



Sun Fire™ V60x Server and Sun Fire V65x Server Server Management Guide

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Managing the Sun Fire V60x Server and Sun Fire V65x Server



Introduction

This document describes how to perform remote management on the Sun Fire™ V60x server and Sun Fire V65x server.

The Sun Fire V60x server and Sun Fire V65x server are Sun's next-generation, x86-based, entry-level servers. Capable of running Standard Linux Distributions or the Solaris™ x86 operating system, the Sun Fire V60x server and Sun Fire V65x server are designed for Tier 0, 1 and 2 applications. These 1U and 2U servers are powerful additions to the portfolio of Sun™ products designed for horizontally scaled compute environments.

With up to two Intel Pentium 4 Xeon processors running at 2.8, 3.06 or 3.2 GHz, the Sun Fire V60x server and Sun Fire V65x server utilize the latest x86 technology to run and drive Solaris-x86-based and Linux-based applications. Drivers for Standard Linux Distributions will be introduced over the next few quarters, enabling customers to choose the OS that best meets their requirements.

Product Family Placement

The Sun Fire V60x server and Sun Fire V65x server are the latest additions to Sun's x86-based server product portfolio and provide an upgrade path for customers from the Sun LX50 server. Based on Intel Pentium 4 Xeon technology and a 533-MHz Front Side Bus (FSB), the Sun Fire V60x server and Sun Fire V65x server provide customers with leading-edge compute power and fast-data-transfer throughput for its price point.

Acronyms

TABLE 1-1 explains the acronyms found in this document.

TABLE 1-1 Acronyms

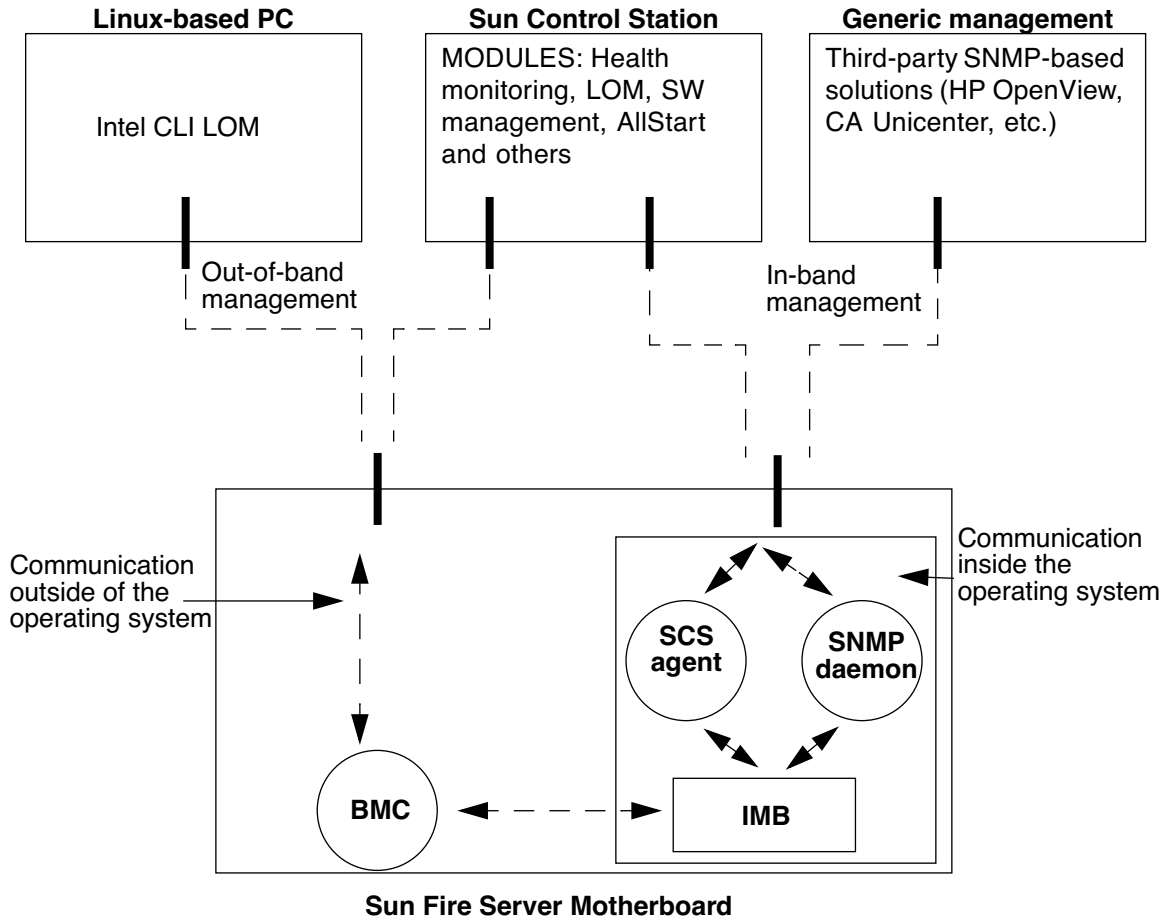
Acronym	Explanation
ARP	Address Resolution Protocol
BMC	Baseboard Management Controller
DPC	Direct Platform Control
grub	Grand Unified Bootloader
IPMI	Intelligent Platform Management Interface
ISM	Intel Server Management
KVM	Keyboard, video and monitor
LAN	Local Area Network
LILO	Linux Loader
LOM	Lights Out Management
MIB	Management Information Base
SCS	Sun Control Station
SDR	Sensor Data Record
SEL	System Event Log
SNMP	Simple Network Management Protocol
SOL	Serial Over LAN
SSU	System Setup Utility
SunMC	Sun Management Center
UDP	User Datagram Protocol
WAN	Wide Area Network

Server Management

There are several options for remotely managing a Sun Fire V60x server or a Sun Fire V65x server:

- Sun Control Station (SCS)
- Lights Out Management (LOM) through Intel's command-line interface (CLI)
- Serial Over LAN (SOL)
- Simple Network Management Protocol (SNMP)

The diagram in FIGURE 1-1 illustrates how the different management options work.



