



SGI® Altix® UV Software Install Guide

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New Features in This Guide

This rewrite of the *SGI Altix UV Software Install Guide* supports the SGI Performance Suite 1.2 release.

Major Documentation Changes

Performed the following:

- Updated "Install and Configure SLES 11 SP1 and SGI Foundation 2.4 Software" on page 3.
- Updated "Install and Configure RHEL 6 and SGI Foundation 2.4 Software" on page 11.
- Added "SMN RPMs for SSI" on page 16.
- Added "Booting from Fibre Channel Disk" on page 45.

Record of Revision

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001	June 2010 Original Printing.
002	October 2010 Updated to support the SGI Performance Suite 1.0 release.
003	February 2011 Updated to support the SGI Performance Suite 1.1 release.
004	April 2011 Updated to support the SGI Performance Suite 1.2 release.

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About This Manual

Your SGI Altix UV 100 or SGI Altix UV 1000 system comes with pre-installed software. This manual describes how to reinstall it if necessary.

Obtaining Publications

You can obtain SGI documentation in the following ways:

- See the SGI Technical Publications Library at: <http://docs.sgi.com>. Various formats are available. This library contains the most recent and most comprehensive set of online books, release notes, man pages, and other information.
- You can also view man pages by typing `man title` on a command line.

Related Publications and Other Sources

This section describes documentation you may find useful, as follows:

- *SGI Performance Suite 1.2 Start Here*
Provides information about the SGI Performance Suite 1.2 release including information about major new features, software installation, and an overview SGI Performance Suite products.
- *SGI Foundation Software 2.4 Start Here*
Provides information about the SGI Foundation Software 2.4 release that supports SGI differentiated server solutions.
- *SGI Management Center Installation and Configuration*
This guide is intended for system administrators. It describes how to install and configure the SGI Management Center. A companion manual, *SGI Management Center System Administrator's Guide*, describes general cluster administration.
- *SGI Altix UV System Management Node Administrator's Guide*
This guide describes the system management node (SMN) for SGI Altix UV 1000 and SGI Altix UV 100 series systems. It provides information on how to install,

configure, and use software on the SMN to manage and monitor SGI Altix UV systems.

- *SGI Altix UV CMC Controller Software User's Guide*

Describes how to use the controller commands on your chassis manager controller (CMC) to monitor and manage SGI Altix UV 100 and SGI Altix UV 1000 systems.

- *SGI Altix UV 1000 System User's Guide*

This guide provides an overview of the architecture and descriptions of the major components that compose the SGI Altix UV 1000 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

- *SGI Altix UV 100 System User's Guide*

This guide provides an overview of the architecture and descriptions of the major components that compose the SGI Altix UV 100 system. It also provides the standard procedures for powering on and powering off the system, basic troubleshooting information, and important safety and regulatory specifications.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
<code>command</code>	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
<code>manpage(x)</code>	Man page section identifiers appear in parentheses after man page names.
<i>variable</i>	Italic typeface denotes variable entries and words or concepts being defined.
user input	This bold, fixed-space font denotes literal items that the user enters in interactive sessions. (Output is shown in nonbold, fixed-space font.)
[]	Brackets enclose optional portions of a command or directive line.

...

Ellipses indicate that a preceding element can be repeated.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this publication, contact SGI. Be sure to include the title and document number of the publication with your comments. (Online, the document number is located in the front matter of the publication. In printed publications, the document number is located at the bottom of each page.)

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SGI values your comments and will respond to them promptly.

Altix UV Software Installation

This chapter describes how to install software on the SGI management node (SMN) and the Altix UV system itself in case of root disk failure on either platform. It covers these topics:

- "System Management Node Software Installation" on page 1
- "SGI Management Center Software Installation" on page 15
- "SGI Altix UV Server Installation Instructions" on page 15

System Management Node Software Installation

Figure 1-1 on page 2 shows one rack of an SGI Altix UV system.

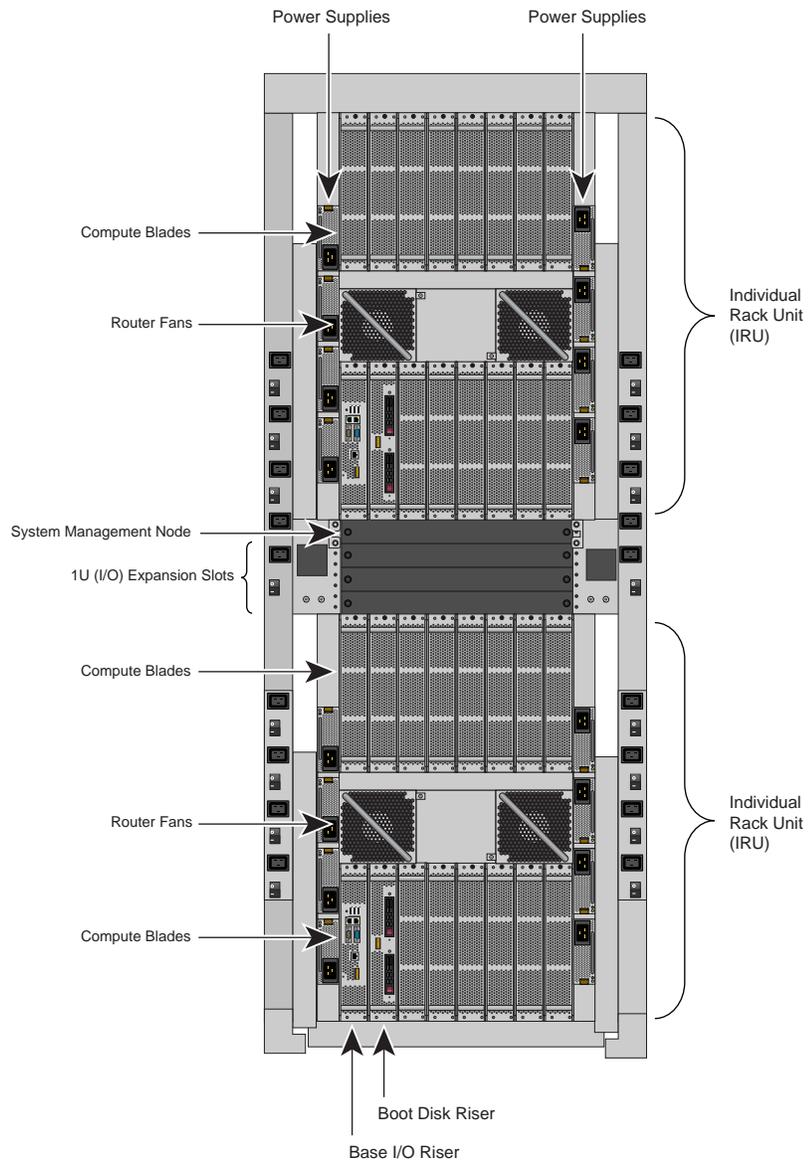


Figure 1-1 SGI Altix UV 1000 System Rack

The system management node (SMN) is either located in the top 1U slot between the individual rack units (IRUs) or at the top of the rack. This section covers installation instructions for the SMN and covers these topics:

- "Install and Configure SLES 11 SP1 and SGI Foundation 2.4 Software" on page 3
- "Install and Configure RHEL 6 and SGI Foundation 2.4 Software" on page 11

Install and Configure SLES 11 SP1 and SGI Foundation 2.4 Software

To install SLES 11 software images on the system management node perform the following steps:

1. Turn on, reset, or reboot the SMN. The power on button is on the right of the SMN, as shown in Figure 1-2 on page 3.

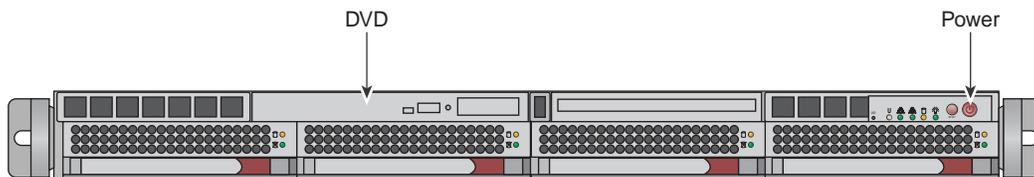


Figure 1-2 System Management Node Power On Button and DVD Drive

2. Insert the SLES 11 Service Pack 1 DVD in the DVD drive on the left of the SMN as shown in Figure 1-2 on page 3.
3. Once installation of software on the system management node is complete, remove the DVD from the DVD drive.
4. After the reboot completes, you will eventually see the **YaST2 - firstboot@Linux Welcome** screen, as shown in Figure 1-3 on page 4. Select the **Next** button to continue.

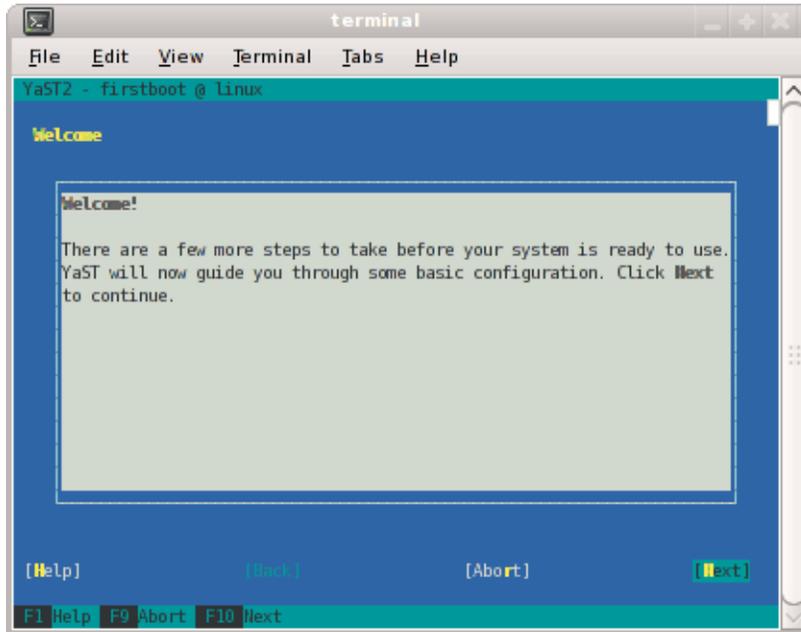


Figure 1-3 YaST2 - firstboot@Linux Welcome Screen

Note: The YaST2 Installation Tool has a main menu with sub-menus. You will be redirected back to the main menu, at various times, as you follow the steps in this procedure.

You will be prompted by YaST2 firstboot installer to enter your system details including the root password, network configuration, time zone, and so on.

5. From the **Hostname and Domain Name** screen, as shown in Figure 1-4 on page 5, enter the hostname and domain name of your system in the appropriate fields. Make sure that **Change Hostname via DHCP** is **not** selected (no **x** should appear in the box). Note that the hostname is saved to `/etc/hosts` in step 10, below. Click the **Next** button to continue.

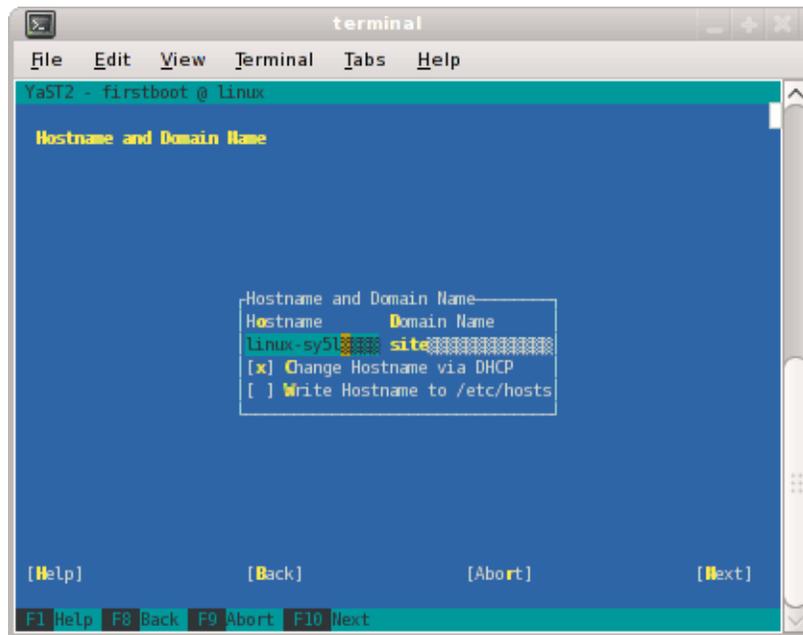


Figure 1-4 Hostname and Domain Name Screen

Note: The mostly used keys are Tab and Shift + Tab to move forward and backward in modules, the arrow keys to move up and down or left and right in lists, the shortcuts (press Alt + highlighted letter) and Enter to execute the selected action or activate a menu item.

