



**SGI® Altix® UV System Management
Node Administrator's Guide**

007-5694-002

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New Features in This Manual

This rewrite of the *SGI Altix UV System Management Node Administrator's Guide* supports the SGI Foundation Software 2.3 release.

Major Documentation Changes

Performed the following:

- Updated installation instructions in Chapter 1, "System Management Node Software Installation and Operation" on page 1.
- Added "SMN Firewall Capabilities" on page 32.
- Added Chapter 4, "Simple Network Management Protocol" on page 53.

Record of Revision

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001	October 2010 Original Printing.
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About This Manual

This manual describes the system management node (SMN) for SGI Altix UV 1000 and SGI Altix UV 100 series systems.

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 Foundation Software 2.3 Start Here*

Provides information about the SGI Foundation Software 2.3 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 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

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System Management Node Software Installation and Operation

This chapter describes the system management node (SMN), how to install software on the SMN, and software operation. It covers these topics:

- "System Management Node Software Requirements" on page 1
- "System Management Node" on page 2
- "System Management Node Software Installation" on page 10
- "Installing SLES 11 SP1 and SGI Foundation 2.3 Software" on page 20
- "Installing and Configure RHEL 6 and SGI Foundation 2.3 Software" on page 23
- "SGI Management Center Software Installation" on page 26
- "Updating Firmware" on page 27

An SMN is generally required for SGI Altix UV 1000 series systems and are optional with SGI Altix UV 100 systems.

System Management Node Software Requirements

The SMN requires the following software components:

- SUSE Linux Enterprise Server 11 Service Pack 1 (SLES 11 SP1) or Red Hat Enterprise Linux 6 (RHEL 6)
- SGI Foundation Software 2.3
- SGI System Management Software bundle

Note: SGI Management Center (SMC) software is optional for provisioning, installing, configuring, operating, and monitoring SGI Altix UV 1000 and 100 series systems. The *SGI Management Center System Administrator's Guide* provides information on using the GUI to administer your Altix UV system.

System Management Node

Both Altix UV 100 and 1000 system individual rack units (IRUs) use an embedded chassis management controller (CMC). The CMC communicates with both the blade-level board management controllers (BMCs) and the system management node (SMN). These components are generically known as the system control network. Remote administration requires that the SMN be connected by an Ethernet connection to a private or public Local Area Network (LAN).

The SMN can run SGI Management Center software. The *SGI Management Center System Administrator's Guide* provides information on using the GUI to administer your Altix UV 100 or Altix UV 1000 system.

For information on the CMC, see *SGI UV CMC Controller Software User's Guide*, *SGI Altix UV 100 System User's Guide*, or *SGI Altix UV 1000 System User's Guide*.

This chapter describes the system management node and covers the following topics:

- "System Control Network Overview" on page 2
- "System Management — Physical Connections" on page 4
- "System Management Node Command Line Interface" on page 5

System Control Network Overview

The system control network configuration of your server will depend on the size of the system and control options selected. Typically, an Ethernet LAN connection to the system controller network is used.

The SMN is a separate stand-alone server installed in the SGI Altix UV 1000 rack (see Figure 1-1 on page 3). The SMN can be installed at the top of a UV rack or in one of the four 1U slots between the individual rack units (IRU), as shown in Figure 1-4 on page 11. The SMN acts as a gateway and buffer between the Altix UV system control network and any other public or private local area networks. The Altix UV system control network will generally include the following three areas:

- The system management node (SMN)
- The chassis management controllers (CMC) boards - one or two per IRU
- The individual blade-based board management controllers (BMC) - report to the CMCs



Warning: The SGI Altix UV system control network is a private, closed network. It should not be reconfigured in any way to change it from the standard SGI Altix UV factory installation. It should not be directly connected to any other network. The Altix UV system control network is not designed for and does not accommodate additional network traffic, routing, address naming (other than its own schema), or DHCP controls (other than its own configuration). The Altix UV system control network also is not security hardened, nor is it tolerant of heavy network traffic, and is vulnerable to Denial of Service attacks.

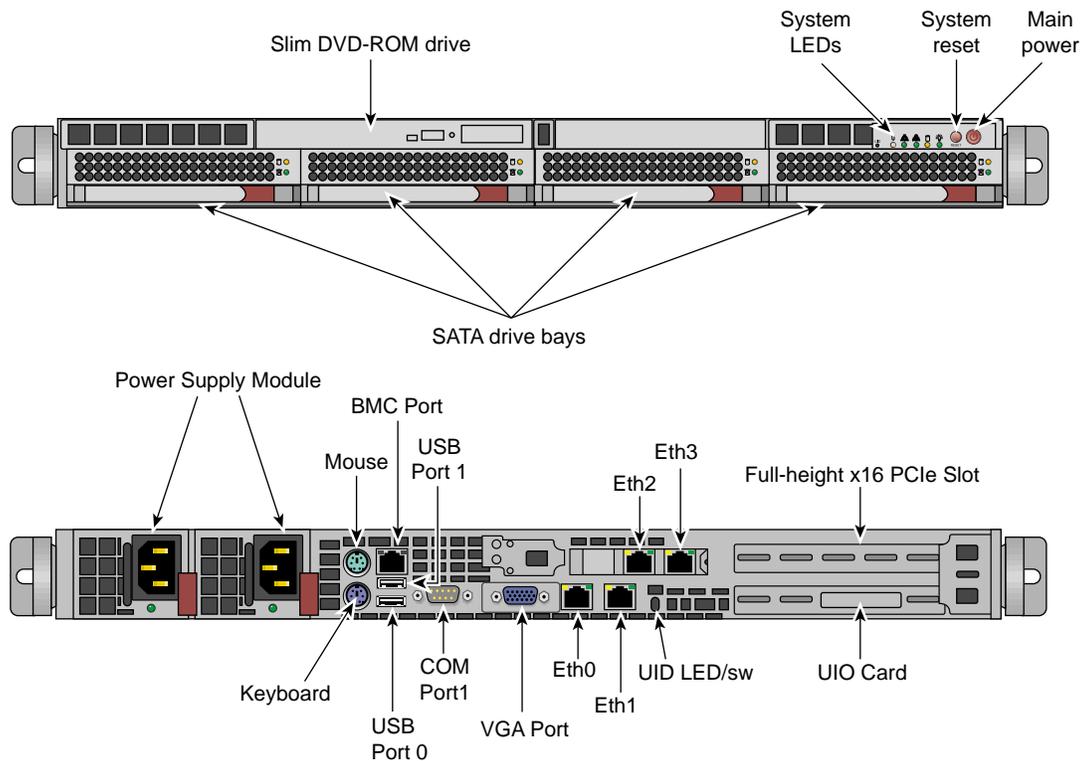


Figure 1-1 System Management Node Front and Rear Panels

In all Altix UV 1000 servers all the system controller types (SMNs, CMCs and BMCs) communicate with each other in the following ways:

- System control commands and communications are passed between the SMN and CMCs via a private dedicated Gigabit Ethernet. The CMCs communicate directly with the BMC in each installed blade by way of the IRU's internal backplane.
- All the CMCs can communicate with each other via an Ethernet "string" configuration network.
- In larger configurations the system control communication path includes a private, dedicated Ethernet switch.

An Ethernet connection directly from the SMN to a local private or public Ethernet allows the system to be administered directly from a local or remote console via the SGI Management Center interface (most often installed on the SMN). Note that there is no direct inter-connected system controller function in the optional expansion PCIe modules.

For more detailed information on the SMN, see "System Management Node Ethernet Ports" on page 30.

System Management — Physical Connections

Each IRU contains a chassis management controller (CMC). Each CMC has seven Ethernet connectors that connect internally to the 48-port Ethernet switch (see Figure 1-2 on page 4).

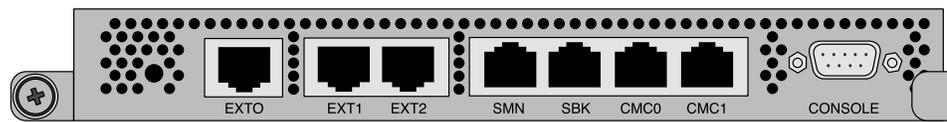


Figure 1-2 Chassis Management Controller

The Ethernet ports are used as follows:

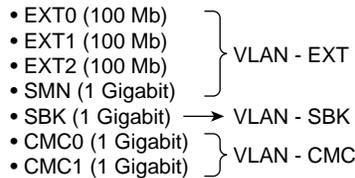


Figure 1-3 CMC Ethernet Port Usage

The CMC0 and CMC1 jacks are used to connect all the CMCs in a ring.

The SBK jack is used to interconnect building blocks into another ring. Up to four building blocks may be interconnected creating a Super block (SBK). Using only the SBK jacks on the CMCs for these connections, connect a cable from a CMC in the first building block to a CMC in the second building block. Then select another CMC in the second building block and connect it to a CMC in the third building block (or back to a CMC in the first building block in the case of only two building blocks). To minimize network hops, its recommended that the two connections within a building block be in different racks (for redundancy) and that the two racks be adjacently cabled with respect to the CMC ring.

One system management node (SMN) is required for each system. Systems with more than one partition or more than one building block will require a GigE switch. Systems with more than one Super Block will require two GigE switches.

The SMN should be connected to the SMN jack in a CMC that also has an SBK connection. The SMN requires a GigE switch to support connections to two different Super Blocks.

The EXT[0,1,2] jacks are used for connections from the smart door controller, and so on. The SMN jack can be used for other in-rack devices if its available and all SMNs in the configuration are already connected. Only the primary CMC SMN ports are to be used.

System Management Node Command Line Interface

The UV command line interface is accessible by logging into either a system maintenance node (SMN) or chassis management controller (CMC).

Log in as `root`, when logging into the CMC, similar to the following:

```
# ssh root@hostname-cmc
SGI Chassis Manager Controller, Firmware Rev. 1.1.11

CMC:r1i1c>
```

Login as `sysco`, when logging into the SMN, similar to the following:

```
# ssh -X sysco@uv-system-smn
sysco@system-smn:~/hw>
```

Once a connection to the SMN or CMC is established, various system control commands can be entered.

SMN Specific CLI Commands

The following CLI command options are available specifically for the SMN:

<code>-h --help</code>	This help message.
<code>hh --help</code>	This help message + CLI help message.
<code>-q --quiet</code>	No diagnostic message.
<code>-s --system</code>	Select UV system. If only one system is present, this one is selected. Otherwise, this option is mandatory.
<code>-S --show depth</code>	Show nodes at depth ≥ 1 using optional supplied pattern. Default pattern= <code>*</code>
<code>-t --target</code>	One target in one of the two following formats: a. rack[/slot[/blade]] b. r{1..}{s i}{1..2}{b n}{0..15}]

Note: This format is NOT for `uvcli` only.

Examples:

`r1i02` = rack 1, slot 2

`r2i1b4` = rack 2, slot 1, blade 4

Select the target from the CLI command itself, or, if not available, using the `-t` option.

The following are examples of `uvcli` commands:

<code>uvcli --help</code>	This help.
<code>uvcli --leds --help</code>	Help on <code>leds</code> command.
<code>uvcli leds r1i1b4</code>	Show leds on BMC located at rack 1, slot1, blade 4.
<code>uvcli -t 1/1 leds</code>	Show leds on all BMCs in rack 1, slot 1.
<code>uvcli --leds -v r1i1</code>	Same as previous command but more verbose
<code>uvcli -S 1</code>	Show all system serial numbers.
<code>uvcli -S 1 '*part*'</code>	Show all system partitions.

List of Valid CLI Commands Used With the System Management Node (SMN)

The following list of available CLI commands are specifically for the SMN:

<code>auth</code>	Authenticate SSN/APPWT change
<code>bios</code>	Perform BIOS actions
<code>bmc</code>	Access the BMC shell
<code>cmc</code>	Access the CMC shell
<code>config</code>	Show system configuration
<code>console</code>	Access system consoles
<code>help</code>	List available commands
<code>hel</code>	Access hardware error logs
<code>hwcfg</code>	Access hardware configuration variable
<code>leds</code>	Display system LED values
<code>log</code>	Display system controller logs
<code>power</code>	Access pwer control/status
Enter <code><cmd> --help</code>	Get a help statement for individual commands

power command

The `power` command, also available on the chassis management controller (CMC), can be run from the SMN command line. When a `power` command is issued, it

checks to see if the individual rack units (IRUs) are powered on; if not on, the power command powers up the IRUs and then the blades in the IRU are powered on.