Note: For clarity, the illustration shows two different entry points for the in-band and out-of-band communications on both the Sun Control Station and the Sun Fire server motherboard. However, these two entry points can physically exist on the same network interface card (NIC).

FIGURE 1-1 Diagram of the Server-Management Options

Sun Control Station (SCS)

A Sun-branded product, the Sun Control Station (SCS) 2.0 is the primary server-management solution for a Sun Fire V60x server or Sun Fire V65x server running the Red Hat 7.3 operating system (OS).

The Sun Control Station is a native-Linux application that allows administrators to take control of their servers: tracking and applying software updates, deploying new services, and monitoring the health and performance of servers. More than just a typical systems-management device, the Sun Control Station is a platform that helps you to manage the complete life cycle of your servers, from initial setup through eventual redeployment at the end of useful life. As an added benefit, customers can continue to use third-party or homegrown software in conjunction with the Sun Control Station.

There is both a server-side component and a client-side component for the Sun Control Station. The server-side component can be installed on any x86-based server running Red Hat OS 7.3 or 8.1; the client-side component, known as an *agent*, will be available for the Sun Fire V60x server and Sun Fire V65x server, for both Linux and Solaris customers.

Sun Control Station supports both in-band and out-of-band system management.

The server-side component consists of two parts: a core framework that is the engine for executing control modules, and the built-in control modules themselves. These control modules can come from Sun Microsystems, Inc., from third-party vendors or from your own in-house design team. Numerous modules are available from Sun: Appliance Inventory, Performance Monitoring, Software Management, Health Monitoring, Lights Out Management (LOM) and AllStart, which includes the JumpStart utility for Solaris-based servers and the KickStart utility for servers running Red Hat operating systems.

Through the Sun Control Station, you can fully control the distribution of software payloads, offering customized and tailor-made services to downstream and end-user customers. Service Providers can offer unique payloads, data or software monitoring services. By leveraging the Sun BlueLinQ technology, all available software updates and patches can be accessed and distributed by a Sun Control Station, as designated by the administrator. Custom-built and third-party software can also be distributed. Furthermore, software packages can be “published” so that BlueLinQ-enabled clients—including other Sun Control Stations—can view and download these packages.

Services on the Sun Control Station

Here is a sample of what you can do with the Sun Control Station:

- **Inventory Management.** You can import and group from hundreds up to thousands of servers, as well as obtain detailed information on the servers.
- **Software Management.** The Server Administrator can keep systems current using the version-tracking feature for software patches and updates. You can also deploy custom software or data.
- **Local Software Repository.** In conjunction with Software Management, you can use the local software repository to “publish” software package files and allow the Server Administrator or end users of various servers to install available package files as desired or needed. You can configure your Sun Control Station to view “published” package files and share package files with other BlueLinQ-enabled servers.
- **Health and Performance Monitoring.** These control modules provide system alerts and the metrics of the basic operations of the servers, allowing you to pinpoint potential causes of failure.
- **Lights Out Management (LOM)** allows you to perform certain management functions remotely on servers that are compliant with the Intelligent Platform Management Interface (IPMI) version 1.5. This control module allows you to:
 - power on and power off a server
 - perform a hardware reset
 - illuminate a blue light-emitting diode (LED) on the server for identification and location
 - view the current sensor data and System Event Log (SEL) from the motherboard in the server
- **AllStart** provides a common user interface for creating software payloads, defining client profiles, and monitoring and validating system installations and updates. This module allows you to:
 - select files or RPMs to load onto a client
 - select the distributions of different OSs to load onto a client
 - create customized payloads made up of files and OS distributions
 - create profiles containing configuration information
 - add clients on to which the payloads and profiles are loaded (using the Media Access Layer [MAC] address of the client)

These services can be used within an extranet or an intranet environment, or across the Internet.

Availability

Sun Control Station v2.0 is available for download for Linux clients.

The Red Hat-7.3-based agent for the Sun Fire V60x server and Sun Fire V65x server is now available as a free download from Sun's Web site.

For more information, visit the Web sites at:

<http://www.sun.com/servers/entry/v60x>

<http://www.sun.com/servers/entry/v65x>

Lights Out Management (LOM)

The Intel Server Management (ISM) software is a set of applications and agents for monitoring and managing servers. The agents can act as low-level stand-alone pieces, or can be used in conjunction with full-featured integrated management suites.

Lights Out Management (LOM) uses a standard Intelligent Platform Management Interface (IPMI) that is associated with a network-interface-card (NIC) connection.

LOM through Direct Platform Control (DPC) includes the `dpcproxy` and `dpccli` programs, provided in the Resource CD for the Sun Fire V60x server and Sun Fire V65x server. The customer can also download a GUI-based DPC management program from Intel's Web site, at www.intel.com.

Available features include power on, power off and reset. System Event Logs (SELs) and Sensor Data Records (SDRs) can be viewed remotely.

For more information on using the `dpccli` program, see "ISM Command Line Interface" on page 10.

Note – The DPC management programs must be run on RedHat Linux systems, but can manage Sun Fire V60x and Sun Fire V56x servers with either the Linux or Solaris operating systems installed.

Serial Over LAN

The Serial Over LAN (SOL) feature lets servers transparently redirect the serial character stream from the baseboard UART to and from the remote client system over LAN. Serial over LAN has the following benefits compared to a serial interface.

- Eliminates the need for a serial concentrator
- Reduces the amount of cabling
- Allows remote management of servers without video, mouse, or keyboard (headless servers)

Serial over LAN requires a properly configured LAN connection, a network proxy running on either the client system or on a central network proxy server, and a console from which an ISM Command Line Interface (CLI) session can be established.

