gt; when entering the command. Do not type the angle brackets.</p>
square brackets [ ]	<p>Enclose an optional value or a list of optional arguments. One or more values or arguments can be specified. For example, in the syntax:</p> <pre>SET PRIVilege = [User   NetMgr]</pre> <p>you can specify either User or NetMgr when entering the command. Do not type the square brackets.</p>
parentheses ( )	<p>Enclose a list of values that can be assigned to a single parameter. At least one of them must be selected. You must type the parentheses and separate the values with a comma if you are assigning more than one value. For example, in the syntax:</p> <pre>SET CurrentPorts = ALL   (&lt;port&gt;, &lt;port&gt;)</pre> <p>you can specify two port numbers by enclosing them in parentheses and separating them with a comma when entering the command.</p>
vertical bar	<p>Separates mutually exclusive items in a list, one of which must be entered. For example, in the syntax:</p> <pre>SET ScreenLength = [None   &lt;line&gt;(6-100)]</pre> <p>you can specify either the word None or a number between 6 and 100 when entering the command. Do not type the vertical bar.</p>
ellipsis ...	<p>Following a parameter name or value, indicates that one or more additional arguments may be specified on the same command line. For example, in the syntax:</p> <pre>ADD !&lt;port&gt; -IP SecAuthIn &lt;authority&gt; [&lt;authority&gt; ...] [ANY]</pre> <p>you can specify multiple authorities (GENSER, SIOP, SCI, NSA, DOE, NONE) when entering the command. Do not type the ellipsis.</p>
hyphen -	<p>A letter preceded by a hyphen represents a command option. Also, when you enter a service name as part of the command, you must precede the service name with a hyphen. For example, in the command:</p> <pre>SETDefault -BRidge CONTrol = Bridge</pre> <p>the hyphen must be included with the service name BRidge when entering the command.</p>
braces { }	<p>Enclose a list of values, one of which must be entered. For example, in the syntax:</p> <pre>SETDefault !&lt;subaddr #&gt; -Gateway SubAddrMap = {(&lt;IPaddr&gt;   &lt;PSAPaddr&gt;)   None}</pre> <p>you must enter either an IP address, PSAP address, or the word None when entering the command. Do not type the braces.</p>
exclamation point !	<p>A number preceded by an exclamation point represents a port, virtual port, or path number. For example, in the syntax:</p> <pre>SHow [!&lt;port&gt;] -DECnet CONFIGuration</pre> <p>the exclamation point must be included before the port number when entering the command.</p> <p>The exclamation point is also used to refer to a profile number. See the PROfile Service chapter in <i>Reference for NETBuilder Family Software</i>.</p>

## Full and Abbreviated Syntax Examples

The following examples show the full form first, followed by the abbreviated command syntax.

The full-form command syntax:

```
ADD !<port> -NRIP AdvToNeighbor <network>%<mac address> [...]
```

can be abbreviated to:

```
ADD !<port> -NRIP ATN <network>%<mac address> [...]
```

Replacing the variables in this abbreviated command syntax with values might specify, for example, that a neighbor on port 2, network number &10, with address %080002030ef2, receives RIP and SAP updates:

```
ADD !2 -NRIP ATN &10%080002030ef2
```

The full-form command syntax:

```
SETDefault -IP CONTrol = ([ROute | NoROute], [RelaySrcRoute |  
NoRelaySrcRoute], [SplitLoad | NoSplitLoad], [Filtering |  
NoFiltering], [SECurity | NoSECurity], [FwdSubnetBcast |  
NoFwdSubnetBcast], [FwdAllSubnetBcast | NoFwdAllSubnetBcast])
```

can be shortened by abbreviating it to:

```
SETD -IP CONT = ([RO | NRO], [RSR | NRSR], [SL | NSL], [F | NF],  
[SEC | NSEC],[FSB | NFSB], [FASB | NFASB])
```

The following command uses this abbreviated syntax to enable IP routing, packet filtering, and security:

```
SETD -IP CONT = (RO, F, SEC)
```

## Variations in Command Syntax

Each command has its own syntax. When a command is used for configuring parameters, its syntax or values may change according to the parameter and service. For example, the SETDefault command sets the NetMapTime parameter in the SYS Service and the MaxAge parameter in the STP Service. In the following example, the general syntax is followed by the syntax variations (different values for different parameters) appropriate to each parameter:

```
SETDefault <parameter> = <value>  
SETDefault -SYS NetMapTime = <number>(0 to 120 seconds)  
SETDefault -STP MaxAge = <second> (6-40)
```

## Entering Service Names in Command Lines

When you are configuring or displaying parameters that appear in more than one service, you must provide a service name to distinguish them. You can enter the service name in abbreviated form. The name must be preceded by a hyphen. For example, to indicate BRidge Service, type -BR.



*Abbreviated service names are indicated in uppercase in the text of this manual.*

There are three exceptions:

- If you have previously set the CurrentServices parameter to the desired service, you do not need to enter the service name. The system prompt

indicates the current service if you set a single service with the CurrentServices parameter. For information on using the CurrentServices parameter, refer to *Reference for NETBuilder Family Software*.

- Environment parameters do not have a service name. For descriptions of these parameters, refer to *Reference for NETBuilder Family Software*.
- You do not need to enter a service name when the parameter name is unique.

### Determining the Display of Ports and Virtual Ports

You can control which ports are displayed in the output of the SHow and SHowDefault commands by setting the CurrentPorts parameter. If you have a bridge/router with several ports, for example a NETBuilder II bridge/router with multiport I/O modules installed, you may want to limit the display to information on certain ports instead of all ports. If you are interested only in displaying information for port 2 and virtual port V3, as well as the paths mapped to these ports, set the CurrentPorts parameter by entering:

```
SET CurrentPorts = (2, V3)
```

Now when you enter SHow and SHowDefault commands, only information for port 2 and virtual port V3, and the paths mapped to these ports, is displayed.

If you have a NETBuilder II bridge/router with a multiport module installed, you must enter its ports individually when setting the CurrentPorts parameter. For instance, if you have an Ethernet 2-Port 10BASE-FL module, the A and B ports are distinct. If you specify port 1 with the CurrentPorts parameter, the software assumes you mean port 1A. For information on port and path numbering conventions for multiport modules, refer to Chapter 1 in *Using NETBuilder Family Software*. For more information about the CurrentPorts parameter, refer to *Reference for NETBuilder Family Software*.

The syntax convention for ports, virtual ports, and group ports is:

```
!<port>
```

For a port, <port> is a variable ID number, for example, !1. For a virtual port or group port, <port> is the letter V followed by a variable ID number, for example, !V1.



*When you create a virtual port or group port, it functions in the same way as a port. Unless otherwise specified, the term “port” refers to virtual ports and group ports as well as ports. For more information on ports, virtual ports, and group ports, refer to Chapter 1 in Using NETBuilder Family Software.*

### Using Aliases

To avoid entering lengthy commands, you can create an alias to represent any command. To define an alias, use:

```
ADD -SYS ALias <alias name> <arguments...>
```

For example, if you use the SHow -SYS NetMAP command often, create an alias called ntmap by entering:

```
ADD -SYS ALias ntmap SHow -SYS NetMAP
```

When you want to display the network map, at the bridge/router prompt enter:

**ntmap**

For more information about aliases, refer to *Reference for NETBuilder Family Software*.