To see a help statement for the `power` command, perform the following:

```
uv45-smn:~ # power --help
```

```
usage: power [-vchosw] on|up [bmc] [--noio] [TARGET]...
on|up          turn power on
bmc           turn aux power on
--noio        do not power on accessories (IO)
-v, --verbose verbose output
-c, --clear   clear EFI variables (system/partition targets only)
-h, --hold    hold in reset
-o, --override override partition check
-s, --single  single node boot
-w, --watch   watch boot progress
```

```
usage: power [-vo] off|down [bmc] [--noio] [--nochassis] [TARGET]...
off|down      turn power off
bmc          turn aux power off
--noio       do not power off accessories (IO)
--nochassis  do not power off chassis power
-v, --verbose verbose output
-o, --override override partition check
```

```
usage: power [-vchosw] reset [bmc|iobmc] [TARGET]...
reset        system reset
bmc|iobmc   BMC reset
-v, --verbose verbose output
-c, --clear  clear EFI variables (system/partition targets only)
-h, --hold   hold in reset
-o, --override override partition check
-s, --single single node boot
-w, --watch  watch boot progress
```

```
usage: power [-vchosw] cycle [bmc] [--noio] [--nochassis] [TARGET]...
cycle      cycle power off on
bmc       cycle aux power
--noio    do not power cycle accessories (IO)
--nochassis do not power cycle chassis power
-v, --verbose verbose output
```

```
-c, --clear          clear EFI variables (system/partition targets only)
-h, --hold          hold in reset
-o, --override      override partition check
-s, --single        single node boot
-w, --watch         watch boot progress
```

```
usage: power [-v10ud] [status] [TARGET]...
status          show power status
-v, --verbose   verbose output
-l, --on        show only blades with on status
-0, --off       show only blades with off status
-u, --unknown   show only blades with unknown status
-d, --disabled  show only blades with disabled status
```

```
usage: power [-ov] nmi|debug [TARGET]...
nmi|debug      issue NMI
-o, --override override partition check
-v, --verbose  verbose output
```

```
usage: power [-v] margin [high|low|norm|] [TARGET]...
margin          power margin control
high|low|norm| margin state
-v, --verbose  verbose output
```

```
usage: power cancel [TARGET]...
cancel          cancel outstanding power action
```

```
usage: power --help
--help         display this help and exit
```

console Command

Use the console command (formerly, `uvcon`) to open a console to an Altix UV system.

To see a help statement for the console command, perform the following:

```
uv45-smn:~ # console --help
```

```
usage: console [-bnd23] [--steal] [--spy] [--kill] [--notty] [--nocache] [--clrcache] [[:]TARGET]
-b, --baseio          specifies baseio bmc console
```

```
-n, -0, --normal          specifies node BMC console (normal channel)
-d, -1, --debug          specifies node BMC console (debug channel)
-2, --chan2              specifies node BMC console (channel 2)
-3, --chan3              specifies node BMC console (channel 3)
--steal                  steal the console
--spy                    spy the console
--kill                   kill all other uvcon sessions
--notty                  disables tty interventions
--nocache                don't return cached output
--clrcache               clear cached output
[:]TARGET                console target
```

NOTE: When tty mode is enabled, use 'CTRL-]' 'q' to exit.

```
usage: console -d[band23c] [-l ] [TARGET]...
-d, --dump                dump cached console output
-b, --baseio              specifies baseio bmc console
-a, --all                 all node BMC consoles
-n, -0, --normal          specifies node BMC console (normal channel)
-d, -1, --debug          specifies node BMC console (debug channel)
-2, --chan2              specifies node BMC console (channel 2)
-3, --chan3              specifies node BMC console (channel 3)
-l, --lines=              limit output to last lines
-c, --clear               clear after dumping (-cc to clear without dumping)
TARGET                    console target(s)

usage: console --help
--help                    display this help and exit
```

For more detailed information on the commands available from the SMN or CMC and how to use them, see the *SGI Altix UV CMC Controller Software User's Guide*.

System Management Node Software Installation

This section describes how to install software on the system management node itself.

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 as shown in Figure 1-4 on page 11. Figure 1-5 on page 12 shows an image of an SMN.

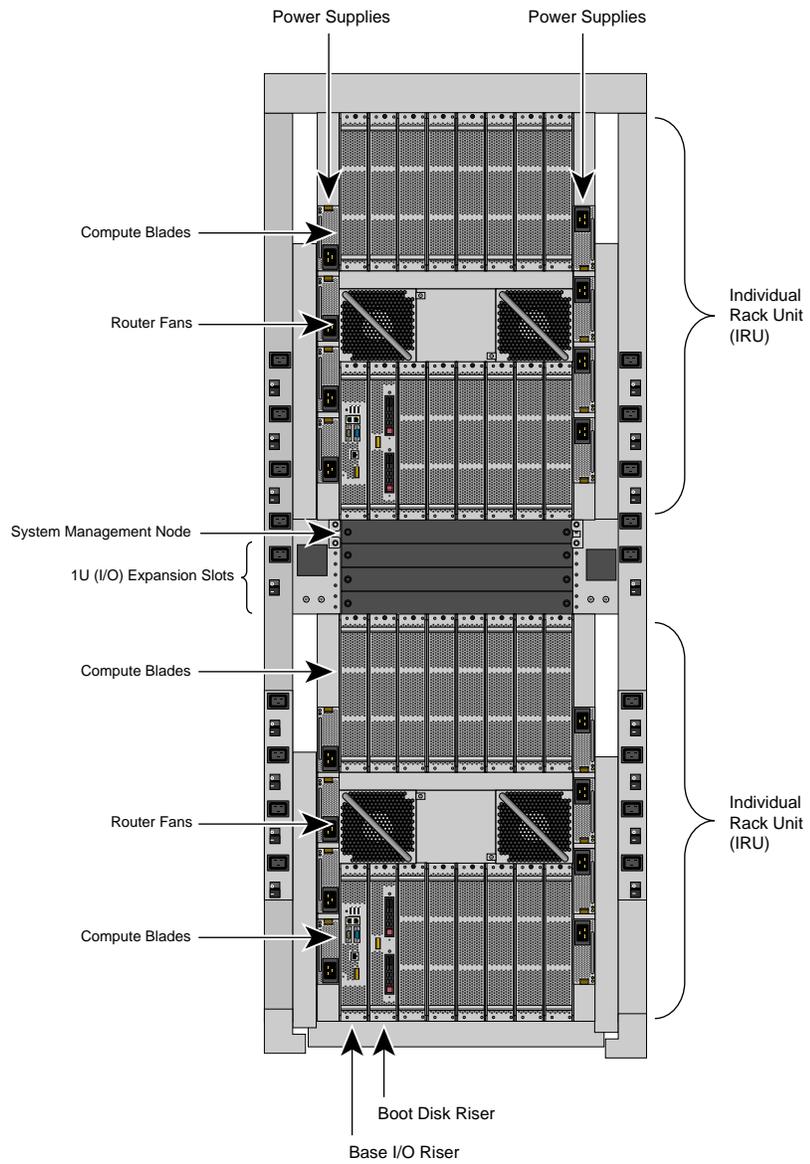


Figure 1-4 SGI Altix UV 1000 System Rack

Procedure 1-1 Installing Software on the System Management Node (SMN)

To install SLES 11 software images on the SMN, 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 1-5 on page 12.

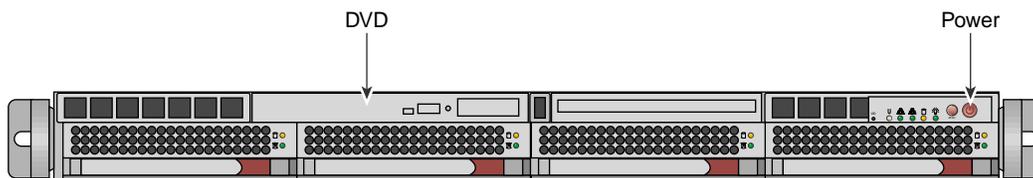


Figure 1-5 System Management Node Power On Button and DVD Drive

2. Insert the SLES 11 Service Pack 1 DVD in the DVD drive on the left of the SMN as shown in Figure 1-5 on page 12.
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 1-6 on page 13. Select the **Next** button to continue.

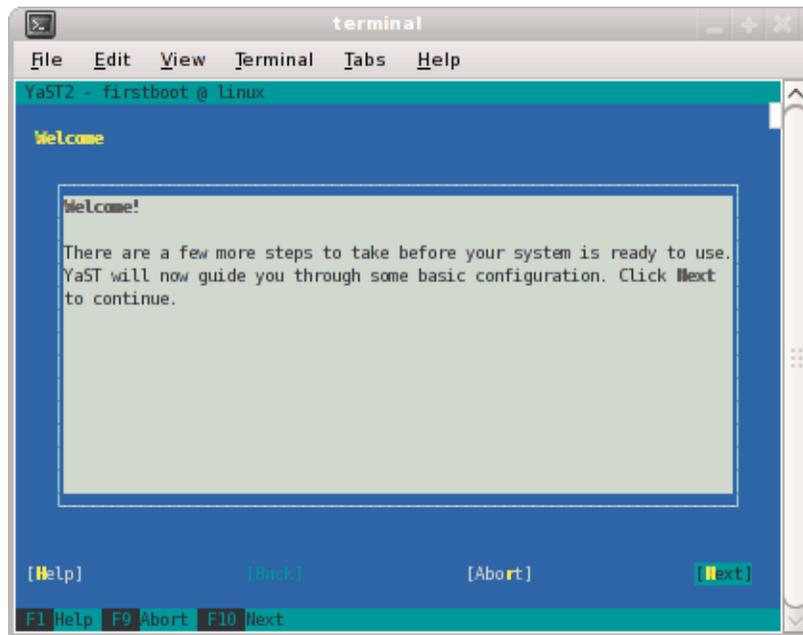


Figure 1-6 YaST2 - firstboot@Linux Welcome Screen

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 1-7 on page 14, 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.

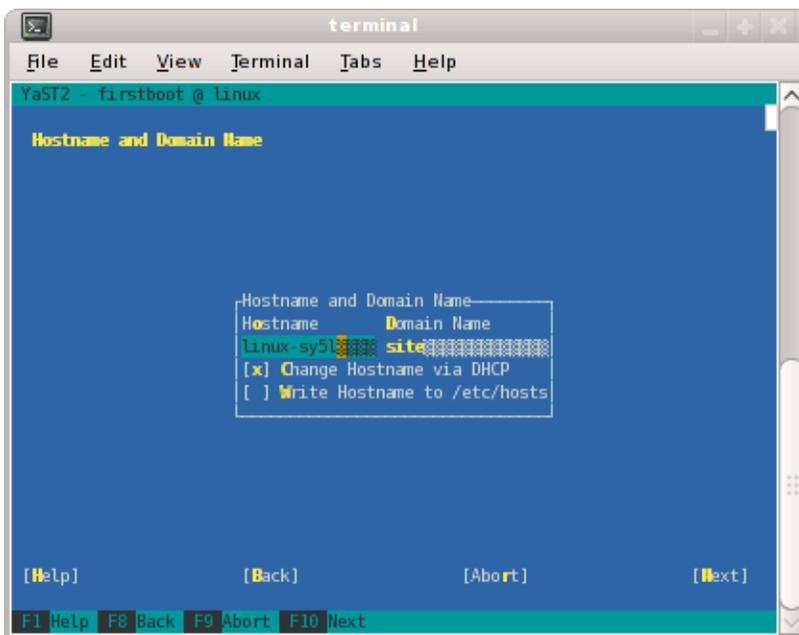


Figure 1-7 Hostname and Domain Name Screen

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 1-8 on page 15. Select **Change** and a small window pops up that lets you choose **Network Interfaces...** or **Reset to Defaults**. Choose **Network Interfaces**.

