Sun Fire™ 15K Software Overview Guide

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Contents

Preface

This *Sun Fire™ 15K Software Overview Guide* document provides an overview of the software that runs on the Sun Fire 15K server system. It shows you which related documents provide detailed information on the use of this software. It also provides experienced Sun Enterprise™ 10000 (Starfire™) system administrators with an overview of some key differences between the software that runs on these two server systems.

Before You Read This Book

This book is an overview document that has no prerequisites.

How This Book Is Organized

Chapter 1 provides an overview of the software that runs on Sun Fire 15K servers.

Chapter 2 describes the books that make up the Sun Fire 15K software documentation set, as well as other Sun™ documentation that describes software that runs on Sun Fire 15K servers.

Chapter 3 provides an overview of major differences between the software on Sun Fire 15K servers and corresponding software on Sun Enterprise 10000 servers.

Chapter 4 provides an overview of the Solaris™ operating environment as it applies to Sun Fire 15K servers.

Chapter 5 provides an overview of System Management Services (SMS) software.

Chapter 6 provides an overview of Dynamic Reconfiguration (DR) software.

Chapter 7 provides an overview of Sun™ Management Center software running on Sun Fire 15K servers.

Using UNIX Commands

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

Refer to one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1   Typographic Conventions

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

Shell Prompts

TABLE P-2   Shell Prompts

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

Related Documentation

TABLE P-3   Related Documentation

Application	Title
Usage	*System Management Services Administrator Guide*
Reference	*System Management Services Reference Manual*
Installation, Issues, Limitations, and Bugs	*System Management Services Installation Guide and Release Notes*
Usage	*System Management Services Dynamic Reconfiguration User Guide*
Usage	*Sun Fire 15K Dynamic Reconfiguration User's Guide*
Usage	*Sun Management Center Software User's Guide*
Usage	*Sun Management Center Supplement for Sun Fire 15K Systems*
Installation	*Sun Management Center Software Installation Guide*
Issues, Limitations, and Bugs	*Sun Management Center Release Notes for Sun Fire 15K Systems*
Issues, Limitations, and Bugs	*Sun Management Center Software Release Notes*
Installation and Configuration	*Sun Fire 15K System Site Planning Guide*

In addition, SM and DR error messages are described by an on-line help system whose use is explained in the user guides shown above.

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
```

Ordering Sun Documentation

Fatbrain.com, an Internet professional bookstore, stocks select product documentation from Sun Microsystems, Inc.

For a list of documents and how to order them, visit the Sun Documentation Center on Fatbrain.com at:

```
http://www.fatbrain.com/documentation/sun
```

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```
docfeedback@sun.com
```

Please include the part number (816-3285-10) of your document in the subject line of your email.

Introduction to Sun Fire 15K Server Software

The Sun Fire 15K server system is a member of the next-generation Sun Fire server family. Sun Fire 15K software runs in the Solaris 8 operating environment.

The Sun Fire 15K system is often referred to as the platform. System boards within the platform can be logically grouped together into separately bootable systems called dynamic system domains, or simply domains. Up to 18 domains can exist simultaneously on a single platform. System Management Services (SMS) software lets you control and monitor domains, as well as the platform itself.

The system controller (SC) in the Sun Fire 15K is a multifunction printed circuit board (PCB) that provides critical services and resources required for the operation and control of the Sun Fire system. SMS software packages are installed on the SC.

You can interact with the SC and the domains on the Sun Fire 15K by using SMS commands. SMS provides a command line interface (CLI) to the various functions and features it contains. See Chapter 5 for more information about SMS software.

An alternative graphical user interface (GUI) for many of the commands in SMS is provided by Sun Management Center software. See Chapter 7 for more information about Sun Management Center software.

Dynamic reconfiguration (DR) software enables you to dynamically reconfigure a domain so that currently installed system boards can be logically attached to, or detached from, the operating system while the domain continues running in multiuser mode. A system board can be physically swapped in and out when it is not attached to a domain, even while the system continues running in multiuser mode. See Chapter 6 for more information about dynamic reconfiguration software.