You can use Ctrl L to refresh the YaST screen as necessary.

6. The **Network Configuration II** screen appears, as shown in Figure 1-5 on page 6. Select **Change** and a small window pops up that lets you choose **Network Interfaces...** or **Reset to Defaults**. Choose **Network Interfaces**.

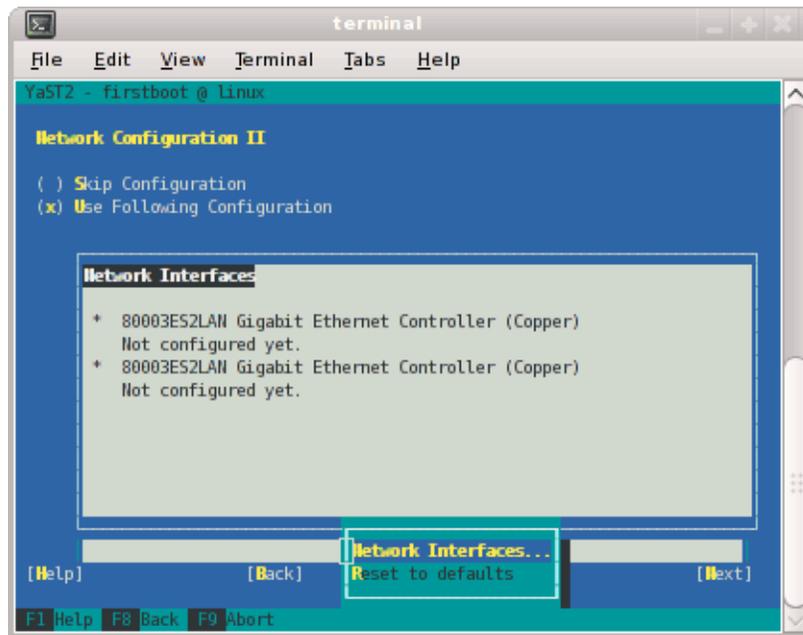


Figure 1-5 Network Configuration II Screen

7. From the **Network Settings** screen, as shown in Figure 1-6 on page 7, configure the first card under **Name** to establish the connection to your SGI Altix UV system. To do this, highlight the first card and select **Edit**.

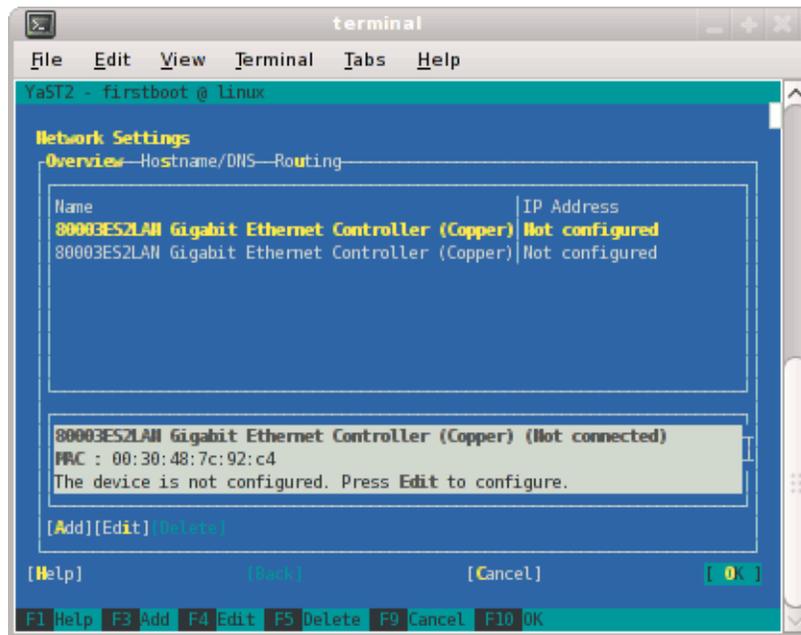


Figure 1-6 Network Settings Screen

Note: In SLES11, this screen is also where we will come back to in order to set up things like the default route and DNS. You can see all of those menu choices just to the right of **Overview** in Figure 1-6 on page 7.

8. The **Network Card Setup** screen appears, as shown in Figure 1-7 on page 8. SGI suggests using static IP addresses and not DHCP for admin nodes. Select **Statically assigned IP Address**. Once selected, you can enter the IP Address, Subnet Mask, and Hostname.

Note: You must use a fully qualified hostname (host + domain), such as, *mssystem-admin.domainname.mycompany.com*.

These are the settings for your SMN house/public network interface. You will enter the default route, if needed, in a different step. Select **Next** to continue.

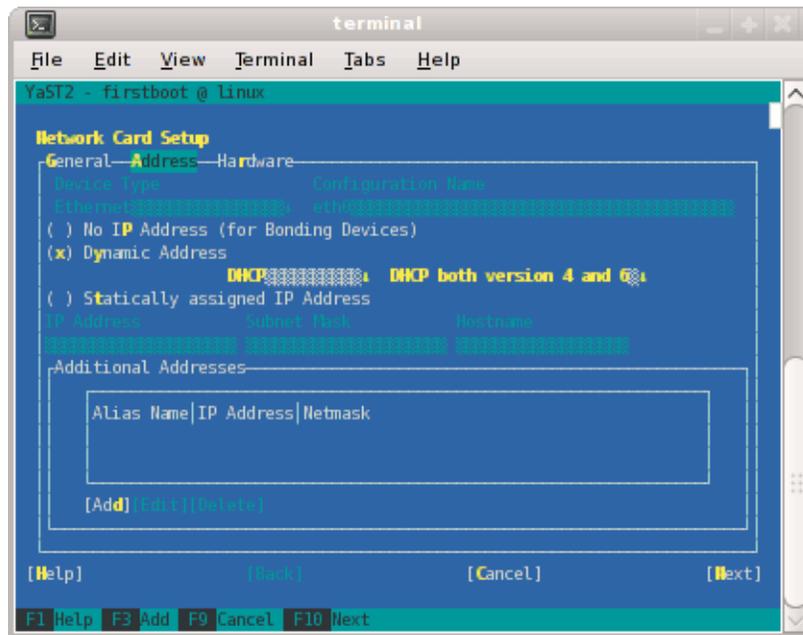


Figure 1-7 Network Card Setup Screen

9. At this point, you are back at the **Network Settings** screen as shown in Figure 1-8 on page 9. At this time, select **Hostname/DNS**. In this screen, you should enter your house/public network hostname and fully qualified domain names. In addition, any name servers for your house/public network should be supplied. Please select (ensure an x is in the box) for **Write hostname to /etc/hosts**. Do **not** select **OK** yet.

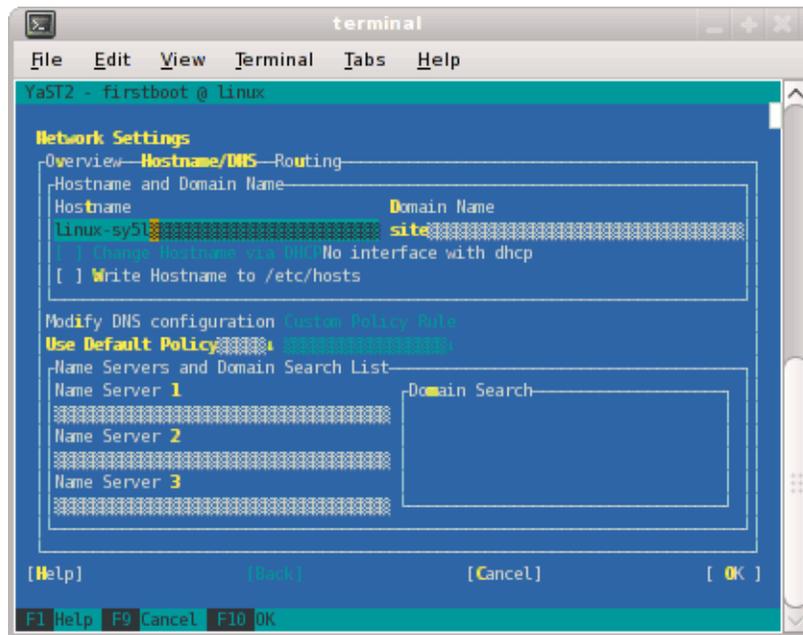


Figure 1-8 Network Settings Screen

10. Select **Routing** shown in Figure 1-9 on page 10 and enter your house/public network default router information there. Now you can select **OK**.

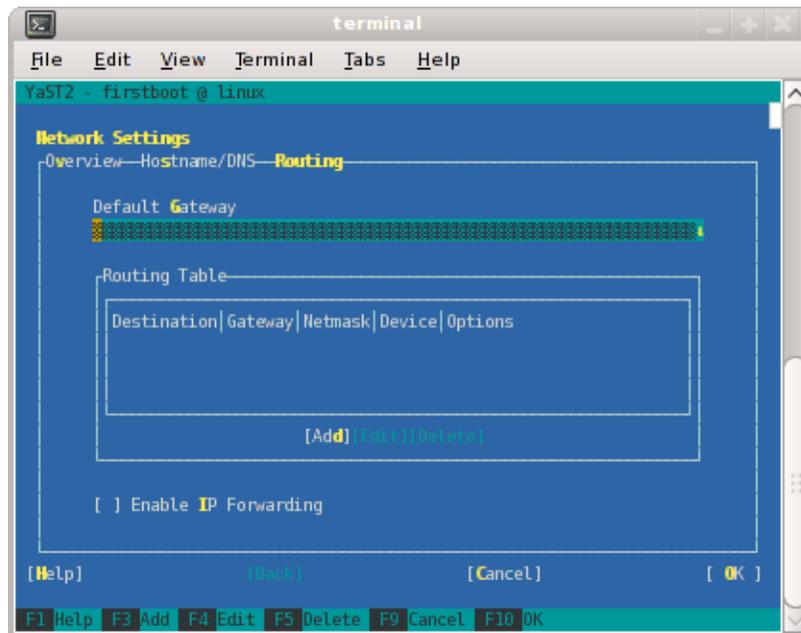


Figure 1-9 Network Settings Routing Screen

11. You are now back at the **Network Configuration II** screen, Click **Next**.
12. In the **Clock and Time Zone** screen, you can enter the appropriate details. Select **Next** to continue.
13. In the **Password for the System Administrator "root"** screen, enter the password you wish to use. Select **Next** to continue.
14. In the **User Authentication Method** screen, most customers will want to stick with the default (**Local**). Select **Next** to continue.
15. In the **New Local User** screen, you can just select **Next** (and say **Yes** to the **Empty User Login** warning). Select **Next** to continue.
16. In **Installation Completed**, select **Finish**.
17. After you have completed the YaST first boot installation instructions, login into the SMN. You can use YaST2 to confirm or correct any configuration settings.

18.

Note: The SGI System Management Node Software 1.2 Release Notes are available on SGI SupportFolio <https://support.sgi.com/login>.