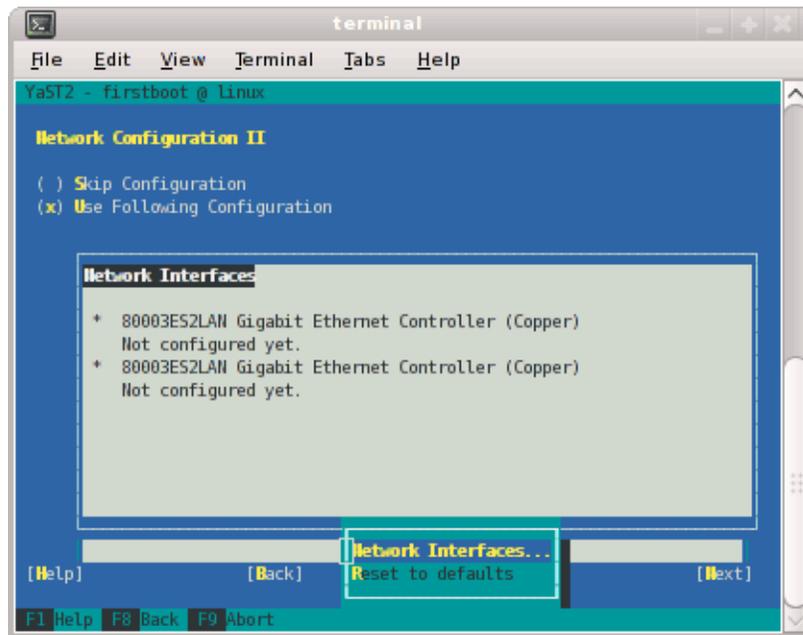


Figure 1-8 Network Configuration II Screen

7. From the **Network Settings** screen, as shown in Figure 1-9 on page 16, configure the first card under **Name** to establish the public network (sometimes called the house network) connection to your system management node (SMN). To do this, highlight the first card and select **Edit**.

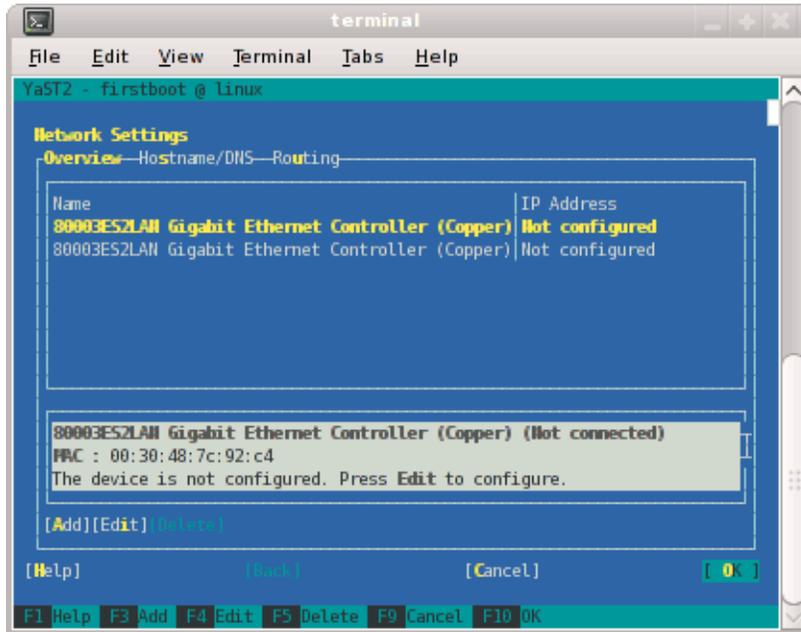


Figure 1-9 Network Settings Screen

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 1-9 on page 16.

8. The **Network Card Setup** screen appears, as shown in Figure 1-10 on page 17. 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 admin node's house/public network interface. You will enter the default route, if needed, in a different step. Select **Next** to continue.

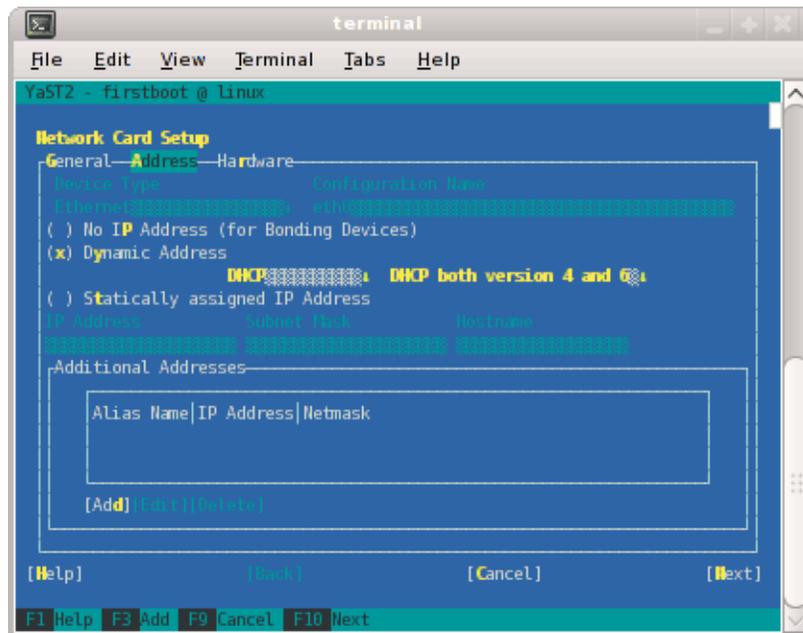


Figure 1-10 Network Card Setup Screen

- At this point, you are back at the **Network Settings** screen as shown in Figure 1-11 on page 18. 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.

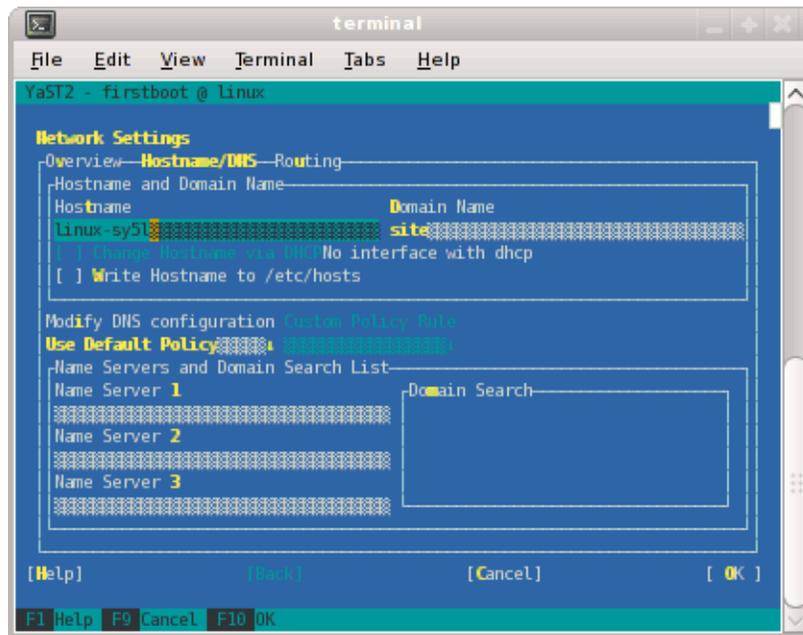


Figure 1-11 Network Settings Screen

10. Select **Routing** shown in Figure 1-12 on page 19 and enter your house/public network default router information there. Now you can select **OK**.

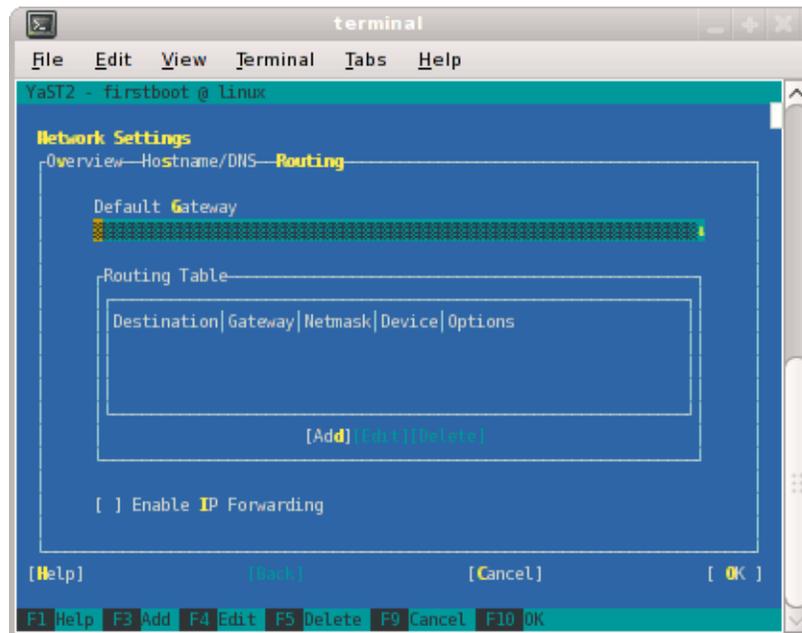


Figure 1-12 Network Settings Routing Screen

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 theSMN. You can use YaST2 to confirm or correct any configuration settings.

18. You need to install SGI Foundation 2.3 software at this point. For installation instructions, see "Installing SLES 11 SP1 and SGI Foundation 2.3 Software" on page 20.
- 19.

Note: The SGI System Management Node Software 1.1 Release Notes are available on SGI SupportFolio <https://support.sgi.com/login>.

Using YaST2 or manually using the `rpm` command, from the SGI-System-Management-Node-Software-1.1 ISO, install the following:

```
rpm -i noarch/sgi-smn-release-1.1-sgi702r3.sles11.noarch.rpm
rpm -i x86_64/monit-5.0.3-1sgi702r1.sles11.x86_64.rpm
rpm -i x86_64/monit-sgi-rules-5.0.3-1sgi702r1.sles11.x86_64.rpm
rpm -i x86_64/sysco-uv-libs-1.0-20100520.1219sgi702r1.sles11.x86_64.rpm
rpm -i x86_64/sgi-gather-smn-uv-1.1-sgi702r1.sles11.x86_64.rpm
rpm -i x86_64/sysco-uv-1.1-20100520.1219sgi702r1.sles11.x86_64.rpm
```

Installing SLES 11 SP1 and SGI Foundation 2.3 Software

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

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.

Procedure 1-2 Intall SLES 11 SP1 and SGI Foundation Software 2.3

To install SUSE Linux Enterprise Server 11 (SLES11) SP1 from the DVD media and SGI Foundation Software 2.3 as an add-on product, 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 1-13 on page

21, click the button next to **Include Add-On Products from Separate Media** and then click **Next** to continue.

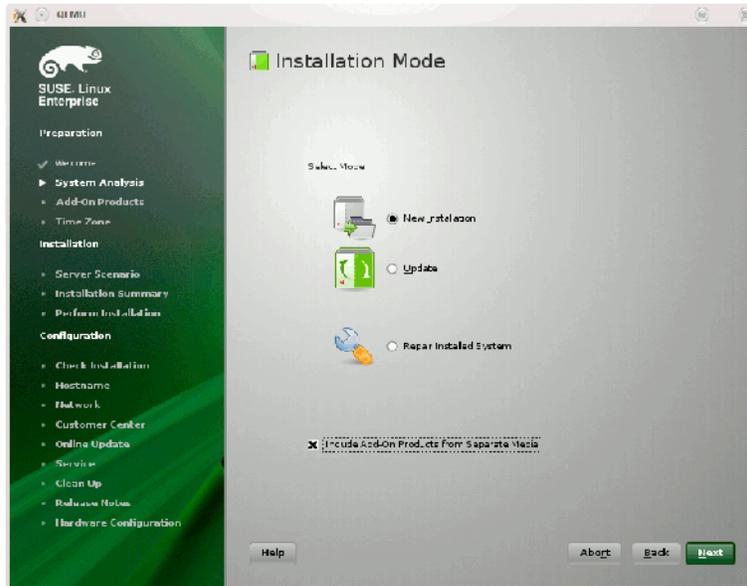


Figure 1-13 SLES11 Installation Mode Screen

3. From the **Media Type** screen, shown in Figure 1-14 on page 22, click the button to the left of **CD**.

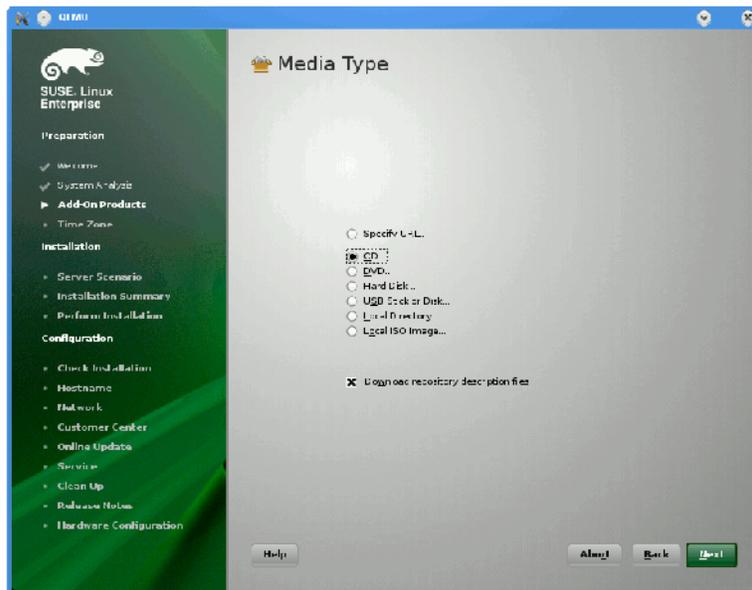


Figure 1-14 SLES11 Media Type Screen

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 1-15 on page 23, click on **SGI-Foundation-x86_64 1-6 cd:///Directory** and click the **Add** button and then **Next** to proceed
6. Follow the SLES11 SP1 instructions to complete the installation.

