Oracle® Solaris 10 1/13 Installation Guide: Basic Installations

Part No: E28036–01
January 2013

ORACLE

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Preface

This book describes how to use CD or DVD media to install the Oracle Solaris operating system (OS) on a non-networked system. This book provides instructions for installing both UFS file systems and ZFS root pools.

This book does not include instructions about how to set up system hardware or other peripherals.

Note – This Oracle Solaris release supports systems that use the SPARC and x86 families of processor architectures. The supported systems appear in the *Oracle Solaris OS: Hardware Compatibility Lists*. This document cites any implementation differences between the platform types.

In this document, these x86 related terms mean the following:

- x86 refers to the larger family of 64-bit and 32-bit x86 compatible products.
- x64 relates specifically to 64-bit x86 compatible CPUs.
- "32-bit x86" points out specific 32-bit information about x86 based systems.

For supported systems, see the *Oracle Solaris OS: Hardware Compatibility Lists*.

Who Should Use This Book

This book is intended for system administrators who are responsible for installing the Oracle Solaris OS. This book provides basic Oracle Solaris installation information for system administrators who perform infrequent Oracle Solaris installations or upgrades.

If you need advanced Oracle Solaris installation information, see "Related Books" on page 6 to find the book that describes the information.

Related Books

The following table lists documentation for system administrators.

TABLE P–1 Are You a System Administrator Who is Installing Oracle Solaris?

Description	Information
Do you need system requirements or high-level planning information? Or want a high-level overview of Oracle Solaris ZFS root pool installations, GRUB based booting, Oracle Solaris Zones partitioning technology, or creating RAID-1 volumes?	*Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*
Do you need to upgrade or patch your system with almost no downtime? Save system downtime when upgrading by using Live Upgrade, a feature of Oracle Solaris.	*Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning*
Do you need to install a secure installation over the network or Internet? Use WAN boot to install a remote client. Or, do you need to install over the network from a network installation image? The Oracle Solaris installation program steps you through an installation.	*Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*
Do you need to install Oracle Solaris on multiple machines? Use JumpStart to automate your installation.	*Oracle Solaris 10 1/13 Installation Guide: JumpStart Installations*
Do you need to install or patch multiple systems quickly? Use Flash Archive, a feature of Oracle Solaris, to create a flash archive and install a copy of the OS on clone systems.	*Oracle Solaris 10 1/13 Installation Guide: Flash Archives (Creation and Installation)*
Do you need to install Oracle Solaris on an iSCSI target system?	See Chapter 4, "Installing the Oracle Solaris 10 OS on an iSCSI Target Disk."
Do you need to back up your system?	Chapter 19, "Backing Up and Restoring UFS File Systems (Overview/Tasks)," in *System Administration Guide: Devices and File Systems*
Do you need troubleshooting information, a list of known problems, or a list of patches for this release?	*Oracle Solaris Release Notes*
Do you need to verify that your system works on Oracle Solaris?	SPARC: *Solaris Sun Hardware Platform Guide*
Do you need to check on which packages have been added, removed, or changed in this release?	*Oracle Solaris Package List*
Do you need to verify that your system and devices work with Solaris SPARC and x86 based systems and other third-party vendors?	Solaris Hardware Compatibility List for x86 Platforms

Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info` or visit `http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs` if you are hearing impaired.

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P–2 Typographic Conventions

Typeface	Description	Example
`AaBbCc123`	The names of commands, files, and directories, and onscreen computer output	Edit your `.login` file. Use `ls -a` to list all files. `machine_name% you have mail.`
`AaBbCc123`	What you type, contrasted with onscreen computer output	`machine_name%` **`su`** `Password:`
aabbcc123	Placeholder: replace with a real name or value	The command to remove a file is `rm` *filename*.
AaBbCc123	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the *User's Guide*. A *cache* is a copy that is stored locally. Do *not* save the file. **Note:** Some emphasized items appear bold online.

Shell Prompts in Command Examples

The following table shows UNIX system prompts and superuser prompts for shells that are included in the Oracle Solaris OS. In command examples, the shell prompt indicates whether the command should be executed by a regular user or a user with privileges.

TABLE P–3 Shell Prompts

Shell	Prompt
Bash shell, Korn shell, and Bourne shell	`$`

TABLE P–3 Shell Prompts *(Continued)*

Shell	Prompt
Bash shell, Korn shell, and Bourne shell for superuser	#
C shell	machine_name%
C shell for superuser	machine_name#

Platform Conventions

The following keyboard and mouse conventions are applicable to SPARC and x86 based systems:

- The key referred to as Return is labeled Enter on some keyboards.
- From left to right on a three-button mouse, the default settings for CDE are SELECT, ADJUST, and MENU. For example, the text says, "Click SELECT" instead of "Click the left mouse button." Otherwise, these keys are referred to as mouse button 1, mouse button 2, and mouse button 3.
- From left to right on a two-button mouse, the default settings are SELECT and MENU. The ADJUST function is obtained by simultaneously pressing SELECT and the Shift key on the keyboard (Shift-SELECT).

◆ ◆ ◆ CHAPTER 1

Planning for a Oracle Solaris Installation From CD or DVD Media (Tasks)

This chapter describes the preparations for completing a successful installation, including the sections described below. The following chapter describes each step in an installation for SPARC systems and an installation for x86 systems.

- "System Requirements and Recommendations" on page 9
- "Checklist for Installation" on page 16
- "Where to Find Additional Installation Information" on page 27

Note – This book uses the term *slice*, but some Oracle Solaris documentation and programs might refer to a slice as a partition. To avoid confusion, this book distinguishes between `fdisk` partitions (which are supported only in Oracle Solaris for x86 based systems) and the divisions within the `fdisk` partition, which might be called slices or partitions.

System Requirements and Recommendations

The following tables list basic system requirements to install the Oracle Solaris OS.

TABLE 1–1 Memory, Swap, and Processor Recommendations

Requirement	Size
Memory to install or upgrade	■ For UFS or ZFS root file systems, 1.5 GB is the minimum memory required for installation. However, note that some optional installation features are enabled only when sufficient memory is present. For example, if you install from a DVD with insufficient memory, you install through the Oracle Solaris installation program's text installer, not through the GUI. For more information about these memory requirements, see Table 1–2. ■ In previous Oracle Solaris releases, you could not install and boot the Oracle Solaris OS from a disk that was greater than 1 TB in size. **Starting with the Oracle Solaris 10 10/09 release**, you can install and boot the Oracle Solaris OS from a disk that is up to 2 TB in size. **Starting with the Oracle Solaris 10 10/09 release**, you can use the VTOC label on a disk of any size, but the addressable space by the VTOC is limited to 2 TB. This feature allows disks that are larger than 2 TB to be used as boot drives, but the usable space from the label is limited to 2 TB. **Note –** This feature is only available on systems that run a 64-bit kernel. A minimum of 1.5 GB of memory is required for x86 based systems. For detailed information, see "Two-Terabyte Disk Support for Installing and Booting the Oracle Solaris OS" in *System Administration Guide: Devices and File Systems*.
Swap area	■ For UFS file systems, 512 MB is the default size ■ For ZFS root pools, see "Disk Space Requirements for a ZFS Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade* **Note –** You might need to customize the swap space. Swap space is based on the size of the system's hard disk.
Processor requirements	■ For SPARC based systems: 200 MHz or faster processor is required. ■ For x86 based systems: 120 MHz or faster processor is recommended. Hardware floating-point support is required.

Oracle Solaris Installation Program GUI or Text Installer Requirements

The Oracle Solaris installation program on the Oracle Solaris Operating System DVD or Oracle Solaris Software - 1 CD can be run with a graphical user interface (GUI) or as an interactive text installer in a desktop or console session. For x86 based systems, the Solaris Device Configuration Assistant is included in the Oracle Solaris installation program.

- GUI – The Oracle Solaris installation GUI provides windows, pull-down menus, buttons, scrollbars, and iconic images to enable you to interact with the installation program. The GUI requires a local or remote DVD-ROM or CD-ROM drive or network connection, video adapter, keyboard, monitor, and enough memory. For more information about these memory requirements, see Table 1–2.
- Text installer – The Oracle Solaris interactive text installer enables you to type information in a terminal or console window to interact with the installation program. You can run the text installer in a desktop session with a windowing environment, or in a console session. The text installer requires a local or remote DVD-ROM or CD-ROM drive or network connection, keyboard, and monitor. You can run the Oracle Solaris installation text installer with the `tip` command. For more information, see the man page, `tip(1)`.

You can choose to install the software with a GUI or with or without a windowing environment. If there is sufficient memory, the GUI is displayed by default. Other environments are displayed by default if memory is insufficient for the GUI. You can override defaults with the `nowin` or `text` boot options, but, you are limited by the amount of memory in your system or if you install remotely. Also, if the Oracle Solaris installation program does not detect a video adapter, it automatically displays in a console-based environment.

For both the text-based and GUI-based installation methods, the minimal memory requirement is 1.5 GB or greater. The types of installation are as follows:

- Text-based – Contains no graphics, but provides a window and the ability to open other windows.

  If you install by using the `text` boot option and the system has enough memory, you are installing in a windowing environment. If you are installing remotely through a `tip` line or using the `nowin` boot option, you are limited to the console-based installation.
- GUI-based – Provides windows, pull-down menus, buttons, scrollbars, and iconic images.

You can also specify the installer you want to use during the installation by entering a selection or special command at a prompt. For instructions, see the procedures in Chapter 2, “Installing With the Oracle Solaris Installation Program For UFS File Systems (Tasks).”

General Disk Space Planning and Recommendations

Planning disk space is different for everyone. The following table list some conditions and considerations for allocating space.

TABLE 1–2 General Disk Space and Swap Space Planning

Conditions for Space Allocations	Description
For UFS file systems	For each file system that you create, allocate an additional 30 percent more disk space than you need to enable you to upgrade to future Oracle Solaris versions. By default, the Oracle Solaris installation methods create only root (/) and /swap. When space is allocated for OS services, the /export directory is also created. If you are upgrading to a major Oracle Solaris release, you might need to reslice your system or allocate double the space that you need at installation time. If you are upgrading to an update, you could prevent having to reslice your system by allocating extra disk space for future upgrades. An Oracle Solaris update release needs approximately 10 percent more disk space than the previous release. You can allocate an additional 30 percent of disk space for each file system to allow space for several Oracle Solaris updates. **Note –** In previous Oracle Solaris releases, you could not install and boot the Oracle Solaris OS from a disk that was greater than 1 TB in size. **Starting with the Oracle Solaris 10 10/09 release**, you can install and boot the Oracle Solaris OS from a disk that is up to 2 TB in size. **Starting with the Oracle Solaris 10 10/09 release**, you can use the VTOC label on a disk of any size, but the addressable space by the VTOC is limited to 2 TB. This feature allows disks that are larger than 2 TB to be used as boot drives, but the usable space from the label is limited to 2 TB. This feature is available only on systems that run a 64-bit kernel. A minimum of 1.5 GB of memory is required for x86 based systems. For detailed information, see "Two-Terabyte Disk Support for Installing and Booting the Oracle Solaris OS" in *System Administration Guide: Devices and File Systems*.
The /var file system for UFS file systems	If you intend to use the crash dump feature savecore(1M), allocate double the amount of your physical memory in the /var file system.

TABLE 1–2 General Disk Space and Swap Space Planning *(Continued)*

Conditions for Space Allocations	Description
Swap	**Note –** For swap allocations for a ZFS root pool, see "Disk Space Requirements for a ZFS Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*. For a UFS file system, the Oracle Solaris installation program allocates a default swap area of 512 MB under the following conditions: ■ If you use the installation program's automatic layout of disk slices ■ If you avoid manually changing the size of the swap slice By default, the Oracle Solaris installation programs allocate swap space by placing swap so that it starts at the first available disk cylinder (typically cylinder 0 on SPARC based systems). This placement provides maximum space for the root (/) file system during the default disk layout and enables the growth of the root (/) file system during an upgrade. If you think you might need to expand the swap area in the future, you can place the swap slice so that it starts at another disk cylinder by using one of the following methods: ■ For the Oracle Solaris installation program, you can customize the disk layout in cylinder mode and manually assign the swap slice to the desired location. ■ For the JumpStart installation program, you can assign the swap slice in the profile file. For more information about the JumpStart profile file, see "Creating a Profile" in *Oracle Solaris 10 1/13 Installation Guide: JumpStart Installations*. For an overview of swap space, see Chapter 16, "Configuring Additional Swap Space (Tasks)," in *System Administration Guide: Devices and File Systems*.
A server that is providing home directory file systems	By default, home directories are usually located in the /export file system.
The Oracle Solaris software group you are installing	A software group is a grouping of software packages. When you are planning disk space, remember that you can add or remove individual software packages from the software group that you select. For information about software groups, see "Disk Space Recommendations for Software Groups" on page 14.
Upgrade	■ If you are using Live Upgrade to upgrade an inactive boot environment and want information about disk space planning, see "Live Upgrade Disk Space Requirements" in *Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning* ■ If you are using other Oracle Solaris installation methods to plan disk space, see "Upgrading With Disk Space Reallocation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.
Language support	If you plan to install a single language, allocate approximately 0.7 GB of additional disk space for the language. If you plan to install support for all languages, you need to allocate up to approximately 2.5 GB of additional disk space depending on the software group you install.
Printing or mail support	Allocate additional space.
Additional software or third-party software	Allocate additional space.

Disk Space Recommendations for Software Groups

The Oracle Solaris software groups are collections of Oracle Solaris packages. Each software group includes support for different functions and hardware drivers.

- For an initial installation, you select the software group to install based on the functions that you want to perform on the system.
- For an upgrade, you must upgrade to a software group that is installed on the system. For example, if you previously installed the End User Oracle Solaris Software Group on your system, you cannot use the upgrade option to upgrade to the Developer Oracle Solaris Software Group. However, during the upgrade, you can add software to the system that is not part of the currently installed software group.

When you are installing the Oracle Solaris software, you can choose to add or remove packages from the Oracle Solaris software group that you selected. When you are selecting which packages to add or remove, you need to know about software dependencies and how the Oracle Solaris software is packaged.

The following figure shows the grouping of software packages. Reduced Network Support contains the minimal number of packages and Entire Oracle Solaris Software Group Plus OEM Support contains all the packages.

FIGURE 1–1 Oracle Solaris Software Groups

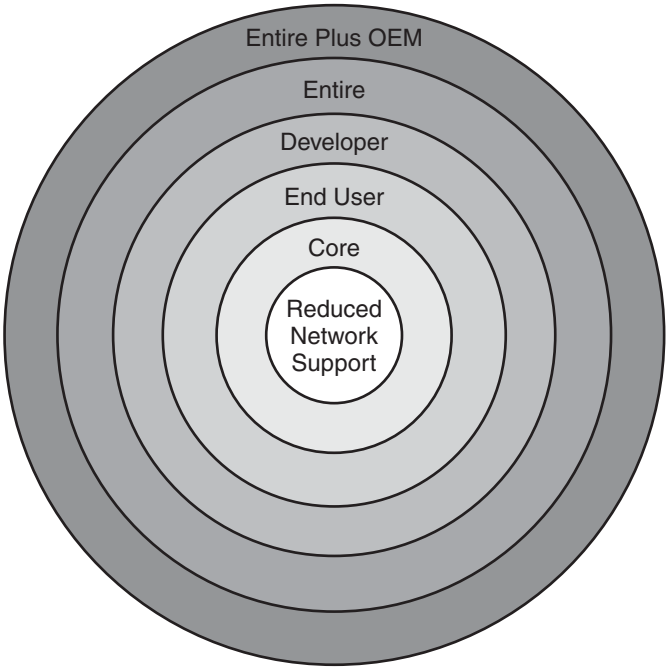


Table 1–3 lists the Oracle Solaris software groups and the recommended amount of disk space that you need to install each group. The disk space recommendations in the table include space for the following items:

- Swap space
- Patches
- Additional software packages

You might find that the software groups require less disk space than the amount that is listed.