In a Linux environment, you can use a shell such as `csh` or `ksh` as your console. In this case, you must start the console interface (`dpccli`) to set the CLI session. This console works well in a scripting environment where you might want to monitor many servers. Also available under Linux is a telnet session (see “Using Telnet Linux for the SOL Feature” on page 18). This connection method results in better SOL console redirection.

Note – The `dpccli` interface does not support formatted output like a VT100 or UTF8 terminal would. When using a command-prompt console, special characters may not appear properly formatted as they would at the server console.

Enabling the SOL Feature on the Server

You can enable the SOL feature locally (on the managed server) through the System Setup Utility (SSU).

To enable the feature on the Sun Fire V60x server or Sun Fire V65x server, see “Configuring the Sun Fire V60x Server or Sun Fire V65x Server” on page 12.

Using the SOL Feature

To use the Serial Over LAN feature, you first initiate a CLI session. When in platform control mode, the CLI displays a unique prompt (`dpccli>`). When in SOL mode, the CLI does not display a prompt and all information displayed comes directly from the SOL character stream.

The following is an overview of how to use the Serial Over LAN feature:

1. Initiate a CLI session, using a telnet session if possible.
See “Using Telnet Linux for the SOL Feature” on page 18 for details on setting up a telnet session.
2. From the CLI prompt, enter commands such as `reset -c` or `power on -c`.
The `-c` parameter on these commands tells the session to switch to Serial Over LAN mode. The user will view console redirection as the system boots.
Refer to “Using the Command Line Interface” on page 22 for details.
3. To exit Serial Over LAN mode, enter the tilde-period key sequence (`~.`).
This switches the console back to Platform Control Mode.

Caution – If you are using a secure shell (`ssh`) session to run the CLI, using the tilde-period (`~.`) key sequence will terminate the `ssh` session.

Simple Network Management Protocol (SNMP)

SNMP is a network-management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance and security on a network.

SNMP-based management allows for third-party solutions to be used. This includes products such as HP OpenView and CA Unicenter.

The base component of an SNMP solution is the Management Information Base (MIB). The MIBs are included on the Resource CD for RedHat 7.x. If these MIBs are not part of your SNMP solution, they may be used as reference to code and compile your SNMP services.

Once you have compiled the MIBs, you can use a standard SNMP application to access the BMC data. For more information, refer to the documentation of the specific SNMP application.

ISM Command Line Interface

The Intel Server Management (ISM) command-line interface can only be run on RedHat Linux servers, but can be used to manage Sun Fire V60x or Sun Fire V65x servers running Linux or Solaris operating systems.

Command Line Interface

The Intel Server Management (ISM) command-line interface is a set of commands accessible through a client console that lets you control platform operations on the server from a command line rather than a graphical user interface (GUI). These commands allow you to interact with managed servers using either scripts or direct user commands to perform the following.

- Start and stop Serial Over LAN mode.
- Remotely power on or off a server
- Remotely reset the server
- Request machine identifiers
- Read sensor values
- Read the System Event Log (SEL)
- Display the network configuration of the Baseboard Management Controller (BMC)

The Linux shell (csh or ksh) console gives you access to the ISM Command Line Interface command set.

The ISM Command Line Interface uses a network proxy (`dpcproxy`) that runs on the client or on a central network proxy. The network proxy is automatically installed as part of the ISM installation process on the console system. Rebooting the console on which the proxy runs automatically starts the network proxy.

For more information about the network proxy, see “The Network Proxy (`dpcproxy`)” on page 13.

With the console `stdin` and `stdout`, an interface (`dpccli`) exists between the network proxy and the console. Like the network proxy, this interface is automatically installed as part of the command line interface installation process. In the case of `dpccli`, it must be started manually or from a script file.

For more information about `dpccli`, see “The Console Interface (`dpccli`)” on page 14.

CLI Installation

The files enabling command-line-interface functionality are installed on the Red Hat Linux console that is used to centrally manage the local area network (LAN) or wide area network (WAN). The components of CLI are installed to the client system as part of a package file (rpm).

Refer to <http://www.sun.com> for information about the most recent versions of management software.

On the console system, insert the Resource CD and navigate to the CLI rpm file in the directory `/srvmgmt/CLI/`. Execute the `installme` script.

Note – When running the `installme` script, the system may report a benign warning, indicating that the current kernel is not supported. If you encounter a problem when running `dpcproxy` with a Red Hat kernel release, visit the Sun Online Support Center at <http://www.sun.com/service/online/>.

After installation, the CLI files are located in the `/usr/local/cli/console` directory. A script file, `cliservice`, is also added to the `/etc/rc.d/init.d` directory.

For more information about the network proxy, see “The Network Proxy (`dpcproxy`)” on page 13.

CLI Configuration

Before you can use the ISM Command Line Interface, you need to verify that the following CLI configuration steps have been taken.

Configuring a Red Hat Linux Console

The `dpcproxy` daemon must be running prior to starting the `dpccli`. By default, the `dpcproxy` is started by the `cliservice` script located in the `/etc/rc.d/init.d` directory. The script file may be modified, if needed, to accommodate `dpcproxy` command parameters.

For more information about the network proxy, see “The Network Proxy (`dpcproxy`)” on page 13.

No other console configuration steps are required to run the CLI.

Configuring the Sun Fire V60x Server or Sun Fire V65x Server

To use `dpcccli` over a local area network (LAN), you must first enable the *LAN Access Mode* feature in the BMC on the Sun Fire V60x or Sun Fire V65x system that will be managed by the ISM CLI.

Note – By default, the *LAN Access Mode* feature is disabled.

Note – Remote-shell (`rsh`) and NIS connections to user-datagram-protocol (UDP) ports 623 and 624 will time out on the network interface used by the BMC if LAN management is enabled on that interface.

