



Sun Update Connection - Enterprise Bare Metal Installation Guide



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Contents

- Preface 5**
- 1 Installing the Bare Metal Installation Server 9**
 - BMI (Overview) 9
 - BMI Prerequisites 10
 - Network Requirements 11
 - Hardware Requirements 11
 - Software Requirements 12
 - Installing the BMI Software 13
 - Install Sun Update Connection – Enterprise 13
 - ▼ To Install Sun Update Connection – Enterprise 13
 - Install Software Dependencies 14
 - Install the BMI Software 15
 - ▼ To Install the BMI Software 15
 - Configure the BMI Server Environment 16
 - ▼ To Configure the BMI Server Environment 16
 - Upload the Restart Script 16
 - ▼ To Upload the Restart Script 16
 - Set Up the Environment For the BMI Server 17
 - ▼ To Create a BMI Admin User Account 17
 - ▼ To Create a BMI Policy File and Profiles 18
 - Upgrade the BMI Software 19
- 2 Using the Bare Metal Installation Server 21**
 - Starting the BMI Server 21
 - ▼ To Start the BMI Server 22
 - Setting Up Your Environment 22
 - ▼ To Configure BMI Channels 22

▼ To Configure IA-32 Channels	23
▼ To Configure AMD-64 Channels	23
▼ To Configure IA-64 Channels	24
▼ To Configure Solaris Software Channels	25
Creating or Provisioning Machines	26
Before You Begin	26
▼ To Install a Linux Distribution or the Solaris OS	26
Reprovisioning Servers	30
▼ To Reprovision a Server	31
Editing Files	31
Before You Begin	32
▼ To Edit the netboot File	32
▼ To Edit the Kickstart or the YaST Files	32
Using BMI in Customized Environments	33
Template Files	33
BMI Template Directories	34
BMI Server Macros in Template Files	34
Host Files	35
Customizing Files	35
▼ To Create Customized Template Files	35
Maintaining Customization	36
Troubleshooting	37
 A Appendix A	 39
Supported Distributions	39
Installation Distributions	39
Provisioning Distributions	39
 Glossary	 41

Preface

The *Sun Update Connection - Enterprise Bare Metal Installation Guide* explains how to install and use the Bare Metal Installation (BMI) server as a tool for SunSM Update Connection – Enterprise. The BMI server is compatible with Sun Update Connection – Enterprise release 1.0.2 or later.

Who Should Use This Book

This book is intended for Sun Update Connection – Enterprise users who want to use the BMI server to automate the installation and recycling of a SolarisTM Operating System (Solaris OS) or Linux distribution and machine profile on a bare metal machine.

Changes For This Revision

The following history describes the changes made for this revision:

October 30, 2006	Revised the steps in “ To Install the BMI Software ” on page 15 to include downloading the <code>syslinux-3.11.tar.gz</code> file.
October 23, 2006	General Availability release with Sun Update Connection – Enterprise version 1.0.2.

Related Third-Party Web Site References

Third-party URLs are referenced in this document and provide additional, related information.

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

Typographic Conventions

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

TABLE P-1 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> . <i>A 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-2 Shell Prompts

Shell	Prompt
C shell	machine_name%
C shell for superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell for superuser	#

Installing the Bare Metal Installation Server

This chapter describes how to install a Bare Metal Installation (BMI) server. For a list of supported operating system and hardware architectures, or *distributions*, see [Appendix A](#).

This chapter covers the following topics:

- “BMI (Overview)” on page 9
- “BMI Prerequisites” on page 10
- “Installing the BMI Software” on page 13
- “Starting the BMI Server” on page 21
- “Upgrade the BMI Software” on page 19

BMI (Overview)

The BMI server automates the installation and recycling of Linux and Solaris OS distributions and system profiles, on bare metal machines.