For additional information about how to plan your disk space, see "Allocating Disk and Swap Space" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

TABLE 1–3 Disk Space Recommendations for Software Groups

Software Group	Description	Recommended Disk Space
Entire Oracle Solaris Software Group Plus OEM Support	Contains the packages for the Entire Oracle Solaris Software Group plus additional hardware drivers, including drivers for hardware that is not on the system at the time of installation.	8575 MB
Entire Oracle Solaris Software Group	Contains the packages for the Developer Oracle Solaris Software Group and additional software that is needed for servers.	8529 MB

TABLE 1–3 Disk Space Recommendations for Software Groups *(Continued)*

Software Group	Description	Recommended Disk Space
Developer Oracle Solaris Software Group	Contains the packages for the End User Oracle Solaris Software Group plus additional support for software development. The additional software development support includes libraries, include files, man pages, and programming tools. Compilers are not included.	8336 MB
End User Oracle Solaris Software Group	Contains the packages that provide the minimum code that is required to boot and run a networked Oracle Solaris system and the Common Desktop Environment.	7074 MB
Core System Support Software Group	Contains the packages that provide the minimum code that is required to boot and run a networked Oracle Solaris system.	3093 MB
Reduced Network Support Software Group	Contains the packages that provide the minimum code that is required to boot and run an Oracle Solaris system with limited network service support. The Reduced Network Support Software Group provides a multiuser text-based console and system administration utilities. This software group also enables the system to recognize network interfaces, but does not activate network services.	3035 MB

Checklist for Installation

Use the following checklist to gather the information that you need to install the Oracle Solaris OS. You do not need to gather all of the information that is requested on the checklist. You only need to collect the information that applies to your system.

Use this checklist if you are performing an initial installation. If you are upgrading your system, see "Checklist for Upgrading" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

Note – If you have a system that contains non-global zones, Live Upgrade, a feature of Oracle Solaris, is the recommended upgrade program or program to add patches. Other upgrade programs might require extensive upgrade time, because the time required to complete the upgrade increases linearly with the number of installed non-global zones.

For information about upgrading with Live Upgrade, a feature of Oracle Solaris, see Part I, "Upgrading With Live Upgrade," in *Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning*.

TABLE 1–4 Installation Checklist

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
Network connection	Is the system connected to a network?	Networked/Nonnetworked

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
Credentials and proxy information for Auto Registration, a feature of Oracle Solaris	Do you want to provide your support credentials and proxy information for Auto Registration with Oracle? Oracle Solaris Auto Registration is new in the Oracle Solaris 10 9/10 release. When you install or upgrade your system, configuration data about your system is, on rebooting, automatically communicated through the existing service tag technology to the Oracle Product Registration System. This service tag data about your system is used, for example, to help Oracle enhance customer support and services. You can learn about service tags at `http://www.oracle.com/technetwork/server-storage/solaris/oracle-service-tag-faq-418684.html`. You can use this same configuration data to create and manage your own inventory of your systems. By registering with your support credentials using one of the registration options below, you have a straightforward way to inventory your systems by recording and tracking the service tags for the systems and for the software products installed on the systems. Prior to an installation or upgrade, you can add an `auto_reg` keyword to your `sysidcfg` file to configure your Auto Registration preferences as follows: ■ Provide your support credentials and proxy information for Auto Registration. ■ Set up an anonymous registration so that the configuration data sent to Oracle has no link to the name of a customer. ■ Disable Auto Registration so that no configuration data is sent to Oracle. For instructions, see "auto_reg Keyword" in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*. If you do not preset the `auto_reg` keyword in the `sysidcfg` file, then during the interactive installation or upgrade, the installer asks you to provide your support credentials, or to register anonymously. If you do not provide your support credentials, the system is registered as an anonymous system. You are, also, asked to provide proxy information, if needed. Alternately, you can disable Auto Registration at the end of the installation or upgrade prior to rebooting. See the disabling instructions included as part of the installation procedures in this guide.	My Oracle Support user name and password Proxy server host name and port number HTTP proxy user name and password

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
Network security	**Starting with the Solaris 10 11/06 release**, you have the option during an initial installation to change the network security settings so that all network services, except Secure Shell, are disabled or restricted to respond to local requests only. This security option is only available during an initial installation, not during an upgrade. An upgrade maintains any previously set services. If necessary, you can restrict network services after an upgrade by using the `netservices` command. During the installation, you can select restricted network security. Or, you can enable a larger set of services as in previous Oracle Solaris releases. You can safely select the restricted network security option, as any services can be individually enabled after installation. For further information about these options, see "Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*. The network services can be enabled after installation by using the `netservices open` command or by enabling individual services by using SMF commands. See "Revising Security Settings After Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.	Restricted/Open network security
DHCP	Can the system use Dynamic Host Configuration Protocol (DHCP) to configure its network interfaces? DHCP provides the network parameters that are necessary for installation.	Yes/No*

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation		Description or Example	Answer — Defaults are noted with an asterisk (*)
If you are not using DHCP, note the network address.	IP Address	If you are not using DHCP, supply the IP address for the system. Example: 172.31.255.255 To find this information on a running system, type the following command. **# ypmatch** *host-name* **hosts**	
	Subnet	If you are not using DHCP, is the system part of a subnet? If yes, what is the netmask of the subnet? Example: 255.255.255.0 To find this information on a running system, type the following command. **# more /etc/netmasks**	
	IPv6	Do you want to enable IPv6 on this machine? IPv6 is a part of the TCP/IP Internet protocol that facilitates IP addressing by adding better security and increasing Internet addresses.	Yes/No*
Host Name		Host name that you choose for the system. To find this information on a running system, type the following command. **# uname -n**	
Kerberos		Do you want to configure Kerberos security on this machine? If yes, gather this information: Default Realm: Administration Server: First KDC: (Optional) Additional KDCs: The Kerberos service is a client-server architecture that provides secure transactions over networks.	Yes/No*

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation		Description or Example	Answer — Defaults are noted with an asterisk (*)
If the system uses a naming service, provide the following information.	Naming Service	Which naming service should this system use? To find this information on a running system, type the following command. `# cat /etc/nsswitch.conf` A naming service stores information in a central place, which enables users, machines, and applications to communicate across the network. Examples of information that is stored are host names and addresses or user names and passwords.	NIS+/NIS/DNS/ LDAP/None
	Domain Name	Provide the name of the domain in which the system resides. During installation, you can choose the default NFSv4 domain name. Or, you can specify a custom NFSv4 domain name. For instructions about how to find the domain name on a running system, see "Checking for the NFS Version 4 Domain" in *System Administration Guide: Network Services*. To preconfigure the NFSv4 domain name in the `sysidcfg` file, see "nfs4_domain Keyword" in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.	

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation		Description or Example	Answer — Defaults are noted with an asterisk (*)

	NIS+ and NIS	Do you want to specify a name server or let the installation program find one?
		
		If you want to specify a name server, provide the following information.
		
		Server's host name:
		
		■ For NIS clients, type the following command to display the server's host name.
		
		`# ypwhich`
		
		■ For NIS+ clients, type the following command to display the server's host name.
		
		`# nisping`
		
		Server's IP Address:
		
		■ For NIS clients, type the following command to display the server's IP address.
		
		`# ypmatch` *nameserver-name* `hosts`
		
		■ For NIS+ clients, type the following command to display the server's IP address.
		
		`# nismatch` *nameserver-name* `hosts.org_dir`
		
		Network Information Service (NIS) makes network administration more manageable by providing centralized control over a variety of network information, such as machine names and addresses.
			Specify One/Find One*

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation		Description or Example	Answer — Defaults are noted with an asterisk (*)
	DNS	Provide IP addresses for the DNS server. You must enter at least one IP address, but you can enter up to three addresses. Server's IP Address: To display the server's IP address, type the following command. `# getent hosts dns` You can enter a list of domains to search when a DNS query is made. List of domains to be searched: The domain name system (DNS) is the naming service that the Internet provides for TCP/IP networks. DNS provides host names to the IP address service. DNS simplifies communication by using machine names instead of numerical IP addresses. DNS also serves as a database for mail administration.	
	LDAP	Provide the following information about your LDAP profile. Profile Name: Profile Server: If you specify a proxy credential level in your LDAP profile, gather this information. Proxy-bind distinguished name: Proxy-bind password: Lightweight Directory Access Protocol (LDAP) defines a relatively simple protocol for updating and searching directories that are running over TCP/IP.	

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
Default Route	Do you want to specify a default route IP address or let the Oracle Solaris installation program find one? The default route provides a bridge that forwards traffic between two physical networks. An IP address is a unique number that identifies each host on a network. You have the following choices: ■ You can specify the IP address. An `/etc/defaultrouter` file is created with the specified IP address. When the system is rebooted, the specified IP address becomes the default route. ■ You can let the Oracle Solaris installation program detect an IP address. However, the system must be on a subnet that has a router that advertises itself by using the ICMP router discovery protocol. If you are using the command-line interface, the software detects an IP address when the system is booted. ■ You can choose None if you do not have a router or do not want the software to detect an IP address at this time. The software automatically tries to detect an IP address on reboot.	Detect one*/Specify one/None
Time Zone	How do you want to specify your default time zone?	Geographic region* Offset from GMT Time zone file
Root Password	Provide the root password for the system.	
Keyboard	If the keyboard is self-identifying, the keyboard language and layout automatically configures during installation. If the keyboard is not self-identifying, you can select from a list of supported keyboard layouts during installation. PS/2 keyboards are not self-identifying. You will be asked to select the keyboard layout during the installation. **SPARC only** – Previously, all of keyboards that were not self-identifying always configured for the U.S. English layout during installation. For further information, see "keyboard Keyword" in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.	
Locales	For which geographic regions do you want to install support?	

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
SPARC: Power Management (only available on SPARC systems that support Power Management)	Do you want to use Power Management? **Note –** If your system has Energy Star version 3 or later, you are not prompted for this information.	Yes*/No
Automatic reboot or CD/DVD ejection	Reboot automatically after software installation? Eject CD/DVD automatically after software installation?	Yes*/No Yes*/No
Default or Custom Install	Do you want to perform a default installation, or customize the installation? ■ Select Default installation to format the entire hard disk and install a preselected set of software. ■ Select Custom installation to modify the hard disk layout and select the software that you want to install. **Note –** The text installer does not prompt you to select a Default or Custom Installation. To perform a default installation, accept the default values that are provided in the text installer. To perform a custom installation, edit the values in the text installer screens.	Default installation*/Custom installation
Software Group	Which Oracle Solaris Software Group do you want to install?	Entire Plus OEM Entire* Developer End User Core Reduced Networking
Custom Package Selection	Do you want to add or remove software packages from the Oracle Solaris Software Group that you install? **Note –** When you select which packages to add or remove, you need to know about software dependencies and how Oracle Solaris software is packaged.	
Select Disks	On which disks do you want to install the Oracle Solaris software? Example: `c0t0d0`	

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
x86: `fdisk` partitioning	Do you want to create, delete, or modify a `fdisk` partition? Each disk that is selected for file system layout must have a `fdisk` partition in Oracle Solaris. If your system currently has a service partition, the Oracle Solaris installation program preserves the service partition by default. If you do not want to preserve the service partition, you must customize the `fdisk` partitions. For more information about preserving a service partition, see "Default Boot-Disk Partition Layout Preserves the Service Partition" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*. Select Disks for `fdisk` Partition Customization? Customize `fdisk` partitions?	 Yes/No* Yes/No*
Preserve Data	Do you want to preserve any data that exists on the disks where you are installing the Oracle Solaris software?	Yes/No*
Auto-layout File Systems	Do you want the installation program to automatically lay out file systems on your disks? If yes, which file systems should be used for auto-layout? Example: `/,/opt,/var` If no, you must provide file system configuration information. **Note –** The Oracle Solaris installation GUI lays out file systems automatically by default.	Yes*/No
Mount Remote File Systems	Does this system need to access software on another file system? If yes, provide the following information about the remote file system. Server: IP Address: Remote File System: Local Mount Point:	Yes/No*
If you are installing through a `tip` line, follow these instructions.	Ensure that your window display is at least 80 columns wide and 24 rows long. For more information, see `tip(1)`. To determine the current dimensions of your `tip` window, use the `stty` command. For more information, see the man page, `stty(1)`.	

TABLE 1–4 Installation Checklist *(Continued)*

Information for Installation	Description or Example	Answer — Defaults are noted with an asterisk (*)
Check your Ethernet connection.	If the system is part of a network, verify that an Ethernet connector or similar network adapter is connected to your system.	
Review the planning chapter and other relevant documentation.	■ Review the entire planning chapter or specific sections in Part I, "Overall Planning of an Oracle Solaris Installation or Upgrade," in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*. ■ Review the *Oracle Solaris 10 8/11 Release Notes* on `http://www.oracle.com/technetwork/indexes/documentation/index.html` and vendor release notes to ensure that the software you use is supported in the new Oracle Solaris release. ■ Review the *Oracle Solaris 10 8/11 Sun Hardware Platform Guide* to ensure that your hardware is supported. ■ Review the documentation that accompanied your system to ensure that your system and devices are supported by the Oracle Solaris release.	

Where to Find Additional Installation Information

For additional information about requirements and recommendations for installing the Oracle Solaris OS, see the following sections in the *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*. This document provides system requirements and high-level planning information, such as planning guidelines for file systems and upgrade planning.

TABLE 1–5 Installation References

Topic	Reference
Network security planning	"Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*
Disk space guidelines and recommendations	"Allocating Disk and Swap Space" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*

TABLE 1–5 Installation References *(Continued)*

Topic	Reference
Additional requirements and recommendations for upgrading to the Oracle Solaris OS	"Upgrade Planning" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade* "Checklist for Upgrading" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*
Information about working with x86 partitions during your installation	"Partitioning Recommendations" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*
Information about ZFS installations, GRUB based booting, Oracle Solaris Zones partitioning technology, and RAID-1 volumes that can be created at installation	Part II, "Understanding Installations Related to ZFS, Booting, Oracle Solaris Zones, and RAID-1 Volumes," in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*
Road map of the overall installation process	"Installing or Upgrading the Oracle Solaris Software Task Map" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*

◆ ◆ ◆ CHAPTER 2

Installing With the Oracle Solaris Installation Program For UFS File Systems (Tasks)

This chapter explains how to use the Oracle Solaris installation program on the Oracle Solaris Operating System DVD or Oracle Solaris Software - 1 CD to install or upgrade Oracle Solaris software.

Note – This chapter provides installation instructions for a UFS (/) root file system. If you want to install a ZFS root pool, see Chapter 3, "Installing With the Oracle Solaris Interactive Text Installer for ZFS Root Pools (Planning and Tasks)."

This chapter contains the following topics:

- "SPARC: Performing an Installation or Upgrade for UFS File Systems With the Oracle Solaris Installation Program" on page 31
- "x86: Performing an Installation or Upgrade for UFS File Systems With the Oracle Solaris Installation Program" on page 40

For information about all the new features in the Oracle Solaris OS, see *Oracle Solaris 10 1/13 What's New*.

Pre-Installation or Upgrade Preparation

▼ To Prepare for an Installation or Upgrade

1 **Ensure that you have the necessary media.**

Select one of the following options:

- If you are installing from a DVD, use the Oracle Solaris Operating System for x86 Platforms DVD.
- If you are installing from CD media:

  You need the following media:

  - Oracle Solaris Software CDs.
  - Oracle Solaris Languages for x86 Platforms CDs – The installation program prompts you for these CDs if necessary to support languages for specific geographic regions.

  Note – Starting with the Oracle Solaris 10 9/10 release, only a DVD is provided. Oracle Solaris Software CDs are no longer provided.

2 **Check your system BIOS to make sure you can boot from CD or DVD media.**

3 **Acquire any install time updates (ITUs) or drivers that you need to install the Oracle Solaris OS on your hardware.**

To determine if you need an ITU or additional drivers, see your hardware documentation.

4 **Verify that your system meets the minimum requirements.**

Your system should meet the following requirements.

- Memory – 1.5 GB or greater
- Disk space – 6.8 GB or greater
- Processor speed – 120 MHz or greater with hardware floating point

For detailed information about system requirements, see "System Requirements and Recommendations" on page 9.

If you are installing the Oracle Solaris OS on a system that is not produced by Oracle Corporation, check the Oracle Solaris Hardware Compatibility List at `http://www.oracle.com/webfolder/technetwork/hcl/index.html` before you begin to install.

5 **Gather the information you need to install the Oracle Solaris OS.**

- For a nonnetworked system:

You need the following information:

- Host name of the system that you are installing
- Language and locales that you intend to use on the system

- For a networked system, gather the following information.
  - Host name of the system that you are installing
  - Keyboard layout

    Note – If the keyboard is self-identifying, the keyboard layout automatically configures during installation. If the keyboard is not self-identifying, you can select from a list of supported keyboard layouts during installation.

    For further information, see "keyboard Keyword" in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

  - Language and locales that you intend to use on the system
  - Host IP address
  - Subnet mask
  - Type of naming service (for example, DNS, NIS, or NIS+)
  - Domain name

    Note – During installation, you can choose the default NFSv4 domain name. Or, you can specify a custom NFSv4 domain name.

  - Host name of the name server
  - Host IP address of the name server
  - Root password

SPARC: Performing an Installation or Upgrade for UFS File Systems With the Oracle Solaris Installation Program

For UFS file systems, you can either install or upgrade the Oracle Solaris OS by using the Oracle Solaris installation program. This section lists the tasks you need to perform to install the Oracle Solaris OS, and provides detailed instructions about how to install the Oracle Solaris OS from DVD or CD media.