To avoid timeouts, configure your services to block the use of UDP ports 623 and 624, or use an alternate network interface for that traffic.

Note – The BMC sends out an Address-Resolution-Protocol (ARP) broadcast every three (3) seconds; ARP traffic scales linearly with additional server deployments. You can disable ARP broadcasts using IPMItool, an open-source IPMI client application available at <http://ipmitool.sourceforge.net/>.

If you disable ARP broadcasts, you must implement a hardcoded ARP resolution table on the managing node.

Note – You can navigate the portions of the Diagnostics CD and the System Setup Utility (SSU) with the mouse as well.

These instructions explain how to navigate by keyboard.

To enable the *LAN Access Mode* feature in the managed Sun Fire V60x server or Sun Fire V65x server:

1. **From the Diagnostics CD, boot the Sun Fire V60x server or Sun Fire V65x server.**
2. **Once the Diagnostics CD has completed booting, use the arrow keys to select the System Utilities option from the top menu.**
3. **From the System Utilities drop-down menu, use the arrow keys to select Run System Setup Utility (SSU) and press Enter.**

The SSU installs onto a ramdisk and takes a few minutes.

4. **Once the installation is complete, press any key to continue into the SSU user interface (UI).**

5. From the SSU task list, use the arrow keys to select PEM - Platform Event Manager and press Enter.
In the PEM Manager, a number of options appear.
6. Select Configure LAN and press Enter.
7. In the field LAN Access Mode, use the arrow keys to select Always Available and press Enter.
8. In the Password fields above LAN Access Mode, enter a password and verify it.
9. Select Save and press Enter.
10. If you will be using the Serial Over LAN (SOL) feature, complete the following steps. If you will not be using SOL, proceed to step 11.
 - a. In the Options menu, select Configure Serial Over LAN.
 - b. Specify the SOL Access Mode as either Always Available or Restricted.
 - c. Set the baud parameter rate.
 - d. Save your changes.
11. Select Close to return to the previous screen.
12. To exit the SSU, press ESC several times and press Enter to confirm each step.
13. To exit the Diagnostics CD, use the arrow keys to select Quit to DOS.
14. Select Quit Now and press Enter.
15. Eject the Diagnostics CD.
You can now reboot the server or power it off.

The Network Proxy (dpcproxy)

When you install Intel Server Management software, the network proxy is automatically installed and runs as a daemon each time the server is rebooted. The `dpcproxy` must be running before the CLI can operate. See “Configuring a Red Hat Linux Console” on page 11.

No command-line arguments are required for `dpcproxy` to start and enable the local console to run the CLI. The arguments are provided to expand the possible functionality of the `dpcproxy`.

Command Syntax

The `dpcproxy` command can be invoked manually or the `cliservice` script can be edited to include certain command arguments that are desired for each execution. When entering the `dpcproxy` command, you can specify the options in any order. The white space between an option flag and its associated argument is optional. Following is the command-line syntax:

```
dpcproxy [-?] [-h] [-p port] [-L] [-d logfiledir]
```

In a Red Hat Linux environment, you can only specify command-line options when you start the proxy (enter the `./dpcproxy` command).

TABLE 1-2 lists the `dpcproxy` command-line options.

TABLE 1-2 dpcproxy Command-line options

Option	Description
-?	Displays a usage message and exits. If you specify either of these options, all other options and input text are ignored.
-h	Displays a usage message and exits. If you specify either of these options, all other options and input text are ignored.
-p <i>port</i>	Specifies an alternate port at which the network proxy can listen for incoming client connections. By default, the network proxy listens on port 623, which is a privileged port in most operating systems.
-L	Causes the network proxy to accept connections only from the local host address (127.0.0.1). This option prevents this instance of the network proxy from providing services to systems other than the local system.
-d <i>logfiledir</i>	Causes <i>logfiledir</i> to be added to the front of the filename on all debug log files generated by the network proxy. If you do not use this option, debug log information is not kept.

The Console Interface (`dpccli`)

When the console you are using uses `stdin` and `stdout`, you must start `dpccli` before you can access the ISM Command Line Interface command set. This executable, `dpccli`, acts as an interface between the console and the network proxy. The Network Proxy (`dpcproxy`) must be running before `dpccli` can be executed. Once the interface is started, you can then connect to a server and enter commands.

The console interface is particularly useful in scripting environments that use standard console input and output. It is also useful as a simple interactive interface when formatted output such as VT100 and VT-UTF8 is not required.

To support non-interactive use, `dpccli` accepts command-line options that control its behavior. You can specify options in any order. The first text encountered not associated with a command-line option is interpreted as the start of text that is to be sent to the network proxy and therefore must be placed last on the command line. White space between an option and its associated argument is optional.

Note – When you use the `dpccli` remote management tool to power off the server, the server will not shut down gracefully. Ensure that you save and close all running applications before shutting down the server, in order to avoid data loss.

Command Syntax

The `dpccli` command line syntax is as follows:

```
dpccli [-?|h][-s server] [-u user] [-p password] [-i inputFile] [-c]
[-o OutputFile] [-I] [-v] [-P networkProxy] [-a alternatePort]
[-r rcFile][text]...
```

Command Line Options

TABLE 1-3 list the `dpccli` command-line options.

TABLE 1-3 `dpccli` Command-line options

Option	Description
-?	Displays command usage. Any options specified with this option are ignored.
-h	Displays command usage.
-s <i>server</i>	Specifies the IP address or DNS host name associated with the network interface card (NIC) used by the BMC. For server, specify either an IP address or DNS host name. If you do not use this argument option, you will be prompted for the information when establishing the connection.
-u <i>username</i>	Specifies the user name stored in the server firmware, which will be associated with this session. By default the user name is a “null” field and may be passed by pressing the <Enter> key. There is currently no method to change or add a user name.
-p <i>password</i>	Specifies the password stored in the server firmware, which will be associated with this session. If you do not use this argument option, you will be prompted for the information while establishing the connection.