Sun Fire 15K Server Software Documentation Set

Sun Fire 15K server software documentation is comprised of three categories of documents:

- Usage, reference, installation, and release note documents for software that runs only on Sun Fire 15K server systems. This category includes System Management Services (SMS) software documents.
- Sun software documentation that applies to other servers and workstations as well as to Sun Fire 15K server systems. This category includes Solaris operating environment usage, reference, installation, and release documents, as well as individual man page commands.
- Documentation for Sun software products that run on other Sun hardware platforms but require additional information and instructions when running on Sun Fire 15K server systems. This category includes Sun Management Center software documents.

In addition, some hardware and service documents are shipped with the Sun Fire 15K hardware. One of these, the *Sun Fire 15K System Site Planning Guide*, contains a preinstallation checklist that includes a necessary step for allocating a range of Internet Protocol (IP) addresses to be used by Management Network software.

See "Related Documentation" on page x for a table that shows titles and part numbers of all these documents, except for this current document and for generic Solaris operating environment documentation.

See Chapter 3 for information about key differences between Sun Fire 15K server software and Sun Enterprise 10000 server software, including descriptions of the documentation that describes the new functionality.

Audience for This Document Set

Sun Fire 15K server systems are used in mission-critical data centers. The intended audience for the Sun Fire 15K software documentation set is experienced system administrators who configure and maintain these high-end servers.

Sun Fire 15K system administrators should be able to qualify as Sun-Certified System Administrators for the Solaris Operating Environment and as Sun-Certified Network Administrators for the Solaris Operating Environment. This certification, available from Sun Microsystems, is for system administrators tasked with performing essential system administration procedures on the Solaris Operating Environment, and for technical application support staff responsible for administering a networked server running the Solaris Operating Environment.

Sun Microsystems is creating certification guidebooks to help you understand the certification process. The guidebooks will contain all the information needed to learn how to prepare and register for Solaris Operating Environment certification examinations:

- Certification requirements
- Examination details
- Supporting courseware
- Testing objectives

For more information about the certification process, click the Certification link on this web page:

```
http://suned.sun.com
```

Certification often accompanies coursework, and Sun Fire 15K system administrators should be familiar with the contents of the standard Sun Educational Services courses in Solaris operating environment administration and network administration, especially:

- The Solaris Operating Environment System Administrator I course, which provides information about the essential tasks of standalone installation, file system management, backup procedures, process control, user administration, and device management.
- The Solaris Operating Environment System Administrator II course, which provides students with the skills necessary to administer Sun systems running Solaris in a network environment. Students will be taught how to maintain Sun systems, configure and troubleshoot the Network File System (NFS), and configure the Network Information Service (NIS) environment.
- The Solaris Operating Environment TCP/IP Network Administration course, which teaches students the advanced administration skills required to plan, create, administer, and troubleshoot a local area network (LAN). This course

provides hands-on experience with network planning, configuration, and troubleshooting, as well as Internet Protocol (IP) routing, Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), and IP version 6 (IPv6).

For more information about these courses and their contents, look for Solaris Operating Environment Courses on this web page:

```
http://suned.sun.com/HQ/catalog/
```

Because some system administration procedures are delegated to operators who may be less familiar with the Solaris operating environment and with Sun Fire 15K servers, step-by-step procedures such as installation and configuration are written more simply, with a single step for each action the operator must take, and ample examples of the messages the operator will see after these steps.

Where to Find Information About Sun Fire 15K Software

The Sun Fire 15K server software documentation includes user guides, reference manuals (including individual man pages that can be viewed separately using the `man` command), installation guides, release notes, and README files. With the exception of individual man pages and README files, these documents are available in Adobe Acrobat PDF files on product CD-ROMs for all software releases.

For production software releases, these software documents are also available in both PDF and HTML formats on the Sun Microsystems website. You can navigate to them by clicking the High-End Servers link on this web page:

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

Printed versions of certain documents, such as installation guides and release notes that you may have to read before the Sun Fire 15K server software is running, are also included in the appropriate Solaris operating environment media kit.

Solaris Operating Environment Information

Read the Solaris operating environment installation documents and Release Notes included in your Solaris operating environment media kit if you are installing or upgrading the Solaris operating environment on any Sun Fire 15K domains.

SMS Software Information

Read the *System Management Services Administrator Guide* for platform administration information.