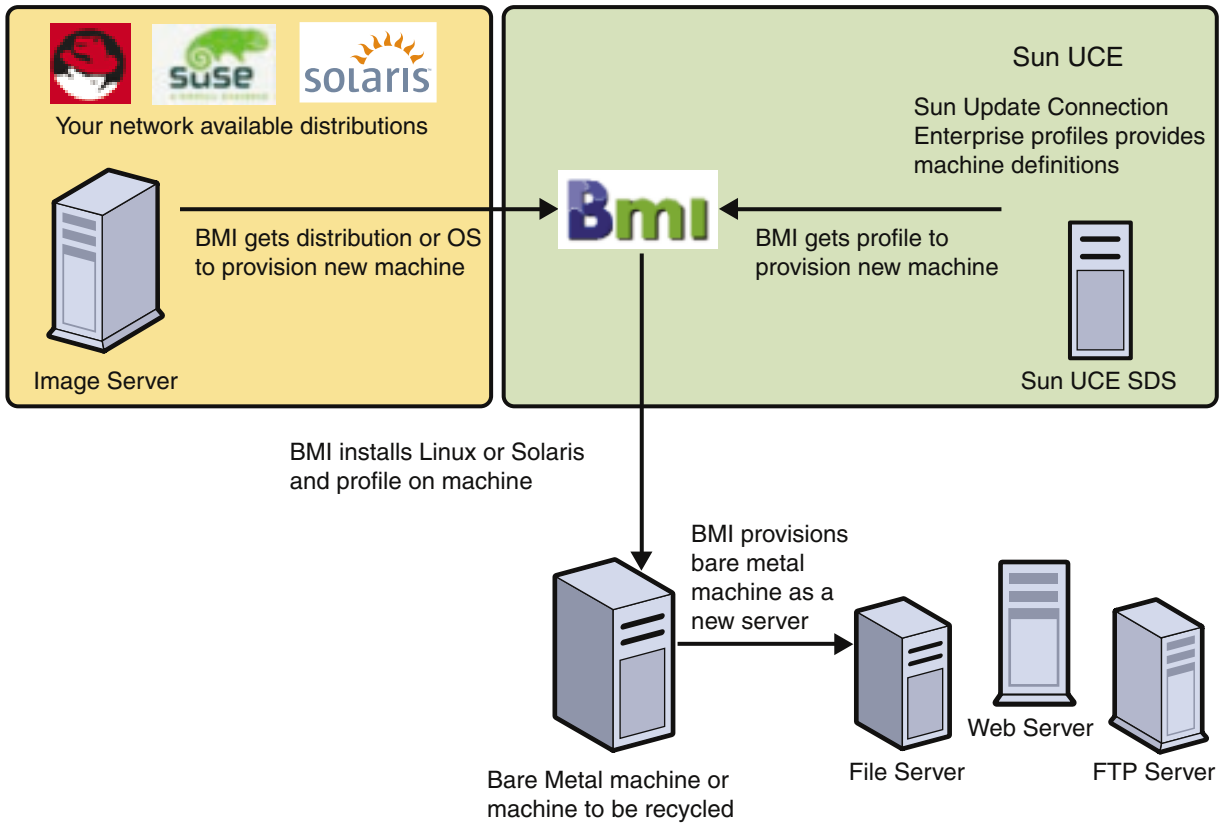


FIGURE 1-1 BMI Overview

BMI Prerequisites

Before you begin the installation process, you must have superuser access and the target environment must fulfill the following requirements:

- "Network Requirements" on page 11
- "Hardware Requirements" on page 11
- "Software Requirements" on page 12

Note – You are responsible for obtaining Linux and Solaris OS source CDs and setting them up for network installation. A system with this setup is known as the *image server*.

Network Requirements

The following section lists the network requirements necessary to perform the BMI process.

BMI Server

TCP/IP to all provisioned systems

Note – Solaris systems to be provisioned mount to the `/tftpboot/pxelinux.cfg` directory. If provisioning a Solaris system, the `/tftpboot/pxelinux.cfg` directory must be NFS exported.

Provisioned Systems

- TCP/IP to BMI server
- Access to the image server:
 - For SPARC platform, use NFS
 - For other platforms, use HTTP, FTP (or similar), or NFS
- Solaris machines to be provisioned must meet the following requirements:
 - Support `net:dhcp` boot options (OpenBoot™ software, at least release 3.0)
 - NFS availability for the kernel directories (usually `Solaris_n/Tools/Boot/usr/platform/`) or be local

Image Server

- Linux distribution CDs, set up for network installation
- Solaris OS CDs, set up for network installation, and an NFS exported path to the software repository

Note – If you provision a Solaris OS, the image server might encounter problems with looped mounts that are needed by the Solaris OS when using BMI. To workaround this issue, the image server must have kernel 2.6 on SUSE 9.2.

Hardware Requirements

The following section describes the minimum hardware requirements necessary for the BMI installation.

BMI Server

- 512 MBytes of memory
- 1000 Mbytes of SWAP space
- 512 Mbytes of disk space

- One dedicated system for Sun Update Connection – Enterprise, the API, and the BMI server

Bare Metal Machines

- PXE-enabled network card, or a diskette drive and a PXE boot disk

Note – Set the PXE network boot as the first boot device

- 256 Mbytes of memory
- 256 Mbytes of disk space
- Other requirements specific for the Solaris OS or Linux distribution

Image Server

- One to two Gbytes of disk space required for each Solaris OS or Linux distribution to be provisioned

Software Requirements

The following list describes the software requirements necessary for the BMI installation.

BMI Server

- Sun Update Connection – Enterprise components
- BMI server
- API
 - **For Linux distributions** – sun-uce-api and sun-uce-api-python
 - **For the Solaris OS** – SUNWuceapi and SUNWuceapi-python
- TFTP server
- Python
- Python module support for XML
- For Solaris 8 or 9 OS, obtain a copy of the SMCwget file and save it in the /product directory on the BMI server before you begin the installation
- For Solaris 10 OS, SMCwgetu is installed with the default installation

Note – If this file is not in the /product directory before you begin the installation, copy this file manually.

- Verify that the BMI server is not running Apache or an instance of the httpd daemon, other than the embedded httpd daemon of Sun Update Connection – Enterprise

Image Server

- HTTP server
- FTP server
- NFS server
- If you are provisioning a Solaris system, use a SUSE 9.2 platform with kernel 2.6

Installing the BMI Software

BMI server functions require a DHCP server. If the network that you want to manage does not have a DHCP server, you can configure the BMI server to use an embedded DHCP server.

The BMI software must be installed on one system, which must be dedicated to Sun Update Connection – Enterprise system dependency server (SDS) and the BMI server. It is referred to as the *local host* throughout these instructions.

Perform the following procedures to install the BMI server:

- “Install Sun Update Connection – Enterprise” on page 13
- “Install Software Dependencies” on page 14
- “Install the BMI Software” on page 15
- “Configure the BMI Server Environment” on page 16
- “Upload the Restart Script” on page 16
- “Set Up the Environment For the BMI Server” on page 17

Note – If the local environment calls for different options not explained in this section, contact Technical Support.

Install Sun Update Connection – Enterprise

The Sun Update Connection – Enterprise components (system dependency server, agent, and console) must be installed before you install the BMI server.

▼ To Install Sun Update Connection – Enterprise

Before You Begin To get information about system requirements and detailed installation instructions, see *Sun Update Connection - Enterprise 1.0 Quick Start Guide: Getting Started*.

- 1 **Install the Sun Update Connection – Enterprise SDS using ezInstaller and the -channels option:**
`./ezInstaller -channels`

Note – If an SDS is already installed, the SDS is reinstalled with additional channels.

- 2 In the `ezInstaller` list of supported distributions, activate all the channels that you want to be able to provision with the BMI.
- 3 Install the agent and the console.

Note – Do not change the name of the BMI system in the console. The BMI server name must be the system's host name.

Install Software Dependencies

The following distributions require that you install additional software on the BMI server system:

- [“Red Hat” on page 14](#)
- [“SUSE” on page 14](#)

The software is not included in the BMI or Sun Update Connection – Enterprise packages.