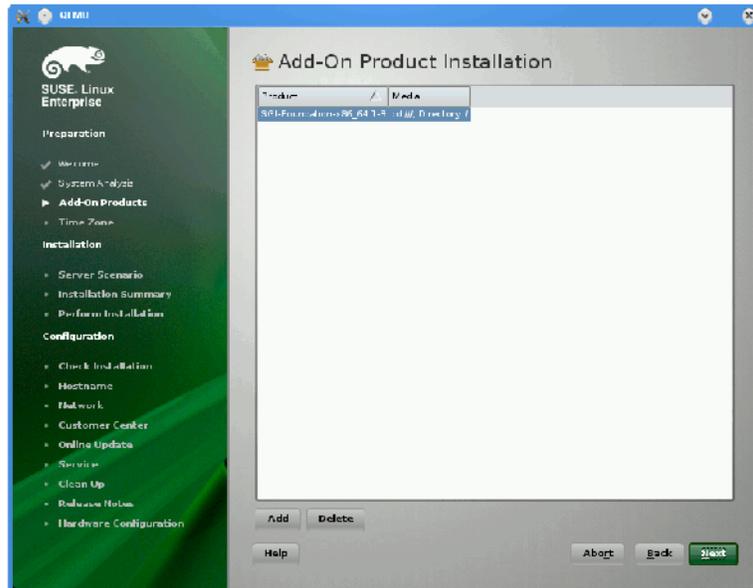


Figure 1-15 SLES11 SP1 Add-On Product Installation Screen Showing SGI Foundation

Installing and Configure RHEL 6 and SGI Foundation 2.3 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 1-3 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) 2.3 and RHEL 6 are provided in the SFS 2.3 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"
```

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-1.1 ISO, install the following:

```
rpm -i monit-sgi-rules-5.0.3-1sgi702rp1.rhel6.x86_64.rpm
rpm -i sgi-gather-smn-uv-1.0-sgi702rp9.rhel6.x86_64.rpm
rpm -i sgi-smn-docs-1-sgi702rp8.rhel6.noarch.rpm
rpm -i sgi-smn-release-1.1-sgi702rp50.rhel6.noarch.rpm
rpm -i sgi-uv-bmc-1.2.3_4-20100929.noarch.rpm
rpm -i sgi-uv-cmc-1.2.4_3-20100929.noarch.rpm
rpm -i sgi-uv-iobmc-1.2.1_3-20100929.noarch.rpm
rpm -i sysco-uv-1.0-20101115.1736sgi702rp1.rhel6.x86_64.rpm
rpm -i sysco-uv-libs-1.0-20101115.1736sgi702rp1.rhel6.x86_64.rpm
rpm -i sysco_uv-tools-1.3-20100922.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”.

Updating Firmware

A set of commands is available from the system management node (SMN) to update Altix UV firmware. The general syntax for the tool is, as follows:

```
flashXXX [-r] <image name> <CMC host/IP> [... <CMC host/IP>
```

There are three firmware flashing commands based on the general syntax, above:

- flashcmc
- flashbmc
- flashiobmc

These tools have the following in common:

- These tools are run from the SMN.
- The commands update the specified image, but will **not** reboot the updated BMCs or CMCs. When you specify the `-r` option, the updated BMCs/CMCs are reset/rebooted so that the firmware update takes effect immediately.
- The flash tools now flash the entire system, not just the CMC specified on the command line. When flashing multi-IRU systems you **must** specify only one CMC hostname.
- Each of the tools now supports a `-?|--help` option which describes the available options.
- For SGI service personnel, when updating these images where the firmware archive is not directly accessible (from an SMN or at a customer site), simply download the firmware binary and flash tool onto the SMN (or service laptop for updates on sites without SMNs) and run the flash tools as indicated below.

To update the system firmware, perform the following:

1. Obtain the latest firmware from SGI SupportFolio at <https://support.sgi.com> or from SGI site personnel.

2. To flash all of the CMCs in your system, perform the following:

```
$ flashcmc -r cmc.bin* <CMC hostname/IP>
```

3. To flash the compute node BMCs in your system, perform the following:

```
$ flashbmc -r uvbmc.bin* <CMC hostname/IP>
```

4. To flash the the BaseIO BMCs in your system, perform the following:

```
$ flashiobmc -r uvbaseio.bin* <CMC hostname/IP>
```

System Network Addressing

This chapter describes the internal system management network addressing scheme for Altix UV 1000 and Altix UV 100 series systems.

It covers the following topics:

- "System Network Addressing Overview" on page 29
- "System Management Node Ethernet Ports" on page 30
- "Altix UV CMC IP Address Assignment" on page 31
- "Multiple Altix UV Partitions or Systems on a Single SMN" on page 31
- "Non Altix UV 100 or UV 1000 Systems on the SMN" on page 32
- "SMN Firewall Capabilities" on page 32

System Network Addressing Overview

The SGI Altix UV hostname assignment is based on the rack and u position of the blade or other component. The rack/u position must be uniform across all Altix UV systems that are attached to an system management node (SMN). In other words, a single Altix UV 1000 system that encompasses multiple racks will have racks numbers 1 to N in increments of 1, and u positions (upos) within each rack will range from 1 to 42, with an increment of 3 (there is an exception where upos 2 is also present). In the case of multiple Altix UV 100 systems, each Altix UV 100 is assigned a unique rack/upos in the same manner, so all Altix UV 100 systems are identifiable in this way.

The system management node (SMN) has three dedicated Ethernet ports to connect to the Altix UV systems, specifically, for the system control network and the primary BaseIO of each partition. There is one Ethernet port on the SMN that is to be attached to the customer network. The connections described in this manual are very specific. Sites are not allowed to also attach other unrelated customer equipment to these dedicated networks because this would interfere with Altix UV system management network.

The SMN detects and then assigns hostnames, IP addresses, and name binding for the Altix UV systems and any additional systems that have a dedicated BMC port connection to the single system image (SSI) segment. For more information, see

"eth1smn" on page 30 and "Multiple Altix UV Partitions or Systems on a Single SMN" on page 31. Because the Altix UV rack/upos convention for identification is used and the network connections are very specific, guidelines must be adhered to carefully.

System Management Node Ethernet Ports

The SMN is a SuperMicro SuperServer 6016T-URF 1U server, with two Gigabit Ethernet (GigE) ports residing on the motherboard, and two additional Ethernet ports provided via an adapter card. The ports are designated eth0 through eth3. The eth0 port is attached to the customer network. Its address is not assigned by the SMN software stack. Customers assign the IP address of the eth0 port. The ports eth1 through eth3 are dedicated to the system management network. To distinguish the SMN Ethernet ports from other ports on BaseIO blades or CMCs, the port is suffixed with "smn", for example eth0smn.

You can get product specification information and other documentation for the SuperMicro 6016T-URF server at <http://www.supermicro.com/> or at <http://docs.sgi.com/>. Search on the title *SuperServer 6016T-URF User's Manual* or on the part number 860-0498-001.

eth1smn

eth1smn is the port for the private network known as the SSI network. This is a dedicated, known path between the SGI Management Center (SMC) application and each kernel instance, or single system image (SSI). If an Altix UV system is partitioned, each partition requires at least one BaseIO blade, and the primary BaseIO of each partition is connected to the SMN. eth1smn is also the network that connects the BaseIO baseboard management controller (BMC) to the SMN. This network is also used to attach non Altix UV system BMCs, such as, SGI Altix XE series systems, the SGI C1103-TY12 system, SGI Altix UV 10, and SGI Rackable series systems, to the SMN, to allow the SMC a means to control these non Altix UV systems.

The IP address range for eth1smn is 172.21.0.0/16 with starting address 172.21.1.1. Within this range, a convention is followed to designate 172.21.1-128.x for BaseIO Ethernet and 172.21.129-254.x for non Altix UV BMCs.

eth2smn

`eth2smn` is the port for the private network known as the primary CMC network. The Altix UV 100 and Altix UV 1000 systems with multiple CMCs are very specifically configured into a small network, and the SMN is a peer on this network.

The range of IP addresses for devices attached to `eth2smn` is 172.19.0.0/16 with starting address 172.19.1.1.

eth3smn

`eth3smn` is the port dedicated to the secondary CMC network. The secondary CMC capability is currently not implemented. However, the IP space is still reserved.

The range of IP addresses for devices attached to `eth3smn` is 172.20.0.0/16 with starting address 172.20.1.1.

Altix UV CMC IP Address Assignment

The chassis management controllers (CMCs) are given IP addresses based on their location in the racks. The address is determined, as follows:

```
172.{19|20}.rh.ruuuuuu
```

Where:

- 'rh' is the lower 8 bits of the rack number.
- 'rr' is the upper two bits of the rack number, shifted down 2. Rarely used.
- 'uuuuuu' is the upos (6 bits)

Multiple Altix UV Partitions or Systems on a Single SMN

A single Altix UV system may be partitioned and have multiple kernels running. The BaseIO blade from each partition must have its `eth0` and BMC ports attached to the system management node (SMN). To accommodate the additional cabling, a GigE switch is needed.

In a similar way, a single SMN can be configured to manage multiple Altix UV100 and Altix UV 1000 systems. One GigE switch is used for the SSI network, another switch for the CMC network.

The `smnconfig` tool performs discovery and address assignment in both of these configurations, if the cabling is connected per the guideline and the multiple Altix UV 100 and Altix UV 1000 systems have their CMCs uniquely designated with the `rack/upos` method.

Non Altix UV 100 or UV 1000 Systems on the SMN

In addition to managing Altix UV 100 and Altix UV 1000 systems, the SMN can also provide system management for other systems, such as the Altix UV 10, Altix XE systems, and so on. For these class of systems, the only connection to the SMN required is the BMC port from the motherboard to the SSI network. As described previously, the SSI network `172.21.0.0/16` is used to connect the UV BaseIO `eth0` ports and the BaseIO BMC ports. The non Altix UV systems connect their BMC ports to this network and will be assigned addresses from the `172.21.129-254.x` range.

SMN Firewall Capabilities

Because of system addressing requirements for the system management node (SMN), see "System Network Addressing Overview" on page 29, firewall capabilities should **only** be applied to the SMN wide area network (WAN) interface `eth0smn`. The interfaces `eth1smn`, `eth2smn`, and `eth3smn` (see "System Management Node Ethernet Ports" on page 30) should not be firewalled in any manner with one exception, as follows:

If you use a remote client (installing the client-only installation of SMC on a different server), then TCP ports 7620, 4672, and 7673 need to be opened up in the firewall. This is the only requirement for the WAN interface.

System Configuration from the SMN

This chapter walks you through steps to use KVM to enable remote console access from the system management node (SMN) to an SGI Altix UV 100 or an SGI Altix UV 1000 system. It covers the following topics:

- "Enabling a Remote Console" on page 33
- "Changing Configuration Settings" on page 45
- "Determining the IP Address of the BaseIO BMC" on page 47
- "Accessing the SGI KVM BIOS Setup Utility" on page 48
- "Enabling BaseIO VGA" on page 51
- "Booting Using iSCSI Protocol" on page 52

Enabling a Remote Console

Note: The enabling a remote console feature is currently NOT available. A new BaseIO firmware image will be released in the near future to enable this capability.

This section describes how to use KVM to enable remote console access.

Procedure 3-1 Enabling a Remote Console

To enable a remote console to your SGI Altix UV system, perform the following steps:

1. Establish a network connection to the SMN, as follows:

```
# ssh -X sysco@uv-system-smn
```

The password set out of the factory is **sysco**.

2. From the SMN, launch the Mozilla Firefox web browser, as follows:

```
sysco@system-smn:~/hw>firefox
```

3. Enter the IP address of the BaseIO node baseboard management controller (BMC), similar to the following:

http://192.168.1.200

To determine the IP address of the BaseIO node BMC, see "Determining the IP Address of the BaseIO BMC" on page 47.