Using YaST2 or manually the rpm command, from the SGI-System-Management-Node-Software-1.2 ISO, install the following:

```
rpm -i monit-5.0.3-1sgi703rp1.sles11.x86_64.rpm
rpm -i monit-sgi-rules-5.0.3-1sgi703rp1.sles11.x86_64.rpm
rpm -i sgi-base-smn-uv-1.0-sgi703rp3.sles11.x86_64.rpm
rpm -i sgi-common-smn-uv-1.0-sgi703rp3.sles11.x86_64.rpm
rpm -i sgi-db-smn-uv-1.0-sgi703rp3.sles11.x86_64.rpm
rpm -i sgi-gather-smn-uv-1.0-sgi703rp3.sles11.x86_64.rpm
rpm -i sgi-smn-docs-1-sgi703rp3.sles11.noarch.rpm
rpm -i sgi-smn-release-1.2-sgi703rp31.sles11.noarch.rpm
rpm -i sgi-snmpagent-smn-uv-1.0-sgi703rp3.sles11.x86_64.rpm
rpm -i sgi-uv-bmc-1.2.5_5-20110121.noarch.rpm
rpm -i sgi-uv-cmc-1.2.6_3-20110121.noarch.rpm
rpm -i sgi-uv-iobmc-1.2.2_3-20110121.noarch.rpm
rpm -i sysco-uv-1.0-20110118.1858sgi703rp1.sles11.x86_64.rpm
rpm -i sysco-uv-libs-1.0-20110118.1858sgi703rp1.sles11.x86_64.rpm
```

Note: Documentation for SUSE Linux Enterprise Server 11 SP1 is located on your system in the /docu/en directory.

For instructions for installing SLES 11 SP1 and SGI Foundation Software 2.4, see Procedure 1-2, page 17.

Install and Configure RHEL 6 and SGI Foundation 2.4 Software

This section describes how to install Red Hat Enterprise Linux 6 on the system management node.

Installation instructions for Red Hat Enterprise Linux 6 (RHEL 6) are contained in the *Red Hat Enterprise Linux 6 Installation Guide* available at http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/pdf/Installation_Guide/Red_Hat_Enterprise_Linux-6-Installation_Guide-en-US.pdf

These instructions assume that you have a VGA display or that you are able to remotely display X11 graphics. If you do not have a VGA display, you should connect from your workstation to the target server with the following command:

```
% ssh -X root@target-server
```

Procedure 1-1 Installing RHEL 6 Software on the System Management Node

To install RHEL 6 software images on the system management node, perform the following steps:

1. Insert the product media and enter the following command to mount it:

```
% mount /dev/cdrom/mnt
```

2. Run the following command and follow the examples provided:

```
% /mnt/create-yum-config-file
```

Additional installation instructions for installing SGI Foundation Software (SFS) 2.4 and RHEL 6 are provided in the SFS 2.4 release notes file.

3. By default RHEL 6 uses NetworkManager and all the directions here assume it is off. Perform the following commands, before proceeding:

```
# chkconfig NetworkManager off
# service NetworkManager stop
```

4. Add the IPADDR, NETMASK, and NETWORK values appropriate for the network interface to the /etc/sysconfig/network-scripts/ifcfg-eth0 file similar to the following example:

```
IPADDR=128.162.244.88
NETMASK=255.255.255.0
NETWORK=128.162.244.0
```

5. Create the /etc/sysconfig/network file similar to the following example:

```
[root@localhost ~]# cat /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=my-system-admin
GATEWAY=128.162.244.1
```

6. Create the `/etc/resolv.conf` file similar to the following example:

```
[root@localhost ~]# cat /etc/resolv.conf
search domain-name.mycompany.com
nameserver 137.38.224.40
nameserver 137.38.31.248
nameserver 137.38.225.5
```

7. Add the IP address of the house network interface and the name(s) of the admin node to `/etc/hosts` file similar to the following example:

```
# echo "128.162.244.88 my-system-admin.domain-name.mycompany.com my-system-admin" >> /etc/hosts
```

8. Set the admin node hostname, as follows:

```
# hostname my-system-admin
```

9. Force the invalidation of the host cache of `nscd` with the `nscd(8)` command on the `hosts` file, as follows:

```
# nscd -i hosts
```

10. Restart the following services (in this order), as follows:

```
# /etc/init.d/network restart
# /etc/init.d/rpcbind start
# /etc/init.d/nfslock start
```

11. Set the local timezone. The timezone is set with `/etc/localtime`, a timezone definition file. The timezone defined in `/etc/localtime` can be determined, as follows:

```
# strings /etc/localtime | tail -1
CST6CDT,M3.2.0,M11.1.0
```

Link the appropriate timezone file from directory `/usr/share/zoneinfo` to `/etc/localtime`. For example, set timezone to Pacific Time / Los Angeles, as follows:

```
# /bin/cp -l /usr/share/zoneinfo/PST8PDT /etc/localtime.$$
# /bin/mv /etc/localtime.$$ /etc/localtime
```

Confirm the timezone, as follows:

```
# strings /etc/localtime | tail -1
PST8PDT,M3.2.0,M11.1.0
```

12. Set network time configuration. By default, the configuration in `/etc/ntp.conf` directs requests to public servers of the `pool.ntp.org` project. Use public servers from the `http://www.pool.ntp.org/en/` project:

```
server 0.rhel.pool.ntp.org
server 1.rhel.pool.ntp.org
server 2.rhel.pool.ntp.org
```

You may need to modify this `ntp` configuration file to point at a time server on your network. Please do not remove any entries that serve the cluster networks. For example, to direct requests to, for example, `my.corp.mycompany.com`, comment/delete the pool entries and insert the local entry, as follows:

```
# Use public servers from the pool.ntp.org project.
# Please consider joining the pool (http://www.pool.ntp.org/join.html).
#server 0.rhel.pool.ntp.org
#server 1.rhel.pool.ntp.org
#server 2.rhel.pool.ntp.org
server my.corp.mycompany.com
```

Restart the `ntp` server, as follows:

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

13. Make sure you have registered with the Red Hat Network (RHN). If you have not yet registered, run the following command:

```
% /usr/bin/rhn_register
```

14. From the `SGI-System-Management-Node-Software-1.2` ISO, install the following:

```
rpm -i monit-5.0.3-1sgi703rp2.rhel6.x86_64.rpm
rpm -i monit-sgi-rules-5.0.3-1sgi703rp2.rhel6.x86_64.rpm
rpm -i sgi-base-smn-uv-1.0-sgi703rp5.rhel6.x86_64.rpm
rpm -i sgi-common-smn-uv-1.0-sgi703rp5.rhel6.x86_64.rpm
rpm -i sgi-db-smn-uv-1.0-sgi703rp5.rhel6.x86_64.rpm
rpm -i sgi-gather-smn-uv-1.0-sgi703rp5.rhel6.x86_64.rpm
rpm -i sgi-smn-docs-1-sgi703rp12.rhel6.noarch.rpm
rpm -i sgi-smn-release-1.2-sgi703rp49.rhel6.noarch.rpm
```

```
rpm -i sgi-snmpagent-smn-uv-1.0-sgi703rp5.rhel6.x86_64.rpm
rpm -i sgi-uv-bmc-1.2.5_5-20110121.noarch.rpm
rpm -i sgi-uv-cmc-1.2.6_3-20110121.noarch.rpm
rpm -i sgi-uv-iobmc-1.2.2_3-20110121.noarch.rpm
rpm -i sysco-uv-1.0-20110118.1858sgi703rp2.rhel6.x86_64.rpm
rpm -i sysco-uv-libs-1.0-20110118.1858sgi703rp2.rhel6.x86_64.rpm
rpm -i sysco_uv-tools-1.6-20110121.i386.rpm
```

SGI Management Center Software Installation

For information on how to install SGI Management Center (SMC) software, see the *SGI Management Center Installation and Configuration* guide available at <http://docs.sgi.com>. In particular, see Chapter 1, “Installing SGI Management Center” and “Install Management Center Payload” section in Chapter 4, “Creating Payloads and Images”.

SGI Altix UV Server Installation Instructions

This section describes how to do a clean install on a SGI Altix UV server.

DVD Access

Currently, to reinstall your software you need a USB-DVD and connect that to the BASEIO (see Figure 1-1 on page 2) and boot the Novell rescue CD.

Software Installation

Use a USB-DVD drive to connect to the BASEIO and boot using the Novell rescue CD. You need to get BIOS booted to efi shell and boot from the DVD. Use a command similar to the following:

```
fs1:efi\boot\bootx64 -i initrd linux console=ttyS0,115200n8 ssh=1
```

Note: The fs number may be different. Booting an Altix UV systems takes some time. It may take awhile for the screen to change.

When partitioning the system disk, you need to create a `/boot/efi` partition instead of a `/boot` partition.

For information on installing software on your Altix UV sever, see "Installing SLES 11 SP1, SGI Foundation 2.4, and SGI Performance Suite 1.2 Software Together" on page 16 or "Installing RHEL 6 on an Altix UV System" on page 20.

SMN RPMs for SSI

For this release, there is an RPM on the SMN media that is installed on each single-system image (SSI).

- SLES 11

```
rpm -i sysco-uv-smnconfig-1.0-20110118.1858sgi703rp1.sles11.x86_64.rpm
```

- RHEL 6

```
rpm -i sysco-uv-smnconfig-1.0-20110118.1858sgi703rp2.rhel6.x86_64.rpm
```

Installing SLES 11 SP1, SGI Foundation 2.4, and SGI Performance Suite 1.2 Software Together

The following set of instructions is based on an install using the physical product media. For other installation methods, see the product release notes.

Note: On large configurations, systems with 2048 processors, for example, can take up to 50 minutes to boot SLES.

You can speed up the software install and booting of your system by initially turning off NUMALink from the CMC, as follows:

```
cmc> hwcfg NL5_ENABLE=no  
cmc> power reset
```

Once the system boots, you can re-enable NUMALink from the CMC, as follows:

```
cmc> hwcfg NL5_ENABLE=yes  
cmc> power reset
```

For an overview of SLES11 SP1 installation, see the *SUSE Linux Enterprise Server 11 Installation Quick Start* ([installquick.pdf](#)). This document provides a quick overview of how to run through the default installation of SLES walking you through a number of installation screens. For detailed installation instructions, see the *SUSE Linux Enterprise Server 11 Deployment Guide* ([deployment.pdf](#)).

Note: Documentation for SUSE Linux Enterprise Server 11 SP1 is located on your system in the `/docu/en` directory.

Note: If you are only installing SLES11 SP1 and SGI Foundation 2.4 software, just skip the steps about installing SGI Performance Suite software.

Procedure 1-2 Installing SLES 11 SP1 and SGI Foundation Software 2.4

To install SUSE Linux Enterprise Server 11 (SLES11) SP1 from the DVD media and SGI Foundation Software 2.4 and SGI Performance Suite 1.2 software as an add-on products, perform the following steps:

1. Insert the SLES 11 SP1 Installation DVD in the DVD drive and reboot your system.
2. Follow the steps in the *SUSE Linux Enterprise Server 11 Installation Quick Start*. When you get to the **Installation Mode** screen, as shown in Figure 1-10 on page 18, click the button next to **Include Add-On Products from Separate Media** and then click **Next** to continue.



