



Setting Up Mac OS X Server for Xserve

Includes software installation and setup information
for Mac OS X Server and Xserve

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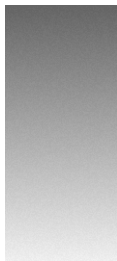
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About This Guide

This guide provides information about installing and using this version of Mac OS X Server on Xserve.

Use this guide as a supplement to the *Mac OS X Server Administrator's Guide*, which is included as a PDF document in the documentation folder on the Admin Tools CD. Read the *Mac OS X Server Administrator's Guide* before you attempt to install and set up your server. Then read this guide to learn

- what's new in this version of Mac OS X Server
- how to use the new command-line tools and administration software to install, set up, configure, and manage server processes
- where to find more information about network planning and other important topics

This guide is written for both new and experienced system administrators. Basic instructions are provided for those administrators who are new to UNIX command-line tools.

Experienced administrators should take a look at all chapters to see what's new in Mac OS X Server for Xserve.

Welcome to Mac OS X Server for Xserve

Mac OS X Server is a powerful suite of server software that lets you manage your network efficiently and provide a full range of services to network users. Mac OS X Server includes services for file and printer sharing, Internet and Web hosting, email, networking and security, desktop management, network operating system startup and software installation, media streaming, and directory services architecture. This version of Mac OS X Server is designed to support your new server.

What's New in This Version of Mac OS X Server

Mac OS X Server provides tools and applications to help you set up and manage your servers. Until now, many setup tasks had to be performed locally on a server. With this version of Mac OS X Server, you can use a Mac OS X desktop computer, PowerBook, or iBook to perform these tasks remotely:

- install software
- set system preferences
- set network preferences
- set up directory services
- create AppleTalk and Line Printer Remote (LPR) print queues
- configure NetBoot IP address ranges

In addition, the applications used to set up servers and directory information have been enhanced to permit remote configuration of servers. Included in this version of Mac OS X Server are updates to these applications:

- Setup Assistant (now called Server Assistant)
- Directory Setup
- NetInfo Domain Setup
- Print and DHCP/NetBoot modules for Server Admin

Command-Line Tools

New command-line tools included in this version of Mac OS X Server let you take advantage of built-in support for Secure Shell (SSH) to remotely set up servers. You can use command-line tools to perform these tasks remotely:

- install software
- run Software Update
- set system preferences
- set network preferences

SNMP Support

This version of Mac OS X Server supports Simple Network Management Protocol (SNMP), a network protocol for monitoring and managing multi-platform computer network devices. Read Chapter 8, “Administration Software,” for information about SNMP.

Server Monitor

Your Xserve software also includes a new application called Server Monitor. Server Monitor allows you to remotely check the status of Xserve hardware. Read about Server Monitor in Chapter 8, “Administration Software.”

Server Enhancements

Mac OS X Server also includes these new features to support your Xserve:

- Network Stack and server software optimizations provide improved network performance.
- Apple RAID (Redundant Array of Independent Disks) volume enhancements allow you to stripe or mirror your startup disk.
- Headless booting with hot-plug support allows you to start up your Xserve without a monitor connected and attach a monitor or KVM (keyboard, video, mouse) switch later without turning off the server.
- Uninterruptable Power Supply (UPS) support allows connection to a USB UPS system.

About ACGI Support

Apple Event-based CGI scripts (ACGI) are not supported in this version of Mac OS X Server. CGI scripts not based on Apple Events will run normally.

Where to Start

If you're a novice system administrator, start by reading the *Mac OS X Server Administrator's Guide*. This book is provided as a PDF document on the Admin Tools CD. The Preface and Chapter 1 will point you to the parts of the book that you need to read, depending on how you plan to use Mac OS X Server in your network.

If you're an experienced systems administrator with some UNIX administration experience, take a look at the *Mac OS X Server Administrator's Guide* to make sure you haven't missed anything. Then use this guide to get started installing and setting up your server.

Important Use this guide for setting up your server instead of Chapter 1 of the *Mac OS X Server Administrator's Guide*.

Getting More Information

Check the Mac OS X Server Web site regularly for new documentation, information about software updates, and useful information. The Mac OS X Server Web site is located at www.apple.com/macosx/server/

The Web site includes these useful documents:

- *Mac OS X Server Migration Guide* provides instructions for upgrading to Mac OS X Server from Macintosh Manager and Mac OS X Server 1.2. For this release of Mac OS X Server, Chapter 3, "Migrating AppleShare IP," does not apply.
- *Understanding and Using NetInfo* describes the built-in Mac OS X directory service and provides instructions for configuring NetInfo and Mac OS X Server.
- *Integrating Mac OS X With Active Directory* describes how you can use the information stored in Microsoft's Active Directory to authenticate Macintosh users and provide file services and home directories for them on Mac OS X Server.

You can also check the Apple Server Web site located at

www.apple.com/servers

for information about your server hardware and the software designed to support it.

Anti-Piracy Information

Be sure you're acting within the terms of the software license agreement before you install programs on a computer. The license agreement specifies how many copies of the program you can make for yourself and others.

Before you put programs inside shared folders, remember that copyright laws may prevent those programs from being shared. Check the applicable licensing agreements and follow their requirements.

If you want or need more information about when it's OK to copy software and when it isn't, or about related consumer issues, you can check the Software Publishers Association (SPA) Web site at

www.spa.org

Before You Begin

Your server comes with Mac OS X Server and the administration applications already installed. But before you get started, you'll need to do some planning and preparation to make the most of your server. Read through this chapter before you start any tasks. You can do the tasks in any order.

Read Mac OS X Server Administrator's Guide

If you're setting up Mac OS X Server for the first time, look at the first few chapters of the *Mac OS X Server Administrator's Guide* before you continue with this chapter. These chapters help you determine how to configure your server for your network.

Filling Out the Mac OS X Server Information Worksheet

At the back of this guide, you'll find a worksheet to help you plan your server setup. You must know the information on this worksheet to configure your server's Ethernet ports and network information when you run Server Assistant. When you're done with your setup, file the worksheet in a secure place for future reference.

Your server comes with a sheet of serial number (license key) stickers for Mac OS X Server and WebObjects. Affix them to the appropriate section of the worksheet and keep any unused stickers in a safe place. The hardware serial number is located on the back of the server and inside the server above the hard drives. Write this number on the worksheet—you must enter the first eight characters of this serial number when you run Server Assistant.

If you have trouble filling out any of the information, you can find answers to many of your questions in the *Mac OS X Server Administrator's Guide*. Your network administrator or Internet Service Provider may also be able to help.

Exporting Existing User Account Information

If you have existing AppleShare IP servers or Mac OS X Servers, you may want to export account information. You can later import this into your new Mac OS X Server. You may also want to migrate Macintosh Manager settings to your new server network.

For detailed instructions about migrating existing information from an earlier version of Mac OS X Server or Macintosh Manager, download the *Mac OS X Server Migration Guide* from the Mac OS X Server Web site at

www.apple.com/macosx/server

Note: Chapter 3 of the guide, “Migrating AppleShare IP,” does not apply for Xserve installations.

Migrating From Mac OS X Server 10.0 or 10.1

If you are replacing a server running Mac OS X Server 10.0 or 10.1 with an Xserve system, you can use the Users & Groups module in Server Admin to export and import user and group data.

To export user and group data:

- 1 Open Server Admin and log in to the server that stores user and group information.
- 2 Click Users & Groups and choose Show Users & Groups.
- 3 Select the user and group names that you want to export and click Export to save this information to a file.

After you've set up your new server, you can import the file you saved. To import the file:

- 1 Open Server Admin and log in to the server where you want the user and group information to be stored.
- 2 Click Users & Groups and choose Import.
- 3 Specify the location of the file with the import information and click Choose. If you already have some user and group data on your new server, choose how you want to handle duplicate names.

Migrating From AppleShare IP 6.3.x

If you are replacing an AppleShare IP 6.3.x server with an Xserve system, you can use the Users & Groups module in the Server Admin application to export the user and group data.

To export user and group data:

- 1 Open Server Admin and go to the Users & Groups module.
- 2 Choose Show Users & Groups from the menu.
- 3 Select the user and group names that you want to export and choose Export Selected Items from the menu to save this information to a file.

After you set up your new server, you can import the file you saved. To import the file:

- 1** Open Server Admin and log in to the server where you want the user and group information to be stored.
- 2** Click Users & Groups and choose Import.
- 3** Specify the location of the file with the import information and click Choose. If you already have some user and group data on your new server, choose how you want to handle duplicate names.

Installing Administration Software

The Admin Tools CD that came with your server has all the software you need to set up and administer the services installed on your server at the factory. This same administration software is also preinstalled on your server, should you decide to set up services locally.

Your admin computer can be a desktop or portable model with Mac OS X v10.1 or later installed. The chart on page 64 of this guide describes the software included on the CD.

To install the administration software package:

- 1** Insert the Admin Tools CD in your admin computer and locate the Admin Install package. The administration software is located here:
English/Admin Install/
- 2** Read the Admin Install PDF document for important information about the software and any updates.
- 3** Double-click the Admin_Install.mpkg icon and follow the onscreen instructions provided by the installer until you see Select a Destination.
- 4** Select a destination volume and click Continue.
- 5** Click Customize to choose the applications you want to install.
A basic installation includes both Mac OS X Server Admin and Mac OS X Server Admin Help.
- 6** Finish the installation, following the onscreen instructions.

Deciding On a Setup Option

You can set up your server in two ways:

- Connect to the server remotely from an admin computer and install software, set up preferences, and configure services using Server Assistant and command-line tools.
- Connect a keyboard and monitor to the server, then install software, set up preferences, and configure services locally on the server using Server Assistant.

Note: You can partition disks on the server remotely or locally. If you partition disks, you'll need to reinstall system software on the server.

Remote Setup

Setting up the server remotely involves using Server Assistant to specify basic preferences, network settings, and service configuration. Then you'll use command-line tools and SSH to install additional software and make any other system and network settings that you want.

Important To set up your server or install software remotely, connect your server to the network through the built-in Ethernet port.

If you plan to partition disks, you need to use some standard UNIX command-line tools. Some information about these tools is included in this guide, but you should already be familiar with these tools to use them effectively. If you partition disks, you'll need to reinstall the Mac OS X Server software before continuing.

Chapter 4, "Using Command-Line Tools," describes SSH and some standard UNIX command-line tools. If you're not familiar with them, read that chapter before you start. Then read the chapters that follow for detailed instructions on using each command-line tool to install software and make system and network settings.

Local Setup

To set up the server locally, you need to attach an external monitor and keyboard to your server and perform the initial setup tasks on the server itself. Once your setup is complete, you can disconnect the monitor and keyboard and restart the server. Then you can use the remote administration and monitoring tools to make further adjustments and monitor the server's performance. You can also leave the monitor and keyboard connected and administer the server locally.

With a local setup, you can also start the server from the hard disk, then use Disk Utility to partition the server's hard disks and set up a RAID (Redundant Array of Independent Disks) scheme. If you do either of these tasks, you'll need to reinstall the Mac OS X Server software on the server before continuing.

Important For instructions on connecting an external monitor and keyboard, see the *Xserve User's Guide*.

Software Setup Instructions

This chapter gives instructions for performing a basic remote setup and a basic local setup. If you plan to partition your server's hard disks, you can refer to the flowcharts at the end of each section to show you the order of the tasks you need to perform. You'll find more detail for some of the advanced setup tasks in the chapters that follow.

Note: If you plan to set up a RAID (Redundant Array of Independent Disks) system, you need to use Disk Utility while the server is started up from the hard drive, not from a CD. Two local setup options are:

- Install Mac OS X Server first on a hard disk in your Xserve and then use Disk Utility locally on the server to set up a RAID system on the remaining hard disks.
- Start up your server from an external FireWire hard disk with Mac OS X installed and use Disk Utility to set up a RAID system on the hard disks installed in your server.

After performing a remote or local setup, turn to "Additional Setup Tasks" on page 26 and follow the steps there.