Red Hat

If your BMI server is using Red Hat, verify that the following software is installed on your BMI server:

- Python
- Python-xml
- TFTP server
- If you are going to provision Solaris systems, you also need `nfs-utils`, configured to export `/tftpboot/pxelinux.cfg` as read only (ro)

Note – Work Station 3.0 does not have `tftp-server`; use the RPM from the Advanced Server distribution.

SUSE

If your BMI server is using SUSE, verify that the following software is installed on your BMI server:

- Python
- TFTP server
- Python-xml

- If you are going to provision Solaris systems, you also need `nfs-utils`, configured to export `/tftpboot/pxelinux.cfg (ro)`

Install the BMI Software

The BMI tool application and files are in the `UCE-BMI-*.tgz` file, which is located in the `/plugins` directory in Sun Update Connection – Enterprise. Expand the file to access the files.

▼ To Install the BMI Software

- 1 **Copy the `UCE-BMI-*.tgz` file to a directory where you want to work.**

This path is referred to as your *installation directory* throughout this section.

- 2 **Expand the contents of the tar file.**

```
# tar xPfv UCE-BMI-*.tgz
```

The `UCE-BMI-plugin-version-release` directory is created.

This directory contains a `ReadMe` file and a subdirectory, `RPMS`, which contains the following packages:

- **Dependent package** – `sun-uce-api-version-release.platform.rpm`
- **Dependent package** – `sun-uce-api-python-version-release.platform.rpm`
- **BMI Server package** – `sun-uce-bmi-version-release.platform.rpm`

- 3 **Download the `syslinux-3.11.tar.gz` file from**

<http://www.kernel.org/pub/linux/utils/boot/syslinux/>.

Newer versions of `syslinux` might work, but are not tested.

- 4 **Extract the `syslinux-3.11.tar.gz` file.**

```
# gunzip syslinux-3.11.tar.gz
```

```
# tar -xvf syslinux-3.11.tar
```

- 5 **Copy the `pxelinux.0` file to the `/tftpboot` directory.**

- 6 **Change to the `RPMS` directory.**

- 7 **Install the API.**

```
# rpm -iv sun-uce-api-version-release.platform.rpm
```

- 8 **Install the Python API.**

```
# rpm -iv sun-uce-api-python-version-release.platform.rpm
```

9 Install the BMI server.

```
# rpm -iv sun-uce-bmi-version-release.platform.rpm
```

10 Restart the Sun Update Connection – Enterprise server.

```
# /etc/init.d/uce_server restart
```

Configure the BMI Server Environment

The following procedures explain how to configure the environment for operations of the software required by the BMI server.

▼ To Configure the BMI Server Environment

1 Open the /etc/xinetd.d/tftp file for editing and replace `disable = yes` with `disable = no`.**2 Restart `xinetd`.**

```
# /etc/init.d/xinetd restart
```

3 Copy the agent tarball and change the name.

```
# cp /usr/local/uce/install/agent-date.tar.gz /tftpboot/shared/agent.tar.gz
```

Note – When you copy the file, change the name. For example, change it from `agent-date.tar.gz` to `agent.tar.gz`.

Upload the Restart Script

A restart script is provided during installation of the `sun-uce-bmi` RPM. Upload the restart script to the knowledge base for the BMI server to use, as needed.

If you have one or more client systems on a SPARC platform, you must upload the restart script. If your client systems are all Intel architectures, you can skip this procedure.

▼ To Upload the Restart Script

1 In the Components list of the Inventory Panel, select `Local\Post-Actions` and create a new category called `reboot_host`. Apply it to all distributions.**2 Select the `reboot_host` category and click `Add` to open the `Add Post Action` window.****3 In the Post Action Name field, type `reboot_host_script`.**

- 4 In the File Name field, type the real path name, which is `/usr/local/uce/server/bmis/reboot.sh`.
- 5 Make sure all relevant distributions are selected, then click Apply.

Set Up the Environment For the BMI Server

You must create a `bmi_admin` user account and a policy file in the console before you can use the BMI server. You can also create profiles for your BMI server in the console.

For more information about user accounts, policy files, and profiles, see the *Sun Update Connection – Enterprise 1.0 User's Guide*.

▼ To Create a BMI Admin User Account

In this procedure you create a `bmi_admin` user accounts with full permissions over all jobs, hosts, groups, and components.

Any Sun Update Connection – Enterprise admin user can access the BMI server, but only the `bmi_admin` user can configure the BMI server.

- 1 **Start the console.**

```
$ uce_console
```

The Login window appears.
- 2 **Log in as the admin user.**

The console initializes and the main window appears.
- 3 **Open the Users window.**
 - From the tool bar, click the Users icon.
 - From the Tools menu, choose Users (Tools → Users).
- 4 **Open the User Editor window:**
 - From the tool bar of the Users window, click the New icon.
 - Right-click in a blank space in the Users window and choose New.
- 5 **Complete the User Editor fields for the new user.**
 - a. In the User Name field, type `bmi_admin`

- b. **Type a password for the user and then verify it.**
 - c. **Type a description of the account.**
 - d. **Check the Grant Full Permissions checkbox.**
 - e. **(Optional) If you want to receive Sun Update Connection – Enterprise notification emails, complete the Notifications section. Provide an email address and check the relevant Notify When options.**
- 6 Click OK.**
- The User Editor window closes. The new user name, with full permissions, is added to the Users window.

▼ **To Create a BMI Policy File and Profiles**

If you create a profile after you log into the BMI server, the profile is displayed the next time that you log in.

1 Start the console.

```
$ uce_console
```

The Login window appears.

2 Log in as the admin user.

The console initializes and the main window appears.

3 Open the Policies window.

- **From the tool bar, click the Policies icon.**
- **From the Tools menu, choose Policies.**

4 Open the Policy Editor window.

- **From the tool bar on the Policies window, click the New icon.**
 - **Right-click a blank space in the Policies window and choose New.**
- The Policy Editor window opens.

5 Create a new policy that predefines the actions.

If you have more than one client distribution, click Multi Distro.

