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Preface

This book describes the dynamic reconfiguration (DR) feature in the system management services (SMS) software. The DR feature enables you to attach and detach system boards to and from an active Sun Fire™ 15K domain while the Solaris™ operating system continues to run.

Before You Read This Book

This book is intended for the Sun Fire 15K platform administrator who has a working knowledge of UNIX® systems, particularly those based on the Solaris operating environment. If you do not have such knowledge, first read the Solaris user and system administrator books in AnswerBook2™ format provided with this system, and consider UNIX system administration training.

How This Book Is Organized

This book contains the following chapters:

Chapter 1 “Introduction to DR in System Management Services”
Chapter 2 “DR Software Components on the SC”
Chapter 3 “SMS DR User Interfaces”
Chapter 4 “SMS DR Procedures”
Using UNIX Commands

This document does not contain complete information on basic UNIX® commands and procedures, such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:
- AnswerBook2™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

<table>
<thead>
<tr>
<th>Typeface or Symbol</th>
<th>Meaning</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>AaBbCc123</td>
<td>The names of commands, files, and directories; on-screen computer output</td>
<td>Edit your .login file. Use ls -a to list all files. % You have mail.</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>What you type, when contrasted with on-screen computer output</td>
<td>% su Password:</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>Book titles, new words or terms, words to be emphasized</td>
<td>Read Chapter 6 in the User’s Guide. These are called class options. You must be superuser to do this.</td>
</tr>
<tr>
<td>AaBbCc123</td>
<td>Command-line variable; replace with a real name or value</td>
<td>To delete a file, type rm filename.</td>
</tr>
</tbody>
</table>
Shell Prompts

<table>
<thead>
<tr>
<th>Shell</th>
<th>Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>C shell</td>
<td><code>machine_name%</code></td>
</tr>
<tr>
<td>C shell superuser</td>
<td><code>machine_name#</code></td>
</tr>
<tr>
<td>Bourne shell and Korn shell</td>
<td><code>#</code></td>
</tr>
<tr>
<td>Bourne shell and Korn shell superuser</td>
<td><code>#</code></td>
</tr>
</tbody>
</table>

Related Documentation

<table>
<thead>
<tr>
<th>Application</th>
<th>Title</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>User information</td>
<td><em>Sun Fire 15K Dynamic Reconfiguration</em></td>
<td>816-4278</td>
</tr>
<tr>
<td></td>
<td><em>User Guide</em></td>
<td></td>
</tr>
<tr>
<td>SMS Command reference</td>
<td><em>System Management Services (SMS) 1.2</em></td>
<td>816-3268</td>
</tr>
<tr>
<td></td>
<td><em>Reference Manual</em></td>
<td></td>
</tr>
<tr>
<td>Administrator Guide</td>
<td><em>System Management Services (SMS) 1.2</em></td>
<td>816-3267</td>
</tr>
<tr>
<td></td>
<td><em>Administrator Guide</em></td>
<td></td>
</tr>
</tbody>
</table>

Accessing Sun Documentation Online

A broad selection of Sun system documentation is located at:

http://www.sun.com/products-n-solutions/hardware/docs

A complete set of Solaris documentation and many other titles are located at:

http://docs.sun.com
Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Sun at:

docfeedback@sun.com

Please include the part number (816-4279-10) of your document in the subject line of your email.
CHAPTER 1

Introduction to DR in System Management Services

This chapter contains an introduction to the dynamic reconfiguration (DR) feature in the system management services software on the Sun Fire 15K system controller (SC). For more information about DR on the domain, refer to the Sun™ Fire 15K Dynamic Reconfiguration User Guide.

What Is DR?

The dynamic reconfiguration feature on the Sun Fire 15K server enables you to perform hardware configuration changes to a live domain that is running the Solaris operating environment, without causing machine downtime. You can also use DR, in conjunction with hot-swap functionality, physically to remove boards from, or add them to, the server.

You can execute DR operations from the SC by using the system management services commands—`addboard(1M)`, `moveboard(1M)`, `deleteboard(1M)`, and `rcfgadm(1M)`.

**Note** – You can execute DR operations either on the SC, or on the domain, using the `cfgadm(1M)` command. Refer to the Sun Fire 15K Dynamic Reconfiguration User Guide for more information about running DR on the domain.