Basic Remote Setup Instructions

These steps describe the installation and setup process for a basic remote setup. The flowchart on page 22 illustrates the task flow for both a basic remote setup and an advanced setup including partitioning drives. Refer to the flowchart during your setup, to keep you on track.

Step 1: Start the server

Press the power button on the server to start up from the hard disk with factory-installed Mac OS X Server software.

To start up from the Mac OS X Server CD:

- 1 Press and hold the system identifier button while you press the power button.
- 2 Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.

- 3 Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 4 Close the tray. The server starts up from the CD.

Step 2: Run Server Assistant

Start Server Assistant on your admin computer and choose whether you want to install software or create an administrator account and configure services. For a basic remote setup, you'll choose "Set up a server." Then locate the server you want to set up in the list.

Important Server Assistant only displays servers located on the local subnet.

When prompted, enter the first eight characters of the hardware serial number of the server you're setting up in the password box. The serial number is on the worksheet you filled out. Server Assistant guides you through the rest of the setup.

You'll use Server Assistant to

- enter the software serial number
- set up an administrator account
- enable encryption for Windows clients
- choose how the server will use NetInfo
- set up network configuration
- configure Ethernet ports

You can also configure these services to start automatically whenever you restart the server:

- Web service
- Print service
- Apple file service
- Macintosh Manager
- NetBoot
- QuickTime Streaming Server

If you're not sure which options to choose during the setup, Server Assistant provides some information—just click the question mark. You'll find more help in the *Mac OS X Server Administrator's Guide*.

When you're done, Server Assistant restarts the server for you.

Step 3: Configure services

To finish configuring Mac OS X Server services, use the Server Admin application. If you haven't already installed the admin software on your admin computer, read "Installing Administration Software" on page 17.

For information about Server Admin, read "Server Admin" on page 65. When you're finished configuring services, you can perform any of the tasks that follow, depending on your needs.

Step 4: Set server network and system preferences

You used Server Assistant to configure some of your network and system preferences. To set additional network and system preferences remotely for the server, you can use Secure Shell (SSH) and the command-line tools provided in this version of Mac OS X Server. See Chapter 5, "Network Setup Tool," and Chapter 6, "System Setup Tool."

If you're new to command-line tools, read Chapter 4, "Using Command-Line Tools," for detailed instructions.

Step 5: Install additional software

To install software on the server from a remote computer, you use Server Assistant (to reinstall system software), or SSH and command-line tools to install other packages.

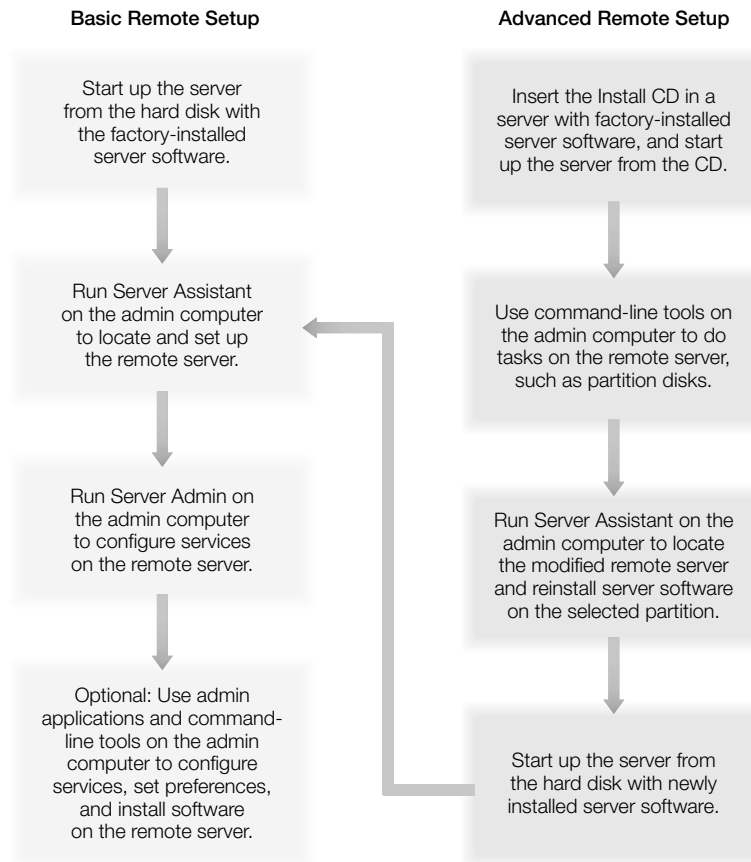
To install software from a CD using these methods, you must have physical access to the server so you can insert the application CD in the server's optical drive.

You can run Software Update Tool (using SSH) to check for and install newer versions of the software on your server. Software updates are available through an Internet connection. You can do these updates without having physical access to the server.

Instructions for using the Installer Tool and Software Update Tool are in Chapter 7, "Using Software Installation Tools and Applications."

Remote Setup Flowchart

If you need to partition disks, use the Advanced Remote Setup flowchart. Otherwise, use the Basic Remote Setup.



Basic Local Setup Instructions

These steps describe a basic local setup. The flowchart on page 25 illustrates the task flow for both a basic local setup and an advanced setup that includes partitioning drives. Refer to the flowchart during your setup, to keep you on track.

Step 1: Connect monitor and keyboard

Follow the instructions in the *Xserve User's Guide* to connect a monitor and keyboard to the server.

Step 2: Start the server

To start up from the hard disk with factory-installed Mac OS X Server software, press the power button on the server.

To start up from the Mac OS X Server CD:

- 1 Press and hold the system identifier button while you press the power button.
- 2 Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.
- 3 Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 4 Close the tray. The server starts up from the CD.

Step 3: Run Server Assistant

When prompted, enter the hardware serial number of the server you're setting up in the password box. The serial number is on the worksheet you filled out. Server Assistant guides you through the rest of the setup.

Use Server Assistant to

- select a keyboard language
- enter the software serial number
- set up an administrator account
- enable encryption for Windows clients
- choose how the server will use NetInfo
- set up network configuration
- configure Ethernet ports

You can also configure these services to start automatically whenever you restart the server:

- Web service
- Print service
- Apple file service
- Macintosh Manager
- NetBoot
- QuickTime Streaming Server

If you're not sure which options to choose during the setup, Server Assistant provides some information—just click the question mark. You'll find more help in the *Mac OS X Server Administrator's Guide*.

When you're done, Server Assistant restarts the server for you.

Step 4: Configure services

To finish configuring Mac OS X Server services, use the Server Admin application. If you haven't already installed the admin software on your admin computer, read "Installing Administration Software" on page 17.

For information about Server Admin, read "Server Admin" on page 65. When you're finished configuring services, you can perform any of the steps that follow, depending on your needs.

Step 5: Set server network and system preferences

Since you're working directly on the server, you can set some network and system configurations using the local System Preferences. You can change these settings later using SSH and the command-line tools described later in this guide.

Step 6: Install additional software

To install additional software packages on the server, insert the application disc in the server's optical drive, and follow the instructions in the software installer.

You can also run Software Update (located in /System Preferences/Software Update) to check for and install newer versions of the software on your server.

You can also install software on the server remotely. See Chapter 7, "Using Software Installation Tools and Applications."

Step 7: Perform any additional tasks

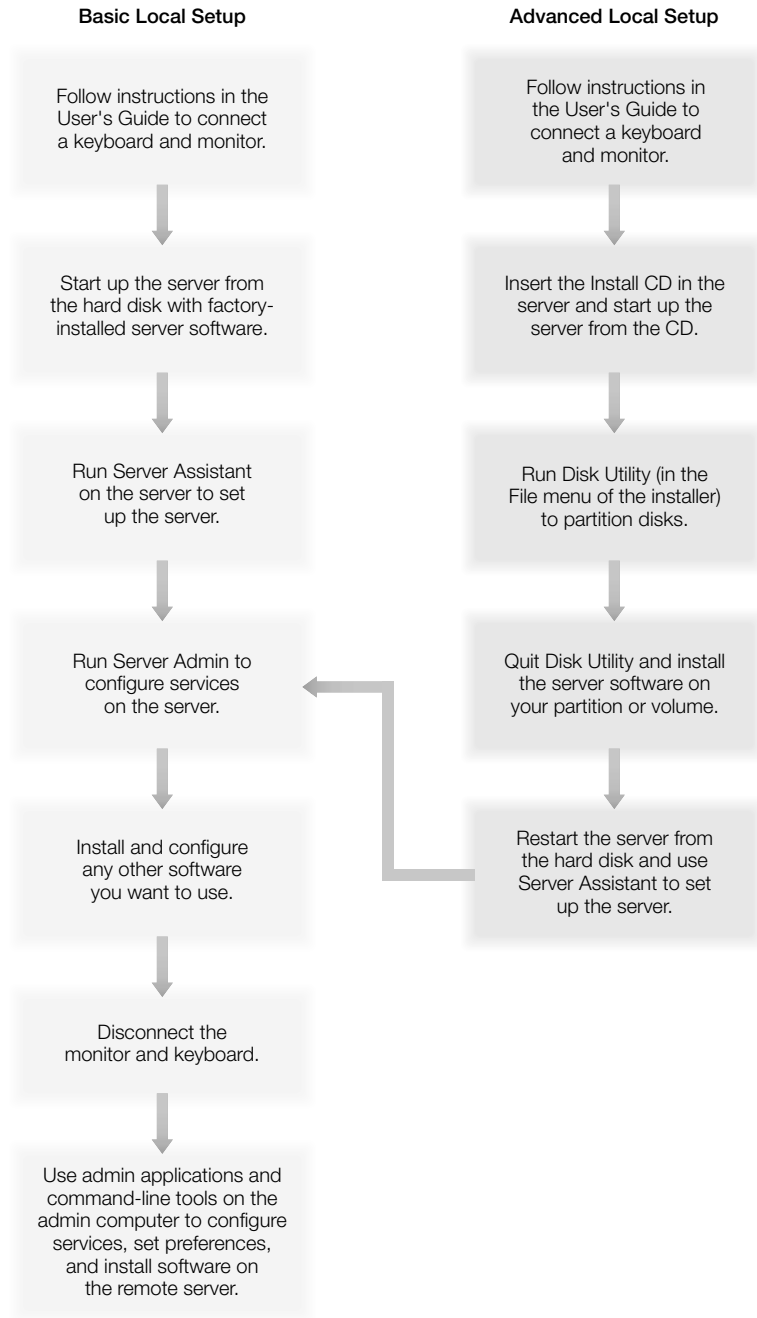
While you're still connected to the server, you may want to perform any of the additional setup tasks mentioned in "Additional Setup Tasks" on page 26.

Step 8: Disconnect the keyboard and monitor

When you've finished all the installation and configuration you planned, you can disconnect the monitor and keyboard if you plan to administer the server remotely. You may also leave the monitor and keyboard attached.

Local Setup Flowchart

If you need to partition disks or set up RAID, use the Advanced Local Setup flowchart.



Additional Setup Tasks

After your initial setup of software, you may need to perform some other tasks.

Set NetInfo Hierarchies and Search Policies

NetInfo is the built-in directory service for Mac OS X. User information needed by directory services is stored on Mac OS X Servers in NetInfo databases known as domains. You use Remote Directory Setup on your admin computer to specify whether your server uses the NetInfo or LDAP (Lightweight Directory Access Protocol) directory for User and Group accounts.

Use Remote NetInfo Domain Setup to create NetInfo hierarchies and set the search policy for your server.

Note: If you are setting up your server locally, use the local versions of these applications: Directory Setup and NetInfo Domain Setup.

For information about setting up NetInfo domains and using LDAP, read Chapter 2 in the *Mac OS X Server Administrator's Guide*. The documents *Understanding and Using NetInfo* and *Integrating Mac OS X With Active Directory* have more information about these topics, and are available for downloading at www.apple.com/macosx/server/

Configure Services

Use the administration software you've installed to set up User and Group accounts and configure services such as WebObjects, NetBoot, Macintosh Manager, and QuickTime Streaming Server.