Figure 1-10 SLES11 Installation Mode Screen

3. From the **Media Type** screen, shown in Figure 1-11 on page 19, click the button to the left of **CD**.

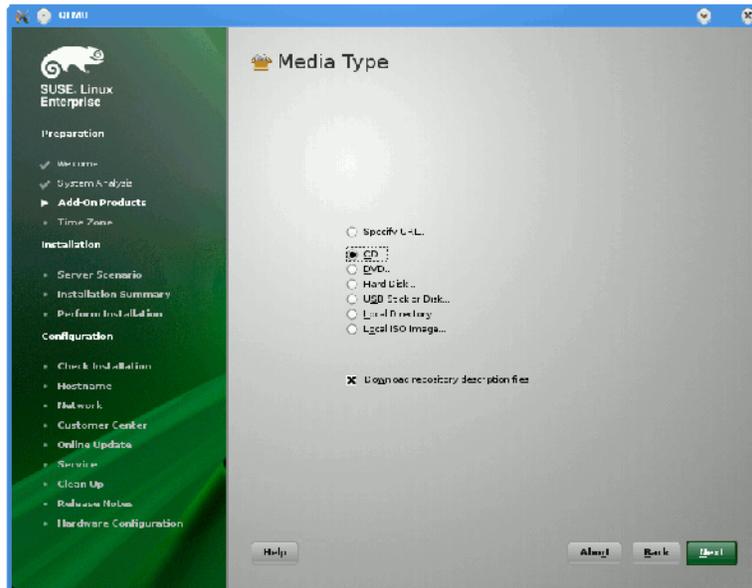


Figure 1-11 SLES11 Media Type Screen

4. The **Insert the add-on product CD** dialog box appears. Insert the SGI-Foundation-x86_64 CD into the drive and click the **Continue** button and then **Next** to proceed.
5. From the **Add-On Product Installation** screen, as shown in Figure 1-12 on page 20, click on **SGI-Foundation-x86_64 1-6 cd:///Directory** and click the **Add** button and then **Next** to proceed
6. Repeat steps 3 through 6 to add a software bundle from the SGI Performance Suite 1.2 product as an add-on product. Eject the SGI Foundation 2.4 CD and replace it with an SGI Performance Suite CD.

The following CDs ship with the SGI Performance Suite 1.2 release:

- SGI® Accelerate™ CD
- SGI® MPI CD
- SGI® REACT® CD

- SGI® UPC CD

For more information on these products, see the *SGI Performance Suite 1.2 Start Here*.

From the Add-On Product Installation screen as shown in Figure 1-12 on page 20, click on SGI-ProPack-x86_64 6-4 cd:///Directory click the Add button and then Next to proceed.

7. Follow the SLES11 SP1 instructions to complete the installation.

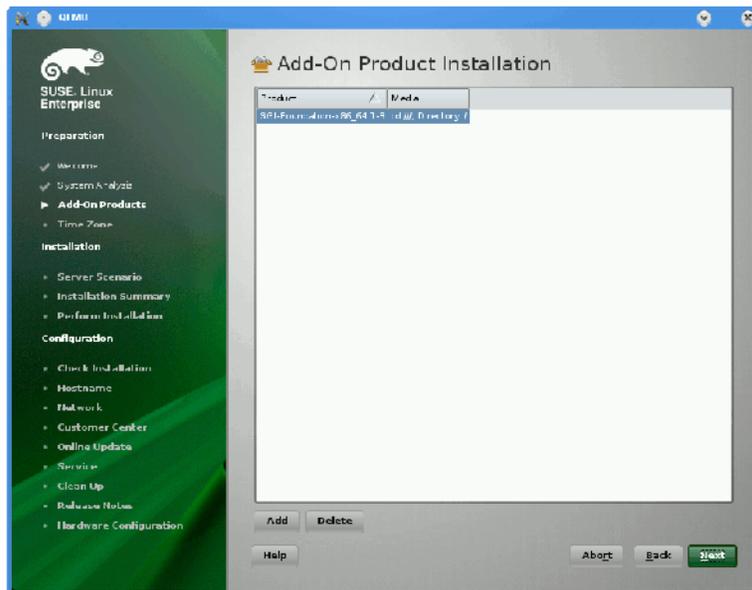


Figure 1-12 SLES11 SP1 Add-On Product Installation Screen Showing SGI Foundation

Installing RHEL 6 on an Altix UV System

This section describes how to install Red Hat Enterprise Linux 6 on an Altix UV 100 or Altix UV 1000 system.

Note: On large configurations, systems with 2048 processors, for example, can take up to 75 minutes to boot RHEL 6.

You can speed up the software install and booting of your system by initially turning off NUMALink from the CMC, as follows:

```
cmc> hwcfg NL5_ENABLE=no
cmc> power reset
```

Once the system boots, you can re-enable NUMALink from the CMC, as follows:

```
cmc> hwcfg NL5_ENABLE=yes
cmc> power reset
```

Procedure 1-3 Installing RHEL 6 Software on an Altix UV System

To install RHEL 6 software images on the an Altix UV 100 or Altix UV 1000 system, perform the following steps:

1. These instructions assume an external USB DVD ROM drive, the BIOS must be in legacy mode. Make sure the BIOS is current, that is, later than the 1.32 release.
2. At the EFI shell, use the map command to get a list of recognized devices/filesystems, for example:

```
Shell> map
Device mapping table

fs0      :Removable HardDisk - Alias hd25a0b blk0
          PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(1,MBR,0x000D9FB8,0x22,0xF329C)

fs1      :Removable HardDisk - Alias hd25b0b blk1
          PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(1,GPT,74D7CC85-8A6C-4F87-8865-E58002CAC

fs2      :Removable CDRom - Alias cd67a0b blk2
          |
          |___ CD/DVD media

          PciRoot(0x0)/Pci(0x1D,0x7)/USB(0x0,0x0)/CDROM(0x1,0x232,0x2C0)
```

3. Select the DVD media, in this example fs2:

```
Shell> fs2:
```

For a sanity check, list its contents, as follows:

```
fs2:\> ls
Directory of: fs2:\

    09/22/10  06:03p                2,048  EFI
                0 File(s)                0 bytes
                1 Dir(s)
```

4. Change directory (cd) to efi\boot, as follows:

```
fs2:> cd efi\boot
```

List the directory contents, as follows:

```
fs2:\EFI\BOOT> dir
Directory of: fs2:\EFI\BOOT

    09/22/10  06:03p                2,048  .
    09/22/10  06:03p                2,048  ..
    09/22/10  06:03p                 429   BOOTX64.conf
    09/22/10  06:03p               232,971  BOOTX64.efi
    09/22/10  06:03p                 1,341  splash.xpm.gz
                3 File(s)           234,741 bytes
                2 Dir(s)
```

5. Run bootx64, as follows:

```
fs2:\EFI\BOOT> bootx64
```

6. At this stage you should be at the GRUB prompt, as follows:

```
grub>
```

Set root to the device that corresponds to the CD/DVD device, in this example

```
grub> root (hd2)
Filesystem type is iso9660, using whole disk
```

If you have selected the correct device, grub will report that it recognized as an iso9660 filesystem. If unsure about which device to select, type root <TAB> to see a list of possible devices.

7. Select the kernel to boot and choose the boot options, as follows:

```
grub> kernel /images/pxeboot/vmlinuz virtefi console=ttyS0,115200 askmethod vnc ip= netmask= gateway= dns=,.,.,.,.
```

If executing correctly, GRUB should display something similar to the following:

```
Trying to allocate 923 pages for VMLINUZ  
[Linux-EFI, setup=0x1034, size=0x39a580]
```

Some important considerations for boot options are, as follows:

- `virtefi`

Note: For Altix UV 100 and Altix UV 1000 systems, you **must** specify the `virtefi` option the or installer's kernel will panic.

- `console=ttyS0,115200`

Setup the serial console

- `askmethod`

Use this option only if you want make sure that the installer will ask you which install method (local DVD, NFS, HTTP and so on) should be used.

- `vnc`

Use `vnc` instead of text mode

Some network related parameters are, as follows:

- `ip=<IPADDR>`

Tells the installer which `IPADDR` should be assigned to the Network Interface Card (NIC).

- `netmask=<NETMASK>`

Tells the installer which `NETMASK` to assign.

- `gateway=<GW>`

Gateway IP address

- `dns=<DNS1>, <DNS2>, . . . , <DNS3>`

DNS servers IP addresses

Note: The network parameters are not needed if you have a Dynamic Host Configuration Protocol (DHCP) server.

8. Select the `initrd` image, as follows:

```
grub> initrd /images/pxeboot/initrd.img
```

If executing correctly, GRUB should display something similar to the following:

```
[Initrd, addr=0x726bf000, size=0x1cab9cc]
```

9. You should now be ready to boot the kernel, as follows:

```
grub> boot
```

Once the kernel booted, the installer will start and ask you which NIC, in case you have several, to use. After you answer few questions, the installer will announce that the Virtual Network Computing (VNC) is up and that the graphical installation has started. You need to manually connect your vnc client to `<hostname:1>` (IPADDR) to begin the install, such as, `<IPADDR:1>` depending on whether a hostname has been set by DHCP.

Press Enter for a shell to start the graphical installation.

10. Connect to the installer's VNC server from another machine, similar to the following:

```
vncviewer IPADDR:1
```

You should now be able to continue the installation, in graphic mode, from within the VNC session.

11. Once the installation complete and the system rebooted, stop at the **GRUB** menu, enter **a** to modify the kernel boot `cmdline` parameter and add `virtefi` option to it.

Note: If you do not add the `virtefi` parameter the kernel will panic.

12. Once the system booted, edit the `/etc/grub.conf` file, which is a symlink to `/boot/efi/EFI/redhat/grub.conf` to make the change permanent.

To enable a remote console to your UV Altix system, see “Enabling a Remote Console” in Chapter 3 of the *SGI Altix UV System Management Node Administrator’s Guide*.

Enabling the BaseIO VGA

This chapter describes how to use the SGI KVM console to enable the Base IO video graphics array (VGA).

Enabling BaseIO VGA

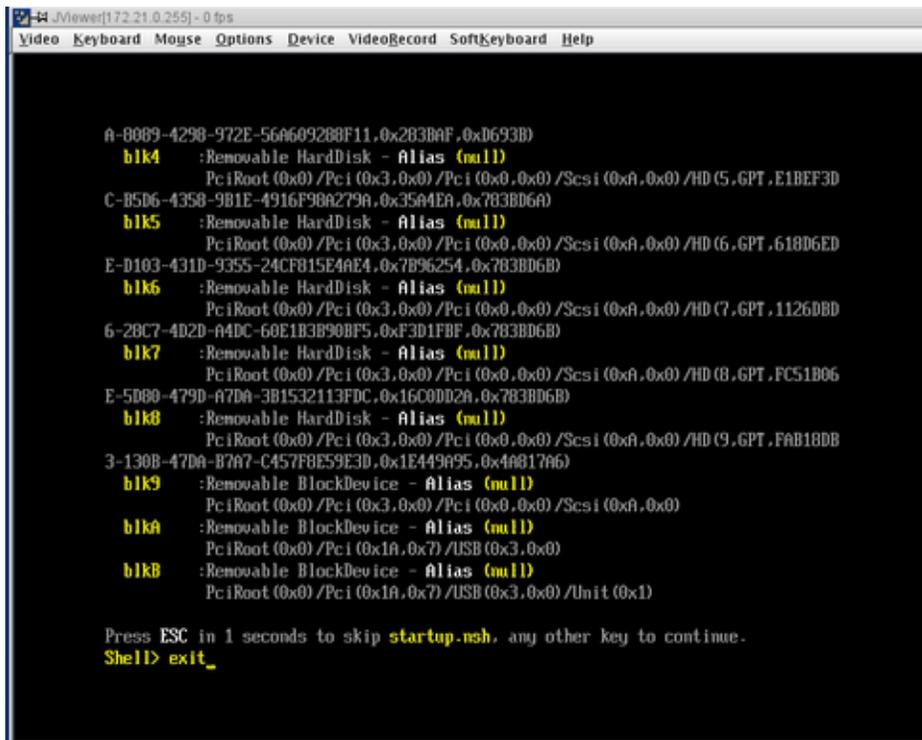
This section walks you through steps to enable BaseIO VGA on an SGI Altix UV 100 or an SGI Altix UV 1000 system.