TABLE 1-3 dpccli Command-line options

Option	Description
-i <i>inputfile</i>	Specifies an input file to be read as standard input (<code>stdin</code>). For <i>inputfile</i> , specify any text file. When the end of file is reached, the session ends unless you have also used the <code>-I</code> command-line option. If you do not use this option, you must interactively supply input from the command line.
-c	Forces the BMC session into Serial Over LAN (SOL) mode. In SOL mode, data is passed unaltered from the managed server to the console. If you do not use this command-line option, Platform Control Mode is the default mode.
-o <i>outputfile</i>	Specifies an output file in which to capture standard output (<code>stdout</code>). For <i>outputfile</i> , specify any text file. If you do not use this option, all standard output arrives at the console.
-I	Causes the session to continue as an interactive session after processing all characters supplied through an input file with the <code>-i</code> command-line option. This is the default mode if an input file or text was not specified on the command line.
-v	Causes session-progress messages to be sent to standard error (for example, verbose output). Additionally, any non-zero exit condition prints an associated error message. This behavior is also the default behavior during any interactive session.
-P <i>networkproxy</i>	Specifies the IP address or DNS host name of the system running the network proxy (<code>dpccproxy</code>). The system whose IP address or host name you supply for <i>networkproxy</i> is the system the client on which you are running the console should contact for service. By default, the IP address is the local host (127.0.0.1).
-a <i>alternateport</i>	Specifies an alternate network proxy port number. By default, the port number is 623.
-r <i>rcfile</i>	Specifies an alternate <code>dpcccli</code> configuration file. By default, <code>dpcccli</code> first looks for a file named <code>.dpcccli.rc</code> in the directory specified by the environment variable HOME and then in the current working directory. This option specifies the path including file name, which can be different than <code>.dpcccli.rc</code> . For information on <code>dpcccli</code> configuration files, see the following section.

The Console Interface Configuration File (`.dpcclic`)

In cases where you need to start the console interface (`dpccli`), there will be situations where you will want to use common command-line options. An example might be the network address of a centralized network proxy (`-P`). You can avoid having to specify this information each time you start `dpccli` by using a console-interface-configuration file. Each time you start `dpccli`, it reads the configuration file. By default, `dpccli` looks for a file with the `.dpcclic` first in the directory specified in the **HOME** environment variable and then looks in the current working directory. You can explicitly specify the file and its path on the command line using the `-r` option.

Options specified on the `dpccli` command line always take precedence over options specified in the configuration file.

Note – Not all options are supported from `.dpcclic`. The supported options are `a`, `I`, `v`, `i`, `o`, `p`, `P`, `s`, and `u`.

Command text is not processed through the configuration file. Any option not understood or supported is silently ignored. Thus, blank lines or comments that start with a non-option letter (for example, `#`) can be placed in the file.

When creating the configuration file, use one command-line option per line. Each line must begin with an option letter optionally preceded by the hyphen character. Follow the option with any argument that applies.

The following example specifies the name of the network proxy and its alternate port address:

```
-P kalamal  
-a 3033
```

Using Telnet Linux for the SOL Feature

For best results when invoking SOL commands during a CLI session, start the connection using Red Hat Linux telnet session.

- 1. At the Linux prompt, type:**

```
telnet xxx.xxx.xxx.xxx 623
```

For example:

```
telnet 10.7.162.58 623
```

The *xxx* represents the IP address of the system running the Network Proxy. This may be the local system or a central network server with the Proxy installed.

The 623 represents the default port address required for CLI connections. If this port address has been changed while executing the `dpcproxy` command, use that port address instead.

- 2. At the Server: prompt, provide the IP address or DNS name of the server to which you want to connect.**

- 3. Press Enter when prompted for a user name.**

The user name value is null. Press Enter without entering a user name.

- 4. Provide a password, if applicable.**

After authentication is performed, you will see a login successful message and the `dpccli>` prompt. You can now enter CLI commands.

Manually Executing the `dpccli` Command

The following steps describe the process to start the CLI in the RedHat Linux console by typing commands directly at the Red Hat Linux shell prompt.

- 1. The `dpcproxy` daemon must be running prior to starting the `dpccli`. By default, the `dpcproxy` is started by the `cliservice` script located in the directory `/etc/rc.d/init.d`.**
- 2. Enter the `dpccli` command and provide any command-line options.**
For a list of the options, see “Command Line Options” on page 15.
- 3. At the Server: prompt, provide the IP address or DNS name of the server to which you want to connect.**
- 4. At the Username prompt, press Enter. By default, there is no user name.**
- 5. Enter the password.**
This is the password you entered in Step 8 in the “Configuring the Sun Fire V60x Server or Sun Fire V65x Server” on page 12.
- 6. After authentication is performed, a Login Successful message appears and the `dpccli>` prompt. You can now enter ISM Command Line Interface commands.**

An example of the command syntax from the Red Hat Linux shell

```
[root@console1 console]# ./dpccli <Enter>
Server: 111.112.113.21 <Enter>
Username: <Enter>
Password: [password] <Enter>
Login successful
dpccli> (CLI prompt, waiting for user commands)
```

If incorrect information is entered for any of the arguments, you will be given two more attempts to enter correct data. If you fail for all three attempts, you will be returned to the Linux shell prompt.

Executing `dpccli` Commands From a Script

In order to scan multiple servers for information or to monitor their health, `dpccli` may be executed as part of a user-created script. The following is an example of how input and output files could be used to query a server and save the information to a file, which could then be parsed for data.

Note – Using the `dpccli` utility with a very long input script file may cause the `dpccli` script to exit unexpectedly or report network connection errors. If this occurs, split the input script file into several smaller files and execute them sequentially.