Read Chapter 8, "Administration Software," for information about these applications. They are also described in detail in the *Mac OS X Server Administrator's Guide*.

Using Command-Line Tools

Xserve can be configured remotely using command-line tools and administration applications designed to support them. This version of Mac OS X Server includes these new command-line tools:

- Installer Tool
- Software Update Tool
- System Setup Tool
- Network Setup Tool

To configure a server remotely with command-line tools, you use the Terminal application on the remote computer.

Using the Terminal Application

Mac OS X Server includes the Terminal application, which you can use to open a shell command-line session on your computer or a remote computer you are administering. The Terminal application is located in /Applications/Utilities.

When you open Terminal, you see a prompt that usually includes the name of the local host, the directory you're using, your user name, and a symbol. For example:

```
[patsy6:/usr/sbin] liz%
```

In this example, patsy6 is the server's host name, the directory you are working in is /usr/sbin, and the user name is liz.

The percent symbol (%) is called the *prompt*. It indicates that you can enter a command. Press the Return key after you type a command. Depending on what you typed, you could see a list of information followed by another prompt, or your command will execute and give you some type of feedback and a prompt, or no feedback and another prompt. No feedback usually means that the command was executed properly.

About UNIX Command-Line Structure

UNIX commands share some basic conventions. First you enter the name of the tool, then any information the tool needs to carry out your request. Most tools come with help or man (short for “manual”) pages that describe how to use the tool. Help pages give an overview of *arguments* (also known as *options* or *parameters*) that the tool understands. Man pages give more detail and examples.

To find help pages, type the name of the tool and then the argument `-help`. For example:

```
pdisk -help
installer -help
```

To find man pages for a tool, type `man`, followed by the tool name. For example:

```
man ssh
man installer
```

These conventions are used in describing tool options: *italic text in <angle brackets>* represents information you need to supply, and text in [square brackets] represents optional information you can supply.

When you supply information in a command, enclose location or item names that include spaces in quotation marks (“like this”).

Here’s an example of a command as you might see it described in a man page for the Network Setup Tool, followed by what you would type, and the result.

Man page example:

```
"Usage: networksetup -setmanual <network service> <ip address> <subnet>
      <router>"
```

```
Set the <network service> TCP/IP configuration to manual with IP Address
set to <ip address>
```

Type this:

```
networksetup -setmanual "Built-in Ethernet" 192.168.00.100
                255.255.255.0 192.168.100.1
```

To get this result:

```
Manual Configuration
IP Address: 192.168.100.100
Subnet Mask: 255.255.255.0
Router: 192.168.100.1
```

Using the Secure Shell (SSH) Command

Mac OS X Server supports Secure Shell (SSH), so an administrator can log in to a remote server and send secure, encrypted commands over a network. With SSH turned on, you can use the Terminal application to open a SSH session and use the command-line tools to configure your remote server. You can also connect a terminal to Xserve through the serial port and log in using SSH. (For information about this, see “Connecting Through the Serial Port” on page 79.)

SSH is turned on by default when you run Mac OS X Server Assistant. You can also turn SSH on or off for a client computer in the Sharing preferences. Click the Application tab and check “Allow remote login.”

Important If you turn SSH off, you can’t administer the server remotely. To turn SSH back on, you must do so locally on the server.

Open a SSH Session

To use command-line tools, you must first open a SSH session and log in to the server you want to configure.

- 1 Open Terminal on your admin computer.
- 2 At the prompt, type `ssh`, then a hyphen, the flag “l” (lower case L, for “login”) followed by the user name of the administrator of the remote server, and the server’s IP address or host name. (You can find this information on the worksheet you filled out during server setup.) Press Return when you’re finished.

For example, if the admin name is `jsmith` and the server’s IP address is `192.168.100.100`, you would type:

```
ssh -l jsmith 192.168.100.100
```

If you’re not sure of the administrator name for the server, you can also enter the administrator information this way:

```
ssh admin@192.168.100.100
```

- 3 At the prompt, type the administrator password and press Return.

Note: If you don’t enter an administrator name (or `admin`), SSH will use the user name of the person currently logged in to the admin computer. If this user doesn’t have administrator access to the server, you must enter the appropriate administrator name.

If everything is entered correctly, the prompt displays the hostname of the remote server. For example:

```
[192.168.100.100:~] jsmith%
```

Note: If you started the server up from a CD and logged in as root, you will only see a number sign (`#`) instead of the hostname of the remote server.

Execute Commands

Once you are logged in using SSH, you can use command-line tools to execute commands on the remote server.

If you want to execute a single command on the server and then immediately log out of the server, you can do it in one step. Type your login information and the command, then press Return. For example, the command to log in to a remote server and remove a file called “Test Data” looks like this

```
ssh -l root 192.168.100.100 rm "/Documents/Test Data"
```

The server asks for the password, then executes the command and returns you to your admin computer.

Close a SSH Session

When you are finished with a SSH session, you should close the session, especially if you are logged in as the root administrator with root privileges, so that no one else can make changes on the server. Here is an example of what a session might look like if jsmith logs in to labserver2 as an administrator and then logs out.

```
[labserver1:~] jsmith%  
ssh -l jsmith labserver2  
Welcome to Darwin!  
[labserver2:~] jsmith% exit  
logout  
Connection to labserver2 closed.  
[labserver1:~] jsmith%
```

About Key Fingerprints

The first time you connect to a server using SSH, your local computer adds a “fingerprint” from the remote server to a list of known remote host computers. The next time you connect, you won’t see this message. Here’s what jsmith might see if he logged in to a server for the first time.

```
ssh -l jsmith 192.168.12.12  
The authenticity of host '192.168.12.12' can't be established.  
RSA key fingerprint is  
    a8:0d:27:63:74:00:f1:04:bd:6a:e4:0d:a3:47:a8:f7.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '192.168.12.12' (RSA) to the list of known  
    hosts.  
jsmith@192.168.12.12's password:
```

If you see a warning message about a “man in the middle attack” when you try to connect using SSH, that means the RSA key fingerprint on the server and your admin computer no longer match. This can happen if you use command-line tools to administer a remote server, establish an RSA key fingerprint, and later change your SSH configuration, perform a clean install of system software, or start up from the Mac OS X Server CD.

To connect to the remote server again using SSH, you need to edit the entries corresponding to the hosts (which can be stored by both name and IP number) in this file: `~/ssh/known_hosts`. You can use TextEdit or another editor to find the hostname or IP address and then delete the key. The key is a long string that may wrap to several lines. In TextEdit you can press the Control key and type K to delete the line, then delete the blank line that it creates.

Standard UNIX Command-Line Tools

Mac OS X Server includes support for many basic UNIX command-line tools that you can use to manage and set up servers. Information about three of these tools is provided here, but you should read the man pages for each tool to fully understand how to use them.

Check Disks for Problems

`fsck`

`fsck_hfs`

To check for problems with disks locally, you can use Apple’s Disk First Aid application. To do this from a remote admin computer, you need to log in using SSH and use these command-line tools: `fsck_hfs` (for Mac OS Extended, or Hierarchical File System, formatted disks) or `fsck` (for UNIX File System formatted disks).

You can only use these commands on unmounted volumes, so you can’t use them on the volume the server is started from. Unmount volumes before you start.

- 1** Log in to the server as the root administrator.

- 2 List the volumes you currently have, as you will need the `/dev/diskXsY` information for each volume. To do this, type:

```
df -lk
```

to see this type of information:

Filesystem	1K-blocks	Used	Avail	Capacity	Mounted On
<code>/dev/disk1s9</code>	8448000	2397216	6050784	28%	<code>/</code>
<code>fdesc</code>	1	1	0	100%	<code>/dev</code>
<code>/dev/disk0s9</code>	8848296	2544256	6304040	28%	<code>/Volumes/Disk1</code>
<code>/devdisk0s10</code>	8848296	17680	8830616	0%	<code>/Volumes/Disk2</code>
<code>/devdisk0s11</code>	102918840	3063916	99854928	2%	<code>/Volumes/Hard\Drive</code>
<code>/devdisk1s10</code>	8448728	3643104	4805624	43%	<code>/Volumes/Disk3</code>
<code>/devdisk1s11</code>	61247160	29544	61217616	0%	<code>/Volumes/Disk4</code>

- 3 Unmount the volume from the system. To do this, type:

```
/usr/sbin/disktool -p <diskXsY> 0
```

and replace `<diskXsY>` with the information you found in the list. For example, to unmount `/dev/disk0s9` in the above list, type:

```
/usr/sbin/disktool -p disk0s9 0
```

Use the default flag 0 (zero) for this command.

Note: If you have a RAID volume, you will only see `/dev/diskX`. If so, use “`disktool -u`” instead of “`disktool -p`” to unmount it.

- 4 Check the files, using `fsck` for UFS volumes and `fsck_hfs` for HFS+ volumes. To do this, type this command (be sure to precede the disk information with “`r`”):

```
/sbin/fsck_hfs /dev/r<diskXsY>
```

- 5 If you receive no warnings or error messages, remount the disk with this command:

```
/usr/sbin/disktool -m <diskXsY> 0
```

To return to the shell prompt, press the Control key and type `c`.

Partition Disk Drives

`pdisk`

You can use this command-line tool to remove and replace existing hard disk partitions but not to create new partitions. Make sure that the revised partitions use the same range of disk blocks as the original partitions. This guide provides information for performing some specialized tasks. To find out more, read the man pages for the tool.

To use this tool:

- 1 Log in to the server as the root administrator.
- 2 At the prompt, type:

```
pdisk
```

and at the next prompt type:

```
?
```

to see a list of top level commands you can use to perform different tasks using the `pdisk` tool.

Note: If you use the `df` or `disktool` commands before you use `pdisk` to partition disks, you may not be able to save your changes.

Initialize a File System

```
newfs
```

```
newfs_hfs
```

Use the `newfs` command-line tool to initialize a file system after you repartition hard disks with the `pdisk` tool. There are many options for this tool. The steps given below produce a wrapped HFS+ volume with default parameters. To find out more about this tool and other parameters, read the man pages for the tool.

- 1 Log in to the server as the root administrator.
- 2 List the volumes you currently have, as you will need the `/dev/diskXsY` information for each volume. To do this, type:

```
df -lk
```

to see something like this:

Filesystem	1K-blocks	Used	Avail	Capacity	Mounted On
<code>/dev/disk1s9</code>	8448000	2397216	6050784	28%	<code>/</code>

- 3 Unmount the volume from the system. To do this, type this command, replacing *<diskXsY>* with the information you found in the list (“0” is the default flag):

```
/usr/sbin/disktool -p <diskXsY> 0
```

For example, to unmount the device above, type:

```
usr/sbin/disktool -p disk1s9 0
```

Note: If you have a RAID volume, you will only see `/dev/diskX`. If so, use “`disktool -u`” instead of “`disktool -p`” to unmount it.

- 4 Initialize the file system. To do this, type:

```
/sbin/newfs_hfs -w -v <newvolumename> /dev/rdiskXsY
```

- 5 If you receive no warnings or error messages, remount the disk with this command:

```
/usr/sbin/disktool -m <diskXsY> 0
```

To return to the shell prompt, press the Control key and type `c`.

Example 1: Divide One 120 GB Disk Drive Into Two 60 GB Partitions

This example illustrates how to use `pdisk` and `newfs` to partition a 120 GB disk drive into two 60 GB partitions and initialize the partitions.

Step 1: Start up from a CD

To start up from the Mac OS X Server CD:

- 1 Press and hold the system identifier button while you press the power button.
- 2 Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.
- 3 Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 4 Close the tray. The server starts up from the CD.

Step 2: Log in to the server

Open a SSH session and log in to the server as root.

