3-DNS® Distributed Traffic Controller Installation Guide

version 3.0

Service and Support Information

Product Version

This manual applies to version 3.0 of the 3-DNS® Controller.

Obtaining Technical Support

Web	tech.f5.com
Phone	(206) 272-0888
Fax	(206) 272-0802
Email (support issues)	support@f5.com
Email (suggestions)	feedback@f5.com

Contacting F5 Networks

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Toll-free phone	(888) 88BIG-IP
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Export Warning

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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This class A digital apparatus complies with Canadian I CES-003.

Standards Compliance

The product conforms to ANSI/UL Std 1950 and Certified to CAN/CSA Std. C22.2 No. 950.

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This product includes software developed by Charles Hannum, by the University of Vermont and Stage Agricultural College and Garrett A. Wollman, by William F. Jolitz, and by the University of California, Berkeley, Lawrence Berkeley Laboratory, and its contributors.

This product includes software developed by the University of Vermont and State Agricultural College and Garrett A. Wollman.

In the following statement, "This software" refers to the Mitsumi CD-ROM driver: This software was developed by Holger Veit and Brian Moore for use with "386BSD" and similar operating systems.   "Similar operating systems" includes mainly non-profit oriented systems for research and education, including but not restricted to "NetBSD," "FreeBSD," "Mach" (by CMU).

In the following statement, "This software" refers to the parallel port driver: This software is a component of "386BSD" developed by William F. Jolitz, TeleMuse.

This product includes software developed by the Apache Group for use in the Apache HTTP server project

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1

Introduction

- Getting started

- Using the Administrator Kit

- Finding help and technical support resources

Getting started

Welcome to the *3-DNS Controller Installation Guide*. Before you get started installing the controller, we recommend that you browse the *3-DNS Controller Administrator Guide* to find the configuration solution that most closely matches your needs. Briefly review the basic configuration tasks and the few pieces of information you should gather in preparation for completing the tasks, such as IP addresses and host names.

Once you find your solution in the Administrator Guide and gather the necessary network information, turn to this Installation Guide for instructions on installing the hardware and running the First-Time Boot utility. Then return to the Administrator Guide for instructions on setting up your chosen solution.

Choosing a configuration tool

The 3-DNS Controller provides the following web-based and command line administrative tools that make for easy setup and configuration.

First-Time Boot utility

The First-Time Boot utility is a wizard that walks you through the initial system set up. The utility helps you quickly define basic system settings, such as a root password and the IP addresses for the interfaces that connect the 3-DNS Controller to the network. The First-Time Boot utility also helps you configure access to the 3-DNS web server, which hosts the web-based Configuration utility, as well as the NameSurfer™ application that you can use for DNS zone file management.

Configuration utility

The Configuration utility is a web-based application that you use to configure and monitor the 3-DNS Controller. Using the Configuration utility, you can define the load balancing configuration along with the network setup, including data centers, sync groups, and servers used for load balancing and path probing.

In addition, you can configure advanced features such as topology settings and the SNMP agent. The Configuration utility also monitors network traffic, current connections, load balancing statistics, and the operating system itself.

The 3-DNS web server, which hosts the Configuration utility, provides convenient access to downloads such as the SNMP MIB, and documentation for third-party applications such as NameSurfer™.

NameSurfer application

The NameSurfer application, produced by Data Fellows, is a third-party application that automatically configures DNS zone files associated with domains handled by the 3-DNS Controller. You can use NameSurfer to configure and maintain additional DNS zone files on 3-DNS Controllers that run as master DNS servers. The Configuration utility provides direct access to the NameSurfer application, as well as the corresponding documentation for the application.

3-DNS Maintenance menu

The 3-DNS Maintenance menu is a command line utility that executes scripts which assist you in configuration and administrative tasks, such as installing the latest version of the **big3d** agent on all your systems, backing up the load balancing configuration files, or adding a new 3-DNS Controller to an existing network. You can use the 3-DNS Maintenance menu directly on the 3-DNS Controller, or you can use the menu when connected to the controller using a remote shell, such as an SSH client (if **ssh** is configured), or an RSH client (if **rsh** is configured).

Browser support

The Configuration utility, which provides web-based access to the 3-DNS Controller system configuration and features, supports the following browser versions:

- Netscape Navigator 4.5 through 4.7
- Microsoft Internet Explorer, version 4.02 or later

Using the Administrator Kit

The *3-DNS® Controller Administrator Kit* provides simple steps for quick, basic configuration, and also provides detailed information about more advanced features and tools, such as the **3dnsmaint** command line utility. The information is organized into the guides described below.

◆ *3-DNS Controller Installation Guide*
The *3-DNS Controller Installation Guide* walks you through the basic steps needed to get the hardware plugged in and the system connected to the network. Most users turn to this guide only the first time that they set up a 3-DNS Controller. The Installation Guide also covers general network administration issues, such as setting up common network administration tools including Sendmail.

◆ *3-DNS Controller Administrator Guide*
The *3-DNS Controller Administrator Guide* describes essential configuration tasks, basic and advanced load balancing solutions, and monitoring and administration tools. For example, in the Administrator Guide, you can find a basic DNS request load balancing solution, and a content delivery network solution.

◆ *3-DNS Controller Reference Guide*
The *3-DNS Controller Reference Guide* provides descriptions and configuration details of individual 3-DNS Controller objects, such as wide IPs, pools, and virtual servers. It also provides syntax information for **3dnsmaint** commands, configuration utilities, configuration files, and system utilities.

Stylistic conventions

To help you easily identify and understand certain types of information, all documentation uses the stylistic conventions described below.

◆ **WARNING**

All examples in this documentation use only non-routable IP addresses. When you set up the solutions we describe, you must use IP addresses suitable to your own network in place of our sample IP addresses.