Procedure 2-1 Enabling BaseIO VGA

To enable BaseIO VGA, perform the following steps:

1. From the Linux **Shell**> prompt, as shown in Figure 2-1 on page 28, enter the `exit` command. When you are using a VGA console, this will drop you into the SGI KVM console system setup screens. If you are using a serial console to the system chassis manager controller (CMC), you will go directly into the **Device Manager** setup screens.

2: Enabling the BaseIO VGA



```
JViewer[172.21.0.255] - 0 fps
Video Keyboard Mouse Options Device VideoRecord SoftKeyboard Help

A-8009-4298-972E-56A609288F11,0x283BAF,0xD693B)
b1k4 :Removable HardDisk - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (5,GPT,E1BEF3D
C-B5D6-4358-9B1E-4916F98A279A,0x35A4EA,0x783BD6A)
b1k5 :Removable HardDisk - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (6,GPT,618D6ED
E-D103-431D-9355-24CF815E4AE4,0x7B96254,0x783BD6B)
b1k6 :Removable HardDisk - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (7,GPT,11260BD
6-28C7-4D2D-A4DC-60E1B3B90BF5,0xF3D1FBF,0x783BD6B)
b1k7 :Removable HardDisk - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (8,GPT,FC51B06
E-5D00-479D-A7DA-3B1532113FDC,0x16C0DD2A,0x783BD6B)
b1k8 :Removable HardDisk - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (9,GPT,FAB18DB
3-130B-47DA-B7A7-C457F8E59E3D,0x1E449A95,0x4A817A6)
b1k9 :Removable BlockDevice - Alias (null)
      PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0)
b1kA :Removable BlockDevice - Alias (null)
      PciRoot (0x0) /Pci (0x1A,0x7) /USB (0x3,0x0)
b1kB :Removable BlockDevice - Alias (null)
      PciRoot (0x0) /Pci (0x1A,0x7) /USB (0x3,0x0) /Unit (0x1)

Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> exit_
```

Figure 2-1 KVM JViewer Shell Prompt with `exit` Command Screen

2. From the SGI KVM Console, as shown in Figure 2-2 on page 29, hit [Space] for the Boot Menu.



Figure 2-2 SGI KVM Console Screen

3. From the boot manager screen, select **Device Manager**, as shown in Figure 2-3 on page 30.

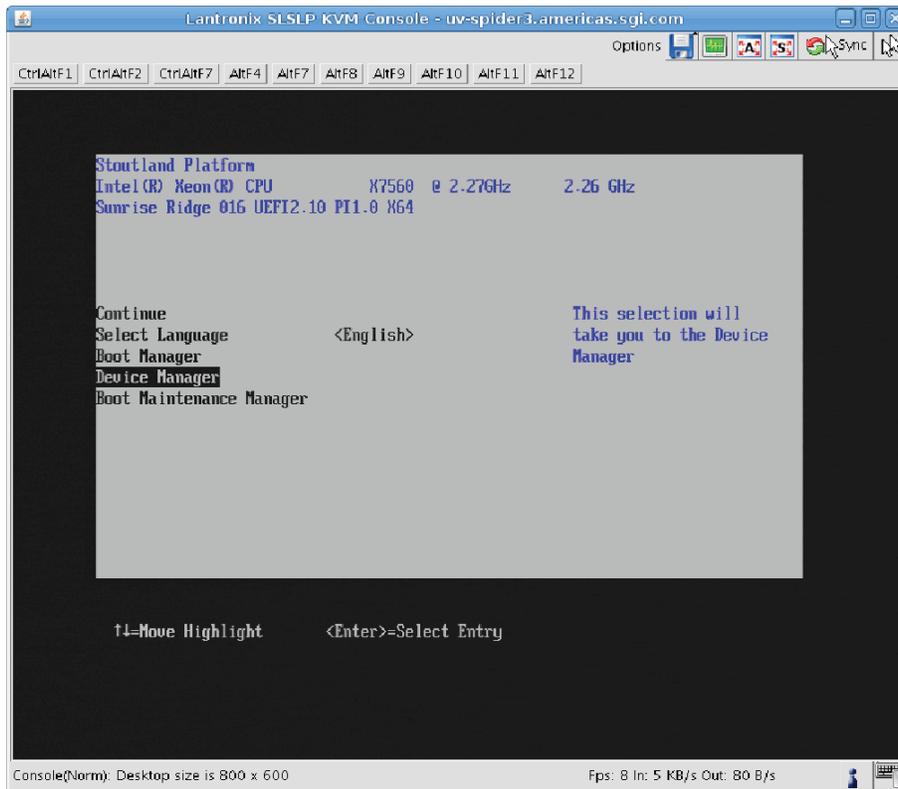


Figure 2-3 Device Manager Boot Manager Selection

4. From the **Device Manager** screen, as shown in Figure 2-4 on page 31, select **Advanced**.

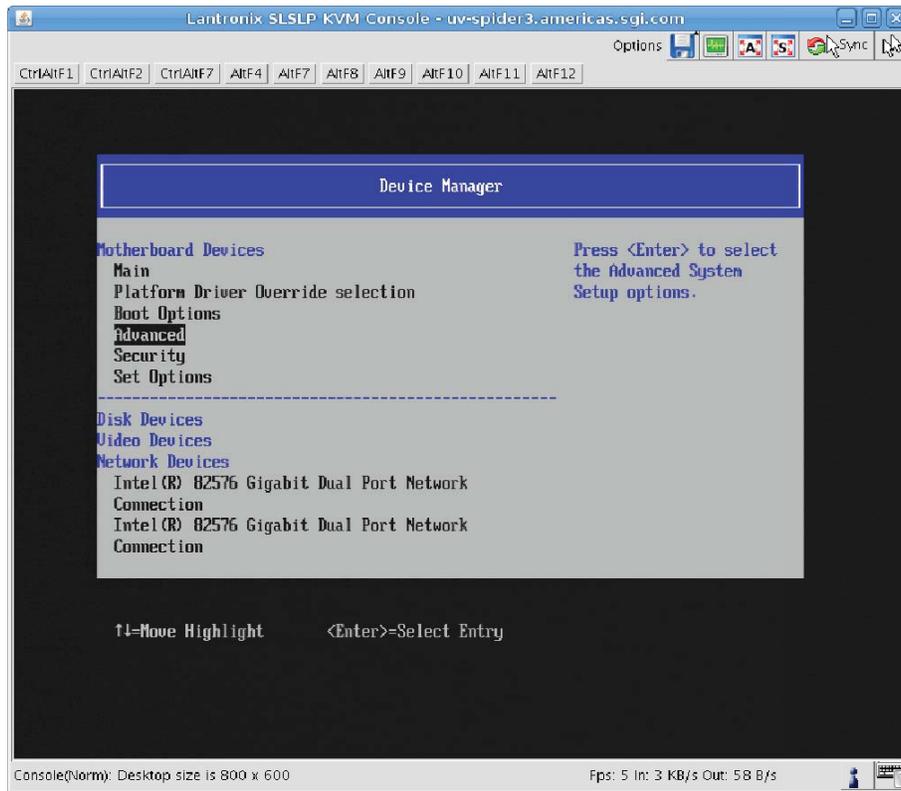


Figure 2-4 Device Manager Screen

5. From the **Advanced** screen, select **Miscellaneous Configuration**, as shown in Figure 2-5 on page 32.

2: Enabling the BaseIO VGA

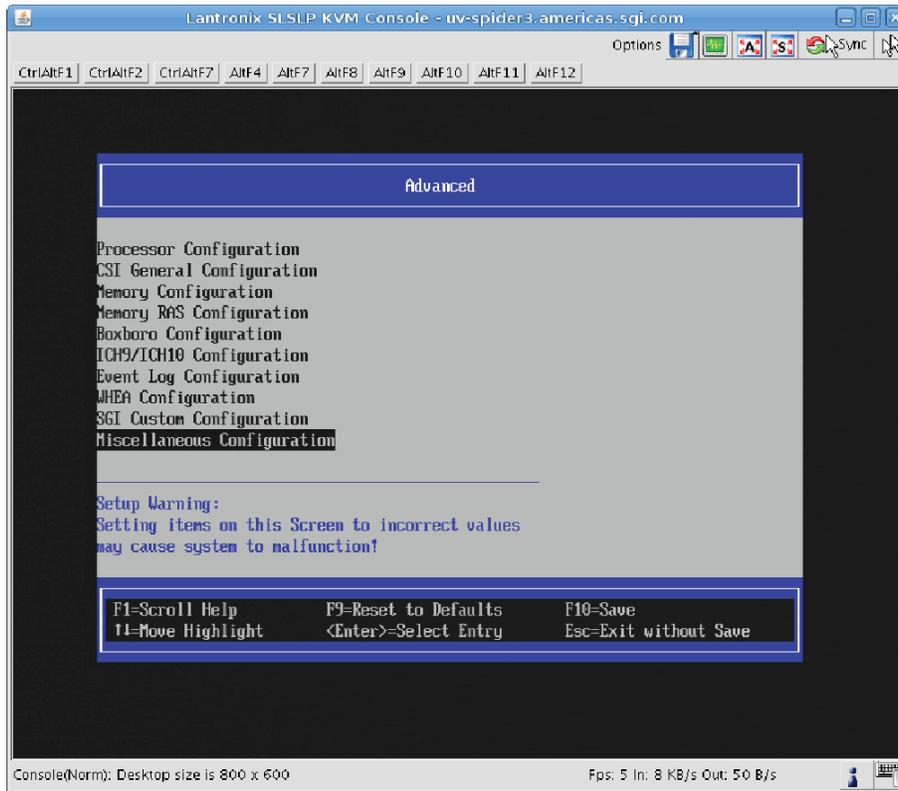


Figure 2-5 Advanced Boot Setup Screen

6. From the **Miscellaneous Configuration** screen, as shown in Figure 2-6 on page 33, for **Active Video** select **<Onboard Device>**.