Step 3: Use `pdisk` to find unmounted volumes

List all the device maps for a hard disk and choose the ones you want to mount. Type:

```
pdisk
L
```

The session, with example output, looks like this:

```
pdisk
Top level command (? for help): L
/dev/rdisk2 map block size =512
#:  type                name                                length base          (size)
1:  Apple_partition_map  Apple                                Apple63 @ 1
2:  Apple_Driver43*Macintosh  56 @ 64
3:  Apple_Driver43*Macintosh  56 @ 120
4:  Apple_Driver_ATA*Macintosh  56 @ 176
5:  Apple_Driver_ATA*Macintosh  56 @ 232
6:  Apple_FWDriver Macintosh  512 @ 288
7:  Apple_Driver_IOKit Macintosh  512 @ 800
8:  Apple_Patches Patch Partition  512 @ 1312
9:  Apple_HFS hfs5                241252896 @ 1824 (115.0G)
```

Step 4: Choose a device map to partition

When prompted, type `e` and choose the disk you want to partition (in this case, `/dev/rdisk2`). The session looks like this:

```
Top level command (? for help): e
Name of device: /dev/rdisk2
/dev/rdisk2
```

Step 5: Delete the existing partitions

You must delete partitions on the disk one at a time. So for each partition, when prompted, type `d` to delete the existing partition, specify the partition number, and then type `p` to print the partition map. When you're done, you will have one partition, `Apple_Free Extra`. The final session looks like this:

```
Top level command (? for help): d
Partition number: 10
Top level command (? for help): p
/dev/rdisk2 map block size=512
#:   type      name      length base      (size)
1:   Apple_Free Extra    241252896 @ 1824    (115.0G)
Device block size=512, Number of Blocks=241254720
```

Step 6: Create a new partition

Create a new partition for the first available block. In this example, you'll split the hard disk in half. The first partition block is 1824 and the length in blocks is 120626448. You will name the block and designate the type of partition (HFS). The session, with output, looks like this:

```
Top level command (? for help): C
First block: 1824
Length in blocks: 120626448
Name of partition: hfs1
Type of partition: Apple_HFS
Command (? for help): p
/dev/rdisk2 map block size=512
#:   type      name      length base      (size)
1:   Apple_HFS hfs1      120626448@ 1824    (57.5G)
2:   Apple_Free Extra    120626448 @ 120628272 (57.5G)
Device block size=512, Number of Blocks=241254720
```

Step 7: Add a second partition

Create and name a second partition formatted as HFS out of the remaining free space listed in the partition map. The session, with output, looks like this:

```
Top level command (? for help): C
First block: 120628272
Length in blocks: 120626448
Name of partition: hfs2
Type of partition: Apple_HFS
Command (? for help): p
/dev/rdisk2 map block size=512

#:   type      name      length base              (size)
1:   Apple_HFS hfs1    120626448@ 1824          (57.5G)
2:   Apple_HFS hfs2    120626448 @ 120628272  (57.5G)

Device block size=512, Number of Blocks=241254720
```

Step 8: Write the new partition map

At the prompt, type `w` to close the map and save (write) the new partitions. A warning message says that writing the map destroys what was there before. This is what you want to do, so type `yes` at the prompt.

Step 9: Exit

Type `q` to exit the `pdisk` tool.

Step 10: Initialize the new partitions

Use `newfs_hfs` to initialize the partitions. You will now have new `dev` entries related to the partition maps available in `/dev/disk*`. In this example, use the `cd` command to change to the `/dev` directory, then list the partition on the first disk. The session looks like this:

```
# newfs_hfs -w -v HFSVolume /dev/disk2s1
Initialized /dev/disk2s1 as a 58 GB HFS Plus volume
# newfs_hfs -w -v HFSVolume1 /dev/disk2s2
Initialized /dev/disk2s2 as a 58 GB HFS Plus volume
```

Step 11: Mount the new volumes

Restart the server, which will automatically mount the new volumes. You can then log in remotely to perform any additional tasks, such as installing an operating system.

Example 2: Divide a Secondary Hard Disk Into Two Partitions

In this example, you have a primary hard disk called disk 0 and a second 120 GB hard disk called disk 1 that you want to divide into two 60 GB partitions.

Step 1: Start up from the hard disk

Start the server from the internal hard disk.

Step 2: Log in to the server

Open a SSH session and log in to the server as root.

Step 3: Use `pdisk` to find volumes

List all the device maps for the volumes. Type:

```
pdisk
L
```

The session, with example output, looks like this:

```
pdisk
Top level command (? for help): L
/dev/rdisk3 map block size =512
#:   type                name                length base          (size)
1:   Apple_partition_map Apple                Apple63 @ 1
2:   Apple_Driver43*Macintosh 56 @ 64
3:   Apple_Driver43*Macintosh 56 @ 120
4:   Apple_Driver_ATA*Macintosh 56 @ 176
5:   Apple_Driver_ATA*Macintosh 56 @ 232
6:   Apple_FWDriver Macintosh 512 @ 288
7:   Apple_Driver_IOKit Macintosh 512 @ 800
8:   Apple_Patches Patch Partition 512 @ 1312
9:   Apple_HFS part1          241252896 @ 1824  (115.0G)
```

Step 4: Unmount the secondary hard disk

Use `disktool` to unmount (or eject) all the partitions of disk 1. To do this, type:

```
[localhost:~] root# disktool -u disk1 0
```

Step 5: Choose a device map to partition

Use `pdisk` to partition the 120 GB hard disk into two 60 GB partitions. When prompted, type `e` and choose the disk you want to partition (in this case, `/dev/rdisk2`). Then type `p` to show the partition maps. The session, with output, looks like this:

```
pdisk
Top level command (? for help): e
Name of device: /dev/rdisk2
/dev/rdisk2
Command (? for help): p
/dev/rdisk2 map block size=512

#:  type          name                length base          (size)
1:  Apple_partition_map Apple                Apple63 @ 1
2:  Apple_Driver43*Macintosh          56 @ 64
3:  Apple_Driver43*Macintosh          56 @ 120
4:  Apple_Driver_ATA*Macintosh         56 @ 176
5:  Apple_Driver_ATA*Macintosh         56 @ 232
6:  Apple_FWDriver Macintosh           512 @ 288
7:  Apple_Driver_IOKit Macintosh       512 @ 800
8:  Apple_Patches Patch Partition      512 @ 1312
9:  Apple_HFS part1                    241252896 @ 1824    (115.0G)

Device block size=512, Number of Blocks=241254720
```

Step 6: Delete the existing partition

You must delete the partitions on the disk one at a time. So for each partition, when prompted, type `d` to delete the existing partition, specify the partition number, and then enter `p` to print the partition map. When you're done, you will have one partition, `Apple_Free Extra`. The final session looks like this:

```
Top level command (? for help): d
Partition number: 9
Top level command (? for help): p
/dev/rdisk2 map block size=512

#:  type          name                length base          (size)
1:  Apple_Free Extra      241252896 @ 1824    (115.0G)

Device block size=512, Number of Blocks=241254720
```

Step 7: Create a new partition

Create a new partition for the first available block. In this example, you'll create a block 1824 with a length of 120626448. The session, with output, looks like this:

```
Top level command (? for help): C
First block: 1824
Length in blocks: 20626448
Name of partition: vol1
Type of partition: Apple_HFS
Command (? for help): p
/dev/rdisk2 map block size=512

#:   type      name          length base          (size)
1:   Apple_HFS vol1          120626448 @ 1824    (57.5G)
2:   Apple_Free Extra          120626448 @ 120628272 (57.5G)

Device block size=512, Number of Blocks=241254720
```

Step 8: Add a second partition

Create and name a second partition formatted as HFS out of the remaining free space listed in the partition map. The session, with output, looks like this:

```
Top level command (? for help): C
First block: 120628272
Length in blocks: 120626448
Name of partition: vol2
Type of partition: Apple_HFS
Command (? for help): p
/dev/rdisk2 map block size=512

#:   type      name          length base          (size)
1:   Apple_HFS vol1          120626448 @ 1824    (57.5G)
2:   Apple_HFS vol2          120626448 @ 120628272 (57.5G)

Device block size=512, Number of Blocks=241254720
```

Step 9: Write the new partition map

At the prompt, type `w` to close the map and save (write) the new partitions. A warning message says that writing the map destroys what was there before. This is what you want to do, so type `yes` at the prompt.

Step 10: Exit

Type `q` to exit the `pdisk` tool. Then use the `cd` command to change to the `/dev` directory and the `ls` command to list the partitions on the disk. The session looks like this:

```
Top level command (? for help): q
The end
[localhost:~] root# cd /dev
[localhost:/dev] root# ls disk2*
disk2 disk2s1 disk2s2
```

Step 11: Initialize the new partitions

Use `newfs_hfs` to initialize the partition. You will now have new `dev` entries related to the partition maps available in `/dev/disk*`. The session looks like this:

```
[localhost:/dev] root# newfs_hfs -w -v HFSVolume1 /dev/disk2s1
newfs_hfs: /dev/disk2s1 is mounted on /Volumes/volume5
[localhost:/dev] root# newfs_hfs -w -v HFSVolume2 /dev/disk2s2
Initialized /dev/disk2s2 as a 58 GB HFS Plus volume
[localhost:/dev] root# reboot
Connection to 192.167.100.100 closed by remote host.
Connection to 192.167.100.100 closed.
```


Network Setup Tool

You can configure settings for network hardware ports such as your server's built-in Ethernet, Ethernet cards, or serial port. Mac OS X also supports multihoming, which means that multiple network services can be active at the same time. With multihoming, you can also have multiple IP configurations on a single network hardware port.

On a computer running Mac OS X, you can configure network services in the Network pane of System Preferences. In Mac OS X Server, you can either connect a keyboard and monitor to a server and edit these settings locally, or you can use the Network Setup command-line tool to configure network services on a server remotely.

A “network service” is a complete collection of settings for a specific network hardware port. You may have one or several network services for a given hardware port.

The Network Setup Tool allows you to

- enable or disable network services
- create new network services
- set the order of network services
- configure the TCP/IP options of the network services
- set other networking options for the services, such as proxy server information

Using Network Setup

Network Setup is a command-line tool that you use with a terminal application and SSH (Secure Shell). Mac OS X comes with a terminal application called Terminal. You can find this application in

/Applications/Utilities

If you're not familiar with command-line tools and SSH, read Chapter 4, “Using Command-Line Tools.”

To use Network Setup:

- 1 Open Terminal.
- 2 Open a SSH session to the target server and log in as an administrator.
- 3 Type `networksetup` followed by any arguments and options you want to set, then press Return. For example, if you want to see a list of all the network services on the server's hardware ports, type

```
networksetup -listallnetworkservices
```

Finding More Information About the Network Setup Tool

Use these parameters to find information about the Network Setup Tool:

```
networksetup -printcommands
```

Displays a list of commands with no detail.

```
networksetup -help
```

Displays a list of all the commands available in the Network Setup Tool, with explanatory information.

```
man networksetup
```

Displays the complete manual pages.

Reverting to Old Network Settings

When you change your network preference settings with the Network Setup Tool, your previous settings are saved to the `com.apple.preferences.xml.old` file located in

```
/var/db/SystemConfiguration/com.apple.preferences.xml.old
```

If you want to revert to your previous settings, rename the file “`com.apple.preferences.xml`” and then restart the server.

If your network settings prevent you from accessing the server using SSH, attach a monitor and keyboard to the server, log in as root, and rename the file “`com.apple.preferences.xml`” (replacing the current one). Restart the server to apply the settings.

Note: If you make changes to network settings locally on the server using Network preferences, the settings in the `com.apple.preferences.xml.old` file will not match the settings you make using Network Setup.

Getting Network Configuration Information for Your Server

Use these parameters when you want to find out information about the network services set up on a remote server:

```
networksetup -listnetworkserviceorder
```

Displays a list of network services in the order they are contacted for a connection, along with the corresponding port and device for each. An asterisk (*) next to a service means the service is inactive.

```
networksetup -listallnetworkservices
```

Displays a list of all network services. An asterisk (*) next to a service means the service is inactive.

```
networksetup -listallhardwareports
```

Displays a list of hardware ports with corresponding device names and Ethernet addresses.

```
networksetup -detectnewhardware
```

Detects new network hardware and creates a default network service on the hardware.

```
networksetup -getinfo <network service>
```

Displays the IP address, subnet mask, router, and Ethernet address for a network service that you specify.