In the window that opens, expand all categories and select all the options. This ensures that the policy is relevant for any distribution you choose to provision.

6 Click OK.

The Policy Editor window closes. The policy is created and appears in the Policies window.

7 (Optional) Create the profiles that you will use in the BMI server to provision systems.

If you have more than one client distribution, click Multi Distro for each profile and in the window that opens, expand all categories and select all the options. This ensures that each profile can be deployed on any remote computer that is being provisioned with any of your selected distributions. For more detailed information about creating profiles, see Chapter 9, “Profiles,” in *Sun Update Connection – Enterprise 1.0 User’s Guide*.

Upgrade the BMI Software

If you upgrade Sun Update Connection – Enterprise, you need to upgrade the BMI server afterward.

1. Upgrade the Sun Update Connection – Enterprise Suite.
2. Upgrade the API:

```
# rpm -Uhv sun-uce-api-version-release.platform.rpm
```

3. Upgrade the Python API:

```
# rpm -Uhv sun-uce-api-python-version-release.platform.rpm
```

4. Upgrade the BMI server:

```
# rpm -Uhv sun-uce-bmi-version-release.platform.rpm
```

5. Restart the Sun Update Connection – Enterpriseserver:

```
# /etc/init.d/uce_server restart
```


Using the Bare Metal Installation Server

The BMI server automatically creates a Linux or Solaris box from a bare-metal system. It allows you to define a specific function for the server, letting the BMI server use Sun Update Connection – Enterprise features to automatically handle component and dependency installations.

This section contains the following procedures for using the BMI server:

- “Starting the BMI Server” on page 21
- “Setting Up Your Environment” on page 22
- “Creating or Provisioning Machines” on page 26
- “Editing Files” on page 31
- “Using BMI in Customized Environments” on page 33
- “Template Files” on page 33
- “Maintaining Customization” on page 36
- “Troubleshooting” on page 37

Starting the BMI Server

The BMI server interface is a web application. The Sun Update Connection – Enterprise user with permissions to manage the BMI server is `bmi_admin`. For the steps to create the user account, see [“To Create a BMI Admin User Account” on page 17](#).

Note – Before you log into a Sun Update Connection – Enterprise interface (console or CLI) with the BMI user account, log out of the BMI server browser.

▼ To Start the BMI Server

- 1 **Open a web browser.**
- 2 **To start the server, type this address:**
`http://IP-address-of-BMI-server/provision/`
The Login dialog box opens.
- 3 **In the login window, type the `bmi_admin` user password.**
The BMI server application opens, displaying the Status page.

Setting Up Your Environment

Before using the BMI server, make sure that the Solaris OS and Linux images that you need are set up for network installation and that the BMI server has HTTP, FTP, or NFS access to the image server. When your image server is ready, configure your BMI channels, as needed, to point the BMI server to the correct image on the image server.

This section contains information about configuring the following channels:

- [“To Configure BMI Channels” on page 22](#)
- [“To Configure IA-32 Channels” on page 23](#)
- [“To Configure IA-64 Channels” on page 24](#)
- [“To Configure Solaris Software Channels” on page 25](#)

▼ To Configure BMI Channels

This task explains how to point the BMI server to an image.

- 1 **Log into the BMI server.**
- 2 **From the BMI server page menu, click Setup.**
The BMI Channels page is displayed, listing the channels you activated when you installed the Sun Update Connection – Enterprise.
- 3 **Check the status of each channel:**
 - **If the status is Configure, click Configure. A distribution-specific configure window opens. Complete the information needed to configure the selected channel for network installation.**
 - [Configure IA-32 Channels](#)
 - [Configure IA-64 Channels](#)

- [Configure Solaris Software Channels](#)
- If the status is **Re-Configure**, it is ready to use. Click **Re-Configure** if you need to change the path to the distribution CDs.
- If the status is **Channel Enabled**, it is an **S/390** channel and is ready to use. These channels are configured on the mainframe instead of the BMI server.

▼ To Configure IA-32 Channels

This task explains how to configure IA-32 channels.

- 1 From the **BMI Channels** page, choose an **IA-32** channel and click **Configure** or **Re-Configure**.
- 2 In the text box, enter the **HTTP**, **FTP** (or similar), or **NFS** path to the distribution CDs on the Image server.
 - Example HTTP format: **http://system-name/path**
 - Example FTP format: **ftp://username:password@system-name/path/**
 - Example NFS format: **NFS: file:///path**

- 3 Click **Continue**.

The change is saved and the **BMI Channels** page is displayed.

More Information

Before Provisioning With the IA-32 Channel

Before provisioning with the IA-32 channel, start up the systems and make sure they are set up for netboot, using their PXE cards.

▼ To Configure AMD-64 Channels

To set up AMD-64 channels, you need paths to specific network boot files. This task explains how to obtain these files and configure channels based on AMD 64-bit architecture.

Before You Begin

You must obtain the network boot files, create a local mount point on the SDS, then loop mount the `boot.img` file on the mount point.

To obtain the network boot files, copy the `boot.img` file from the `images` subdirectory in the first installation CD to the SDS.

To create a local mount point on the SDS, type the following:

```
# mkdir /mnt/ia64boot
```

To loop mount the `boot.img` file on the mount point, type the following:

```
# mount -o loop /tmp/boot.img /mnt/ia64boot
```

- 1 From the BMI Channels page, choose a AMD-64 channel and click **Configure** or **Re-Configure**.
- 2 In the first text box, enter the HTTP, FTP (or similar), or NFS path to the distribution CDs on the image server.
- 3 In the next text boxes, enter the path names mounted in the preparation procedure:
 - **pxelinux** – `file:///mnt/ia64boot/elilo.efi`
 - **initrd file** – `file:///mnt/ia64boot/initrd.img`
 - **Kernel** – `file:///mnt/ia64boot/vmlinuz`
- 4 Click **Continue**.

The change is saved and the BMI Channels page is displayed.

More Information

Before Provisioning With the AMD-64 Channel

Before provisioning with the AMD-64 channel, start up the systems and make sure they are set up for netboot.