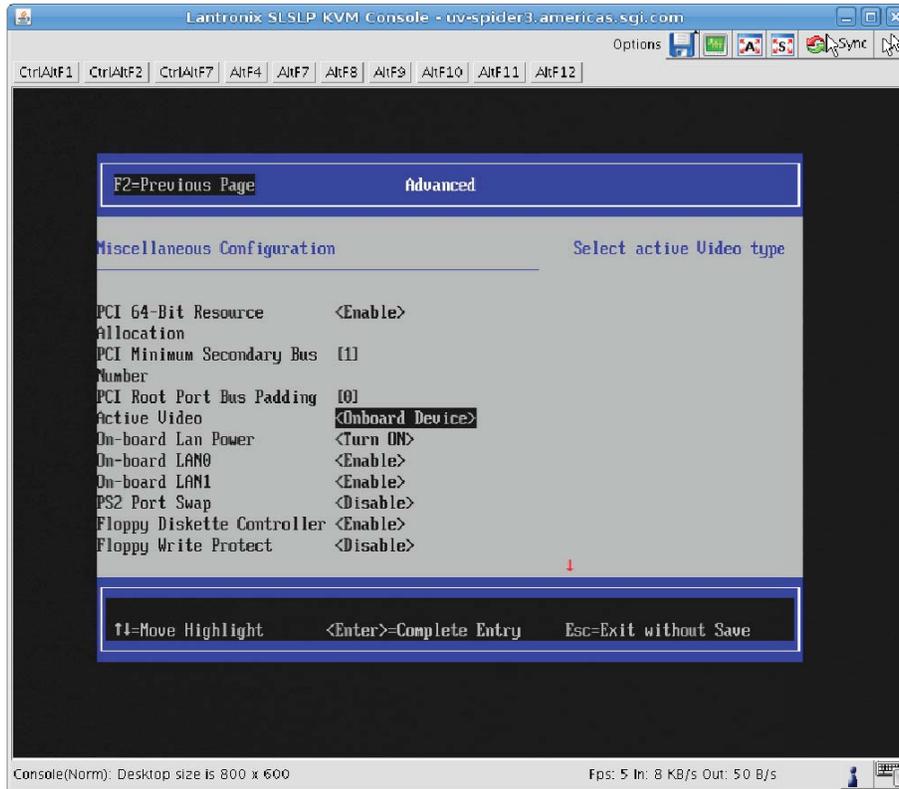


Figure 2-6 Miscellaneous Configuration Screen

7. From the **Active Video** pop-up menu, select **Onboard Device**, as show in Figure 2-7 on page 34.

2: Enabling the BaseIO VGA

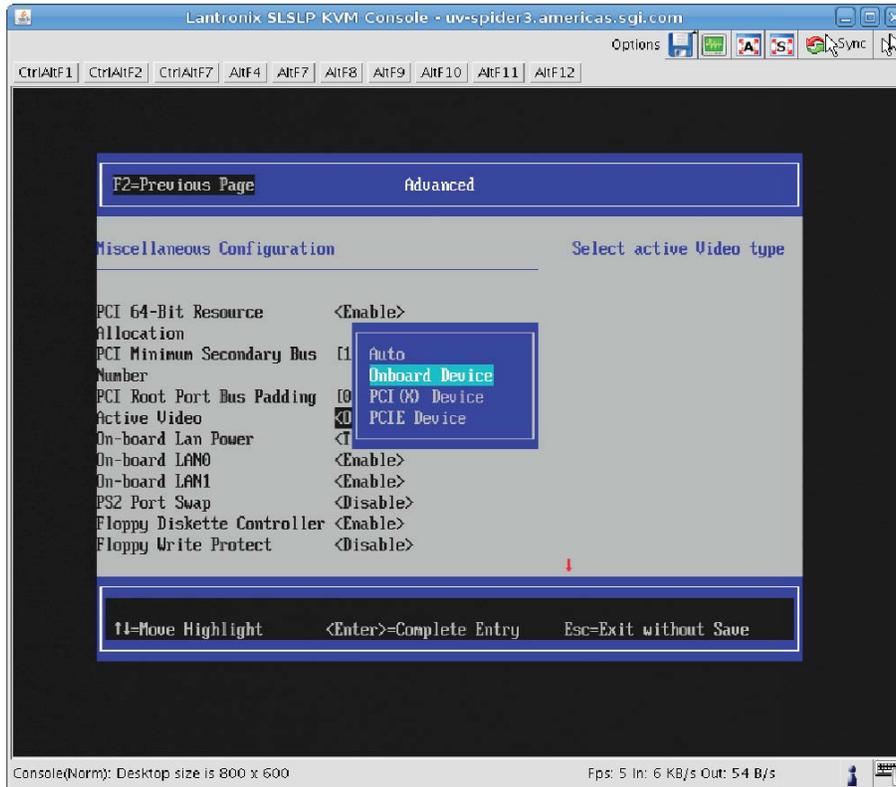


Figure 2-7 Active Video Pop-up Menu

8. Save your configuration changes, exit KVM, and reboot your system.
9. Launch the YaST2 System Configuration Editor shown in Figure 2-8 on page 35.

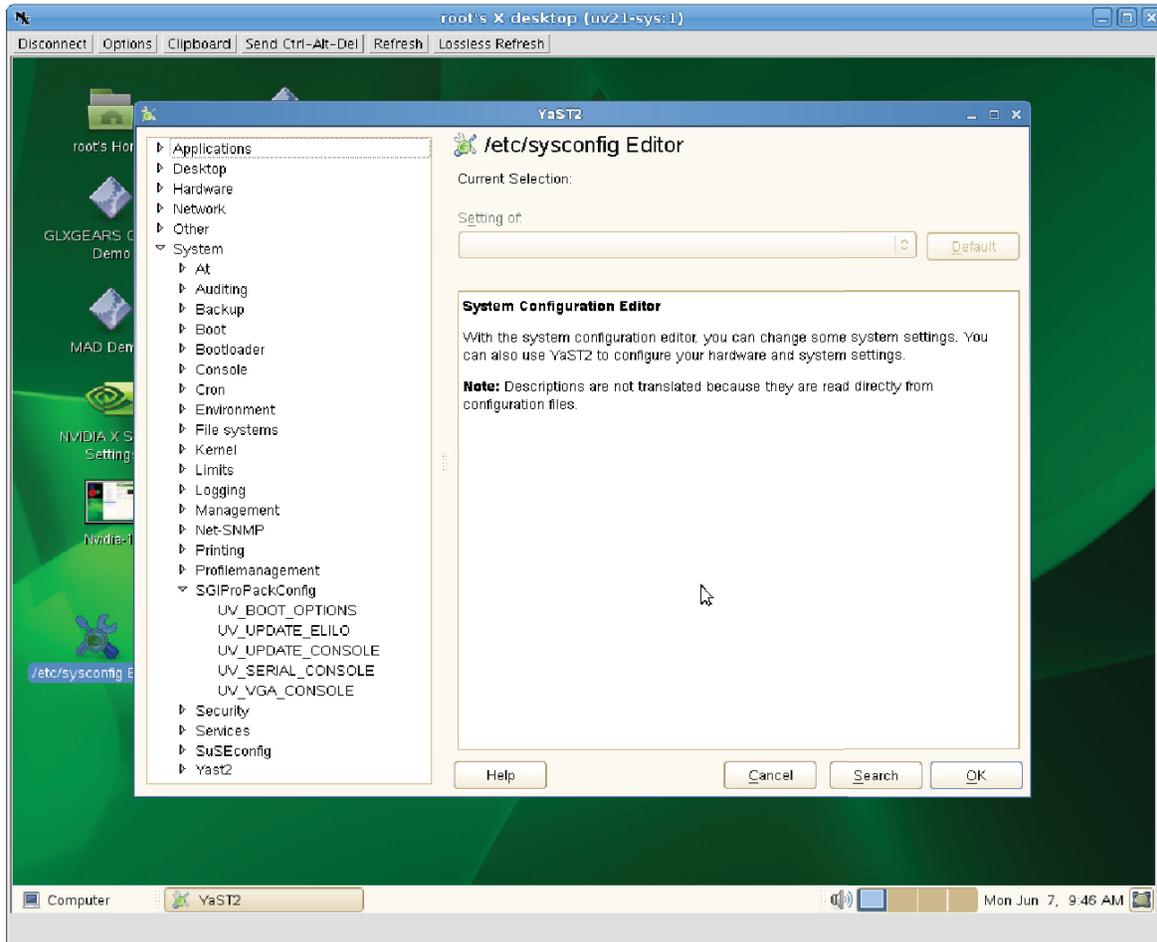


Figure 2-8 YaST2 System Configuration Editor Screen

10. Specify that the Altix UV BaseIO VGA device be added to the kernel boot cmdline, as shown in Figure 2-9 on page 36.

2: Enabling the BaseIO VGA

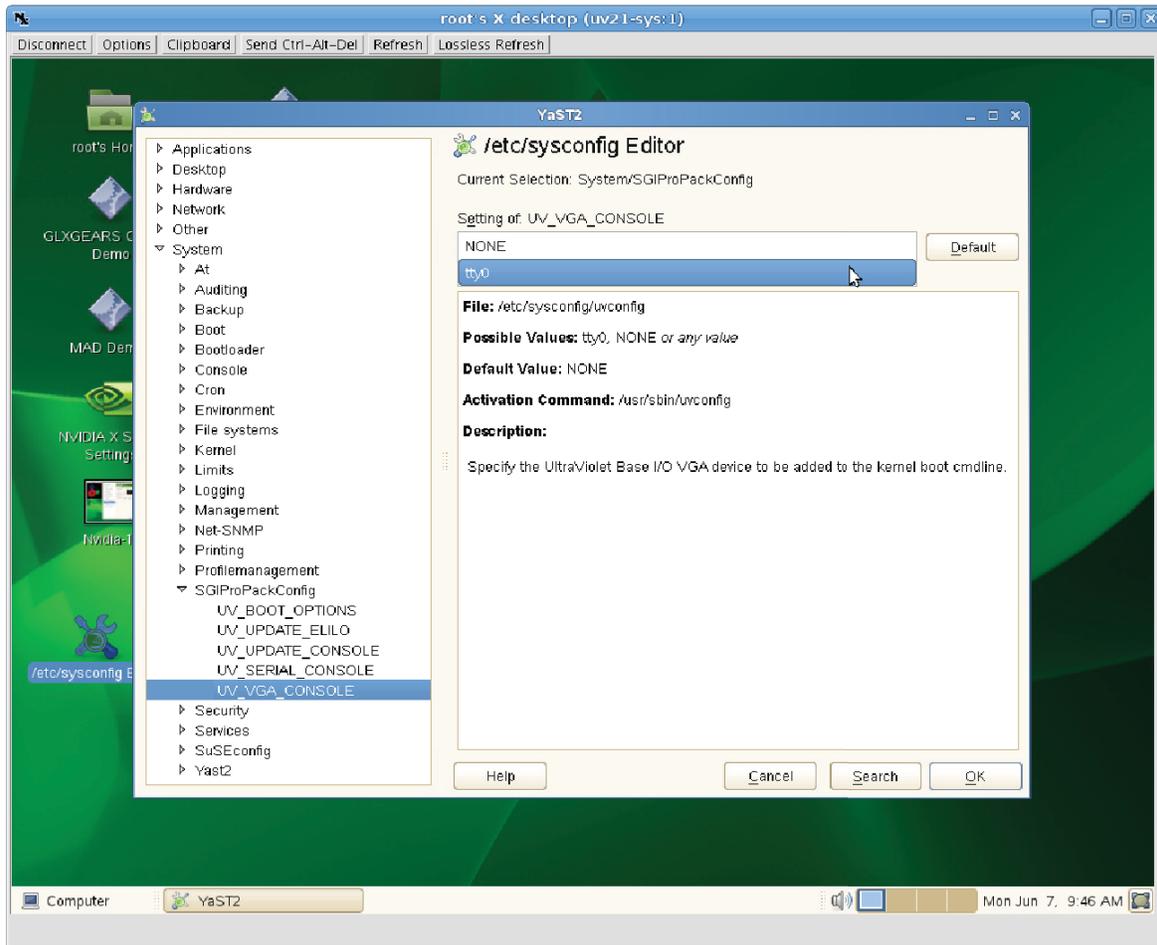


Figure 2-9 UV_VGA_Console Selection

11. When the **Modified Variables** screen appears, as shown in Figure 2-10 on page 37, click **OK** to save your changes.