Example command:

```
networksetup -getinfo "Built-in Ethernet"
```

Configuring TCP/IP Settings

You can use these Network Setup parameters to configure TCP/IP settings.

Set the TCP/IP Configuration to Manual

Use this command to specify a manual TCP/IP configuration for the network service.

```
-setmanual <network service> <ip address> <subnet mask> <router>
```

Example command:

```
networksetup -setmanual "Built-in Ethernet" 192.168.100.100  
255.255.255.0 192.168.100.1
```

Set the TCP/IP Configuration to DHCP

Use this command to set the TCP/IP configuration for the specified network service to use DHCP. The client ID is optional.

```
-setdhcp <network service> [client id]
```

Example command:

```
networksetup -setdhcp "Built-in Ethernet"
```

Set the TCP/IP and DHCP Router to Manual

Use this command to specify a manual IP address to use for DHCP.

```
-setmanualwithdhcprouter <network service> <ip address>
```

Example command:

```
networksetup -setmanualwithdhcprouter "Built-in Ethernet"  
192.167.100.100
```

Set BOOTP

Use this command to set the TCP/IP configuration for the specified network service to use BOOTP.

```
-setbootp <network service>
```

Example command:

```
networksetup -setbootp "Built-in Ethernet"
```

Configuring DNS Servers and Search Domains

Use these parameters to specify how you want network services to use DNS.

Designate DNS Servers

Use this command to specify the IP addresses of servers you want the network service to use to resolve domain names. You can list any number of servers (replace dns1, dns2, and so on with the IP addresses of domain name servers).

```
-setdnsservers <network service> <dns1> [dns2] [...]
```

Example command:

```
networksetup -setdnsservers "Built-in Ethernet" 192.168.100.100  
192.168.100.128
```

If you want to clear all DNS entries for the specified network service, type “empty” in place of the DNS server name.

Example command:

```
networksetup -setdnsservers "Built-in Ethernet" empty
```

Designate Search Domains

Use this command to designate the search domain for the network service. List any number of search domains (replace domain1 and so on with the name of a local domain).

```
-setsearchdomains <network service> <domain1> [domain2] [...]
```

Example command:

```
networksetup -setsearchdomains "Built-in Ethernet" company.com  
corp.com
```

If you want to clear all search domain entries for the network service, type “empty” in place of the domain name.

Example command:

```
networksetup -setsearchdomains "Built-in Ethernet" empty
```

Managing Network Services

You can use the Network Setup Tool to create or rename network services, turn them on or off, remove them, and change the order they’re contacted. The `-listallhardwareports` command displays the names of the hardware ports.

Create a New Network Service

Use this command to create a new network service with the specified name on the specified port.

```
-createnetworkservice <new network service> <hardware port>
```

Example command:

```
networksetup -createnetworkservice "Built-in Ethernet2" "Built-in  
Ethernet"
```

Duplicate an Existing Network Service

Use this command to duplicate an existing network service and name the new service.

```
-duplicatenetworkservice <network service> <new network service name>
```

Example command:

```
networksetup -duplicatenetworkservice "Built-in Ethernet" "Built-in  
Ethernet2"
```

Rename a Network Service

Use this command to rename the specified network service.

```
-renamenetworkservice <network service> <new network service name>
```

Example command:

```
networksetup -renamenetworkservice "Built-in Ethernet" "LocalLAN"
```

Delete a Network Service

Use this command to delete a network service.

```
-removenetworkservice <network service>
```

Example command:

```
networksetup -removenetworkservice "Built-in Ethernet2"
```

Note: You cannot use this command to delete the last remaining service for a hardware port. To do so, you use the `-setnetworkserviceenabled` command.

Turn a Network Service On or Off

Use this command to turn the specified network service on or off (enable or disable).

```
-setnetworkserviceenabled <network service> <on or off>
```

Example command:

```
networksetup -setnetworkserviceenabled "Built-in Ethernet" off
```

To turn AppleTalk on or off:

```
-setappletalk <network service> <on or off>
```

Example command:

```
networksetup -setappletalk "Built-in Ethernet" off
```

To turn passive FTP on or off:

```
-setpassiveftp <network service> <on or off>
```

Example command:

```
networksetup -setpassiveftp "Built-in Ethernet" on
```

Set the Order Network Services are Contacted

Use this command to designate the order network services are contacted on the specified hardware port. Name the network you want contacted first, then the second, and so on.

```
-ordernetworkservices <service1> <service2> [...]
```

Example command:

```
networksetup -ordernetworkservices "Built-in Ethernet" "LocalLAN"
```


Designating Proxy Servers

You can use the Network Setup Tool to designate servers to be used as proxies for some services. Use these commands to set up proxy servers.

```
-setftpproxy  
-setwebproxy  
-setsecurewebproxy  
-setstreamingproxy  
-setgopherproxy  
-setsocksfirewallproxy
```

For each command, specify the network service, domain, and port number in this format:

```
-setwebproxy <network service> <domain> <port number>
```

Example command:

```
networksetup -setwebproxy "Built-in Ethernet" proxy.company.com 80
```

Turn Proxy Servers On or Off

Use these commands to enable or disable the proxy settings.

```
-setftpproxystate <on or off>  
-setwebproxystate <on or off>  
-setsecurewebproxystate <on or off>  
-setstreamingproxystate <on or off>  
-setgopherproxystate <on or off>  
-setsocksfirewallproxystate <on or off>
```

For each command, specify the network service in this format:

```
networksetup -setftpproxystate <network service> <on or off>
```

Example command:

```
networksetup -setstreamingproxystate "Built-in Ethernet" off  
networksetup -setgopherproxystate "Built-in Ethernet" on
```

Designate the Proxy Bypass Domain

Use this command to designate the bypass domain that you want to use for the specified network service. You can list any number of domains.

```
-setproxybypassdomains <network service> <domain1> [domain2] [...]
```

Example command:

```
networksetup -setproxybypassdomains "Built-in Ethernet Port"  
company.com corp.com
```

If you want to clear all bypass domain entries for the specified network service, type “empty” in place of the domain name.

Example command:

```
networksetup -setproxybypassdomains "Built-in Ethernet" empty
```

System Setup Tool

In Mac OS X, you set computer and user preferences using the System Preferences application locally on a computer. With this version of Mac OS X Server, you can use the System Setup command-line tool to make certain computer settings on remote servers. The System Setup Tool allows you to remotely configure

- sleep settings
- remote login (SSH)
- startup disk
- computer name
- date, time, and time zone selection

Using System Setup

System Setup is a command-line tool used with a terminal application and SSH (Secure Shell). Mac OS X comes with a terminal application called Terminal. You can find this application in

/Applications/Utilities

If you're not familiar with command-line tools and SSH, read Chapter 4, "Using Command-Line Tools."

To use System Setup:

- 1** Open Terminal.
- 2** Open a SSH session to the target server and log in as an administrator.
- 3** Type the name of the tool followed by any arguments and options you want to set, then press Return. For example, if you want to set the time on the server to 11:32:06 A.M., type

```
systemsetup -settime 11:32:06
```

Finding More Information About the System Setup Tool

Type these parameters to find information about the System Setup Tool:

```
systemsetup -printcommands
```

Displays a list of all the commands available for the System Setup Tool.

```
systemsetup -help
```

Displays a list of all the commands available in the System Setup Tool, with explanatory information.

```
man systemsetup
```

Displays the complete manual pages, including usage examples.

About Get and Set Commands

For each “set” parameter, there is an equivalent “get” parameter that shows you the current setting. For example, if you want to see whether the server is currently using a network time server, type:

```
systemsetup -getusingnetworktime
```

and you’ll see something like this:

```
Network Time: Off
```

Then if you want to use a network time server, type:

```
systemsetup -setusingnetworktime on
```

and you’ll see this:

```
setUsingNetworkTime: On
```

Setting Server Identity and Preferences

Use these arguments to set information about the computer and how to handle startup.

Set the Computer Name

Use this command to set the computer name, which is used by file sharing and AppleTalk.

```
-setcomputername <computer name>
```

Example command:

```
systemsetup -setcomputername "All Purpose Server"
```

Designate a Startup Disk

Use these commands to designate the startup disk for the server. The first command tells you the current startup disk for the server. Use the second command to list all available disks, then use the disk name exactly as formatted in the list to set the startup disk.

```
-getstartupdisk  
-liststartupdisks  
-setstartupdisk <disk>
```

Example commands:

```
systemsetup -getstartupdisk  
systemsetup -liststartupdisks  
systemsetup -setstartupdisk "/Volumes/HD1/CoreServices"
```

Restart After Power Failure

Use this command to specify whether the server automatically restarts after a power failure.

```
-setrestartpowerfailure <on or off>
```

Example command:

```
systemsetup -setrestartpowerfailure on
```

Restart After a System Freeze

Use this command to specify whether the server restarts automatically after the system freezes.

```
-setrestartfreeze <on or off>
```

Example command:

```
systemsetup -setrestartfreeze on
```

Set Remote Apple Events Preference

Use this command to set whether the server responds to events sent by other computers (such as AppleScript programs).

```
-setremoteappleevents <on or off>
```

Example command:

```
systemsetup -setremoteappleevents on
```

Set Remote Login (SSH)

Use this command to turn remote login off. If you don't want to receive a warning prompt when you turn it off (it is sometimes necessary to turn off the warning when using shell scripts), use the flag "f" with the command.

```
-setremotelogin <off>
```

Example commands:

```
systemsetup -setremotelogin off  
systemsetup -f -setremotelogin off
```

Important If you turn off remote login, you won't be able to administer the server using remote command-line tools and SSH. To turn remote login back on, you'll need to connect a monitor and keyboard to the server to administer it locally.

Setting Date and Time Preferences

Use these arguments to set date and time preferences for the server.

Set the Date

Use this command to set the current month, day, and year.

```
-setdate <mm.dd.yy>
```

Example command:

```
systemsetup -setdate 07:22:01
```

Set the Time

Use this command to set the current hour, minutes, and seconds.

```
-settime <hh:mm:ss>
```

Example command:

```
systemsetup -settime 15:24:30
```

Set the Time Zone

Use these commands to set the local time zone. First list the time zones, then type the time zone as formatted in the list to set the time zone.

```
-listtimezones  
-settimezone <timezone>
```

Example command:

```
systemsetup -settimezone US/Pacific
```

Designate a Network Time Server

Use this command to designate a network time server. Enter the IP address or DNS name for the network time server.

```
-setnetworktimeserver <timeserver>
```

Example command:

```
systemsetup -setnetworktimeserver 192.168.100.100
```

Turn Network Time On or Off

Use this command to specify whether the server uses a network time server.

```
-setusingnetworktime <on or off>
```

Example command:

```
systemsetup -setusingnetworktime on
```

Setting Sleep Preferences

You can set when the server hard disk sleeps, and whether the server wakes for different types of network activity.

Important If you set the system to go to sleep, you won't be able to administer the server remotely while it's sleeping.

Set Sleep Time

Use this command to specify how long the server can be inactive before going to sleep. If you don't want the server to sleep, enter "0" or "never."

```
-setsleep <minutes>
```

Example commands:

```
systemsetup -setsleep 60
```

```
systemsetup -setsleep 0
```

Set Server for Modem Activity

Use this command to specify whether the server wakes from sleep when modem activity is detected.

```
-setwakeonmodemactivity <on or off>
```

Example command:

```
systemsetup -setwakeonmodemactivity off
```

Set Server for Network Access

Use this command to specify whether the server wakes from sleep when a network admin packet is sent to it.

```
-setwakeonnetworkaccess <on or off>
```

Example code:

```
systemsetup -setwakeonnetworkaccess on
```


Using Software Installation Tools and Applications

Mac OS X Server provides these tools to install software on Xserve:

- Server Assistant
- Software Update Tool
- Installer Tool

To use the command-line tools (Software Update Tool and Installer Tool), you need to open a SSH (Secure Shell) session. Read Chapter 4, “Using Command-Line Tools,” to learn about SSH and how to use command-line tools.