### Command History Substitution

The bridge/router “remembers” the last 10 commands you enter. To display a list of these commands, at the bridge/router prompt enter:

**SHow History**

For more information refer to *Reference for NETBuilder Family Software*. Each command in the display is numbered. To repeat any of the commands, use the event designator, represented by an exclamation point (!).

You can use history substitution with the following options:

!!	Repeats the previous command.
!<n>	Repeats the command numbered <n>. For example, entering !100 repeats the command numbered 100. If you know the command number, you do not need to display it first.
!-<n>	Repeats the command whose number is the current command number minus <n>. The current command number is shown on the screen preceding the bridge/router prompt. For example, if the current command is 100 and <n> is 2, command number 98 is repeated.
!<string>	Repeats the most recent command that starts with the variable <string>. The SHow History command might display: <pre>166 setdefault !1 -path control = enabled 167 show -path configuration 168 show history 169 set screenlength = 23 170 setdefault -bridge control = bridge 171 show statistics ?</pre> If you enter !SETD at the prompt, the most recent occurrence of the SETDefault command is executed: <pre>setdefault -bridge control = bridge</pre>
!?!<string>	Repeats the most recent command containing <string>. In the preceding example, if you enter !?stat, the command show statistics ? (number 171) is executed. You can also repeat a previous command with modifications by using the syntax described next.
^<string1>	Repeats the most recent command that contains <string1>. If <string2> is specified, it replaces <string1> in that command. For example, suppose you entered the following SETDefault command with a typing mistake:
^<string1>^<string2>	
	<pre>seed welcomestring = "You are talking to the 3Com NETBuilder"</pre>

To repeat the command with the correct spelling of SETD, you do not need to reenter the entire command. Enter:

```
^seed^setd
```

The following command is then displayed and executed:

```
setd welcomestring = "You are talking to the 3Com NETBuilder"
```

### Privilege Level

The privilege level determines which commands and parameters a user can access. The network manager must set the Network Manager password and the User password to be the same in order to provide equal levels of security. If only the Network Manager password is set, any other user receives User level privileges. Refer to "Changing the Password" on page 6-19.

You can change the privilege level with the SET PRivilege command. For more information, refer to *Reference for NETBuilder Family Software*.

### Command-Line Parameter Attributes

Parameter values, set members, and addresses can be expressed either as numbers or as text. This section provides guidelines for specifying numeric values, strings, and addresses. For details on the values permitted for each parameter, refer to *Reference for NETBuilder Family Software*.

### Syntax for Assigning Values

Most parameters must be assigned a value of a particular type. Table 6-2 shows the possible types.

**Table 6-2** Parameter Value Types

Type	Meaning	Example
Numbers	Represent the numerical value of a parameter.	15, 1024
Names	Usually represent either system-defined parameter or parameter values (written as <i>param-name</i> or <i>value</i> ) or user-defined macros or files (written as <i>macroname</i> or <i>filename</i> ).	Route, None
Strings	Some parameter values can be set to user-defined strings, ranging from a single character (written as <i>char</i> ) to a multicharacter string (written as <i>string</i> ).	"A," "B," "password"
Addresses	Two types of addresses can be assigned: media addresses for Ethernet, FDDI, token ring, and wide area protocols (SMDS, X.25, Frame Relay) and network layer addresses.	#311040800245, 129.213.24.30

The SET, SETDefault, and SYSgen commands require both parameter names and parameter values. The parameter name is followed by an equals sign (=) and a value. Spaces are permitted, but not required, before and after the equals sign, for example:

```
SETDefault -SYS ScreenLength = 30
```

The ADD and DELete commands also require both parameter names and parameter values. These commands modify sets of objects. No equals sign precedes the value that is added or deleted as a set member, for example:

```
ADD -IP ADDRess 10.0.0.1 %080002001234
```

## Numeric Values

To assign a hexadecimal value to a parameter, precede the number with a percent sign (%). Alphabetic characters can be entered in upper- or lowercase letters.

To assign a decimal number, type the number without any preceding symbol.

## Names

To assign a name, type the name in the command. Names, unlike strings, do not require quotation marks; however, the character length of the name may be limited.

## Strings

String values fall into two categories: single characters and variable-length strings. Table 6-3 lists the conventions for entering string values.

**Table 6-3** Conventions for Entering Strings

String Type	Characters	Valid Characters	Examples
Single characters	Enclose in apostrophes.	All alphanumeric characters and symbols	'S', 's', '\$'
Variable-length strings	Enclose in quotation marks.	All alphanumeric characters and symbols	"Hello!"

Characters in a string are case-sensitive. For example, "ABC" is different from "abc."

A few characters have special meaning to the bridge/router and must be preceded by a backslash (\) in string text to prevent them from being misinterpreted. These symbols are the apostrophe ('), backslash (\), caret (^), and quotation mark ("). For example, to include an apostrophe in string text, enter a backslash followed by an apostrophe (\'). To include a backslash (\) in string text, enter two backslashes (\\). The first backslash prevents the bridge/router from treating the second as a special character.

When specifying AppleTalk zone strings, you can use the extended AppleTalk ASCII character set. For more information, refer to *Using NETBuilder Family Software*.

You can assign strings to the PATH NAME parameter, and use this string as an instance identifier. For example, you can assign the name "testnet" to path 2 by entering:

```
SETDefault !2 -PATH NAME = "testnet"
```

In subsequent path-specific commands, you can substitute the path name for !2. For example, if you want to set the connector type on path 2 after assigning a name to this path, enter:

```
SETDefault !testnet -PATH CONNECTOR = RS232
```

This same feature is available for port-specific commands. You can assign a name to a port and then substitute the port name for !<port> in subsequent commands. To assign a name to a port, use:

```
SETDefault !<port> -PORT NAME = "<string>"
```

For more information on the NAME parameter, refer to *Reference for NETBuilder Family Software*.

### Port and Path Naming Restrictions

Port and path names are subject to the following restrictions:

- The name string can contain a maximum of eight characters, the first of which must be alphabetic.
- No blank spaces are allowed. The only non-alphanumeric characters allowed are the asterisk (\*), underscore (\_), period (.), and hyphen (-).
- Two ports or two paths cannot have the same name, but a port name can be the same as a path name.
- Alphabetic characters are stored and displayed as entered. Names are case-insensitive when compared with previously entered names. For example, port2 and PORT2 are evaluated as the same name.

### Setting Up IP Routing

You must set up the port that accesses the server for IP routing. To set up IP routing, follow these steps:

- 1 Log on as root and press the Return key.

The password prompt is displayed.

- 2 At the password prompt, press the Return key.

The network manager prompt (NETBuilder #) is displayed.

- 3 Set up an IP address and subnet mask using:

```
SETDefault !<port> -IP NETaddr = <IP address> [<subnet mask>]
```

For more information on IP configuration, refer to *Reference for NETBuilder Family Software*.