1
Automatic DR

Automatic DR enables an application to execute DR operations without requiring user interaction. This ability is provided by an enhanced DR framework that includes the reconfiguration coordination manager (RCM) and the system event facility, `sysevent`. The RCM enables application-specific loadable modules to register callbacks. The callbacks perform preparatory tasks before a DR operation; error recovery during a DR operation; or clean-up after a DR operation. The system event framework enables applications to register for system events and receive notifications of those events. The automatic DR framework interfaces with the RCM and with the system event facility to enable applications to automatically give up resources prior to unconfiguring them and to capture new resources as they are configured into the domain.

The automatic DR framework can be used both locally (that is, from the domain by using the `cfgadm(1M)` command) or from the SC. The automatic DR operations that are initiated locally on the domain are referred to as local automatic DR, and the automatic DR operations initiated from the SC are referred to as global automatic DR. The global automatic DR operations include moving system boards from one domain to another, configuring hot-swaped boards into a domain, and removing system boards from a domain.

Enhanced System Availability

The DR feature enables you to hot-swap system boards without bringing the server down. It is used to unconfigure the resources on a faulty system board from a domain so that the system board can be removed from the server. The repaired, or replacement, board can be inserted into the domain while the Solaris operating environment is running. DR then configures the resources on the board into the domain. If you use the DR feature to add or remove a system board or component, DR always leaves the board or component in a known configuration state (see Chapter 1 “SC State Models” for more information about configuration states for system boards and components).
Component Types

You can use DR to add or to remove the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cpu</td>
<td>An individual CPU</td>
</tr>
<tr>
<td>memory</td>
<td>All of the memory on the board</td>
</tr>
<tr>
<td>pci</td>
<td>Any I/O device, controller, or bus</td>
</tr>
</tbody>
</table>

DR on I/O Boards

You must use caution when you add or remove system boards with I/O devices. Before you can remove a board with I/O devices, all of its devices must be closed and all its file systems must be unmounted.

If you need to remove a board with I/O devices from a domain temporarily and then re-add it before any other boards with I/O devices are added, reconfiguration is not necessary and need not be performed. In this case, device paths to the board devices will remain unchanged. But if you add another board with I/O devices after the first was removed, then re-add the first board, reconfiguration is required because the paths to devices on the first board have changed.

Sun Fire 15K Domains

The Sun Fire 15K server can be divided into dynamic system domains, referred to simply as domains in this document. These domains are based on system board slots that are assigned to the domains. Each domain is electrically isolated into hardware partitions, which ensures that any failure in one domain does not affect the other domains in the server.

Sun Fire 15K domain configuration is determined by the domain configuration in the platform configuration database (PCD), which resides on the SC. The PCD controls how the system board slots are logically partitioned into domains. The domain
configuration represents the intended domain configuration. Thus, the configuration
can include empty slots and populated slots. The physical domain is determined by
the logical domain.

**Note** – You can run DR operations in one of two ways: from the SC by using the
system management services commands—addboard(1M), moveboard(1M),
deleteboard(1M), and rcfadm(1M); or directly on the domain, using the
cfgadm(1M) command.

The number of slots available to a given domain is controlled by an available
component list (ACL) that is maintained on the SC. A slot must be assigned or
available to a domain before you can change its state. After a slot has been assigned
to a domain, it becomes visible to that domain and unavailable and invisible to any
other domain. Conversely, you must disconnect and unassign a slot from its domain
before you can assign and connect it to another domain.

The logical domain is the set of slots that belong to the domain. The physical domain
is the set of boards that are physically interconnected. A slot can be a member of a
logical domain without having to be part of a physical domain. After the domain is
booted, the system boards and the empty slots can be assigned to or unassigned
from a logical domain; however, they are not allowed to become a part of the
physical domain until the operating system requests it. System boards or slots that
are not assigned to any domain are available to all domains. These boards can be
assigned to a domain by the platform administrator; however, an available
component list can be set up on the SC to allow users with appropriate privileges to
assign available boards to a domain.

**DR Administration Models**

The available component list controls what administrative tasks can be performed,
based on the name and group identification of the user. For instance, the platform
administrator can add, delete, or move boards to or from a domain, as well as assign
and unassign boards to or from a domain; however, the domain administrator or a
domain configurator cannot assign or unassign boards to or from a domain. A brief
description of the privileges model for each DR operation is given in Chapter 3
“SMS DR User Interfaces”. For a detailed description of the privileges required for
each SMS command, refer to the *System Management Services (SMS) 1.2 Administrator
Guide*. 
SC State Models

On the Sun Fire 15K SC, a board can be in one of four states: unavailable, available, assigned, or active. You can use the `showboards(1M)` command to view the state (that is, status in the `showboards(1M)` output) of a specific board. You must have the appropriate privileges for the specified domain.