Sample input file

```
111.112.113.20
    (null username. carriage return only, no spaces or tabs)
    (null password. carriage return only, no spaces or tabs)
sensors -v
network
```

Script command to execute

```
./dpccli -i inputfilename -o outputfilename
```


Output file created based on the sample input file above.

Server: 111.112.113.20

Username:

Password:

Login successful

dpccli> sensors -v

```
04/08/02 | 06:56:18 | Baseboard 1.25V | ok | 1.24 | Volts
04/08/02 | 06:56:18 | Baseboard 2.5V | ok | 2.47 | Volts
04/08/02 | 06:56:18 | Baseboard 3.3V | ok | 3.29 | Volts
04/08/02 | 06:56:18 | Baseboard 3.3VSB | ok | 3.28 | Volts
04/08/02 | 06:56:18 | Baseboard 5.0V | ok | 4.97 | Volts
04/08/02 | 06:56:18 | Baseboard 12V | ok | 11.97 | Volts
04/08/02 | 06:56:18 | Baseboard -12V | ok | -11.97 | Volts
04/08/02 | 06:56:19 | Baseboard VBAT | ok | 3.07 | Volts
04/08/02 | 06:56:19 | Processor VRM | ok | 1.45 | Volts
04/08/02 | 06:56:19 | Baseboard Temp | ok | 30.00 | Celsius
04/08/02 | 06:56:19 | FntPnl Amb Temp | ok | 28.00 | Celsius
04/08/02 | 06:56:19 | Processor1 Temp | ok | 37.00 | Celsius
04/08/02 | 06:56:19 | Processor2 Temp | ok | 36.00 | Celsius
04/08/02 | 06:56:19 | PwrDstBd Temp | ok | 27.00 | Celsius
04/08/02 | 06:56:19 | PwrDstBrd Fan | ok | 7320.00 | RPM
04/08/02 | 06:56:19 | System Fan 3 | ok | 3872.00 | RPM
04/08/02 | 06:56:19 | System Fan 1 | ok | 5852.00 | RPM
```

dpccli> network

IP Address: 111.112.113.20

IP Address Source: static

MAC Address: 00:03:47:A4:FC:7D

Subnet Mask: 255.255.255.0

Gateway: 111.112.113.20

dpccli> exit

Using the Command Line Interface

This section describes the commands available once you are at the `dpccli>` prompt.

CLI Commands

TABLE 1-4 lists the ISM Command Line Interface commands. For command descriptions, syntax and options, refer to the appropriate section following TABLE 1-4. CLI commands are case-sensitive and must be all lowercase.

TABLE 1-4 CLI Commands

Command	Description
exit	Ends the CLI session
quit	Ends the CLI session
boot	Sets the IPMI boot options and then resets the system.
help	Displays command usage
id	Displays the GUID of the managed server
identify	Causes the server to signal its location
network	Displays the network configuration of the BMC
power on	Initiates a power-up sequence on the managed server
power off	Initiates a power-down sequence on the managed server
reset	Performs a reset operation on the managed server
sel	Displays the System Event Log (SEL) records
sensors	Displays the current status of the server's sensors
set	Defines the CLI command-mode prompt and response prefix
version	Displays the version of the active dpcproxy

Exit and Quit

Syntax:

`exit`
`quit`

Description:

You can terminate the CLI session using the Exit or Quit command. Either of these commands closes all sessions associated with the user of the network proxy, and closes the network-proxy socket.

Boot

Syntax:

`boot [-f] [-c] normal | service`

Description:

Sets the IPMI boot options and then resets the system. If the specified boot option is unavailable, the server will boot using the boot order set in its BIOS.

Options:

`[-f]`

Forces a boot without a graceful shutdown.

`[-c]`

Switches the session to Serial Over LAN mode after successfully executing the IPMI reset command. You will see the BIOS output and other boot messages as if sitting at the managed server. If you specify a `service` option along with the `-c` option, the CLI opens a connection with the Remote Service Agent (RSA) running on the service partition instead of establishing a Serial Over LAN session. Then you can interact with RSA using the Service command.

`normal`

Boots the server from the hard drive.

`service`

Boots the server from the Service Partition.

Note – If you need to shut down the operating system, issue a shutdown command to the operating system, wait for the server to halt, then issue the CLI `boot` command.

Help

Syntax:

help [*CLIcommand*]

Description:

Displays usage descriptions for the specified CLI command. If you do not specify a CLI command, usage information for all CLI commands is displayed.

Options:

[*CLIcommand*] is any valid CLI command.

ID

Syntax:

id

Description:

Displays the 16-byte system Globally Unique Identifier (GUID) of the managed server in the conventional GUID format – for example, 422e7704-23f5-4706-a943-a7859c073aed.

Identify

Syntax:

identify [-on [seconds]] [-off]

Description:

Causes the server to signal its physical location with a blinking light-emitting diode (LED), if the system has an ID LED available. This command can help you locate a server in a rack of servers.

Options:

[-on [seconds]]

Specifies the number of seconds to blink the LED. If you do not provide a value for seconds, the default time will be 15 seconds.

[-off]

Turns off the blinking LED.

Network

Syntax:

`network [mac | ip | subnet | gateway]`

Description:

Displays the network configuration of the Baseboard Management Controller (BMC). The display includes the MAC address, IP address and source (static, DHCP, BIOS), subnet mask, and gateway IP address. If you do not supply an option, all information is displayed.

Options:

`[-mac]` Displays only the MAC address.

`[-ip]` Displays only the IP Address.

`[-subnet]` Displays only the subnet mask.

`[-gateway]` Displays only the gateway IP Address.

Power On

Syntax:

`power on [-c]`

Description:

Initiates a power-on sequence on the managed server.

Options:

`[-c]`

Switches the session to Serial Over LAN mode after successfully executing the IPMI power-on command.