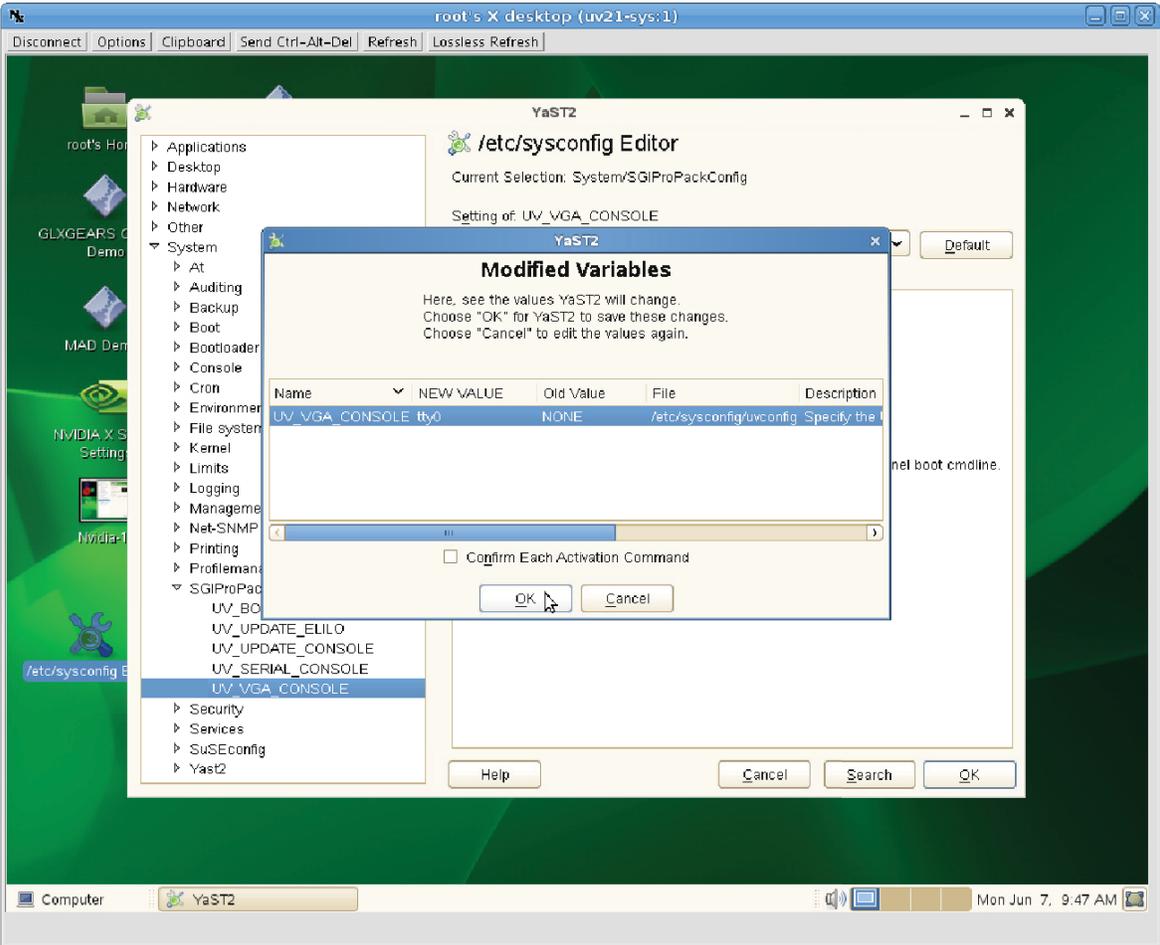


Figure 2-10 YAST 2 /etc/sysconfig Editor Modified Variables Screen

Using the EFI Utility to Manage System Booting

This chapter describes how to use the Extensible Firmware Interface (EFI) utility to manage system booting and covers the following topics:

- "Bootting Using iSCSI Protocol" on page 39
- "Bootting from Fibre Channel Disk" on page 45

Bootting Using iSCSI Protocol

This section walks you through steps to enable your SGI Altix UV system to boot using iSCSI protocol.

Procedure 3-1 Bootting Using iSCSI Protocol

To setup your SGI Altix UV system to boot using iSCSI protocol, perform the following steps:

1. From the EFI **Shell**> prompt, enter the `exit` command and the boot manager screen appears.
2. From the boot manager screen, select **Device Manager**, see Figure 2-3 on page 30.
3. From the **Device Manager** screen, as shown in Figure 3-1 on page 40, select **iSCSI Configuration**.

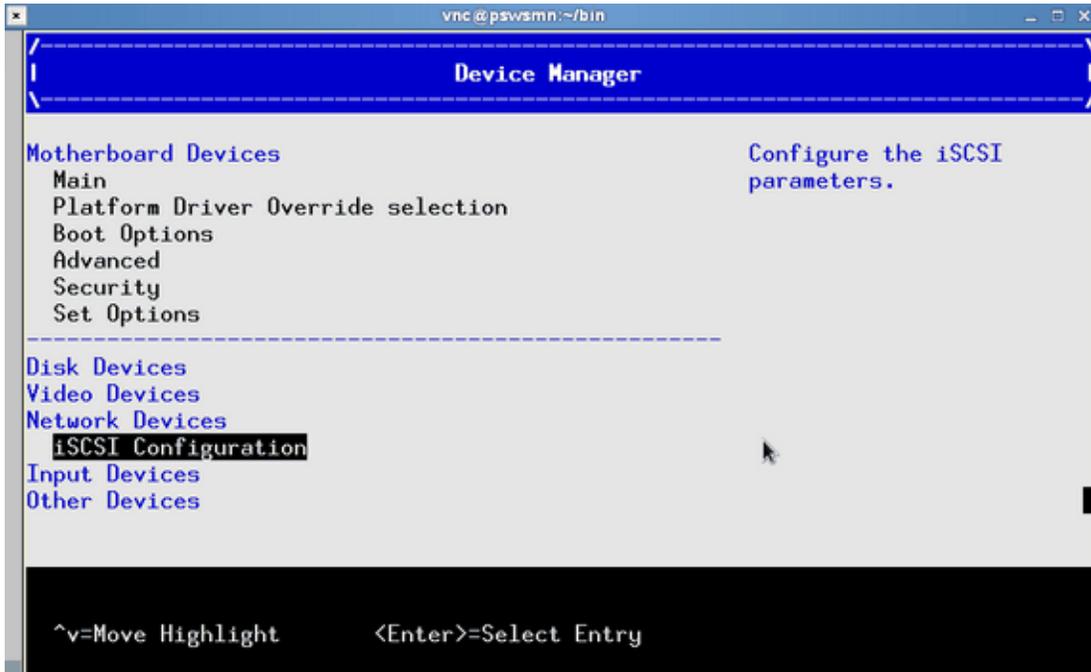


Figure 3-1 Device Manager iSCSI Configuration Screen

4. On the **iSCSI Configuration** screen, as shown in Figure 3-2 on page 41, enter a worldwide unique **iSCSI Initiator Name** for your initiator.

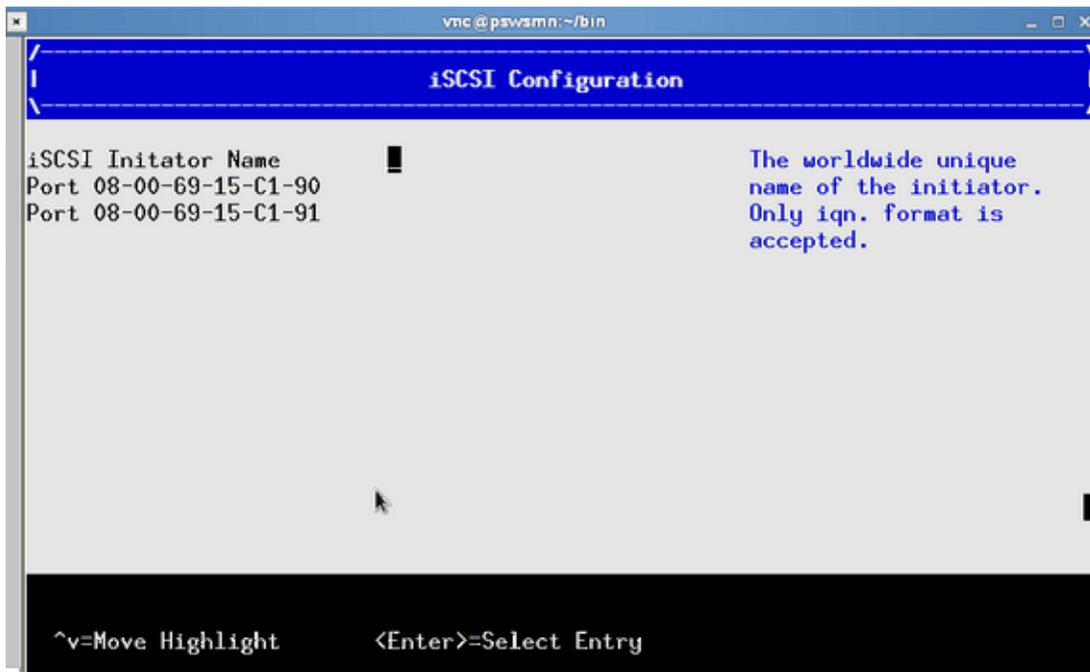


Figure 3-2 iSCSI Configuration Screen 1 of 4

5. Select the MAC address of the port you want to configure and enter it into that menu, as shown in Figure 3-3 on page 42. The **Enable iSCSI** option **iSCSI Configuration** screen appears, as shown in Figure 3-4 on page 43.

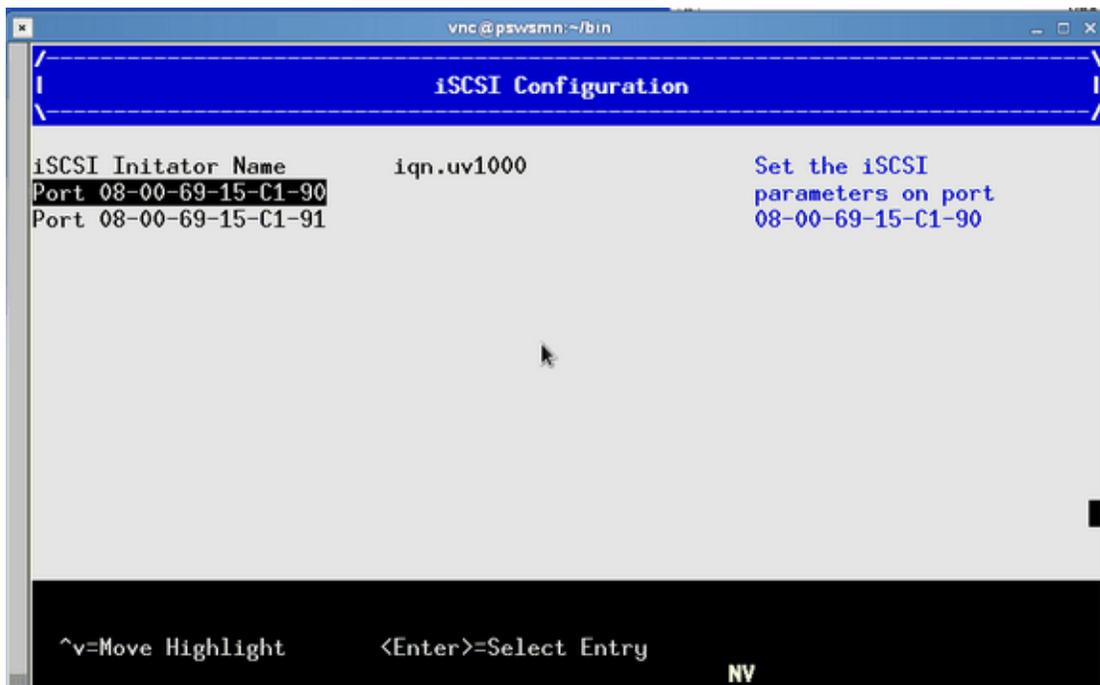


Figure 3-3 iSCSI Configuration 2 of 4 Screen



Figure 3-4 iSCSI Configuration 3 of 4 Screen

6. Enable iSCSI on the port (see Figure 3-5 on page 44). If you are using DHCP to get your initiator's IP address, enable DHCP, otherwise enter the Initiator's IP address, Subnet address and Gateway. Also enter the **Target Name** of the iSCSI target along with the IP address of the **Target**. Then enter the **Target Port** and **Boot LUN**. Save your changes.