4. The BMC login screen appears, as shown in Figure 3-1 on page 34. Login as **root** with the password **superuser**.

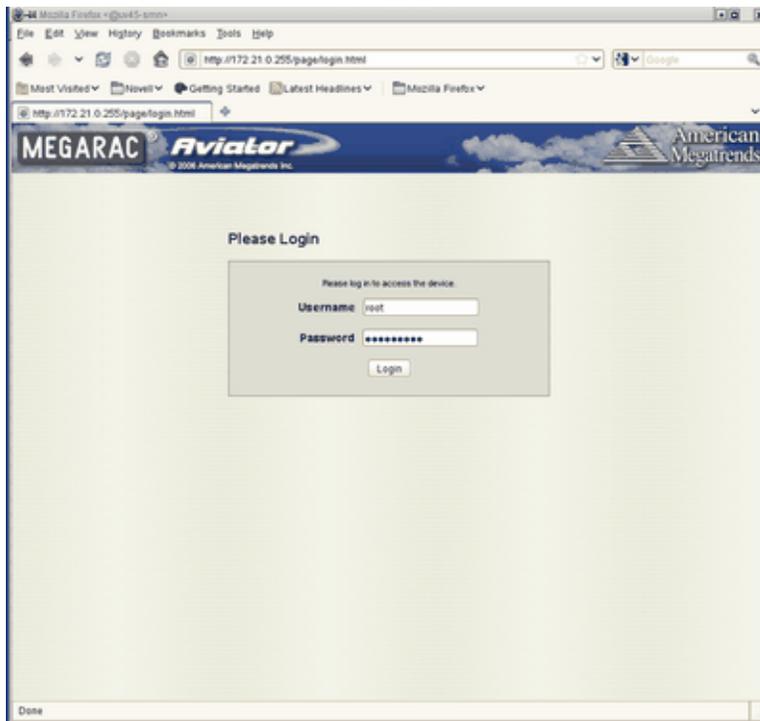


Figure 3-1 BMC Login Screen

5. The **System Information** screen appears, as shown in Figure 3-2 on page 35. Click on the **Remote Control** tab.

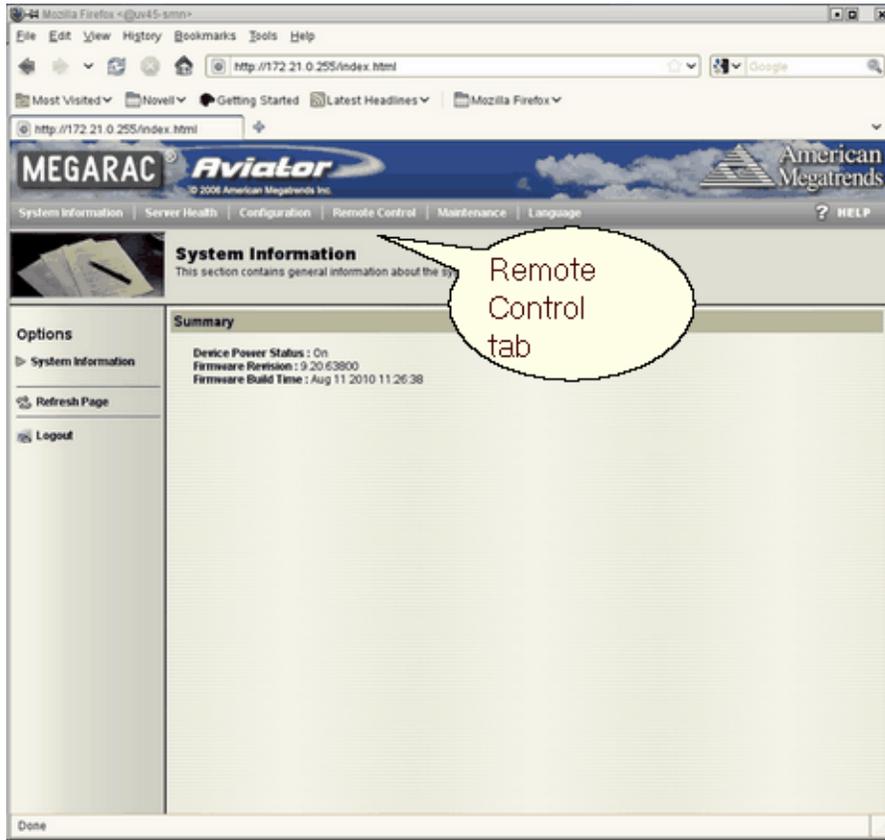


Figure 3-2 BMC System Information Screen

6. The **Remote Control** screen appears, as shown in Figure 3-3 on page 36. Click on the **Console Redirection** button.

3: System Configuration from the SMN

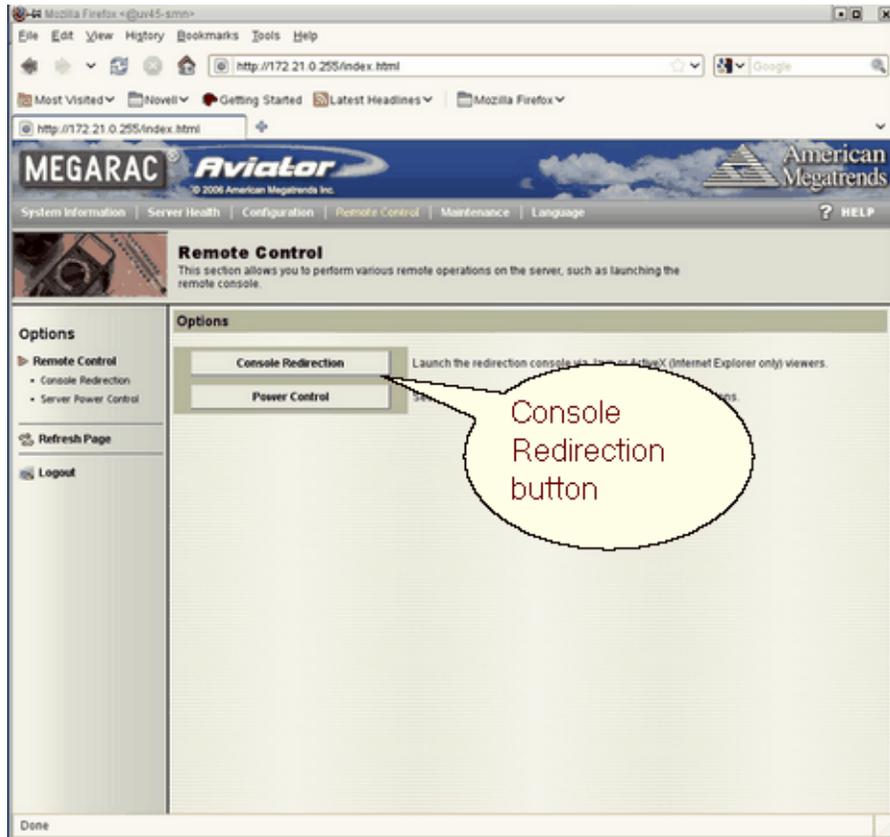


Figure 3-3 BMC Remote Control Screen

7. The **Console Redirection** screen appears, as shown in Figure 3-4 on page 37. Click on the **Launch Console** button.

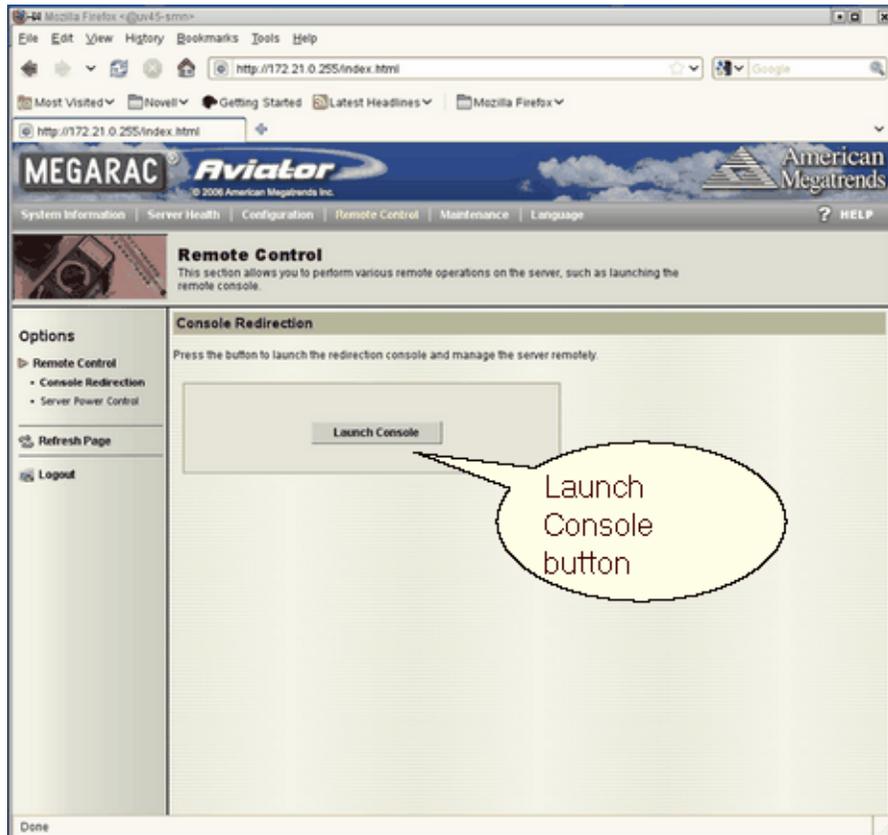


Figure 3-4 BMC Remote Control Console Redirection Screen

8. A Java application under Firefox will open. **Select Execute Java Web Start file (default)** from the pop-up menu, as shown in Figure 3-5 on page 38. You may need to enable pop-ups for this address for the Firefox browser first.



Figure 3-5 Select Execute Java Web Start file (default) Pop-up Menu

9. You will then get a screen about **The web site's certificate cannot be verified. Do you want to continue?**, as shown in Figure 3-6 on page 38. Click the **Yes** button to continue. You can also click the checkbox to keep it from showing up later.

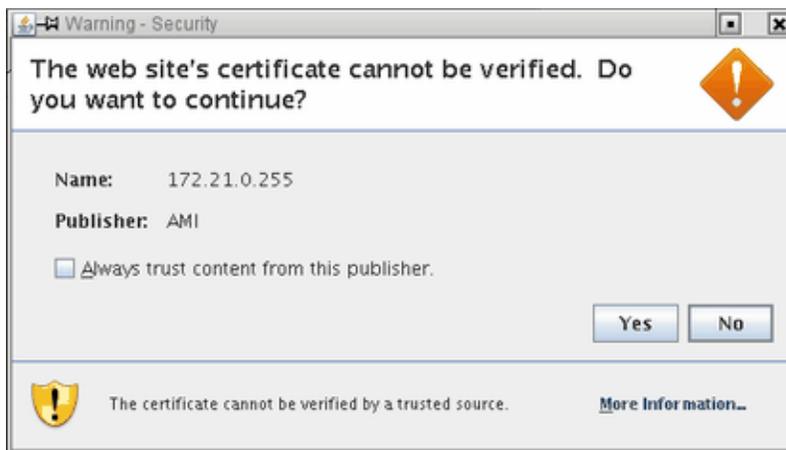


Figure 3-6 Web site Warning-Security Screen

10. You will then get a screen about **The application's digital signature cannot be verified. Do you want to run the application?**, as shown in Figure 3-7 on page 39. Click the **Run** button to continue. You can also click the checkbox to keep it from showing up later.



Figure 3-7 Application **Warning-Security** Screen

11. The JViewer KVM redirection window appears with a **Shell>** prompt, as shown in Figure 3-8 on page 40.

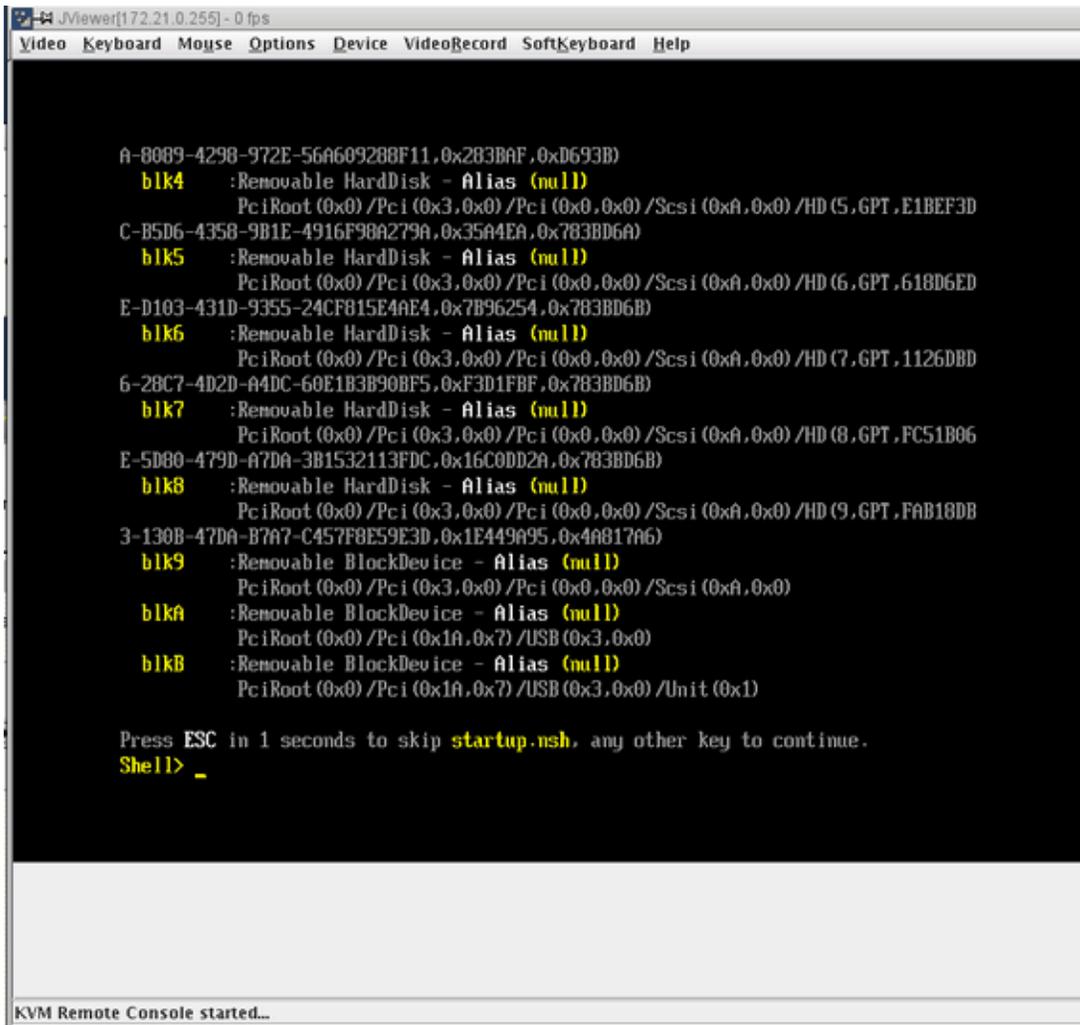
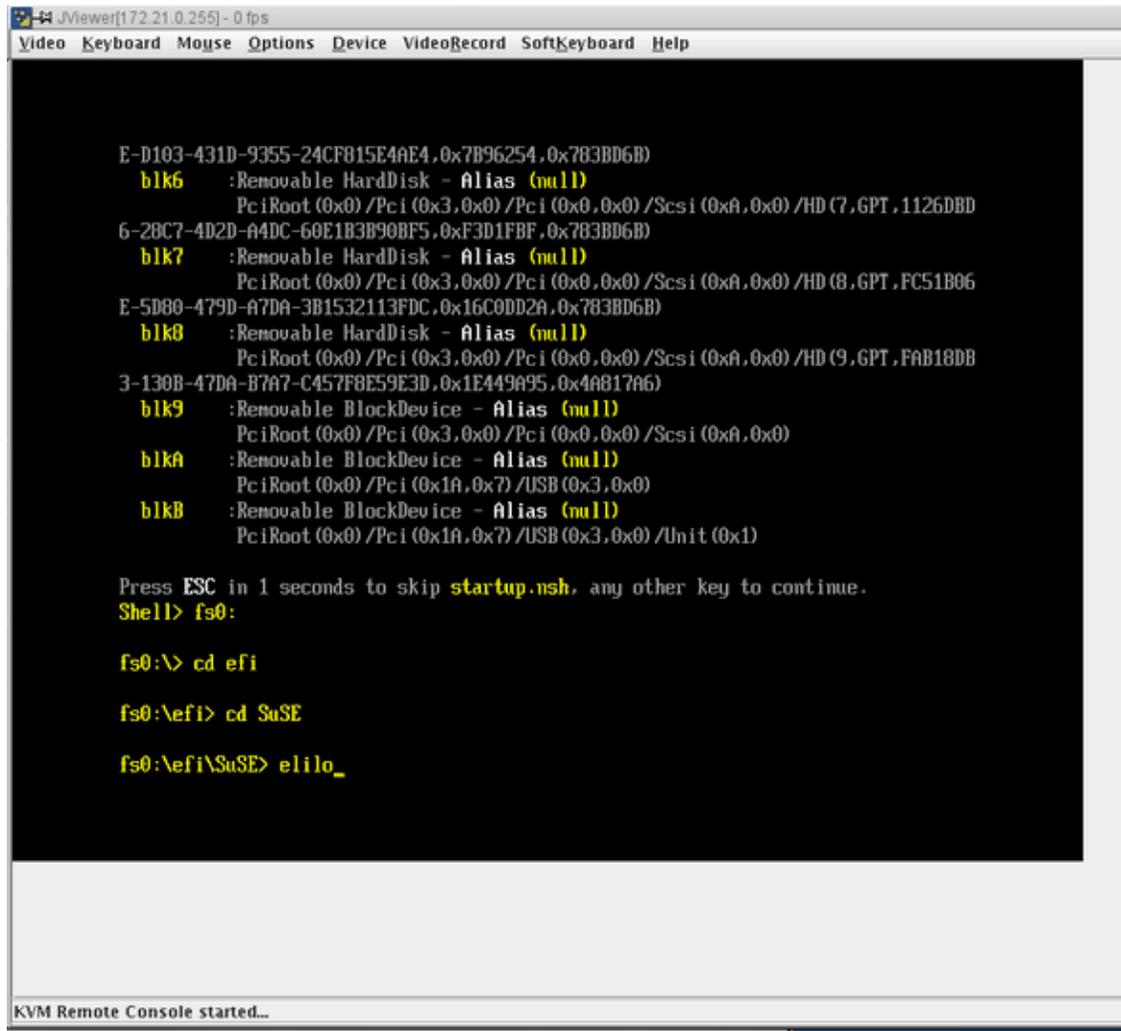


Figure 3-8 KVM JViewer Shell Prompt Screen

12. From the **Shell>** prompt issue the following commands, as shown in Figure 3-9 on page 41:

```
Shell>fs0
fs0:\>cd efi
```

```
fs0:\efi>cd SuSE
fs0:\efi\SuSe>elilo
```



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

E-D103-431D-9355-24CF815E4AE4,0x7B96254,0x783BD6B)
  blk6  :Removable HardDisk - Alias (null)
        PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (7,GPT,1126DBD
6-28C7-4D2D-A4DC-60E1B3B90BF5,0xF3D1FBF,0x783BD6B)
  blk7  :Removable HardDisk - Alias (null)
        PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0) /HD (8,GPT,FC51B06
E-5D80-479D-A7DA-3B1532113FDC,0x16C0DD2A,0x783BD6B)
  blk8  :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)
  blk9  :Removable BlockDevice - Alias (null)
        PciRoot (0x0) /Pci (0x3,0x0) /Pci (0x0,0x0) /Scsi (0xA,0x0)
  blkA  :Removable BlockDevice - Alias (null)
        PciRoot (0x0) /Pci (0x1A,0x7) /USB (0x3,0x0)
  blkB  :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> fs0:

fs0:\> cd efi

fs0:\efi> cd SuSE

fs0:\efi\SuSE> elilo_

KVM Remote Console started...
```

Figure 3-9 Booting the Operating System from the JViewer Shell> Prompt Screen

Note: This example shows booting SLES11 SP1. Alternatively, you could boot RHEL 6 at the **Shell>** prompt.

13. The operating system login screen appears. At the prompt enter **init5**, as shown in Figure 3-10 on page 43.

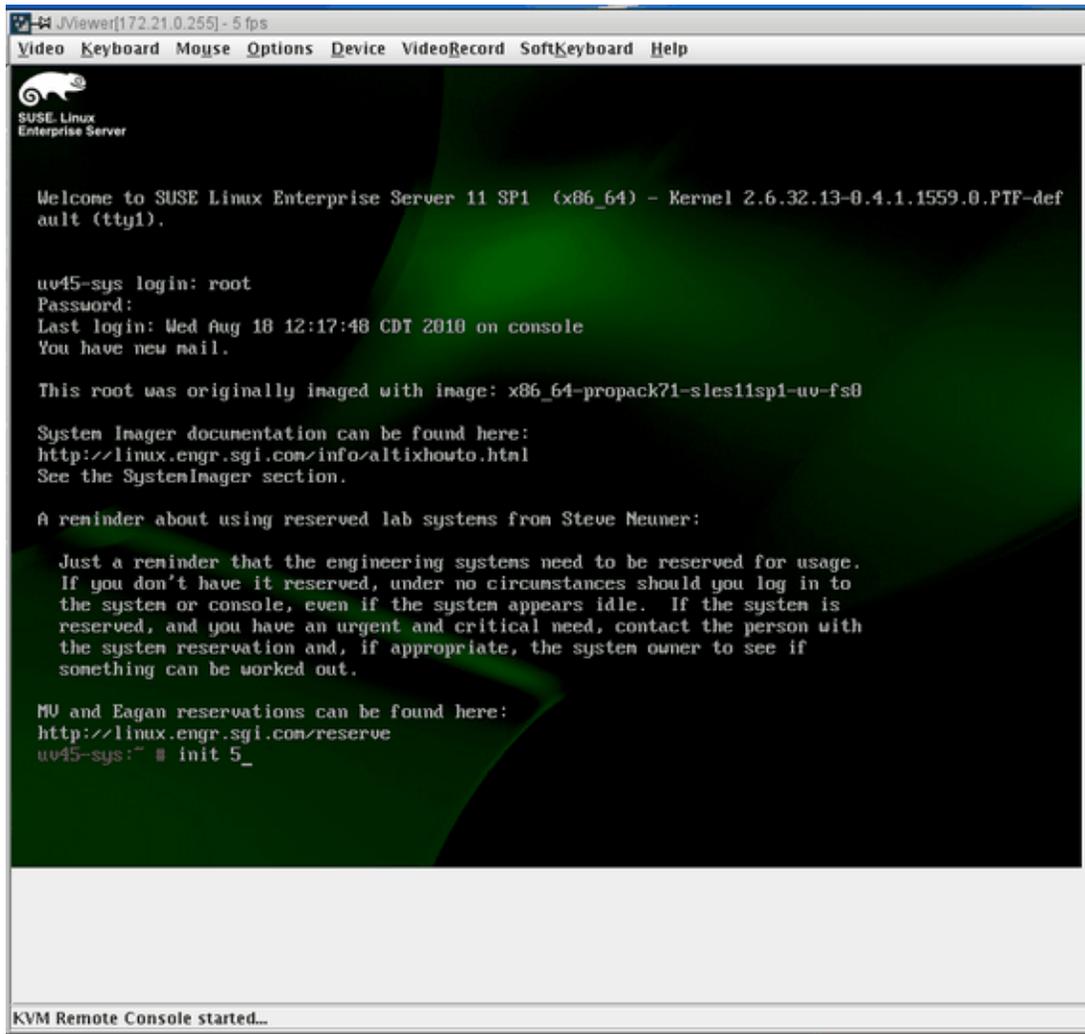


Figure 3-10 JViewer Operating System Login Screen

Note: To see the SUSE graphics screen you want system run level 5.

14. The **SUSE Linux Enterprise Server 11 (x86_64)** login screen appears, as shown in Figure 3-11 on page 44. Log in as root user

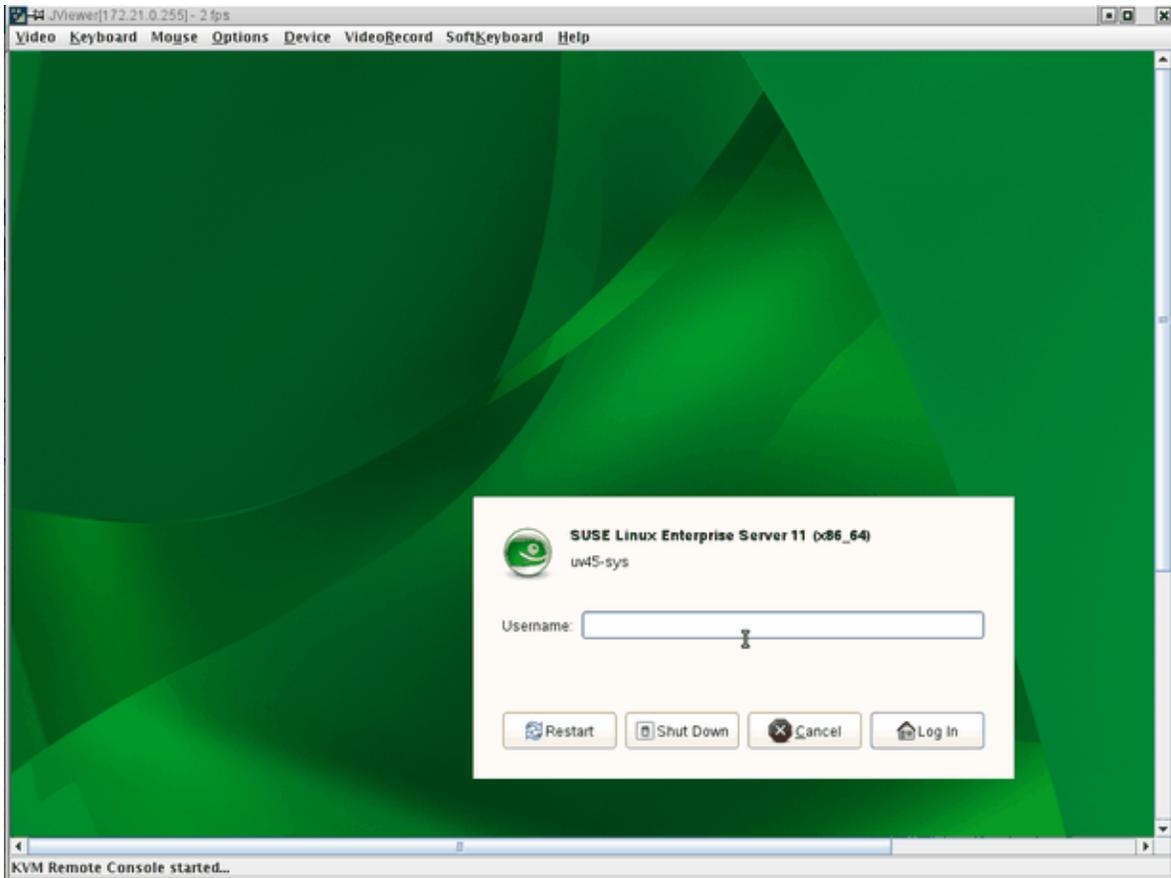


Figure 3-11 SUSE Linux Enterprise Server 11 (x86_64) Login Screen

15. The SUSE Linux Enterprise Server 11 (x86_64) desktop appears, as shown in Figure 3-12 on page 45.

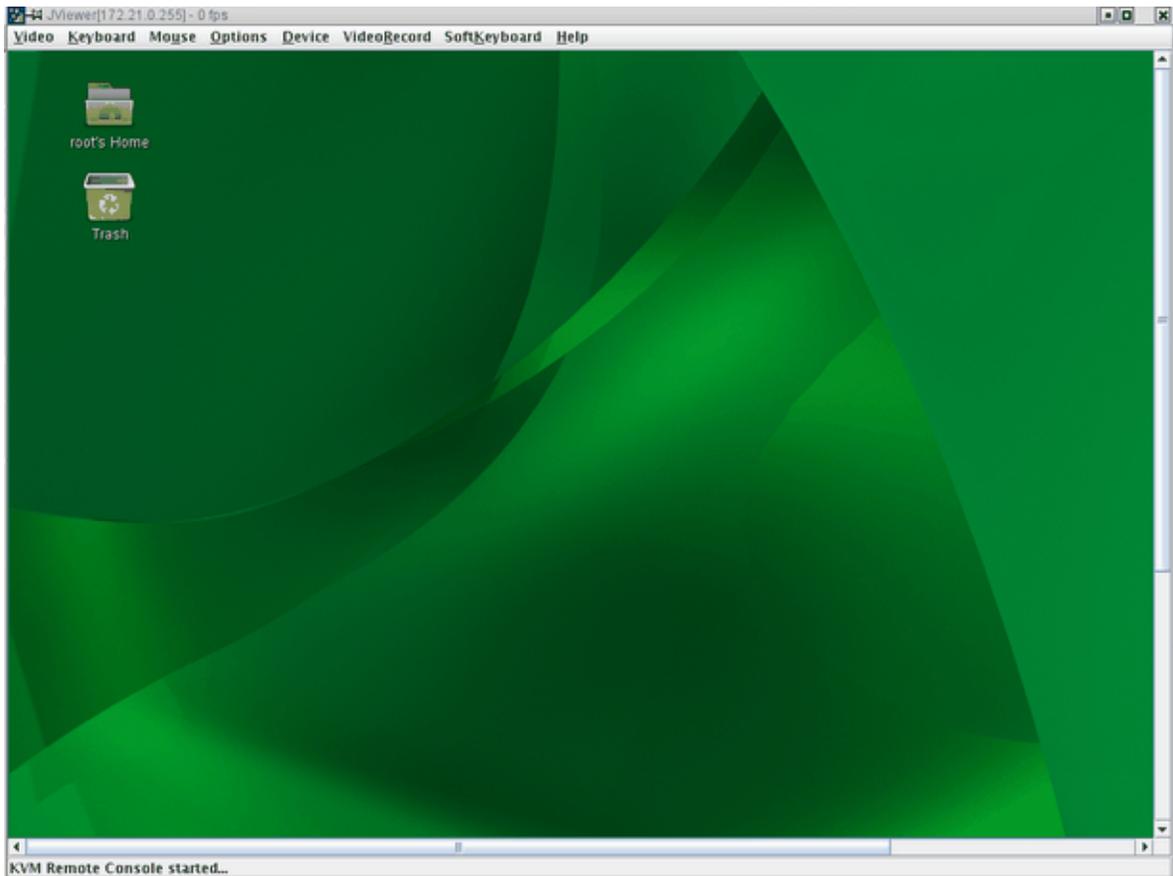


Figure 3-12 SUSE Linux Enterprise Server 11 (x86_64) Desktop Screen

Changing Configuration Settings

From the **Configuration** tab shown in Figure 3-13 on page 46, you can access various configuration setting pages. For example, you can configure fixed network settings under the **Network Settings** page.

Under the **Mouse Mode Settings** page, the **Absolute** setting should be selected for both Linux and Windows operating systems on the host. Older Linux distributions required **Relative** mouse mode. SGI Altix UV systems use **Absolute** mouse mode.

3: System Configuration from the SMN

The remainder of the configuration pages are security related and may be of use to you if you connect the BaseIO BMC to your house network rather than the system management node.

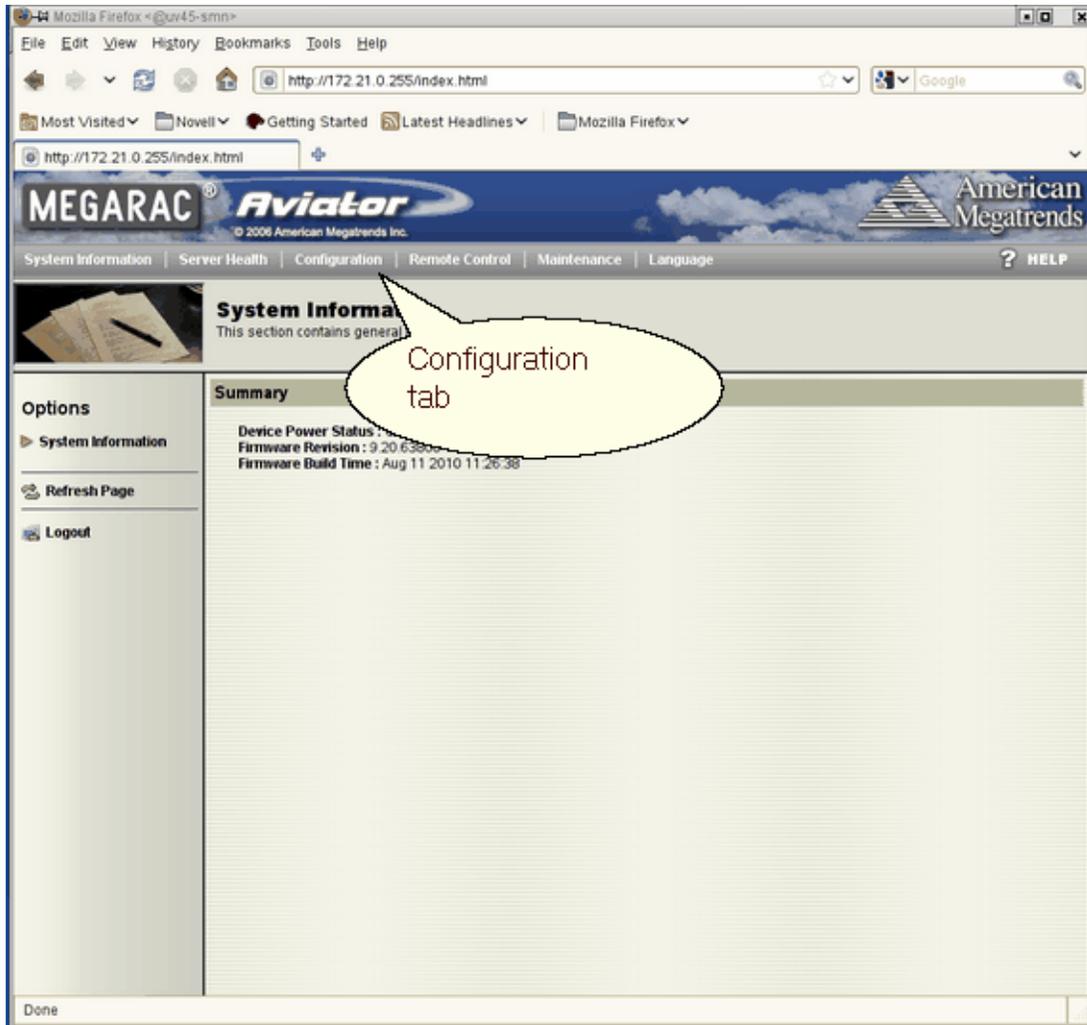


Figure 3-13 Configuration Tab

Determining the IP Address of the BaseIO BMC

This section describes how to determine the IP address of the BaseIO BMC.

By default, the external Ethernet port on the BaseIO BMC is configured to use DHCP. In the case that it is connected to an SMN, the SMN will serve it an IP address mapped to a known host name.

Procedure 3-2 Determining the IP address of the BaseIO BMC without an SMN

To determine the IP address of the BaseIO, perform the following steps:

1. Login to the CMC, as follows:

```
ssh root@hostname-cmc
SGI Chassis Manager Controller, Firmware Rev. 1.1.11

CMC:rlilc>
```

2. Run the `iodcon` command on the CMC to get to the node BMC 'bmc0', as follows:

```
CMC:rlilc> iodcon
Starting BaseIO BMC debug console on node BMC 'bmc0'
*** Use CTRL-X to exit this console ***

SGI UV BMC, Firmware Rev. 1.1.11
```

3. Log into the console as root, as follows:

```
rlilb0i login: root
Password:

SGI UV BMC, Firware Rev. 1.0.0

rlilb0i>
```

4. Run the `ifconfig eth1` command to obtain the inet addr, as follows:

```
rlilb0i> ifconfig eth1
eth1      Link encap:Ethernet  HWaddr 08:00:69:15:C1:2B
          inet addr:172.20.255.254  Bcast:172.20.255.255  Mask:255.255.0.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:331167 errors:0 dropped:0 overruns:0 frame:0
          TX packets:596190 errors:0 dropped:0 overruns:0 carrier:0
```

```
collisions:0 txqueuelen:1000
RX bytes:22075035 (21.0 MiB) TX bytes:742617052 (708.2 MiB)
Interrupt:1
```

5. Enter `CTRL-X` to exit the console.
6. The output also displays the MAC address as the `HWaddr`. You can use this information to configure a known MAC to IP address/host name mapping in your DHCP server.

Procedure 3-3 Determining the IP address of the BaseIO BMC with an SMN

To determine the IP address of the BaseIO, perform the following steps:

1. Establish a network connection to the SMN, as follows:

```
# ssh -X sysco@uv-system-smn
```

The password set out of the factory is `sysco`.

2. Perform the following command to find the IP address of the BaseIO BMC, as follows:

```
sysco@uv-sys-smn:~/hw> cmclist -a
# File: /var/lib/dhcp/db/dhcpd.leases
# UID IP Address
d \001\010\000i\025\300\237 172.21.0.255
```

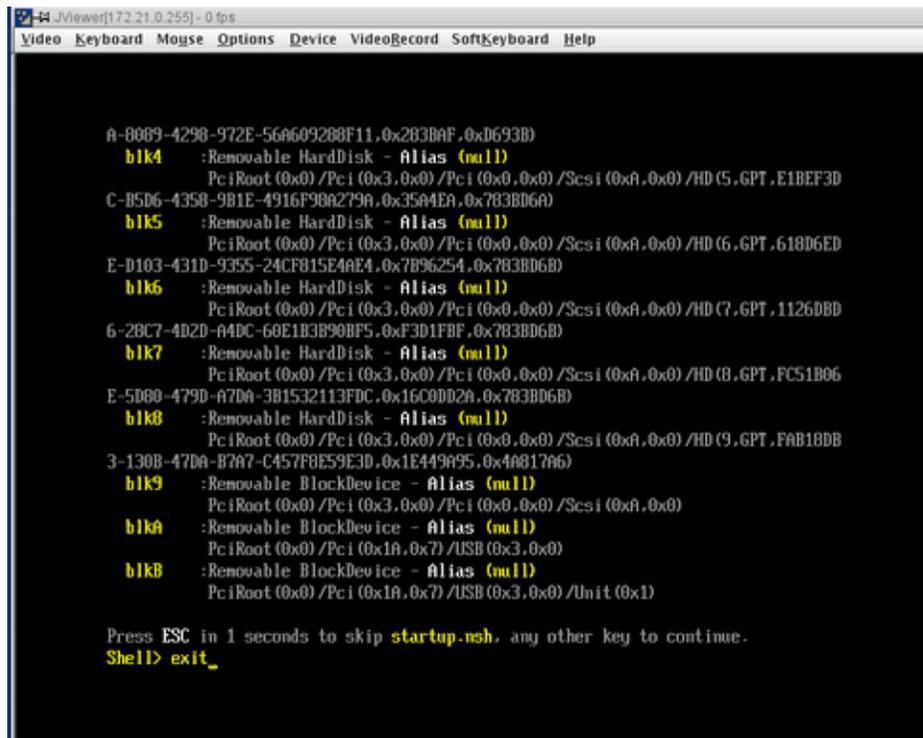
Accessing the SGI KVM BIOS Setup Utility

This section describes how to access the SGI KVM BIOS setup utility software residing on the BaseIO blade.

Procedure 3-4 Accessing the SGI KVM BIOS Setup Utility

To access the SGI KVM BIOS setup utility software, perform the following steps:

1. Perform steps one through 11 in Procedure 3-1 on page 33.
2. When the Linux `Shell>` prompt appears enter `exit`, as shown in Figure 3-14 on page 49.



```
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 3-14 KVM JViewer Shell Prompt with `exit` Command Screen

3. The SGI KVM screen appears, as shown in Figure 3-15 on page 50.



Figure 3-15 SGI KVM Console Startup Screen

After the SGI KVM Console software completes loading, the BIOS setup utility appears, as shown in Figure 3-16 on page 51.

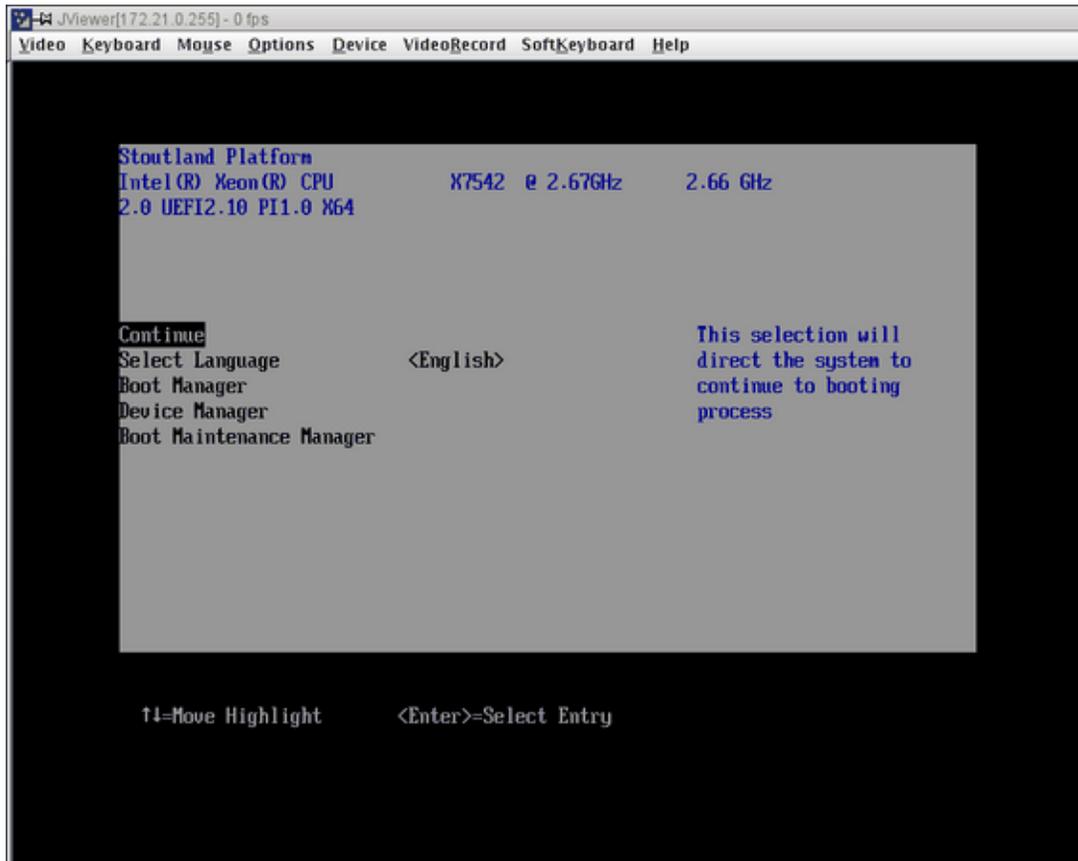


Figure 3-16 BIOS Setup Utility

Enabling BaseIO VGA

The “Enabling BaseIO” section of the *SGI Altix UV Software Install Guide* walks you through steps to enable BaseIO video graphics array (VGA) on an SGI Altix UV 100 or an SGI Altix UV 1000 system.

Booting Using iSCSI Protocol

The “Booting Using iSCSI Protocol” section of the *SGI Altix UV Software Install Guide* walks you through steps to boot an SGI Altix UV system using iSCSI protocol.

Simple Network Management Protocol

The Simple Network Management Protocol (SNMP) is part of the Internet protocol suite, as defined by the Internet Engineering Task Force (IETF). The SNMP provides a means to monitor and manage network-attached devices. For general information about SNMP, see <http://www.snmplink.org/>.

This section describes the `snmpd-uv(8)` agent which is the SGI SNMP agent for Altix UV 100 and 1000 series systems. The `snmpd-uv(8)` agent is **only** available on the System Management Node (SMN) node.

SNMP Agent Overview

The `snmpd-uv(8)` agent fetches configuration information from the System Controller (SYSCO) network attached to the System Management Node (SMN). The SYSCO network contains all the Chassis Management Controller (CMC) and Base Management Controller (BMC) and accessories, such as, the I/O expansion chassis.

The `snmpd-uv(8)` agent supports multiple Altix UV systems attached to the SMN.

The `snmpd-uv(8)` retrieves information stored in a MySQL database by translating SNMP `pass_persist GET` and `GETNEXT` OID requests into equivalent MySQL `SELECT` queries on appropriate tables corresponding to those defined in the Altix UV SNMP.

The `snmpd-uv(8)` agent does not perform data gathering or MySQL tables update operations. Instead, two additional services are used in tandem to perform the following:

- Data gathering

A system daemon, called `uv_gather`, collects information from the SYSCO network attached to the SMN. After parsing the data in a readable format, it pushes the data to another system daemon, `uv_db`, to perform MySQL updates.

- MySQL Tables updates

A system daemon, `uv_db`, is responsible for receiving data from `uv_gather` and performs appropriate MySQL tables update.

Since the `snmpd-uv(8)` agent does not perform data gathering, it is important to make sure the `uv_gather` and `uv_db` services are enabled in order to get up-to-date information from the periodically updated MySQL Altix UV database. The `uv_gather` and `uv_db` services are normally setup to start at boot time.

The SNMP Agent companion services maintain information of all the Altix UV nodes attached to the SMN. They also fetch environmental information, such as, fan speed and voltage margins. For further details, please consult the management information base (MIB) file that comes with the package.

The `snmpd-uv(8)` agent can also send trap if the configuration file contains `trapsink` or `trapsink2` directives.

Note: The current version of the agent does not yet support sending traps. This functionality will be offered in future updated version of the agent. Instead, the user can still use the `NET-SNMP DISMAN Net-SNMP` standard embedded sub-agent facilities to perform various trap configuration.

Normally, the `snmpd-uv(8)` agent is not manually invoked. It is actually invoked by `snmpd(8)` daemon via a configuration file. See "SNMP Configuration" on page 54.

SNMP Configuration

In order to integrate the `snmpd-uv` agent into `snmpd`, two configuration methods are available, as follows:

- "Automatic Configuration Using `uv_snmpconfig`" on page 54
- " Manual Configuration " on page 55

Automatic Configuration Using `uv_snmpconfig`

This is the easiest and recommended method. The `uv_snmpconfig` command performs all the configuration steps explained in the manual configuration section below. It also offers an option to test the configuration consisting in verifying:

- MIB translation of Object Identifiers (OIDs) using `snmptranslate`.
- The SNMP agent can `snmpwalk` the entire `uv` SNMP agent SQL database
- Basic and configured (if relevant) traps are captured.

Run `uv_snmpconfig -h` on the SMN for help and command-line options, as follows:

```
uv41-smn:~ # uv_snmpconfig -h
Jan 3 12:03:00 ----- uv_snmpconfig NOTICE: SNMPCONFIG mode. INSTANCE=uv
Usage: uv_snmpconfig [-hfctr] args

    Configure SNMP, test and restore configuration files
    depending on command-line flags:

    -h                This help message
    -f                Overwrite configuration files
    -c                Configure SNMP
    -t                Test SNMP
    -r                Restore configuration files if '-c' is used.

    Agent            Args
    -----
    a4700            12:IP addresss or hostname
    xe
    xe_cluster      pm|tempo|isle|file config_file
    uv
```

Note: The utility will not overwrite already installed SNMP configuration files unless the command-line option `-f` (force) is used. However, in most cases, although the utility backs up files before overwriting them (when `-f` is used), it is recommended to make a copy of the configuration files before proceeding. `uv_snmpconfig` is a generic script for all the agents supported by SGI.

Manual Configuration

To manually configure the SNMP agent, three steps are required, as follows:

1. Integrate the agent MIB.

On RHEL, modify or create the `snmpd /etc/snmp/snmpd.options` file. The easiest is to make sure the following start-up parameters are defined:

```
# Original option
OPTIONS="-Lsd -Lf /dev/null -p /var/run/snmpd.pid -a"

# Adding SGI agent
```

```
OPTIONS="${OPTIONS} -M +/opt/sgi/snmpagents/mibs -m ALL"
```

On SLES, the `/opt/sgi/snmpagents/mibs/sgi-uv-smi.mib` should be copied to `/usr/share/snmp/mibs/` directory. Also, if not already done, the remaining `/opt/sgi/snmpagents/mibs/` files should also be copied.

Optionally, apply the same changes in the global `/etc/snmp/snmp.conf` file by adding the following two lines:

```
mibs          ALL
mibdirs       +/opt/sgi/snmpagents/mibs
```

2. Configure agent configuration file.
3. This is where the agent is actually called by `snmpd(8)` using the `pass_persist` protocol. Also, this is where various monitored events are defined. The file itself contains configuration instructions.

Copy or append `/opt/sgi/snmpagents/etc/snmpd.uv.conf` to `/opt/sgi/snmpagents/etc/snmpd.local.conf`. Do NOT edit the file directly as it can be replaced later by an RPM package update.

Finally, if NET-SNMP DISMAN facilities are used and you want to change monitoring intervals, the `monitor -r 300` lines should be changed.

You also have to specify the `-c /opt/sgi/snmpagents/etc/uv.conf` file for use by agent itself. A template file `/opt/sgi/snmpagents/etc/uv.conf.template` contains instructions on how to configure this file.

4. Integrate agent configuration file.

On RHEL, modify or create `snmpd /etc/snmp/snmpd.options` file and set the following environment variable:

```
# Add SGI agent configurations
OPTIONS="${OPTIONS} -c /opt/sgi/snmpagents/etc/snmpd.local.conf"
```

On SLES, a properly substituted `/opt/sgi/snmpagents/etc/snmpd.uv.conf` file should be appended to the `/etc/snmp/snmpd.local.conf` file.

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