If you do not have a preconfigured network boot option in the Boot Manager menu, add a boot option in the Boot Option Maintenance Menu.

▼ To Configure IA-64 Channels

To set up Itanium type channels, you need paths to specific network boot files. This task explains how to obtain these files and configure channels based on 64-bit Intel architectures (Itanium).

Before You Begin You must obtain the network boot files, create a local mount point on the SDS, then loop mount the `boot.img` file on the mount point.

To obtain the network boot files, copy the `boot.img` file from the `images` subdirectory in the first installation CD to the SDS.

To create a local mount point on the SDS, type the following:

```
# mkdir /mnt/ia64boot
```

To loop mount the `boot.img` file on the mount point, type the following:

```
# mount -o loop /tmp/boot.img /mnt/ia64boot
```

- 1 From the BMI Channels page, choose a IA-64 channel and click **Configure** or **Re-Configure**.

- 2 In the first text box, enter the HTTP, FTP (or similar), or NFS path to the distribution CDs on the image server.
 - 3 In the next text boxes, enter the path names mounted in the preparation procedure:
 - **pxelinux** – file:///mnt/ia64boot/elilo.efi
 - **initrd file** – file:///mnt/ia64boot/initrd.img
 - **Kernel** – file:///mnt/ia64boot/vmlinuz
 - 4 Click Continue.
- The change is saved and the BMI Channels page is displayed.

More Information

Before Provisioning With the IA-64 Channel

Before provisioning with the IA-64 channel, start up the systems and make sure they are set up for netboot.

If you do not have a preconfigured network boot option in the Boot Manager menu, add a boot option in the Boot Option Maintenance Menu. You can find additional details at <http://developer.intel.com/technology/efi/help/efidocs.htm>.

▼ To Configure Solaris Software Channels

This task explains how to configure channels based on Solaris UNIX® software on a SPARC® technology architecture.

Note – After you activate your Solaris channels in Sun Update Connection – Enterprise, use the `upload.html` command to upload your Solaris software to the SDS. See Chapter 5, “Local Inventory,” in *Sun Update Connection – Enterprise 1.0 User’s Guide*.

- 1 From the BMI Channels page, choose a Solaris channel and click Configure or Re-Configure.
 - 2 In the first text box, enter the NFS path to the distribution CDs on the image server.
 - 3 In the second text box, enter the HTTP, FTP (or similar), or local path to the Solaris kernels directory, which is typically under the directory you entered in the first text box.
 You can use the `file://`, `http://`, or `ftp://` protocol to access the directory. The directory is typically `/CD-install-directory/Tools/Boot/usr/platform-name`.
 - 4 Click Continue.
- The change is saved and the BMI Channels page is displayed.

**More
Information****Before Provisioning With the Solaris Channel**

Start up the systems and make sure they are set up for netboot.

- To reach the `ok>` prompt, press Stop-A.
- To begin the installation, boot the system.

```
ok> boot net:dhcp -v install
```

For more information, see the Solaris documentation.

Creating or Provisioning Machines

This procedure explains how to install a Linux distribution or the Solaris operating system with the BMI server.

Note – The BMI software only loads profiles at log in. If you create a profile after you log in to the BMI server, the profile is displayed the next time that you log in to the BMI server.

Before You Begin

If you want to provision specific system functionality, such as a web server or printer server, on the system where you install the operating system, you must first create a profile. The Sun Update Connection – Enterprise interface (console or CLI) enables you to create profiles to define installation requirements for a specific type of system. For more information, see Chapter 9, “Profiles,” in *Sun Update Connection – Enterprise 1.0 User’s Guide*.

▼ To Install a Linux Distribution or the Solaris OS

- 1 **Log into the BMI server.**
- 2 **On the Status page, check existing systems to make sure that the one upon which you want to perform a bare-metal installation does not yet exist.**

Note – If you run the BMI server functions on an existing Linux system or Solaris system, the previous operating system and all data are overwritten.

- 3 **Click Provisioning.**
The Select Platform page appears.
- 4 **From the Select list, click the platform of the system that you want to provision, then click Continue.**
The Server Provisioning page appears. This page is platform-specific.

- 5 Type the host name and MAC address of the system to be provisioned.
- 6 Select an IP assignment type:
 - **Dynamic** – DHCP gives IP addresses on dynamic basis. If you select this, leave the IP Address field blank.
 - **Static** – Predefined IP address in the DHCP server for this host. If you select this, enter the static IP address in the IP Address field. Whenever you boot the system, the DHCP server assigns the defined IP address to the host.
- 7 If you are provisioning a Linux system, skip to [Step 8](#). If you are provisioning a Solaris system, select the appropriate Disk Type from the list.
- 8 Select the distribution from the drop-down menu.
- 9 If you are provisioning a Linux system, skip to [Step 10](#). If you selected a SPARC platform distribution, select the system platform in the Platform Name field.
- 10 (Optional) Select either or both of the following optional profile deployments:
 - In the Post-install Action field, select one or more system-defined tests to run after the installation:
 - System Check – Identifies missing dependencies
 - Security Check – Identifies available security updates to install
 - Upgrade – Installs any available software upgrades
 - In the Host Profile field, select one or more profiles from the list. The list contains the profiles that you created in Sun Update Connection – Enterprise.

Note – If you create a profile after you log into the BMI server, the profile does not display until the next time that you log in to the BMI server.

- 11 In the Root Password field, create a password for root permissions for the new system.
- 12 Determine if you want to customize startup files..
 - To customize a start up file, select the **Edit netboot File** or **Edit Kickstart** checkbox, then click **Continue**. The file is uploaded to the BMI and is displayed for you to view, edit, or overwrite. For editing information, see [“Editing Files” on page 31](#).
The kickstart files are for Red Hat Kickstart, for YaST for SUSE, or the AutoYaST module of YaST2 applications.

- To provision the system without customizing a start up file, or to continue provisioning after editing your `netboot` file, deselect the **Edit `netboot` file** checkbox, then go to [Step 13](#).

13 Click Continue.

The system data is displayed in the Confirmation table.

14 Determine if you want to provision the systems displayed, or if you want to provision additional systems.

- To provision the systems displayed, go to [Step 15](#).
- To provision additional systems, select the platform that you want to provision. The **Server Provisioning** page is displayed. Go to [Step 5](#) and complete the provisioning information for the new system.

15 Select the checkboxes for the host systems that you want to provision, then click Commit.

The new hosts are added to the BMI server database. A window containing the group designation opens for each host that is added to the database.

16 Copy the group designation text and paste the text into the IP address range in the `dhcp.conf` file on the DHCP server.

The graphic shows an example of the group designation text that you need to add to the IP address range in the `dhcp.conf` file.

Copy & paste next text into your `dhcp.conf` file:

Save to file

```
group{
  next-server;
  filename "pxelinux.0";
  option pxelinux.magic f1:00:74:7e;
  option pxelinux.configfile = concat("pxelinux.cfg",binary-to-ascii(16,8,"",hardware));
  if exists dhcp-parameter-request-list {
    option dhcp-parameter-request-list = concat(option
  dhcp-parameter-request-list,d0,d1,d2,d3);
  }
  host lnx35 {
    hardware ethernet 00:03:B3:15:BE:08;
  }
}
```

Save to file

17 Depending on the type of DHCP server your environment uses, do one of the following:

- **Local DHCP server – Define additional options in the `dhcp.conf` file.**

a. **Save the exported `dhcp.conf` data as a file.**

b. **Add the following lines:**

```
option space pxelinux;
option pxelinux.magic code 208 =string;
option pxelinux.configfile code 209 =text;
option pxelinux.pathprefix code 210 = text;
option space SUNW;
option SUNW.root-mount-options code 1 = text;
option SUNW.root-server-ip-address code 2 = ip-address;
option SUNW.root-server-hostname code 3 = text;
option SUNW.root-path-name code 4 = text;
option SUNW.swap-server-ip-address code 5 = ip-address;
option SUNW.swap-file-path code 6 = text;
option SUNW.boot-file-path code 7 = text;
option SUNW.posix-timezone-string code 8 = text;
option SUNW.boot-read-size code 9 = unsigned integer 16;
option SUNW.install-server-ip-address code 10 = ip-address;
```

```
option SUNW.install-server-hostname code 11 = text;
option SUNW.install-path code 12 = text;
option SUNW.sysid-config-file-server code 13 = text;
option SUNW.JumpStart-server code 14 = text;
option SUNW.terminal-name code 15 = text;
option SUNW.magic code 208 =string;
option SUNW.configfile code 209 =text;
option SUNW.pathprefix code 210 =text;
option SUNW.magic code 208 =string;
```

c. Append the file to the DHCP server's `dhcp.conf` file.

■ **Local DHCP server on Windows – Define additional options in the DHCP server application.**

a. See the following URL:

http://www.microsoft.com/resources/documentation/WindowsServ/2003/standard/proddocs/en-us/Default.asp?url=/resources/documentation/WindowsServ/2003/standard/proddocs/en-us/sag_DHCP_pro_Topnode.asp

b. Add the following lines:

```
option space pxelinux;
option pxelinux.magic code 208 =string;
option pxelinux.configfile code 209 =text;
option pxelinux.pathprefix code 210 = text;
```

18 Restart the dhcp server.

The following actions are carried out on the system:

- The selected distribution/operating system is installed on the host.
- The Sun Update Connection – Enterprise agent is installed for further management tasks.
- The new system is installed with software of the profile, provisioning it for the selected purpose (if you selected an optional profile).
- The selected Post-Install Actions are performed to ensure the integrity of the server.

Reprovisioning Servers

This procedure explains how to recycle a system's function by reprovisioning a new operating system, a new profile, or both. You can reprovision a managed host that has already been provisioned.

▼ To Reprovision a Server



Caution – When you click Continue in the Reprovisioning form, the operating system is reinstalled and all existing data is overwritten. This occurs even if you did not make any changes.

1 In the Status page, select the host to be reprovisioned.

2 Click the recycle icon.

The Reprovisioning page opens. The Reprovisioning page is prepopulated with the system information. For more information, see [“Creating or Provisioning Machines” on page 26](#).

3 Edit the options required to recycle this system.

Note – If you change the platform operating system of a Solaris system, you must copy the DHCP content to the `dhcp.conf` file on the Solaris client. The BMI then sends a Sun Update Connection – Enterprise job to restart the system.

4 Click Continue.

The operating system is reinstalled and all existing data is overwritten.

Next Steps The following actions are carried out on the system:

- The selected distribution/operating system is installed on the host, overwriting the previous operating system.
- The Sun Update Connection – Enterprise agent is reinstalled for further management tasks.
- If you selected an optional profile, the system is installed with software of the profile, provisioning it for the selected purpose.
- The selected Post-Install Actions are performed to ensure the integrity of the server.

Editing Files

Options in the Server Provisioning and Reprovisioning pages enable you to view and edit the netboot and the startup files.

The startup files are for the following applications:

- Red Hat Kickstart
- YaST for SUSE,
- AutoYaST module of YaST2

Before You Begin

Make sure that you are familiar with the contents of the netboot file, which details parameters of the kernel and command line options, and with the contents of the startup file you are using. For details, see the URLs, documentation, or technical support of the distribution. For example, find the Red Hat Kickstart Customization Guide at

<http://www.redhat.com/docs/manuals/linux/RHL-9-Manual/custom-guide/>, the Novell SUSE AutoYaST documentation at <http://www.suse.de/~nashif/autoinstall/ref.html>, and a Solaris JumpStart HowTo at <http://www.pimpworks.org/sun/jumpstart-howto.html> (see “How To Setup a Jumpstart Server”).

Alternatively, contact Sun Technical Support.

▼ To Edit the netboot File

- 1 **Open the netboot file in a text editor. The netboot file is located in the**
/tftpboot/pxelinux.cfg/MAC-address-of-system-to-provision/ **directory on the BMI server.**
- 2 **The netboot file contains the kernel parameters. The line that you most probably need to check or edit is the append line.**

In the following example, the append line is shown on two lines, but it will be on a single line in the file.

```
default ks
prompt 1
timeout 10
label ks
kernel images/redhat/AS_3.0/vmlinux
append ksdevice=eth0 ks=nfs:10.0.1.3:/tftpboot/images/redhat/AS_3.0/kickstart
initrd=images/redhat/AS_3.0/initrd.img
```

- a. **If there is more than one network card to choose from, verify that the value of `ksdevice` is correct.**
- b. **Verify that the value of `ks` correctly points to the appropriate configuration file, either Kickstart or YaST (or the AutoYaST module of YaST2), and that the path is correct.**
- c. **Verify that the value of `initrd` is the correct distribution and path to the network setup for the operating system that you want to install.**

▼ To Edit the Kickstart or the YaST Files

Kickstart is a Red Hat configuration application. YaST, or the AutoYaST module of YaST2, is a SUSE configuration application. Both offer GUIs for the creation and editing of the resulting host file. The BMI server offers a browser to the file. Typically, it is easier to use the application than to edit the file.

1 Open the configuration file.

- To edit the file using the GUI, open the configuration application.
- To edit the file using a text editor, open the file in the `/tftpboot/pxelinux.cfg/MAC-address-of-system-to-provision/` directory.

2 Verify that the following parameters have the same value as the host that you are provisioning:

- **Host name** – Check that the host name in the file is the same as the host name you have given to the selected managed host to be created.
- **Root password** – Although the root password is encrypted in the file, you can copy and paste from the BMI server provisioning or reprovisioning form into the file.
- **NFS installation server** – Check that the server name and path correctly point to the installation CDs.

Note – The parameters might have different names in the Kickstart and the YaST files.

Using BMI in Customized Environments

You can have proprietary files for unattended installation and provisioning. For example, your enterprise may have a specific disk partitioning requirement or a pre-OS-installation methodology to enable proprietary hardware. This section explains how to use the BMI server with your customized environment. Sun Update Connection – Enterprise does not support a customized environment. The procedures are given as best-practice suggestions for manually creating a custom environment.

Note – Customization of the BMI server files, and their maintenance and control, is the responsibility of the user.

Template Files

The `/usr/local/uce/server/private/channels.xml` file contains a section called `bmi`, which contains pointers to the BMI *template files*. The BMI template files define how the BMI server provisions managed hosts. The template files are refreshed whenever a user configures or reconfigures the channel.

The template files are explained in the following table.

File Defining Behavior	Description
initrd (binary)	The init ramdrive determines the modules to be present before installation.
kernel (binary)	Kernel used for installation.
netboot (configuration template)	Identifies the location of these files in the filesystem.
kickstart (configuration template)	Response file, which contains the predefined answers for installation, created by either Kickstart or the AutoYaST module in YaST. This file controls system creation.

BMI Template Directories

After you configure a channel, the BMI server gets the latest template files from the knowledge base and stores them in the `/tftpboot/images/TYPE (Redhat or SuSE)/ARCHITECTURE (IA32 or AMD64)/DISTRIBUTION/` directory on the BMI server.

For example: `/tftpboot/images/SuSE/IA32/SLES_9_0_IA32/kickstart`

A channel-specific template directory is created for each set of architecture-distribution type systems that is relevant for your environment. Each directory contains the appropriate BMI server template files.

BMI Server Macros in Template Files

The configuration template files (netboot and kickstart) contain parameter macros. The BMI server substitutes the macros with actual data when a system is added as a managed host of the BMI server. The macros are needed as-is for BMI server operations.



Caution – Do not change the macro text or the placement of the macros in the file.

Template File	Macro Name	Template File	Macro Name
netboot	INITRD_PATH	kickstart	{HOSTNAME}
	KERNEL_PATH		{ROOT_PASSWORD}
	KICKSTART_PATH		{SERVER_NAME}
	DISTRO_SOURCE		{USERNAME}
			{PASSWORD}

Host Files

When a system is provisioned, a subdirectory is created under the `/tftpboot/pxelinux.cfg` directory on the BMI server. The name of the subdirectory is the MAC address of the provisioned host. The `//BMI-system/tftpboot/pxelinux.cfg/MAC-address/` directory contains the kickstart and netboot *host files*. A host file contains the same lines that are in the template file, but the macro is replaced with host-specific data. A host file also has a post-install section that must not be changed.

Host files are refreshed whenever a host is reprovisioned.

Customizing Files

When you customize the files, either the template files or the host files, there are some parts that must be copied exactly from the original files.

Customizing Template Files

BMI template files belong to a specific architecture-distribution. Modifying the files affects all future system provisioning for that distribution.

When you change or add a template file, you *must* copy the macros from the original file in the exact text and order.

Customizing Host Files

A host file affects the installation and provisioning of one system. To ensure consistency, copy your customized files to every relevant `/MAC-address/` directory.

The kickstart host file is the BMI name for the file created with either Kickstart or YaST. In the kickstart file there is a post section containing data that leads the installation of the Sun Update Connection – Enterprise agent and notifies the BMI server of successful provisioning. The post-install section *must* be copied exactly into all your customized files.

▼ To Create Customized Template Files

1 Maintain the default template files for copying and backup:

```
# cd /tftpboot/images/TYPE/ARCH/DISTRO
# mv kickstart kickstart.orig
# mv netboot netboot.orig
```

2 Maintain the default host files for copying and backup:

```
# cd /tftpboot/pxelinux.cfg/MAC-address/
# mv kickstart kickstart.orig
# mv netboot netboot.orig
```

3 In either or both directories, make another copy for customization:

```
# cp kickstart.orig kickstart.significant-suffix
# cp netboot.orig netboot.significant-suffix
```

4 Change the files as needed:

- If you change a template file, make sure the macro lines are exactly as in the original template file, in the same order and the same text.
- If you change a host file, make sure your host file has the post-install section copied exactly, in the same location in the file as in the original host file.
- If you want to keep multiple versions of a file, give each version a different suffix and make sure to copy over the needed macros or post-install section.

5 Decide which version will be used for the next BMI server session. Make a backup of this file. This is important, because if any user changes the configuration through the BMI Server Setup feature, your active files will be overwritten.**6 Create a symlink for the BMI server to find the files that you want to use for the next BMI provisioning session:**

```
# ln -s kickstart.your-suffix kickstart
# ln -s netboot.your-suffix netboot
```

Example 2–1 Symlink For the BMI Server

```
kickstart.orig
kickstart.myServers
kickstart.myWorkstations_partA
kickstart.myWorkstations_partB
kickstart.myWorkstations_partA_backup
kickstart -> kickstart.myWorkstations_partA
```

Maintaining Customization

If the BMI Server Setup feature is used to reconfigure a channel, either by you or by another user, the original files will be reinstalled and will overwrite the symlink and the linked file.

To make sure you can recover from this overwrite:

- Maintain a backup of your customized files, both template and host files.
- Check that the symlinks point to the correct file; fix them if necessary.
- Check the `/tftpboot/images/TYPE/ARCHITECTURE/DISTRIBUTION/` directories. The file that was linked will have been overwritten. Replace it with a backup version.

- Check the *//BMI-system/tftpboot/pxelinux.cfg/MAC-address/* directories. If your host file was overwritten, replace it with a backup version.

Troubleshooting

When you install the BMI, it is configured to work with the Sun Update Connection – Enterprise Python-API. If the default configuration is not appropriate for your local environment, the following message is displayed:

```
Failed to prepare API working directory!
Failed to extract uce_port from uce.rc!
run config.py manually!
```

1. Open a terminal window and log in with root permissions.
2. Use the `which python` command to find the path to your python executable.
3. In `/opt/local/uce/agent/bin/.uce.rc`, find `server-port` and `distrizor-port`.
4. In a terminal, type the following command in one line:

```
# <path/to/python> /opt/local/uce/api/python/lib/Py0sApi/Utils/config.py \
local-host server-port local-host distrizor-port \
/usr/local/uce/engine/bin/uce.public /opt/local/uce/.uce_python
```

5. Type `chown uce-sds.uce.sds /opt/local/uce/.uce_python/`.

This allows the API read-write functions in the BMI server, because `uce-sds` is the owner of web applications.

Appendix A

The following section describes distributions that currently support BMI installations.

Supported Distributions

Sun has tested the BMI server installation and functional provisioning on various distributions. As Sun adds support for more distributions and platforms, your BMI server will be automatically updated. For more information, contact Technical Support.

Installation Distributions

The BMI server can be installed on a machine with one of the following distributions:

- Red Hat Enterprise Linux 3.0 Advanced Server IA-32
- Red Hat Enterprise Linux 3.0 Enterprise Server IA-32
- Red Hat Enterprise Linux 3.0 Workstation Server IA-32
- Red Hat Enterprise Linux 3.0 Advanced Server AMD-64
- Red Hat Enterprise Linux 3.0 Workstation Server AMD-64
- SUSE 9.2 Professional IA-32
- SUSE 9.1 Professional IA-32
- SUSE SLES 9 IA-32

Provisioning Distributions

The following listed distributions are those have been tested, at the time of publication of this document, for clients of the BMI server, to provision machines with these distributions:

- Solaris 10 on SPARC platforms
- Solaris 9 on SPARC platforms
- Solaris 8 on SPARC platforms

- Red Hat Enterprise Linux 3.0 Advanced Server IA-32
- Red Hat Enterprise Linux 3.0 Enterprise Server IA-32
- Red Hat Enterprise Linux 3.0 Workstation Server IA-32
- Red Hat Enterprise Linux 3.0 Advanced Server AMD-64
- Red Hat Enterprise Linux 3.0 Workstation Server AMD-64
- Red Hat Enterprise Linux 3.0 Workstation Server IA-64
- Red Hat Enterprise Linux 2.1 Advanced Server IA-32
- Red Hat Enterprise Linux 2.1 Enterprise Server IA-32
- SUSE 9.2 Professional IA-32
- SUSE 9.1 Professional IA-32
- SUSE 9.0 Professional AMD-64
- SUSE SLES 9 AMD-64
- SUSE SLES 9 IA-32
- SUSE SLES 8 IA-32
- SUSE SLES 8 AMD-64

Glossary

BMI server	Automates the installation and recycling of Linux and Solaris OS distributions and system profiles.
Distribution	The operating system and hardware architecture of one or more managed hosts.
Image server	A system installed with Linux and Solaris operating systems and configured for network installation.
Knowledge base	<p>Subsystem of the Sun Update Connection – Enterprise system dependency server, acts as a proxy server for the universal server, keeping dependency rules for certified object (CO) deployment on managed hosts.</p> <p>A local knowledge base is a private, on-site only, collection of non-certified object (NCO) listings and their deployment rules as generated by the local expansion technology.</p>
Local expansion technology	Application that generates knowledge for local components unknown to the universal server.
Local host	System that is installed with the BMI software, and which is dedicated to Sun Update Connection – Enterprise system dependency server (SDS) and the BMI server.
Policy	Set of confirmation rules for the implementation of the dependency resolver and level of automation of dependency handling.
Profile	Defines installation requirements for a specific type of system.
Security Check	Identifies available security updates to install.
System Check	Identifies missing dependencies.
System dependency server (SDS)	<p>The complete management system for Sun Update Connection – Enterprise. Your local proxy to the Universal Server.</p> <p>Its subsystems include:</p> <ul style="list-style-type: none">■ Server application - Pulls certified updates from the Universal Server and push local packages and scripts to the local knowledge base.■ Dependency manager (DM) - Manages communications between applications, job queuing, and data storage.

- Knowledge base - Caches deployment rules (both certified and generated) and components (both certified and local).
- Local expansion technology - Generates rules for local components.