Figure 3-5 iSCSI Configuration 4 of 4 Screen

7. Reboot the BIOS. On reboot your iSCSI target will show up in the EFI map (**fs0** in this example):

```

EFI Shell version 2.10 [4096.11]
Current running mode 1.1.2
Device mapping table
fs0      :HardDisk - Alias hd22aiaagjbfmbja8010215484a801021516210ffk1 blk0
          PciRoot(0x0)/Pci(0x1,0x0)/Pci(0x0,0x0)/MAC(08006915C190,0x0)/IPv4(128
          .162.241.42,TCP,DHCP,128.162.244.132)/iSCSI(iqn.2010-06.sgi.americas:efb1a580-88
          c6-4b75-abb0-6376dcf284eb,0x1,0x0,None,None,None,TCP)/HD(1,MBR,0x00054FFB,0x40,0
          x1FFFC0)
fs1      :HardDisk - Alias hd137bowjcwipaegxc0b blk1
          PciRoot(0x2)/Pci(0x3,0x0)/Pci(0x0,0x1)/Fibre(0x21000011C61DD831,0x0)/
          HD(1,GPT,D3719E17-3DBC-41E8-AD60-C57C9020766B,0x1000,0xF9001)
fs2      :Removable HardDisk - Alias hd25a0b blk2
          PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(1,GPT,01B74A5
          0-5E4D-4E55-B080-EA57E95519A5,0x22,0xD6919)
fs3      :Removable HardDisk - Alias hd25a0c blk3
          PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(2,GPT,7189C05
          E-EEF2-4AD9-BB28-2FEFB3F3676A,0xD693B,0xD693A)
fs4      :Removable HardDisk - Alias hd25a0d blk4
          PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x0,0x0)/HD(3,GPT,BE14BC8
          F-EF92-41EE-B6A9-12219273D9D6,0x1AD275,0xD693A)
blk0     :HardDisk - Alias hd22aiaagjbfmbja8010215484a801021516210ffk1 fs0
          PciRoot(0x0)/Pci(0x1,0x0)/Pci(0x0,0x0)/MAC(08006915C190,0x0)/IPv4(128

```

Figure 3-6 EFI Shell Device Mapping Table Screen

Booting from Fibre Channel Disk

This section walks you through steps to enable your SGI Altix UV 100 or SGI Altix UV 1000 system to boot using Fibre Channel disk.

Procedure 3-2 Booting Using Fibre Channel Disk

Note: To boot from Fibre Channel disk, your SGI Altix UV system firmware must be BIOS version 1.34 or later.

To setup your SGI Altix UV system to boot using Fibre Channel disk, perform the following steps:

1. In order to boot from a Qlogic Fibre Channel disk on an SGI Altix UV 100 or SGI Altix UV 1000 system, the `ProcessEfiOpRoms` EFI environment variable needs to be set. Use the EFI `set` command, as shown in Figure 3-7 on page 46.

Note: You need to reset the BIOS for the variable change to take affect.

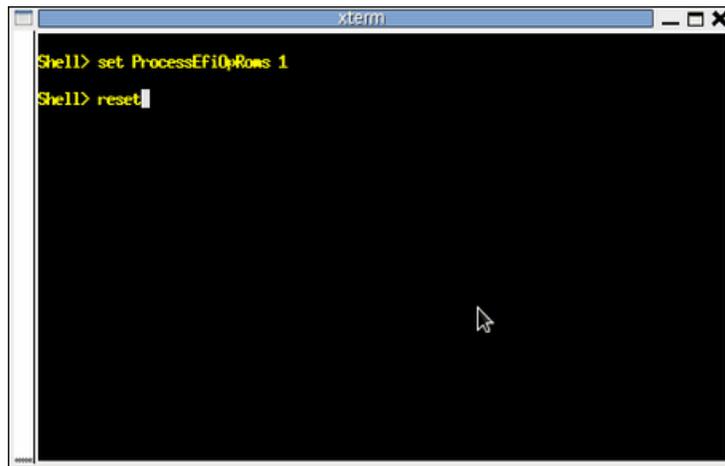


Figure 3-7 EFI Shell Prompt Showing `set` Command

2. Use the EFI `drivers` command to verify that the QLogic Fibre channel driver is being loaded after the EFI reset, as shown in Figure 3-8 on page 47.

```

Shell> drivers
=====
# DRIVER NAME                                IMAGE NAME
-----
5B 00000001 ? - - - ICH Serial ATA Controller Initializ SataController
CF 03040000 B X X 1 2 LSI Logic Fusion MPT SAS Driver ebscas
D0 03090500 B X X 2 2 Intel(R) PRO/1000 3.9.05 PCI-E Gigbndi
D2 0000000A D - - 2 - Simple Network Protocol Driver SNP
D3 0000000A B - - 2 6 NMP Network Service Driver Nmp
D4 0000000A D - - 2 - ARP Network Service Driver Arp
D5 0000000A B - - 2 14 IP4 Network Service Driver Ip4
D6 0000000A D - - 2 - IP4 CONFIG Network Service Driver Ip4Config
D7 0000000A B - - 12 10 UDP Network Service Driver Udp4
D8 0000000A D - - 2 - Tcp Network Service Driver Tcp4
D9 0000000A B - - 2 2 DHCP Protocol Driver Dhcp4
DA 0000000A B - - 4 2 NTFTP4 Network Service Mtftp4
DB 0000000A D - - 8 - UEFI PXE Base Code Driver UefiPxeBc
DC 0000000A ? - - - iSCSI Driver IScsi
E1 00000003 ? - - - BIOS[INT13] Block Io Driver BiosBlockIo
E2 00000003 B - - 1 1 BIOS[INT10] Video Driver BiosVideo
E3 00000003 ? - - - BIOS[UNDI] Simple Network Protocol BiosSnipIS
E5 0000000A D - - 2 - Platform Console Management Driver ConPlatform
E6 0000000A D - - 3 - Platform Console Management Driver ConPlatform
E7 0000000A B - - 3 3 Console Splitter Driver ConSplitter
E8 0000000A B - - 2 2 Console Splitter Driver ConSplitter
E9 0000000A B - - 2 2 Console Splitter Driver ConSplitter
EA 0000000A ? - - - Console Splitter Driver ConSplitter
EE 0000000A D - - 1 - Graphics Console Driver GraphicsConsole
EF 0000000A B - - 2 2 Serial Terminal Driver Terminal
F0 0000000A ? - - - VGA Class Driver VgaClass
F1 0000000A D - - 35 - Generic Disk I/O Driver DiskIo
F4 0000000A D - - 6 - FAT File System Driver Fat
FC 0000000A ? - - - AHCI Bus Driver Ahci
FD 0000000A ? - - - PCI IDE/ATAPI Bus Driver IdebUs
100 0000000A B - - 1 3 ISA Bus Driver IsaBus
101 00000010 B - - 2 2 <UNKNOWN> IsaSerial
102 0000000A ? - - - ISA Floppy Driver LegacyFloppy
103 0000000A ? - - - PCI Serial Driver PciSerial
104 00000001 D - - 1 - PilotII and National(R) PC8374 SIO PilotIIPc8374
105 0000000A B - - 10 23 Partition Driver(MBR/GPT/El Torito) Partition
106 0000000A B - - 2 84 PCI Bus Driver PciBus
10F 00000011 D - - 1 - Usb Mass Storage Driver UsbMassStorage
110 0000000A B - - 3 10 SCSI Bus Driver ScsiBus
111 0000000A D - - 8 - Scsi Disk Driver ScsiDisk
11F 00000010 D - - 2 - Usb Keyboard Driver UsbKb
121 00000010 D - - 2 - Usb Mouse Driver UsbMouse
123 00000020 D - - 2 - UEFI Usb Ehci Driver Ehci
125 00000020 D - - 6 - UEFI Usb Uhci Driver Uhci
127 00000018 B - - 8 7 USB Bus Driver UsbBus
173 00000227 D X X 1 - QLogic Fibre Channel Driver MemoryMapped(0xB,0
175 00000227 D X X 1 - QLogic Fibre Channel Driver MemoryMapped(0xB,0
Shell>

```

Figure 3-8 EFI Shell drivers Command

3. A disk needs to have a bootable partition in order to show up as an `fs#` entry in the EFI map. If it does not have a bootable partition it will show up as a `blk#` entry. You can use the `map` command to verify `fs0` is booting the system from Fibre channel disk.

```
root@uvmid1-sys:~
Shell>
Shell> map
Device mapping table
fs0      :HardDisk - Alias hd78b0c0e6ksrww0b blk0
         :PciRoot(0x1)/Pci(0x7,0x0)/Pci(0x0,0x0)/Fibre(0x22000004CFB459D5,0x0)/
         HD(1,GPT,683854B8-E798-4E24-A8F2-4B6B73E8F1C,0x22,0xD6919)
fs1      :Removable HardDisk - Alias hd27b0b blk1
         :PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(1,GPT,8E33956
         F-F484-4A86-A9E9-02BF71F4DBFC,0x22,0xD6919)
fs2      :Removable HardDisk - Alias hd27b0c blk2
         :PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(2,GPT,4B4832B
         4-B41E-43B3-8B5A-ADE70D4F033E,0xD693B,0xD693A)
fs3      :Removable HardDisk - Alias hd27b0d blk3
         :PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(3,GPT,7D16745
         E-0431-4205-B12A-B82131BE8B22,0x1AD275,0xD693A)
fs4      :Removable HardDisk - Alias hd27b0e blk4
         :PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(4,GPT,1D235AA
         2-B72C-4395-BD9A-7069EE432E99,0x283BAF,0xD693B)
fs5      :Removable HardDisk - Alias hd27b0k blk5
         :PciRoot(0x0)/Pci(0x3,0x0)/Pci(0x0,0x0)/Scsi(0x1,0x0)/HD(10,GPT,78054F
         8C-AB95-4451-95E6-6F52F1F22CDA,0x4595800,0x64000)
blk0     :HardDisk - Alias hd78b0c0e6ksrww0b fs0
         :PciRoot(0x1)/Pci(0x7,0x0)/Pci(0x0,0x0)/Fibre(0x22000004CFB459D5,0x0)/
         HD(1,GPT,683854B8-E798-4E24-A8F2-4B6B73E8F1C,0x22,0xD6919)
```

Figure 3-9 EFI Shell map Command Showing Device Mapping Table

4. The `EFIUtilx64.efi` command can be used to configure Qlogic Fiber Channel to EFI boot. The `EFIUtilx64.efi` utility can be downloaded from <http://www.qlogic.com/Pages/default.aspx>. Figure 3-10 on page 49 shows the `EFIUtilx64.efi` utility.

```

xterm
Fs1:\efi> EfiUtilx64.efi

Fibre Channel Card Efi Utility  2.92  (06/14/2010)

2 Fibre Channel Adapters found:

Adapter      MWN          Driver Firmware      Path
AO           2100001B329BED3D  2.27  5.03.06  PciRoot(0x1)/Pci(0x7,0x0)/Pci(0x0,0x0)
AI           2101001B32BBED3D  2.27  5.03.06  PciRoot(0x1)/Pci(0x7,0x0)/Pci(0x0,0x0)

EfiUtilx64.efi> help
EfiUtilx64.efi interactive mode commands:
adapter      Select adapter
configure    EFI configuration protocol
diagnostics  EFI diagnostics protocol
info         Display adapter info
luns         Display lun inquiry strings
lun_names    Display lun world wide unique names
lun_paths    Display lun paths
lun_attribs  Display lun attributes
directory    Display directory of flash contents
efi_read     Read driver image from flash to file
efi_write    Write driver image to flash from file
efi_verify   Verify driver image in flash from file
restore_nvdefault Restore nvrAm default from existing BIOS image
nvrAm_read   Read image from nvrAm to file
nvrAm_write  Write image to nvrAm from file
nvrAm_verify Verify image in nvrAm from file
risc_fw_read Read risc image from flash to file
risc_fw_write Write risc image to flash from file
risc_fw_verify Verify risc image in flash from file
vpd_display  Display vpd information
vpd_print    Print detailed vpd information
sfp_dump     Dump SFP raw data from HBA
sfp_print    Print user-friendly SFP data from HBA
force        Overwrite flash image
noforce      Don't overwrite flash if flash image & new image is same
log          Enable logging
help         Display help
quit         Quit from utility

EfiUtilx64.efi>

```

Figure 3-10 Fibre Channel Card EFI Utility (EfiUtilx64.efi)

- The change to the `ProcessEfiOpRoms` EFI environment variable is persistent as the system is rebooted. To clear it, use the `set -d` option, as follows:

```

Shell> set -d ProcessEfiOpRoms
Shell> reset

```

You can also clear the EFI variables from either the CMC or BMC, as follows:

```

cmc>power -c

```

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