- 4 Enable IP routing by entering:

```
SETDefault -IP CONTROL = RO
```

- 5 Enable a routing protocol. For example, to enable RIP use:

```
SETDefault !<port> -RIPIP CONTROL = (Listen, Talk)
```



*This step is optional.*

- 6 Ensure your configuration by verifying that the bridge/router can access other devices on the network, use:

```
PING <IP address>
```

where <IP address> is the IP address of another device on the network.

### ISDN-Related Syntax Variation

The syntax for some parameters is different for Integrated Services Digital Network (ISDN) interfaces. The syntax variation for these parameters is presented in *Reference for NETBuilder Family Software* in the following format:

*For non-ISDN interfaces*

```
SETDefault !<path> -PATH remoteDialNo = "<string>"
SHow [!<path> | !*] -PATH remoteDialNo
SHowDefault [!<path> | !*] -PATH remoteDialNo
```

*For ISDN interfaces*

```
SETDefault !<connectorID.channelID> -PATH remoteDialNo = "<string>"
SHow [!<connectorID.channelID> | !<connectorID>.*] -PATH
remoteDialNo
SHowDefault [!<connectorID.channelID> | !<connectorID>.*] -PATH
remoteDialNo
```

The syntax variation for non-ISDN interfaces applies to local area network (LAN) and data terminal equipment (DTE) interfaces.



*NETBuilder software menus and help strings do not display the syntax variation for ISDN interfaces.*

The variation in syntax is caused partially by the different path-numbering convention used for ISDN. For information, refer to *Using NETBuilder Family Software*. Special ISDN-related parameter values can also cause a variation in syntax.

Some parameters in ISDN-specific software are connector-related, and require that you specify a connector number (<connectorID>), for example, 2. Other parameters are channel-related, and require that you specify both a connector and a channel number (<connectorID.channelID>), for example, 2.1. When you specify both a connector and a channel number, you must separate them with a decimal point.

If you do not specify a channel number in a command that requires both a connector and a channel number, the software assumes the first channel associated with the connector. For example, if you specify connector number 2 when the syntax requires that you to specify both a connector and a channel number, the software assumes you mean 2.1.

To specify all channels associated with a connector, specify the connector number, a decimal point, and an asterisk, for example, 2.\*

## Address Formats

The following summary describes media addresses and network layer addresses the bridge/router uses and their formats. For detailed information on protocol-specific addressing, refer to *Reference for NETBuilder Family Software*.

### Media Addresses

**MAC** Contains 12 hexadecimal digits preceded by a percent sign (%). The NETBuilder II bridge/router has a media access control (MAC) address (physical) for each LAN interface (Ethernet, FDDI, or token ring), for each HSS interface, and for the CEC module. The MAC address and the network identifier constitute a network address, which is the only address used by Xerox Network Systems (XNS) and Internetwork Packet Exchange (IPX) routers. IP routers have both MAC addresses for their LAN interfaces and Internet addresses for their configured ports. Internet addresses are described in "Network Layer Addresses" on page 6-15. Each MAC address is assigned by 3Com. A MAC address can be displayed by entering:

**SHow -SYS ADDRess .**

The following is an example of a MAC address:  
%080002001326

- Frame Relay Requires an address called a Data Link Connection Identifier (DLCI). DLCIs are assigned by the appropriate authority at subscription time. A DLCI follows an at sign (@) and can range from 1 through 1022 decimal. The DLCI identifies a virtual circuit on the Frame Relay network, and is used by the local bridge/router to send a packet to a router on the other end of the circuit. The following is an example of a Frame Relay address:  
@22  
In the standard (local) addressing convention, the DLCI number has only local significance; a duplicate number can be used by other bridge/routers. In the global addressing convention, identifiers used throughout the Frame Relay network are unique, and all traffic to a node has the same destination DLCI number.
- ATM Consists of an 8-bit virtual path identifier (VPI) and a 16-bit virtual circuit identifier (VCI), usually represented in VPI.VCI format, where VPI is a decimal number between 0 and 255 and VCI is a decimal number between 0 and 65,535. The following is an example of an Asynchronous Transfer Mode (ATM) address:  
107.44  
Some vendors' DSUs require an ATM address that consists of a 0-bit VPI and a 10-bit VCI. In this case, the 10-bit VCI maps directly to a Frame Relay DLCI.
- SMDS There are two types of Switched Multimegabit Data Service (SMDS) addresses: individual addresses, for unicast traffic, and group addresses, for multicast traffic. An individual address routes data to a unique node. Packets sent to a group address are delivered to all nodes that share that address. Both types of address begin with a dollar sign. They are distinguished by the first or control digit: hexadecimal C for an individual address and hexadecimal E for a group address. Each address has 15 decimal digits following the control digit and resembles a telephone number. The software automatically right-pads shorter addresses with hexadecimal F to the full length. The following are examples of individual and group SMDS addresses:  
C14085551212FFFF Individual Address  
E14085551234FFFF Group Address
- X.25 Consists of up to 15 decimal digits and can vary in length. The address looks similar to a telephone number and is preceded by a pound sign (#). An X.25 address is also referred to as a data terminal equipment (DTE) address.  
When a device is attached to a public data network (PDN), the network provider assigns it an X.25 address or an international data number (IDN). The first four digits indicate the country and PDN to which the device is attached. The remaining digits represent a unique device address determined by the network provider. The following is an example of an X.25 address:  
#311041503333

**ISDN** An ISDN address is a phone number provided by your telecommunications carrier. It can include a dial prefix, country code, area code, and phone number. It can consist of a maximum of 30 characters. If you create a subaddress, you must separate the phone number and the subaddress with a semicolon (;). The subaddress can be composed of a maximum of 20 characters. The following is an example of a valid ISDN address, including a subaddress:  
 011122134567000;200  
 For complete information on ISDN addresses, refer to *Using NETBuilder Family Software*.

### Network Layer Addresses

**AppleTalk** Consists of the network number and node ID. Each AppleTalk node address is unique throughout the AppleTalk Internet. For details on assigning an AppleTalk address, refer to *Reference for NETBuilder Family Software*. The following is an example of an AppleTalk address:  
 4.23

**DECnet** Consists of an area address and a node address. The area number identifies the area to which the router belongs. Enter an area number between 1 and 63. The node number assigned to the router must be unique within the area. Enter a node number between 1 and 1,023. For details on assigning a DECnet address, refer to *Reference for NETBuilder Family Software*. The following is an example of a DECnet address:  
 1.15

**Internet** Also known as an IP address. It consists of up to 12 decimal digits arranged in four three-digit fields separated by periods, as shown in the following format:  
 xxx.xxx.xxx.xxx  
 Leading zeros can be omitted. For example, the following addresses are the same:  
 010.002.002.001  
 10.2.2.1

An Internet address is required for:

- A bridge/router port to perform IP routing
- The bridge/router to be accessed via Telnet
- The bridge/router to respond to the PING command from another host
- The bridge/router to participate in SNMP-based network management

An address includes both a network number and a host number. The actual format of these numbers varies depending on the class of address being designated. Address class is determined by the value in the first octet of the address.

Table 6-4 shows valid address classes, the range of the first address field, and the resulting address format. The maximum value for any single field is 255.

**Table 6-4** Internet Address Format

Class	Range of First Address Field	Address Format
A	0–127	nnn.hhh.hhh.hhh*
B	128–191	nnn.nnn.hhh.hhh*
C	192–223	nnn.nnn.nnn.hhh*
D	224–239	yyy.yyy.yyy†

\* n represents a digit of the network number; h represents a digit of the host number.

† Class D addresses are used for multicast applications as assigned by the Internet Assigned Numbers Authority (IANA).

For more information on Internet addresses, subnet masks, and variable length subnet masks, refer to *Using NETBuilder Family Software*.

**IPX** Leading zeros can be omitted. Consists of an ampersand (&) followed by a network address, which contains eight hexadecimal digits, followed by the MAC address.

You may need to enter an IPX address when using the bridge/router for IPX routing. The network address uniquely distinguishes one IPX network from all other IPX networks. The following example addresses are the same:

```
&00003333%080002005678
```

```
&3333%080002005678
```

**OSI** Open System Interconnection (OSI) network addresses are called network service access points (NSAPs). NSAPs are of variable length and format, although they are always considered to have the following three parts:

- Area address (variable length)
- System ID (six octets)
- N-selector (one octet)

The system ID and N-selector are the last seven octets of the MAC address, and the area address is everything but the system ID and N-selector. The following is an example of an OSI address:

```
/49/0053080002A0089D01
```

where the area address is: /49/0053

the system ID is: 080002A0089D

and the N-selector is: 01

For more information on the OSI addressing scheme, OSI routing domains, and area addresses, refer to *Using NETBuilder Family Software*.

**VIP** A VINES Internet Protocol (VIP) address is globally unique, fixed, and permanent for servers and routers only. Each node has a two-field, 48-bit Internet address, which is derived from the 32-bit VINES network number and the 16-bit subnetwork number.

The Internet address has eight hexadecimal digits (VIP network ID) and four hexadecimal digits (subnetwork ID) separated by a colon (:). The Internet address (logical network) is independent of any data link layer address assigned to a node on a physical medium. The following is an example of a VIP address:

02A01339:0001

XNS Consists of a network address followed by a MAC address. The network address distinguishes between different XNS Ethernet networks. It contains eight hexadecimal digits, and is preceded by an ampersand (&), which is used for identification. Leading zeros can be omitted. The following addresses are the same:

&3333%080002001326

&00003333%080002001326

---

## Storing Configuration Parameter Values

Configuration parameters are stored in flash memory or on the disk of another server (for example, the TFTP/FTP server that boots the bridge/router). In this guide, the term "disk" refers to either the local flash memory drive or the hard disk on another server.

When the bridge/router is booted, it copies configuration parameters from the disk to memory. Parameter values on the disk are *default values* and values in memory are *active values*. You can alter the default and active values with the SETDefault and SET commands. For more information, refer to *Reference for NETBuilder Family Software*.

When the new value of a parameter takes effect depends on whether its active value has been changed. Some commands change the active value only, some change the default value, and some change both. If you display the parameter after modifying it and see the new value, the new value has taken effect immediately. If a command changes only the default value, the new value takes effect only after reboot. In this guide, if the description does not specify when the new value of a parameter takes effect after being enabled or disabled, it is effective immediately after it is set.

---

## Getting Help

The user interface provides help menus as memory aids. To display the help menu, enter a question mark (?). The question mark can be used with different options as described in Table 6-5.

**Table 6-5** Online Help Syntax Summary

Syntax	Description
?	Displays the help menu. Different commands are displayed depending on whether Network Manager privilege or User privilege is in effect. The commands are organized according to services.
-?	Displays a list of services.

(continued)

**Table 6-5** Online Help Syntax Summary (continued)

Syntax	Description
-service?	<p>Displays a list of commands within the service.</p> <p>For example, to display a list of commands in the SYS Service, enter:</p> <p><b>-SYS?</b></p> <p>If there are no commands under the service, a message is displayed to indicate this. For example, enter this command at the prompt:</p> <p><b>-IDP?</b></p> <p>A message similar to the following appears:</p> <p>No commands available in IDP service</p>
command -service?	<p>Displays a list of parameters that can be used with the command within the service.</p> <p>For example, to display a list of PORT Service parameters that can be used with the SETDefault command, enter:</p> <p><b>SETDefault -PORT?</b></p>
command ?	<p>Displays parameters by service name that can be used with the command. Only parameters in services specified by the CurrentServices parameter are displayed.</p>
command -service parameter?	<p>Displays syntax for the command used with the parameter.</p> <p>For example, to display the syntax for the SETDefault command used with the CONTROL parameter in the SNMP Service, enter:</p> <p><b>SETDefault -SNMP CONTROL?</b></p>

## Obtaining Network Manager Privilege Level

Before changing the Network Manager password, you must obtain Network Manager privilege.

To display or change the privilege level, follow these steps:

- 1 To determine the current privilege level, enter the following command:

```
SHow PRIVilege
```

If the following message is displayed, you already have Network Manager privilege:

```
PRIVilege = NetMgr
```

If the following message is displayed, go to step 2:

```
PRIVilege = User
```

You also can determine the privilege level from the NETBuilder prompt. The following prompt is displayed at the Network Manager privilege level:

```
NETBuilder #
```

The following prompt is displayed at the User privilege level:

```
NETBuilder >
```

- 2 If you are currently at User privilege level, enter the following command to change the privilege level from User to Network Manager:

```
SET PRIVilege = NetMgr
```

The following prompt is displayed:

```
Password:
```

- 3 Press the Return key.

A null string is entered, which is the default password.

After obtaining Network Manager privilege, proceed to the next section to change the Network Manager password.

---

## Changing the Password

Changing the Network Manager password prevents unauthorized users from accessing the bridge/router. You should change the password immediately after you log on for the first time.

The privilege level determines which commands and parameters a user can access. Each level has its own password. You must set the Network Manager password and the User password to be the same in order to provide equal levels of security. If only the Network Manager password is set, any other user receives User level privileges.

Users with NetMgr privileges can lower their privileges without a password. Users with User privileges cannot raise their privileges. To raise privileges after lowering them, you must enter the password again.



*The Network Manager password must be set before the User password. The User password must be cleared before the Network Manager password.*

To change the password, follow these steps:

- 1 At the NETBuilder prompt (NETBuilder #), enter:  
**SysPassWord**  
When a menu is displayed, Select 1, Set Network Manager Privilege Password.
- 2 Enter the new Network Manager password. Retype it when prompted to do so. You are returned to the SysPassWord menu.
- 3 Enter 2.
- 4 Enter the new User password and retype it when prompted to do so.
- 5 Press the Return key to exit the SysPassWord menu and return to the NETBuilder prompt (NETBuilder #).

Go to the next section to set the time and date on the system.

---

## Setting the Time and Date

To set the time and date on your system, use the following syntax:

```
SET -SYS DATE = YY/MM/DD HH:MM[:SS]
```

For example, to set the date and time to January 10, 1995, 9:40 a.m., enter:

```
SET -SYS DATE = 1995/1/10 09:40
```

The NETBuilder II bridge/router contains a real-time clock, so you do not need to set the date after each reboot to keep it correct.

For more information on these parameters, refer to *Reference for NETBuilder Family Software*. Proceed to the next section to enter system administrator information.

---

## Setting System Administrator Information

As system administrator, you can set the system name, location, and system contact so that other system administrators can contact you for information. If you are planning to use SNMP, you must set the system administrator information; otherwise, these settings are optional.

Before performing the procedure, you need to decide on or obtain the following information:

- System name
- System location
- System contact person and phone number

To set system administrator information, follow these steps:

- 1 Specify a name for the node, using:

```
SETDefault -SYS SysNAME = "<string>"
```

For example, to set the bridge/router name as "Sales.SanJose," enter:

```
SETDefault -SYS SysNAME = "Sales.SanJose"
```

The system name can contain no more than 255 characters. The default value is " " (null string).

- 2 Specify the system location, using:

```
SETDefault -SYS SysLOCation = "<string>"
```

For example, to set the system location as "SecondFloor.Lab," enter:

```
SETDefault -SYS SysLOCation = "SecondFloor.Lab"
```

The system location can contain no more than 255 characters. The default value is " " (null string).

- 3 Specify a string that identifies the contact person managing the bridge/router, using:

```
SETDefault -SYS SysCONTACT = "<string>"
```

For example, to specify John Smith as the system contact and a number to reach him, enter:

```
SETDefault -SYS SysCONTACT = "John Smith (408) 555-1111"
```

The system contact string can contain no more than 255 characters. The default value is " " (null string). Users can obtain this information by entering:

```
SHow -SYS SysCONTACT
```

Proceed to the next section to assign an Internet address.

---

## Assigning Internet Addresses

This section describes how to assign one or more Internet addresses to the system using the NETaddr parameter in the IP Service. Before you assign an Internet address, you must determine the following:

- Whether you want your network to connect to the Internet, and how to obtain a unique Internet address
- Whether you want to use the system as a bridge, a router, or a bridge/router
- Whether you need subnet addressing

If you have already decided on these issues, proceed to “Assigning Internet Addresses to a Bridge” on page 6-21 or to “Assigning Internet Addresses to a Router” on page 6-22. If you need more information to make your decision, refer to “Obtaining an Internet Address” on page 6-22 and to the subnet information in the *Using NETBuilder Family Software*.

### Assigning Internet Addresses to a Bridge

Even though a bridge does not route IP traffic, it needs an Internet address to participate in network management and to be accessible from other devices through Telnet or the SNMP.

When assigning an Internet address to an entire bridge, assign the address to port 0 using:

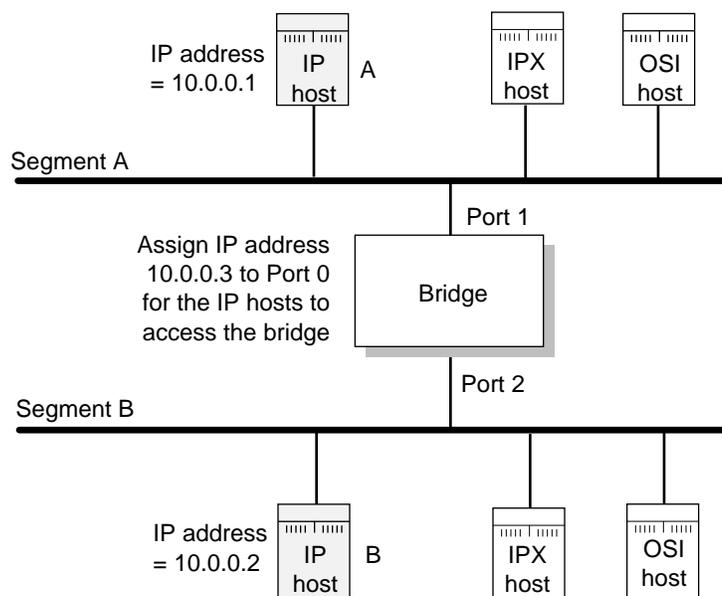
```
SETDefault !0 -IP NETaddr = <IP address>
```

An Internet address assigned to port 0 is considered an Internet address for the entire bridge.

The following example illustrates how to assign an Internet address to a bridge.

*Example* Figure 6-3 shows a configuration in which you need to assign an Internet address to a bridge. Hosts A and B are two hosts belonging to the same IP network, network 10. The IP host on Network A has an Internet address 10.0.0.1, and the one on Network B has an Internet address 10.0.0.2. The bridge forwards packets between these segments. To allow communication between the hosts and the bridge, ports 1 and 2 must reside on the same network. Assigning the same network number to two or more bridge ports is prohibited, so you must assign the address to the entire bridge, entering a command similar to the following:

```
SETDefault !0 -IP NETaddr = 10.0.0.3
```



**Figure 6-3** Assigning an IP Address to the Entire Bridge

After assigning an Internet address to the bridge, proceed to Chapter 1 in the *Using NETBuilder Family Software*.

### Assigning Internet Addresses to a Router

If the bridge/router is used to route IP traffic, you must configure the ports on which IP packets are routed by assigning Internet addresses to them. You can assign Internet addresses to individual ports using:

```
SETDefault !<port> -IP NETaddr = <IP address>
```

For more information, refer to the *Reference for NETBuilder Family Software*.



**CAUTION:** Do not assign an Internet address to port 0, or the IP routing function will be disabled.

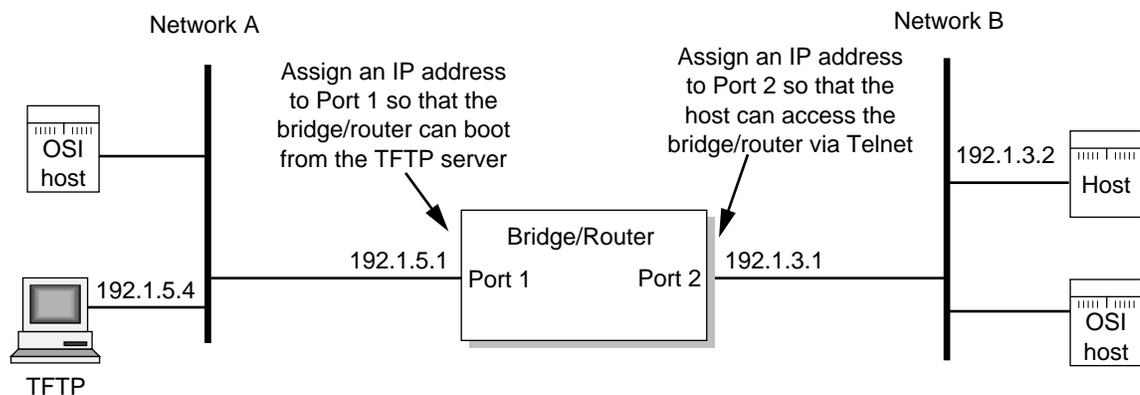
The next example illustrates how to assign Internet addresses to a bridge/router.

*Example* In Figure 6-4, Networks A and B are two different IP networks, and the bridge/router is used for routing IP packets and for bridging OSI packets. To assign an IP address to port 1, enter a command similar to the following:

```
SETDefault !1 -IP NETaddr = 192.1.5.1
```

To assign an address to port 2, enter a command similar to the following:

```
SETDefault !2 -IP NETaddr = 192.1.3.1
```



**Figure 6-4** Assigning an IP Address to a Bridge/Router Port

For additional information on Internet addresses and subnet masks, refer to *Using NETBuilder Family Software*. After assigning an Internet address or addresses to the bridge/router, proceed to Chapter 1 in *Using NETBuilder Family Software*.

### Obtaining an Internet Address

If you want to connect your TCP/IP network to the Internet, you must obtain a unique address from the central authority, the InterNIC. This central authority provides the following services:

- Registration Services
  - Assists in registering networks and domains, and assigns network numbers and other entities to the Internet community.
- Directory and Database Services
  - Maintains lists of FTP sites, various types of servers available on the Internet, white and yellow page directories, library catalogs, and data archives. For more information, phone (908) 668-6587 or use network mail (admin@ds.internic.net).

- Information Services

Offers information about how to get connected to the Internet, pointers to network tools and resources, and seminars on various topics held in locations around the country. For more information, phone (800) 444-4345 or use network mail (info@internic.net).

The Registration Service of the InterNIC assigns a globally unique network number, leaving responsibility for assigning a unique local host number to the network administrator.

To obtain a unique Internet address, contact the following organization:

Network Solutions  
 Attn: InterNIC Registration Services  
 505 Huntmar Park Drive  
 Herndon, VA 22070  
 1-703-742-4777  
 800-444-4345 (Referral Desk)  
 Network mail: HOSTMASTER@RS.INTERNIC.NET

For customers in Europe (including the former Soviet Union and the Middle East), contact the Reseaux IP European (RIPE) Network Coordination Center in the Netherlands using telephone number 3120592 5065.

All other customers abroad should contact Network Solutions at the telephone number given above for assistance in locating network providers in your region.

If you do not plan to be connected to the Internet, you can assign network addresses on your own. However, if you plan on accessing the Internet in the future, you may want to apply for an Internet network address so you will not have to change network addresses when you make the connection.

After obtaining your Internet address, refer to "Assigning Internet Addresses to a Bridge" on page 6-21 or to "Assigning Internet Addresses to a Router" on page 6-22. For additional information on Internet addresses and subnets, refer to *Using NETBuilder Family Software*.

---

## Setting Up the Simple Network Management Protocol

The NETBuilder II bridge/router participates in different types of network management activities. Most management activities require configuration because they are disabled by default. The bridge/router manages networks in the following ways:

- Configuring and monitoring from a UNIX or Windows network management station using Transcend Enterprise Manager
- Remote upgrade management using the NETBuilder Remote Upgrade Management Utilities supplied on CD-ROM with every NETBuilder release
- Building network maps (netmaps)

This guide does not describe in detail how to set up the SNMP Service. Refer to *Using NETBuilder Family Software* and *Reference for NETBuilder Family Software* for more information.

SNMP allows you to modify and display some NETBuilder parameters from a network management station. You do not need to attach a terminal to the bridge/router console port to change its configuration. To implement SNMP,

follow specifications in RFC 1155, RFC 1157, and RFC 1213. System parameters described in RFC 1213 and 3Com extended parameters can be accessed from the host.

### Modifying SNMP Parameters

To enable SNMP read/write access, you need to modify two parameters in the SNMP Service: COMMunity and MANager.

The COMMunity parameter is an SNMP Service parameter that modifies the list of communities. For information on how to use the COMMunity parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software*.

By default, the community name "ANYCOM" exists with read access to the management information base (MIB) variables and allows unrestricted access to the bridge/router. To ensure that access is available only to the proper system administrator, 3Com recommends that you delete the "ANYCOM" community name, and add the appropriate community string and the IP address of the manager.

To modify SNMP parameters, follow these steps:

- 1 Delete the default community string "ANYCOM" by entering:

```
DELeTe -SNMP COMMunity "ANYCOM"
```

- 2 Configure at least one new community string with read/write access.

For example:

```
ADD -SNMP COMMunity "private" TRiv RW AL1
```

- 3 Add other community strings with read-only access as required.

For example:

```
ADD -SNMP COMMunity "public" TRiv RO AL1
```

- 4 Create a new manager with read/write access to the NETBuilder bridge/router. For security reasons, limit the number of network management stations.

For example:

```
ADD -SNMP MANager "private" 129.213.224.1 255.255.0
```

- 5 Enable the SNMP service by entering:

```
SETDefault -SNMP CONTrol = (Manage, Trap)
```

---

## NETBuilder Security

NETBuilder security can be obtained many ways including limiting the access to a particular network or by limiting the access to certain files. Limiting access to a particular network can be accomplished by building Internet firewalls. Limiting access to particular files can be accomplished by using certain commands and parameters.

### Building Firewalls for Security

A firewall allows users inside a private network to have outbound access, while restricting outside users from inbound access. For more conceptual information about firewall and its capabilities, and details on how to configure firewalls, refer to *Using NETBuilder Family Software*. For a description and syntax of the various firewall service parameters, refer to *Reference for NETBuilder Family Software*.

## Security Commands and Parameters

To make sure that some designated files are accessible only to the system administrator, use the following commands and parameters:

- NetAccess

This parameter is a SYS Service parameter that determines how a bridge/router can be accessed from another device on the network. For information on how to use the NetAccess parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software*.

- SysPassWord

This command brings up a menu allowing you to specify the password for the Network Manager and User privilege levels. For information on how to use the SysPassWord command, refer *Reference for NETBuilder Family Software*.

- RemoteManager

This parameter is a SYS Service parameter that specifies the Internet addresses of devices that can connect to the bridge/router through the REMote command. For information on how to use the RemoteManager parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software*.

- COMmunity

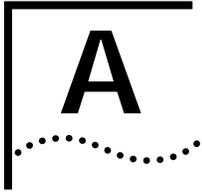
This parameter is an SNMP Service parameter that modifies the list of communities. For information on how to use the COMmunity parameter, refer to *Using NETBuilder Family Software* and to *Reference for NETBuilder Family Software*.

---

## What Next?

You are now ready to refer to *Using NETBuilder Family Software* to configure your bridge/router for your specific network needs.





# BOOTING THE NETBUILDER II CEC 20 SYSTEM FROM THE NETWORK

---

## Booting from a TFTP/FTP Server

If you do not have a flash memory drive or want to manage the software for one or more bridge/routers on a centralized server, you can boot from a Trivial File Transfer Protocol (TFTP) server. Configuration files can be accessed from the same workstation running a File Transfer Protocol (FTP) server program.



*Network boot is not supported by the NETBuilder II bridge/routers with the DPE modules installed.*

When you set up your NETBuilder bridge/router for network boot, you must configure your bridge/router to boot from a particular server by specifying the IP address of that server to the bridge/router. If you do not want to specify a particular server, you may configure your NETBuilder II bridge/router to use BOOTP, which discovers available TFTP servers on the local network by broadcasting BOOTP request packets. For more information about BOOTP, refer to *Reference for NETBuilder Family Software*.

## Installing the NETBuilder Software on the UNIX-based Network Management Station

This section describes how to install NETBuilder II bridge/router software on a UNIX-based network management station.

### Prerequisites

To install the NETBuilder II bridge/router software image from a CD-ROM, the CD-ROM drive must reside either locally on the network management station or on another system on the network.

Before installing version 9.3 software from a CD-ROM, check that:

- Your network management station is running Solaris 2.4 or 2.5x, SunOS 4.1.4, HP-UX 9.0.5, 10.10 or 10.20, or IBM AIX 3.2.5, 4.1.4 or 4.2.

To verify the operating system environment you are running, enter:

```
uname -a
```

The version message will refer to Solaris 2.5x as SunOS 5.5.

- You know the root password.
- There is sufficient disk space on the network management station for the amount of software you are installing.

Minimal disk storage requirements are dependent on the number of NETBuilder systems being installed. For dual image support allocate 40 MB for the NETBuilder Upgrade Management Utilities software image. For single image support, allocate 4 MB for each NETBuilder II system.

- The NETBuilder Upgrade Management Utilities released with this software package have been installed on the network management station. Refer to *Upgrading NETBuilder Family Software* for more information.

## Installing the NETBuilder Software on the UNIX NMS

To install the NETBuilder software, follow these steps:

- 1 Ensure that the TFTP server on the network management station is running and has been correctly configured.
- 2 Mount the version 9.3 software CD-ROM on the network management station. For mount instructions for your specific UNIX operating system, refer to *Upgrading NETBuilder Family Software*.
- 3 Set environmental variables with the location of NETBuilder Upgrade Management Utilities. (These variables depend on the UNIX shell that is installed at your site.)

- If you are using a C-shell (csh), at the prompt enter:

```
source /usr/3Com/common/data/.login-bcm
```

- If you are using a Bourne (sh) or Korn (ksh) shell, at the prompt enter:

```
. /usr/3Com/common/data/.profile-bcm
```

- 4 Ensure that you are using the version of the NETBuilder Upgrade Management Utilities that shipped with your software upgrade. To check the version you have installed, enter:

```
bcmdiagnose -h
```

The version of the installed utilities is displayed in the following message:

```
bcmdiagnose version 9.3. Copyright 3Com Corporation 1996
```

If the version of the utilities you have installed differs from the version shipped with your software package, you must first install the utilities shipped with your software package.



*In the next step, the `bcminstall` utility extracts the files from the CD-ROM and installs them on the network management station hard disk in the `/tftpboot/image/<platform>/SW/FW/<version>/<pkg>` directory. For example, the software may be installed in the `/tftpboot/image/NBII/SW/93/FF` directory. If there is insufficient space on the disk, you can link `/tftpboot` to another disk.*

- 5 Using the NETBuilder Upgrade Management Utilities, install the NETBuilder software from the CD-ROM (the default) by entering:

```
bcminstall
```



*The optional `path` parameter may also be used to install on a network management station that has two or more drives connected as well as for installing from a remote CD-ROM drive. You must explicitly specify the second CD-ROM drive.*

To install a NETBuilder package from a second CD-ROM drive on a Solaris machine, enter:

```
bcminstall -cdrom /cdrom/cdrom1/image
```

After the installation is complete, the screen shows an inventory of all NETBuilder packages installed, including previous versions you have installed.

### Setting Up a Unique Configuration File Directory on a TFTP/FTP Server

The NETBuilder II system accesses both configuration files and multiprocessor (MP) images from a unique directory on the network management station using TFTP. MP images (MP6e.29k or MPatm) are always in /TFTPboot/image/NBII/SW/<release>/FF. Configuration files on the network management station exist only when the user does a bcmbbackup and they are always stored in the following directory:

/tftpboot/image/<platform>/sw/version<package>.

To set up this unique directory, perform these steps:

- 1 For each NETBuilder II bridge/router, you must create a directory for these files with appropriate read/write permissions.

For example, enter:

```
mkdir /tftpboot/configs/93/NBIICA
```

- 2 If your NETBuilder II bridge/router is using MP modules, you must copy these images from the location on the network management station where they were installed during the CD-ROM installation procedure.

These files are mp6e.29k and mpatm.29k. They reside in a default directory represented by /tftpboot/image/NBII/SW/<version>/<pkg>.

For example, to use the 6-Port Ethernet module, enter:

```
cp /tftpboot/image/NBII/SW/93/FF/mp6e.29k  
/tftpboot/configs/93/NBIICA
```

### Setting the Primary Boot Source

Set up the boot source to be a TFTP/FTP server accessed over a single Ethernet port or FDDI port (FDDILink ports are not supported).

See Table A-1 for additional boot source parameter settings, such as those related to booting over a token ring port, an HSS port using PPP, or a multiport Ethernet module.

To set the primary boot source, follow these steps:

- 1 From the NETBuilder monitor prompt, enter:

```
SF
```

The System Configuration menu is displayed.

- 2 Select the Primary Boot Source option.

The Primary Boot Source menu is displayed.

- 3 Select the Boot Device option, and set the Boot Device to Network.

You are then prompted to set the slot number and boot filename.

- 4 Enter the slot number of the module that is used to reach your TFTP server.

If you have a 4-Slot chassis, your options are 1 through 4. If you have an 8-Slot chassis, your options are 1 through 8.

- 5 Enter the boot filename by entering the directory path and filename relative to the "tftpboot" directory where the CEC 20 boot image resides.

For example, enter:

```
/image/NBII/SW/93/FF/boot.29k
```

- 6 Enter Q to return to the Primary Boot Source menu.

- 7 Enter 2 and set the Primary Config File Source to Boot Device.  
You will be prompted for the Default directory for your configuration files.
- 8 Enter Q to return to the Primary Boot Source menu.
- 9 Select the Boot Protocol option, and set the Primary Boot Protocol to TFTP.  
You are then prompted to set the TFTP Address Discovery Protocol.
- 10 Enter Q to return to the Primary Boot Source menu.
- 11 Select the IP Addresses option, and enter the primary IP addresses assigned to your client, boot server, gateway, remote file server, and subnet mask.
- 12 Enter Q twice to return to the Primary Boot Source menu.
- 13 Select the FTP Login option, and enter the username and password to be used by FTP.  
The password is not displayed on the console when you type it.
- 14 Exit the SysconF menu system by typing Q repeatedly.
- 15 Reboot the system by simultaneously pressing both Reset buttons on the front panel, or by typing RS at the monitor prompt.

### More Boot Options

Table A-1 summarizes other parameters you may need to configure, including parameters you need to boot from a TFTP server over a token ring port, HSS port using PPP, or multiport Ethernet module.