If you want to install the Oracle Solaris OS on a machine or domain that does not have a directly attached DVD-ROM or CD-ROM drive, you can use a DVD-ROM or CD-ROM drive that is

attached to another machine. For detailed instructions, refer to Appendix B, "Installing or Upgrading Remotely (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

Note – Starting with the Oracle Solaris 10 9/10 release, only a DVD is provided. Oracle Solaris Software CDs are no longer provided.

If you have a system that contains non-global zones, Live Upgrade, a feature of Oracle Solaris, is the recommended upgrade program or program to add patches. Other upgrade programs might require extensive upgrade time, because the time required to complete the upgrade increases linearly with the number of installed non-global zones.

For information about upgrading with Live Upgrade, a feature of Oracle Solaris, see Part I, "Upgrading With Live Upgrade," in *Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning*.

▼ SPARC: To Install or Upgrade With the Oracle Solaris Installation Program

This procedure describes how to install a stand-alone SPARC based system from CD or DVD media for UFS file systems. For more information about how to prepare for an installation or upgrade, see "To Prepare for an Installation or Upgrade" on page 30.

1. **Insert the Oracle Solaris Operating System for SPARC Platforms DVD or Oracle Solaris Software for SPARC Platforms - 1 CD.**

2. **Boot the system.**

   - **If the system is new, turn on the system.**
   - **If you want to install on a system that is currently running, shut down the system.**

   The ok prompt is displayed.

3. **Start the Oracle Solaris installation program.**

   - **To boot from the local DVD or CD and start the Oracle Solaris installation GUI in a desktop session, type the following command.**

     ```
     ok boot cdrom
     ```

   - **To boot from the local DVD or CD and start the text installer in a desktop session, type the following command.**

     ```
     ok boot cdrom - text
     ```

`text` Specifies to run the text installer in a desktop session. Use this option to override the default GUI installer.

- **To boot from the local DVD or CD and start the text installer in a console session, type the following command.**

```
ok boot cdrom - nowin
```

`nowin` Specifies to run the text installer in a console session. Use this option to override the default GUI installer.

Note – *Starting with the Oracle Solaris 10 1/13 release*, the text installer enables you to select network based installation when installing Oracle Solaris from a CD/DVD. This enhancement provides an option to install Oracle Solaris from a CD/DVD or from the network file system.

For detailed information about the Oracle Solaris installation GUI and text installer, see "Oracle Solaris Installation Program GUI or Text Installer Requirements" on page 11.

If the operating system cannot locate a self-identifying keyboard, a screen displays keyboard layout selections.

Note – PS/2 keyboards are not self-identifying. You will be asked to select the keyboard layout during the installation.

---

4 If a screen appears listing keyboard layouts, select the desired keyboard layout and press F2 to continue.

The system configures the devices and interfaces and searches for configuration files.

If you selected a GUI installation in the earlier steps, the next two screens confirm GUI functioning.

5 Verify the installation type that you selected earlier.

- **If you selected a text installation, you will be asked to select a language. Proceed to Step 6.**
- **If you selected a GUI installation, confirmation screens will be displayed to enable you to verify that the installation will work on your system.**

  a. In the first confirmation screen that appears, press Return.

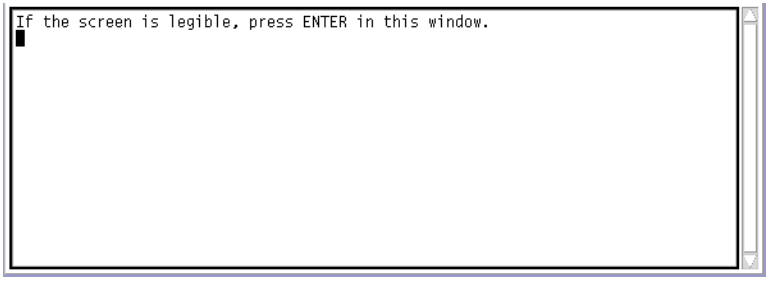
```
Starting Oracle Solaris Interactive (graphical user interface)
Installation
+-----------------------------------------------------------+
| You must respond to the first question within 30 seconds   |
| or the installer proceeds in a non-window environment      |
| (console mode).                                            |
```

```
|                                                              |
| If the screen becomes blank or unreadable the installer      |
| proceeds in console mode.                                    |
|                                                              |
| If the screen does not properly revert to console mode,      |
| restart the installation and make the following selection:   |
|                                                              |
|      Oracle Solaris Interactive Text (Console session)             |
+--------------------------------------------------------------+
```

If your system has insufficient memory to display a graphical user interface (GUI), the program exits and displays an error message. You can address this issue in one of two ways:

- Upgrade your system's memory and restart the installation.
- Restart the installation and select the text installer option rather than the GUI installer option.

b. In the next confirmation screen that appears, move your cursor into the screen and press Return.



6 In the list of language choices that is displayed, select the language you want to use during the installation and press Return.

7 Provide system configuration information if prompted.

- **If you preconfigured all of the system information, the installation program does not prompt you to provide any configuration information. Proceed to the next step.**

  See Chapter 2, "Preconfiguring System Configuration Information (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations* for more information.

- **If you did not preconfigure all the system information, the installation program prompts you for this information on several screens.**

  Use the Checklist for Installation to help you answer the configuration questions.

  a. Choose the default NFSv4 domain name or specify a customNFSv4 domain name if desired.

b. Indicate whether youwant to enable network services for use by remote clients.

- **To enable network services, choose the default response ("Yes, Iwould like to enable network services for use by remote clients").**
- **To provide a more secure configuration in which Secure Shell is the only network service provided to remote clients, choose "No."**

  If desired, you can enable network services after installation by using the netservices open command or by enabling individual services by using SMF commands. See "Revising Security Settings After Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

For further information about these options, see "Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

8 After you answer the configuration questions, the Welcome to Oracle Solaris screen appears. Click Next.

The Installer Questions screen appears.

9 Indicate whether you want to reboot the system automatically and whether you want to automatically eject the disc. Click Next.

Important: If you intend to disable Auto Registration after installation, deselect the automatic reboot.

The Specify Media screen appears.

10 Specify the media you are using to install. Click Next.

The License panel appears.

11 Accept the license agreement to continue the installation. Click Next.

The Oracle Solaris installation program then determines if the system can be upgraded. To upgrade, the system must have an existing Oracle Solaris root (/) file system. The Oracle Solaris installation program detects the necessary conditions and then upgrades the system.

The Select Upgrade or Initial Install screen appears.

12 Indicate whether you want to perform an initial installation or an upgrade. Click Next.

The next screen enables you to choose a default installation or a custom installation.

13 Select the type of installation you want to perform. Click Next.

- **Select Default Install to install the Entire Oracle Solaris Software Group.**

- **Select Custom Install if you want to perform the following tasks:**
  - Install a specific software group
  - Install additional software
  - Install specific software packages
  - Install a specific locale
  - Customize the disk layout

  For more information about software groups, see "Disk Space Recommendations for Software Groups" on page 14.

Note – The text installer does not prompt you to select a default or custom installation. To perform a default installation, accept the default values that are provided in the text installer. To perform a custom installation, edit the values in the text installer screens.

---

14 If you are prompted, provide Auto Registration information.

- **If you set up your Auto Registration preferences using the `auto_reg` keyword in the `sysidcfg` file prior to the installation or upgrade, the installer does not prompt you for that information as part of completing the configuration questions.**

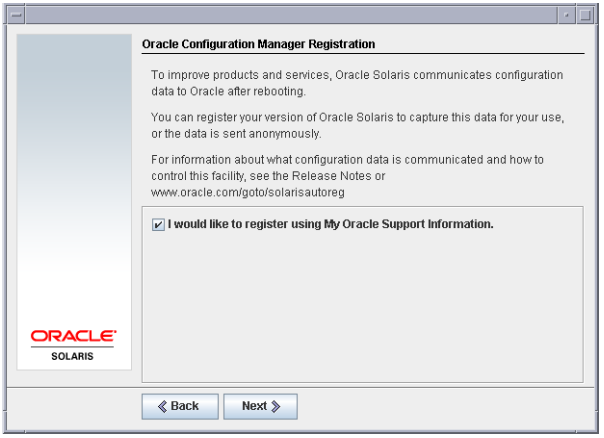
- **If you did not include the `auto_reg` keyword in the `sysidcfg` file, the installer prompts you to provide Auto Registration information as part of completing the configuration questions.**

  Note – If you intend to disable Auto Registration at the end of the installation or upgrade, you can proceed through these Auto Registration screens without providing any information.

  ---

a. Select the option to register using your support credentials or deselect the option to have data sent anonymously.

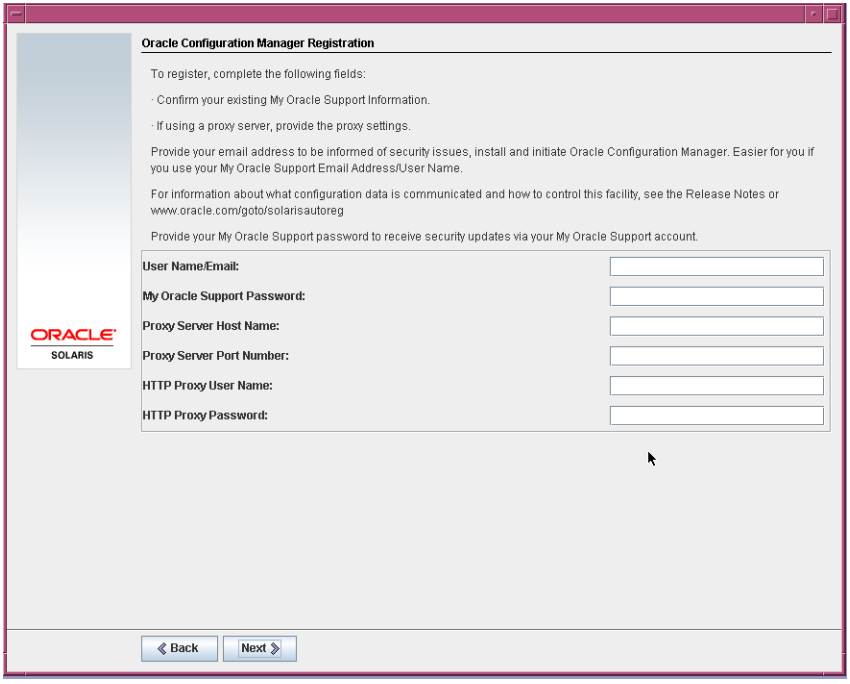
The following figure shows the GUI version of the Auto Registration screen. The test installer version displays the same text. Click Next to continue.



In the text installer screen, use the arrow keys to navigate to the option box. Press Return to mark the option box to select registering with your support credentials. Press Esc-2 key to continue.

b. Provide the requested proxy and credential information.

The following figure shows the GUI version of the Auto Registration data entry screen. The text installer version provides the same options.



If you chose to register with your support details, you are prompted to provide your My Oracle Support user name and password. If you use a proxy server, you can provide the server host name and port number, and the proxy user name and password.

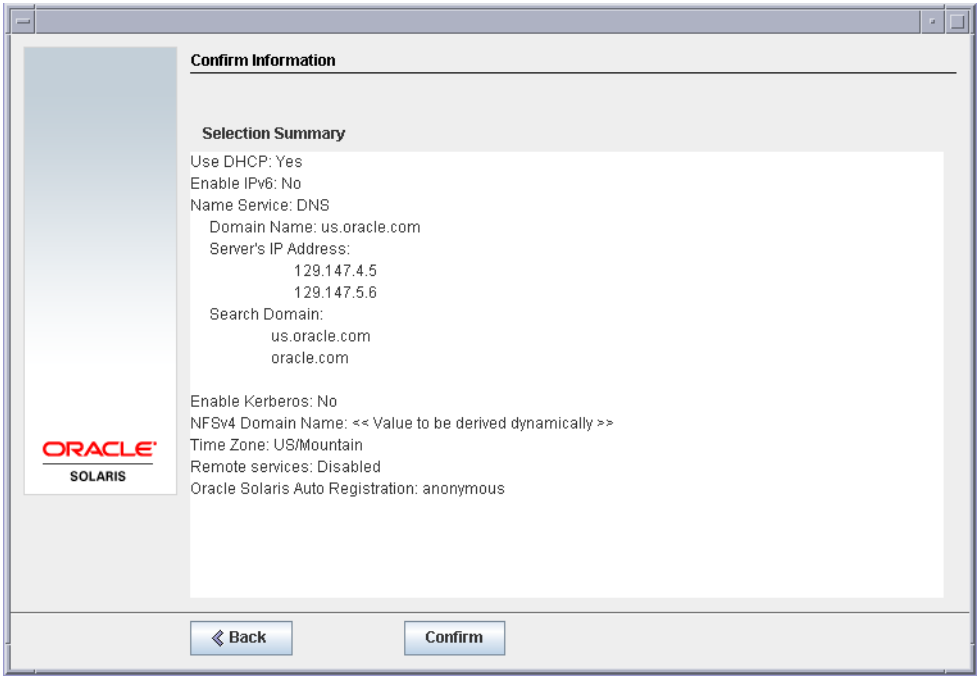
If you chose to register anonymously, this screen asks only for the proxy information.

For the text installer version, use the arrow keys to navigate between lines. Type your support credentials and optional proxy entries. Press the Esc—2 key to continue.

The Ready to Install screen is displayed.

15 Review the Ready to Install screen.

The following figure shows the GUI screen. The text install screen contains the same summary information.



16 Click Install Now and then follow the instructions to install the Oracle Solaris software.

When the installation program finishes installing the Oracle Solaris software, the system reboots automatically or prompts you to reboot manually.

If you are installing additional products, you are prompted to insert the DVD or CD for those products. For installation procedures, refer to the appropriate installation documentation.

After the installation is finished, installation logs are saved in a file. You can find the installation logs in the `/var/sadm/system/logs` and `/var/sadm/install/logs` directories.

- **If you are performing an initial installation, the installation is complete.**
- **If you are upgrading the Oracle Solaris software, you might need to correct some local modifications that were not preserved.**

  a. **Review the contents of the `/a/var/sadm/system/data/upgrade_cleanup` file to determine whether you need to correct local modifications that the Oracle Solaris installation program could not preserve.**

b. **Correct any local modifications that were not preserved.**

17 **If you previously deselected automatic rebooting, choose one of the following two options:**

- **If you do not want to disable Auto Registration, eject any installation media, then manually reboot the system as follows:**

  ```
  # reboot
  ```

- **If you want to disable Auto Registration so that no configuration data is sent to Oracle on reboot, perform the following steps prior to manually rebooting the system.**

  a. **Open a terminal window as follows:**

     - **For a GUI install, right-click.**
     - **For a text install, press "!".**

  b. **At the command line, remove the `/a/var/tmp/autoreg_config` file.**

     ```
     # rm /a/var/tmp/autoreg_config
     ```

  c. **Save the file.**

  d. **Eject any installation media and manually reboot the system.**

     ```
     # reboot
     ```

Note – After an installation, the Oracle Configuration Manager (OCM) is enabled by default. The OCM service can be disabled using the following command:

```
svcadm disable ocm
```

---

x86: Performing an Installation or Upgrade for UFS File Systems With the Oracle Solaris Installation Program

You can either install or upgrade the Oracle Solaris OS on x86 systems by using the Oracle Solaris installation program. This section lists the task you need to perform to install the Oracle Solaris OS, and provides detailed instructions about how to install the Oracle Solaris OS from DVD or CD media.

▼ x86: To Install or Upgrade With the Oracle Solaris Installation Program With GRUB

The Oracle Solaris installation programs for x86 based systems use the GRUB boot loader. This procedure describes how to install a stand-alone x86 based system with the GRUB bootloader from CD or DVD media for a UFS file system. For overview information about the GRUB boot loader, see Chapter 6, "SPARC and x86 Based Booting (Overview and Planning)," in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

Note – If you want to install the Oracle Solaris OS on a machine or domain that does not have a directly attached DVD-ROM or CD-ROM drive, you can use a DVD-ROM or CD-ROM drive that is attached to another machine. For detailed instructions, refer to Appendix B, "Installing or Upgrading Remotely (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

For more information about how to prepare for an installation or upgrade, see "To Prepare for an Installation or Upgrade" on page 30.

1 Insert the appropriate media in your system.

If you boot from the Oracle Solaris Operating System DVD or the Oracle Solaris Software - 1 CD, insert the disc. Your system's BIOS must support booting from a DVD or CD.

Note – *Starting with the Oracle Solaris 10 1/13 release*, the text installer enables you to select network based installation when installing Oracle Solaris from a CD/DVD. This enhancement provides an option to install Oracle Solaris from a CD/DVD or from the network file system.

You might need to manually set your BIOS to boot from a DVD or CD. See your hardware documentation for more information about how to set the BIOS.