In the following example of the `showboards(1M)` command, the output does not include boards that are assigned to other domains.

You will never see an unavailable board in the output for the domain administrator. Only the platform administrator can see every board in the system.

The following table contains the names and descriptions of the states for boards on the SC. The state of a board on the SC is not the same as the state of a board on the domain. For more information about board states on the domain, refer to the *Sun Fire 15K Dynamic Reconfiguration User Guide*.

<table>
<thead>
<tr>
<th>Slot</th>
<th>Pwr</th>
<th>Type of Board</th>
<th>Board Status</th>
<th>Test Status</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB3</td>
<td>On</td>
<td>CPU</td>
<td>Active</td>
<td>Passed</td>
<td>engB</td>
</tr>
<tr>
<td>SB6</td>
<td>-</td>
<td>Empty Slot</td>
<td>Available</td>
<td>-</td>
<td>Isolated</td>
</tr>
<tr>
<td>IO8</td>
<td>On</td>
<td>HPCI</td>
<td>Assigned</td>
<td>Unknown</td>
<td>engB</td>
</tr>
<tr>
<td>IO9</td>
<td>Off</td>
<td>HPCI</td>
<td>Assigned</td>
<td>Failed</td>
<td>engB</td>
</tr>
</tbody>
</table>

You will never see an unavailable board in the output for the domain administrator. Only the platform administrator can see every board in the system.

The following table contains the names and descriptions of the states for boards on the SC. The state of a board on the SC is not the same as the state of a board on the domain. For more information about board states on the domain, refer to the *Sun Fire 15K Dynamic Reconfiguration User Guide*.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>unavailable</td>
<td>The board is unavailable to the domain. The board has not been added to the ACL for the specified domain, or the board is currently assigned to another domain. Note that boards that are not in the ACL are invisible to the domain. In the unavailable state, the board is not considered part of the specified domain.</td>
</tr>
<tr>
<td>available</td>
<td>The board is available to be added to the domain. The board is in the ACL for the domain. Note that the board can be available to any number of domains. In the available state, the board is not considered to be part of the logical domain.</td>
</tr>
<tr>
<td>assigned</td>
<td>The board has been assigned to the domain; it is in the ACL for that domain and is unavailable to any other domain. In the assigned state, the board is considered to be part of the logical domain.</td>
</tr>
<tr>
<td>active</td>
<td>The board has been connected. Or, the board has been connected and configured into the Solaris operating environment and is available for use by the operating system. In the active state, the board is considered part of the physical domain.</td>
</tr>
</tbody>
</table>
DR Software Components on the SC

This chapter contains information about the various processes and daemons on the Sun Fire 15K system controller (SC) that work together to accomplish DR operations. The processes and/or daemons that are used depends entirely on the point of execution of the DR operation. For instance, if you execute the DR operation from the SC, the system uses several more processes and/or daemons to accomplish the DR operation than it would if you executed the DR operation from the domain.

For more information about the processes and daemons that reside on the domain, refer to the Sun Fire 15K Dynamic Reconfiguration User Guide. In addition, refer to the System Management Services (SMS) 1.2 Administrator Guide for more information about the processes and daemons that reside in the SMS software on the SC.

Domain Configuration Agent

The domain configuration agent (DCA) enables applications such as Sun™ Management Center and SMS to initiate DR operations on a Sun Fire 15K domain. The DCA runs on the SC and manages the DR communications between software applications running on the SC and the domain configuration server on the domain. An individual instance of the DCA runs on the SC for each domain on the platform. For more information about the DCA, refer to the System Management Services (SMS) 1.2 Administrator Guide.
PCD Daemon

The platform configuration daemon (PCD) manages the configuration of the Sun Fire 15K platform through a collection of flat files that comprise the PCD database. All changes to the configuration of the platform must go through the PCD. For more information about the PCD, refer to the *System Management Services (SMS) 1.2 Administrator Guide*. 
CHAPTER 3

SMS DR User Interfaces

The dynamic reconfiguration (DR) feature supports a single point of control, the Sun Fire 15K system controller (SC), which runs the system management services (SMS) software. However, it also supports administration control from the domain. This chapter describes the DR interfaces on the SC. For information about using `cfgadm(1M)` to run DR on the domain, refer to the Sun Fire 15K Dynamic Reconfiguration User Guide.