Be sure you’re acting within the terms of the software license agreement before you install programs on a computer. The license agreement specifies how many copies of the program you can make for yourself and others.

Server Assistant

You can use Server Assistant to install or reinstall Mac OS X Server software remotely on a server. To do this, you must start the server off the Mac OS X Server CD.

To install Mac OS X Server using Server Assistant:

- 1** Press and hold the system identifier button while you press the power button.
- 2** Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.
- 3** Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 4** Close the tray. The server starts up from the CD.
- 5** Start Server Assistant on your admin computer, or on the server if you’re installing it locally. Server Assistant is located in

/Applications/Utilities

- 6 On the Welcome screen, select “Install the Mac OS X Server software.”
- 7 Select the server on which you want to install the software (if you’re installing locally, skip this step). Server Assistant will lead you through the steps necessary to successfully install the software.

Software Update Tool

You use Software Update Tool to find new versions of software and install them remotely on a server. You can run Software Update Tool from an admin computer. If you need help with this tool, read Chapter 4, “Using Command-Line Tools.”

- 1 Open Terminal and log in to the target server using SSH.
- 2 At the prompt, type:

```
softwareupdate
```

You’ll see a list of available updates. For example:

```
-BrazilianPortugueseSWU  
“Brazilian Portuguese Language Support” (10.1.2), 6268K  
-PrintingEpsonEU  
“Epson European Printer Drivers”(1.0), 31568K  
-PrintingEpsonUS  
“Epson US Model Printer Drivers” (1.0), 30074K
```

- 3 Type `softwareupdate` and any items you want to install. For example:

```
softwareupdate PrintingEpsonUS PrintingEpsonEU
```

The tool then downloads and installs the software on the server.

- 4 If the software package requires that you restart the server, type:

```
/sbin/reboot
```

or

```
/sbin/shutdown -r
```

Installer Tool

You use the Installer Tool to install software packages from a CD-ROM on a mounted remote server volume. The Installer Tool doesn’t perform any authentication, so if a package needs authentication (set in the package’s `.info` file), you must log in as root or use the `sudo` command (see “Setting Up Administrator Permissions” on page 81).

If you need help using the Installer Tool, read Chapter 4, “Using Command-Line Tools.”

Important Before you put programs inside shared folders, remember that copyright laws may prevent those programs from being shared. Check the applicable licensing agreements and follow their requirements.

Follow these steps to install software on a server.

- 1** Insert the application disc in the optical drive of the server that you want to install the software on.
- 2** Open a SSH connection in Terminal and log in to the target server.
- 3** Type the installer command. It will be some variation of the following (parameters in square brackets are optional):

```
installer [-volinfo] [-pkginfo] [-allow] [-dumplog] [-help] [-  
verbose] [-vers] [-config] [-plist] [-file <pathToFile>] [-lang  
<ISOLanguageCode>] -pkg <pathToPackage> -target  
<pathToDestinationVolume>
```

If the software package you’re installing requires that you restart the server, type:

```
/sbin/reboot
```

or

```
/sbin/shutdown -r
```

Note: When you type the package name or the path to the destination volume, don’t end the string with a forward slash (/) or the command will not execute.

Parameters

This section describes the parameters of the Installer Tool.

-volinfo

Displays a list of mounted volumes into which the software package can be installed.

-pkginfo

Displays a list of packages that can be installed onto the target volume. If a metapackage is specified, all of its subpackages are listed.

-allow

Installs an older version over a newer version if the software package supports this.

-dumplog

Sends the standard installer log to StdOut.

-help

Displays a list of parameters you can use with the Installer Tool.

-verbose

Displays more information than the default output, which is formatted for scripting. Use this parameter in conjunction with information requests.

-vers

Displays the version of the tool.

-config

Formats the command-line installation arguments for later use. You can redirect the output to a configuration file. Then you can use the `-file` parameter to perform multiple identical installs.

-plist

Formats the Installer Tool's output into an XML file, which is sent by default to StdOut. You use this parameter with `-pkginfo` and `-volinfo`.

-file <pathToFile>

Specifies the path to an XML file containing parameter information. This file can be used instead of the command-line parameters, and supersedes any parameters on the command-line. For example:

```
installer -file /temp/configfile.plist
```

-lang <ISOLanguageCode>

Specifies the default language of the installed system. You need this parameter only if you perform a full system install. You specify the language in ISO language code format. They are:

- EN for English
- JA for Japanese
- FR for French
- DE for German

Full Operating System Installation

Important When you start up from the Mac OS X Server CD, volumes are not automatically mounted. If you mount your volumes using a command-line tool such as `autodiskmount` (to recover data or to use the Installer Tool), don't use the Disk Utility and Installer applications. Disk Utility and the Mac OS X Installer application have their own mechanism for mounting volumes. If you use these applications after you mount volumes manually, you will get unreliable results.

If you use command-line tools to recover data, you need to restart the server before you use the Disk Utility or Mac OS X Installer applications.

Important Apple strongly recommends that you not store data on the hard disk or hard disk partition where the operating system is installed. This way, should you need to reinstall or upgrade system software, you will not risk losing data.

To use the Installer Tool to install a full operating system:

- 1** Insert a bootable CD and start up the server from the CD. (You can't install an operating system onto the current startup volume.)
- 2** Open Terminal and log in to the server as root using SSH. For example, type:

```
ssh -l root <ip address>
```
- 3** Mount volumes using the `autodiskmount` tool. To do this, type:

```
autodiskmount
```
- 4** List the volumes you can install the software on and specify the package you want to install. For example, type:

```
/usr/sbin/installer -volinfo -pkg /System/Installation/Packages/  
OSInstall.mpkg
```

and get a list like this:

```
/private/var/tmp/Mount01  
/private/var/tmp/Mount1  
/private/var/tmp/Mount02
```

- 5 Install the operating system on a volume from the list. For example, type:

```
/usr/sbin/installer -pkg /System/Installation/Packages/  
OSInstall.mpkg -target /private/var/tmp/Mount01 -lang en  
-verbose
```

to get this result:

```
installer: Package name is Mac OS X  
installer: Installing onto volume mounted at  
/private/var/tmp/Mount01.  
installer: The install was successful.
```

- 6 Type one of these commands to restart the server:

```
/sbin/reboot  
/sbin/shutdown -r
```

Administration Software

Mac OS X Server comes with applications to set up, administer, and monitor server processes and services, including

- Server Assistant
- Server Admin
- Macintosh Manager
- NetBoot Desktop Admin
- Streaming Server Admin
- Monitor (WebObjects)
- Server Monitor
- Simple Network Management Protocol (SNMP)

System Requirements

The table below shows the operating system required for each application.

These admin programs	Can be run on these computers
Server Assistant	Mac OS X Server or Mac OS X
Server Admin	Mac OS X Server or Mac OS X
Macintosh Manager	Mac OS 9 (and later) or Mac OS X
NetBoot Desktop Admin	Mac OS 9 client computers started up from the NetBoot server
Streaming Server Admin	Any computer running a Web browser
Monitor (WebObjects)	Any computer running a Web browser
Server Monitor	Mac OS X Server or Mac OS X

To use admin applications:

- 1 Connect to the server from the admin computer and log in to the server using the administrator name and password.
- 2 Open the appropriate administration program. The table below will help you decide which application to use.

To do this	Use this admin program
Install server software on a remote server, configure server, start selected services	Server Assistant (Use one time to set up newly installed software. Can also be used later to reinstall and then set up system software.)
Configure File, print, Web, mail, NetBoot, and network services	Server Admin
Configure Macintosh Management service	Macintosh Manager
Configure QuickTime Streaming Server	Streaming Server Admin (via Web browser)
Manage NetBoot disk images	NetBoot Desktop Admin
Configure WebObjects Deployment	Monitor (via Web browser)
Monitor server hardware and set up email notification	Server Monitor
Choose directory plugins (NetInfo and LDAP) and set search policy	Remote Directory Setup
Configure NetInfo and set up authentication	Remote NetInfo Domain Setup

Server Admin



You use the Server Admin application to configure and manage most services, to set up and manage server user accounts, and to configure share points (items such as folders and disks you want users to be able to access on the server). Server Admin has an individual module for managing each service.

You can use Server Admin locally (at the server) or remotely (from a computer running Mac OS X or another Mac OS X Server).

Install Server Admin

To install Server Admin on a computer running Mac OS X, follow these steps:

- 1 On a Mac OS X computer with networking configured, insert the Admin Tools CD.
- 2 Open the Admin Install folder and double-click the installer package, Admin_Install.mpkg. Server Admin is installed in /Applications/Utilities.

Log In to Server Admin

To log in to Server Admin:

- 1 Open Server Admin (located in /Applications/Utilities).
- 2 Enter the IP address or domain name of the Mac OS X Server you want to administer. (By default, the IP address of the local server appears in the login window.) Then enter the administrator's user name and password for the server.
- 3 Click Connect.

You can manage multiple servers simultaneously by logging in to each server and administering it from its own toolbar.

For more information about Server Admin, see the *Mac OS X Server Administrator's Guide* beginning on page 32.

Remote Printer Setup

This version of Mac OS X Server supports the creation of print queues for servers from within the Server Admin application. To learn about print service and how to manage it using Server Admin, see Chapter 6 of the *Mac OS X Server Administrator's Guide*.

To set up print service for the first time and create print queues, follow these steps:

- 1 Open Server Admin and log in to the server you want to administer.
- 2 Click the File & Print tab.
- 3 Click Print and choose Show Print Monitor.
- 4 Click the New Queue button.
- 5 Choose the type of connection (AppleTalk, LPR Printers Using IP, or Directory Services).
- 6 If you choose AppleTalk or Directory Services, select a printer from the list of available printers.
- 7 If you choose LPR Printers Using IP, type the printer's IP address or DNS name. If you want to change the queue name, deselect "Use Default Queue on Server" and type a name in the Queue Name box.
- 8 Click Add.

The Print module has no option for creating USB printers. If you need to set up print queues for USB printers, you need to use the Print Center application locally on the server.

Print service in Mac OS X Server does not use printer descriptions (PPDs)—these are only used by client computers to generate PostScript files for print jobs.

NetBoot

NetBoot allows Macintosh client computers to start up using a Mac OS 9 image provided by a Mac OS X Server. The server hosts the startup image, which contains a System Folder and applications folder for all Mac OS 9 computers using NetBoot. Any changes made on the server are automatically reflected on the client computers when they restart from the image.

In this version of Mac OS X Server, you configure NetBoot by using the DHCP/NetBoot module in Server Admin to set up IP address ranges for NetBoot clients.

Important Read Chapter 11 in the *Mac OS X Server Administrator's Guide* and complete the NetBoot Server Worksheet on page 253 in that guide before you begin. Then follow the steps in this guide to install NetBoot and configure IP address ranges for client computers.

Install NetBoot

Use the NetBoot CD to install the NetBoot.pkg file on your server. You can install the package locally on the server, or use the Installer Tool to install remotely. You should also copy the NetBoot Desktop Admin application to your admin computer.

Configure NetBoot With Server Admin

For NetBoot client computers to start up using a particular port on your Mac OS X Server, you need to enable NetBoot on that port. To do this, specify which version of NetBoot you want NetBoot client computers on a port to use. NetBoot 1.0 uses static IP addresses and NetBoot 2.0 uses DHCP to dynamically assign IP addresses to NetBoot client computers.

Important You should configure only one server on a network or subnet to use NB 1.