Note – To perform a Preboot eXecution Environment (PXE) network boot after power-on, use the Esc-@ key sequence to emulate an F12 keystroke during system start-up (POST).

Power Off

Syntax:

```
power off [-f]
```

Description:

Initiates a power-down sequence on the managed server.

Option:

`[-f]` Forces a power off without attempting a graceful shutdown.

Note – If you need to shut down the operating system, issue a shutdown command to the operating system, wait for the server to halt, then issue the CLI `power off` command.

Reset

Syntax:

```
reset [-f] [-c]
```

Description:

Performs a platform power cycle.

Options:

`[-c]`

Switches the session to Serial Over LAN mode after successfully executing the IPMI reset command.

`[-f]`

Forces a reset without attempting a graceful shutdown.

Note – If you need to shut down the operating system, issue a shutdown command to the operating system, wait for the server to halt, then issue the CLI `reset` command.

Sel

Syntax:

`sel [-c] [-num]`

Description:

Displays the System Event Log (SEL) records. Each record displays on a single line and uses the following format:

```
Record # | Date Time | Sensor | Event description
```

Options:

`[-c]`

Displays the record in a comma-separated value format. In this format, a single comma separates each field as shown in the following example:

```
23,08/23/01,13:22:01,Fan #01,Lower Critical - going low
24,08/25/01,06:13:41,System Event,System Boot Event
```

`[-num]`

Specifies the number of events displayed. If you do not use this option, all SEL records display. For example, `sel -10` will display the last 10 SEL events.

Sensors

Syntax:

`sensors [-v] [-c] [-f threshold] [sensor]`

Description:

Displays the current status of platform sensors using this general format:

```
Date | Time | Sensor Type | Sensor # | Status [ | Value | Units ]
```

Options:

`[-v]`

Displays all information fields (date, time, sensor type, and so on) if they are available. The following shows an example:

```
09/13/01 | 10:08:55 | Voltage | #02 | ok | 5.2 | Volts
09/13/01 | 10:08:55 | Temperature | #12 | critical | 102 | Degrees Celsius
```

[-c]

Displays the record using a comma-separated format. In this format, fields are separated by a single comma. The following shows an example:

```
09/13/01,10:08:55,Voltage,#02,ok,5.2,Volts
09/13/01,10:08:55,Temperature,#12,critical,102,Degrees Celsius
```

[-f *threshold*]

Filters the display based on *threshold*. You can use one of the following for *threshold*. All sensors that are at the threshold and above will display. For example, setting the threshold to **cr** causes all sensors with critical, non-recoverable and unspecified conditions to display.

- **ok** Operating in normal ranges.
- **nc** Non-critical condition caused by a sensor outside of its normal ranges.
- **cr** Critical condition that is potentially fatal error caused by a sensor exceeding its specified ratings.
- **nr** Non-recoverable condition that has potential to damage hardware.
- **us** Unspecified status indicating a fault whose severity is unknown.

[sensor]

Specifies the sensor group (**temp**, **volt** or **fan**) for which information is displayed. If you do not specify a sensor group, all groups for which there is information display.

For example, `dpccli> sensors fan`

```
09/13/01 | 10:21:38 | PwrDstBrd Fan | ok
09/13/01 | 10:21:38 | System Fan 3 | ok
09/13/01 | 10:21:39 | System Fan 1 | ok
```


Set

Syntax:

```
set prompt=text | prefix=text
```

Description:

Allows you to define the CLI-command-mode prompt and the prefix that is applied to CLI-command responses. By default, the command-line prompt is `dpccli>`, while the default response prefix is an empty string.

Options:

```
prompt=text
```

Specifies the CLI-command-mode prompt change to text.

```
prefix=text
```

Specifies the response prefix be text.

```
text
```

The prompt or prefix text. You can supply any literal text characters plus the system variables `$System`, `$time` and `$date`. These variables resolve to the hostname or IP address, the system time and date, respectively. The time and date reflect current time for the system that is hosting the network proxy.

Version

Syntax:

```
version
```

Description:

Displays the version of the active network proxy (`dpcproxy`).

Console Redirection Over Serial on a Linux System

Instructions for console redirection on a Solaris system can be found in the *Sun Fire V60x and Sun Fire V65x Server Solaris Operating Environment Installation Guide*.

Caution – Redirecting the console over serial is a procedure intended for advanced users of Linux only.

You can seriously disrupt the proper functioning of your server or render the Sun Fire™ V60x server or Sun Fire V65x server unbootable if you introduce a problem in the configuration files.

Redirecting the console interaction over the serial port allows the user another method to monitor the server. The goal of these configurations is to configure the bootloader to redirect its output, pass the kernel the proper parameters and configure a login session on the serial port.

This chapter specifies how to configure these options.

The BIOS redirects console output to serial by default (9600, 8N1, no handshake) until a bootloader program is run from the hard disk drive. The bootloader must be configured to support the serial console in addition to the keyboard, video and monitor (KVM) console.

Two common bootloaders are `grub` and Linux Loader (LILO).

Caution – Do not edit the working-image section of your configuration files directly.

Copy the working-image section and paste it within the configuration file. Make your editing changes to this copied section.

grub

If you use `grub`, there are three steps to enable console redirection over serial; these steps all involve editing the `grub` configuration file `/etc/grub.conf`.

Note – The file `/etc/grub.conf` is a symbolic link to the file `/boot/grub/grub.conf`.

1. Passing the proper console parameters to the kernel.
2. Configuring the `grub` menu system to redirect to the proper console.
3. Removing any splash images that would prevent the proper serial-console display.

For more information on the parameters, refer to the file `kernel-parameters.txt` in your kernel documentation.

For more information on `grub`, run the command `info grub`.

Note – If the arrow keys do not work through your remote serial concentrator, you can use the keystroke combinations of `<CTRL+P>` and `<CTRL+N>` work to highlight the Previous and Next entry, respectively. Pressing `Enter` then boots that entry.