SMS DR Commands and Options

This section contains descriptions of the SMS DR commands and related options.

`addboard(1M)`

The `addboard(1M)` command attaches a specific board to a specific domain. The following table describes the `addboard(1M)` command options and operands:

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>board_id</code></td>
<td>The board ID of the board to be added. The board ID corresponds to the board location (for example, SB2 is the board in slot 2). Multiple board identifiers are permitted.</td>
</tr>
<tr>
<td><code>-c function</code></td>
<td>The configuration state into which to move the board. You can add a board by steps. For example, you can assign the board, connect it, then configure it.</td>
</tr>
<tr>
<td>`-a domain_id</td>
<td>domain_tag`</td>
</tr>
</tbody>
</table>
Refer to the `addboard(1M)` man page for more information.

The following table contains the privileges needed to use the `addboard(1M)` command. The platform operator, platform service, and superuser groups cannot initiate the `addboard(1M)` command.

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-h</code></td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td><code>-n</code></td>
<td>No to all prompts</td>
</tr>
<tr>
<td><code>-q</code></td>
<td>Quiet mode, which means messages are not written to standard output</td>
</tr>
<tr>
<td><code>-r retry_count</code></td>
<td>Number of retries that are performed if the attach fails</td>
</tr>
<tr>
<td><code>-t timeout</code></td>
<td>Wait time in seconds before a retry</td>
</tr>
<tr>
<td><code>-y</code></td>
<td>Yes to all prompts</td>
</tr>
</tbody>
</table>

The following example of the `addboard(1M)` command attaches system board 2 to the domain specified by `domain_id`. Two retries are performed, if necessary, with a wait time of 10 minutes.

```bash
% addboard -d domain_id -r 2 -t 600 SB2
```
deleteboard(1M)

The deleteboard(1M) command attempts to detach the specified board from the domain in which it currently resides. The following table describes the deleteboard(1M) command options and operands:

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td>board_id</td>
<td>The board ID of the board to be deleted. The board ID corresponds to the board location (for example, SB2 is the system board in slot 2). Multiple board identifiers are permitted.</td>
</tr>
<tr>
<td>-c function</td>
<td>The configuration state into which to move the board. You can add a board by steps. For example, you can unconfigure the board, disconnect it, then unassign it.</td>
</tr>
<tr>
<td>-h</td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td>-n</td>
<td>No to all prompts</td>
</tr>
<tr>
<td>-q</td>
<td>Quiet mode, which means messages are not written to standard output.</td>
</tr>
<tr>
<td>-r retry_count</td>
<td>Number of retries that are performed if the detach fails</td>
</tr>
<tr>
<td>-t timeout</td>
<td>Wait time in seconds before a retry</td>
</tr>
<tr>
<td>-y</td>
<td>Yes to all prompts</td>
</tr>
</tbody>
</table>

Refer to the deleteboard(1M) man page for more information.

The following table contains the privileges needed to use the deleteboard(1M) command. The platform operator, platform service, and superuser groups cannot initiate the deleteboard(1M) command.

<table>
<thead>
<tr>
<th>Platform Admin</th>
<th>Domain Admin</th>
<th>Domain Configurator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can unassign boards from a domain by using the -c option with the unassign function. This function unconfigures and disconnects the board before it unassigns the board. The board cannot be active in a running domain.</td>
<td>Can disconnect or unconfigure a board from the domain. The board remains assigned to the domain.</td>
<td>Can disconnect or unconfigure a board from the domain. The board remains assigned to the domain.</td>
</tr>
</tbody>
</table>
The following example of the deleteboard(1M) command detaches system board 2 from its current domain. Two retries are performed, if necessary, with a wait time of 15 minutes.

```
% deleteboard -r 2 -t 900 SB2
```

**moveboard(1M)**

The moveboard(1M) command detaches a board from the domain in which it currently resides and attaches it to the specified domain. The following table describes the moveboard(1M) command options and operands:

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>board_id</code></td>
<td>The board ID of the board to be moved. The board ID corresponds to the board location (for example, SB2 is the system board in slot 2). Multiple board identifiers are permitted.</td>
</tr>
<tr>
<td><code>-c function</code></td>
<td>The configuration state into which to move the board. You can move a board by steps. For example, you can assign the board, connect it, then configure it.</td>
</tr>
<tr>
<td>`-d domain_id</td>
<td>domain_tag`</td>
</tr>
<tr>
<td><code>-h</code></td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td><code>-n</code></td>
<td>No to all prompts</td>
</tr>
<tr>
<td><code>-q</code></td>
<td>Quiet mode, which means messages are not written to standard output</td>
</tr>
<tr>
<td><code>-r retry_count</code></td>
<td>Number of retries that are performed if the operation fails</td>
</tr>
<tr>
<td><code>-t timeout</code></td>
<td>Wait time in seconds before a retry</td>
</tr>
<tr>
<td><code>-y</code></td>
<td>Yes to all prompts</td>
</tr>
</tbody>
</table>

Refer to the moveboard(1M) man page for more information.
The following table contains the privileges needed to use the `moveboard(1M)` command. The platform operator, platform service, and superuser groups cannot initiate the `moveboard(1M)` command.

<table>
<thead>
<tr>
<th>Platform Admin</th>
<th>Domain Admin</th>
<th>Domain Configurator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can re-assign boards from one domain to another domain by using the <code>-c</code> option with the <code>assign</code> function. The board cannot be active in the domain from which it is being re-assigned.</td>
<td>Can re-assign a board between domains for which he or she has domain admin privileges. The board must already be assigned to the target domain, or it must be in the ACL for that domain.</td>
<td>Can re-assign a board between domains for which he or she has domain configurator privileges. The board must already be assigned to the target domain, or it must be in the ACL for that domain.</td>
</tr>
</tbody>
</table>

The following example of the `moveboard(1M)` command moves system board 5 from its current domain to the domain specified by `domain_id`. Two retries are performed, if necessary, with a wait time of 15 minutes.

```bash
% moveboard -d domain_id -r 2 -t 900 SB5
```

**rcfgadm(1M)**

The `rcfgadm(1M)` command provides remote configuration administration operations on dynamically reconfigurable hardware resources. The `rcfgadm(1M)` command performs configuration administration on attachment points, which are device nodes in the device tree.

The following table describes the `rcfgadm(1M)` command options and operands.

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-a</code></td>
<td>The <code>-a</code> option lists dynamic attachment points.</td>
</tr>
<tr>
<td><code>-c function</code></td>
<td>The configuration state into which to move the board. You can disconnect, connect, configure, or unconfigure a board.</td>
</tr>
<tr>
<td>`-d domain_id</td>
<td>domain_tag`</td>
</tr>
<tr>
<td><code>-f</code></td>
<td>The specified action to be forced to occur</td>
</tr>
<tr>
<td>`-h ap_id</td>
<td>ap_type`</td>
</tr>
<tr>
<td>`-l ap_id</td>
<td>ap_type`</td>
</tr>
</tbody>
</table>
Refer to the `rcfgadm(1M)` man page for more information and examples of how to use this command.

The following table contains the privileges needed to use the `rcfgadm(1M)` command. The platform operator, platform service, and superuser groups cannot initiate the `rcfgadm(1M)` command.

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td>-n</td>
<td>No to all prompts</td>
</tr>
<tr>
<td>-o hardware_options</td>
<td>Hardware specific options</td>
</tr>
<tr>
<td>-r retry_count</td>
<td>Number of times to retry the DR operation</td>
</tr>
<tr>
<td>-s listing_options</td>
<td>Options to list</td>
</tr>
<tr>
<td>-T timeout</td>
<td>Wait time in seconds before a retry</td>
</tr>
<tr>
<td>-t</td>
<td>A test on one or more attachment points</td>
</tr>
<tr>
<td>-v</td>
<td>Verbose mode</td>
</tr>
<tr>
<td>-x hardware_function</td>
<td>Hardware specific functions</td>
</tr>
<tr>
<td>-y</td>
<td>Yes to all prompts</td>
</tr>
</tbody>
</table>

Refer to the `rcfgadm(1M)` man page for more information and examples of how to use this command.

The following table contains the privileges needed to use the `rcfgadm(1M)` command. The platform operator, platform service, and superuser groups cannot initiate the `rcfgadm(1M)` command.

<table>
<thead>
<tr>
<th>Platform Admin</th>
<th>Domain Admin</th>
<th>Domain Configurator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can assign or unassign boards to or from a domain by using the -x option with the assign or unassign function, respectively. To use the unassign function, the board must be assigned and cannot be active in a running domain.</td>
<td>Can disconnect, connect, configure, or unconfigure a board to or from the domain. The board must be assigned to the domain or in the ACL.</td>
<td>Can disconnect, connect, configure, or unconfigure a board to or from the domain. The board must be assigned to the domain or in the ACL.</td>
</tr>
</tbody>
</table>

**scdrhelp(1M)**

The `scdrhelp(1M)` shell script starts the Sun Fire 15K dynamic reconfiguration errors help system. The help system uses the JavaHelp™ `hsviewer` script that launches a graphical user interface (GUI) by using Java™ Swing foundation classes.