Read the *System Management Services Reference Manual,* and the individual SMS man pages it contains, for information about individual SMS command usage and syntax.

Read the *System Management Services Installation Guide and Release Notes* if you are upgrading or reinstalling SMS software on a main or spare system controller.

Dynamic Reconfiguration Software Information

Read the *System Management Services Dynamic Reconfiguration User Guide* to understand how to perform DR operations from the system controller as a platform administrator.

Read the *Sun Fire 15K Dynamic Reconfiguration User's Guide* and the `cfgadm`(1M) and `dr`(7) man pages to understand the usage and syntax of DR operations performed while logged onto an individual domain.

Read the *Sun Management Center Supplement for Sun Fire 15K Systems* for information about performing DR and other system management operations in the Sun Management Center environment.

Sun Management Center Software Information

Read the *Sun Management Center Software User's Guide* and *Sun Management Center Supplement for Sun Fire 15K Systems* for information about using Sun Management Center on Sun Fire 15K servers.

Read the *Sun Management Center Software Installation Guide, Sun Management Center Supplement for Sun Fire 15K Systems, Sun Management Center Software Release Notes*, and *Sun Management Center Release Notes for Sun Fire 15K Systems* for information about installing, upgrading, or configuring Sun Management Center software on Sun Fire 15K servers.

Read the *Sun Management Center Supplement for Sun Fire 15K Systems* for information about performing DR and other system management operations in the Sun Management Center environment.

For more information about Sun Management Center and the other platforms it supports, or to download the software or the documentation, refer to the Sun Management Center web site at:

`http://www.sun.com/sunmanagementcenter/`

Differences Between Sun Fire 15K Software and Sun Enterprise 10000 Software

Many Sun Fire 15K system administrators have significant experience with Sun Enterprise 10000 (Starfire™) servers. This chapter provides a quick overview of major differences between the software on the two servers.

The Sun Enterprise 10000 server system is the predecessor of the Sun Fire 15K server system, and the two systems share a number of architectural features. Most importantly, they both feature a single-chassis platform that contains sufficient processors, memory, and input-output (I/O) channels for many separately configured domains to run completely separated applications in separate instances of the Solaris operating environment within the same physical chassis.

For both Sun Enterprise 10000 servers and Sun Fire 15K server systems, software monitors and enables control of the entire platform.

- Sun Enterprise 10000 server platform software is called System Service Processor (SSP) Software. The SSP software runs in the Solaris operating environment on a physically separate Sun workstation.
- Sun Fire 15K server platform software, called System Management Services software, runs on a single-board computer called a system controller (SC). A second system controller is often configured inside the chassis as well so that platform monitoring and management operations can failover to the spare SC in case a problem develops with the main SC.

System Management Services Software

System administrators familiar with SSP software will have little trouble adapting to SMS software. Both use similar command-line interface (CLI) commands to perform platform management. SMS software has several advantages over SSP software.

- SMS software is more flexible than SSP software.
- SMS software is more secure than SSP software.
- SMS software is sufficient for complete platform management.

Unlike SSP software, there is no equivalent of the SSP `hostview`(1M) graphical user interface (GUI). To perform Sun Fire 15K server monitoring and management with a GUI, use Sun Management Center software. See Chapter 7 for more information about Sun Management Center software.

Since the Sun Fire 15K system controller is housed inside the Sun Fire 15K server chassis, there is no equivalent to the control boards found on the SSP. Instead, Management Network hardware and software controls communication between the SC and individual domains. The Sun Fire 15K Management Network is a closed network with no user interaction. Although no user involvement is required, it is necessary to configure a block of available IP addresses for the Management Network before the Sun Fire 15K server is put into service. For a checklist that includes this step, refer to the *Sun Fire 15K System Site Planning Guide* shipped with the Sun Fire 15K server.

In addition to increases in size and performance, Sun Fire 15K servers use a different system architecture, featuring the Sun™ Fireplane interconnect, a higher-bandwidth centerplane and bus architecture. As a result, the nomenclature for identifying devices and attachment points differs from that of Sun Enterprise 10000 servers. This nomenclature change also affects Dynamic Reconfiguration and Sun Management Center operations.