**Table A-1** Additional TFTP Primary Boot Source Parameters

Parameter	Configuration
Boot Device: Network	Interface Number  You are prompted with this field only if an Ethernet 2-Port or Ethernet 6-Port module resides in the slot. Make sure this parameter is set to the appropriate interface (A or B or A-F). The default is A.
MP Module Parameters	You need to configure this parameter only if the TFTP server is reachable through an HSS port running PPP or a token ring port.
<b>HSS port running PPP</b>	
If your boot source is reachable through an HSS port running PPP, you are prompted to configure the following fields:	
<ul style="list-style-type: none"> <li>■ HSS Baud Rate This setting must correspond to your serial line setting.</li> <li>■ HSS Clock Source Set this parameter appropriately (the default setting is external).</li> <li>■ HSS Connector Type Set this parameter to the connector that the server is reachable through (the default is V.35).</li> <li>■ HSS Protocol Select PPP.</li> <li>■ HSS WAN Password Leave this field empty.</li> </ul>	

(continued)

**Table A-1** Additional TFTP Primary Boot Source Parameters (continued)

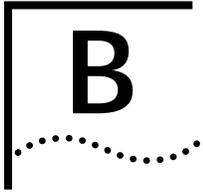
Parameter	Configuration
	<p><b>Token ring port</b></p> <p>If your boot source is reachable through a token ring port, you are prompted to configure the following field:</p> <ul style="list-style-type: none"> <li>■ Token Ring Speed This setting must correspond to the token ring line setting (the default is 4 Mbps).</li> <li>■ Token Ring Baud Rate Make sure the setting of this field matches that of your token ring line.</li> </ul>
Boot Protocol	<p>Make sure the Boot Protocol is set to TFTP.</p> <p>If you are configuring your bridge/router to use TFTP only, set the Address Discovery Protocol to Local Configured Addresses.</p> <p>If you are configuring your bridge/router to use TFTP and BOOTP, set the Address Discovery Protocol to BOOTP.</p>
Boot Sources	Make sure the Boot Sources are set to Primary and Secondary.
MAC Address	Make sure this parameter is set to the CEC 20 MAC address.
ARP Format	If your boot source is reachable through a token ring port, make sure that the setting of this parameter agrees with the Address Resolution Protocol (ARP) format used on your token ring network: noncanonical.

**What Next?** You may set up the Simple Network Management Protocol (SNMP) to allow network management of the bridge/router. For information on this service, refer to "Setting Up the Simple Network Management Protocol" on page 6-23.

Go to Chapter 6 to configure basic settings.

To set other boot options, see the SysconF appendix in *Reference for NETBuilder Family Software*.





# TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site as described below.

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## Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFacts<sup>SM</sup> automated fax service
- 3ComForum on CompuServe<sup>®</sup> online service

## World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

<http://www.3Com.com/>

This service features news and information about 3Com products, customer service and support, 3Com Corporation's latest news releases, *NetAge* Magazine, and more.

## 3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available via modem or ISDN 24 hours a day, 7 days a week.

### Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680

(continued)

Country	Data Rate	Telephone Number
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853
P. R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

### Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

**408 654 2703**

### 3ComFacts<sup>SM</sup> Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
Hong Kong	852 2537 5610
U.K.	44 1442 278279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1 800 123853	Netherlands	06 0228049
Belgium	0800 71279	Norway	800 11062
Denmark	800 17319	Portugal	0505 442 607
Finland	98 001 4444	Russia (Moscow only)	956 0815
France	05 90 81 58	Spain	900 964 445
Germany	0130 81 80 63	Sweden	020 792954
Italy	1678 99085	U.K.	0800 626403

### 3ComForum on CompuServe<sup>®</sup> Online Service

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

- 1 Log on to CompuServe.
- 2 Type **go threecom**
- 3 Press [Return] to see the 3ComForum main menu.

## Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

## Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number	Regional Sales Office	Telephone Number
<b>3Com Corporation</b>		<b>3Com Ireland</b>	353 1 820 7077
U.S.	800 NET 3Com <i>or</i> 1 408 764 5000	<b>3Com Japan</b>	81 3 3345 7251
<b>3Com ANZA</b>		<b>3Com Latin America</b>	
East	61 2 9937 5000	Argentina	54 1 312 3266
West	61 3 9866 8022	Brazil	55 11 546 0869
<b>3Com Asia Limited</b>		Chile	56 2 633 9242
China	86 10 68492 568 (Beijing) 86 21 6374 0220 Ext 6115 (Shanghai)	Colombia	57 1 629 4110
Hong Kong	852 2501 1111	Mexico	52 5 520 7841
India	91 11 644 3974	Peru	51 1 221 5399
Indonesia	62 21 523 9181	Venezuela	58 2 953 8122
Korea	82 2 319 4711	<b>3Com Mediterraneo</b>	
Malaysia	60 3 732 7910	Italy	39 2 253011 (Milan) 39 6 5279941 (Rome)
Singapore	65 538 9368	<b>3Com Middle East</b>	971 4 349049
Taiwan	886 2 377 5850	<b>3Com Nordic AB</b>	
Thailand	662 231 8151 4	Denmark	45 39 27 85 00
<b>3Com Benelux B.V.</b>		Finland	358 0 435 420 67
Belgium	32 725 0202	Norway	47 22 18 40 03
Netherlands	31 30 6029700	Sweden	46 8 632 56 00
<b>3Com Canada</b>		<b>3Com Russia</b>	007 095 2580940
Calgary	403 265 3266	<b>3Com South Africa</b>	27 11 807 4397
Montreal	514 683 3266	<b>3Com UK Limited</b>	
Ottawa	613 566 7055		44 131 2478558 (Edinburgh)
Toronto	416 498 3266		44 161 8737717 (Manchester)
Vancouver	604 434 3266		44 1628 897000 (Marlow)
<b>3Com France</b>	33 1 69 86 68 00		
<b>3Com GmbH</b>			
Austria	43 1 5134323		
Czech and Slovak Republics	42 2 21845 800		
Germany	49 30 3498790 (Berlin) 49 89 627320 (Munich)		
Hungary	36 1 250 83 41		
Poland	48 22 6451351		
Switzerland	41 31 996 14 14		

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**Returning Products  
for Repair**

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

<b>Country</b>	<b>Telephone Number</b>	<b>Fax Number</b>
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 7801	408 764 7120
Europe, South Africa and Middle East	44 1442 438125	44 1442 435822
Outside Europe, U.S.A., and Canada	1 408 326 7804	1 408 764 7120

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## 3Com Corporation LIMITED WARRANTY

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### HARDWARE

3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Network adapters	Lifetime
Other hardware products (unless specified above)	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

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### SOFTWARE

3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of ninety (90) days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation with respect to this express warranty shall be (at 3Com's discretion) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to 3Com's applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will work in combination with any hardware or applications software products provided by third-parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third-party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the noncompatibility is caused by a "bug" or defect in the third-party's product.

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### STANDARD WARRANTY SERVICE

Standard warranty service for *hardware* products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to 3Com's Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for *software* products may be obtained by telephoning 3Com's Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after receipt of the defective product by 3Com.

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### WARRANTIES EXCLUSIVE

IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND SATISFACTORY QUALITY. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLIGENCE, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

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### LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

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### GOVERNING LAW

This Limited Warranty shall be governed by the laws of the state of California.

**3Com Corporation**, 5400 Bayfront Plaza, Santa Clara, CA 95052-8145 (408) 764-5000

9/1/96