All of the user privileges groups can use this command, except for the domain administrator and the domain configurator.

Refer to the `scdrhelp(1M)` man page for more information about this script.
showboards(1M)

The showboards(1M) command displays the assignment information and status of the system boards in a domain. Although the showboards(1M) command is not DR-specific, it should be used in conjunction with the DR commands. The following table describes the showboards(1M) command options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td>-d domain_id</td>
<td>The target domain name</td>
</tr>
<tr>
<td>-h</td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td>-v</td>
<td>Verbose mode. In this mode, showboards(1M) displays all of the components on the board, including the domain configuration units such as CPUs, DPUs, and I/O boards.</td>
</tr>
</tbody>
</table>

All of the user privileges groups can use this command; however, the domain platform administrator and the domain configurator can show boards only in the domains for which they have privileges.

Refer to the showboards(1M) man page for more information and examples of how to use this command.

showdevices(1M)

The showdevices(1M) command displays the configured physical devices on system boards and the resources that are made available by these devices. Although the showdevices(1M) command is not DR-specific, it should be used in conjunction with the DR commands.

The usage information is provided by applications and subsystems that are actively managing system resources. The predicted impact of a system board DR operation can be displayed by performing an offline query of managed resources.
The following table describes the `showdevices(1M)` command options and operands.

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>board_id</code></td>
<td>The board ID of the board to be added. The board ID corresponds to the board location (for example, SB2 is the system board in slot 2). Multiple board identifiers are permitted.</td>
</tr>
<tr>
<td>`-d domain_id</td>
<td>domain_tag`</td>
</tr>
<tr>
<td><code>-h</code></td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td><code>-p reports</code></td>
<td>Offline query information</td>
</tr>
<tr>
<td><code>-v</code></td>
<td>All I/O devices</td>
</tr>
</tbody>
</table>

Only the domain platform administrator and the domain configurator can show device information in the domains for which they have privileges.

Refer to the `showdevices(1M)` man page for more information and examples of how to use this command.

**showplatform(1M)**

The `showplatform(1M)` command displays the available component list and the domain state for each domain. Although the `showplatform(1M)` command is not DR-specific, it should be used in conjunction with the DR commands.

The following table describes the `showplatform(1M)` command options and operands.

<table>
<thead>
<tr>
<th>Options and Operands</th>
<th>Specifies</th>
</tr>
</thead>
<tbody>
<tr>
<td>`-d domain_id</td>
<td>domain_tag`</td>
</tr>
<tr>
<td><code>-h</code></td>
<td>Help, which displays the usage description</td>
</tr>
<tr>
<td>`-p domains</td>
<td>acls`</td>
</tr>
<tr>
<td><code>-v</code></td>
<td>All available command information</td>
</tr>
</tbody>
</table>

All of the user privileges groups, except for the platform service and superuser groups, can use this command; however, the domain administrator and the domain configurator can show the platform information only in the domains for which they have privileges.
Refer to the showplatform(1M) man page for more information and examples of how to use this command.

Error Message Help System

The SMS software contains an error message help systems that you can use to find a description and recovery for a specific error message.

You can start the DR error message help system with the following command.

```
% /opt/SUNWSMS/jh/scdrhelp &
```

The standard JavaHelp system viewer, hsviewer, is used to display the DR error messages help system. The viewer consists of a toolbar and two panes: the content pane and the navigation pane, as shown in FIGURE 3-1.
JavaHelp Table of Contents

The DR error messages are separated into logical groups according to the type of errors, as shown in FIGURE 3-1. These groups represent the major topics that appear as the top level headings in the table of contents. Error message numbers and/or abbreviated text appear under their respective group name.

JavaHelp Index

The IDN error messages are indexed so that key topics are represented in the Index display (FIGURE 3-2). Some index topics are embedded when that embedding is deemed appropriate. For these topics, only the embedded topics are links to error messages.

![JavaHelp Index Display](image)

JavaHelp Search

The DR error messages help system provides a full-text search function. The search database is constructed by indexing the error message help files.