The parameter `console=ttyS1` tells the system to send the data to the serial port first. The parameter `console=tty0` tells the system to send the data to the KVM second.

A `working-image` section in your file `/etc/grub.conf` should have an entry for the kernel image to boot. The stock kernel entry looks like:

```
kernel /vmlinuz-<kernelrevision> ro root=/dev/sda5
```

where `<kernelrevision>` is simply the kernel version that you are using.

You need to change the stock kernel entry of your image to include the console-kernel parameters, as follows:

```
kernel /vmlinuz-<kernelrevision> ro root=/dev/sda5
console=ttyS1,9600 console=tty0
```

Note – These options should be all on one line with no wrap to a second line.

Add the following two lines to the file `/etc/grub.conf`:

```
serial --unit=1 --speed=9600
terminal serial console
```

Adding these two lines sets up your serial port or your KVM as your grub console so that you can remotely or locally select a boot image from the grub menu.

Comment out or remove the following line from the file `/etc/grub.conf`:

```
splashimage=(hd0,1)/boot/grub/splash.xpm.gz
```

Removing the `splashimage` line allows for greater compatibility during your serial connection; with this line removed, the splash image will not prevent the proper grub menu from displaying.

LILO

LILO uses the `append` feature in an image section in order to pass the kernel the proper parameters to use the serial console.

You can enter the consoles in the `append` statement of the file `/etc/lilo.conf`:

```
append="console=ttyS1,9600 console=tty0"
```

After modifying the file `/etc/lilo.conf`, the user must run `lilo` from the command line to activate the change.

For more information on LILO, run the commands `man lilo` or `man lilo.conf`.

getty

You can run a service called `getty` to log out of idle shell sessions automatically on the serial interface.

To enable `getty`, append the following line to the list of `gettys` in the file `/etc/inittab` file:

```
7:12345:respawn:/sbin/agetty 9600 ttyS1
```

Note – It does not matter where you append this line in the list.

The list of `gettys` currently looks like the following:

```
# Run gettys in standard runlevels
1:2345:respawn:/sbin/mingetty tty1
2:2345:respawn:/sbin/mingetty tty2
3:2345:respawn:/sbin/mingetty tty3
4:2345:respawn:/sbin/mingetty tty4
5:2345:respawn:/sbin/mingetty tty5
6:2345:respawn:/sbin/mingetty tty6
```

Enabling BIOS Console Redirection

Note – Console redirection is enabled by default in the BIOS.

If the default settings have been changed in the BIOS, the following procedure explains how to change the console-redirection settings.

1. **Reset or power on the Sun Fire V60x server or Sun Fire V65x server.**
2. **As soon as the “SETUP” option appears on the monitor, press <F2> to enter the “SETUP” section.**
3. **Once in the main page of the Setup menu, use the arrow keys to select the “Server” menu.**
4. **Press Enter.**
5. **In the “Server” menu, select “Console redirection”.**
6. **Press Enter.**
7. **In the “Console redirection” screen, view the following settings. Ensure that these settings match the settings at the remote terminal. Make any necessary changes.**
 - BIOS redirection port: [Serial 2 (RJ45)]
 - Baud Rate: [9600]
 - Flow control: [No flow control]
 - Terminal type: [PC-ANSI]
8. **To exit the “Setup” menu and save your changes, press <F10>.**

For the new settings to take effect, you need to reboot the server.

Once the server reboots, the console redirection will work.

Diagnostics CD

Note – You can navigate the portions of the Diagnostics CD and the System Setup Utility (SSU) with the mouse as well.

The instructions in these procedures explain how to navigate the menus by keyboard.

Diagnostics CD and Service Partition over Serial Console

The Diagnostics CD or the Service Partition can run over the serial console if console redirection is enabled in the BIOS. For more information, see “Enabling BIOS Console Redirection” on page 34.

To run the Diagnostic functions from the Diagnostics CD or the Service Partition on the server’s hard disk drive, you need to reboot the server.

Once the server reboots, the console redirection will work without any special configuration changes.

- If you are booting to the Service Partition, you need to press <F4> to invoke the Service Partition.
- If you are booting from the Diagnostics CD, the Diagnostics menu comes up automatically.

Viewing and Saving the SEL Information

Note – You will need a blank floppy diskette to save the System Event Log (SEL) information for this procedure.

To view the SEL information:

1. **From the Diagnostics CD, boot the Sun Fire V60x server or Sun Fire V65x server.**
2. **Insert the floppy diskette into the floppy diskette drive.**

3. Once the Diagnostics CD has completed booting, use the arrow keys to select the "System Utilities" option from the top menu.

4. From the "System Utilities" drop-down menu, use the arrow keys to select "Run System Setup Utility (SSU)" and press Enter.

The SSU installs onto a ramdisk and takes a few minutes.

5. Once the installation is complete, press any key to continue into the SSU UI.

6. From the SSU task list, use the arrow keys to select "SEL Manager" and press Enter.

In the SEL Manager, a list of the SEL contents appears. You can page up and down through the listing to view the events.

7. To save the SEL to a floppy diskette:

a. Press <ALT+F>.

b. Select "Save As...".

c. Enter the filename for the SEL.

d. The 8.3 naming limitation in DOS applies (format: xxxxxxxx.yyy).

e. Use the TAB key to navigate to the "Drives" drop-down menu. Use the arrow keys to select "A: ".

f. Use the TAB key to navigate to OK button and press it.

g. Once the SEL information has been saved, press Enter to confirm.

8. To exit the SSU, press ESC several times and press Enter to confirm each step.

9. To exit the Diagnostics CD, use the arrow keys to select "Quit to DOS".

10. Select "Quit Now" and press Enter.

11. Eject the Diagnostics CD and remove the floppy diskette.

You can now reboot the server or power it off.