2 Boot the system by shutting it down and then turning it off and on.

3 If you need to manually set the BIOS to boot from CD or DVD, type the appropriate key sequence to interrupt your system boot process.

Modify the boot priority in the BIOS, and exit the BIOS to return to the installation program.

A memory test and hardware detection are executed. The screen refreshes. The GRUB menu is displayed.

```
GNU GRUB version 0.95 (631K lower / 2095488K upper memory)
+-------------------------------------------------------------------------+
| Oracle Solaris                                                          |
| Oracle Solaris Serial Console ttya                                      |
| Oracle Solaris Serial Console ttyb (for lx50, v60x and v65x)            |
```

```
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.
```

4 Select the appropriate installation option.

- **If you want to install the Oracle Solaris OS from CD or DVD on your current system, select Oracle Solaris, then press Enter.**

  Select this option if you want to install the system by using the default values.

- **If you want to install the Oracle Solaris OS and send the screen output to a device that is connected to serial port COM1, select Oracle Solaris Serial Console ttya.**

- **If you want to install the Oracle Solaris OS and send the screen output to a device that is connected to serial port COM2, select Oracle Solaris Serial Console ttyb.**

- **If you want to install the Oracle Solaris OS with specific boot arguments to customize the system configuration during the installation, follow these steps.**

  a. On the GRUB menu, select the installation option you want to edit, then press e.

  Boot commands that are similar to the following text are displayed in the GRUB menu.

  ```
  kernel /boot/multiboot kernel/unix -B install_media=cdrom
  module /boot/x86.miniroot
  ```

  b. Use the arrow keys to select the boot entry that you want to edit, then press e.

  The boot command that you want to edit is displayed in the GRUB edit window.

  c. Edit the command by typing the boot arguments or options you want to use.

  The command syntax for the Grub edit menu is as follows.

  ```
  grub edit>kernel /boot/multiboot kernel/unix/ \
  install [url|ask] -B options install_media=media_type

  grub edit>kernel$ /boot/platform/i86pc/$ISADIR/kernel/unix/ \
  install [url|ask] -B options install_media=media_type
  ```

  For information about boot arguments and command syntax, see Chapter 9, "Installing From the Network (Command Reference)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

  d. Press Enter to go back to the GRUB menu and save your edits.

  The GRUB menu is displayed. The edits you made to the boot command are displayed.

  To go back to the GRUB menu without saving your edits, press Escape.

e. To begin the installation, type `b` in the GRUB menu.

The Oracle Solaris installation program checks the default boot disk for the requirements to install or upgrade the system. If the Oracle Solaris installation cannot detect the system configuration, the program prompts you for any missing information.

When the check is completed, the installation selection screen is displayed.

```
Select the type of installation you want to perform:

   1 Oracle Solaris Interactive
   2 Custom JumpStart
   3 Oracle Solaris Interactive Text (Desktop session)
   4 Oracle Solaris Interactive Text (Console session)
     (Select option 3 or 4 to install a ZFS root file system)
   5 Apply driver updates
   6 Single user shell

   Enter the number of your choice.
```

5 (Optional) If you need to update drivers or install an install time update (ITU), insert the update media, type 5, then press Enter.

You might need to update drivers or install an ITU to enable the Oracle Solaris OS to run on your system. Follow the instructions for your driver update or ITU to install the update.

6 (Optional) If you need to perform system administration tasks, type 6, then press Enter.

You might want to launch a single user shell if you need to perform any system administration tasks on your system before you install. For information about system administration tasks you can perform prior to installation, see *Oracle Solaris Administration: Basic Administration*.

7 Select an installation type.

- **To install with the Oracle Solaris interactive installation GUI, type 1, then press Enter.**
- **To perform an unattended custom JumpStart installation, type 2, then press Enter.**

  For information about JumpStart installations, see *Oracle Solaris 10 1/13 Installation Guide: JumpStart Installations*.

- **To install with the interactive text installer in a desktop session, type 3, then press Enter. You can also type `b - text` at the prompt.**

  Select this installation type to override the default GUI installer and run the text installer.

  For detailed information about the Oracle Solaris installation GUI and text installer, see "System Requirements and Recommendations" on page 9.

- **To install with the interactive text installer in a console session, type 4, then press Enter. You can also type `b - nowin` at the prompt.**

  Select this installation type to override the default GUI installer and run the text installer.

  The system configures the devices and interfaces, and searches for configuration files. If the operating system cannot locate a self-identifying keyboard, a screen displays keyboard layout selections. If the system locates a self-identifying keyboard, skip to Step 11.

8 If a screen appears listing keyboard layouts, select the desired keyboard layout and press F2 to continue.

The system configures the devices and interfaces and searches for configuration files.

If you selected a GUI installation in the earlier steps, the next two screens confirm GUI functioning.

9 (Optional) In the following screen, press Enter.

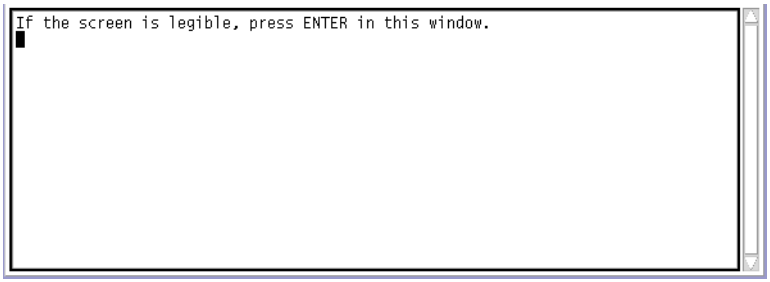
```
Starting Oracle Solaris Interactive (graphical user interface)
Installation
+------------------------------------------------------------+
| You must respond to the first question within 30 seconds   |
| or the installer proceeds in a non-window environment      |
| (console mode).                                            |
|                                                            |
| If the screen becomes blank or unreadable the installer    |
For a GUI install, right-click.| proceeds in console mode.   |
|                                                            |
| If the screen does not properly revert to console mode,    |
| restart the installation and make the following selection: |
|                                                            |
|     Oracle  Solaris Interactive Text (Console session)     |
------------------------------------------------------------+
```

Note – If your system has insufficient memory, the program exits and displays an error message. You can upgrade your memory and restart the installation.

For an alternative that requires less memory to install, restart the installation and select a text installer option instead of a GUI installer option.

After progress messages are completed, another confirmation screen is displayed.

10 (Optional) Move your cursor into the following text screen and press Enter.



A list of language choices is displayed.

11 Select the language you want to use during the installation, and press Enter.

12 If you are prompted, answer any remaining configuration questions.

- If you preconfigured all of the system information, the installation program does not prompt you to enter any configuration information. See Chapter 2, "Preconfiguring System Configuration Information (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations* for more information.
- If you did not preconfigure all the system information, the installation program prompts you for this information on several screens. Use the "Checklist for Installation" on page 16 to help you answer the configuration questions.
- One configuration question asks you whether you want to enable network services for use by remote clients. The default response is "Yes, I would like to enable network services for use by remote clients."

  Selecting "No" provides a more secure configuration in which Secure Shell is the only network service provided to remote clients. Selecting "Yes" enables a larger set of services as in previous Oracle Solaris releases. You can safely select "No" as any services can be enabled after installation. For further information about these options, see "Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

  The network services can be enabled after installation by using the `netservices open` command or by enabling individual services by using SMF commands. See "Revising Security Settings After Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

After you answer the configuration questions, the Welcome to Oracle Solaris panel appears.

13 Click Next in the Welcome screen.

The Installer Questions screen displays.

14 Indicate whether you want to reboot the system automatically and whether you want to automatically eject the disc. Click Next.

Important: If you intend to disable Auto Registration after installation, deselect the automatic reboot.

The Specify Media screen appears.

15 Specify the media you are using to install. Click Next.

The License screen appears.

16 Accept the license agreement to continue the installation. Click Next.

The Oracle Solaris installation program then determines if the system can be upgraded. To upgrade, the system must have an existing Oracle Solaris root (`/`) file system. The Oracle Solaris installation program detects the necessary conditions and then upgrades the system.

The Select Upgrade or Initial Install screen appears.

17 Indicate whether you want to perform an initial installation or an upgrade. Click Next.

Note – If you restored the diagnostic or service partition on your system before you started the installation, you might not be able to upgrade to the Oracle Solaris OS. For more information, see "Service Partition Not Created by Default on Systems With No Existing Service Partition" in *Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning*.

The next screen enables you to choose a default installation or a custom installation.

18 Select the type of installation you want to perform. Click Next.

- **Select Default Install to install the Entire Oracle Solaris Software Group.**
- **Select Custom Install if you want to perform the following tasks:**
  - Install a specific software group
  - Install additional software
  - Install specific software packages
  - Install a specific locale
  - Customize the disk layout

For more information about software groups, see "Disk Space Recommendations for Software Groups" on page 14. For information about customizing `fdisk` partitions, see "Partitioning Recommendations" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

Note – The text installer does not prompt you to select a default or custom installation. To perform a default installation, accept the default values that are provided in the text installer. To perform a custom installation, edit the values in the text installer screens.

19 If you are prompted, provide Auto Registration information.

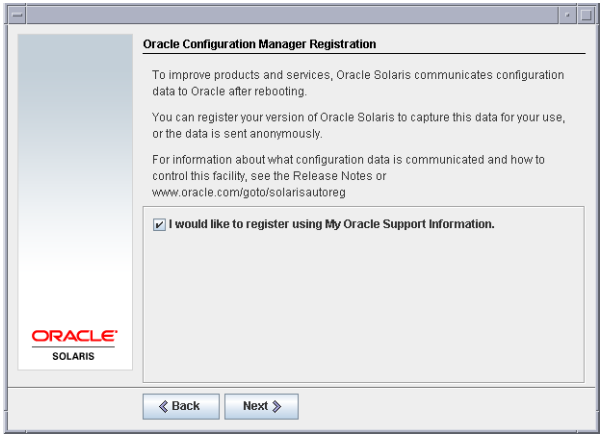
If you set up your Auto Registration preferences using the `auto_reg` keyword in the `sysidcfg` file prior to the installation or upgrade, the installer does not prompt you for that information as part of completing the configuration questions.

- **If you did not include the `auto_reg` keyword in the `sysidcfg` file, the installer prompts you to provide Auto Registration information as part of completing the configuration questions.**

  Note – If you intend to disable Auto Registration at the end of the installation or upgrade, you can proceed through these Auto Registration screens without entering any information.

  a. Select the option to register using your support credentials or deselect the option to have data sent anonymously. Click Next to continue.

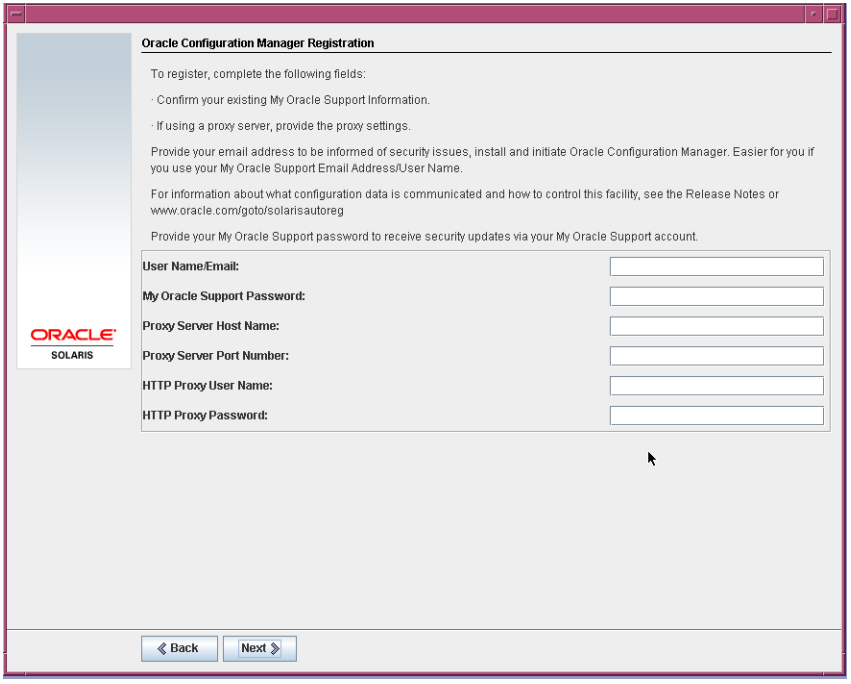
  The following figure shows the GUI version of the Auto Registration screen. The text installer version displays the same text.



  In the text installer screen, use the arrow keys to navigate to the option box. Press Return to mark the option box to select registering with your support credentials. Press Esc-2 key to continue.

b. Provide the requested proxy and credential information.

The following figure shows the GUI version of the Auto Registration data entry screen. The text installer version provides the same options.



If you chose to register with your support details, you are prompted to provide your My Oracle Support user name and password. If you use a proxy server, you can provide the server host name and port number, and the proxy user name and password.

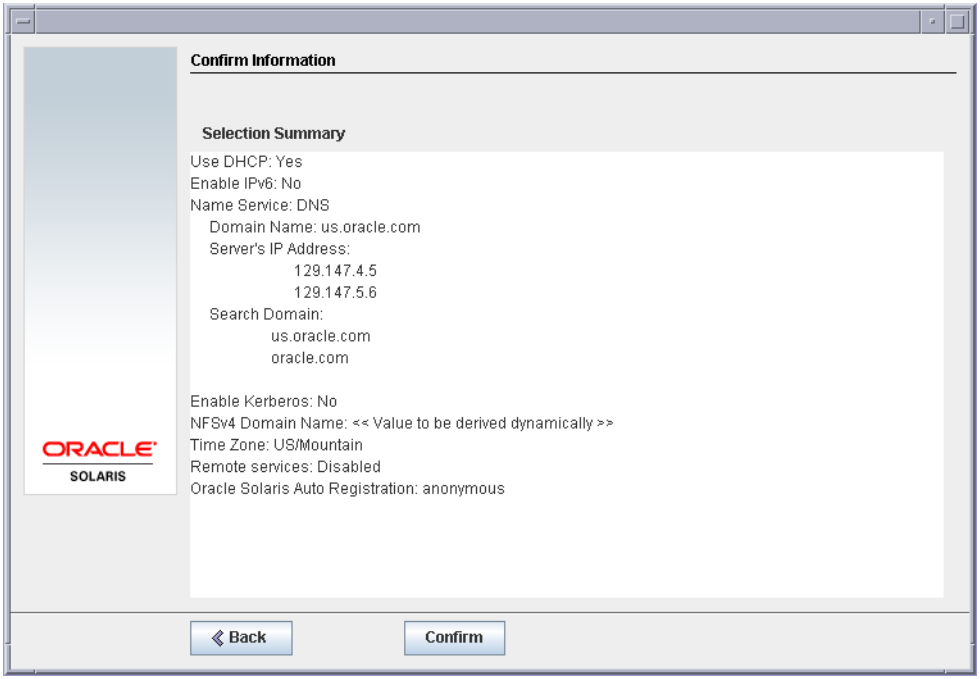
If you chose to register anonymously, this screen asks only for the proxy information.

Use the arrow keys to navigate between lines. Type your support credentials and optional proxy entries. Press the Esc-2 key to continue.

The Ready to Install screen is displayed.

20 Review the Ready to Install screen.

The following figure shows the GUI screen. The text version of this screen contains the same information.



21 Click Install Now and then follow the instructions to install the Oracle Solaris software.

When the installation program is finished installing the Oracle Solaris software, the system reboots automatically or prompts you to reboot manually.

After the installation is finished, installation logs are saved in a file. You can find the installation logs in the `/var/sadm/system/logs` and `/var/sadm/install/logs` directories

- **If you are performing an initial installation, the installation is complete. If you deselected automatic reboot, continue to Step 22.**
- **If you are upgrading the Oracle Solaris software, you might need to correct some local modifications that were not preserved.**

  a. **Review the contents of the `/a/var/sadm/system/data/upgrade_cleanup` file to determine whether you need to correct local modifications that the Oracle Solaris installation program could not preserve.**

  b. **Correct any local modifications that were not preserved.**

22 **If you previously deselected automatic rebooting, choose one of the following two options:**

- **If you do not want to disable Auto Registration, eject any installation media, then manually reboot the system as follows:**

  ```
  # reboot
  ```

- **If you want to disable Auto Registration so that no configuration data is sent to Oracle on reboot, perform the following steps prior to manually rebooting the system.**

Caution – If the system does automatically reboot, you cannot use the following steps to disable Auto Registration. Instead, after the automatic reboot, you can disable Auto Registration by using the Oracle Configuration Manager (OCM). See Chapter 17, "Working With Oracle Configuration Manager," in *Oracle Solaris Administration: Basic Administration*

a. **Open a terminal window as follows:**

   - **For a GUI install, right-click.**
   - **For a text install, press "!".**

b. **At the command line, remove the `/a/var/tmp/autoreg_config` file.**

   ```
   # rm /a/var/tmp/autoreg_config
   ```

c. **Save the file.**

d. **Eject any installation media and manually reboot the system.**

   ```
   # reboot
   ```

   After the system reboots, a GRUB menu lists the operating systems that are installed, including the newly installed Oracle Solaris OS.

e. **Select which operating system you want to boot.**

   The default selection loads if you do not make another selection.

More Information

Next Steps

If you install multiple operating systems on your machine, you need to instruct the GRUB boot loader to recognize these operating systems in order to boot. For more information, see "Modifying Boot Behavior by Editing the GRUB Menu at Boot Time" in *Oracle Solaris Administration: Basic Administration*.

◆ ◆ ◆ CHAPTER 3

Installing With the Oracle Solaris Interactive Text Installer for ZFS Root Pools (Planning and Tasks)

This chapter explains how to use the Oracle Solaris interactive installation program on the Oracle Solaris Operating System DVD or Oracle Solaris Software - 1 CD to perform an initial installation of a ZFS root pool.

This chapter contains the following topics:

- "ZFS Root Pool Installation (Planning)" on page 51
- "Performing Initial Installation With the Oracle Solaris Interactive Text Installer for ZFS" on page 52

ZFS Root Pool Installation (Planning)

You can perform an initial installation by using the Oracle Solaris interactive text installer to create a ZFS storage pool that contains a bootable ZFS root pool. You cannot use the standard GUI installation program to install a ZFS root pool.

The Solaris interactive text installation process is similar to previous Oracle Solaris releases. The difference is that you have the option to install a UFS (/) root file system or ZFS root pool. UFS is the still the default file system. You must select the ZFS option to create and install a ZFS storage pool.

If you already have ZFS storage pools on the system, they remain untouched unless you select the disks in the existing pool to create the new storage pool. If you have an existing ZFS storage pool that you want to use for your ZFS root file system, you must use Live Upgrade, a feature of Oracle Solaris, to migrate your existing UFS root (/) file system to a ZFS root pool. Live Upgrade also provides the means to upgrade a ZFS root pool. For more information, see Chapter 10, "Live Upgrade and ZFS (Overview)," in *Oracle Solaris 10 1/13 Installation Guide: Live Upgrade and Upgrade Planning*.

Before you begin the initial installation to create a ZFS storage pool, see Chapter 5, "ZFS Root File System Installation Planning," in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

Note – Installations to ZFS root file systems for both SPARC and x86 systems require a minimum of at least 1.5 GB or greater memory.

Performing Initial Installation With the Oracle Solaris Interactive Text Installer for ZFS

This procedure describes how to install a stand-alone SPARC based system from CD or DVD media.

▼ SPARC: How to Install a ZFS Root Pool

Before You Begin

If you want to install the Oracle Solaris OS on a machine or domain that does not have a directly attached DVD-ROM or CD-ROM drive, you can use a drive that is attached to another machine. For detailed instructions, refer to Appendix B, "Installing or Upgrading Remotely (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

Ensure that you have the necessary media.

- For a DVD installation, you need the Oracle Solaris Operating System for SPARC Platforms DVD.
- For a CD installation, you need the following media:
  - Oracle Solaris Software CDs.
  - Oracle Solaris Languages for SPARC Platforms CDs – The installation program prompts you for these CDs if necessary to support languages for specific geographic regions.

Note – Starting with the Oracle Solaris 10 8/11 release, only a DVD is provided. Oracle Solaris Software CDs are no longer provided.

If you want to preserve any existing data or applications, back up the system. For information about backing up a ZFS root pool, see "Recovering the ZFS Root Pool or Root Pool Snapshots" in *Oracle Solaris ZFS Administration Guide*.

1 **Insert the Oracle Solaris Operating System for SPARC Platforms DVD or Oracle Solaris Software for SPARC Platforms - 1 CD.**

2 **Boot the system.**

- **If the system is new, turn on the system.**

- **If you want to install a system that is currently running, shut down the system.**

The `ok` prompt is displayed.

3 Type the following command to start the Oracle Solaris interactive text installer by booting from the local DVD or CD.

```
ok boot cdrom - text
```

`text` Specifies to run the text installer in a desktop session. Use this option to override the default GUI installer.

You cannot run the installation GUI to install a ZFS root pool. If the operating system cannot locate a self-identifying keyboard, a screen displays keyboard layout selections.

Note – PS/2 keyboards are not self-identifying. You will be asked to select the keyboard layout during the installation.

---

4 If a screen appears listing keyboard layouts, select the desired keyboard layout from the following screen and press F2 to continue.

The system configures the devices and interfaces and searches for configuration files. A list of language choices might be displayed. If this screen is not displayed, skip to Step 6.

5 If a screen is displayed prompting you to select a language, select the language you want to use during the installation, and press F2.

```
Select a Language
+------------------------------------------------------------------------+
|   Please specify the the language from the list below.                 |
|                                                                        |
|   To make a selection, use the arrow keys to highlight the option and  |
|   press Return to mark it [X].                                         |
|                                                                        |
|       [  ] English                                                     |
|       [  ] French                                                      |
|       [  ] German                                                      |
|       [  ] Italian                                                     |
|       [  ] Japanese                                                    |
|       [  ] Korean                                                      |
|       [  ] Simplified Chinese                                          |
|       [  ] Spanish                                                     |
|       [  ] Swedish                                                     |
|       [  ] Traditional Chinese                                         |
|       [  ] UK-English                                                  |
|                                                                        |
|    F2_Continue      F6_Help                                            |
+------------------------------------------------------------------------+
```

6 Press F2. to display .

The Oracle Solaris Installation screen is displayed.

7 Provide system configuration information if prompted.

- **If you preconfigured all of the system information, the installation program does not prompt you to type any configuration information.**

  See Chapter 2, "Preconfiguring System Configuration Information (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations* for more information.

- **If you did not preconfigure all the system information, the installation program prompts you for this information on several screens.**

  Use the "Checklist for Installation" on page 16 to help you answer the configuration questions.

8 If prompted, indicate whether you want to enable network services for use by remote clients.

- **To enable network services, choose the default response, "Yes, I would like to enable network services for use by remote clients".**

- **To provide a more secure configuration in which Secure Shell is the only network service provided to remote clients, select "No".**

  If desired, you can enable network services after installation by using the `netservices open` command or by enabling individual services by using SMF commands. See "Revising Security Settings After Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

After you answer the configuration questions and set the root password, the Oracle Solaris Interactive Installation screen is displayed.

```
Oracle Solaris Interactive Installation
+-------------------------------------------------------------------------+
|On the following screens, you can accept the defaults or you can customize  |
| how Solaris software will be installed by:                              |
|                                                                         |
|  - Selecting the type of Solaris software to install                    |
|  - Selecting disks to hold the software you've selected                 |
|  - Selecting unbundled products to be installed with Solaris            |
|  - Specifying how file systems are laid out on the disks                |
|                                                                         |
|After completing these tasks, a summary of your selections              |
|(called a profile) will be displayed.                                    |
|                                                                         |
|There are two ways to install your Solaris software:                     |
|                                                                         |
|  - 'Standard' installs your system from a standard Oracle Solaris       |
|      Distribution. Selecting 'standard' allows you to choose between    |
|      initial install and upgrade, if your system is upgradeable.        |
|                                                                         |
|  - 'Flash' installs your system from one or more Flash Archives.        |
|                                                                         |
|    F2_Standard    F4_Flash    F5_Exit     F6_Help                       |
+-------------------------------------------------------------------------+
```

For further information about these options, see "Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

9 Choose the installation method.

- **To install a ZFS flash archive, press F4.**

  For step-by-step instructions on installing a ZFS flash archive, see the *Oracle Solaris ZFS Administration Guide*.

- **To perform an initial installation of a ZFS root file system, press F2.**

10 Indicate whether you want to reboot the system automatically and whether you want to automatically eject the disc. Press F2.

Note – If you want to disable Auto Registration after the installation and prior to rebooting, deselect automatic rebooting.

If you already have ZFS storage pools on the system, they are acknowledged by the following message, but remain untouched unless you select the disks in the existing pools to create the new storage pool.

```
There are existing ZFS pools available on this system.
However, they can only be upgraded using the Live Upgrade tools.
The following screens will only allow you to install a ZFS root system,
not upgrade one.
```

Press F2 to continue when you see the message that you already have ZFS storage pools on the system.

The License screen appears.

11 Accept the license agreement to continue the installation. Press F2.

The Select Upgrade or Initial Install screen might display. If you have UFS file system that is upgradeable, this screen is displayed. If this screen does not display, skip to Step 13.

12 To perform a ZFS installation, press F4 for an initial installation.

Screens for choosing geographic regions, locales, and additional products are displayed.

13 Make your choices for geographic regions, locales, and additional products.

The Choose a Filesystem Type screen is displayed.

14 To create a ZFS root pool, select the ZFS option and press F2.

```
Choose a Filesystem Type
+--------------------------------------------------------------------------+
```

```
|   Select the filesystem to use for your Oracle Solaris installation       |
|                                                                           |
|           [ ] UFS                                                         |
|           [X] ZFS                                                         |
|                                                                           |
|    F2_Continue      F6_Help                                               |
+---------------------------------------------------------------------------+
```

The Select Software screen is displayed.

15 Select the type of installation you want to perform. Press F2.

To perform a default installation, accept the default value that is provided. To perform a custom installation, edit the values in the text installer screen. In this example screen, the default Entire Distribution Software Group is selected for installation.

For more information about software groups, see "Disk Space Recommendations for Software Groups" on page 14.

```
Select Software
+---------------------------------------------------------------------------+
|Select the Solaris software to install on the system                       |
|                                                                           |
|Note: After selecting a software group, you can add or remove              |
|software by customizing it. However this requires understanding of         |
|software dependencies and how Solaris software is packaged.                |
|                                                                           |
|  [ ] Entire Distribution plus OEM support ......8575.00 MB                |
|  [X] Entire Distribution.......................8529.00 MB                |
|  [ ] Developer System Support..................8336.00 MB                |
|  [ ] End User System Support....................7074.00 MB                |
|  [ ] Core System Support.......................3093.00 MB                |
|  [ ] Reduced Networking Core System Support.....3035.00 MB                |
|                                                                           |
|    F2_Continue      F6_Help                                               |
+---------------------------------------------------------------------------+
```

The Select Disks screen is displayed.

After you select the software to be installed, you are prompted to select the disks to create your ZFS storage pool. This screen is similar to previous Oracle Solaris releases, except for the following text:

```
For ZFS, multiple disks will be configured as mirrors, so the disk you choose,
or the slice within the disk must exceed the Suggested Minimum value.
```

16 Select the disk or disks to be used for your ZFS root pool.

Note the following information:

- If you select a single disk and want to configure mirroring later, see the `zpool attach` command in "Managing Devices in ZFS Storage Pools" in *Oracle Solaris ZFS Administration Guide*.

- If you select two disks, a mirrored two-disk configuration is set up for your root pool. Either a two-disk or three-disk mirrored pool is optimal.
- If you have eight disks and you select all eight disks, those eight disks are used for the root pool as one big mirror. This is not an optimal configuration.

A RAID-Z pool configuration for the root pool is not supported. For more information about configuring ZFS storage pools, see "Replication Features of a ZFS Storage Pool" in *Oracle Solaris ZFS Administration Guide*.

```
Select Disks
+-----------------------------------------------------------------------------+
|On this screen you must select the disks for installing Solaris              |
|software. Start by looking at the Suggested Minimum Field;                   |
|this value is the approximate space needed to install the software           |
|you've selected. For ZFS, multiple disks will be configured as mirrors,      |
|so the disk you choose on the slice within the disk must exceed              |
|the Suggested Minimum Value.                                                 |
|                                                                             |
|  Note: ** denotes the current boot disk                                     |
|                                                                             |
|Disk Device                                          Available Space         |
|=============================================================================|
|                                                                             |
|[X]** c0t0d0                                          69994 MB (F4 to edit)  |
|[X]   c0t1d0                                          69994 MB               |
|[-]   c0t2d0                                              0 MB               |
|[-]   c0t3d0                                              0 MB               |
|                                                                             |
|                                 Maximum Root Size: 69994 MB                 |
|                                 Suggested Minimum: 8529 MB                  |
|                                                                             |
|    F2_Continue    F3_Go Back    F4_Edit     F5_Exit    F6_Help              |
+-----------------------------------------------------------------------------+
```

The Preserve Data screen is displayed.

17 (Optional) Preserve data on the disk where you are installing the software.

If a disk that you have selected for installing contains file systems or has unnamed slices that you want to save, you can save these file systems or unnamed slices now.

```
Preserve Data?
+-----------------------------------------------------------------------------+
|Do you want to preserve existing data? At least one of the disks you've      |
|selected for installing Solaris software has file systems or unnamed slices|
|that you may want to save                                                    |
|                                                                             |
|    F2_Continue      F4_Preserve    F6_Help                                  |
+-----------------------------------------------------------------------------+
```

If you pressed F4 to save data, the screen for saving data is displayed.

18 (Optional) Select the data to save.

To manage a ZFS root to file system, provide the size of the entire disk in a slice. For example, provide the size in slice 0. Sharing different root file systems on the same disk can be hard to manage.

To copy data off the disk to be installed as the root file system, exit the installer and back up the data that you want to preserve on this disk, and then restart the installer.

```
# install-solaris
```

The screen for configuring ZFS settings is displayed.

19 Accept the default values or modify them.

You can change the name of the ZFS pool, the dataset name, the pool size, swap and dump. In addition, you can modify the way the `/var` file system is created and mounted.

```
Configure ZFS Settings
+---------------------------------------------------------------------- -+
|Specify the name of the pool to be created from the disk(s) you have chosen.|
|Also specify the name of the dataset to be created within the pool that is  |
|to be used as the root directory for the filesystem.                        |
|                                                                            |
|                                                                            |
|              ZFS Pool Name: rpool                                          |
|      ZFS Root Dataset Name: s10zfsBE                                       |
|          ZFS Pool Size in (MB): 69995                                      |
|          Size of swap area in (MB): 2048                                   |
|          Size of dump area in (MB): 1024                                   |
|        (Pool size must be between 6481 MB and 69995 MB)                    |
|                                                                            |
|                         [X] Keep / and /var combined                       |
|                         [ ] Put /var on a separate dataset                 |
|                                                                            |
|    F2_Continue     F3_Go Back     F5_Exit     F6_Help                      |
+---------------------------------------------------------------------- --+
```

The screen for mounting a remote file system is displayed.

20 Indicate whether you want to mount a remote file system.

```
Mount Remote File System
+---------------------------------------------------------------------- -+
|Do you want to mount a software from a remote file server? This may         |
|be necessary if you had to remove software because of disk space problems.  |
|                                                                            |
|                                                                            |
|    F2_Continue      F6_Help                                                |
+---------------------------------------------------------------------- --+
```

21 If you are prompted, provide Auto Registration information.

- **If you set up your Auto Registration preferences using the `auto_reg` keyword in the `sysidcfg` file prior to the installation or upgrade, the installer does not prompt you for that information as part of completing the configuration questions.**

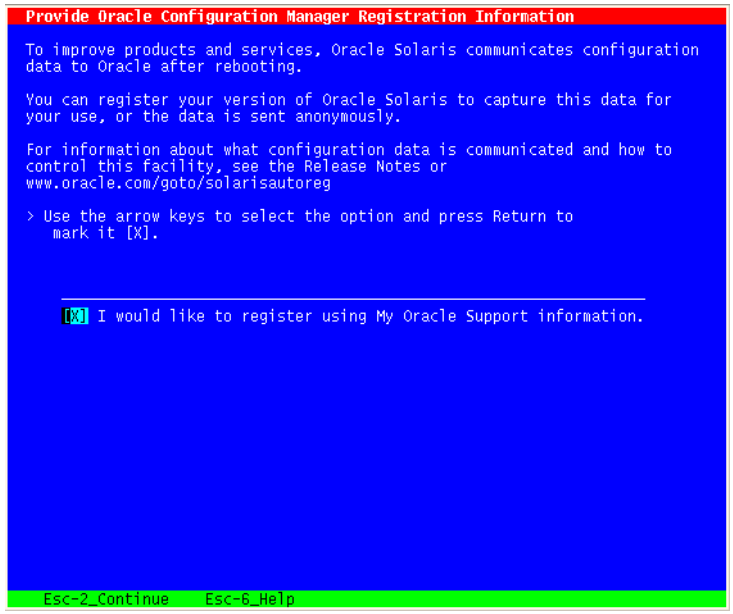
  For information about using the `auto_reg` keyword, see "auto_reg Keyword" in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.

- **If you did not include the `auto_reg` keyword in the `sysidcfg` file, the installer prompts you to provide Auto Registration information as part of completing the configuration questions.**

Note – If you intend to disable Auto Registration at the end of the installation or upgrade, you can proceed through these Auto Registration screens without entering any information.

---

a. Select the option to register using your support credentials or , deselect the option to have data sent anonymously.

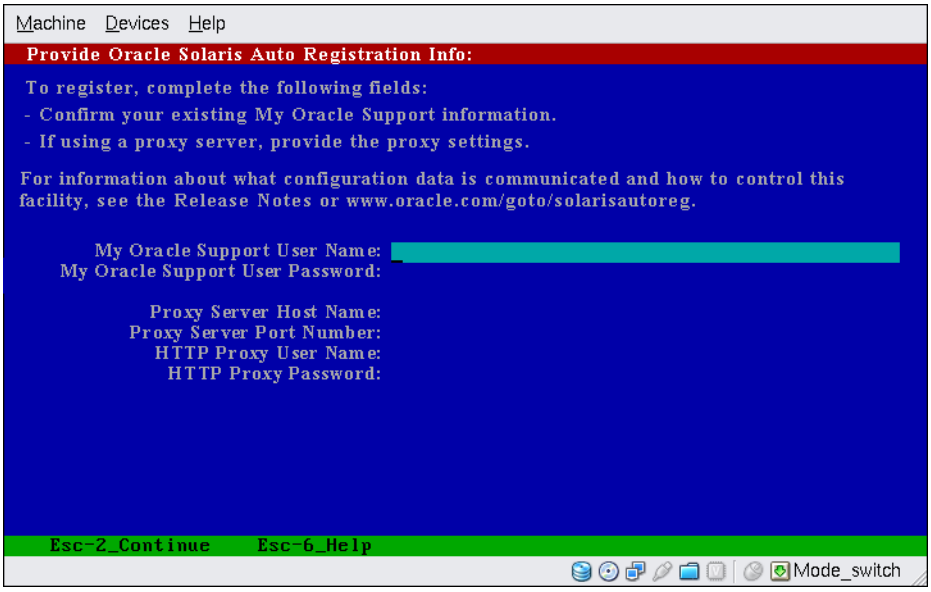


Use the arrow keys to navigate to the option box. Press Return to mark the option box to select registering with your support credentials. Press Esc–2 key to continue.

b. Provide the requested proxy and credential information.

If you chose to register with your support information, you are prompted to provide your My Oracle Support user name and password. If you use a proxy server, you can provide the server host name and port number, and the proxy user name and password.

If you chose to register anonymously, this screen asks only for the proxy information.



Use the arrow keys to navigate between lines. Type your support credentials and optional proxy entries. Press Esc–2 key to continue.

The Profile screen is displayed.

22 Review the Profile screen that displays your choices for installation.

You can change the installation profile if needed. The following example is of a final installation Profile screen.

```
Profile
+------------------------------------------------------------------------ -+
|The information shown below is your profile for installing Solaris software.|
|It reflects the choices you've made on previous screens.                   |
|                                                                           |
|===========================================================================|
|                                                                           |
|                Installation Option: Initial                               |
|                        Boot Device: c0t0d0                                |
|              Root File System Type: ZFS                                   |
|                     Client Services: None                                 |
|                       System Locale: C ( C )                              |
|                                                                           |
```

```
|                          Software: Solaris 10, Entire Distribution        |
|                         Pool Name: rpool                                  |
|              Boot Environment Name: s10zfsBE                              |
|                         Pool Size: 69995 MB                               |
|                     Devices in Pool: c0t0d0                               |
|                                      c0t1d0                               |
|                                                                           |
|    F2_Begin Installation    F4_Change     F5_Exit     F6_Help             |
+---------------------------------------------------------------------- --+
```

23 To install the Oracle Solaris software, press F2 and follow the instructions.

When the Oracle Solaris interactive text program finishes installing the Oracle Solaris software, the system reboots automatically or prompts you to reboot manually.

If you are installing additional products, you are prompted to insert the DVD or CD for those products. For installation procedures, refer to the appropriate installation documentation.

After the installation is finished, installation logs are saved in a file. You can find the installation logs in the `/var/sadm/system/logs` and `/var/sadm/install/logs` directories.

The installation is complete. If you deselected automatic rebooting after installation, continue to Step 24.

24 If you previously deselected automatic rebooting, choose one of the following two options:

- **If you do not want to disable Auto Registration, eject any installation media, then manually reboot the system as follows:**

  ```
  # reboot
  ```

- **If you want to disable Auto Registration so that no configuration data is sent to Oracle on reboot, perform the following steps prior to manually rebooting the system.**

Caution – If the system does automatically reboot, you cannot use the following steps to disable Auto Registration. Instead, after the automatic reboot, you can disable Auto Registration by using the Oracle Configuration Manager (OCM). See Chapter 17, "Working With Oracle Configuration Manager," in *Oracle Solaris Administration: Basic Administration*

  a. **When the installation is complete and before manually rebooting, press "!" to open a terminal window.**

  b. **At the command line, remove the `/a/var/tmp/autoreg_config` file.**

     ```
     # rm /a/var/tmp/autoreg_config
     ```

  c. **Save the file.**

d. Eject any installation media and manually reboot the system.

```
# reboot
```

Your system boots to the ZFS root pool that you installed.

You can display a list of available boot environments by using the `boot` command with the `-L` option. For more information about SPARC based booting, see "Booting From a Specified ZFS Root File System on a SPARC Based System" in *Oracle Solaris Administration: Basic Administration*.

25 (Optional) Review the resulting ZFS storage pool and file system information, as in the following example.

The sample `zpool status` and `zfs list` output identify the root pool components.

```
# zpool status
  pool: rpool
 state: ONLINE
 scan: none requested
config:

        NAME        STATE     READ WRITE CKSUM
        rpool       ONLINE       0     0     0
         mirror-0  ONLINE       0     0     0
          c0t0d0s0 ONLINE       0     0     0
          c0t1d0s0 ONLINE       0     0     0

errors: No known data errors
# zfs list
NAME                     USED  AVAIL  REFER  MOUNTPOINT
rpool                   7.15G  59.4G    106K  /rpool
rpool/ROOT              4.45G  59.4G     31K  legacy
rpool/ROOT/s10zfsBE     4.45G  59.4G   4.45G  /
rpool/dump              1.00G  59.4G   1.00G  -
rpool/export              63K  59.4G     32K  /export
rpool/export/home         31K  59.4G     31K  /export/home
rpool/swap              2.06G  61.5G     16K  -
```

If you have initially created your ZFS storage pool with one disk, you can convert the disk to a mirrored ZFS configuration after the installation. For more information about adding or attaching disks, see "Managing Devices in ZFS Storage Pools" in *Oracle Solaris ZFS Administration Guide*.

x86: Performing an Initial Installation With the Oracle Solaris Interactive Text Installer for ZFS

You can perform an initial installation the Oracle Solaris OS by using the Oracle Solaris interactive text installer. An initial installation overwrites the data on the disks being installed. This section provides detailed instructions about how to install the Oracle Solaris OS from DVD or CD media.

▼ x86: How to Install With the Oracle Solaris Interactive Text Installer With GRUB for ZFS

The Oracle Solaris installation program for x86 based systems uses the GRUB boot loader. This procedure describes how to install a stand-alone x86 based system with the GRUB boot loader from CD or DVD media. For overview information about the GRUB boot loader, see "Modifying Boot Behavior by Editing the GRUB Menu at Boot Time" in *Oracle Solaris Administration: Basic Administration*.

Before You Begin Perform the following tasks before you begin your installation.

- If you want to install the Oracle Solaris OS on a machine or domain that does not have a directly attached DVD-ROM or CD-ROM drive, you can use a DVD-ROM or CD-ROM drive that is attached to another machine. For detailed instructions, refer to Appendix B, "Installing or Upgrading Remotely (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations*.
- Ensure that you have the necessary media.
  - If you are installing from a DVD, use the Oracle Solaris Operating System for x86 Platforms DVD.
  - If you are installing from CD media:

    You need the following media.
    - Oracle Solaris Software CDs.
    - Oracle Solaris Languages for x86 Platforms CDs – The installation program prompts you for these CDs if necessary to support languages for specific geographic regions.

    Note – Starting with the Oracle Solaris 10 8/11 release, only a DVD is provided. Oracle Solaris Software CDs are no longer provided.

- Check your system BIOS to ensure you can boot from CD or DVD media.
- If you are installing the Oracle Solaris OS on a system that is not produced by Oracle Corporation, check the Oracle Solaris Hardware Compatibility List at `http://www.oracle.com/webfolder/technetwork/hcl/index.html` before you begin to install.
- (Optional) Back up your system.

  If you want to preserve any existing data or applications, back up the system. For backing up a ZFS root pool, see "Recovering the ZFS Root Pool or Root Pool Snapshots" in *Oracle Solaris ZFS Administration Guide*.

1 **Insert the appropriate media in your system.**

If you boot from the Oracle Solaris Operating System DVD or the Oracle Solaris Software - 1 CD, insert the disc. Your system's BIOS must support booting from a DVD or CD.

You might need to manually set your BIOS to boot from a DVD or CD. See your hardware documentation for more information about how to set the BIOS.

2 **Boot the system by shutting it down and then turning it off and on.**

3 **If you need to manually set the BIOS to boot from CD or DVD, type the appropriate key sequence to interrupt your system boot process.**

Modify the boot priority in the BIOS, and exit the BIOS to return to the installation program.

A memory test and hardware detection are executed. The screen refreshes. The GRUB menu is displayed.

```
GNU GRUB version 0.95 (631K lower / 2095488K upper memory)
+-------------------------------------------------------------------------+
| Oracle Solaris                                                          |
| Oracle Solaris Serial Console ttya                                      |
| Oracle Solaris Serial Console ttyb (for lx50, v60x and v65x)            |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+
Use the ^ and v keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.
```

4 **Select Solaris, then press Enter.**

The Oracle Solaris installation program checks the default boot disk for the requirements to install or upgrade the system. If the installation program cannot detect the system configuration, the program prompts you for any missing information.

When the check is completed, the installation selection screen is displayed.

5 **Select the interactive text installer in a desktop session by typing 3, then press Enter.**

Select this installation type to override the default GUI installer and run the text installer for a ZFS installation.

The system configures the devices and interfaces, and searches for configuration files. If the operating system cannot locate a self-identifying keyboard, a screen displays keyboard layout selections. If the system locates a self-identifying keyboard, skip to Step 7.

6 **(Optional) If a screen appears listing keyboard layouts, select the desired keyboard layout and press F2 to continue.**

The system configures the devices and interfaces and searches for configuration files. You might see two screens that confirm that windows are functioning. Confirm the next two screens and continue in text mode.

7 If the following screen is displayed, press Enter.

```
Starting Oracle Solaris Interactive (graphical user interface)
Installation
+------------------------------------------------------------+
| You must respond to the first question within 30 seconds   |
| or the installer proceeds in a non-window environment      |
| (console mode).                                            |
|                                                            |
| If the screen becomes blank or unreadable the installer    |
| proceeds in console mode.                                  |
|                                                            |
| If the screen does not properly revert to console mode,    |
| restart the installation and make the following selection: |
|                                                            |
|      Oracle Solaris Interactive Text (Console session)     |
+------------------------------------------------------------+
```

After progress messages are completed, another confirmation screen is displayed.

8 Move your cursor into the following text screen and press Enter.

```
+------------------------------------------------------------+
|If the screen is legible, press ENTER in this window.       |
|                                                            |
|                                                            |
|                                                            |
|------------------------------------------------------------+
```

A list of language choices might be displayed. If this screen is not displayed, skip to Step 10.

9 If language choices are displayed, select the language you want to use during the installation, and press F2.

```
Select a Language
+-------------------------------------------------------------------------+
|   Please specify the the language from the list below.                  |
|                                                                         |
|   To make a selection, use the arrow keys to highlight the option and   |
|   press Return to mark it [X].                                          |
|                                                                         |
|       [  ] English                                                      |
|       [  ] French                                                       |
|       [  ] German                                                       |
|       [  ] Italian                                                      |
|       [  ] Japanese                                                     |
|       [  ] Korean                                                       |
|       [  ] Simplified Chinese                                           |
|       [  ] Spanish                                                      |
|       [  ] Swedish                                                      |
|       [  ] Traditional Chinese                                          |
|       [  ] UK-English                                                   |
|                                                                         |
|    F2_Continue      F6_Help                                             |
+-------------------------------------------------------------------------+
```

10 Press F2.

The Oracle Solaris Installation screen is displayed.

11 Provide system configuration information if prompted.

- **If you preconfigured all of the system information, the installation program does not prompt you to type any configuration information.**

  See Chapter 2, "Preconfiguring System Configuration Information (Tasks)," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations* for more information.

- **If you did not preconfigure all the system information, the installation program prompts you for this information on several screens.**

  Use the "Checklist for Installation" on page 16 to help you answer the configuration questions.

12 If prompted, indicate whether you want to enable network services for use by remote clients.

- **To enable network services, choose the default response "Yes, I would like to enable network services for use by remote clients".**

- **To provide a more secure configuration in which Secure Shell is the only network service provided to remote clients, select "No".**

  If desired, you can enable network services after installation by using the `netservices open` command or by enabling individual services by using SMF commands. See "Revising Security Settings After Installation" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

For further information about these options, see "Planning Network Security" in *Oracle Solaris 10 1/13 Installation Guide: Planning for Installation and Upgrade*.

After you answer the configuration questions and set the root password, the Oracle Solaris Interactive Installation screen is displayed.

```
Solaris Interactive Installation
+-----------------------------------------------------------------------------+
|On the following screens, you can accept the defaults or you can customize  |
| how Solaris software will be installed by:                                  |
|   - Selecting the type of Solaris software to install                       |
|   - Selecting disks to hold the software you've selected                    |
|   - Selecting unbundled products to be installed with Solaris               |
|   - Specifying how file systems are laid out on the disks                   |
|                                                                             |
|After completing these tasks, a summary of your selections                  |
|(called a profile) will be displayed.                                       |
|                                                                             |
|There are two ways to install your Solaris software:                         |
|                                                                             |
|   - 'Standard' installs your system from a standard Solaris Distribution.   |
```

```
|     Selecting 'standard' allows you to choose between initial install      |
|     and upgrade, if your system is upgradeable.                            |
|                                                                            |
|  - 'Flash' installs your system from one or more Flash Archives.           |
|                                                                            |
|    F2_Continue       F4-Flash       F5-Exit      F6_Help                   |
+----------------------------------------------------------------------------+
```

13 Choose the installation method.

- **To install a ZFS flash archive, press F4.**

  For step-by-step instructions on installing a ZFS flash archive, see *Oracle Solaris ZFS Administration Guide*.

- **To perform an initial installation of a ZFS root file system, press F2.**

14 Indicate whether you want to reboot the system automatically and whether you want to automatically eject the disc. Press F2.

Note – If you want to disable Auto Registration prior to rebooting the system, deselect automatic rebooting.

If you already have ZFS storage pools on the system, they are acknowledged by the following message but remain untouched unless you select the disks in the existing pools to create the new storage pool.

```
There are existing ZFS pools available on this system.
However, they can only be upgraded using the Live Upgrade tools.
The following screens will only allow you to install a ZFS root system,
not upgrade one.
```

Press F2 to continue when you see the message that you already have ZFS storage pools on the system.

The License screen appears.

15 Accept the license agreement to continue the installation. Press F2.

The Select Upgrade or Initial Install screen might display. If you have UFS file system that is upgradeable, this screen is displayed. If this screen does not display, skip to Step 17.

16 To perform a ZFS installation press F4 for an initial installation.

Screens for choosing geographic regions, locales, and additional products are displayed.

17 Make your choices for geographic regions, locales, and additional products.

The Choose a Filesystem Type is displayed.

18 To create and install a ZFS root pool, select the ZFS option.

```
Choose a Filesystem Type
+-------------------------------------------------------------------------+
|   Select the filesystem to use for your Solaris installation            |
|                                                                         |
|           [ ] UFS                                                       |
|           [X] ZFS                                                       |
|                                                                         |
|    F2_Continue      F6_Help                                             |
+-------------------------------------------------------------------------+
```

The Select Software screen is displayed.

19 Select the type of installation you want to perform. Press F2.

To perform a default installation, accept the default value that is provided. To perform a custom installation, edit the values in the text installer screen. In this example screen, the default Entire Distribution Software Group is checked for installation.

For more information about software groups, see "Disk Space Recommendations for Software Groups" on page 14.

```
Select Software
+-------------------------------------------------------------------------+
|Select the Solaris software to install on the system                     |
|                                                                         |
|Note: After selecting a software group, you can add or remove            |
|software by customizing it. However this requires understanding of       |
|software dependencies and how Solaris software is packaged.              |
|                                                                         |
|  [ ] Entire Distribution plus OEM support ......8575.00 MB              |
|  [X] Entire Distribution........................8529.00 MB              |
|  [ ] Developer System Support...................8336.00 MB              |
|  [ ] End User System Support....................7074.00 MB              |
|  [ ] Core System Support........................3093.00 MB              |
|  [ ] Reduced Networking Core System Support.....3035.00 MB              |
|                                                                         |
|                                                                         |
|    F2_Continue      F6_Help                                             |
+-------------------------------------------------------------------------+
```

The Select Disks screen is displayed.

After you select the software to be installed, you are prompted to select the disks to create your ZFS storage pool. This screen is similar to previous Oracle Solaris releases, except for the following text:

```
For ZFS, multiple disks will be configured as mirrors, so the disk you choose,
or the slice within the disk must exceed the Suggested Minimum value.
```

20 Select the disk or disks to be used for your ZFS root pool.

Note the following information:

- If you select a single disk and want to configure mirroring later, see the `zpool attach` command in "Managing Devices in ZFS Storage Pools" in *Oracle Solaris ZFS Administration Guide*.
- If you select two disks, a mirrored two-disk configuration is setup for your root pool. Either a two-disk or three-disk mirrored pool is optimal.
- If you have eight disks and you select all eight disks, those eight disks are used for the root pool as one big mirror. This is not an optimal configuration.

A RAID-Z pool configuration for the root pool is not supported. For more information about configuring ZFS storage pools, see "Replication Features of a ZFS Storage Pool" in *Oracle Solaris ZFS Administration Guide*.

```
Select Disks
+-----------------------------------------------------------------------------+
|On this screen you must select the disks for installing Solaris              |
|software. Start by looking at the Suggested Minimum Field;                   |
|this value is the approximate space needed to install the software           |
|you've selected. For ZFS, multiple disks will be configured as mirrors,      |
|so the disk you choose on the slice within the disk must exceed              |
|the Suggested Minimum Value.                                                 |
|                                                                             |
|  Note: ** denotes the current boot disk                                     |
|                                                                             |
|Disk Device                                          Available Space         |
|=============================================================================|
|                                                                             |
|[X]** c0t0d0                                          69994 MB (F4 to edit)  |
|[X]   c0t1d0                                             69994 MB            |
|[-]   c0t2d0                                                 0 MB            |
|[-]   c0t3d0                                                 0 MB            |
|                                                                             |
|                                 Maximum Root Size: 69994 MB                 |
|                                 Suggested Minimum: 8529 MB                  |
|                                                                             |
|    F2_Continue      F3_Go Back      F4_Edit      F6_Help                    |
+-----------------------------------------------------------------------------+
```

The Preserve Data screen is displayed.

21 (Optional) Preserve data on the disk where you are installing the software.

If a disk that you have selected for installing contains file systems or have unnamed slices that you want to save, you can save these file systems or unnamed slices now.

```
Preserve Data?
+-----------------------------------------------------------------------------+
|Do you want to preserve existing data? At least one of the disks you've      |
|selected for installing Solaris software has file systems or unnamed slices  |
|that you may want to save                                                    |
|                                                                             |
|                                                                             |
|    F2_Continue      F4_Preserve    F6_Help                                  |
+-----------------------------------------------------------------------------+
```

If you pressed F4 to save data, the screen for saving data is displayed.

22 (Optional) Select the data to save.

To manage a ZFS root to file system, provide the size of the entire disk in a slice. For example, provide the size in slice 0. Sharing different root file systems on the same disk can be hard to manage.

To copy data off the disk to be installed as the root file system, exit the installer and back up the data that you want to preserve on this disk, and then restart the installer.

```
# install-solaris
```

The screen for configuring ZFS settings is displayed.

23 You can accept the default values or modify them.

You can change the name of the ZFS pool, the dataset name, the pool size, swap, and dump. In addition, you can modify the way the `/var` file system is created and mounted.

```
Configure ZFS Settings
+------------------------------------------------------------------------ -+
|Specify the name of the pool to be created from the disk(s) you have chosen.|
|Also specify the name of the dataset to be created within the pool that is  |
|to be used as the root directory for the filesystem.                        |
|                                                                            |
|                                                                            |
|              ZFS Pool Name: rpool                                          |
|      ZFS Root Dataset Name: s10ZfsBE                                       |
|          ZFS Pool Size in (MB): 69995                                      |
|          Size of swap area in (MB): 2048                                   |
|          Size of dump area in (MB): 1024                                   |
|        (Pool size must be between 6481 MB and 69995 MB)                    |
|                                                                            |
|                         [X] Keep / and /var combined                       |
|                         [ ] Put /var on a separate dataset                 |
|                                                                            |
|    F2_Continue     F3_Go Back     F5_Exit      F6_Help                     |
+------------------------------------------------------------------------ --+
```

The screen for mounting a remote file system is displayed.

24 Indicate whether you want to mount a remote file system.

```
Mount Remote File System
+------------------------------------------------------------------------ -+
|Do you want to mount a software from a remote file server? This may         |
|be necessary if you had to remove software because of disk space problems.  |
|                                                                            |
|                                                                            |
|    F2_Continue      F6_Help                                                |
+------------------------------------------------------------------------ --+
```

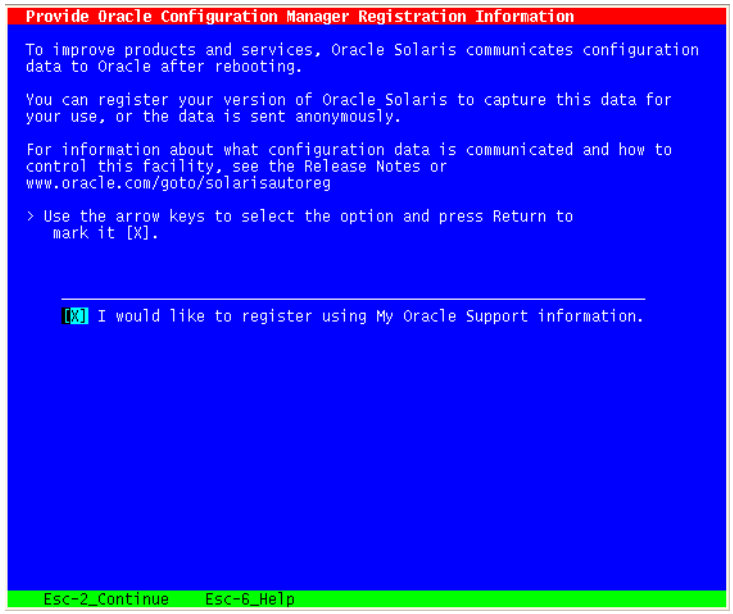
25 If you are prompted, provide Auto Registration information.

- **If you set up your Auto Registration preferences using the `auto_reg` keyword in the `sysidcfg` file prior to the installation or upgrade, the installer does not prompt you for that information as part of completing the configuration questions.**
- **If you did not include the `auto_reg` keyword in the `sysidcfg` file, the installer prompts you to provide Auto Registration information as part of completing the configuration questions.**

Note – If you intend to disable Auto Registration at the end of the installation or upgrade, you can proceed through these Auto Registration screens without entering any information.

---

a. Select the option to register using your support credentials or deselect the option to have data sent anonymously.



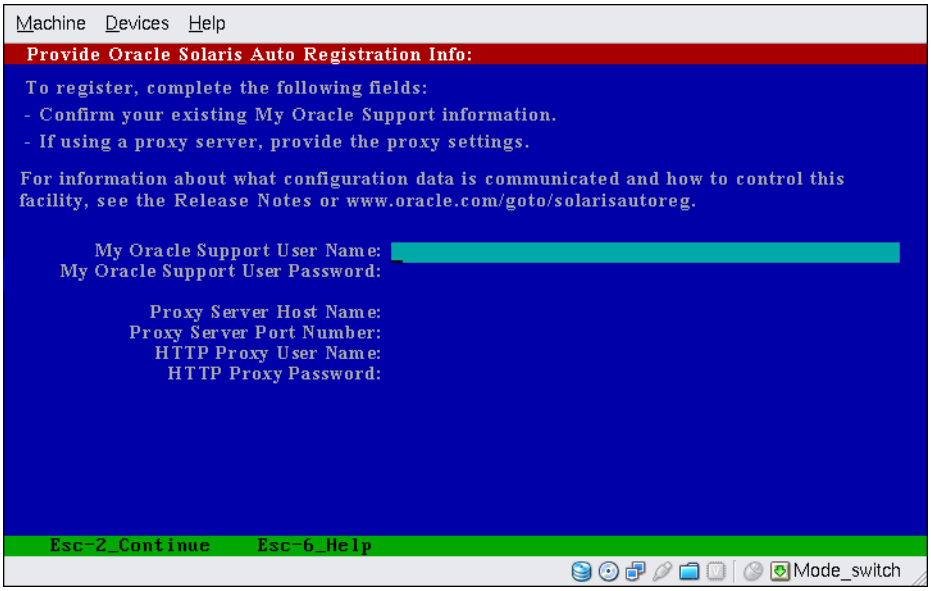
Use the arrow keys to navigate to the option box. Press Return to mark the option box to select registering with your support credentials. Press Esc–2 key to continue.

b. Provide the requested proxy and credential information.

If you chose to register with your support information, you are prompted to provide your My Oracle Support user name and password. If you use a proxy server, you can provide the server host name and port number, and the proxy user name and password.

If you chose to register anonymously, this screen asks only for the proxy information.

FIGURE 3–1 Text Auto Registration Data Entry Screen



Use the arrow keys to navigate between lines. Type your support credentials and optional proxy entries. Press Esc–2 key to continue.

The Profile screen is displayed.

26 Review the Profile screen that displays your choices for installation.

You can change the installation profile if needed. The following example is of a final installation Profile screen.

```
Profile
+------------------------------------------------------------------------ -+
|The information shown below is your profile for installing Solaris software.|
|It reflects the choices you've made on previous screens.                   |
|                                                                           |
|===========================================================================|
|                                                                           |
|               Installation Option: Initial                                |
|                         Boot Device: c0t0d0                               |
|             Root File System Type: ZFS                                    |
|                  Client Services: None                                    |
|                    System Locale: C ( C )                                 |
|                                                                           |
|                          Software: Solaris 10, Entire Distribution        |
|                         Pool Name: rpool                                  |
|             Boot Environment Name: s10ZfsBE                               |
|                         Pool Size: 69995 MB                               |
|                   Devices in Pool: c0t0d0                                 |
```

```
|                                    c0t1d0                                  |
|                                                                            |
|    F2_Begin Installation    F4_Change    F5_Exit              F6_Help      |
+----------------------------------------------------------------------------+
```

27 To install the Oracle Solaris software, press F2 and follow the instructions.

When the Oracle Solaris interactive text program finishes installing the Oracle Solaris software, the system reboots automatically or prompts you to reboot manually.

If you are installing additional products, you are prompted to insert the DVD or CD for those products. For installation procedures, refer to the appropriate installation documentation.

After the installation is finished, installation logs are saved in a file. You can find the installation logs in the `/var/sadm/system/logs` and `/var/sadm/install/logs` directories.

The installation is complete. If you deselected automatic reboot previously in the installer screens, continue to Step 28.

28 If you previously deselected automatic rebooting, choose one of the following two options:

- **If you do not want to disable Auto Registration, eject any installation media, then manually reboot the system as follows:**

  ```
  # reboot
  ```

- **If you want to disable Auto Registration so that no configuration data is sent to Oracle on reboot, perform the following steps prior to manually rebooting the system.**

Caution – If the system does automatically reboot, you cannot use the following steps to disable Auto Registration. Instead, after the automatic reboot, you can disable Auto Registration by using the Oracle Configuration Manager (OCM). See Chapter 17, "Working With Oracle Configuration Manager," in *Oracle Solaris Administration: Basic Administration*

a. When the installation is complete and before manually rebooting, press "!" to open a terminal window.

b. At the command line, remove the `/a/var/tmp/autoreg_config` file.

```
# rm /a/var/tmp/autoreg_config
```

c. Save the file.

d. Eject any installation media and manually reboot the system.

```
# reboot
```

After the system reboots, a GRUB menu lists the operating systems that are installed, including the newly installed Oracle Solaris OS.

29 Select which operating system you want to boot.

The default selection loads if you do not make another selection.

The GRUB menu list is displayed.

```
GNU GRUB version 0.95 (637K lower / 3144640K upper memory)
+-------------------------------------------------------------------------+
|Oracle Solaris 10 8/11 s10zfsBE                                          |
|Solaris Failsafe                                                         |
|                                                                         |
|+-----------------------------------------------------------------------+

     Use the ^ and v keys to select which entry is highlighted.
     Press enter to boot the selected OS, .e. to edit the
     commands before booting, or .c. for a command-line.
```

30 When the GRUB menu is displayed, press Enter to boot the default OS instance. The default is the newly installed root pool.

In this example, the boot environment name is `szboot_0507`. If you do not select an entry within 10 seconds, the system automatically boots.

31 When the installation is complete, review the resulting ZFS storage pool and file system information.

In this example, the sample `zpool status` and `zfs list` output identify the root pool components.

```
# zpool status
  pool: rpool
 state: ONLINE
 scan: none requested
config:

        NAME        STATE     READ WRITE CKSUM
        rpool       ONLINE       0     0     0
         mirror-0  ONLINE       0     0     0
           c0t0d0s0 ONLINE       0     0     0
           c0t1d0s0 ONLINE       0     0     0

errors: No known data errors
# zfs list
NAME                     USED  AVAIL  REFER  MOUNTPOINT
rpool                   7.15G  59.4G    106K  /rpool
rpool/ROOT              4.45G  59.4G     31K  legacy
rpool/ROOT/s10zfsBE     4.45G  59.4G   4.45G  /
rpool/dump              1.00G  59.4G   1.00G  -
rpool/export              63K  59.4G     32K  /export
rpool/export/home         31K  59.4G     31K  /export/home
rpool/swap              2.06G  61.5G     16K  -
```

If you initially created your ZFS storage pool with one disk, you can convert the disk to a mirrored ZFS configuration after the installation. For more information about adding or attaching disks, see "Managing Devices in ZFS Storage Pools" in *Oracle Solaris ZFS Administration Guide*.

More Information

Next Steps

If you install multiple operating systems on your machine, you need to instruct the GRUB boot loader to recognize these operating systems in order to boot. For more information, see "Modifying Boot Behavior by Editing the GRUB Menu at Boot Time" in *Oracle Solaris Administration: Basic Administration*.

◆ ◆ ◆ CHAPTER 4

Installing the Oracle Solaris 10 OS on an iSCSI Target Disk

This chapter explains the process of installing the Oracle Solaris 10 OS on an iSCSI target and the different methods available for iSCSI installation.

This chapter covers the following topics:

- "iSCSI Installation (Overview)" on page 77
- "Configuring iSCSI Parameters" on page 80
- "(Example) Preparing a Target and Associating a Target With an Initiator" on page 85

iSCSI Installation (Overview)

iSCSI (Internet Small Computer System Interface), is an Internet Protocol (IP) based storage networking standard for linking data storage subsystems. This networking standard was developed by the Internet Engineering Task Force (IETF). For more information about the iSCSI technology, see RFC 3720 at `http://www.ietf.org/rfc/rfc3720.txt`.

In this document, an iSCSI installation refers to installing the Oracle Solaris 10 OS on an iSCSI target that has been configured and is discoverable. iSCSI parameters have to be configured prior to the installation. See "Oracle Solaris iSCSI Technology (Overview)" in *System Administration Guide: Devices and File Systems* for an explanation of iSCSI technology.

The following topics are covered in this section:

- "Hardware and Firmware Requirements" on page 77
- "iSCSI Configuration and Installation" on page 78
- "Creating And Configuring an iSCSI Target" on page 79

Hardware and Firmware Requirements

See "Identifying Solaris iSCSI Software and Hardware Requirements" in *System Administration Guide: Devices and File Systems* for details.

Note the following firmware requirements for a successful iSCSI installation:

For SPARC systems, OBP version should be 4.32.2 and above. If the value of LUN is other than 0 for a JumpStart installation, the OBP version on the Initiator and Target should be 4.33.2 or higher.

For x86 systems, NICs must have iBFT. See the iSCSI Boot Firmware table at `http://msdn.microsoft.com/en-us/windows/hardware/gg463101.aspx`.

iSCSI Configuration and Installation

An iSCSI installation includes the following phases:

1. Discovery – The two methods of discovering an iSCSI target are static device discovery and dynamic device discovery. See "Configuring Solaris iSCSI Target Devices (Tasks)" in *System Administration Guide: Devices and File Systems* for details.
2. Installation – You can configure the iSCSI parameters and install the Oracle Solaris 10 OS on an iSCSI target by using one of the following methods:
   - **Text Interactive.** Includes initial installation, upgrade, and flash-based installation. See "Configuring iSCSI Parameters" on page 80 for details.
   - **JumpStart.** See "Configuring iSCSI Parameters: JumpStart Installation Method" on page 83 for details.
   - **WAN Boot.** See Part III, "Installing Over a Wide Area Network," in *Oracle Solaris 10 1/13 Installation Guide: Network-Based Installations* for details.
3. Booting – After the OS is installed, you can choose to reboot the system automatically. See Step 7 in "How to Configure iSCSI Parameters on the Initiator (Text Interactive Method)" on page 80.

Supported SPARC Systems

The following SPARC systems support booting from an iSCSI disk:

- Sun SPARC Enterprise T5120 and T5220 servers
- Sun SPARC Enterprise T5140 and T5240 servers
- Sun SPARC Enterprise T5440 server
- SPARC T3-1 server
- SPARC T3-1B server
- SPARC T3-4 server
- SPARC T3-2 server

Creating And Configuring an iSCSI Target

Before beginning with an Oracle Solaris 10 OS installation on an iSCSI target, you must have created the iSCSI target and the target must be discoverable by the host initiator.

In the context of an iSCSI installation, the following terms are defined:

Initiator or Host System	A system that is used for installation and booting off of an iSCSI disk. The term host system and initiator are used interchangeably and have the same meaning.
Target System	A system that hosts one or more iSCSI targets. Each iSCSI target is identified uniquely and the target can be either globally visible or configured specific to an Initiator.
iSCSI Target Name	The iSCSI target name includes a iSCSI Qualified Name (IQN) which is documented in RFC 3720, with more examples of names in RFC 3721. See the IETF site for details. For example, `iqn.1986-03.com.sun:02:358ddbf8-601a-e73a-df56-89`, is a typical iSCSI target name. The name consists of the following fields: ■ *Literal IQN* ■ Date *(yyyy-mm)* that the naming authority took ownership of the domain ■ Reversed domain name of the authority ■ Optional colon ":" prefixing a storage target name specified by the naming authority.
LUN (Logical Unit Number)	LUN represents an individually addressable (logical) SCSI device that is a part of a physical SCSI device (target). In an iSCSI environment, LUNs are essentially numbered disk drives. An initiator negotiates with a target to establish connectivity to a LUN. The result is an iSCSI connection that emulates a connection to a SCSI hard disk. Initiators treat iSCSI LUNs the same way as they would a raw SCSI or IDE hard drive For instance, rather than mounting remote directories as in NFS or CIFS environments, iSCSI systems format and directly manage file systems on iSCSI LUNs. In enterprise deployments, LUNs usually represent slices of large RAID disk arrays, often allocated one per client. iSCSI imposes no rules or restrictions on multiple computers sharing individual LUNs. It leaves shared access to a single underlying filesystem as a task for the operating system.

CHAP	CHAP (Challenge-Handshake Authentication Protocol) is used to authenticate the iSCSI target to the initiator. Using CHAP prevents cleartext passwords from appearing on the wire. CHAP authentication also ensures that once a target is associated with a user or initiator, the target is not visible to any other host system. Only unidirectional CHAP authentication is supported.

Refer to the following links for information on configuring iSCSI targets and initiators:

- "Configuring Solaris iSCSI Target Devices (Tasks)" in *System Administration Guide: Devices and File Systems*.
- `iscsitadm`(1M)
- `iscsiadm`(1M)

Configuring iSCSI Parameters

Before installing the Oracle Solaris 10 OS on an iSCSI target, provide a set of parameters that would enable the host system to specify the mode of discovery, view and select the targets available for installation, and authenticate itself to the target system.

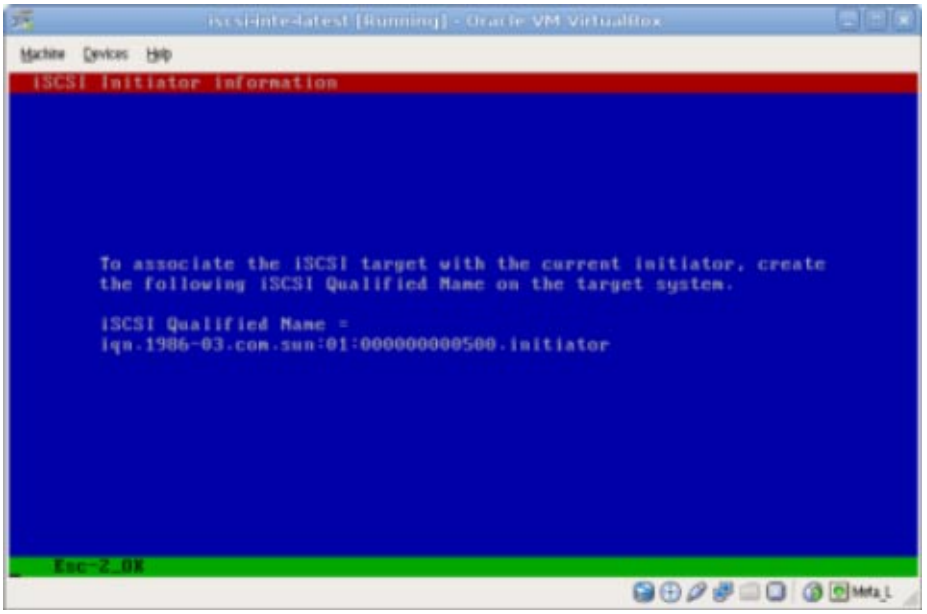
The modes of discovery and security through the Installer are explained in the following sections.

▼ How to Configure iSCSI Parameters on the Initiator (Text Interactive Method)

The following procedure configures the iSCSI parameters on the host initiator through the text installation method.

Before You Begin

- You must create an IQN number on the iSCSI target system that will enable the target system to identify and associate itself with the current initiator system. The IQN number is provided to the user and is displayed on the screen. A sample IQN number generated by the host system is shown below:



- See "Creating And Configuring an iSCSI Target" on page 79 for definitions of the mandatory and optional parameters used in this task.

1 Select the type of installation.

If you choose to install the OS on a non-iSCSI target, you will be directed to the OS installation screens.

2 Enter the values of the mandatory fields to find the target.

There are two methods of discovering the targets :

- Send targets – This method searches for all targets on a specified iSCSI target system. The mandatory field values of Target IP and Target Port are required.
- Static Discovery – This method is recommended if there are many targets because the iSCSI driver and the other subsystems try to find all targets in the vicinity, update the OID (Object ID of the target) and LUN List, enumerate the iSCSI target as a local disk in the `c0t0d0s0` format, and have the disk mounted.

Note – For this method, in addition to the mandatory field values, the iSCSI Qualified Target Name (IQN) value is required.

The iSCSI Target IP and the iSCSI Target Port fields are mandatory fields.

iSCSI Target IP	Required when configuring iSCSI over TCP/IP. Each target IP may represent a physical device, such as a disk or a tape or a virtualized target.
iSCSI Target Port	A port on which an iSCSI target server would listen on for requests from the Initiator. The default values is 3260.

3 (Optional) Type the values of the following fields if required.

iSCSI Target LUN	A LUN value is required if the method of Static Discovery method is used for discovering the targets.
iSCSI Target Name	For example, `iqn.1986-03.com.sun:02:358ddbf8-601a-e73a-df56-89`, is a typical iSCSI target name.
CHAP Authentication	If you want CHAP authentication, type a username and password that will authenticate the host initiator to the target system. This value is `CHAP-secret`. For more information about CHAP Authentication, see "Configuring Authentication in Your iSCSI-Based Storage Network" in *System Administration Guide: Devices and File Systems*.

4 Type the IQN number on the target device.

5 Configure and prepare the iSCSI target.

See "(Example) Preparing a Target and Associating a Target With an Initiator" on page 85 for more information.

6 Choose to either automatically or manually eject the CD/DVD after completion.

7 Press F2 to continue.

8 Install the OS and reboot the system.

- **For SPARC systems, the system reboots automatically.**
- **For x86 systems, follow the steps below to reboot:**

  a. **Enter into the BIOS and choose an iBFT (iSCSI Boot Firmware Table) card to boot from the target.**

     Press F12 to access Setup in the BIOS menu. Press Ctrl-S to enter into the iBFT menu.

  b. **Save the BIOS settings and update the Initiator and Target Info in the General Parameters and Target Information Parameters of the iBFT menu.**

Note – To boot off the iSCSI target LUN installed with the Oracle Solaris 10 OS, the iBFT card from which we want to boot should be in the same subnet as the iSCSI target system. Further, it can be configured to get the IP address either through DHCP or Static IP by configuring the NIC card through the iBFT menu.

For example, to obtain the IP address for the iBFT card through Static IP, in the `General Parameters` option in the `iBFT` menu, set the `TCP/IP parameters via DHCP` option to `Disabled`. Further, in the `Initiator Parameters` menu, atleast the following parameters must be specified:

- IP Address
- Subnet Mask
- Default Gateway

See Also For information about Intel iSCSI NICs, see `http://www.intel.com/content/www/us/en/network-adapters/gigabit-network-adapters/ethernet-unified-networking-isci.html`.

Configuring iSCSI Parameters: JumpStart Installation Method

The JumpStart installation method is a command-line interface method that enables you to automatically install or upgrade several systems, based on the profiles that you create. The profiles define specific software installation requirements. You can also incorporate shell scripts to include preinstallation and postinstallation tasks. You choose which profile and scripts to use for installation or upgrade.

The custom JumpStart installation method installs or upgrades the system based on the profile and scripts that you select. Also, you can use a `sysidcfg` file to specify configuration information so that the custom JumpStart installation is completely hands-free. See the *Oracle Solaris 10 1/13 Installation Guide: JumpStart Installations* for information about creating profiles and the JumpStart process.

When installing the Oracle Solaris 10 OS on an iSCSI target through the JumpStart method, include the following new keywords in the profile:

- `iscsi_target_name`
- `iscsi_target_ip`
- `iscsi_target_lun`
- `iscsi_target_port`
- `iscsi_target_slice`

See "Creating And Configuring an iSCSI Target" on page 79 section for a definition of the above parameters.

Note – Both an initial installation and upgrade of the OS are supported on an iSCSI target.

The following example shows a sample JumpStart profile for an initial iSCSI installation.

EXAMPLE 4–1 JumpStart Profile for an Initial iSCSI Installation

```
install_type   initial_install
partitioning  explicit
filesys rootdisk.s4 5000
filesys rootdisk.s1 2048
iscsi_target_name   iqn.1986-03.com.sun:02:358ddbf8-601a-e73a-df56-89
iscsi_target_ip   10.12.162.24
iscsi_target_lun 0
iscsi_target_port  3260
cluster  SUNWCrnet
```

The following example shows a sample JumpStart profile for an upgrade installation.

EXAMPLE 4–2 JumpStart Profile for an iSCSI Upgrade Installation

```
install_type upgrade
iscsi_target_name  iqn.1986-03.com.sun:02:358ddbf8-601a-e73a-df56-89
iscsi_target_ip  10.12.162.24
iscsi_target_lun 0
iscsi_target_port 3260
iscsi_target_slice 4
```

The following keywords are used in the JumpStart profile to indicate where the locations of the directories such as the `root` directory, swap space, the `/usr` directory and so on have to be created.

- `filesys`
- `pool`
- `boot_device`

Because the disk number is dynamically generated during an iSCSI installation, do not explicitly provide the disk nomenclature *(cxtxdxsx)* for the above keywords in the JumpStart profile during an iSCSI installation.

Caution – When the iSCSI key-value information is provided in the profile, the `boot_device` key-value pair and the `root_device` key-value pair should not be included in the profile. The `root_device` key-value pair is dynamically assigned by the `pfinstall` command based on the iSCSI target.

(Example) Preparing a Target and Associating a Target With an Initiator

The procedures in this section describe how to prepare a target and associate the target with an initiator. The tasks are listed in the order of operation:

1. Preparing the Target for Oracle Solaris 10 Installation
2. Associating a Target With the Initiator
3. Clearing CHAP details on the Target System

▼ How to Prepare the Target for Oracle Solaris 10 Installation

1 Become superuser.

2 If the following packages are not already installed. install them.

Tip – Use the `pkginfo` *package-name* command to find out if the packages are installed.

- `SUNWiscsitu`
- `SUNWiscsitr`
- `SUNWiscsidmu`
- `SUNWiscsidmr`
- `SUNWstmf`
- `SUNWstmfu`

3 Create a ZFS volume `iscsi-pool` as an iSCSI target.

For example, to create `zpool` named `iscsi-pool` out of slice `c0t1dos0`:

```
# zpool create -f iscsi-pool c0t1d0s0
```

4 **Create the target directory on the `iscsi-pool` zpool where the Oracle Solaris 10 OS will be installed.**

For example:

```
# zfs create -V 20G iscsi-pool/mytarget
```

5 **Share the target to make it globally accessible for installation.**

For example:

```
# zfs set shareiscsi=on iscsi-pool/mytarget
```

6 **List the iSCSI target names to confirm that the target has been created successfully.**

```
# iscsitadm list mytarget

Target: iscsi-pool/mytarget
     iSCSI Name: iqn.1986-03.com.sun:02:d0a02ee1-91ad-67d9-bb8c-a3d4c4f1e152
     Connections: 0
```

A value of `0` in the `Connections` field indicates that no Initiator has attempted to connect to the target.

7 **Ensure that your target system is on the same subnet as the Initiator for which you want to install Oracle Solaris 10.**

Targets can be a flat file, a UFS slice, a COMSTAR object, or a ZFS Volume.

Next Steps If you want to set up CHAP authentication on the target system, see "How to Associate a Target With the Initiator" on page 86 and `How to Configure CHAP Authentication for Your iSCSI Target` in the *System Administration Guide: Devices and File Systems*.

If CHAP authentication is not required, the target is globally visible. Associate the target with the Initiator.

▼ How to Associate a Target With the Initiator

This procedure describes how to set the CHAP username and password on a target system, and the steps to create and associate a target with the Initiator profile.

Before You Begin The target must be prepared before beginning this task. See "How to Configure iSCSI Parameters on the Initiator (Text Interactive Method)" on page 80 for more information.

1 **(Optional) Set the CHAP username and secret for the administrator.**

See "Configuring Authentication in Your iSCSI-Based Storage Network" in *System Administration Guide: Devices and File Systems* for details.

2 Create and associate a target with the Initiator profile.

You can also provide an alias for the initiator such as my-initiator-profile.

For example:

```
# iscsitadm create initiator
--iqn iqn.1986-03.com.sun:01:000000000500.initiator my-initiator-profile
```

The initiator ID (IQN) is provided by the host system during the configuration of the iSCSI parameters. As an example, the IQN number shown in the "How to Configure iSCSI Parameters on the Initiator (Text Interactive Method)" on page 80 task is used.

3 Set the CHAP username as given on the Initiator.

For example:

```
# iscsitadm modify initiator --chap-name mytestname my-initiator-profile
```

4 Provide the same CHAP secret credential as set on Initiator.

For example :

```
# iscsitadm modify initiator --chap-secret mytestname my-initiator-profile
    Enter secret: **************
    Re-enter secret: **************
```

5 Add this profile to the access control list.

For example :

```
# iscsitadm modify target --acl my-initiator-profile  iscsi-pool/mytarget
```

This command ensures that the Initiator profile, my-initiator-profile, is associated with the target iscsi-pool/mytarget and also restricts access to the targets.

See Also If you have used CHAP authentication and want to clear the settings on the target after completion of your task, see "How to Clear CHAP Settings on an iSCSI Target" on page 87.

▼ How to Clear CHAP Settings on an iSCSI Target

This procedure lists the steps to remove the CHAP settings on an iSCSI target and to disassociate related profiles. This process ensures that the target is released from the currently configured host and is available to other host initiators.

1 Delete the initiator profile from the access control list for the target.

For example :

```
# iscsitadm delete target --acl  my-initiator-profile iscsi-pool/mytarget
```

2 Clear the CHAP secret for associated profile, iscsi-pool/mytarget.

For example :

```
# iscsitadm modify initiator --chap-secret mytestname my-initiator-profile
Enter secret:
Re-enter secret :
```

3 Clear the CHAP username for associated profile, my-initiator-profile.

```
# iscsitadm modify initiator --chap-name ""  my-initiator-profile
```

4 Clear the admin CHAP secret.

```
# iscsitadm modify admin --chap-secret
Enter secret:
Re-enter secret :
```

5 Clear the admin CHAP username.

```
# iscsitadm modify admin --chap-name ""
```

6 Delete the Initiator profile.

```
# iscsitadm delete initiator --all my-initiator-profile
```

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