Before you search for a specific error message, read the following list of search tips:
- Search on a specific string of text in the error message.
- Avoid using numeric values. They are treated as replaceable text (FIGURE 3-3).

**FIGURE 3-3** JavaHelp Search Display
SMS DR Procedures

This chapter contains procedures that describe how to use the DR feature on the Sun Fire 15K system controller (SC), which runs the system management services (SMS) software. The following procedures are included:

- “Showing Platform Information”
- “Showing Board Information”
- “Showing Device Information”
- “Adding Boards”
- “Deleting Boards”
- “Moving Boards”

Showing Platform Information

Before you attempt to add, move, or delete a board to or from a specific domain, use the `showboards(1M)` command to determine the domain ID, the boards available to the domain, and the status of the domain.

You can use the domain ID in all of the DR commands. You can use the board list to determine the domain to which a specific board is assigned, and you can use the domain status to determine whether or not you can delete or move a board from the domain. For domain administrators and domain configurators, the board must be assigned to the domain, or it must be in the available component list before it can be added to the domain. Use the `showplatforms(1M)` command to determine whether the component is in the ACL. For platform administrators, the assigned board must not be active in a running domain before it can be deleted from the domain or moved to another domain.

You must have the appropriate privileges for this command. See “showboards” on page 15 and “showplatform” on page 16 for an explanation of which user groups can use this command.
To Show the Platform Information

- Use the `showplatform(1M)` command to obtain the domain information.

```
% showplatform
```

The `showplatform(1M)` command displays the domain ID, the available component list, and the status of the domain, as in the following example.

```
ACLs for domain domainA:
 slot0: SB0, SB1, SB2, SB3
 slot1: I00, I01, I02, I03

ACLs for domain domainB:
 slot0: None
 slot1: None

Domain | Solaris Nodename | Domain Status
domainA | sms3-b0 | Powered Off
domainB | sms3-b1 | Running Solaris
```

Showing Board Information

Before you attempt to delete or move a system board, you must query the board to determine the state of the board and to which domain the board is assigned.

**Note** – The output of the `showboards(1M)` command depends on the privileges of the user. For instance, the platform administrator can obtain information about all of the boards in the server. The domain administrator and domain configurator, however, can obtain the information about only those boards that are assigned and available to the domain(s) to which they have access.

After you have determined the domain ID that contains the board that you want to delete or move, or after you have determined that a particular board has already been assigned to a specific domain, use the `showboards(1M)` command to determine the state of the board. The board may be in a state that makes it impossible for you to delete or move it.
▼ To Show Board Information

- Use the `showboards(1M)` command to display the board information for the domain.

```
% showboards -d A
```

The above command displays the device information for domain A. The following example contains the information that would be displayed.

<table>
<thead>
<tr>
<th>Slot</th>
<th>Pwr</th>
<th>Type of Board</th>
<th>Board Status</th>
<th>Test Status</th>
<th>Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB0</td>
<td>On</td>
<td>CPU Board</td>
<td>Active</td>
<td>Passed</td>
<td>A</td>
</tr>
<tr>
<td>SB1</td>
<td>-</td>
<td>Empty Slot</td>
<td>Assigned</td>
<td>-</td>
<td>A</td>
</tr>
</tbody>
</table>

You can use the `showboards(1M)` command to display all of the assigned system boards, all of the available system boards, and/or all of the CPU, memory, and I/O boards in the domain. Refer to the `showboards(1M)` man page for more information on how to obtain board information.

### Showing Device Information

Before you attempt to perform any DR operation, use the `showdevices(1M)` command to display the device information, especially when you are removing devices.
To Show Device Information

- Use the `showdevices(1M)` command to display the device information for the domain.

```bash
% showdevices -v -d A
```

The above command displays the device information for all of the devices in the domain. Refer to the `showdevices(1M)` man page to learn how to display device-specific information. The above command produces the following output for CPUs in domain A (the following is only an example).

<table>
<thead>
<tr>
<th>domain</th>
<th>board</th>
<th>id</th>
<th>state</th>
<th>speed</th>
<th>ecache</th>
<th>usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SB1</td>
<td>40</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB1</td>
<td>41</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB1</td>
<td>42</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB1</td>
<td>43</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB2</td>
<td>55</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB2</td>
<td>56</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB2</td>
<td>57</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>SB2</td>
<td>58</td>
<td>online</td>
<td>400</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

The following output represents an example of the memory output for the `showdevices(1M)` command above.