Identifying new terms

When we first define a new term, the term is shown in bold italic text. For example, a ***virtual server*** is the combination of an IP address and port that maps to a set of back-end servers.

Identifying references to objects, names, and commands

We apply bold text to a variety of items to help you easily pick them out of a block of text. These items include web addresses, IP addresses, utility names, and portions of commands, such as variables and keywords. For example, the **nslookup** command requires that you include at least one **<ip_address>** variable.

Identifying references to other documents

We use italic text to denote a reference to another document. In references where we provide the name of a book as well as a specific chapter or section in the book, we show the book name in bold, italic text, and the chapter/section name in italic text to help quickly differentiate the two. For example, you can find information about **3dnsmaint** commands in the *Chapter 9, Scripts*, in the ***3-DNS Controller Reference Guide***.

Identifying command syntax

We show actual, complete commands in bold Courier text. Note that we do not include the corresponding screen prompt, unless the command is shown in a figure that depicts an entire command line screen. For example, the following command shows the current status of the 3-DNS daemons:

ndc status

Table 1.1 explains additional special conventions used in command line syntax.

Item in text	Description
\	Continue to the next line without typing a line break.
< >	You enter text for the enclosed item. For example, if the command has **<your name>**, type in your name.
|	Separates parts of a command.
[ ]	Syntax inside the square brackets is optional.
...	Indicates that you can type a series of items.

Table 1.1 *Command line conventions used in this manual*

Finding help and technical support resources

You can find additional technical documentation about the 3-DNS Controller in the following locations:

◆ **Release notes**
The release note for the current version of the 3-DNS Controller is available from the home screen of the Configuration utility. The release note contains the latest information for the current version including a list of new features and enhancements, a list of fixes, and a list of known issues.

◆ **Online help for 3-DNS Controller features**
You can find help online in three different locations:

• The Configuration utility home screen has PDF versions of the guides included in the *Administrator Kit*. Software upgrades for the 3-DNS Controller replace the guides with updated versions as appropriate.

• The Configuration utility has online help for each screen. Just click the **Help** button in the toolbar.

• Individual commands have online help, including command syntax and examples, in standard UNIX man page format. Simply type **man** followed by the command (for example **man ndc**), and the 3-DNS Controller displays the syntax and usage associated with the command.

◆ **Third-party documentation for software add-ons**
The Configuration utility contains online documentation for NameSurfer, the third-party software application that is included with the 3-DNS Controller.

◆ **Technical support through the World Wide Web**
The F5 Networks Technical Support web site, **http://tech.F5.com**, contains the Ask F5 knowledge base and provides the latest technical notes and updates for administrator guides (in PDF and HTML formats). To access this site you must first email **askf5@f5.com** and obtain a customer ID and a password.

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Setting Up the Hardware

- Unpacking and installing the hardware

- Addressing special hardware configuration issues

Unpacking and installing the hardware

Regardless of the configuration you intend to use, you need to completely install the 3-DNS Controller hardware. This chapter reviews the hardware requirements, introduces the hardware, notes the environmental issues, and gives procedures for installing the hardware. It also provides basic information about configuration and management issues for redundant systems, multiple network interfaces, and DNS zone files.

The two basic tasks you must complete to get the 3-DNS Controller installed and set up are as follows:

◆ Connect the peripheral hardware and connect the 3-DNS Controller to the network.

◆ Turn the system on and run the First-Time Boot utility. The First-Time Boot utility is a wizard that helps you configure basic system elements such as administrative passwords, IP addresses, and host names for both the root system and the 3-DNS web server. For more information on configuring your 3-DNS Controller, see Chapter 3, *Working with the First-Time Boot Utility*.

Reviewing the hardware requirements

The 3-DNS Controller comes with the hardware you need for installation and maintenance. However, you must provide standard peripheral hardware, such as a keyboard and monitor or serial terminal.

Hardware provided with the 3-DNS Controller

When you unpack the 3-DNS Controller, make sure the following components are included:

• One power cable

• One PC/AT-to-PS/2 keyboard adapter

• Four rack-mounting screws

• Two keys for the front panel lock

- One extra fan filter
- One 3-DNS Controller Administrator Kit, which includes the *3-DNS Controller Installation Guide,* the *3-DNS Controller Administrator Guide*, and the *3-DNS Controller Reference Guide*.

If you purchase a hardware-based redundant system, you also receive one fail-over cable to connect the two controllers together (network-based redundant systems do not require a fail-over cable).

Peripheral hardware that you provide

For each 3-DNS Controller in the system, you need to provide the following peripheral hardware:

◆ Standard input/output hardware for direct administrative access to the 3-DNS Controller. Either of the following options is acceptable:

- VGA monitor and PC/AT-compatible keyboard
- Serial terminal and a null modem cable. (See *Using a serial terminal with the 3-DNS Controller*, on page 4-2, for serial terminal configuration information.)

◆ Network hubs, switches, or concentrators to connect to the 3-DNS Controller network interfaces. The devices you select must be compatible with the network interface cards installed in the 3-DNS Controller. The devices can support 10/100 Ethernet, Gigabit Ethernet, or FDDI/CDDI (including multiple FDDI and full duplex).

- For Ethernet, you need either a 10Mb/sec or 100 Mb/sec hub or switch.
- For FDDI/CDDI, a concentrator or a switch is optional.

If you plan on doing remote administration from your own PC workstation, as most users do, we recommend that you have your workstation already in place. Keep in mind that the First-Time Boot utility prompts you to enter your workstation's IP address when you set up remote administrative access.

Familiarizing yourself with the 3-DNS Controller hardware

The 3-DNS Controller is offered in two hardware configurations: the 4U hardware configuration, and the 2U hardware configuration. Before you begin to install the 3-DNS Controller, you may want to quickly review the following figures that illustrate the controls and ports on both the front and the back of a 4U 3-DNS Controller and a 2U 3-DNS Controller.

Using the 4U hardware configuration

This section describes the front and back layout of a 4U 3-DNS Controller. If you have a special hardware configuration, such as those that include more than two interface cards, the ports on the back of your unit will differ slightly from those shown below.

Figure 2.1 illustrates the front of a 4U 3-DNS Controller with the access panel open. On the front of the unit, you can turn the unit off and on, and you can reset the unit. You can also view the indicator lights for hard disk access and for the keyboard lock.
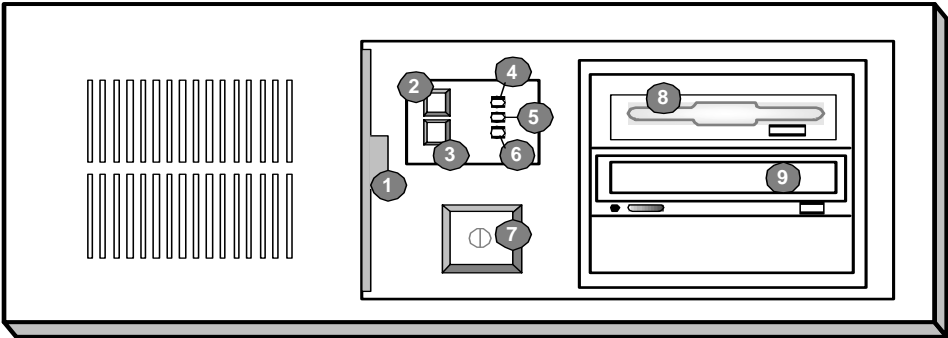
|	
1. Fan filter	6. Power LED
2. Keyboard lock	7. On/off button
3. Reset button	8. 3.5 floppy disk drive
4. Keyboard lock LED	9. CD-ROM drive
5. Hard disk drive LED	

Figure 2.1 *Front view of a 4U 3-DNS Controller*

Figure 2.2 illustrates the back of a 4U 3-DNS Controller. Note that all ports are labeled, even those which are not intended to be used with the 3-DNS Controller. Ports marked with an asterisk (*) in the list following the figure are not used by the 3-DNS Controller, and you do not need to connect them to any peripheral hardware.

◆ **Note**

The ports on the back of every 3-DNS Controller are individually labeled.
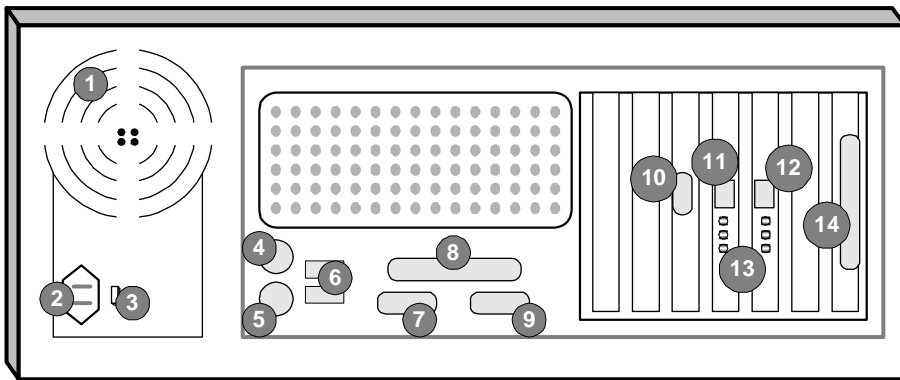
| 1. Fan	8. Printer port*
2. Power in	9. Fail-over port
3. Voltage selector	10. Video (VGA) port
4. Mouse port*	11. Internal interface (RJ-45)
5. Keyboard port	12. External interface (RJ-45)
6. Universal serial bus ports*	13. Interface indicator LEDs
7. Serial terminal port	14. Watchdog card
Not to be connected to any peripheral hardware	

Figure 2.2   *Rear view of a 4U 3-DNS Controller*

Using the 2U hardware configuration

This section describes the front and back layout of a 2U 3-DNS Controller. If you have a special hardware configuration, such as those that include more than two interface cards, the ports on the back of your unit will differ slightly from those shown below.

◆ **Note**

The ports on the back of every 3-DNS Controller are individually labeled, so it should be clear what each port is, no matter which hardware configuration you have purchased.
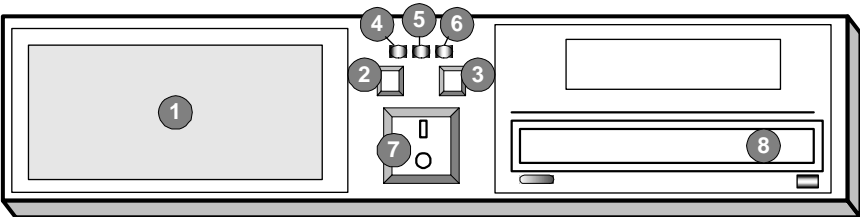
1. Fan filter	6. Power LED
2. Keyboard lock	7. On/off button
3. Reset button	8. CD-ROM drive
4. Keyboard lock LED	
5. Hard disk drive LED	

Figure 2.3 *Front view of a 2U 3-DNS Controller*

Figure 2.3 illustrates the front of a 2U 3-DNS Controller with the access panel open. On the front of the unit, you can turn the unit off and on, and you can reset the unit. You can also view the indicator lights for hard disk access and for the keyboard lock.