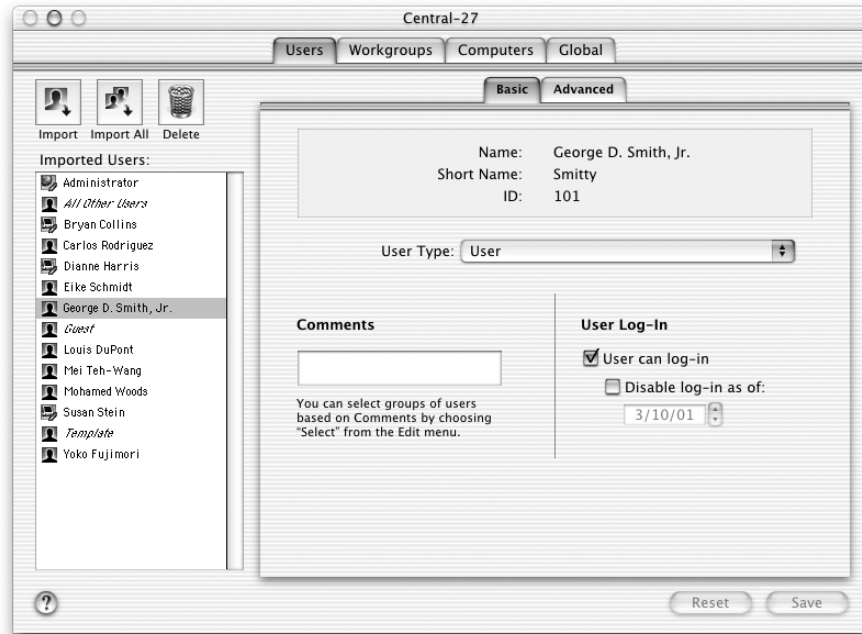
To enable NetBoot on a port:

- 1** Open Server Admin and log in to the server you want to administer.
- 2** Click the Network tab.
- 3** Click DHCP/NetBoot and choose Configure DHCP/NetBoot.
- 4** Click NetBoot and choose the version of NetBoot (NB 1 or NB 2) to use for each port listed.
- 5** If you choose NB 1, click Subnets and choose the matching port name from the pop-up menu, then create an IP address range for the port.

If you have an existing DHCP infrastructure, you don't need to configure an IP address range for computers using only NetBoot 2.0.

You can choose both NetBoot versions for a port, but if you do, you must set an IP address range for the port.

Macintosh Manager



You use Macintosh Manager to set up authentication and define user environments for computers with Mac OS 8.1 through Mac OS 9.2 installed. You can use Macintosh Manager locally (at the server) or remotely (from a Mac OS 9 or Mac OS X computer on the same network as your Mac OS X Server).

You need to use two Server Admin modules to administer Macintosh Management service: Users & Groups and Sharing. Details about all these applications can be found starting on page 195 of the *Mac OS X Server Administrator's Guide*.

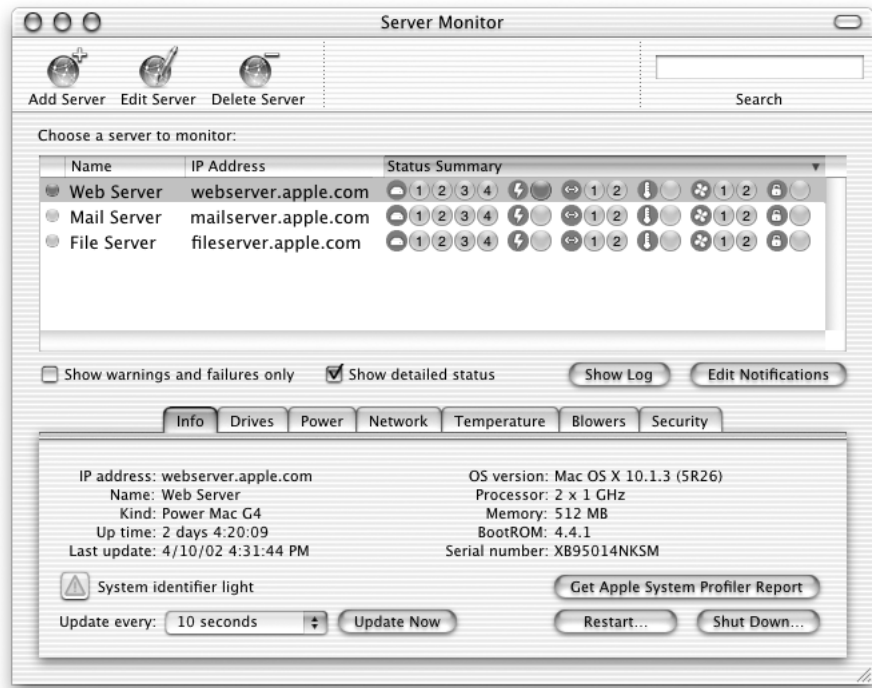
Install Macintosh Manager

To install Macintosh Manager on a computer running Mac OS X or Mac OS 9.2:

- 1 On a computer with networking configured, insert the Admin Tools CD.
- 2 Open the Admin Install folder and double-click the installer package, Admin_Install.mpkg.
- 3 Choose the Custom Install option, then select Macintosh Manager Admin.

In Mac OS X, Macintosh Manager is installed in /Applications/Utilities. In Mac OS 9, Macintosh Manager is installed in the Applications (Mac OS 9) folder.

Server Monitor



Server Monitor is a new application, included with this version of Mac OS X Server, that is designed to support your Xserve. You can see the following information about your Xserve systems:

- installed operating system
- drives
- power supply and UPS
- enclosure and processor temperature
- cooling blowers
- security
- network

Install Server Monitor

Server Monitor is on the Admin Tools CD and is automatically installed when you install the Admin_Install.mpkg.

Set Up Server Monitor

To display the toolbar, click the oval button in the top-right corner of the Server Monitor window.

To set up Server Monitor:

- 1** Open Server Monitor and click Add Server.
- 2** Enter the IP address or DNS name of the server you want to add.
- 3** Enter an administrator name and password for the server. You can save the password for this server in your keychain.
- 4** Choose how often you want Server Monitor to check the server using the “Update every” pop-up menu.
- 5** Click OK.
- 6** Repeat these steps for each server you want to monitor.

Switch Between Server Lists

When you restart Server Monitor, you see the list of servers you worked with most recently. If you want to look at different sets of servers, you can export server lists, then import them later. Choose Export or Import from the File menu to do this. Choose Merge from the File menu to merge different lists into one.

Set the System Identifier Lights Manually

The system identifier lights located on the front and back of your Xserve light when service is required. Check Server Monitor to find the reason the lights are on.

You can also turn the lights on to identify a particular server in a rack of servers. To turn the system identifier lights on or off, select the server and click “System identifier light” on the Info pane.

Receive Automatic Status Change Notifications

You can set Server Monitor to notify you by email when a server’s status changes. For each server, you set up the conditions that you want notification about. The email message can come from Server Monitor or from the server.

Get Information About a Server

Server Monitor keeps logs of Server Monitor activity for each server. (The logs do not include system activity on the server.) The log shows, for example, the times Server Monitor attempted to contact the server, and whether a connection was successful. The log also shows server status changes.

You can also use Server Monitor to get an Apple System Profiler report on a remote server.

Streaming Server Admin

QuickTime Streaming Server (QTSS) is a technology that delivers media over the Internet in real time. With streaming, your users can tune in to a broadcast of live or prerecorded media, or they can view prerecorded media on demand. Users see streamed media as soon as it reaches their computers; they don't have to wait to download files. To set up and manage QuickTime Streaming Server, you use the Web-based Streaming Server Admin program.

Important Before you set up QTSS, read Chapter 9, "QuickTime Streaming Server," in the *Mac OS X Server Administrator's Guide*. It includes hardware and software requirements and all the information you need to plan and set up your streaming server.

Install Streaming Server Admin

Streaming Server Admin is installed with Mac OS X Server. The application requires Netscape Navigator, Netscape Communicator, or Microsoft Internet Explorer version 4.5 or later. Read Chapter 9, "QuickTime Streaming Server," in the *Mac OS X Server Administrator's Guide*, to find out how to access Streaming Server Admin using your Web browser.

WebObjects

WebObjects Deployment provides the architecture and tools to deploy your WebObjects applications on an intranet or the World Wide Web. It supplies the necessary Web server adaptors as well as WebObjects Monitor. You can also use the command-line tool `wotaskd` to remotely view server instances and generate statistical data on your deployed applications.

The Admin Tools CD has more information about WebObjects, located in:

Admin Tools/Documentation/WebObjects Documents

Install WebObjects

WebObjects comes already installed on your Xserve. If you need to reinstall it (because you partitioned disks), you can do so either locally on the server or remotely using the Installer command-line tool.

Local Installation Instructions

- 1 Insert the Mac OS X Server CD and go to the WebObjects 5.1 Deployment folder located in:
Welcome to Mac OS X Server/Additional Installs
- 2 Double-click the item named "WebObjects_X_Deployment.mpkg."
- 3 When prompted, enter an admin user name and password. Then click Continue.
- 4 Read the software license agreement and click Continue. If you agree to its terms, click Agree to continue with the installation.

- 5 Select the root volume to install WebObjects and click Continue.
- 6 Choose an installation option and click Install.
Apple recommends that you perform an Easy installation.
- 7 The installer launches the WebObjectsLicenseUpgrader application. Enter the WebObjects license key from the License Keys sheet and click Install. Then click OK in the dialog that appears.
- 8 The installer may need to run scripts or overwrite existing files. In these cases it presents one or more alerts. To proceed with installation, click OK.
- 9 Once the installer has finished, click Close to quit the installer and then restart the server.

Remote Installation Instructions

Follow the instructions for remote software installation on page 58. To install WebObjects, type:

```
/usr/sbin/installer r -pkg "/Volumes/Mac OS X Server/Welcome to  
Mac OS X Server/Additional Installs/WebObjects 5.1 Deployment/  
WebObjects_X_Deployment.mpkg" -target /
```

Install Web Server Adaptors

By default, the installer configures the Apache Web server to use the WebObjects Apache adaptor. WebObjects also includes a CGI adaptor. To use it, follow the configuration instructions located in:

```
/System/Library/WebObjects/Adaptors/CGI/installationInstructions.html
```

The source code for both adaptors (and adaptors for other platforms) are provided so that you can customize them. Instructions on rebuilding the WebObjects HTTP server adaptors are available in:

```
/Developer/Examples/WebObjects/Source/Adaptors/BuildingInstructions.html
```

Upgrade Your License

The WebObjectsLicenseUpgrader allows you to modify your WebObjects license without reinstalling the software. To run this application, you must log in as an administrator. The application requires the license key that came with your copy of WebObjects. The WebObjectsLicenseUpgrader is located in:

```
/Applications/Utilities
```


Simple Network Management Protocol (SNMP)

SNMP is a set of protocols used to manage and monitor multi-platform computer network devices. SNMP support is included in the basic Mac OS X Server installation, but is turned off by default.

SNMP uses agents to contact devices such as routers and network servers and interacts with these devices through virtual information databases known as management information bases (MIBs). Mac OS X Server provides a variety of useful system and network usage statistics via its default public MIB, which you can display with a suitable SNMP browser.

To use SNMP, you can use a graphical administration tool (not supplied with Mac OS X Server) to retrieve SNMP data, or you can use the SNMP command-line tools available in `/usr/sbin`. You can find SNMP information and tools on the Net-SNMP Home Page located at www.net-snmp.com

To turn SNMP on, use TextEdit or another application to edit the `/etc/hostconfig` file. If you turn SNMP on, you should run the `snmpconf` command to enter site-specific information such as system location and admin email address.

You can find more information about SNMP and how to use it in the SNMP man pages.

Problem Solving

The solutions in this chapter assume that you've read the other chapters in this guide. If you need help doing any of the tasks, such as using SSH (Secure Shell) to log into a remote computer, you will find help in the chapters that cover those topics.

If you have physical access to the server, and you have an extra monitor and keyboard that you can attach to the server, you can fix server problems locally. You might want to do this if you don't have a lot of experience using command-line tools, or if you don't know the IP address or DNS name of the server.

If you don't have physical access to the server, or if you're comfortable using command-line tools, you can also use the tools provided in Mac OS X Server to correct problems remotely.