For enhanced security between domains, Sun Fire 15K servers use and enforce a community separation model. This security model is different from that used on Sun Enterprise 10000 servers. Refer to *System Management Services Administrator Guide* for more information about community separation.

Administering Solaris Domains

The same Solaris operating environment runs on Sun Fire 15K server domains and system controllers as on other Sun hardware platforms. This commonality is advantageous for customers who are adding Sun Fire 15K servers to an existing Sun network, and to system administrators who are already familiar with the Solaris operating environment running on workstations and other servers.

The Solaris software release incorporates Sun Fire 15K software commands, drivers, and support files, including domain-side Dynamic Reconfiguration and Management Network software components.

Installation documentation for the Solaris operating environment has been revised to accommodate platforms that support multiple domains, such as Sun Fire 15K servers and Sun Enterprise 10000 servers. As a result, the separate installation instructions for Sun Enterprise 10000 servers found in the *Hardware Platform Guide* are now contained in the Solaris installation documentation and in the *System Management Services Administrator Guide.*

Dynamic Reconfiguration Software

Dynamic Reconfiguration software enables you to move, remove, and add physical resources such as system boards and processors to and from operating domains. Unlike SMS software, DR operations can be performed on both the platform system controller, affecting multiple domains, and by logging directly onto an individual domain.

Dynamic Reconfiguration on Sun Fire 15K servers is more powerful and more streamlined than on Sun Enterprise 10000 servers, but the underlying concepts and operations are similar. One of the most notable differences is that operations requiring multiple commands in a prescribed sequence on Sun Enterprise 10000 servers now take place in the background when you use a single command such as `moveboard`(1M).

Syntax differs somewhat between the two servers when operations are performed while logged onto the system controller. DR operations performed while logged onto an individual domain, however, are similar.

Sun Management Center Software

Sun Management Center software on Sun Fire 15K servers is very similar to Sun Management Center software on Sun Enterprise 10000 servers. There are, however, two important differences:

- Because the physical architecture of the two platforms is substantially different, Sun Management Center will report different properties and values for many hardware components. These properties are displayed in different tables and with different names. The rules governing the alarms for these properties also have different names.
- In addition to the platform monitoring capabilities found on both servers, Sun Management Center on Sun Fire 15K servers enables you to perform platform management operations such as dynamic reconfiguration. These operations are explained in the *Sun Management Center Supplement for Sun Fire 15K Systems.*

IDN and AP Software

Inter-Domain Networking (IDN) and Alternate Pathing (AP) software is available for Sun Enterprise 10000 servers but does not exist on Sun Fire 15K servers in the current release.

The AP functionality found in Sun Enterprise 10000 server software is superseded by functionality included in the Solaris operating environment.

Solaris Operating Environment for Sun Fire 15K Servers

The Sun Fire 15K server can be divided into dynamic system domains. 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.

The Sun Fire 15K server runs the Solaris operating environment on its domains and on the system controller. Previous versions of the Solaris operating environment are not supported on Sun Fire 15K servers.

Solaris offers the best of UNIX-class reliability, availability, and serviceability at a fraction of the cost of mainframe operating systems.

The Solaris operating environment provides:

- Stability, high performance, capacity, and precision
- 32- and 64-bit operating environments
- Easy-to-use tools
- High quality and reliability
- Integrated graphics with industry-standard API support
- Over 12,000 leading technical and business applications

System Management Services Software

SMS software supports Sun Fire servers running the Solaris Operating Environment. SMS software is compatible with Sun Fire 15K domains that are running the Solaris operating environment. The commands provided with the SMS software can be used remotely.

SMS software enables the **platform** administrator to perform the following tasks:

■ Administrate domains by logically grouping domain configurable units (DCU) together. DCUs are system boards such as CPU and I/O boards. Domains are able to run their own operating systems and handle their own workloads.
■ Dynamically reconfigure a domain so that currently installed system boards can be logically attached to or detached from the operating system while the domain continues running in multiuser mode. A system board can be physically swapped in and out when it is not attached to a domain, even while the system continues running in multiuser mode.
■ Perform automatic dynamic reconfiguration of domains using a script.
■ Monitor and display the temperatures, currents, and voltage levels of one or more system boards or domains.
■ Monitor and control power to the components within a platform.
■ Execute diagnostic programs such as power-on self-test (POST).

In addition, SMS software:

■ Warns you of impending problems, such as high temperatures or malfunctioning power supplies.
■ Notifies you when a software error or failure has occurred.
■ Monitors a dual SC configuration for single points of failure and performs an automatic failover from the main SC to the spare SC, depending on the failure condition detected.
■ Automatically reboots a domain after a system software failure such as a panic.
■ Keeps logs of interactions between the SC environment and the domains.
■ Provides support for the Sun Fire 15K dual grid power option.

SMS software enables the **domain** administrator to perform the following tasks:

- Administrate domains by logically grouping domain configurable units (DCU) together. DCUs are system boards such as CPU and I/O boards. Domains are able to run their own operating systems and handle their own workloads.
- Boot domains for which the administrator has privileges.
- Dynamically reconfigure a domain for which the administrator has privileges. Thus currently installed system boards can be logically attached to, or detached from, the operating system while the domain continues running in multiuser mode.
- Perform automatic dynamic reconfiguration of domains using a script for which the administrator has privileges.
- Monitor and display the temperatures, currents, and voltage levels of one or more system boards or domains for which the administrator has privileges.
- Execute diagnostic programs such as power-on self-test (POST) for which the administrator has privileges.

The following features are provided in this release of Sun Fire 15K SMS software:

- Dynamic System Domain (DSD) configuration
- Configured domain services
- Domain control capabilities
- Domain status reporting
- Hardware control capabilities
- Hardware status monitoring, reporting and handling
- Hardware error monitoring, reporting and handling
- System Controller (SC) failover
- Configurable administrative privileges

System Architecture

SMS software uses a distributed client-server architecture. init(1M) starts, and restarts as necessary, one process: ssd(1M). ssd is responsible for monitoring all other SMS processes and restarting them as necessary.

The Sun Fire 15K platform, the SC, and other workstations communicate over Ethernet. You perform SMS operations by entering commands on the SC console after remotely logging onto the SC from another workstation on the local area network. You must log in as a user with the appropriate platform or domain privileges if you want to perform SMS operations such as monitoring and controlling the platform.

Dual system controller boards are supported within the Sun Fire 15K platform. One board is designated as the primary or main system controller board, and the other is designated as the spare system controller board. If the main system controller fails, the failover capability automatically switches to the spare system controller.

SMS Administration Environment

Administration tasks on the Sun Fire 15K are secured by group privileges requirements. Upon installation, SMS installs the following UNIX groups to the `/etc/group` file.

- `platadmn` identifies a platform administrator.
- `platoper` identifies a platform operator.
- `platsvc` identifies a platform service.
- `dmn[`*A...R*`]admn` - domain [*domain_id* | *domain_tag*] identifies the administrator of one of the eighteen available domains.
- `dmn[`*A...R*`]rcfg` - domain [*domain_id* | *domain_tag*] identifies the configurator of one of the eighteen available domains.

Management Network

One of the system controller's main functions is to provide administration services for the Sun Fire 15K platform and its domains. The Sun Fire 15K Management Network (MAN) is a combination of hardware and software providing the network architecture by which such administration services are delivered.

The primary services provided by the Management Network include:

- Domain consoles
- Message logging
- Time synchronization
- Dynamic reconfiguration
- Network boot and Solaris installation
- System Controller heartbeats

Access to the Management Network is restricted to the SC and the domains in the platform. No external IP traffic should be routed across the Management Network.

For More Information

See "SMS Software Information" on page 6 to determine which documents to read for more information about SMS software.

Dynamic Reconfiguration Software for Sun Fire 15K Servers

Dynamic reconfiguration software running 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 perform DR operations from the SC or from an individual domain.

You can perform DR operations from the SC using the `addboard`(1M), `moveboard`(1M), `deleteboard`(1M), and `rcfgadm`(1M) SMS commands.

Dynamic Reconfiguration software also 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 then be inserted into the domain while the Solaris operating environment is running.

DR software 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.

Component Types

You can use DR software to add or remove several types of components:

- cpu refers to an individual CPU.
- memory refers to all of the memory on the board.
- pci refers to any I/O device, controller, or bus.

System Board Slots and Logical Domains

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. 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.

The number of slots available to a given domain is controlled by an available component list (ACL) maintained on the system controller. A slot must be assigned or available to a domain before you can use a `cfgadm`(1M) command to 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 unassign and disconnect a slot from its domain before you can assign and connect it to another domain.

After the domain is booted, the system boards and the empty slot 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 board 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.

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 of a specific board. You must have appropriate privileges for the specified domain. Unavailable boards cannot be viewed by the domain administrator. Only the platform administrator can see every board in the system.

The names and descriptions of the states for boards on the SC are shown below. The state of a board on the SC is not the same as the state of a board on the domain.

unavailable

The board is **unavailable** to the domain. This means that the board has not been added to the available component list for the specified domain or that the board is currently assigned to another domain. Note that boards that are not in the available component list are invisible to the domain. In the unavailable state, the board is not considered part of the specified domain.

available

The board is **available** to be added to the domain. This means that the board is in the available component list (ACL) for the domain. Note that the board can be available to any number of domains. In the available state, the board is considered to be part of the logical domain.

assigned

The board has been **assigned** to the domain, which means that the board is in the available component list for that domain and that it is unavailable to any other domain. In the assigned state, the board is considered to be part of the physical domain.

active

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.

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 add it back 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 remain unchanged. But if you add another board with I/O devices before the first board has been put back, reconfiguration is required because the paths to devices on the first board have changed.

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 sysevent system event facility. 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, and cleanup 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 locally 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-swapped boards into a domain, and removing system boards from a domain.

For More Information

See "Dynamic Reconfiguration Software Information" on page 6 to determine which documents to read for more information about Dynamic Reconfiguration software.

Sun Management Center Software for Sun Fire 15K Servers

Sun Management Center software is the latest management software that easily integrates into heterogeneous IT environments and scales from a single system to thousands of servers and desktop systems. Sun Management Center software is an open, extensible system monitoring and management application that uses Java™ software and the Simple Network Management Protocol (SNMP) to provide an integrated and comprehensive enterprise-wide management of Sun products and their subsystems, components, and peripheral devices.

Sun Management Center offers a single point of management for Sun systems and storage components, for the Solaris operating environment, and for applications running on the Solaris operating environment. With Sun Management Center software, organizations can deliver monitoring and management capabilities that optimize performance, enhance application availability, and simplify management of the IT environment.

Sun Management Center Add-on Sun Fire 15K Software Packages

The add-on Sun Fire 15K software packages provide support for the Sun Fire 15K platform and domains. For the Sun Fire 15K platform, hardware configuration information resides on both system controllers and on each of the individual Sun Fire 15K platform domains. Hardware configuration information, process monitoring, and management operations for the Sun Fire 15K system are provided by Sun Fire 15K agent modules.

Sun Management Center software provides the only graphical user interface (GUI) available for monitoring and managing Sun Fire 15K servers. Sun Management Center software also provides flexible integration with most major enterprise management software packages.

Core Features of Sun Management Center Software

- It manages thousands of Sun systems.
- Its three-tier architecture provides a single point of management.
- The Java GUI offers a common look and feel.
- It can be integrated with leading third-party vendors to address enterprise-wide, heterogeneous environments
- The Sun Management Center Developer Environment enables you to create and modify customized modules.

New Features of Sun Management Center Software

- Grouping of objects provides an easy way to define and invoke complex tasks on a set of managed objects.
- Enhanced alarm management and predictive failure analysis increase system availability.
- Comprehensive online hardware diagnostic testing identifies faults before the system is affected.
- A web-based interface simplifies administration.
- A GUI module builder provides a powerful, easy-to-use interface for developing custom modules.
- New filtering capabilities help pinpoint problems quickly, even in systems with thousands of objects or nodes.
- Secure management controls enable dynamic reconfiguration and domain management through an easy-to-use GUI.

Sun Management Center Software Pricing

Sun offers its Basic Sun Management Center software package free of charge and downloadable from the Web. This package enables you to manage an unlimited number of nodes, and is sufficient to perform monitoring and management of Sun Fire 15K servers.

Advanced Systems Monitoring and Premier Management Applications are licensed per node or per Solaris image.

For More Information

See "Sun Management Center Software Information" on page 7 to determine which documents to read for more information about Sun Management Center software.