Figure 2.4 illustrates the back of a 2U 3-DNS Controller. Note that all ports are labeled, even those which are not intended to be used with the 3-DNS Controller. Ports marked with an asterisk (*) in the list following the figure are not used by the 3-DNS Controller, and you do not need to connect them to any peripheral hardware.
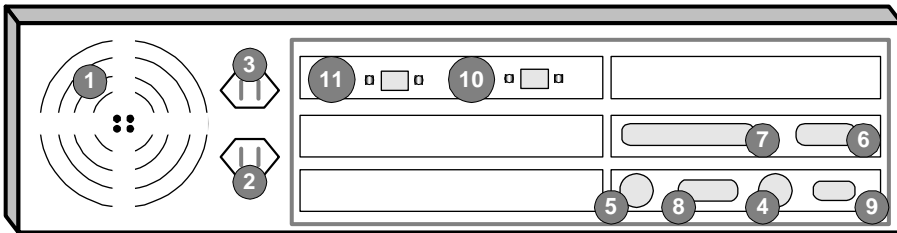
1. Fan	8. Serial terminal port
2. Power in	9. Video (VGA) port
3. Power out	10. External interface (exp0)
4. Mouse port*	11. Internal interface (exp1)
5. Keyboard port	
6. Fail-over port	
7. Printer port*	

Not to be connected to any peripheral hardware.

Figure 2.4 *Back view of a 2U 3-DNS Controller*

Environmental requirements and usage guidelines

A 3-DNS Controller is an industrial network appliance, designed to be mounted in a standard 19-inch rack. To ensure safe installation and operation of the unit:

• Install the rack according to the manufacturer's instructions, and check the rack for stability before placing equipment in it.

- Build and position the rack so that once you install the 3-DNS Controller, the power supply and the vents on both the front and back of the unit remain unobstructed. The 3-DNS Controller must have adequate ventilation around the unit at all times.

- Do not allow the air temperature in the room to exceed 40° C.

- Do not plug the unit into a branch circuit shared by more electronic equipment than the circuit is designed to manage safely at one time.

- Verify that the voltage selector is set appropriately before connecting the power cable to the unit.

⚠ **The unit must be connected to Earth ground, and it should have a reliable ground path maintained at all times.**

⚠ **The 3-DNS Controller contains a lithium battery. There is danger of an explosion if you replace the lithium battery incorrectly. We recommend that you replace the battery only with the same type of battery originally installed in the unit, or with an equivalent type recommended by the battery manufacturer. Be sure to discard all used batteries according to the manufacturer's instructions.**

⚠ **This equipment is not intended for operator serviceability. To prevent injury and to preserve the manufacturer's warranty, allow only qualified service personnel to service the equipment.**

Guidelines for DC-powered equipment

A DC-powered installation must meet the following requirements:

- Install the unit using a 20 Amp external branch circuit protection device.

- For permanently connected equipment, incorporate a readily-accessible disconnect in the fixed wiring.

- Use only copper conductors.

⚠ **Install DC powered equipment only in restricted access areas, such as dedicated equipment rooms, equipment closets, or similar locations.**

Installing and connecting the hardware

There are six basic steps to installing the hardware. You simply need to install the controller in the rack, connect the peripheral hardware and the external and internal interfaces, and then connect the fail-over and power cables. If you have a unit with three or more network interface cards (NICs), be sure to review step 3.

◆ **WARNING**

Do not turn on a 3-DNS Controller until all peripheral hardware is connected to the unit.

To install the hardware

1. Mount the 3-DNS Controller on the rack and secure it using the four rack-mounting screws that are provided.

2. Connect the hardware that you have chosen to use for input/output:

   • If you are using a VGA monitor and keyboard, connect the monitor connector cable to the video port (number 10 in the 4U figure, or number 9 in the 2U figure) and connect the keyboard connector cable to the keyboard port (number 5 in the 4U or 2U figure). Note that a PC/AT-to-PS/2 keyboard adapter is included with each 3-DNS Controller (see the component list on page 2-1).

   • Optionally, if you are using a serial terminal as the console, connect the serial cable to the serial terminal port (number 7 in the 4U figure, or number 8 in the 2U figure). You should not connect a keyboard to the 3-DNS Controller. If there is no keyboard connected to the 3-DNS Controller when it is started or rebooted, the 3-DNS Controller defaults to using the serial port as the console.

3. Connect the external interface (number 11 in the 4U figure, or number 10 in the 2U figure) to the network from which the 3-DNS Controller receives connection requests.

   If you have purchased a unit with three or more network interface cards (NICs), be sure to note or write down how you connect the cables to the internal and external interfaces. When you run the First-Time Boot utility, it automatically detects the number of interfaces that are installed and prompts you to configure more external interfaces, if you want. It is important to select the correct external interface based on the way you have connected the cables to the back of the unit.

4. Connect the internal interface (number 11 in the 4U or 2U figure) to the network that houses the array of servers, routers, or firewalls that the 3-DNS Controller load balances.

5. If you have a hardware-based redundant system, connect the fail-over cable to the serial terminal port on each unit (number 7 in the 4U figure, or number 8 in the 2U figure).

6. Connect the power cable to the 3-DNS Controller (number 2 in the 4U or 2U figure), and then connect it to the power source.

◆ WARNING

Before connecting the power cable to a power supply, customers outside the US should make sure that the voltage selector is set appropriately. This check is necessary only if the controller has an external voltage selector.

Addressing special hardware configuration issues

Before you start the hardware setup, you may want to review the following items which address configuration and management issues for redundant systems, systems that use more than one network interface, and DNS zone file management.

Setting up a stand-alone unit or a redundant system

If you are setting up a stand-alone unit, you need one IP address and host name for each of the interfaces you plan to connect to the network. If you are setting up a redundant system, you need one IP address for each network interface card in each unit, as well as a shared IP alias for the primary network interface, and a shared IP alias for the secondary network interface (if you are connecting the redundant system to more than one network).

Setting up a redundant system with hardware-based fail-over or network-based fail-over

Hardware-based fail-over is a redundant system that connects two 3-DNS Controller units directly to each other using a fail-over serial cable. *Network-based fail-over* is a redundant system where two units are connected to each other either directly using an Ethernet cable, or indirectly via an Ethernet network. Of the two units in a redundant system, one runs as the *active unit*, managing all DNS resolution requests, and the other runs as the *standby unit*, waiting to take over in case the active unit fails and reboots. The communication between the units, such as fail-over notification, runs across either the fail-over cable in the hardware-based redundant system, or the network in the network-based redundant system.

When you run the First-Time Boot utility, it prompts you to enter the IP address of the other unit in the system.

Triggering a fail-over in a redundant system

The 3-DNS Controller tracks two key aspects of the system to validate system performance. In a redundant system, there are two events that indicate a system failure, and trigger a fail-over.

- If the **named** daemon becomes unresponsive, or if you manually stop the daemon using the **ndc stop** or **ndc restart** commands, the 3-DNS Controller treats this as system failure and initiates a fail-over.

- If the 3-DNS Controller fails to detect any traffic on its network interfaces, it attempts to create traffic to test the integrity of the interface. If the test fails, the 3-DNS Controller treats this as a system failure and initiates a fail-over.

Using redundant systems with the sync group feature

If you include a redundant system in a sync group, you include the system by specifying the system's shared IP alias.

Using more than one network interface

The First-Time Boot utility prompts you to configure the primary network interface, and then asks if you want to configure more interfaces, or if you want to skip to the next section of the utility. If you want to configure another network interface, you simply enter the same type of information you entered for the first interface. The other interfaces can connect to a separate network, or they can act as redundant paths to the same network that the first interface is connected to.

Setting up automatic DNS zone file management

The First-Time Boot utility asks you if you want to use the NameSurfer application as the master for DNS zone files. We recommend that you always run NameSurfer as the master for DNS zone files. When you define or modify wide IPs in the Configuration utility, NameSurfer automatically makes the corresponding changes to the DNS zone files. The NameSurfer application also provides you with easy management of high-level domain zone files unrelated to the wide IP configuration.

If you plan on transferring existing BIND files from a primary DNS server to the 3-DNS Controller, you do not configure NameSurfer when you run the First-Time Boot utility; you configure the application later on in the installation process. For more details about this and other DNS zone file management issues, refer to Chapter 2, *Essential Configuration Tasks*, in the **3-DNS Controller Administrator Guide**.

3

Working with the First-Time Boot Utility

- Using the First-Time Boot utility

- Gathering configuration information

- Starting the First-Time Boot utility

- Configuring remote administration

- Configuring settings for the 3-DNS web server

- Configuring NameSurfer for zone file management

- Confirming your configuration settings

- Committing your configuration settings to the system

Using the First-Time Boot utility

The First-Time Boot utility is a wizard that walks you through a brief series of required configuration tasks, such as defining a root password and configuring IP addresses for the network interfaces. Once you complete the First-Time Boot utility, you can connect to the 3-DNS Controller from a remote workstation or a web browser and begin configuring your load balancing setup.

The First-Time Boot utility is organized into three phases: configure, confirm, and commit. Each phase walks you through a series of screens, so that you can configure the following settings:

• Root password

• Host name (FQDN)

• Default route (typically a router's IP address)

• Time zone

• NTP clocks

• Settings for the network interface(s)

• Configuration for 3-DNS Controller redundant systems (fail-over IP address)

• Settings for remote administration

• Settings for the 3-DNS web server

• Settings for the NameSurfer application

• Settings for optional technical support access

First, you configure all of the required information. Next, you have the opportunity to correct, if necessary, and confirm each individual setting that you have configured. Last, your confirmed settings are committed and saved to the system. Note that the screens you see are tailored to your specific hardware and software configuration. For example, if you have a stand-alone system, the First-Time Boot utility skips the redundant system screens.

Gathering configuration information

Before you run the First-Time Boot utility on a specific 3-DNS Controller, you should have the following information ready to enter:

• Passwords for the root system, for the 3-DNS web server, and for technical support access (optional)

• Host names for the root system and the 3-DNS web server

• A default route (typically a router's IP address)

• Settings for the network interfaces, including IP addresses, media type, and custom netmask and broadcast addresses

• Configuration information for redundant systems, including the IP addresses of the individual controllers, and an IP address for the shared IP alias

• The IP address or IP address range for remote administrative connections

An important note about configuring non-crypto 3-DNS Controllers

When you run the First-Time Boot utility on a ***non-crypto*** 3-DNS Controller, a controller that does not use encrypted communications, certain screens are different from those shown when you run the First-Time Boot utility on a ***crypto*** 3-DNS Controller, a controller that uses encrypted communications.

• On crypto 3-DNS Controllers, the First-Time Boot utility prompts you to choose either SSH or RSH for remote, secure connections. We recommend that you configure an administrative IP address from which the 3-DNS Controller accepts SSH connections.

• On non-crypto 3-DNS Controllers, the First-Time Boot utility prompts you can only configure an administrative IP address from which the 3-DNS Controller accepts RSH connections.

The 3-DNS Controller stores the administrative IP address for RSH connections in the **/etc/hosts.allow** file. Note that storing the administrative IP address in the **/etc/hosts.allow** file may differ slightly from other common RSH configurations, where it is often stored in the **/etc/hosts.equiv** file.

◆ **Note**

*If you have both crypto and non-crypto F5 Networks devices in your network, including 3-DNS Controllers, BIG-IP Controllers, or EDGE-FX Caches, and you are setting up a crypto 3-DNS Controller, you need to configure the controller so that it accepts RSH and RCP connections. For more information on configuring RSH and RCP on crypto controllers, see **Enabling remote login tools**, on page 4-1.*

Starting the First-Time Boot utility

The First Time Boot utility starts automatically when you turn on the 3-DNS Controller (the power switch is located on the front of the controller). The first screen the controller displays is the License Agreement screen. You must scroll through the screen, read the license, and accept the agreement before you can move to the next screen. If you agree to the license statement, the next screen you see is the Welcome screen. From this screen, simply press any key on the keyboard to start the First-Time Boot utility, and then follow the instructions on the subsequent screens to complete the process.

◆ **Note**

*You can re-run the First-Time Boot utility after you run it for the initial configuration. To rerun the First-Time Boot utility, type **config** at the command line.*

Defining a root password

A root password allows you administrative access to the 3-DNS Controller. The root password must contain a minimum of 6 characters, but no more than 32 characters. Passwords are case-sensitive, and we recommend that your password contain a combination of uppercase and lowercase characters, as well as punctuation characters. Once you enter a password, the First-Time Boot utility prompts you to confirm your root password by typing it again. If the two passwords match, your password is immediately saved. If the two passwords do not match, you receive an error message asking you to re-enter your password.

◆ WARNING

The root password is the only setting that is saved immediately, rather than confirmed and committed at the end of the First-Time Boot utility process. You can change the root password after the First-Time Boot utility completes and you reboot the 3-DNS Controller (see the 3-DNS Controller Administrator Guide, Chapter 6, Administration and Monitoring, for more information). You can change other system settings when the First-Time Boot utility prompts you to confirm your configuration settings.

Defining a host name

The host name identifies the 3-DNS Controller itself. Host names must be in the format of a fully-qualified domain name. Host names may contain letters, numbers, and the symbol for dash (-), however, they may not contain spaces. For example, if the controller's label is **controller1**, then you define the host name as **controller1.yourdomain.com**.

Configuring a default route

If a 3-DNS Controller does not have a predefined static route for network traffic, the controller automatically sends traffic to the IP address that you define as the default route. Typically, a default route is set to a router's IP address.

Configuring a time zone

Configuring a time zone ensures that the clock for the 3-DNS Controller is set correctly, and that dates and times recorded in log files correspond to the time zone of the system administrator. Scroll through the time zone list to find the zone closest to your location. Note that one option may appear with multiple names.

Configuring NTP clocks

You can synchronize the time on your 3-DNS Controller to a public time server by using Network Time Protocol (NTP). NTP is built on top of TCP/IP and assures accurate, local timekeeping with reference to clocks located on the Internet. This protocol is capable of synchronizing distributed clocks, within milliseconds, over long periods of time. If you choose to enable NTP, make sure UDP port 123 is open in both directions when the 3-DNS Controller is behind a firewall.

Configuring the interfaces

When you configure the interfaces on your 3-DNS Controller, you have several options based on whether you are configuring a redundant system, and whether you are configuring the internal or external interface. On the Configure 3-DNS Interfaces screen, select **Yes, it is a redundant 3-DNS System**, if you have a redundant system. Otherwise, select **No, it is not a redundant 3-DNS System**. The subsequent configuration screens vary based on your selection.

◆ Note

Please note that if you are configuring a redundant system, you need to select a unit ID, and configure a shared IP alias for the redundant pair, in addition to configuring the interfaces themselves.

Selecting a unit ID for redundant systems

If you are configuring a redundant system, the First-Time Boot
utility prompts you to provide a unit ID and an IP address for
fail-over for the 3-DNS Controller. The default unit ID number is
1. If you are configuring the first controller in the redundant
system, use the default. When you configure the second controller
in the redundant pair, type **2**. These unit IDs are used for
active-active redundant controller configuration.

◆ **Note**

*If you are configuring a stand-alone controller you do not
configure a unit ID. The First-Time Boot utility goes straight to the
Configure Interfaces screen.*

Configuring the shared IP alias for redundant systems

If you have a redundant system, you are also prompted to provide
the IP address that serves as an IP alias for both 3-DNS Controllers.
The IP alias is shared between the units, and is used only by the
currently active machine. Each controller uses unique IP addresses
on its network interface card(s). The First-Time Boot utility guides
you through configuring the interfaces, based on your hardware
configuration.

◆ **Stand-alone controllers**
   On stand-alone controllers, you enter IP addresses in the
   following order: primary Ethernet interface IP address,
   secondary Ethernet interface IP address.

◆ **Redundant systems**
   On redundant systems, you enter IP addresses in the following
   order: primary Ethernet interface IP address, primary shared
   alias, secondary Ethernet interface IP address, secondary shared
   alias.

Configuring the primary and secondary Ethernet interfaces

The Select Interface screen shows a list of the installed interfaces. You must configure the primary Ethernet interface, but you need to configure the secondary Ethernet interface only if you want to have two independent network access paths to the 3-DNS Controller.

◆ **WARNING**

The First-Time Boot utility lists only the network interface cards that it detects during boot up. If the utility lists only one interface card, the network adapter may have come loose during shipping. Check the LED indicators on the network adapters to ensure that they have properly detected the 3-DNS Controller media that should be installed.

Select the Ethernet interface you want to configure, and press **Enter** (the primary Ethernet interface is typically labeled **fxp0**). The utility prompts you for the following information, in many cases offering you a default:

◆ **IP address**

◆ **Netmask**
   Note that the 3-DNS Controller uses a default netmask appropriate to the subnet indicated by the IP address. The default netmask is shown in brackets at the prompt.

◆ **Broadcast address**
   The default broadcast address is a combination of the IP address and the netmask. The default broadcast address is shown in brackets at the prompt.

◆ **Primary shared IP alias** (redundant systems only)

◆ **Peer IP address (redundant systems only)**
   The peer IP address is the IP address of the other controller that runs in the redundant system. The 3-DNS Controller uses the specified peer IP address to communicate with the second controller.

◆ **Media type for primary Ethernet interface**
The media type options depend on the network interface card included in your hardware configuration. The 3-DNS platform supports the following types:

- Auto
- 10baseT
- 10baseT,FDX
- 100baseTX
- 100baseTX,FDX
- FDDI
- Gigabit Ethernet

◆ **Note**

The IP address of the primary Ethernet interface is not the IP address associated with your domain(s). You specify the IP addresses of the domains themselves when you define the wide IPs.

Configuring remote administration

When you configure remote administration, the screens that you see vary, depending on whether you have a crypto 3-DNS Controller, or a non-crypto 3-DNS Controller.

- On crypto 3-DNS Controllers, the first screen you see is the Configure SSH screen, which prompts you to type an address for **ssh** command line access. The next screen you see is the Configure RSH screen. We recommend that you enable SSH remote administrative access, and disable RSH remote administrative access.

- On non-crypto 3-DNS Controllers that do not have SSH, the First-Time Boot utility displays only the Configure RSH screen.

The First-Time Boot utility prompts you to enter a single IP address or a range of IP addresses, from which the 3-DNS Controller can accept administrative connections (either remote

shell connections, or connections to the 3-DNS web server). To specify a range of IP addresses, you can use the asterisk (*****) as a wildcard character in the IP addresses.

The following example allows remote administration from all hosts on the **192.168.2.0** network:

```
192.168.2.*
```

◆ **Tip**

For 3-DNS Controllers, you must configure command line access. If you do not configure command line access, the 3-DNS Controllers cannot communicate with each other, and they cannot properly exchange configuration information.

Configuring settings for the 3-DNS web server

The 3-DNS web server requires that you define a domain name for the server. The 3-DNS web server configuration requires that you define a user ID and password. On crypto 3-DNS Controllers, the configuration also generates certificates for authentication.

The First-Time Boot utility guides you through a series of screens to set up web server access:

- The first screen prompts you to enter a fully-qualified domain name. The default is the host name that you entered at the beginning of the First-Time Boot utility.

- The next web server screen prompts you for a user name and a password. The password does not show on screen as you type it. The utility prompts you to enter the password again for confirmation purposes.

- The final screen prompts you to specify whether you want to allow F5 technical support to have access to the web server.

- The certification screen prompts you to enter the country, state, city, company, and division information used for the authentication certificate (crypto 3-DNS Controllers only).

◆ **WARNING**

If you ever change the IP addresses or host names on the 3-DNS Controller interfaces, you need to reconfigure the 3-DNS web server to reflect your new settings. You can run the re-configuration utility from the command line using the following command:

```
config_httpd
```

Configuring 3-DNS web server passwords

If you wish to create a new password for the 3-DNS web server, delete the **/var/f5/httpd/basicauth/users** file before running the **config_httpd** utility. If this file is missing from the configuration, the utility prompts you for both user ID and password information.

You can also add users to the existing password file, change a password for an existing user, or recreate the password file, without actually going through the 3-DNS web server configuration process. For more information, see *Utilities* in the ***3-DNS Controller Reference Guide***.

◆ **WARNING**

*If you have modified the 3-DNS web server configuration outside of the Configuration utility, be aware that some changes may be lost when you run the **config_httpd** utility. This utility overwrites the **httpd.conf** file, and several other files, but it does warn you before doing so.*

Identifying additional controllers in the network

Note that if you are defining a redundant system (either 3-DNS Controllers or BIG-IP Controllers), you need to enter the IP address of the controller, as well as the shared IP alias for each interface on the controller. You also need to choose whether the current 3-DNS Controller will be a principal member or a receiver member of a sync group. A *sync group* is a group of two or more 3-DNS Controllers that share the same configuration information by staying synchronized with the *principal* controller. For more information, see *Chapter 2, Essential Configuration Tasks,* in the ***3-DNS Controller Administrator Guide***.

◆ **Note**

A sync group can have only one principal, but can have an unlimited number of receivers.

Configuring NameSurfer for zone file management

In the final series of screens, you choose whether to have NameSurfer handle DNS zone file management on the current 3-DNS Controller. We strongly recommend that you configure NameSurfer to handle zone file management by selecting NameSurfer to be the master on the 3-DNS Controller. If you select NameSurfer as the master, NameSurfer converts the DNS zone files on the controller and handles all changes and updates to these files. (You can access the NameSurfer application directly from the Configuration utility).

Confirming your configuration settings

At this point, you have entered all the configuration information, and now you confirm each setting. Each confirmation screen displays a setting and prompts you to either accept or re-enter it. If you choose to edit the setting, the utility displays the original configuration screen in which you defined the setting the first time. When you finish editing the item, you return directly to the Confirmation screen for that item, and continue the confirmation process. Note that once you accept a setting in the Confirmation screen, you do not have another opportunity to review it.

You confirm or edit the settings in the same order that you configured them:

- Confirm host name

- Confirm default route

- Confirm time zone

- Confirm all interface settings

- Confirm administrative IP address

- Confirm web server options

- Confirm NameSurfer options

Once you have confirmed the last setting, the First-Time Boot utility moves directly into the commit phase, where you are not able to make any changes.

Committing your configuration settings to the system

Once you confirm all of the configuration settings, the configuration utility saves the configuration settings. During this commit process, the First-Time Boot utility creates the following files and tables:

- An **/etc/hosts.allow** file
  This file stores the IP address, or IP address range, from which the 3-DNS Controller accepts administrative connections.

- An **/etc/rc.conf** file

- An **/etc/hosts** file

- A sample **wideip.conf** file

- A **/var/3dns/etc/remote.data** file

- A **topology.inc** file

- A **/var/f5/httpd/conf/httpd.conf** file

If you want to change any information in these files at a later time, you can edit the files directly, change the information in the web-based Configuration utility, or change certain settings using command line utilities. If necessary, you can also re-run the First-Time Boot utility.

4

Additional Setup Options

- Enabling remote login tools

- Preparing workstations for command line access

- Addressing general networking issues

Enabling remote login tools

If you are setting up a crypto 3-DNS Controller that needs to communicate with non-crypto 3-DNS Controllers, you must enable the **rsh** and **rcp** tools on the crypto 3-DNS Controller. These are the standard communication and copying tools that non-crypto 3-DNS Controllers, BIG-IP Controllers, and EDGE-FX Caches use.

To enable the remote login tools on a crypto 3-DNS Controller

Run the **rsetup** script from the command line utility. The **rsetup** script performs several essential steps to enable access for **rsh** and **rcp**, and we strongly recommend that you use the script rather than doing this manually.

Preparing workstations for command line access

The type of system you have determines the options you have for remote command line administration:

- Crypto 3-DNS Controllers support secure shell (SSH) command line access. If you have a Windows-based PC workstation, you can use the Mindbright Mindterm SSH console to run an **ssh** session. If you have a UNIX workstation, you can use the standard **ssh** client.

- Non-crypto 3-DNS Controllers support command line access using a standard **rsh** shell.

If you are working with a crypto 3-DNS Controller, you can access a Mindbright Mindterm console through the web-based Configuration utility.

Addressing general networking issues

You must address several networking issues when you place a 3-DNS Controller in your network. These networking issues include routing, DNS configuration, and special email considerations. The type of hardware and software in your network determine how you address these issues. This section describes the following networking issues:

◆ Using a serial terminal with the 3-DNS Controller

◆ Configuring Sendmail

Using a serial terminal with the 3-DNS Controller

To configure a serial terminal in addition to the console

To configure a serial terminal, in addition to the standard console, for the 3-DNS Controller, you need to complete the following configuration steps. Note that if you are using a serial VT100 connection, you must edit both the **/etc/ttys** and **bash_profile** files on the 3-DNS Controller.

◆ **Note**

Before you configure the serial terminal, you must disconnect the keyboard from the 3-DNS Controller. When there is no keyboard connected to the 3-DNS Controller, the 3-DNS Controller defaults to using the serial port for the console.

Before the 3-DNS Controller is booted, you must attach a serial device to the serial port in order for the controller to use the serial port as the console.

1. Configure the serial terminal settings as follows:

   • 9600 baud

   • 8 bits

   • 1 stop bit

   • No parity

2. Open the **/etc/ttys** file and find the line that reads **ttyd0 off**. Modify it as shown here:

   # PC COM ports (tty00 is DOS COM1) ttyd0 "/user/libexec/getty std.9600" vt100 on secure

3. Save the **/etc/ttys** file and close it.

4. Reboot the 3-DNS Controller.

Configuring Sendmail

You can configure the 3-DNS Controller to send email notifications to you, or to other administrators, using the Sendmail utility. The 3-DNS Controller includes a sample Sendmail configuration file that you can use to start with, but you must customize the Sendmail setup for your network environment before you can use it.

Before you begin setting up Sendmail, you may need to look up the name of the mail exchanger for your domain. If you already know the name of the mail exchanger, refer to *Setting up Sendmail*, on page 4-4 for details about setting up the **sendmail** daemon itself.

Finding the mail exchanger for your domain

You can use the **nslookup** command on any workstation that is configured for lookup. Once you find the primary IP address for your domain, you can find the mail exchanger for your domain.

To find the mail exchanger

1. Identify the default server name for your domain. From a workstation capable of name resolution, type the following on the command line:

   ```
   nslookup
   ```

2. The command returns a default server name and corresponding IP address:

   ```
   Default Server: <server name>
   Address:  <server>
   ```

3. Use the domain name to query for the mail exchanger:

```
set q=mx
<domain name>
```

The returned information includes the name of the mail exchanger. For example, the sample information shown in Figure 4.1 lists **bigip.net** as the preferred mail exchanger.

```
bigip.net    preference = 10, mail exchanger = mail.domain.com
bigip.net    nameserver = ns1.bigip.net
bigip.net    nameserver = ns2.bigip.net
bigip.net    internet address = 192.17.112.1
ns1.bigip.net        internet address = 192.17.112.2
ns2.bigip.net        internet address = 192.17.112.3
```

Figure 4.1   Sample mail exchanger information

Setting up Sendmail

When you set up Sendmail, you must edit two configuration files. Since the 3-DNS Controller does not accept email messages, you can use the **crontab** utility to purge unsent or returned messages and send them to yourself or another administrator.

To set up and start Sendmail

1. Copy **/etc/sendmail.cf.off** to **/etc/sendmail.cf**.

2. To set the name of your mail exchange server, open the **/etc/sendmail.cf** file and set the **DS** variable to the name of your mail exchanger. The syntax for this entry is:

   ```
   DS<MAILHUB_OR_RELAY>
   ```

3. Save and close the **/etc/sendmail.cf** file.

4. To allow Sendmail to purge outgoing messages that cannot be delivered immediately from the queue containing mail, open the **/etc/crontab** file, and change the last line of the file to read:

```
0,15,30,45 * * * *   root /usr/sbin/sendmail -q > /dev/null 2>&1
```

5. Save and close the **/etc/crontab** file.

6. To prevent returned or undelivered email from going unnoticed, open the **/etc/aliases** file and create an entry so that **root** points to you or another administrator at your site.

   ```
   root: networkadmin@domain.com
   ```

7. Save and close the **/etc/aliases** file.

8. Run the **newaliases** command to generate a new aliases database that incorporates the information you added to the **/etc/aliases** file.

9. To turn Sendmail on, either reboot the system or type the following command:

   ```
   /usr/sbin/sendmail -bd -q30m
   ```

◆ **Note**

The 3-DNS Controller supports only outgoing mail for Sendmail servers.

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