Solving Problems With Network Settings

Despite your best intentions and careful planning, it is possible to create network settings that don't give you the results you expect or want. For example, if you inadvertently assign the same IP address to different servers, you'll see one server on the network, but not the other. Sometimes network settings can become corrupted and need to be set again.

To fix network settings locally:

- 1 Shut down the server and follow the instructions in the *Xserve User's Guide* for connecting a monitor and keyboard.
- 2 Restart the server by pressing the power button.
- 3 Choose System Preferences from the Apple menu.
- 4 Click Network to open Network preferences. You can make whatever network settings you need for the server in this pane.

To fix network settings using the serial port:

- 1** Connect a terminal to the serial port of your Xserve (follow the instructions in “Connecting Through the Serial Port” on page 79).
- 2** Log in to the server as root.
- 3** Use the Network Setup Tool to make new network settings.

For information about the Network Setup Tool and how to use it, see Chapter 5, “Network Setup Tool.”

Solving Startup Problems

If the server has a problem and won't restart, try reinstalling system software on the startup disk or partition. If you have data stored on this disk or partition, copy it onto another disk or partition before you reinstall the system software. If you have a FireWire hard disk, you may be able to connect it to the server and copy data onto it.

Copy Data and Reinstall System Software Locally

- 1** Turn the server off and follow the instructions in the *Xserve User's Guide* for connecting a monitor and keyboard to the server.
- 2** Press and hold the system identifier button while you press the power button.
- 3** Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.
- 4** Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 5** Close the tray. The server starts up from the CD.
- 6** Copy the data on the startup disk drive or partition to another disk drive, partition, or FireWire device.
- 7** Reinstall the software on the startup disk drive or partition. The server restarts at the end of the installation.
- 8** After the server restarts, Server Assistant appears. Choose “Create an administrator account and configure basic services” on the Welcome screen.
- 9** Follow the onscreen instructions to set up the server. The Mac OS X Server Information Worksheet that you filled out when you first set up the server should have all the necessary information.
- 10** Restart the server and remove the Mac OS X Server CD.
- 11** Copy any data back onto the startup disk drive or partition.

Copy Data and Reinstall System Software Remotely

If you have information on the server that you need to preserve, you need to copy the information to another disk or partition, then copy it back to the server when you're finished. You can use the ditto command to do this.

- 1 Turn the server off.
- 2 Press and hold the system identifier button while you press the power button.
- 3 Continue to hold the system identifier button until the system identifier light flashes and the CD tray opens.
- 4 Release the system identifier button and insert the Mac OS X Server CD in the tray.
- 5 Close the tray. The server starts up from the CD.
- 6 Open the Terminal application on your admin computer and use SSH to log in to the target server.
- 7 Use the ditto command to copy the data from the corrupted startup disk drive or partition to another disk drive, partition, or FireWire device. (See “Copying Data Between Remote Servers” on page 78.)
- 8 Use Server Assistant or the Installer Tool to reinstall the system software on the startup hard disk or partition. The server restarts at the end of the installation.
- 9 Run Server Assistant to set up the server again. The Mac OS X Server Information Worksheet that you filled out when you first set up the server should have all the necessary information.
- 10 Copy the data back onto the server using the ditto command.

For more information about the Installer Tool, see Chapter 7, “Using Software Installation Tools and Applications.”

Resetting the Administrator Password

You may want to set a new administrator password if you think the password is no longer secure, or if you've forgotten what it is. You can do this by running Server Assistant again.

Note: If you've forgotten the root password, you can't run Server Assistant remotely. You need to know the root password to log in.

Rerun Server Assistant Locally

- 1 Follow the instructions in the *Xserve User's Guide* for connecting a monitor and keyboard to the server.
- 2 Log in to the server as the root administrator.

- 3 Drag the AppleSetupDone file to the trash and empty the trash. This file is located in:
`/var/db/`
- 4 Restart the server. Server Assistant starts automatically.
- 5 Choose the option to set up an administrator account and configure services, then follow the onscreen instructions. Use the Mac OS X Server Information Worksheet that you filled out the first time to help you re-enter the server information.

Rerun Server Assistant Remotely

- 1 Open the Terminal application on your admin computer and type this command to delete the .AppleSetupDone file:

```
ssh -l root <server name or IP address> rm /var/db/.AppleSetupDone
```

- 2 Use SSH to log in to the server as the root user.
- 3 Type this to restart the server:

```
/sbin/reboot
```

Important Make sure you are logged in to the remote server. Otherwise, when you type this command you will restart your admin computer.

- 4 Open Server Assistant and choose the option to set up an administrator account and configure services.
- 5 Choose the target server from the list and follow the onscreen instructions. Use the Mac OS X Server Information Worksheet that you filled out the first time to help you re-enter the server information.

Copying Data Between Remote Servers

You can use the ditto command to copy data from one remote server to another. It's similar to the cp (copy) command but allows you to keep resource forks intact. The syntax of the ditto command is as follows:

```
ditto [-v] [-V] [-rsrc] <file pathname> <target directory>
```

These parameters can be used with the ditto command:

-v

Prints a line for each file copy (making it easier to see what's happening).

-V

Prints a line only for special files.

-rsrc

Copies resource forks.

For example, to back up jmartin's user file to another hard disk named NewDrive, type the following:

```
ditto -v -V -rsrc /Users/jmartin /Volume/NewDrive
```

Connecting Through the Serial Port

You can connect a portable computer or terminal computer to the serial port of your Xserve and use command-line tools over that connection to change settings on the server.

To make the connection, you'll need a serial cable and a terminal emulation program that allow you to set these specifications:

- DB9 connector
- 8-bit
- no parity
- 1 stop bit
- 9600 kilobits per seconds (kbps)

You can use a terminal emulation program such as ZTerm to communicate with the server over this type of connection. The Console application can't be used for this procedure.

Once you've connected successfully, you can use the Network Setup Tool described in Chapter 5 to change the server's network settings.

Finding a Server on the Network

To log in to the server, you'll need to know one of the following pieces of information about the server:

- IP address
- DNS name
- hardware address
- computer model

Then you can use the Server Assistant Searcher command to display information about the matching servers that respond to the command. Your missing server should be in this list.

Follow these steps:

- 1 Start up the server if it's turned off. You can either start up from the hard disk, or start up from a bootable CD.

Note: If you start up from a bootable CD, you must know the server's hardware serial number to log in using SSH (it's used to generate a dynamic password).

- 2 On your admin computer, open Terminal and type:

```
/System/Library/ServerSetup/sa_srchr 224.0.0.1
```

You'll see a list of all the computers in the same subnet that could respond to the command, and information about each one. If you don't see the computer you're looking for, search again or broadcast for the computer. To broadcast for a specific server, enter the server's IP address in place of 224.0.0.1.

Here's an example of what you might see for one server:

```
bigkahuna.lab.com#Power Macintosh  
G3#192.168.100.100#00:05:02:2b:b4:27#10.1.2#HD_BOOT#1.0
```

The pound sign (#) separates types of information. Here's a translation of the example:

- bigkahuna.lab.com is the DNS name of this server
- Power Macintosh G3 is the model of this computer
- 192.168.100.100 is the IP address assigned to this server
- 00:05:02:2b:b4:27 is this server's hardware address
- 10.1.2 is the version of system software installed on this server
- HD_BOOT is the volume the server is started up from (CD_BOOT means the server is started up from a CD-ROM disc)
- 1.0 is a private version number used by Server Assistant.

This information can help you find the server you need to fix. You can log in to the server using SSH, the IP address, and the user ID and serial number.

Note: If the server was started up from a CD-ROM disc, you need to know the hardware serial number of the server in order to connect to the server using SSH. You can find this number on the server itself or noted on the Mac OS X Server Information Worksheet that you filled out before you began the server installation and setup.

Setting Up Administrator Permissions

You can give specific users permission to administer servers using the sudo tool. Sudo is short for “Superuser do,” a UNIX tool you can use to set up a list of users and the system commands that each is allowed to perform. If you use this tool, you don’t have to reveal the root administrator password to all network administrators.

Read the sudo man pages to learn how to create a sudo configuration file.

Getting More Information

The *Mac OS X Server Administrator’s Guide*, located on the Admin Tools CD as a PDF document, is your best resource for planning your network setup, configuring services, and administering services. It also includes recommendations for additional reading and study.

For additional documentation and information, try these resources:

- Mac OS X Server Web site:

www.apple.com/macosx/server

- Server support site:

www.apple.com/servers

Help

Don’t overlook another built-in resource in Mac OS X Server—the onscreen help. Choose Help from any Server Admin module, type your question, and get a list of search results that will help you complete your task. Most of the administration applications included in Mac OS X Server come with built-in onscreen help.

Mac OS X Server Information Worksheet

This appendix contains a worksheet for recording information about your server. You can make a photocopy of the worksheet and fill in the information before you begin setting up your server. Then file the filled-out worksheet in a secure location in case you need to refer to the information again.

Mac OS X Server Information Worksheet

Server Assistant asks you for the information in this worksheet. If you don't have all of the networking and Ethernet port planning information, your network administrator or Internet service provider (ISP) can give it to you.

Important This worksheet contains important security information. Keep it in a safe place.

Identification information	
Mac OS X Server serial number	Affix a serial number sticker from the license key sheet:
Xserve serial number	Enter the first 8 characters of the serial number on your Xserve:

Security information	
Administrator (owner) name	Enter a name shorter than 100 characters (the name can include spaces):
Administrator short name	Enter a name with 8 or fewer characters and no special characters other than a period (.), hyphen (-), or underscore (_):
Administrator password	Enter a case-sensitive password with no spaces or Option-key combinations:
QuickTime Streaming Server administrator name	Enter a name no longer than 255 characters that does not include a colon (:):
QuickTime Streaming Server administrator password	Enter a password no longer than 80 characters:

Networking information	
NetInfo data sharing (select one)	<input type="checkbox"/> The server will use the local NetInfo domain only.
	<input type="checkbox"/> The server will access a NetInfo domain on another server.
	Enter the static IP address of that server:
	Enter the filename (server tag) of the NetInfo domain. Specify "network" if the domain was set up using Server Assistant:
Note: Select the first option if you're not sure what to select. For information about NetInfo, see the <i>Mac OS X Server Administrator's Guide</i> and <i>Understanding and Using NetInfo</i> .	

Networking information (continued)	
Server's host name	Enter a name that begins with a letter and contains only letters, numbers, periods (.), or the underscore (_):
IP address(es) of domain name server (DNS)	
DNS search domain(s)	If you wish, enter one or more domain names (for example, apple.com), separated by commas:
Server's AppleTalk name	Enter a name no longer than 31 characters:

Your server has a built-in Ethernet port and may have additional ports installed on Ethernet cards. When you use Server Assistant, you'll specify how each port should be used (TCP/IP and/or AppleTalk) and enter address information for the ports. While AppleTalk is optional, it can be used on one port by Apple file service and print service.

Important To set up your server or install software remotely, connect your server to the network through the built-in Ethernet port.

If you don't select TCP/IP and/or AppleTalk for a port, Server Assistant won't configure that port. For each port you choose to configure, you'll see a panel where you enter the address information.

Note: You should configure at least one port using Server Assistant. For a local setup, use the Network pane of System Preferences to configure the remaining ports. For a remote setup, use the Network Setup command-line tool.

Ethernet port planning		
Use for TCP/IP and/or AppleTalk? (AppleTalk can be active on only one port.)		
Built-in Ethernet port:	TCP/IP <input type="checkbox"/>	AppleTalk <input type="checkbox"/>
Ethernet card port 1:	TCP/IP <input type="checkbox"/>	AppleTalk <input type="checkbox"/>
Ethernet card port 2:	TCP/IP <input type="checkbox"/>	AppleTalk <input type="checkbox"/>
Specify the following information using the IP address format (for example, 192.168.12.12):		
Built-in Ethernet port	Ethernet card port 1	Ethernet card port 2
IP address:	IP address:	IP address:
Subnet mask:	Subnet mask:	Subnet mask:
Router address:	Router address:	Router address:

