



Solaris 10 Installation Guide for IBM BladeCenter Servers



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Preface

This book describes how to install the Solaris™ 10 Operating System (Solaris OS) on IBM BladeCenter servers, starting with the Solaris 10 1/06 release.

Note – Information and instructions in this book apply to installing the Solaris OS on the x86 platform *only*.

This book does not include instructions for setting up system hardware or other peripherals. Hardware-specific information for IBM BladeCenter servers can be found at <http://www.ibm.com/systems/bladecenter/>.

Who Should Use This Book

This book is intended for system administrators who are responsible for installing the Solaris OS on IBM BladeCenter servers.

This book provides the following information:

- Solaris installation information for system administrators who perform Solaris installations or upgrades on IBM BladeCenter servers.
- Information about bugs and issues that are encountered when installing or using the Solaris OS on IBM BladeCenter servers.
- Information for troubleshooting the Solaris OS installation on IBM BladeCenter servers.

Related Books

The following table lists related information that you need when you install the Solaris software.

TABLE P-1 Related Information

Information	Description
<i>Solaris 10 What's New</i>	Describes new features in the Solaris release
<i>Solaris 10 Release Notes</i>	Describes any bugs, known problems, software that is being discontinued, and patches that are related to the Solaris release
<i>Solaris 10 Package List</i>	Lists and describes the packages in the Solaris 10 OS
<i>Solaris Hardware Compatibility List</i>	Contains supported hardware information and device configuration
<i>System Administration Guide: Devices and File Systems</i>	Describes how to back up system files

Related Third-Party Web Site References

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Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- [Documentation](http://www.sun.com/documentation/) (<http://www.sun.com/documentation/>)
- [Support](http://www.sun.com/support/) (<http://www.sun.com/support/>)
- [Training](http://www.sun.com/training/) (<http://www.sun.com/training/>)

Typographic Conventions

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

TABLE P-2 Typographic Conventions

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

Shell Prompts in Command Examples

The following table shows the default UNIX® system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-3 Shell Prompts

Shell	Prompt
C shell	<code>machine_name%</code>
C shell for superuser	<code>machine_name#</code>
Bourne shell and Korn shell	<code>\$</code>
Bourne shell and Korn shell for superuser	<code>#</code>

Installing the Solaris Operating System on IBM BladeCenter Servers (Tasks)

This chapter provides step-by-step instructions for installing the Solaris 10 Operating System (Solaris OS) on IBM BladeCenter servers. The instructions that are included in this chapter apply to the following Solaris 10 releases:

- Solaris 10 8/07
- Solaris 10 11/06
- Solaris 10 6/06
- Solaris 10 1/06

Instructions for preparing a system for installation, as well as instructions for performing an installation of client systems from the network and for performing a stand-alone installation are described in detail. More information about IBM BladeCenter servers can be found at <http://www.ibm.com/systems/bladecenter/>.

This is a list of the information in this chapter:

- “Preparing to Install the Solaris Operating System on IBM BladeCenter Servers (Task Map)” on page 13
- “Preconfiguring System Configuration Information (Task Map)” on page 20
- “Preconfiguring System Configuration Information With the DHCP Service (Task Map)” on page 51
- “Booting and Installing the Solaris OS (Task Map)” on page 58

Note – Several of the tasks in this chapter are part of the preparation for installing the Solaris 10 OS on IBM BladeCenter servers. Depending on your situation, you might not need to perform all of these tasks. Review the individual task maps first to determine which tasks are required for the type of installation you are performing.

Starting with the Solaris 10 1/06 release, the open source GNU GRand Unified Bootloader (GRUB) has been implemented on x86 based systems. GRUB is the boot loader that is responsible for loading a boot archive into a system's memory. The boot archive contains the

kernel modules and configuration files that are required to boot the system. The most notable change is the replacement of the Device Configuration Assistant with the GRUB menu. This menu is displayed when the system is booted. This document includes task-related information for installing and booting a system with GRUB.

GRUB implements a simple menu interface that includes boot options that are predefined in a configuration file. GRUB also has a command-line interface that is accessible from the menu interface for performing various boot commands. The GRUB implementation on x86 based systems in the Solaris OS is compliant with the Multiboot Specification. For more information about this boot loader package, do an Internet search on “GNU GRUB.”

For more information about GRUB, refer to the following documentation:

- For step-by-step instructions on booting a Solaris system, see Chapter 11, “GRUB Based Booting (Tasks),” in *System Administration Guide: Basic Administration*.
- For installation instructions, see the following documentation:
 - If you are installing with the Solaris interactive installation program, see *Solaris 10 Installation Guide: Basic Installations*.
 - If you are installing with the custom JumpStart™ program, see *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations*.
 - If you need to set up an installation server to install over the network, see *Solaris 10 Installation Guide: Network-Based Installations*.
 - If you are installing or upgrading with Solaris Live Upgrade, see *Solaris 10 Installation Guide: Solaris Live Upgrade and Upgrade Planning*.
- For information about managing devices and file systems, see “Disk Management in the GRUB Boot Environment” in *System Administration Guide: Devices and File Systems*.

The complete set of Solaris installation and system administration documentation can be found at <http://docs.sun.com>.

For a listing of all the new features in the Solaris 10 OS, see the *Solaris 10 What's New*.

Installing the Solaris OS on IBM BladeCenter Servers

This chapter describes how to install the Solaris OS on IBM BladeCenter servers, starting with the Solaris 10 1/06 release.

Installation information for the following IBM BladeCenter Servers is included:

- AMD Opteron LS20 for IBM BladeCenter
- AMD Opteron LS21 for IBM BladeCenter
- AMD Opteron LS41 for IBM BladeCenter
- Intel Xeon IBM BladeCenter HS20

- Intel Xeon IBM BladeCenter HS21
- Intel Xeon IBM BladeCenter HS40

For additional information about installing the Solaris 10 8/07 and Solaris 10 11/06 OS on the BladeCenter LS21, LS41, and HS21 servers, see the appropriate sections under [Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers \(Tasks\)”](#).

See the following resources for additional hardware-specific installation instructions:

- Information about the AMD Opteron LS20 for IBM BladeCenter (Type 8850) can be found at:
<http://www.ibm.com/support/docview.wss?uid=psg1MIGR-63018>
- Information about the Intel Xeon IBM BladeCenter HS20 (Type 7981) can be found at:
<http://www.ibm.com/support/docview.wss?uid=psg1MIGR-64047>
- Information about the Intel Xeon IBM BladeCenter HS20 (Type 8843) can be found at:
<http://www.ibm.com/support/docview.wss?uid=psg1MIGR-62921>
- Information about the Intel Xeon IBM BladeCenter HS40 (Type 8839) can be found at:
<http://www.ibm.com/support/docview.wss?uid=psg1MIGR-5070449>

Note – Before you begin the installation process, see [Chapter 2, “Bugs and Issues Encountered When Installing the Solaris Operating System on IBM BladeCenter Servers,”](#) for information about bugs and issues you need to be aware of before installing and running the Solaris OS on IBM BladeCenter servers.

Also, see [Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers \(Tasks\)”](#), for additional information that pertains to installing the Solaris 10 OS on IBM BladeCenter servers.

Preparing to Install the Solaris Operating System on IBM BladeCenter Servers (Task Map)

TABLE 1-1 Preparing to Install the Solaris Operating System on IBM BladeCenter Servers: Task Map

Task	Description	For Instructions
Create an x86 installation server with CD media.	Use the <code>setup_install_server</code> command to copy the Solaris 10 OS to the installation server's disk from CD.	“How to Create an Installation Server With x86 CD Media” on page 15

TABLE 1-1 Preparing to Install the Solaris Operating System on IBM BladeCenter Servers: Task Map
(Continued)

Task	Description	For Instructions
Create an x86 installation server with DVD media.	Use the <code>setup_install_server</code> command to copy the Solaris 10 OS to the installation server's disk from DVD.	“How to Create an Installation Server With x86 DVD Media” on page 18

Before you can install the Solaris OS on client systems, you must first set up an installation server. The tasks that are necessary for performing a network installation by using this method are described in this section. If you are installing the Solaris OS on a stand-alone system, see [“Performing an Installation With the Solaris Installation Program on IBM BladeCenter Servers \(Stand-Alone\)”](#) on page 64.

Note – The procedure for setting up an installation server with CD media differs from the procedure for setting up an installation server with DVD media. Use the procedure that is appropriate for the installation media you have selected.

Creating an Installation Server With CD Media

The installation server contains the installation image that is needed to install the Solaris software on systems from the network. You must create an installation server to install the Solaris software on a system from the network. You do not always need to set up a separate boot server. Refer to the following guidelines to determine whether you need to set up a separate boot server.

- If you are using DHCP to set installation parameters, or if your installation server and client are on the same subnet, you do not need a separate boot server. For information about how to configure the DHCP client, see Chapter 16, “Configuring and Administering the DHCP Client,” in *System Administration Guide: IP Services*.
- If your installation server and your client are not on the same subnet and you are not using DHCP, you must create separate boot servers for each subnet. You could create an installation server for each subnet. However, installation servers require more disk space.

▼ How to Create an Installation Server With x86 CD Media

Note – This procedure assumes that the system is running Solaris Volume Manager. If you are not using Solaris Volume Manager to manage media, refer to *System Administration Guide: Devices and File Systems* for detailed information about managing removable media without Solaris Volume Manager.

- 1 On the system that is to become the installation server, become superuser or assume an equivalent role.**

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

The system must include a CD-ROM drive and be part of the site's network and name service. If you do not use a name service, you must distribute information about this system by following your site's policies.

- 2 Insert the Solaris installation CD into the system's drive.**

- 3 Create a directory for the CD image.**

```
# mkdir -p install-dir-path
```

install-dir-path – Specifies the directory where the CD image is to be copied.

- 4 Change to the `Tools` directory on the mounted disc.**

```
# cd /cdrom/cdrom0/Solaris_10/Tools
```

where `cdrom0` is the path to the drive that contains the Solaris OS CD media.

- 5 Copy the image in the drive to the installation server's hard disk.**

```
# ./setup_install_server install-dir-path
```

Note – The `setup_install_server` command indicates whether you have enough disk space available for the Solaris Software disc images. To determine available disk space, use the `df -kL` command.

- 6 Decide if you need to make the installation server available for mounting.**

- **If the installation server is on the same subnet as the system to be installed or you are using DHCP, you do not need to create a boot server. Proceed to Step 7.**

- If the installation server is not on the same subnet as the system to be installed and you are not using DHCP, complete the following steps:
 - a. Verify that the path to the installation server's image is shared appropriately.

```
# share | grep install-dir-path
```

 - If the path to the installation server's directory is displayed and anon=0 is displayed in the options, proceed to Step 7.
 - If the path to the installation server's directory is not displayed or you do not have anon=0 in the options, continue.
 - b. Make the installation server available by adding this entry to the `/etc/dfs/dfstab` file.

```
share -F nfs -o ro,anon=0 -d "install server directory" install-dir-path
```
 - c. Verify that the `nfsd` daemon is running.
 - If the installation server is running at least the Solaris 10 1/06 OS or a compatible version, type the following command:

```
# svcs -l svc:/network/nfs/server:default
```

If the `nfsd` daemon is online, continue to Step d. If the `nfsd` daemon is not online, start it.

```
# svcadm enable svc:/network/nfs/server
```
 - d. Share the installation server.

```
# shareall
```
- 7 Change to the root (`/`) directory.

```
# cd /
```
- 8 Eject the Solaris Software - 1 CD.
- 9 Insert the Solaris Software - 2 CD into the system's CD-ROM drive.
- 10 Change to the `Tools` directory on the mounted CD.

```
# cd /cdrom/cdrom0/Solaris_10/Tools
```
- 11 Copy the CD in the CD-ROM drive to the installation server's disk.

```
# ./add_to_install_server install-dir-path
```
- 12 Change to root (`/`) directory.

```
# cd /
```


- 13 Eject the Solaris Software - 2 CD.
- 14 Repeat Step 9 through Step 13 for each Solaris Software CD installation.
- 15 Insert the Solaris Languages CD into the system's CD-ROM drive.
- 16 Change to the `Tools` directory on the mounted CD.

```
# cd /cdrom/cdrom0/Tools
```
- 17 Copy the CD in the CD-ROM drive to the installation server's disk.

```
# ./add_to_install_server install-dir-path
```
- 18 Change to the root (`/`) directory.

```
# cd /
```
- 19 Determine if you need to create a boot server.
 - If the installation server is *not* on the same subnet as the system to be installed or you are *not* using DHCP, you need to create a boot server. For more information, see “To Create a Boot Server on a Subnet With a CD Image” in *Solaris 10 Installation Guide: Network-Based Installations*.
 - If you are using DHCP or the installation server is on the same subnet as the system to be installed, you do not need to create a boot server.

When you have finished setting up the installation server, you can begin to add client systems to be installed from the network. For information about how to add client systems, see “How to Add Systems to Be Installed From the Network With `add_install_client`” on page 47.

See Also For additional information about the `setup_install_server` and the `add_to_install_server` commands, see the `install_scripts(1M)` man page.

Creating an Installation Server With DVD Media

The installation server contains the installation image needed to install systems from the network. You must create an installation server to install the Solaris software on a system from the network. You do not always need to set up a boot server. Refer to the following guidelines to determine whether you need to set up a separate boot server.

- If you are using DHCP to set installation parameters, or if your installation server and client are on the same subnet, you do not need a boot server. See Chapter 16, “Configuring and Administering the DHCP Client,” in *System Administration Guide: IP Services*.

- If your installation server and your client are not on the same subnet and you are not using DHCP, you must create separate boot servers for each subnet. You could create an installation server for each subnet. However, installation servers require more disk space.

▼ How to Create an Installation Server With x86 DVD Media

Note – This procedure assumes that the system is running Solaris Volume Manager. If you are not using Solaris Volume Manager to manage media, refer to *System Administration Guide: Devices and File Systems* for detailed information about managing removable media without Solaris Volume Manager.

- 1 On the system that is to become the installation server, become superuser or assume an equivalent role.**

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

The system must include a DVD-ROM drive and be part of the site's network and name service. If you do not use a name service, you must distribute information about this system by following your site's policies.

- 2 Insert the Solaris Software DVD into the system's drive.**

- 3 Create a directory to contain the boot image.**

```
# mkdir -p install-dir-path
```

install-dir-path – Specifies the directory where the DVD image is to be copied.

- 4 Change to the `Tools` directory on the mounted disc.**

```
# cd /cdrom/cdrom0/Solaris_10/Tools
```

where `cdrom0` is the path to the drive that contains the Solaris OS DVD media.

- 5 Copy the disc in the drive to the installation server's disk.**

```
# ./setup_install_server install-dir-path
```

install-dir-path – Specifies the directory where the DVD image is to be copied,

Note – The `setup_install_server` command indicates whether you have enough disk space available for the Solaris software disc image. To determine available disk space, use the `df -k` command.

6 Decide if you need to make the installation server available for mounting.

- If the installation server is on the same subnet as the system to be installed or you are using DHCP, you do not need to create a boot server. Proceed to Step 7.
- If the installation server is not on the same subnet as the system to be installed and you are not using DHCP, complete the following steps:

a. Verify that the path to the installation server's image is shared appropriately.

```
# share | grep install-dir-path
```

install-dir-path – Specifies the installation image where the DVD image was copied.

- If the path to the installation server's directory is displayed and anon=0 is displayed in the options, proceed to Step 7.
- If the path to the installation server's directory is not displayed or you do not have anon=0 in the options, continue.

b. Make the installation server available to the boot server by adding this entry to the `/etc/dfs/dfstab` file.

```
share -F nfs -o ro,anon=0 -d "install server directory" install-dir-path
```

c. Verify that the `nfsd` daemon is running.

- If the installation server is running the Solaris 10 106 OS or compatible version, type the following command:

```
# svcs -l svc:/network/nfs/server:default
```

If the `nfsd` daemon is online, continue to Step d. If the `nfsd` daemon is not online, start it.

```
# svcadm enable svc:/network/nfs/server
```

d. Share the installation server.

```
# shareall
```

7 Change to the root (`/`) directory.

```
# cd /
```

8 Determine if you need to create a boot server.

- **If the installation server is *not* on the same subnet as the system to be installed or you are *not* using DHCP, you need to create a boot server. For more information, see “To Create a Boot Server on a Subnet With a DVD Image” in *Solaris 10 Installation Guide: Network-Based Installations*.**
- **If you are using DHCP or the installation server is on the same subnet as the system to be installed, you do not need to create a boot server.**

After you set up the installation server, you must add the client as an installation client. For information about installing client systems over the network, see “How to Add Systems to Be Installed From the Network With `add_install_client`” on page 47.

See Also For additional information about the `setup_install_server` and the `add_to_install_server` commands, see the `install_scripts(1M)` man page.

Preconfiguring System Configuration Information (Task Map)

TABLE 1-2 Preconfiguring System Configuration Information: Task Map

Task	Description	For Instructions
Create a <code>sysidcfg</code> file.	Create a unique <code>sysidcfg</code> file for every system that requires different configuration information. Note that sample files are available to use.	“How to Create a <code>sysidcfg</code> Configuration File” on page 31
Create a profile for networked systems.	When setting up a hands off installation for systems on the network, you need to create a directory on a server that is called a <i>JumpStart</i> directory. This directory can be created on the installation server. The JumpStart directory contains system configuration information that is required to complete a hands off installation of the Solaris software.	<p>“How to Create a JumpStart Directory on a Server” on page 33</p> <p>“How to Enable All Systems to Access the Profile Server” on page 35</p> <p>“How to Create a Profile” on page 37</p> <p>“How To Test a Profile” on page 40</p>

TABLE 1-2 Preconfiguring System Configuration Information: Task Map (Continued)

Task	Description	For Instructions
Create a rules file.	Create the rules file for each group of systems on which you want to install the Solaris OS. Each rule distinguishes a group of systems that are based on one or more system attributes. Each rule also links each group to a profile. A <i>profile</i> is a text file that defines how the Solaris software is to be installed on each system in the group.	“How To Create a rules File” on page 44 “How to Validate the rules File” on page 46
Add systems to be installed from the network.	Use the <code>add_install_client</code> command to set up each system you want to install from the network. Each system you want to install needs to find the installation server, the boot server if required, and configuration information about the network. Note that the procedure for adding systems to be installed from the network is the same for both CD and DVD media.	“How to Add Systems to Be Installed From the Network With <code>add_install_client</code>” on page 47

The tasks in the preceding table must be completed before installing the Solaris OS on the client systems. Preconfiguration can help you avoid being prompted by the system for this information when installing the Solaris OS. Information that is provided is specific to creating a `sysidcfg` file for a Solaris OS installation on IBM BladeCenter servers. For complete syntax rules and information about creating a `sysidcfg` file in other Solaris OS installation situations, refer to the full set of Solaris OS installation documentation at <http://docs.sun.com>.

Preconfiguring With the sysidcfg File

You can specify a set of keywords in the `sysidcfg` file to preconfigure a system.

You must create a unique `sysidcfg` file for every system that requires different configuration information. You can use the same `sysidcfg` file to preconfigure the time zone on a set of systems if you want all the systems to be assigned the same time zone. However, if you want to preconfigure a different root (superuser) password for each of those systems, you need to create a unique `sysidcfg` file for each system.

You can place the `sysidcfg` file in one of the following:

- A UFS or PCFS diskette – Place the `sysidcfg` file in the root (`/`) directory on the diskette.
- A HTTP or HTTPS server – If you want to perform a wide area network (WAN) boot installation, place the `sysidcfg` file in the document root directory of the web server.

You can place only one `sysidcfg` file in a directory or on a diskette. If you are creating more than one `sysidcfg` file, you must place each file in a different directory or on a different diskette.

The following sections describe the components of the `sysidcfg` file. Refer to this information when creating a new `sysidcfg` file. A sample of the `sysidcfg` file is located in the `/install-dir-path/Solaris_10.1/Tools` directory. Instead of creating a new file, you can copy this file to use and customize for your installation environment.

Syntax Rules for the `sysidcfg` File

You can use two types of keywords in the `sysidcfg` file: independent and dependent. Dependent keywords are guaranteed to be unique only within independent keywords. A dependent keyword exists only when it is identified with its associated independent keyword.

Syntax Rule	Example
Independent keywords can be listed in any order.	<code>pointer=MS-S</code> <code>display=ati {size=15-inch}</code>
Keywords are not case-sensitive.	<code>TIMEZONE=US/Central</code> <code>terminal=sun-cmd</code>
Enclose all dependent keywords in braces ({}) to tie them to their associated independent keyword.	<code>name_service=NIS</code> <code>{domain_name=marquee.central.example.com}</code>
You can optionally enclose values in single (') or double quotation marks (").	<code>network_interface='none'</code>

`sysidcfg` File Keywords

The following table lists the keywords that you can use to configure system information in the `sysidcfg` file.

TABLE 1-3 `sysidcfg` Configuration Information and Keyword Examples

Configuration Information	Keyword
Network interface, host name, Internet Protocol (IP) address, netmask, DHCP, IPv6	<code>network_interface</code>
root (superuser) password	<code>root_password</code>
Security policy	<code>security_policy</code>
Language in which to display the installation program and desktop	<code>system_locale</code>
Terminal type	<code>terminal</code>

TABLE 1-3 sysidcfg Configuration Information and Keyword Examples (Continued)

Configuration Information	Keyword
Time zone	timezone
Date and time	timeserver
Monitor type	monitor
Keyboard language, keyboard layout	keyboard
Graphics card, screen size, color depth, display resolution	display
Pointing device, number of buttons, IRQ level	pointer

The following sections describe the keywords that you can use in the sysidcfg file.

network_interface Keyword

Use the network_interface keyword to perform the following tasks:

- Specify a host name.
- Specify an IP address.
- Specify a netmask value.
- Use DHCP to configure the network interface.
- Enable IPv6 on the network interface.

The following sections describe how to use the network_interface keyword to configure system interfaces.

Syntax for Nonnetworked Systems

To turn off networking for a system, set the network_interface value to none. For example:

```
network_interface=none
```

Syntax for Configuring a Single Interface

You can use the network_interface keyword to configure a single interface in the following ways.

- **With DHCP** – You can use a DHCP server on your network to configure the network interface. For more information about how to use a DHCP server during your installation, see [“Preconfiguring System Configuration Information With the DHCP Service \(Task Map\)”](#) on page 51.

To use the DHCP server to configure a single interface on the system, use the following syntax for the network_interface keyword:

```
network_interface=PRIMARY or value
                    {dhcp protocol_ipv6=yes-or-no}
```

PRIMARY Instructs the installation program to configure the first up, non-loopback interface that is found on the system. The order is the same order that is displayed with the `ifconfig` command. If no interfaces are up, then the first non-loopback interface is used. If no non-loopback interfaces are found, then the system is nonnetworked.

Note – Do not use the **PRIMARY** keyword value if you want to configure multiple interfaces.

value Instructs the installation program to configure a specific interface, such as `hme0` or `eri1`.

`protocol_ipv6=yes-or-no` Instructs the installation program to configure the system to either use IPv6 or to not use IPv6.

- **Without DHCP** – If you do not want to use DHCP to configure the network interface, you can specify the configuration information in the `sysidcfg` file. To instruct the installation program to configure a single interface on the system without using DHCP, use the following syntax:

```
network_interface=PRIMARY or value
    {hostname=host-name
    default_route=ip-address
    ip_address=ip-address
    netmask=netmask
    protocol_ipv6=yes-or-no}
```

PRIMARY Instructs the installation program to configure the first up, non-loopback interface that is found on the system. The order is the same as the order that is displayed with the `ifconfig` command. If no interfaces are up, then the first non-loopback interface is used. If no non-loopback interfaces are found, then the system is notnetworked.

Note – Do not use the **PRIMARY** keyword value if you want to configure multiple interfaces.

value Instructs the installation program to configure a specific interface, such as `hme0` or `eri1`.

`hostname=host-name` (Optional) Specifies the host name of the system.

<code>default_route=<i>ip-address</i> or NONE</code>	(Optional) Specifies the IP address of the default router. If you want the installation program to detect the router by using the ICMP router discovery protocol, omit this keyword. If the installation program cannot detect the router, you are prompted for the router information during the installation.
<code>ip_address=<i>ip-address</i></code>	(Optional) Specifies the IP address of the system.
<code>netmask=<i>netmask</i></code>	(Optional) Specifies the netmask value for the system.
<code>protocol_ipv6=<i>yes-or-no</i></code>	(Optional) Instructs the installation program either to configure the system to either use IPv6 or to not use IPv6. To perform an unattended custom JumpStart installation, you must specify a value for the <code>protocol_ipv6</code> keyword.

Note – Include any combination or none of the `hostname`, `ip_address`, and `netmask` keywords, as needed. If you do not use any of these keywords, omit the braces (`{}`).

EXAMPLE 1-1 Configuring a Single Interface by Using DHCP With the `network_interface` Keyword

The following example shows how to instruct the installation program to DHCP to configure the `eri0` network interface. IPv6 support is not enabled.

```
network_interface=eri0 {dhcp protocol_ipv6=no}
```

EXAMPLE 1-2 Configuring a Single Interface by Specifying Configuration Information With the `network_interface` Keyword

The following example shows how to configure the `eri0` interface with the following settings:

- The host name is set to `host1`.
- The IP address is set to `172.31.88.100`.
- The netmask is set to `255.255.255.0`.
- IPv6 support is not enabled on the interface.

```
network_interface=eri0 {hostname=host1 ip_address=172.31.88.100
                        netmask=255.255.255.0 protocol_ipv6=no}
```

Syntax for Configuring Multiple Interfaces

You can configure multiple network interfaces in your `sysidcfg` file. For each interface that you want to configure, include a `network_interface` keyword entry in the `sysidcfg` file.

You can use the `network_interface` keyword to configure multiple interfaces in the following ways:

- With DHCP** – You can use a DHCP server on your network to configure the network interface. For more information about how to use a DHCP server during your installation, see [“Preconfiguring System Configuration Information With the DHCP Service \(Task Map\)”](#) on page 51.

To use the DHCP server to configure a network interface on the system, use the following syntax for the `network_interface` keyword.

```
network_interface=value {PRIMARY
                        dhcp protocol_ipv6=yes-or-no}
```

value Instructs the installation program to configure a specific interface, such as `hme0` or `eri1`.

PRIMARY (Optional) Specifies *value* as the primary interface.

`protocol_ipv6=yes-or-no` Instructs the installation program to configure the system either to use IPv6 or to not use IPv6.

- Without DHCP** – If you do not want to use DHCP to configure the network interface, you can specify the configuration information in the `sysidcfg` file. To instruct the installation program to configure multiple interfaces without using DHCP, use the following syntax.

```
network_interface=value {PRIMARY hostname=host-name
                        default_route=ip-address or NONE
                        ip_address=ip-address
                        netmask=netmask
                        protocol_ipv6=yes-or-no}
```

value Instructs the installation program to configure a specific interface, such as `hme0` or `eri1`.

PRIMARY (Optional) Specifies *value* as the primary interface.

`hostname=host-name` (Optional) Specifies the host name of the system.

`default_route=ip-address or NONE` (Optional) Specifies the IP address of the default router. If you want the installation program to detect the router by using the ICMP router discovery protocol, omit this keyword.

If you configure multiple interfaces in the `sysidcfg` file, set `default_route=NONE` for each secondary interface that does not use a static default route.

If the installation program cannot detect the router, you are prompted for the router information during installation.

`ip_address=ip-address`

(Optional) Specifies the IP address of the system.

`netmask=netmask`

(Optional) Specifies the netmask value for the system.

`protocol_ipv6=yes-or-no`

(Optional) Instructs the installation program to configure the system either to use IPv6 or to not use IPv6.

To perform an unattended custom JumpStart installation, you must specify a value for the `protocol_ipv6` keyword.

Note – Include any combination or none of the `hostname`, `ip_address`, and `netmask` keywords, as needed. If you do not use any of these keywords, omit the braces (`{}`).

In the same `sysidcfg` file, you can use DHCP to configure certain interfaces, while also specifying the configuration information for other interfaces in the `sysidcfg` file.

EXAMPLE 1-3 Configuring Multiple Interfaces With the `network_interface` Keyword

In the following example, the network interfaces `eri0` and `eri1` are configured in the following way:

- `eri0` is configured by using the DHCP server. IPv6 support is not enabled on `eri0`.
- `eri1` is the primary network interface. The host name is set to `host1`, and the IP address is set to `172.31.88.100`. The netmask is set to `255.255.255.0`. IPv6 support is not enabled on `eri1`.

```
network_interface=eri0 {dhcp protocol_ipv6=no}
network_interface=eri1 {primary hostname=host1
                        ip_address=172.31.88.100
                        netmask=255.255.255.0
                        protocol_ipv6=no}
```

root_password Keyword

You can specify the root (superuser) password to the system in the sysidcfg file. To specify the root (superuser) password, use the root_password keyword with the following syntax:

```
root_password=encrypted-password
```

encrypted-password is the encrypted password as it appears in the /etc/shadow file.

security_policy Keyword

You can use the security_policy keyword in your sysidcfg file to configure your system to use the Kerberos network authentication protocol. If you want to configure the system to use Kerberos, use the following syntax:

```
security_policy=kerberos {default_realm=FQDN  
                           admin_server=FQDN kdc=FQDN1, FQDN2, FQDN3}
```

FQDN specifies the fully qualified domain name of the Kerberos default realm, the administration server, and key distribution center (KDC). You must specify at least one, but no more than three, key distribution centers.

If you do not want to set the security policy for the system, set security_policy=NONE.

For more information about the Kerberos network authentication protocol, see Part VI, “Kerberos Service,” in *System Administration Guide: Security Services*.

EXAMPLE 1-4 Configuring the System to Use Kerberos With the security_policy Keyword

The following example configures the system to use Kerberos with the following information:

- The Kerberos default realm is example.COM.
- The Kerberos administration server is krbadmin.example.COM.
- The two key distribution centers are kdc1.example.COM and kdc2.example.COM.

```
security_policy=kerberos  
    {default_realm=example.COM  
      admin_server=krbadmin.example.COM  
      kdc=kdc1.example.COM,  
      kdc2.example.COM}
```

system_locale Keyword

You can use the system_locale keyword to specify the language in which to display the installation program and desktop. Use the following syntax to specify a locale:

```
system_locale=locale
```

locale specifies the language that you want the system to use to display the installation panels and screens. For a list of valid locale values, see the `/usr/lib/locale` directory or the *International Language Environments Guide*.

terminal **Keyword**

You can use the `terminal` keyword to specify the terminal type for the system. Use the following syntax to specify the terminal type:

```
terminal=terminal_type
```

terminal_type specifies the terminal type for the system. For a list of valid terminal types, see the subdirectories in the `/usr/share/lib/terminfo` directory.

timezone **Keyword**

You can set the time zone for the system with the `timezone` keyword. Use the following syntax:

```
timezone=timezone
```

The *timezone* keyword specifies the time zone value for the system. The directories and files in the `/usr/share/lib/zoneinfo` directory provide the valid time zone values. The *timezone* value is the name of the path relative to the `/usr/share/lib/zoneinfo` directory. You can also specify any valid Olson time zone.

EXAMPLE 1-5 Configuring the System Time Zone With the `timezone` Keyword

In the following example, the system time zone is set to mountain standard time in the United States.

```
timezone=US/Mountain
```

The installation program configures the system to use the time zone information in `/usr/share/lib/zoneinfo/US/Mountain`.

timeserver **Keyword**

You can use the `timeserver` keyword to specify the system that sets the date and time on the system you want to install.

Note – Do not set `timeserver=host-name` or `ip-address` if you are running a name service.

Choose one of the following methods to set the `timeserver` keyword:

- To configure the system to serve as its own time server, set `timeserver=localhost`. If you specify `localhost` as the time server, the system's time is assumed to be correct.
- To specify another system as the time server, specify either the host name or the IP address of the time server with the `timeserver` keyword. Use the following syntax:

```
timeserver=host-name or ip-address
```

where *host-name* is the host name of the time server system, and *ip-address* specifies the IP address of the time server.

monitor **Keyword**

You can configure monitor information with the `monitor` keyword. Use the following syntax with the `monitor` keyword:

```
monitor=monitor-type
```

To set the value for the `monitor` keyword, run the `kdmconfig -d` command on the system that you want to install. Copy the line of output that includes the `monitor` keyword, and include this line in the `sysidcfg` file.

keyboard **Keyword**

You can configure the keyboard language and layout information with the `keyboard` keyword. Use the following syntax with the `keyboard` keyword:

```
keyboard=keyboard-language {layout=value}
```

To set the value for the `keyboard` keyword, run the `kdmconfig -d` command on the system you want to install. Copy the line of output that includes the `keyboard` keyword, and include this line in the `sysidcfg` file.

display **Keyword**

You can configure the following information with the `display` keyword:

- Graphics card
- Screen size
- Color depth
- Display resolution

Use the following syntax with the `display` keyword:

```
display=graphics_card {size=screen_size  
                  depth=color_depth  
                  resolution=screen_resolution}
```

To set the appropriate values for the `display` keyword, run the `kdmconfig -d` command on the system you want to install. Copy the line of output that includes the `display` keyword, and include this line in the `sysidcfg` file.

`pointer` Keyword

You can configure the following mouse information with the `pointer` keyword:

- Pointing device
- Number of buttons
- IRQ level

Use the following syntax with the `pointer` keyword:

```
pointer=pointing-device {nbuttons=number-buttons irq=value}
```

To set the value for the `pointer` keyword, run the `kdmconfig -d` command on the system that you want to install. Copy the line of output that includes the `pointer` keyword, and include this line in the `sysidcfg` file.

For more information about all of these keywords, see the `kdmconfig(1M)` man page.

▼ How to Create a `sysidcfg` Configuration File

The Solaris OS installation programs require you to provide configuration information about a system, such as peripheral devices, host name, IP address, and name service (if applicable). Before the installation tools prompt you for this configuration information, the tools check for this information in the `sysidcfg` file and then in the name services databases (if applicable). When the Solaris installation program or the custom JumpStart installation program detects preconfigured system information in the `sysidcfg` file, you are not prompted to enter this information manually, which saves on time and resources. For example, if you have several systems, and you do not want a time zone prompt displayed every time you install the Solaris OS, you can specify the time zone in the `sysidcfg` file.

For more information about the `sysidcfg` file, see the `sysidcfg(4)` man page.

- 1 **Using a text editor, create a file named `sysidcfg`.**
- 2 **Type the keywords that you want to include in the `sysidcfg` configuration file. See “Preconfiguring With the `sysidcfg` File” on page 21 for guidelines and syntax to use.**
- 3 **Save the `sysidcfg` file.**

Note – If you create more than one `sysidcfg` file, you must save each file in a separate directory or on a separate diskette.

4 Make the `sysidcfg` file available to clients through either of the following:

- A shared NFS file system. Use the `add_install_client` command with the `-p` option to set up the system to install from the network.
- The root (`/`) directory on a UFS diskette or PCFS diskette.

Example 1–6 `sysidcfg` File

The following example shows a `sysidcfg` file for a group of systems that use the same type of keyboard, graphics cards, and pointing devices information. If the `sysidcfg` file in this example were used, you would be prompted to select a language (`system_locale`) before the installation could proceed.

The device information (keyboard, display, and pointer) was obtained by running the `kdmconfig` command with the `-d` option. See the `kdmconfig(1M)` man page for more information.

```
keyboard=ATKBD {layout=US-English}
display=ati {size=15-inch}
pointer=MS-S
timezone=US/Central
timeserver=timehost1
terminal=ibm-pc
name_service=NIS {domain_name=marquee.central.example.com
                  name_server=nmsvr2(172.25.112.3)}
root_password=URFUni9
```

More Information **Continuing the Installation**

If you plan to use the `sysidcfg` file in an installation over the network, you need to set up an installation server and add the system as an installation client. For more information, see [“Preparing to Install the Solaris Operating System on IBM BladeCenter Servers \(Task Map\)”](#) on page 13 and [“Preconfiguring With the `sysidcfg` File”](#) on page 21.

If you plan to use the `sysidcfg` file in a custom JumpStart installation, you need to create a profile and a `rules.ok` file. See [“How To Create a `rules` File”](#) on page 44.

Creating a Profile Server for Networked Systems

When setting up custom JumpStart installations for systems on the network, you need to create a directory on a server that is called a JumpStart directory. The JumpStart directory contains all of the essential custom JumpStart files, for example, the `rules` file, `rules.ok` file, and profiles. You must save the JumpStart directory in the root (`/`) directory of the profile server.

The server that contains a JumpStart directory is called a *profile server*. A profile server can be the same system as an installation server or a boot server. The profile server can also be a separate server. The profile server can provide custom JumpStart files for different platforms.

Note – After you create a profile server, you must enable all systems access to the server. For detailed instructions, see [“How to Enable All Systems to Access the Profile Server”](#) on page 35.

▼ How to Create a JumpStart Directory on a Server

The JumpStart directory contains all of the essential custom JumpStart files, for example, the `rules` file, the `rules.ok` file, and profiles. You must save the JumpStart directory in the root (`/`) directory of the profile server.

This procedure assumes that the system is running Solaris Volume Manager. If you are not using Solaris Volume Manager to manage discs, refer to *System Administration Guide: Devices and File Systems* for detailed information about managing removable media without Solaris Volume Manager.

- 1 **On the server on which you want to create the JumpStart directory, log in as superuser.**
- 2 **Create the JumpStart directory anywhere on the server.**

```
# mkdir -m 755 jumpstart-dir-path
```

where *jumpstart-dir-path* is the absolute path of the JumpStart directory.

For example, the following command creates a directory that is called `jumpstart` in the root (`/`) directory and sets the permissions to `755`:

```
# mkdir -m 755 /jumpstart
```

- 3 **Edit the `/etc/dfs/dfstab` file by adding the following entry:**

```
share -F nfs -o ro,anon=0 jumpstart-dir-path
```

For example, the following entry shares the `/jumpstart` directory:

```
share -F nfs -o ro,anon=0 /jumpstart
```

4 Share the JumpStart directory by typing `shareall`. Press Enter.

5 Determine if you want to copy examples of custom JumpStart files to your JumpStart directory.

- If no, go to Step 8.
- If yes, depending on the type of software media you are using, do one of the following:
 - **At least the Solaris 10 1/06 Operating System DVD or the Solaris 10 1/06 Software – 1 CD**

Insert the CD into the server's CD-ROM drive.

Solaris Volume Manager automatically mounts the CD.

- **Image of at least the Solaris 10 1/06 Operating System DVD or the Solaris 10 1/06 Software – 1 CD**

Change directory to the location of the Solaris Operating System DVD or the Solaris Software – 1 image.

For example, type:

```
# cd /export/install
```

6 Copy the sample custom JumpStart files into the JumpStart directory on the profile server.

```
# cp -r media-path/Solaris_Solaris_10.1/Misc/jumpstart_sample/* jumpstart-dir-path
```

media-path The path to the CD, DVD, or image on the local disk.

jumpstart-dir-path The path on the profile server where you are placing the sample custom JumpStart files.

For example, the following command copies the `jumpstart_sample` directory into the `/jumpstart` directory on the profile server:

```
cp -r /cdrom/cdrom0/s0/Solaris_Solaris_10.1/Misc/jumpstart_sample/* /jumpstart
```

7 Update the sample JumpStart files so that the files work in your environment.

8 Ensure that `root` owns the JumpStart directory and that the permissions are set to 755.

9 Allow systems on the network access to the profile server.

For detailed instructions, see [“How to Enable All Systems to Access the Profile Server”](#) on page 35.

Enabling All Systems to Access the Profile Server

When you create a profile server, you must ensure that systems can access the JumpStart directory on the profile server during a custom JumpStart installation. Use one of the following ways to enable access.

- Use the `add_install_client` command.

Each time that you add a system for network installation, use the `-c` option with the `add_install_client` command to specify the profile server.

Note – If you are not using NFS, then you must edit the boot entry on the GRUB menu to enable all systems to access the profile server.

For instructions, see [“How to Add Systems to Be Installed From the Network With `add_install_client`” on page 47.](#)

- Edit the boot entry in the GRUB menu.

Specify the location of the JumpStart directory on the profile server when you boot the system by editing the boot entry on the GRUB menu. You must compress the custom JumpStart configuration files into one file. Then, save the compressed configuration file on an NFS server, an HTTP server, or on media that the system can access locally. Note that when you edit the GRUB menu entry, you must specify the location of the compressed file.

For instructions, see [“To Create a Compressed Configuration File” in *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations*](#) and [“Performing a Custom JumpStart Installation by Editing the GRUB boot Command” in *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations*.](#)

- Add a wildcard in the `/etc/bootparams` file.

For instructions, see [“How to Enable All Systems to Access the Profile Server” on page 35.](#)

▼ How to Enable All Systems to Access the Profile Server

Use this procedure *only* if you store network installation information in the `/etc/bootparams` file.

To use this procedure, all systems must be of the same type, such as all x86 based systems.

Do not use this procedure under the following conditions:

- If you save the JumpStart directory on a diskette.
- If you specify the location of the profile server when you boot the system.

Creating a Profile

A profile is a text file that defines how to install the Solaris software on a system. A profile defines the elements of an installation, for example, which software group to install. Every rule specifies a profile that defines how a system is to be installed. You can create different profiles for every rule. You can also use the same profile in more than one rule. See [“Creating the rules File” on page 42](#).

A profile consists of one or more profile keywords and their values. Each *profile keyword* is a command that controls one aspect of how the JumpStart program is to install the Solaris software on a system. For example, the following profile keyword and value specify that the JumpStart program install the system as a server:

```
system_type server
```

Note – Sample profiles are already located in the JumpStart directory, if you created the JumpStart directory by using the procedure, [“Creating a Profile Server for Networked Systems” on page 33](#).

Syntax of Profiles

A profile must contain the following:

- The `install_type` profile keyword as the first entry
- One keyword per line
- The `root_device` keyword if the systems that are being upgraded by the profile contain more than one root (/) file system that can be upgraded

A profile can contain the following:

- Commented text
Any text that is included after the # symbol on a line is treated by the JumpStart program as commented text. If a line begins with the # symbol, the entire line is treated as a comment.
- One or more blank lines

▼ How to Create a Profile

- 1 **Using a text editor, create a text file. Name the file descriptively. Or, open a sample profile in the JumpStart directory that you created.**

Note – Ensure that the name of the profile reflects how you intend to use the profile to install the Solaris software on a system. For example, you might name the profiles `basic_install`, `eng_profile`, or `user_profile`.

2 Add profile keywords and values to the profile.

See “[Profile Examples](#)” on page 38.

Note – Profile keywords and their values are case-sensitive.

3 Save the profile in the JumpStart directory.

4 Ensure that `root` owns the profile and that the permissions are set to 644.

5 (Optional) Test the profile.

See “[How To Test a Profile](#)” on page 40.

Profile Examples

The following examples of profiles show how to use different profile keywords and profile values to control how the Solaris software is installed on a system. Profile keywords and values contains a description of profile keywords and values.

EXAMPLE 1-7 Specifying Where to Install File Systems by Using a Profile

```
# profile keywords      profile values
# -----
install_type           initial_install
system_type            standalone
partitioning           explicit
filesys                c0t0d0s0 auto /
filesys                c0t3d0s1 auto swap
filesys                any auto usr
cluster                SUNWCall
```

The following describes some of the keywords and values from this example:

partitioning The file system slices are determined by the `filesys` keywords that are value `explicit`. The size of the root (`/`) directory is based on the selected software, value `auto`, and is installed on `c0t0d0s0`. The size of swap is set to the necessary size and is installed on `c0t3d0s1`. `usr` is based on the selected software and the installation program determines where `usr` is installed, based on the value `any`.

EXAMPLE 1-7 Specifying Where to Install File Systems by Using a Profile *(Continued)*

`cluster` The Entire Solaris Software Group, `SUNWCaLL`, is installed on the system.

EXAMPLE 1-8 Using the `fdisk` Keyword in a Profile

```
# profile keywords      profile values
# -----
install_type           initial_install
system_type            standalone

fdisk                  c0t0d0 0x04 delete
fdisk                  c0t0d0 solaris maxfree
cluster                SUNWCaLL
cluster                SUNWCacc delete
```

The following describes some of the keywords and values from this example:

`fdisk` All `fdisk` partitions of type `DOSOS16` (04 hexadecimal) are deleted from the `c0t0d0` disk.

`fdisk` A Solaris `fdisk` partition is created on the largest contiguous free space on the `c0t0d0` disk.

`cluster` The Entire Solaris Software Group, `SUNWCaLL`, is installed on the system.

`cluster` The system accounting utilities, `SUNWCacc`, are not to be installed on the system.

Testing a Profile

After you create a profile, use the `pfinstall` command to test the profile. Test the profile before installing or upgrading a system. Testing a profile is especially useful when you are creating upgrade profiles that reallocate disk space.

Review the installation output that is generated by `pfinstall` to determine if the profile works as you intended. For example, use the profile to determine if a system has enough disk space for installing a new release of the Solaris software before you perform the installation on that system.

The `pfinstall` command enables you to test a profile against the following:

- The system's disk configuration where `pfinstall` is being run.
- Other disk configurations. You use a disk configuration file that represents a structure of a disk, for example, a disk's bytes/sector, flags, and slices.

Note – You cannot use a disk configuration file to test a profile you intend to use for installing a system. Instead, you must test the profile against the system's actual disk configuration and the software that is currently installed on that system.

▼ How To Test a Profile

- 1 Locate a system on which to test the profile.
- 2 Test an initial installation profile on a system that is running at least the Solaris 10 1/06 software.

- 3 Become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

- 4 Create a temporary mount point.

```
# mkdir /tmp/mnt
```

- 5 Mount the directory that contains the profile or profiles that you want to test. Type the instructions that apply.

- To mount a remote NFS file system for systems on the network, type:

```
# mount -F nfs server-name:path /tmp/mnt
```

- To mount a PCFS-formatted diskette, type:

```
mount -F pcfs /dev/diskette /tmp/mnt
```

- 6 To test the profile with a specific system memory size, set `SYS_MEMSIZE` to the specific memory size in MB.

```
# SYS_MEMSIZE=memory-size
```

```
# export SYS_MEMSIZE
```

- 7 Depending on whether you mounted a directory in Step 4, do one of the following:

- If you mounted a directory in Step 4, change to that directory.

```
# cd /tmp/mnt
```

- If you did not mount a directory in Step 4, change to the directory where the profile is located, which is usually the JumpStart directory.

```
# cd jumpstart-dir-path
```


8 Test the profile.

```
# /usr/sbin/install.d/pfinstall -D:-d disk-config-file -c path profile
```



Caution – You *must* include the `-d` option or the `-D` option when using the `pfinstall` command. If you do not include one of these options, the command uses the profile you that specify for installing the Solaris software. As a result, all of the system data is overwritten.

`-D` `pfinstall` uses the current system's disk configuration to test the profile.

`-d disk-config-file` `pfinstall` uses the disk configuration file, *disk-config-file*, to test the profile. If *disk-config-file* is not located in the directory where `pfinstall` is run, you must specify the path.

Note – You cannot use the `-d disk-config-file` option with an upgrade profile, `install_type upgrade`. You must always test an upgrade profile against a system's disk configuration, that is, you must use the `-D` option.

`-c path` The path to the Solaris software image. You use this option, for example, if the system is using Solaris Volume Manager to mount the Solaris Software - 1 CD for your platform.

The `-c` option is not required if you booted from at least the Solaris 10 1/06 DVD or the Solaris 10 1/06 Software - 1 CD image for your platform. The DVD or CD image is mounted on `/cdrom` as part of the booting process.

profile The name of the profile to test. If *profile* is not in the directory where `pfinstall` is being run, you must specify the path.

Profile Test Examples

The following example shows how to use `pfinstall` to test a profile that is named `basic_prof`. The profile is tested against the disk configuration on a system on which the Solaris software is installed. The `basic_prof` profile is located in the `/jumpstart` directory, and the path to the Solaris 10 1/06 Software for x86 Platforms - 1 CD image is specified because Solaris Volume Manager is being used.

EXAMPLE 1-9 Using a Solaris 10 1/06 System to Test a Profile

```
# cd /jumpstart
# /usr/sbin/install.d/pfinstall -D -c /cdrom/path-name basic_prof
```

The following example shows how to use `pfinstall` to test the profile that is named `basic_prof` on a Solaris 10 1/06 system. The test is performed against the `535_test` disk configuration file. The test checks for 64 MB of system memory. This example uses a Solaris 10 1/06 Software for x86 Platforms - 1 CD image that is located in the `/export/install` directory.

EXAMPLE 1-10 Profile Test Using a Disk Configuration File

```
# SYS_MEMSIZE=64
# export SYS_MEMSIZE
# /usr/sbin/install.d/pfinstall -d 535_test -c /export/install basic_prof
```

Creating the rules File

The rules file is a text file that contains rules for each group of systems on which you want to install the Solaris OS. Each rule distinguishes a group of systems that are based on one or more system attributes. Each rule also links each group to a profile. A *profile* is a text file that defines how the Solaris software is to be installed on each system in the group. For example, the following rule specifies that the JumpStart program use the information in the `basic_prof` profile for installing any system with the `sun4u` platform group:

```
karch sun4u - basic_prof -
```

The rules file is used to create the `rules.ok` file, which is required for custom JumpStart installations.

Note – If you set up the JumpStart directory by using the procedures in [“Creating a Profile Server for Networked Systems” on page 33](#), a sample rules file is already located in the JumpStart directory. The sample rules file contains documentation and some sample rules. If you use the sample rules file, make sure you comment out the sample rules that you do not intend to use.

Syntax of the rules File

The rules file must have the following attributes:

- The file must be assigned the name `rules`.
- The file must contain at least one rule.

The rules file can contain any of the following:

- Commented text

Any text that is included after the `#` symbol on a line is treated by JumpStart as commented text. If a line begins with the `#` symbol, the entire line is treated as a comment.

- One or more blank lines
- One or more multiline rules

To continue a single rule onto a new line, include a backslash character (\) just before pressing Return.

A rule within a rules file must adhere to the following syntax:

```
!rule-keyword rule-value && !rule-keyword rule-value ... begin profile finish
```

!	A symbol that is used before a keyword to indicate negation.
<i>rule-keyword</i>	A predefined lexical unit or word that describes a general system attribute, such as host name, <i>hostname</i> , or memory size, <i>memorysize</i> . <i>rule-keyword</i> is used with the rule value to match a system with the same attribute to a profile.
<i>rule-value</i>	A value that provides the specific system attribute for the corresponding <i>rule-keyword</i> . Rule values are described in the section, “Rule Keywords and Values” in <i>Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations</i> .
&&	A symbol you must use to join <i>rule-keyword</i> and <i>rule-value</i> pairs in the same rule (a logical AND). During a custom JumpStart installation, a system must match every pair in the rule before the rule matches.
<i>begin</i>	The name of an optional Bourne shell script that can be executed before the installation begins. If no <i>begin</i> script exists, you must type a minus sign (-) in this field. All <i>begin</i> scripts must be located in the JumpStart directory. Information about how to create <i>begin</i> scripts is presented in “Creating Begin Scripts” in <i>Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations</i> .
<i>profile</i>	The name of a text file that defines how the Solaris software is to be installed on the system when a system matches the rule. The information in a profile consists of profile keywords and their corresponding profile values. All profiles must be located in the JumpStart directory.
<i>finish</i>	The name of an optional Bourne shell script that can be executed after the installation is completed. If no <i>finish</i> script exists, you must type a minus sign (-) in this field. All <i>finish</i> scripts must be located in the JumpStart directory. Information about how to create <i>finish</i> scripts is presented in “Creating Finish Scripts” in <i>Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations</i> .

At the minimum, each rule must contain the following:

- A keyword, a value, and a corresponding profile

- A minus sign (-) in the *begin* and *finish* fields if no begin or finish scripts are specified

▼ How To Create a rules File

- 1 Use a text editor to create a text file that is named `rules`. Or, open the sample `rules` file in the `JumpStart` directory that you created.
- 2 Add a rule in the `rules` file for each group of systems on which you want to install the Solaris software.
For an example of some `rules` file keywords and values, see “[rules File Example](#)” on page 44. For a complete list of the `rules` file keywords and values, see “Rule Keywords and Values” in *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations*.
- 3 Save the `rules` file in the `JumpStart` directory.
- 4 Ensure that `root` owns the `rules` file and that the permissions are set to 644.

rules File Example

The following shows example rules in a `rules` file. Each line has a rule keyword and a valid value for that keyword.

The `JumpStart` program scans the `rules` file from top to bottom. When the `JumpStart` program matches a rule keyword and value with a known system, the `JumpStart` program installs the Solaris software that is specified by the profile listed in the `profile` field.

EXAMPLE 1-11 Generic rules File

# rule keywords and rule values	begin script	profile	finish script
# -----	-----	-----	-----
hostname eng-1	-	basic_prof	-
network 192.168.255.255 && !model \	-	net_prof	-
'SUNW,Sun-Blade-100'	-	lx_prof	complete
model SUNW,SPARCstation-LX	setup	x86_prof	done
network 192.168.2.0 && karch i86pc	-	prog_prof	-
memsize 64-128 && arch i386	-	generic_prof	-
any -	-		

The following describes some of the keywords and values from this example.

`hostname` The rule matches if the system's host name is `eng-1`. The `basic_prof` profile is used for installing the Solaris software on systems that match the rule.

EXAMPLE 1-11 Generic rules File (Continued)

network	The rule matches if the system is on subnet 192.168.255.255, and if the system is <i>not</i> a Sun Blade™ 100 (SUNW, Sun-Blade-100). The net_prof profile is used for installing the Solaris software on systems that match this rule.
model	The rule matches if the system is a SPARCstation® LX. The lx_prof profile and the complete finish script are used to install the Solaris software on systems that match this rule.
network	The rule matches if the system is on subnet 192.168.2.0 and is an x86 based sun4u system. The setup begin script, the x864u_prof profile, and the done finish script are used for installing the Solaris software on systems that match the rule.
memsize	The rule matches if the system has between 64 and 128 MB of memory and is an x86 based system. The prog_prof profile is used for installing the Solaris software on systems that match this rule.
any	The rule matches any system that did not match the preceding rules. The generic_prof profile is used for installing the Solaris software on systems that match this rule. If any is used, it should always be the last rule in the rules file.

Validating the rules File

Before you can use a profile and rules file, you must run the check script to validate that the files are set up correctly. If all rules and profiles are correctly set up, the rules.ok file is created. This file is required by the custom JumpStart installation software to match a system to a profile.

The following table describes what the check script does.

TABLE 1-4 check Script Functions

Stage	Description
1	The rules file is checked for correctness of syntax. check verifies that the rule keywords are legitimate and that the <i>begin</i> , <i>class</i> , and <i>finish</i> fields are specified for each rule. The <i>begin</i> and <i>finish</i> fields can consist of a minus sign (-) instead of a file name.
2	If no errors are found in the rules file, each profile that is specified in the rules is checked for correct syntax.
3	If no errors are found, check creates the rules.ok file from the rules file, removes all comments and blank lines, retains all the rules, and adds the following comment line at the end of the file: # version=2 checksum=num

▼ How to Validate the `rules` File

The check script is in the `Solaris_Solaris_version/Misc/jumpstart_sample` directory on the Solaris Software DVD or the Solaris Software 1 – CD.

- 1 **Ensure that the check script is located in the JumpStart directory.**

Note – The check script is in the `Solaris_Solaris_version/Misc/jumpstart_sample` directory on the Solaris 10 Software DVD or on the Solaris Software - 1 CD.

- 2 **Change to the JumpStart directory.**
- 3 **Run the check script to validate the `rules` file.**

```
$ ./check -p path -r filename
```

-p path Validates the `rules` by using the check script from the Solaris 10 software image instead of the check script from the system you are using. *path* is the image on a local disk or a mounted on the Solaris DVD or a Solaris Software - 1 CD.

Use this option to run the most recent version of check if your system is running a previous version of Solaris.

-r filename Specifies a `rules` file other than the file that is named `rules`. Using this option, you can test the validity of a rule before you integrate the rule into the `rules` file.

As the check script runs, the script reports on the validity of the `rules` file and each profile. If no errors are reported, the script generates the following:

```
The custom JumpStart configuration is ok
```

- 4 **Ensure that `root` owns the `rules.ok` file and that the permissions are set to 644.**

Adding Systems to Be Installed From the Network With `add_install_client`

After you create an install server and, if necessary, a boot server, you must set up each system that you want to install from the network. Use the following procedure to set up a client system to install from the network with the `add_install_client` command.

For more options to use with this command, see the `add_install_client(1M)` man page.

▼ How to Add Systems to Be Installed From the Network With `add_install_client`

Before You Begin If you have a boot server, make sure that you have shared the installation server installation image and have started the appropriate services. See “[How to Create an Installation Server With x86 CD Media](#)” on page 15 or “[How to Create an Installation Server With x86 DVD Media](#)” on page 18.

Each system that you want to install needs to find the following:

- Installation server
- Boot server, if it is required
- The `sysidcfg` file, if you use a `sysidcfg` file to preconfigure system information
- The profile in the JumpStart directory on the profile server, if you are using the custom JumpStart installation method

1 On the installation server or boot server, become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see “[Configuring RBAC \(Task Map\)](#)” in *System Administration Guide: Security Services*.

2 Change to the `Tools` directory on the Solaris DVD image.

```
# cd /install-dir-path/Solaris_10/Tools
```

install-dir-path Specifies the path to the `Tools` directory

3 Set up the client system so that it can be installed from the network.

```
# ./add_install_client -d -s install-server:install-dir_path -c jumpstart-server:jumpstart-dir-path -p sysid-server:path  
-t boot-image-path -b "boot-property=value" -e ethernet-address client-name platform-group
```

`-d`

Specifies that the client is to use DHCP to obtain the network installation parameters. If you use the `-d` only, the `add_install_client` command sets up the installation information for client systems of the same class, for example, all x86 based client machines. To set up the installation information for a specific client, use `-d` with the `-e` option.

Use this option to boot the systems from the network by using a PXE network boot. The output of this option lists the DHCP options that you need to create on the DHCP server.

- For more information about class-specific installations that use DHCP, see [“Creating DHCP Options and Macros for Solaris Installation Parameters”](#) on page 52.
- `-s install-server:install-dir-path` Specifies the name and path to the installation server.
- where *install-server* is the host name of the installation server and *install-dir-path* is the absolute path to the Solaris DVD or CD image.
- `-c jumpstart-server:jumpstart-dir-path` Specifies a JumpStart directory for custom JumpStart installations. *jumpstart-server* is the host name of the server on which the JumpStart directory is located. The *jumpstart-dir-path* is the absolute path to the JumpStart directory.
- `-p sysid-server:path` Specifies the path to the `sysidcfg` file for preconfiguring system information. *sysid-server* is either a valid host name or an IP address for the server that contains the file. *path* is the absolute path to the directory containing the `sysidcfg` file.
- `-t boot-image-path` Specifies the path to an alternate boot image if you want to use a boot image other than the image in the `Tools` directory on the Solaris OS net installation image, CD, or DVD.
- `-b “boot-property=value”` Enables you to set the value of a boot property variable that you want to use to boot the client from the network. The `-b` option must be used with the `-e` option.
- See the `eeprom(1M)` man page for descriptions of boot properties.
- `-e ethernet-address` Specifies the Ethernet address of the client that you want to install. This option enables you to set up the installation information to use for a specific client, including a boot file for that client. For instance, if you specify `-e 00:07:e9:04:4a:bf` for a client, the command creates the boot file `010007E9044ABF.i86pc` in the `/tftpboot` directory.

Note – In previous releases, the `-e` option created a boot file with the prefix `nbp.`. Starting with the Solaris 10 1/06 release, the `nbp.` prefix is not used in boot file names. However, starting with the Solaris 10 1/06 release, the use of legacy boot files with the `nbp.` prefix is supported.

For more information about client-specific installations by using DHCP, see [“Creating DHCP Options and Macros for Solaris Installation Parameters”](#) on page 52.

client-name

Is the name of the system to be installed from the network. This name is *not* the host name of the installation server.

platform-group

Is the platform group of the system to be installed.

Example 1–12 Adding an Installation Client on an installation Server When Using DHCP: Solaris 10 1/06

The following example illustrates how to add an installation client to an installation server when you are using DHCP to set installation parameters on the network. The `-d` option is used to specify that clients use the DHCP protocol for configuration. To perform a PXE network boot, you *must* use the DHCP protocol. The `-s` option is used to specify that the clients are to be installed from the installation server that is named `rosemary`. This server contains a Solaris 10 1/06 DVD image in `/export/home/dvdx86`.

```
# cd /export/boot/dvdx86/Solaris_10/Tools
# ./add_install_client -d -s rosemary:/export/home/dvdx86 i86pc
```

Example 1–13 Adding a Single Installation Client on an Installation Server When Using DHCP

The following example illustrates how to add an installation client to an installation server when you are using DHCP to set installation parameters on the network. The `-d` option is used to specify that clients are to use the DHCP protocol for configuration. You must use the DHCP protocol to perform a PXE network boot. The `-e` option indicates that this installation occur only on the client with the Ethernet address `00:07:e9:04:4a:bf`. The `-s` option is used to specify that the clients are to be installed from the installation server that is named `rosemary`. This server contains a image in `/export/home/dvdx86`.

```
# cd /export/boot/dvdx86/Solaris_10/Tools
# ./add_install_client -d -e 00:07:e9:04:4a:bf -s rosemary:/export/home/dvdx86 i86pc
```

These commands set up the client with the Ethernet address `00:07:e9:04:4a:bf` as an installation client. The boot file `010007E9044ABF.i86pc` is created on the installation server. In previous releases, this boot file was named `nbp.010007E9044ABF.i86pc`.

Example 1-14 Specifying a Serial Console to Use During a Network Installation (DVD)

The following example illustrates how to add an install client to an installation server and specify a serial console to use during the installation. This example sets up the install client in the following manner.

- The `-d` option indicates that the client is set up to use DHCP to set installation parameters.
- The `-e` option indicates that this installation will occur only on the client with the Ethernet address `00:07:e9:04:4a:bf`.
- The `-b` option instructs the installation program to use the serial port `ttya` as an input and as an output device.

```
# cd /export/boot/dvdx86/Solaris_10/Tools
# ./add_install_client -d -e 00:07:e9:04:4a:bf -b "console=ttya" i86pc
```

For a complete description of the boot property variables and values that you can use with the `-b` option, see the `eeprom(1M)` man page.

For information about setting up a serial over LAN (SOL) connection after installing the Solaris OS, see [“How to Set Up a Serial Over LAN Connection” on page 72](#). The SOL connection is used to manage systems remotely.

More Information Continuing the Installation

If you are using a DHCP server to install the client over the network, configure the DHCP server and create the options and macros that are listed in the output of the `add_install_client -d` command. For instructions on how to configure a DHCP server to support network installations, see [“Preconfiguring System Configuration Information With the DHCP Service \(Task Map\)” on page 51](#).

If you are not using a DHCP server, you must boot the system from a local Solaris OS DVD or CD.

See Also For additional information about the `add_install_client` command, see the `install_scripts(1M)` man page.

Preconfiguring System Configuration Information With the DHCP Service (Task Map)

TABLE 1-5 Preconfiguring System Configuration Information With the DHCP Service: Task Map

Task	Description	For Instructions
Configure the DHCP server. This task is optional. Note – If you want to install a system from the network with PXE, you must configure a DHCP server.	If you want to use DHCP to provide system configuration and installation parameters, configure the DHCP server, then create the appropriate options and macros for your installation.	Chapter 13, “Planning for DHCP Service (Tasks),” in <i>System Administration Guide: IP Services</i> and Chapter 14, “Configuring the DHCP Service (Tasks),” in <i>System Administration Guide: IP Services</i> .
Write a script that creates DHCP options and macros to support a Solaris installation by using the <code>dhtadm</code> command.	To install DHCP clients with a DHCP server over the network, you can create a script that uses the <code>dhtadm</code> command. The DHCP options and macros that you create by running this script are used to pass information that is needed for installing the Solaris OS.	“Writing a Script That Uses dhtadm to Create Options and Macros” on page 54
Use DHCP Manager to create DHCP options and macros to support a Solaris installation.	To install DHCP clients with a DHCP server over the network, you can use DHCP Manager to create options and macros. The DHCP options and macros that you create are used to pass information that is needed for installing the Solaris OS.	“How to Create Options to Support a Solaris Installation (DHCP Manager)” on page 56 “How to Create Macros to Support a Solaris Installation (DHCP Manager)” on page 57

Preconfiguring System Configuration Information With the DHCP Service

The Dynamic Host Configuration Protocol (DHCP) enables host systems in a TCP/IP network to be configured automatically for the network as they boot. DHCP uses a client and server mechanism. Servers store and manage configuration information for clients, and provide that information as a result of a client's request. The information includes the client's IP address and information about network services that are available to the client.

A primary benefit of DHCP is its ability to manage IP address assignments through leasing. *Leasing* enables IP addresses to be reclaimed when not in use and reassigned to other clients. This ability enables a site to use a smaller pool of IP addresses than would be needed if all clients were assigned a permanent address.

You can use DHCP for installing the Solaris OS on certain client systems on your network. All systems that meet the hardware requirements for running the Solaris OS can use this feature.

Creating DHCP Options and Macros for Solaris Installation Parameters

When you add clients with the `add_install_client -d` script on the installation server, the script reports DHCP configuration information to standard output. This information can be used when you create the options and macros that are needed to pass network installation information to clients. You can create DHCP options and macros in one of the following ways:

For installing DHCP clients with a DHCP server over the network, you must create DHCP options to pass information that is needed for installing the Solaris OS. You can customize the macros in your DHCP service to perform the following types of installations:

You can create these options and macros by using the following methods:

- Write a script that creates the options and macros by using the `dhctadm` command. See “Writing a Script That Uses `dhctadm` to Create Options and Macros” on page 54.
- Create the options and macros with DHCP Manager. See “How to Create Options to Support a Solaris Installation (DHCP Manager)” on page 56 and “How to Create Macros to Support a Solaris Installation (DHCP Manager)” on page 57.
- **Class-specific installations** – You can instruct the DHCP service to perform a network installation for all clients of a specific class. For example, you can define a DHCP macro that performs the same installation on all Sun Blade systems on the network. Use the output of the `add_install_client -d` script to set up a class-specific installation.
- **Network-specific installations** – You can instruct the DHCP service to perform a network installation for all clients on a specific network. For example, you can define a DHCP macro that performs the same installation on all systems in the 192.168.2.1 network.
- **Client-specific installations** – You can instruct the DHCP service to perform a network installation for a client with a specific Ethernet address. For example, you can define a DHCP macro that performs a specific installation on the client with the Ethernet address `00:07:e9:04:4a:bf`. Use the output of the `add_install_client -d -e ethernet-address` command to set up a client-specific installation.

For more information about setting up clients to use a DHCP server for a network installation, see “Supporting Solaris Network Installation With the DHCP Service” in *System Administration Guide: IP Services*.

For detailed information about DHCP options, see “Working With DHCP Options (Task Map)” in *System Administration Guide: IP Services*.

You can use the standard DHCP options that are listed in [Table 1–6](#) to configure and install systems. These options are not platform specific, and can be used for installing the Solaris OS on a variety of x86 based systems. Use these options for installing the Solaris software on systems by using DHCP. For a complete list of standard options, see the `dhcp_inittab(4)` man page.

TABLE 1–6 Values for Standard DHCP Options

Option Name	Code	Data Type	Granularity	Maximum	Description
BootFile	N/A	ASCII	1	1	Path to the client's boot file
BootSrvA	N/A	IP address	1	1	IP address of boot server
DNSdomain	15	ASCII	1	0	DNS domain name
DNSserv	6	IP address	1	0	List of DNS name servers
NISdomain	40	ASCII	1	0	NIS domain name
NISservs	41	IP address	1	0	IP address of NIS server
NIS+dom	64	ASCII	1	0	NIS+ domain name
NIS+serv	65	IP address	1	0	IP address of NIS+ server
Router	3	IP address	1	0	IP addresses of network routers

When you have created the options, you can create macros that include those options. The following table lists examples of macros that you can create to support a Solaris client installation.

TABLE 1–7 Example Macros to Support Network Installation Clients

Macro Name	Contains These Options and Macros
Solaris	SrootIP4, SrootNM, SinstIP4, SinstNM
i86pc	Solaris macro, SrootPTH, SinstPTH, SbootFIL
PXEClient:Arch: 00000:UNDI:002001	BootSrvA, BootFile
xxx.xxx.xxx.xxx network address macros	BootSrvA option could be added to existing network address macros. The value of BootSrvA indicates the tftboot server.
01client-MAC-address client-specific macros (for example, 010007E9044ABF)	BootSrvA, BootFile

The macro names in this table match the vendor client classes of the clients that are installed from the network. These names are examples of clients that you might have on your network.

The total size of the vendor options that are provided to a particular client must not exceed 255 bytes, including option codes and length information. This limitation results from the current Solaris DHCP protocol implementation. Generally, you must pass the minimum amount of vendor information needed. Use short path names in options that require path names. If you create symbolic links to long paths, you can use the shorter link names.

Writing a Script That Uses `dhtadm` to Create Options and Macros

You can create a Korn shell script by adapting examples in this section to create all the options that are described and some other useful macros. Be sure to change all IP addresses and values contained in quotation marks to the correct IP addresses, server names, and paths for your network. Also, edit the `Vendor=` key to indicate the class of clients that you have. Use the information that `add_install_client -d` reports to obtain the data that you need to adapt the script.

EXAMPLE 1-15 Server Script Example to Support Network Installation on IBM BladeCenter Systems

```
#!/bin/sh

ImageDir="/export/home/sol10_18b"
JumpStartDir="/export/home/jumpstart"
DHCPDir="/export/home/dhcp"
DHCPNetwork="192.168.70.0"
SrvAdd="192.168.70.35"

# Sharing out the Image directory
share -F nfs -o ro,anon=0 $ImageDir

# Sharing out the jumpstart directory
share -F nfs -o ro,anon=0 $JumpStartDir

dhcpconfig -D -r SUNWfiles -p $DHCPDir -l 84600 -h files
dhcpconfig -N $DHCPNetwork

echo "Adding vendor specific symbol table"
echo ""
dhtadm -A -s SrootIP4 -d 'Vendor=SUNW.i86pc,2,IP,1,1'
dhtadm -A -s SrootNM -d 'Vendor=SUNW.i86pc,3,ASCII,1,0'
dhtadm -A -s SrootPTH -d 'Vendor=SUNW.i86pc,4,ASCII,1,0'
dhtadm -A -s SinstIP4 -d 'Vendor=SUNW.i86pc,10,IP,1,1'
dhtadm -A -s SinstNM -d 'Vendor=SUNW.i86pc,11,ASCII,1,0'
dhtadm -A -s SinstPTH -d 'Vendor=SUNW.i86pc,12,ASCII,1,0'
dhtadm -A -s SsysidCF -d 'Vendor=SUNW.i86pc,13,ASCII,1,0'
```

EXAMPLE 1-15 Server Script Example to Support Network Installation on IBM BladeCenter Systems
(Continued)

```

dhtadm -A -s SjumpsCF -d 'Vendor=SUNW.i86pc,14,ASCII,1,0'
dhtadm -A -s SbootURI -d 'Vendor=SUNW.i86pc,16,ASCII,1,0'

echo "Adding PXE info"
echo ""
dhtadm -A -m PXEClient:Arch:00000:UNDI:002001 -d (Command continued on next line)
':BootFile="pxegrub.I86PC.Solaris_10-1":BootSrvA=192.168.70.35:'

```

EXAMPLE 1-16 Example Client Script to Support Network Installation

```

#!/bin/sh

echo "Add install client"
echo ""
cd /export/home/sol10_18b/Solaris_10/Tools
./add_install_client -d -e 0:11:25:9b:9c:98 i86pc

echo "Creating client ID and association of macros"
echo ""
dhtadm -A -m 010011259B9C98 -d ':SinstPTH="/export/home/sol10_18b":'
dhtadm -M -m 010011259B9C98 -e 'SrootPTH="/export/home/sol10_18b/Solaris_10/Tools/Boot"'
dhtadm -M -m 010011259B9C98 -e 'SrootNM="sun10hw1"'
dhtadm -M -m 010011259B9C98 -e 'SrootIP4=192.168.70.35'
dhtadm -M -m 010011259B9C98 -e 'SinstIP4=192.168.70.35'
dhtadm -M -m 010011259B9C98 -e 'SinstNM="sun10hw1"'
dhtadm -M -m 010011259B9C98 -e 'BootSrvA=192.168.70.35'
dhtadm -M -m 010011259B9C98 -e 'SbootURI=tftp://192.168.70.35/inetboot.I86PC.Solaris_10-1'
dhtadm -M -m 010011259B9C98 -e 'SjumpsCF=192.168.70.35:/export/home/sol10_18b'
dhtadm -M -m 010011259B9C98 -e 'SsysidCF=192.168.70.35:/export/home/sol10_18b'

pntadm -A 192.168.70.44 -c sunblade1 -f PERMANENT -m (Command continued on next line)
010011259B9C98 -h sunblade1 -i 010011259B9C98 -s 192.168.70.35 192.168.70.0

```

As superuser, execute the `dhtadm` command in batch mode. Specify the name of the script to add the options and macros to your `dhcptab`. For example, if your script is named `netinstalloptions`, you would type the following command:

```
# dhtadm -B netinstalloptions
```

Clients that have vendor client classes listed in the `Vendor=` string can now use DHCP for installing over the network.

For more information about how to use the `dhtadm` command, see the `dhtadm(1M)` man page. For more information about the `dhcptab` file, see the `dhcptab(4)` man page.

Using DHCP Manager to Create Installation Options and Macros

This section includes two procedures for creating installation options and macros by using DHCP Manager. The first procedure describes how to create installation options with DHCP Manager. The second procedure describes how to create installation macros with DHCP Manager.

▼ How to Create Options to Support a Solaris Installation (DHCP Manager)

Before You Begin Perform the following tasks before you create DHCP options for your installation.

- Add the clients that you want to install with DHCP as installation clients of your network installation server. For more information, see [“How to Add Systems to Be Installed From the Network With `add_install_client`” on page 47](#).
- Configure your DHCP server, if it has not already been configured. For more information, see [“Configuring and Unconfiguring a DHCP Server Using DHCP Manager”](#) in *System Administration Guide: IP Services* and [“Configuring and Unconfiguring a DHCP Server Using `dhcpconfig` Commands”](#) in *System Administration Guide: IP Services*.

1 On the DHCP server, become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see [“Configuring RBAC \(Task Map\)”](#) in *System Administration Guide: Security Services*.

2 Start DHCP Manager.

```
# /usr/sadm/admin/bin/dhcpmgr &
```

The DHCP Manager window is displayed.

3 Select the Options tab.

4 Choose Create from the Edit menu.

The Create Option dialog box opens.

5 Type the option name for the first option, then type values appropriate for that option.

Use the output of the `add_install_client` command, and the information in the tables in this section to check the option names and values for options that you must create. Notice that the vendor client classes are only suggested values. See [Table 1–7](#). Create classes to indicate the

actual client types that need to obtain Solaris installation parameters from the DHCP service. See “Working With DHCP Options (Task Map)” in *System Administration Guide: IP Services* for information about how to determine a client's vendor client class.

6 Click OK after you have typed all the values.

7 In the Options tab, select the option that you just created.

8 Select Duplicate from the Edit menu.

The Duplicate Option dialog box opens.

9 Type the name of another option, then modify other values appropriately.

The values for code, data type, granularity, and maximum are most likely to need modification. See [Table 1-6](#).

10 Repeat Step 7 through Step 9 until you have created all the options.

You can now create macros to pass the options to network installation clients, as explained in the following procedure.

Note – You do not need to add these options to a Solaris client's `/etc/dhcp/inittab` file because they are already included in that file.

▼ How to Create Macros to Support a Solaris Installation (DHCP Manager)

Before You Begin Perform the following tasks before you create DHCP macros for your installation:

- Add the clients that you want to install with DHCP as installation clients of your network installation server. For more information, see “[How to Add Systems to Be Installed From the Network With `add_install_client`](#)” on page 47.
- Configure your DHCP server, if it has not already been configured. For more information, see “[Configuring and Unconfiguring a DHCP Server Using DHCP Manager](#)” in *System Administration Guide: IP Services* and “[Configuring and Unconfiguring a DHCP Server Using `dhcpconfig` Commands](#)” in *System Administration Guide: IP Services*.
- Create the DHCP options that you want to use in your macro. See “[Creating DHCP Options and Macros for Solaris Installation Parameters](#)” on page 52.

1 On the DHCP server, become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see “[Configuring RBAC \(Task Map\)](#)” in *System Administration Guide: Security Services*.

2 Start DHCP Manager.

```
# /usr/sadm/admin/bin/dhcpmgr &
```

The DHCP Manager window is displayed.

3 Select the Macros tab.

4 Choose Create from the Edit menu.

The Create Macro dialog box opens.

5 Type the name of a macro.

6 Click the Select button.

The Select Option dialog box opens.

7 Select Vendor in the Category list.

The Vendor options that you created previously are listed.

8 Select an option that you want to add to the macro , and click OK.

9 Type a value for the option.

See “[Creating DHCP Options and Macros for Solaris Installation Parameters](#)” on page 52 for the option's data type and refer to the information that `add_install_client -d` reports.

10 Repeat Step 6 through Step 7 for each option you want to include.

To include another macro, type **Include** as the option name and type the macro name as the option value.

11 Click OK when the macro is complete.

Booting and Installing the Solaris OS (Task Map)

The following table describes the tasks for booting a system from the network and instructions for performing a stand-alone installation of the Solaris OS with CD or DVD media.

TABLE 1-8 Booting and Installing the Solaris Operating System: Task Map

Task	Description	For Instructions
Boot the client system over the network.	Begin the installation by booting the system from the network.	“How to Boot a Client Over the Network” on page 60

TABLE 1-8 Booting and Installing the Solaris Operating System: Task Map (Continued)

Task	Description	For Instructions
Install the Solaris OS on stand-alone systems with CD or DVD media.	You can perform an initial installation of the Solaris OS on stand-alone systems by using the Solaris installation program.	“How to Install With the Solaris Installation Program on IBM BladeCenter Servers (Stand-Alone)” on page 64
Set up a serial over LAN connection to manage servers remotely. Note – This is an optional procedure that is performed after you have completed the Solaris OS installation.	To manage systems remotely, you must first set up a serial over LAN connection. This connection provides access to the text console command prompt, which is necessary for managing servers from a remote location.	“How to Set Up a Serial Over LAN Connection” on page 72

Booting and Installing a System From the Network

This section describes how to boot a system and install the Solaris OS from the network by using PXE.

The open source GNU GRand Unified Bootloader (GRUB) has been implemented in the Solaris OS on x86 based systems, starting with the Solaris 10 1/06 release. GRUB is responsible for loading a boot archive, which contains the kernel modules and configuration files, into the system's memory. The Solaris kernel starts based on the contents of the in-memory boot archive. The kernel then begins the Solaris installation program. The most notable change is the replacement of the Device Configuration Assistant with the GRUB menu. The GRUB menu is displayed when you boot a system. From this menu, you can select an OS instance to install by using the up and down arrow keys. If you do not make a selection, the default OS instance is booted and installed.

As a part of this functionality, systems must have a minimum of 256 MB of RAM available for booting and installing the Solaris OS.

Note – Some versions of PXE firmware cannot boot the Solaris OS. A system with these versions can read the PXE network bootstrap program from a boot server, but the bootstrap does not transmit packets. To avoid this problem, upgrade the PXE firmware on the network adapter. Obtain firmware upgrade information from the adapter manufacturer's web site. Refer to the `e1x1(7D)` and the `iprb(7D)` man pages for more information.

▼ How to Boot a Client Over the Network

To install the system over the network, you must instruct the client system to boot over the network. Enable network boot on the client system by using the BIOS setup program in the system BIOS, the network adapter BIOS, or both. On some systems, you must also adjust the boot device priority list so that network boot is attempted before booting from other devices. See the manufacturer's documentation for each setup program, or watch for setup program instructions during boot.

Note – Starting with the Solaris 10 1/06 OS, GRUB based booting has been implemented on x86 based systems. This procedure includes information for booting a client over the network with GRUB. The most notable change is the replacement of the Device Configuration Assistant with the GRUB menu when a system is booted. For additional information about GRUB, see Chapter 11, “GRUB Based Booting (Tasks),” in *System Administration Guide: Basic Administration*.

Before You Begin This procedure assumes that you have completed the following tasks:

- **Set up an installation server.** For instructions on how to create an installation server from CD or DVD media, see [“How to Create an Installation Server With x86 CD Media” on page 15](#) or [“How to Create an Installation Server With x86 DVD Media” on page 18](#).
- **Set up a boot server or a DHCP server, if necessary.** If the system you want to install is on a different subnet than the installation server, you must set up a boot server, or use a DHCP server. For instructions on how to set up a DHCP server to support network installations, see Part III, “DHCP,” in *System Administration Guide: IP Services*.
- **Gathered or preconfigured the information that you need to perform the installation.** You can perform this task in one or both of the following ways:
 - Create a `sysidcfg` file, if you use a `sysidcfg` file to preconfigure system information. For information about how to create a `sysidcfg` file, see [“Preconfiguring With the `sysidcfg` File” on page 21](#).
 - Create a profile in the JumpStart directory on the profile server, if you are using the custom JumpStart installation method. See [“How to Create a JumpStart Directory on a Server” on page 33](#).

1 Turn on the system.

2 Type the appropriate keystroke combination to enter the system BIOS.

Some PXE-capable network adapters have a feature that enables PXE boot if you type a particular keystroke in response to a brief boot-time prompt.

3 In the system BIOS, instruct the system to boot from the network.

See your hardware documentation for information about how to set the boot priority in the BIOS.

4 Exit the BIOS.

The system boots from the network. The GRUB menu is displayed.

Note – The GRUB menu that is displayed on your system might vary from the following example, depending on the configuration of your network installation server.

```
GNU GRUB version 0.95 (631K lower / 2095488K upper memory)
+-----+
| Solaris 11 /sol_11_x86                               |
|                                                       |
|                                                       |
+-----+
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.
```

5 Select the appropriate installation option.

- **To install the Solaris OS from the network, select the appropriate Solaris entry on the menu, then press Enter.**

Select this entry if you want to install from the network installation server that you set up in [“How to Create an Installation Server With x86 CD Media”](#) on page 15 or [“How to Create an Installation Server With x86 DVD Media”](#) on page 18.

- **To install the Solaris OS from the network with specific boot arguments, follow these steps.**

You might need to set specific boot arguments if you want to modify the device configuration during the installation, and did not set these boot arguments previously with the `add_install_client` command as described in [“How to Add Systems to Be Installed From the Network With `add_install_client`”](#) on page 47.

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

b. Edit the command to add the boot arguments or options you want to use.

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

```
grub edit>kernel /image-directory/multiboot[kernel-name] install
[url|ask] [-B prop=value[,prop=value]...] install_media=media-type
```

For example:

```
kernel /I86pc.Solaris_11/multiboot kernel/unix -B install_media=192.168.2.1:/export/sol_10.1_x86/boot
module /platform/i86pc/boot_archive
```

<i>kernel-name</i>	Specifies the kernel to boot.
-a	Prompts the user for configuration information.
-s	Boots the system in single-user mode.
-r	Specifies a reconfiguration boot. The system probes all attached hardware devices and then assigns nodes in the file system to represent only those devices that are actually found.
-v	Boots the system with verbose messages enabled.
-x	Does not boot in clustered mode.
-k	Boots the system with the kernel debugger enabled.
-m <i>smf-options</i>	Controls the boot behavior of the Service Management Facility (SMF). Included are two categories of options, recovery options and messages options.
-i <i>altinit</i>	Specifies an alternative executable as the primordial process. <i>altinit</i> is a valid path to an executable.
-B <i>prop=value[,prop=value]...</i>	Is parsed by the multiboot program. The multiboot program then translates the argument into properties.

c. To return to the GRUB menu, press Esc.

The GRUB menu is displayed.

d. To begin the installation, type b in the GRUB menu.

The Solaris installation program checks the default boot disk for installation requirements of the system. If the 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.

6 Select an installation type.

The installation selection screen displays the following options:

Select the type of installation you want to perform:

1 Solaris Interactive

- 2 Custom JumpStart
- 3 Solaris Interactive Text (Desktop session)
- 4 Solaris Interactive Text (Console session)
- 5 Apply driver updates
- 6 Single user shell

Enter the number of your choice followed by the <ENTER> key.
Alternatively, enter custom boot arguments directly.

If you wait 30 seconds without typing anything,
an interactive installation will be started.

- **To install the Solaris OS, choose from the following options:**
 - **To install with the Solaris interactive installation GUI, type 1, then press Enter.**
 - **To install with the interactive text installer in a desktop session, type 3, then press Enter.**
Select this installation type to override the default GUI installer and run the text installer.
 - **To install with the interactive text installer in a console session, type 4, then press Enter.**
Select this installation type to override the default GUI installer and run the text installer.

If are performing an unattended custom JumpStart installation (option 2), see the *Solaris 10 Installation Guide: Custom JumpStart and Advanced Installations* additional instructions.

The system configures the devices and interfaces, and searches for configuration files. The `kdmconfig` utility detects the drivers that are necessary to configure the keyboard, display, and mouse on your system. The installation program begins. Go to Step 7 to continue the installation.

- **If you need to perform system administration tasks before the installation, choose from the following options:**
 - **To update drivers or install an installation 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 Solaris OS to run on your system. Follow the instructions for your driver update or ITU to install the update.
 - **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 the software. For information about system administration tasks you can perform prior to installation, see *System Administration Guide: Basic Administration*.

After you perform these system administration tasks, the previous list of installation options is displayed. Select the appropriate option to continue the installation.

7 If you are prompted, answer the system configuration questions.

- If you preconfigured all of the system information, the installation program does not prompt you to specify any configuration information. See [“Preconfiguring With the sysidcfg File” on page 21](#) for more information.

If you are using the installation GUI, after you confirm the system configuration information, the Welcome to Solaris dialog box appears.

8 After the system boots and installs over the network, instruct the system to boot from the disk drive on subsequent boots.

More Information Next Steps

If you plan to 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 [“GRUB Based Booting \(Overview\)”](#) in *System Administration Guide: Basic Administration*.

Performing an Installation With the Solaris Installation Program on IBM BladeCenter Servers (Stand-Alone)

You can install the Solaris OS by using the Solaris installation program. This section explains the tasks that you need to perform to install the Solaris OS, and provides detailed instructions on how to install the Solaris OS on a stand-alone system from CD or DVD media.

▼ How to Install With the Solaris Installation Program on IBM BladeCenter Servers (Stand-Alone)

This procedure describes how to install a stand-alone system from CD or DVD media. Starting with the Solaris 10 1/06 release, the Solaris installation programs for x86 based systems use the GRUB boot loader.

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

- Ensure that you have the following media.
 - If you are installing from a DVD, use the Solaris Operating System DVD for x86 platforms for the Solaris release you are installing.

- If you are installing from CD media, use the following:
 - Solaris Software CDs.
 - Solaris Languages for x86 Platforms CD – The installation program prompts you for this CD if necessary to support languages for specific geographic regions.
- Check your system BIOS to make sure that you can boot from CD or DVD media.
- Acquire any installation time updates (ITUs) or drivers that you need to install the Solaris OS on your hardware. To determine if you need an ITU or additional drivers, see your hardware documentation.

Note – If you are installing the Solaris 10 11/06 OS on an IBM BladeCenter LS21 server, see [Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers \(Tasks\)”](#), for important troubleshooting information regarding creating a new installation image.

- Verify that your system meets the following minimum requirements:
 - Memory – 256 MB or greater
 - Disk space – 6.7 GB or greater
 - Processor speed – 120 MHz or greater with hardware floating point

If you are installing the Solaris OS on a system that is not produced by Sun Microsystems, Inc., check the Solaris Hardware Compatibility List at <http://www.sun.com/bigadmin/hcl> before you begin the installation.

- Gather the information you need for installing the Solaris OS.
 - For a nonnetworked system, gather 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
 - Language and locales that you intend to use on the system
 - Host IP address
 - Subnet mask
 - Domain name
 - root (superuser) password
- (Optional) If you want to preserve any existing data or applications, back up your system.

1 Insert the appropriate media in your system.

If you boot from the Solaris Operating System DVD or the Solaris Software – 1 CD, insert the disc. Your system’s BIOS must support booting 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, and the GRUB menu is displayed.

```
GNU GRUB version 0.95 (631K lower / 2095488K upper memory)
```

```
+-----+
| Solaris                                     |
| Solaris Serial Console ttya                |
| 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 Solaris OS from CD or DVD on your current system, select 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 Solaris OS and send the screen output to serial console, ttya (COM1), select ttya.**

Select this option if you want to change the system display to a device that is connected to serial port, COM1.

- **If you want to install the Solaris OS and send the screen output to serial console, ttyb (COM2), select ttyb.**

Select this option if you want to change the system display to a device that is connected to serial port, COM2.

- **If you want to install the Solaris OS with specific boot arguments, follow these steps.**

You might want to use specific boot arguments to customize the system configuration during the installation.

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

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

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

- b. **Edit the command to add the boot arguments or options that 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
```

<i>kernel-name</i>	Specifies the kernel to boot.
-a	Prompts the user for configuration information.
-s	Boots the system in single-user mode.
-r	Specifies a reconfiguration boot. The system probes all attached hardware devices and then assigns nodes in the file system to represent only those devices that are actually found.
-v	Boots the system with verbose messages enabled.
-x	Does not boot in clustered mode.
-k	Boots the system with the kernel debugger enabled.
-m <i>smf-options</i>	Controls the boot behavior of the Service Management Facility (SMF). Included are two categories of options, recovery options and messages options.
-i <i>altinit</i>	Specifies an alternative executable as the primordial process. <i>altinit</i> is a valid path to an executable.
-B <i>prop=value[,prop=value]...</i>	Is parsed by the multiboot program. The multiboot program then translates the argument into properties.

- c. **To return to the GRUB menu, press Esc.**

The GRUB menu is displayed.

- d. **To begin the installation, type b in the GRUB menu.**

The Solaris installation program checks the default boot disk for the installation requirements of the system. If the Solaris installation program cannot detect the system configuration, it prompts you for any missing information.

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

5 Select an installation type.

The installation selection screen displays the following options.

Select the type of installation you want to perform:

- 1 Solaris Interactive
- 2 Custom JumpStart
- 3 Solaris Interactive Text (Desktop session)
- 4 Solaris Interactive Text (Console session)
- 5 Apply driver updates
- 6 Single user shell

Enter the number of your choice followed by the <ENTER> key. Alternatively, enter custom boot arguments directly.

If you wait 30 seconds without typing anything, an interactive installation will be started.

Note – Information in the installation selection screen might vary slightly, depending on which version of the Solaris 10 OS you are installing.

■ To install the Solaris OS, choose from the following options:

- **To install with the Solaris interactive installation GUI, type 1, then press Enter.**
- **To install with the interactive text installer in a desktop session, type 3, then press Enter.**
Select this installation type to override the default GUI installer and run the text installer.
- **To install with the interactive text installer in a console session, type 4, then press Enter.**
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. The `kdmconfig` utility detects the drivers that are necessary to configure the keyboard, display, and mouse on your system. The installation program begins. Go to Step 6 to continue the installation.

- **If you need to perform system administration tasks before your installation, choose from the following options:**

- **To update drivers or install an installation 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 Solaris OS to run on your system. Follow the instructions for your driver update or ITU for installing the update.

- **To perform system administration tasks, type 6, then press Enter.**

After you perform these system administration tasks, the previous list of installation options is displayed. Select the appropriate option to continue the installation.

6 Decide if you need to modify the configuration settings.

If the `kdmconfig` utility cannot detect the video driver for your system, it selects the 640x480 VGA driver. The Solaris installation GUI cannot be displayed with the 640x480 VGA driver. As a result, the Solaris installation text installer is displayed. To use the Solaris installation GUI, use the `kdmconfig` utility to select the correct video driver for your system.

- **If you do not need to modify the configuration settings, let the Window System Configuration for Installation screen time out. Go to Step 7.**
- **If you need to modify the configuration settings, follow these steps:**

- a. **Press the Esc key.**

Note – You must press the Esc key within five seconds to interrupt the installation and modify device settings.

The `kdmconfig` – Introduction screen is displayed.

- b. **Examine the configuration information on the `kdmconfig` – View and Edit Window System Configuration screen, and determine which devices you need to edit.**
- c. **Select the device that you want to change, and press F2_Continue.**
- d. **Select the appropriate driver for the device, and press F2_Continue.**
- e. **Repeat Step c through Step d for each device that you need to change.**

- f. When you are finished, select No changes needed – Test/Save and Exit and press F2_Continue.**

The `kdmconfig` Window System Configuration Test screen appears.

- g. Press F2_Continue.**

The screen refreshes and the `kdmconfig` Window System Configuration Test palette and pattern screen appears.

- h. Move the pointer and examine the colors that are shown on the palette to ensure that they are displayed accurately.**

- **If the colors are not displayed accurately, click No. If possible, press any key on the keyboard, or wait until `kdmconfig` automatically exits the `kdmconfig` Window System Configuration Test screen. Repeat Step b through Step h until the colors are displayed accurately and you can move the pointer as expected.**

- **If the colors are displayed accurately, click Yes.**

After a few seconds, the Select a Language screen is displayed.

- 7 Select the language that you want to use during the installation, and press Enter.**

After a few seconds, the Solaris Installation Program screen appears.

- If you are running the Solaris GUI installation program, the Solaris GUI Installation Program Welcome screen is displayed.
- If you are running the Solaris text installer in a desktop session, the Solaris Text Installation Program Welcome screen is displayed.

- 8 Click Next to begin the installation. 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 specify any configuration information.
- If you did not preconfigure all the system information, the installation program prompts you to specify this information on the next several screens.

After you answer the configuration questions, the Welcome to Solaris dialog box appears.

- 9 Decide if you want to reboot the system automatically and if you want to automatically eject the disc. Click Next.**

The Specify Media screen appears.

- 10 Specify the media that you are using for the installation. Click Next.**

- 11 **Decide if you want to perform an initial installation. Click Next.**
- 12 **Select the type of installation you want to perform. Click Next.**
 - **Select Default Install to install the Entire Solaris Software Group.**
 - **Select Custom Install if you want to perform any of the following tasks.**
 - Install a specific software group.
 - Install additional software.
 - Install specific software packages.
 - Install a specific locale.
 - Customize the disk layout.

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.

- 13 **If you are prompted, answer any additional configuration questions.**

When you have provided the information that is required for installing the system, the Ready to Install screen is displayed.
- 14 **Click Install Now to install the Solaris software. Follow the instructions on the screen for installing the Solaris software and any additional software on the system.**

When the Solaris installation program is finished installing the 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. Go to Step 15.**
 - **If you are upgrading the Solaris software, you might need to correct some local modifications that were not preserved. Follow these steps:**
 - 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 Solaris installation program could not preserve.**
 - b. **Correct any local modifications that were not preserved.**
- 15 **If you did not select automatic reboot during the installation, reboot the system.**

```
# reboot
```

- 16 If you are installing the Solaris 10 1/06 OS, download and apply the latest revision of patch 118966. See “6339315: Bad Compiler Induces IBM BladeCenter HS20 Resets” on page 84.**

Note – This bug applies to the Solaris 10 1/06 OS *only*. You do not need to perform this step if you are installing the Solaris 10 6/06 or the Solaris 10 11/06 release.

Patches can be downloaded from the SunSolveSM web site. For further instructions, go to <http://sunsolve.sun.com/>.

- 17 Reboot the system.**

```
# reboot
```

More Information Next Steps

If you plan to 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 “GRUB Based Booting (Overview)” in *System Administration Guide: Basic Administration*.

Setting Up a Serial Over LAN Connection (Post Installation)

This section includes information about setting up a serial over LAN connection to manage systems remotely. Perform the following procedure after you have completed the Solaris OS installation. The BladeCenter Management Module (MM) command-line interface provides access to the text console command prompt on IBM BladeCenter servers through an SOL connection. If you want to manage systems remotely, you must first set up this connection. More information about the BladeCenter systems MM can be found at <http://researchweb.watson.ibm.com/journal/rd/496/brey.html>.

▼ How to Set Up a Serial Over LAN Connection

- 1 Become superuser or assume an equivalent role.**

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

- 2 Change the values in the `/etc/ttydefs` as follows:**

```
console:19200 hupcl opost onlcr:19200::console
```

- 3 In the `/boot/solaris/bootenv.rc` file, change the `ttyb-mode` and `console` values as follows:**

```
setprop ttyb-mode 19200,8,n,1,h
setprop console 'ttyb'
```


- 4 To eliminate the splash image and use `ttyb` at 19200, change the following information in the `/boot/grub/menu.lst` file:**

```
#splashimage /boot/grub/splash.xpm.gz
title Solaris 10 1/06 s10x_u1wos_19a X86 SOL
kernel /platform/i86pc/multiboot -B console=ttyb
```

- 5 If you are installing either the Solaris 10 1/06 or the Solaris 10 6/06 release on the HS40 BladeCenter server, add the following line to the `asy.conf` file:**

```
name="asy" parent="isa" reg=1,0x2f8,8 interrupts=3;
```

Note – The IBM HS20 BladeCenter server has a BIOS update that addresses the missing COM2 port. If this port is not displayed by the BIOS, you can use the preceding workaround. Or, you can download the latest BIOS update from the IBM web site.

- 6 Reboot the system and run the `devfsadm` command.**

Rebooting the system and running the `devfsadm` command ensures that the `/dev/ttyb` file has been created.

- 7 Initiate the SOL session by following these steps:**

- a. Telnet to the IP address of the BladeCenter Management Module.**

```
# telnet management-module-ip-address
```

- b. Log in and type the following command:**

```
console -T system:blade[xx]
```

where `xx` is the bay number of the blade on which you want to initiate a session.

If the SOL connection is working, you should now have access to the text console command prompt.

If the connection is not working, the following error message is displayed:

```
SOL is not ready
```

If the serial over LAN connection is not established, verify that the values you modified in Steps 2, 3, and 4 are correct. If necessary, repeat Steps 6 and 7 to establish the SOL connection.

Bugs and Issues Encountered When Installing the Solaris Operating System on IBM BladeCenter Servers

This chapter describes bugs and issues that you might encounter when installing and using the Solaris Operating System (Solaris OS) on IBM BladeCenter servers. Information in this chapter applies to the following Solaris 10 releases:

- Solaris 10 8/07
- Solaris 10 11/06
- Solaris 10 6/06
- Solaris 10 1/06

Bugs and issues are listed by release, starting with most recent Solaris release, which is the Solaris 10 8/07 release. Bugs and issues that apply to more than one release are noted accordingly.

When available, patch information has been provided, along with the description of the bug or issue. When no patch information is available, a workaround or further instructions is provided.

Note – Some patches might be restricted and therefore require a Sun Service Plan or Solaris Subscription to gain access. To obtain a Sun Service Plan, Solaris Subscription, or get information about downloading and applying recommended patches, go to the SunSolve web site at <http://sunsolve.sun.com/>.

This is a list of the information in this chapter:

- “Solaris 10 8/07 Bugs and Issues” on page 76
- “Solaris 10 11/06 Bugs and Issues” on page 76
- “Solaris 10 6/06 Bugs and Issues” on page 80
- “Solaris 10 1/06 Bugs and Issues” on page 82

For general installation information, see Chapter 1, “Installing the Solaris Operating System on IBM BladeCenter Servers (Tasks).”

For troubleshooting information, see [Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers \(Tasks\)”](#).

Solaris 10 8/07 Bugs and Issues

This is a list of bugs and issues that you should be aware of when installing and using the Solaris 10 8/07 OS on IBM BladeCenter servers. These bugs and issues also apply to the Solaris 10 11/06 release:

- [“6377378: Additional Support Required for Broadcom NetXtreme II BCM 5708S Chipset” on page 77](#)
- [“6505757: PCI Express Software Support Not Enabled by Default on Some Newer PCI Express Hardware” on page 79](#)

For a complete description of these bugs and issues, see [“Solaris 10 11/06 Bugs and Issues” on page 76](#).

Note – For some of these bugs, you are required to create a custom installation image. More information about this workaround is provided in the individual bug descriptions and [Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers \(Tasks\)”](#).

Solaris 10 11/06 Bugs and Issues

This is a list of bugs and issues that you should be aware of when installing and using the Solaris 10 11/06 OS on IBM BladeCenter servers:

The following bug applies to systems that have the Broadcom NetXtreme II network interface card (NIC), such as the BladeCenter LS21, LS41, and HS21 servers:

- [“6377378: Additional Support Required for Broadcom NetXtreme II BCM 5708S Chipset” on page 77](#)

For PCI Express capable servers, such as the BladeCenter LS21, LS41, and HS21 servers, the following bugs and issues apply:

- [“6474277: Cannot Complete Installation of Solaris OS on Some IBM BladeCenter Servers Due to Keyboard Input Failure” on page 77](#)
- [“6477887: Installation of the Solaris OS Fails on Some IBM BladeCenter Servers Due to Gratuitous NMI Errors” on page 78](#)
- [“6505757: PCI Express Software Support Not Enabled by Default on Some Newer PCI Express Hardware” on page 79](#)

The following bug applies to systems that use the ATI ES1000 515E chipset, such as the BladeCenter LS21, LS41, and HS21 servers:

- “6494769: Xorg Does Not Work in Remote Control on IBM BladeCenter Servers With ATI ES1000 Video Controller” on page 78

The following bug applies to systems with four or more NetXtreme II gigabit Ethernet interfaces, such as the BladeCenter LS41, with the Multiprocessor Expansion Unit (MPE):

- “6495236: Broadcom bnx Driver Conflicts With Solaris bge Driver on IBM BladeCenter LS41 Server” on page 79

Note – For some of these bugs, you are required to create a custom installation image. More information about this workaround is provided in the following individual bug descriptions and Chapter 3, “Troubleshooting Installation Issues on IBM BladeCenter Servers (Tasks).”

6377378: Additional Support Required for Broadcom NetXtreme II BCM 5708S Chipset

Description: This bug applies to systems that utilize the Broadcom NetXtreme II NIC, such as the IBM BladeCenter LS21, LS41, and HS21 servers. Support for this driver is available directly from Broadcom.

Workaround: Download and install the latest version of the Broadcom bnx driver for the Solaris OS.

Directions for downloading the Broadcom bnx driver can be found on Broadcom web site at http://www.broadcom.com/support/ethernet_nic/netxtremeii.php.

6474277: Cannot Complete Installation of Solaris OS on Some IBM BladeCenter Servers Due to Keyboard Input Failure

Description: The bug impacts systems that have PCI Express capabilities, such as the IBM BladeCenter LS21, LS41, and HS21 servers. Solaris PCI support causes a problem whereby USB interrupts are not handled as expected. In particular, USB Host controllers on these systems do not support Memory-Mapped PCI Configuration Space (MCFG) accesses, by default. As a result, the keyboard input stops functioning during the installation phase, which causes the installation to fail.

Workaround: Before installing the Solaris 10 11/06 release, you need to create a new installation image. This installation image contains patch 125034, which also requires the

installation of two additional patches, 123840-04 and 118855-36. For step-by-step instructions, see [“Troubleshooting the Solaris 10 11/06 Installation on IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 86.

Alternatively, install at least the Solaris 10 8/07 OS.

6477887: Installation of the Solaris OS Fails on Some IBM BladeCenter Servers Due to Gratuitous NMI Errors

Note – This issue is related to the issue that is described in 6474277.

Description: When the `Xsun -probe` command enumerates the PCI bus during installation of the Solaris OS, it reads the PCI configuration space for all possible PCI devices and all possible functions. Some BladeCenter hardware only supports functions 0 and 2. When function 1 is accessed, non-maskable interrupts (NMI) occur, causing the management processor to reboot the BladeCenter server.

This problem occurs on PCI Express capable hardware, such as the BladeCenter LS21, LS41, and HS21 servers.

Workaround: Before installing the Solaris 10 11/06 release, you need to create a new installation image. This installation image contains patch 125034, which also requires the installation of two additional patches 123840-04 and 118855-36. For step-by-step instructions, see [“Troubleshooting the Solaris 10 11/06 Installation on IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 86.

Alternatively, install at least the Solaris 10 8/07 OS.

6494769: Xorg Does Not Work in Remote Control on IBM BladeCenter Servers With ATI ES1000 Video Controller

Description: This problem is specific to systems that use an ATI ES1000 video controller. Although the graphical login screen is visible on the server console, if you attempt to access the server through the remote control function of the Management Module (MM), the graphical login screen is not visible.

The following message is displayed:

```
No video available
```

Workaround: Download and install the latest revision of patch 125720 or install at least the Solaris 10 8/07 OS..

6495236: Broadcom bnx Driver Conflicts With Solaris bge Driver on IBM BladeCenter LS41 Server

Description: The Broadcom bnx driver, Version 3.0.0, conflicts with the Solaris bge driver. This conflict also occurs with driver versions prior to Version 3.0.0.

The bnx driver provides support for the Broadcom NetXtreme II gigabit Ethernet interface, while the bge driver provides support for the Broadcom NetXtreme I gigabit Ethernet interface. The bnx driver does not encounter any problems if only two NetXtreme II interfaces are present. However, when four, or more interfaces are present on a system, such as the BladeCenter LS41 server with a Multiprocessor Expansion Unit (MPE) attached, failures occur in the form of system panics.

Workaround: Download and install the latest version of the Broadcom bnx driver for the Solaris OS.

For further instructions, see [“Troubleshooting the Solaris 10 11/06 Installation on IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 86.

6505757: PCI Express Software Support Not Enabled by Default on Some Newer PCI Express Hardware

Description: Some IBM BladeCenter servers, such as the BladeCenter LS21, LS41, and HS21 servers, do not support Memory-Mapped PCI Configuration Space (MCFG) by default. Solaris PCI Express software does not work on these systems without performing some type of workaround.

Workaround: Before you install the Solaris 10 11/06 OS or a later release, you need to update the system BIOS.

To update the system BIOS, follow these steps.

1. Reboot the system.
2. As the system is rebooting, press F1 to access the system BIOS.
3. To enable MCFG, select Advanced Setup → PCI Bus Control → PCI Enhanced Configuration Access.
4. Use the Right arrow or Left arrow key to set the PCI Enhanced Configuration Access to Enabled.

Solaris 10 6/06 Bugs and Issues

This a list of bugs and issues that you should be aware of when installing and using the Solaris 10 6/06 OS on IBM BladeCenter servers:

- “6303855: ATI Driver Performance Might Result in Slow Mouse Responsiveness” on page 80
- “6337987: Serial Over LAN Connection Does Not Work When Using e1000g Driver” on page 80
- “6396086: Absolute Mouse Type Event Not Delivered to Xorg Server Startup During Hot-Plug of Mouse” on page 81
- “6416708: Asy Driver Does Not Recognize Serial Port 2 on BladeCenter HS40 Servers” on page 81
- “6445356: Xsun -probe of Crash Server Prevents Solaris OS Installation on IBM BladeCenter HS20 Servers” on page 81

6303855: ATI Driver Performance Might Result in Slow Mouse Responsiveness

Description: On IBM BladeCenter servers that are equipped with the ATI Rage XL video chip, mouse responsiveness might be visibly slow if the system is under load.

Workaround: Download and apply the lastest revision of patch 118966 or install at least the Solaris 10 11/06 OS.

6337987: Serial Over LAN Connection Does Not Work When Using e1000g Driver

Description: The BladeCenter HS40 Server has an onboard Intel NIC that is supported by the e1000g driver. This driver does not currently provide full support for Serial over LAN (SOL) connections. While it is possible to initiate the connection, the login prompt is never displayed.

Workaround: Download and apply the latest revision of patch 118855 or install at least the Solaris 10 11/06 OS. For step-by-step instructions on setting up an SOL connection, see “[How to Set Up a Serial Over LAN Connection](#)” on page 72.

6396086: Absolute Mouse Type Event Not Delivered to Xorg Server Startup During Hot-Plug of Mouse

Note – The installation of patch 118966 introduces this problem. See “[6339315: Bad Compiler Induces IBM BladeCenter HS20 Resets](#)” on page 84 for more information.

Description: The absolute mouse type event is not delivered to the Xorg server startup during a hot-plug of a mouse in a system. As a result, both of the mouse pointers are not located in the same position on the screen. When you move the mouse, the mouse pointers diverge further away from each other. The divergence between the two mouse pointers depends on the X server resolution.

Workaround: Download and install the latest revision of patch 118855 or install at least the Solaris 10 OS 11/06 OS.

6416708: Asy Driver Does Not Recognize Serial Port 2 on BladeCenter HS40 Servers

Description: On BladeCenter HS40 servers, the `/dev/ttyb` device might not be created. The Solaris OS uses the ACPI table to determine which serial ports are present on a system. Because the BIOS on the BladeCenter HS40 does not list COM2 in the ACPI table, the `/dev/ttyb` device is not created.

Workaround: Download and apply the latest revision of patch 118855 or install at least the Solaris 10 11/06 OS.

6445356: Xsun -probe of Crash Server Prevents Solaris OS Installation on IBM BladeCenter HS20 Servers

Description: When the `Xsun -probe` command enumerates the PCI bus during installation of the Solaris OS, it reads the PCI configuration space for all possible PCI devices and all possible functions. Some BladeCenter hardware only supports functions 0 and 2. When function 1 is accessed, non-maskable interrupt (NMI) interrupts occur, causing the management processor to reboot the machine.

This problem occurs on the BladeCenter HS20 server, Model 7981.

Workaround: Update the system BIOS on the BladeCenter server to disable the Reboot on NMI option.

Follow these steps:

1. Turn on the power to the BladeCenter server.
2. Press F1 when the prompt to Press F1 for Configuration/Setup is displayed.
3. Select Advanced Setup → Baseboard Management Controller (BMC) Settings → Reboot System on NMI.
4. Press the Right arrow or Left arrow key until the Disabled option is selected.
5. Press the Esc key twice.
6. Select Save Settings.
7. Follow the instructions that guide you through the installation process.

The system appears to hang when the following message is displayed.

rebooting . .

8. Do one of the following:
 - Eject the CD and manually power cycle the system.
 - Eject the CD and power cycle the system through the BladeCenter Management Module.
9. When the installation has completed, log into the system.

Solaris 10 1/06 Bugs and Issues

This is a list of bugs and issues that you should be aware of when installing and using the Solaris 10 1/06 OS on IBM BladeCenter servers:

- [“6232859: System Reboot Hangs on Some IBM BladeCenter HS20 Servers”](#) on page 83
- [“6245431: Xorg Server Fails to Start”](#) on page 83
- [“6334271: Partial Login Failure Occurs After Canceling First Login Attempt”](#) on page 83
- [“6337341: Sideband NIC Usage Is Destroyed When bge Driver Attaches”](#) on page 84
- [“6339315: Bad Compiler Induces IBM BladeCenter HS20 Resets”](#) on page 84
- [“6339376: Hot-Plugged Mouse Undetected if Not Present Prior to Xorg Server Startup”](#) on page 84

This is a list of bugs and issues that apply to the Solaris 10 1/06 *and* the Solaris 10 6/06 releases:

- [“6303855: ATI Driver Performance Might Result in Slow Mouse Responsiveness”](#) on page 80
- [“6337987: Serial Over LAN Connection Does Not Work When Using e1000g Driver”](#) on page 80
- [“6396086: Absolute Mouse Type Event Not Delivered to Xorg Server Startup During Hot-Plug of Mouse”](#) on page 81
- [“6416708: Asy Driver Does Not Recognize Serial Port 2 on BladeCenter HS40 Servers”](#) on page 81

For a complete description of these bugs and issues, see “Solaris 10 6/06 Bugs and Issues” on page 80.

6232859: System Reboot Hangs on Some IBM BladeCenter HS20 Servers

Description: On some IBM BladeCenter HS20 servers, attempts to reboot the system result in an apparent hang. In most cases, the last screen output you see is the following:

```
Rebooting...
```

Workaround: Download and apply the latest revision of patch 118855 or install at least the Solaris 10 6/06 OS.

6245431: Xorg Server Fails to Start

Description: The Xorg server might fail to start under the following conditions:

Scenario #1: This problem occurs when the IBM BladeCenter server does not own the Keyboard Video Mouse (KVM). If a mouse is not attached when the Xorg server starts, and you attempt to plug in a mouse afterward, it is not recognized and is unusable.

Scenario #2: Regardless of whether the system owns the KVM, or whether a mouse is attached, if the `/etc/X11/xorg.conf` file does not exist when the Xorg server starts, Xorg fails to start.

Workaround: Download and apply the latest revision of patch 118966 or install at least the Solaris 10 6/06 OS.

6334271: Partial Login Failure Occurs After Canceling First Login Attempt

Description: On newly-installed systems with no previous login session, when you log in as the root user, a screen is displayed, giving you the choice of the Solaris Common Desktop Environment (CDE), or the Sun Java™ Desktop System (Java DS). If you click Cancel, the system resets to the `dt login` screen. The Solaris CDE and JDS desktop login choices are not displayed on subsequent attempts to log in to system as the root user. Instead, after a moment, the screen resets to the `dt login` screen, preventing you from logging in to the system as the root user.

Workaround: Download and apply the latest revision of patch 119279 or install at least the Solaris 10 6/06 OS.

6337341: Sideband NIC Usage Is Destroyed When bge Driver Attaches

Description: The IBM BladeCenter HS20 and LS20 servers have an onboard Broadcom network interface card (NIC) that is supported by the bge driver. This driver requires an update to support serial over LAN connections.

Workaround: To update the bge driver to support SOL connections, download and apply the latest revision of patch 122028 or install at least the Solaris 10 6/06 OS.

For step-by-step instructions on how to set up an SOL connection, see [“How to Set Up a Serial Over LAN Connection” on page 72.](#)

6339315: Bad Compiler Induces IBM BladeCenter HS20 Resets

Description: Spontaneous resets occur when the JDS is entered on IBM BladeCenter servers that are equipped with RADEON VE/7000 (an R100-based GPU), Intel Xeon processors, and the Solaris 10 1/06 OS installed. The reset occurs immediately after the GNOME splash screen disappears, and the desktop is painted. The cursor changes to a watch, the system freezes for approximately 10 seconds, and BIOS POST is displayed, indicating a system reset has occurred.

Workaround: Download and apply the latest revision of patch 118966 or install at least the Solaris 10 6/06 OS.

Note – The installation of patch 118966 introduces the problem that is described in [“6396086: Absolute Mouse Type Event Not Delivered to Xorg Server Startup During Hot-Plug of Mouse” on page 81.](#)

6339376: Hot-Plugged Mouse Undetected if Not Present Prior to Xorg Server Startup

Description: If an IBM BladeCenter server owns the KVM and no physical mouse is attached prior to the Xorg server startup, `/dev/mouse` is unusable if the mouse protocol in the `/etc/X11/xorg.conf` file is set to `auto`. Any attempt to hot-plug a mouse is refused.

Workaround: Download and apply the latest revision of patch 121803 or install at least the Solaris 10 6/06 OS.

Troubleshooting Installation Issues on IBM BladeCenter Servers (Tasks)

This chapter includes information for troubleshooting bugs and issues that you might encounter when installing and using the Solaris 10 OS on IBM BladeCenter servers. Information in this chapter that applies to a specific Solaris 10 release, or a specific IBM BladeCenter server, is labeled accordingly. When applicable, patch information and cross references to related bugs and issues are provided.

Step-by-step instructions included in this section apply to bugs that were introduced in the Solaris 10 release. For basic instructions on installing the Solaris OS on IBM BladeCenter servers, see [Chapter 1, “Installing the Solaris Operating System on IBM BladeCenter Servers \(Tasks\)”](#).

More detailed information about IBM BladeCenter servers can be found at <http://www.ibm.com/systems/bladecenter/>.

The following procedures are included in this chapter:

- “How to Create an x86 Installation Image for the Solaris 10 8/07 or Solaris 10 11/06 OS” on page 88
- “How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers” on page 91
- “How to Create a DVD ISO Image” on page 94

For more information about bugs and issues that you might encounter when installing and using the Solaris 10 OS on IBM BladeCenter servers, see [Chapter 2, “Bugs and Issues Encountered When Installing the Solaris Operating System on IBM BladeCenter Servers”](#).

Troubleshooting the Solaris 10 8/07 Installation on IBM BladeCenter LS21, LS41 and HS21 Servers

The BladeCenter LS21, LS41, and HS21 servers have an onboard NetXtreme II gigabit Ethernet interface which requires a new device driver. This device driver (bnx) is available from the Broadcom web site.

Before you can install Solaris 10 8/07 software on the IBM BladeCenter LS21, LS41, or HS21 servers utilizing the onboard NetXtreme II gigabit Ethernet interface, you must first perform the following tasks:

1. Create a copy of the Solaris 10 8/07 OS installation image.
2. Add a new device driver (bnx) for Broadcom NetXtreme II gigabit Ethernet interface to the x86 miniroot image.

For step-by-step instructions on performing these tasks, see [“How to Create an x86 Installation Image for the Solaris 10 8/07 or Solaris 10 11/06 OS”](#) on page 88.

After you have completed these tasks, you can proceed with the installation of the Solaris 10 8/07 software. For step-by-step instructions, see [“How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 91.

Troubleshooting the Solaris 10 11/06 Installation on IBM BladeCenter LS21, LS41, and HS21 Servers

A number of related bugs affect how the Solaris OS interacts with newer PCI Express hardware, such as the IBM BladeCenter LS21, LS41, and HS41 servers. If you attempt to install the Solaris 10 11/06 release on any of these servers, one or more problems is encountered during the installation process.

The following bugs are related to this problem:

- [“6474277: Cannot Complete Installation of Solaris OS on Some IBM BladeCenter Servers Due to Keyboard Input Failure”](#) on page 77
- [“6477887: Installation of the Solaris OS Fails on Some IBM BladeCenter Servers Due to Gratuitous NMI Errors”](#) on page 78
- [“6505757: PCI Express Software Support Not Enabled by Default on Some Newer PCI Express Hardware”](#) on page 79

For a complete description of these bugs, including additional workaround information, see [“Solaris 10 11/06 Bugs and Issues”](#) on page 76.

Before you can install the Solaris 10 11/06 software on the IBM BladeCenter LS21, LS41, and HS21 servers, you must first perform the following tasks:

1. Create a copy of the Solaris 10 11/06 installation image.
2. Apply the latest revision of the following patches to the x86 miniroot image:
 - 125034 - Is a patch that addresses the bugs previously mentioned.
 - 118855 - Is a Kernel Update (KU) patch.
 - 123840 - Is a patch that is a dependency for the KU patch.
3. Add a new device driver for the Broadcom NetXtreme II gigabit Ethernet interface.

For step-by-step instructions on performing these tasks, see [“How to Create an x86 Installation Image for the Solaris 10 8/07 or Solaris 10 11/06 OS”](#) on page 88.

After you have completed these tasks, you can proceed with the installation of the Solaris 10 11/06 software. For step-by-step instructions, see [“How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 91.

About the x86 Miniroot Image

In some cases, Sun provides hardware support through driver patches. Sun provides these driver patches to support third-party hardware, such as IBM BladeCenter servers. Another reason Sun might provide hardware support is to enable the installation of a particular Solaris release on newer hardware without necessitating the re-engineering of that particular Solaris release. In such instances, it is often necessary to install a particular driver patch. Most often, the process involves installing the latest KU patch for the OS in question.

The miniroot is a minimal, bootable root (/) file system that resides on the Solaris installation media. A miniroot consists of all the Solaris software that is required to boot the system to either install or upgrade the system. The miniroot is what the JumpStart installation program or installation media uses to perform a full installation of the Solaris OS. The miniroot only runs during the installation process.

It is important to understand that the procedure that follows describes how to install a patch on the miniroot image *only*. When you patch the miniroot image, the patch is not installed on the system where the Solaris OS installation will take place or on the system that the `patchadd -C` command is run. Patching the x86 miniroot image is strictly used for adding driver and hardware support to the process that performs the actual installation of the Solaris OS. An example of new hardware might be a new motherboard that has driver support in a later KU. The installed image still requires the installation of a patch prior to the first boot. This process occurs after the installation completes. A finish script is invoked, initiating the installation of the KU on the freshly-installed system prior to first boot. This installation of the KU is separate from the x86 miniroot image patch process.

▼ How to Create an x86 Installation Image for the Solaris 10 8/07 or Solaris 10 11/06 OS

To install the Solaris 10 8/07 or the Solaris 10 11/06 OS on the BladeCenter LS21, LS41, and HS21 servers, you must first create an x86 Solaris 10 8/07 or an x86 Solaris 10 11/06 installation image. This process includes applying one or more patches to the x86 miniroot image. For Solaris 10 11/06 release, it also includes downloading and installing the Broadcom NetXtreme II gigabit Ethernet device driver.

This procedure does not include all the steps for creating an x86 installation server.

For information about setting up an x86 installation server, see the following references:

- [“How to Create an Installation Server With x86 DVD Media” on page 18](#)
- [“How to Create an Installation Server With x86 CD Media” on page 15](#)

- 1 **On an x86 network installation server that implements GRUB based booting, become superuser or assume an equivalent role.**

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

- 2 **Change directories to the `Solaris_10/Tools` directory on the Solaris 10 8/07 OS DVD, the Solaris 10 11/06 OS DVD, or the network installation image.**

```
# cd install-dir-path/Solaris_10/Tools
```

install-dir-path Specifies the directory where the image is to be copied, for example, `/export/solaris-image`

Note – Be aware that the root (`/`) level directory for the OS image varies, depending on whether you are installing the Solaris OS from DVD or CD media, or from a network installation server. The examples in this procedure show how to create an OS image on a network installation server.

- 3 **Run the `setup_install_server` command to create a new installation image.**

```
# ./setup_install_server new-install-dir-path
```

new-install-dir-path Specifies the path in which to create the new installation image.

Note – This command creates a *new* installation image of the Solaris 10 8/07 or the Solaris 10 11/06 OS for x86 system.

- 4 **Create a writable copy of the miniroot.**

```
# /boot/solaris/bin/root_archive unpackmedia new-install-dir-path miniroot-dir-path
```


miniroot-dir-path Specifies the path to the directory to contain the unpacked boot archive, for example, /export/sol10-mod-miniroot.

- 5 From the SunSolve web site, download the patches that apply to the release for which you are creating the installation image.
 - For the Solaris 10 8/07 release proceed to Step 6.
 - For the Solaris 10 11/06 release:
 - a. Download the following patches from the SunSolve web site:
 - 118855-36
 - 123840-04
 - 125034-01
 - b. Proceed to Step 6.

Note – Some patches might be restricted and therefore require a Sun Service Plan or Solaris Subscription to gain access. To obtain a Sun Service Plan, Solaris Subscription, or get information about downloading and applying recommended patches, go to the SunSolve web site at <http://sunsolve.sun.com/>.

- 6 For the Solaris 10 8/07 and 10 11/06 releases, download the latest version of the bnx driver for the Solaris OS from the Broadcom web site.
 Directions for downloading and installing the Broadcom bnx driver can be found on the Broadcom web site at http://www.broadcom.com/support/ethernet_nic/netxtremeii.php.
- 7 Create a new `Tmp` directory, then copy the patches and the driver, or drivers, to the new `Tmp` directory.

```
# mkdir new-install-dir-path /Solaris_10/Tmp
```
- 8 Change directories to the directory where the patches and the driver, or drivers, are located.

```
# cd new-install-dir-path/Solaris_10/Tmp
```

 - For Solaris 10 8/07 release:
 - a. Unzip the bnx driver.

```
# unzip solaris-version.zip
```
 - b. Proceed to Step 9.

- For Solaris 10 11/06 release:

- a. Unzip the patches.

```
# unzip 123840-04.zip
# unzip 118855-36.zip
# unzip 125034-01.zip
```

- b. Unzip the bnx driver.

```
# unzip solaris-version.zip
```

9 Set the `PKG_NONABI_SYMLINKS` variable to true.

```
# export PKG_NONABI_SYMLINKS=true
```

10 Apply the patches to the miniroot.

- For the Solaris 10 8/07 release, skip to Step 11.

- For the Solaris 10 11/06 release:

```
# patchadd -C miniroot-dir-path new-install-dir-path/Solaris_10/Tmp/patch-id
patch-id Specifies the patch ID that you want to apply, for example, 123840-04
```

Repeat the command for each of the patches that you want to apply.

11 For the Solaris 10 8/07 and Solaris 10 11/06 releases, install the bnx driver in the miniroot.

```
# pkgadd -d new-install-dir-path/Solaris_10/Tmp/Server/solaris/BRCMBnx.pkg -R \
miniroot-dir-path
```

12 Modify the miniroot's repository.db.



Caution – The `SVCCFG_REPOSITORY` variable must point to the location of the unpacked miniroot's repository.db. The repository.db is located in the directory `/etc/svc`, under the unpacked miniroot. Failure to export this variable results in the modification of the live repository, which prevents the system from booting.

```
# svccfg
svc:> repository miniroot-dir-path/etc/svc/repository.db
svc:> select /system/device/local
svc:/system/device/local> setprop start/exec=:true
svc:/system/device/local> select /milestone/single-user
svc:/milestone/single-user> setprop start/exec=:true
svc:/milestone/single-user> select /system/filesystem/usr
svc:/system/filesystem/usr> setprop start/exec=:true
svc:/system/filesystem/usr> exit
```

13 Repack the miniroot.

```
# /boot/solaris/bin/root_archive packmedia new-install-dir-path miniroot-dir-path
```

Next Steps After you have completed these steps, proceed to [“How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers”](#) on page 91.

▼ How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers

Before You Begin This procedure assumes you are using a network installation server. Before you begin the installation process, you must add the client system to the network installation server. The steps for adding the client system to the network installation server are described in this procedure. For more information, see [“Adding Systems to Be Installed From the Network With add_install_client”](#) on page 46.

See the following additional references:

- If you are using a DVD for installing the Solaris OS, you need to burn the Solaris OS installation image to a DVD before beginning the installation. For more information, [“How to Create a DVD ISO Image”](#) on page 94.
- For information about creating a network installation server with DVD or CD media, see [“Creating an Installation Server With DVD Media”](#) on page 17 and [“Creating an Installation Server With CD Media”](#) on page 14.
- For information about preparing for an installation of the Solaris OS, see [“Preparing to Install the Solaris Operating System on IBM BladeCenter Servers \(Task Map\)”](#) on page 13.

Note – If you used the procedure for patching the x86 miniroot image that is described in this document, you cannot install the Solaris 10 11/06 OS by using the graphical user interface (GUI) installation program. The installation program automatically defaults to the text console mode.

1 On the network installation server or boot server, become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see [“Configuring RBAC \(Task Map\)”](#) in *System Administration Guide: Security Services*.

2 Change directories to the Solaris_10/Tools directory.

```
# cd new-install-dir-path/Solaris_10/Tools
```

new-install-dir-path Specifies the location of the newly-created OS image.

3 Run the add_install_client command to set up a network installation of the client system.

```
# ./add_install_client -d -e ethernet-address i86pc
```

add_install_client Adds the x86 install client to an install server when you are using DHCP to set installation parameters on the network.

-d Specifies that clients are to use the DHCP protocol for configuration.

Use the *-d* option to boot the systems from the network by using PXE network boot. The output of this option lists the DHCP options you need to create on the DHCP server.

-e Indicates that this installation will only occur on the client with the Ethernet address that is specified in the command syntax.

For more information, see the *install_scripts(1M)* man page.

4 Reboot the system that is to be installed.

5 Follow the instructions that are described in the procedure, “[Booting and Installing a System From the Network](#)” on page 59.

6 When the installation begins, select the Manual Reboot option.

Select this option if you are installing from DVD or from the network.

Note – During the installation, you might see the following error message:

```
EEPROM: syntax error in /boot/solaris/bootenv.rc line 23
```

You can safely ignore this message.

7 After the installation has completed, before the system reboots, type the appropriate keystroke combination to exit to a command shell.

8 Make sure the DVD or network installation image is mounted.

```
# ls /cdrom
```

- **If the following output is displayed, proceed to Step 9.**

```
Copyright          boot
JDS-THIRDPARTYLICENSEREADME installer
Solaris_10
```

- **If the preceding output is not displayed, type this command:**

```
# iostat -En
```

Output that is similar to the following is displayed:

```
c4t0d0          Soft Errors: 7 Hard Errors: 0 Transport Errors: 0
Vendor: HL-DT-ST Product: RW/DVD GCC-4244N Revision: 1.02
Size: 0.00GB <0 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 7 Predictive Failure Analysis: 0
```

In the preceding example, the DVD device to mount is c4t0d0. The DVD device that you need to mount might be vary.

```
# mount -F hsfs -o ro /dev/dsk/c4t0d0s0 /cdrom
```

- **To mount the network installation image, type:**

```
# mount install-server:new-install-dir-path /cdrom
```

9 Add the patches and the Broadcom Ethernet driver package to the newly-installed disk.

- **For the Solaris 10 8/07 release:**

- a. **Type the following command:**

```
# pkgadd -R /a -d /cdrom/Solaris_10/Tmp/Server/solaris/BRCMbnx.pkg
```

- b. **Proceed to Step 10.**

- **For the Solaris 10 11/06 release:**

- a. **Type the following commands:**

```
# patchadd -R /a /cdrom/Solaris_10/Tmp/118855-36
# patchadd -R /a /cdrom/Solaris_10/Tmp/123840-04
# patchadd -R /a /cdrom/Solaris_10/Tmp/125034-01
# pkgadd -R /a -d /cdrom/Solaris_10/Tmp/Server/solaris/BRCMbnx.pkg
```

b. Proceed with Step 10.

10 After adding the patches, reboot the system.

See Also For more information about performing a PXE network boot, see “Overview of Booting and Installing Over the Network With PXE” in *Solaris 10 Installation Guide: Network-Based Installations*.

For more information about client-specific installations by using DHCP, see “Creating DHCP Options and Macros for Solaris Installation Parameters” on page 52.

▼ How to Create a DVD ISO Image

1 On the network installation server or boot server, become superuser or assume an equivalent role.

Roles contain authorizations and privileged commands. For more information about roles, see “Configuring RBAC (Task Map)” in *System Administration Guide: Security Services*.

2 Change directories and run the `mkisofs` command to create a bootable iso9660 file system installation image.

```
# cd /new-install-dir-path
# mkisofs -o /tmp-dir/solaris-image.iso -b boot/grub/stage2_eltorito -c .catalog \
-no-emul-boot -boot-load-size 4 -boot-info-table -relaxed-filenames -N \
-allow-leading-dots -l -r -J -d -D -V SOL_10_U3MOD /new-install-dir-path
```

tmp-dir Specifies the directory that is used to temporarily store the DVD image. Note that you need a minimum of 4 GB of free disk space.

For information about how to access the `mkisofs(1M)` man page, see the `cdrw(1)` man page.

3 Copy the ISO image to the DVD burning computer. To burn the DVD, type:

```
# cdrw -iC /tmp-dir/solaris-image.iso
```

For more information about the `cdrw` command, see the `cdrw(1)` man page.

To begin the installation, proceed to Step 5 of “How to Perform an Installation of the Solaris 10 8/07 or the Solaris 10 11/06 OS on the IBM BladeCenter LS21, LS41, and HS21 Servers” on page 91.

See Also For more information about installing the Solaris OS from DVD, see “Performing an Installation With the Solaris Installation Program on IBM BladeCenter Servers (Stand-Alone)” on page 64.

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