<table>
<thead>
<tr>
<th>board</th>
<th>perm</th>
<th>base</th>
<th>domain</th>
<th>target</th>
<th>deleted</th>
<th>remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>mem MB</td>
<td>mem MB</td>
<td>addr</td>
<td>mem MB</td>
<td>board MB</td>
<td>MB</td>
<td></td>
</tr>
<tr>
<td>A SB1</td>
<td>2048</td>
<td>933</td>
<td>0x600000</td>
<td>4096</td>
<td>C2</td>
<td>250</td>
</tr>
<tr>
<td>A SB2</td>
<td>2048</td>
<td>0</td>
<td>0x200000</td>
<td>4096</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following output represents an example of the I/O devices output for the
showdevices(1M) command above.

<table>
<thead>
<tr>
<th>domain</th>
<th>board</th>
<th>device</th>
<th>resource</th>
<th>usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I01</td>
<td>sd0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd3</td>
<td>/dev/dsk/c0t3d0s0</td>
<td>mounted filesystem “/”</td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd3</td>
<td>/dev/dsk/c0t3d0s1</td>
<td>dump device (swap)</td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd3</td>
<td>/dev/dsk/c0t3d0s1</td>
<td>swap area</td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd3</td>
<td>/dev/dsk/c0t3d0s3</td>
<td>mounted filesystem “/var”</td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd3</td>
<td>/var/run</td>
<td>mounted filesystem “/var/run”</td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>I01</td>
<td>sd5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to the showdevices(1M) man page for a complete list of the options and arguments for this command.

Adding Boards

Adding a board to a domain moves the board through several state changes. If it is not already assigned, it is first assigned to the domain. Then, it is connected to the domain and configured into the Solaris Operating Environment. After it is connected, it is considered to be part of the physical domain and available to be used by the operating system.

You must have the appropriate privileges to add a board to a domain. See “addboard” on page 9 for a description of the privileges needed to use this command.
To Add a Board to a Domain

- Use the `addboard(1M)` command to add the board to the domain.

The following example of the `addboard(1M)` command adds system board 2 to the domain specified by `domain_id`. Two retries are performed, if necessary, with a wait time of 10 minutes.

```
% addboard -d domain_id -r 2 -t 600 SB2
```

Deleting Boards

Deleting a board from a domain removes the board from the domain that it is currently assigned to and possibly active in. The board must be in the assigned or active state.

Always check the usage of the components on a board before you delete it from a domain. If the board hosts permanent memory, the memory is moved to another board within the same domain before the board is deleted from the domain. Likewise, if any busy devices are present, you must wait or ensure that the device is no longer being used by the system before you attempt to remove the board.

**Caution** – You must power off the board before you physically remove it from the server. The `deleteboard(1M)` command does not power off the board.

A domain administrator can unconfigure and disconnect a board, but cannot delete a board from the a domain unless the board is in the available component list. See “deleteboard” on page 11 for more information about privileges for this command.

To Delete a Board From a Domain

- Use the `deleteboard(1M)` command to delete the board from the domain.

The following example of the `deleteboard(1M)` command deletes system board 2 from its current domain. Two retries are performed, if necessary, with a wait time of 15 minutes.

```
% deleteboard -r 2 -t 900 SB2
```
Moving Boards

Moving a board from one domain to another domain unassigns the board from the first domain and assigns, connects, and configures the board into the target domain.

You should always check the usage of the memory and devices on a board before you move it out of a domain. If the board hosts permanent memory, the memory must be moved to another board within the same domain before the board can be moved to another domain. Likewise, if any busy devices are present, you must wait or ensure that the device is no longer being used by the system before you attempt to move the board.

▼ To Move a Board

- Use the `moveboard(1M)` command to move the board from one domain to another domain.

The following example of the `moveboard(1M)` command moves system board 2 from its current domain to the domain specified by `domain_id`. Two retries are performed, if necessary, with a wait time of 15 minutes.

```
% moveboard -d domain_id -r 2 -t 900 SB2
```

Replacing System Boards

This section describes how to physically replace a board in a domain by using the commands described in this chapter.

▼ To Physically Replace a System Board

In the following steps, system board 2 is removed from its current domain and replaced by system board 3.

1. Delete the board from the domain.

```
% deleteboard -r 2 -t 900 SB2
```
2. Power off the board.

```
% poweroff SB2
```

3. Power on the board.

```
% poweron SB3
```

4. Add the board to the domain.

```
% addboard -d domain_id -r 2 -t 900 SB3
```
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