



# Sun Cluster 3.0 12/01 Release Notes

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# Sun Cluster 3.0 12/01 Release Notes

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This document provides the following information for Sun™ Cluster 3.0 12/01 (Update 2) software.

- [“New Features and Functionality” on page 2](#)
- [“Supported Products” on page 6](#)
- [“Features Nearing End of Life” on page 7](#)
- [“Sun Cluster AnswerBooks Installation” on page 9](#)
- [“PDF Files” on page 12](#)
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- [“SunPlex Agent Builder License Terms” on page 20](#)
- [“Sun Management Center Software Upgrade” on page 20](#)
- [“Known Problems” on page 23](#)
- [“Known Documentation Problems” on page 30](#)

The appendices to this document include installation planning worksheets and examples for planning the Sun Cluster 3.0 12/01 software and data services installation.

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# New Features and Functionality

The following table lists new features and functionality that require updates to the Sun Cluster documentation. The second column identifies the documentation that was updated. Contact your Sun sales representative for the complete list of supported hardware and software.

**TABLE 0-1** New Features and Functionality

Feature or Functionality	Documentation Updates
Enhancements to installation	<p>The <i>Sun Cluster 3.0 12/01 Software Installation Guide</i> was updated to include new functionality added to the <code>scinstall(1M)</code> and <code>scsetup(1M)</code> commands.</p> <ul style="list-style-type: none"><li>• During Sun Cluster software installation, <code>sccheck</code> checks and validates the node to ensure that it meets the very basic configuration required for it to be functional in a Sun Cluster configuration. The <code>sccheck(1M)</code> man page has also been updated to reflect this new functionality.</li><li>• The interactive <code>scinstall</code> installation method also now provides optional autodiscovery of installed cluster transport adapters.</li></ul>
Support for the Remote Shared Memory Application Programming Interface (RSMAPI)	<p>The <i>Sun Cluster 3.0 12/01 Software Installation Guide</i> was updated with steps to install the software packages required to support the RSMAPI in a Sun Cluster configuration.</p>
Dynamic reconfiguration support	<p>A new section was added to the <i>Sun Cluster 3.0 12/01 Concepts</i> that describes the initial phase of Sun Cluster 3.0 support for the dynamic reconfiguration feature. Considerations and manual actions required by the user for this phase are described.</p>
PCI-SCI interconnect support	<p>The <i>Sun Cluster 3.0 12/01 Hardware Guide</i> chapter on interconnect hardware was updated to include sample cabling diagrams, considerations, and troubleshooting to support the use of PCI-SCI interconnect hardware in a cluster. The <i>Sun Cluster 3.0 12/01 Software Installation Guide</i> was also updated with steps to install PCI-SCI software packages.</p>
Storage Area Network (SAN) support	<p>The <i>Sun Cluster 3.0 12/01 Hardware Guide</i> was updated with SAN information, including sample cabling diagrams, supported SAN features, and considerations in each of the four chapters for the storage arrays on which the SAN functionality is supported. The arrays that support SANs are the Sun StorEdge A5200 array, the Sun StorEdge A3500FC array, and the Sun StorEdge T3/T3+ arrays in single-controller configuration and in partner-group configuration.</p>

**TABLE 0-1** New Features and Functionality (Continued)

Feature or Functionality	Documentation Updates
Sun StorEdge T3+ qualification	The two <i>Sun Cluster 3.0 12/01 Hardware Guide</i> chapters for Sun StorEdge T3 arrays in single-controller configuration and in partner-group configuration were updated to accommodate differences for the Sun StorEdge T3+ arrays. Some procedures in both chapters were also modified with improvements encountered during testing.
Sun Netra D130 and Sun StorEdge S1 qualification	The <i>Sun Cluster 3.0 12/01 Hardware Guide</i> was updated with a new chapter that describes procedures for the Sun Netra D130 and Sun StorEdge S1 storage enclosures.
Support for VERITAS File System (VxFS)	The <i>Sun Cluster 3.0 12/01 Software Installation Guide</i> and the <i>Sun Cluster 3.0 12/01 System Administration Guide</i> were updated to include instructions to create VxFS cluster file systems. See <a href="#">"Guidelines to Support VxFS" on page 4</a> for more information.
Sun Cluster HA for BroadVision One-To-One Enterprise qualification	The <i>Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide</i> was updated with a new chapter required to support Sun Cluster HA for BroadVision One-To-One Enterprise. This data service uses fault monitoring and automatic failover to eliminate single points of failure in a BroadVision One-To-One Enterprise installation.
Support for Sun Cluster HA for Oracle on Oracle 9i.	The <i>Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide</i> was updated with new procedures required to support Sun Cluster HA for Oracle on Oracle 9i.
Support for Sun Cluster Security Hardening	The Sun Cluster Security Hardening documentation is available at <a href="http://www.sun.com/security/blueprints">http://www.sun.com/security/blueprints</a> . From this URL, scroll down to the Architecture heading to locate the article on Sun Cluster Security Hardening. See <a href="#">"Sun Cluster Security Hardening" on page 4</a> for more information.

# Notes on New Features and Functionality

This section includes additional information on new features and functionality.

## Sun Cluster Security Hardening

Sun Cluster Security Hardening uses the Solaris Operating Environment hardening techniques recommended by the Sun BluePrints program to achieve basic security hardening for clusters. The Solaris Security Toolkit automates the implementation of Sun Cluster Security Hardening. Sun Cluster Security Hardening supports the following three agents.

- Apache Web Server
- iPlanet Web Server
- iPlanet Mail Server

The Sun Cluster Security Hardening documentation is available at <http://www.sun.com/security/blueprints>. From this URL, scroll down to the Architecture heading to locate the article on Sun Cluster Security Hardening.

## Guidelines to Support VxFS

The following VxFS features are not supported in a Sun Cluster 3.0 configuration.

- Quick I/O
- Snapshots
- Storage checkpoints
- Cache advisories (these can be used, but the effect will be observed on the given node only)
- VERITAS CFS (requires VERITAS cluster feature & VCS)
- VxFS-specific mount options
  - convosync (Convert O\_SYNC)
  - mincache
  - qlog, delaylog, tmplog

All other VxFS features and options that are supported in a cluster configuration are supported by Sun Cluster 3.0 software. See VxFS documentation and man pages for details about VxFS options that are or are not supported in a cluster configuration.

The following guidelines for how to use VxFS to create highly available cluster file systems are specific to a Sun Cluster 3.0 configuration.

- Create a VxFS file system by following procedures in VxFS documentation.
- Globally mount and unmount a VxFS file system from the primary node (the node that masters the disk on which the VxFS file system resides) to ensure that the operation succeeds. A VxFS file system mount or unmount operation that is performed from a secondary node might fail.
- Perform all VxFS administration commands from the primary node of the VxFS cluster file system.

The following guidelines for how to administer VxFS cluster file systems are not specific to Sun Cluster 3.0 software. However, they are different from the way you administer UFS cluster file systems.

- You can access and administer files on a VxFS cluster file system from any node in the cluster, with the exception of `ioctls`, which you must issue only from the primary node. If you do not know whether an administration command involves `ioctls`, issue the command from the primary node.
- If a VxFS cluster file system fails over to a secondary node, all standard-system-call operations that were in progress during failover are re-issued transparently on the new primary. However, any `ioctl`-related operation in progress during the failover will fail. After a VxFS cluster file system failover, check the state of the cluster file system. There might be administrative commands that were issued on the old primary before failover that require corrective measures. See VxFS documentation for more information.

# Supported Products

This section describes the supported software and memory requirements for Sun Cluster 3.0 12/01 software.

- **Operating environment and patches** – Supported Solaris versions and patches are available at the following URL.

<http://sunsolve.sun.com>

For more details, see “[Patches and Required Firmware Levels](#)” on page 17.

- **Volume managers** – Solstice DiskSuite™ 4.2.1 and VERITAS Volume Manager 3.0.4, 3.1, 3.1.1, and 3.2.
- **File systems** – Solaris UFS and VERITAS File System (VxFS) 3.4.
- **Data services (agents)** – Contact your Sun sales representative for the complete list of supported data services and application versions. Specify the resource type names when you install the data services with the `scinstall(1M)` utility and when you register the resource types associated with the data service with the `scrgadm(1M)` utility.

**TABLE 0-2** Supported Data Services for Sun Cluster 3.0 12/01 Software

Data Service	Sun Cluster Resource Type
Sun Cluster HA for DNS	dns
Sun Cluster HA for NFS	nfs
Sun Cluster HA for iPlanet Web Server	iws
Sun Cluster HA for Netscape LDAP	nsldap
Sun Cluster HA for Oracle	oracle
Sun Cluster HA for Oracle Parallel Server	N/A
Sun Cluster HA for Apache	apache
Sun Cluster HA for SAP	sap
Sun Cluster HA for Sybase ASE	sybase
Sun Cluster HA for BroadVision One-To-One Enterprise	bv
Sun Cluster HA for NetBackup	netbackup

- **Memory Requirements** – Sun Cluster 3.0 software requires extra memory above what is configured for a node under a normal workload. The extra memory equals 128 Mbytes plus ten percent. For example, if a standalone node normally requires 1 Gbyte of memory, you need an extra 256 Mbytes to meet memory requirements.

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# Features Nearing End of Life

Public Network Management (PNM) will not be supported in the next Sun Cluster feature release. Network adapter monitoring and failover for Sun Cluster will instead be performed by Solaris IP Multipathing.

## Public Network Management (PNM)

Use the PNM to configure and administer network interface card monitoring and failover. However, the user interfaces to the PNM daemon and PNM administration commands are obsolete and will be removed in the next Sun Cluster feature release. Users are strongly discouraged from developing tools that rely on these interfaces.

The following interfaces are officially supported in the current release, but are expected to be removed in the next Sun Cluster feature release.

- `pnmd(1M)`
- `pnmconfig(4)`
- `pnmstat(1M)`
- `pnmset(1M)`
- `pnmrtp(1M)`
- `pnmptor(1M)`

To prepare for the transition to IP Multipathing in the next Sun Cluster feature release, consider the following issues.

- With the integration of IP Multipathing in the next feature release, the Solaris IP Multipathing administration model and interfaces should be used for network availability management. See the *Solaris IP Multipathing Administration Guide* for more details.
- Solaris IP Multipathing requires that for IP Multipathing groups with more than one physical interface, each interface must have its own IP address to be used strictly by the IP Multipathing daemon for monitoring of its health. Therefore, before transitioning to IP Multipathing, you must prepare an additional IP address for each interface (active and backup) in a NAFO group. This is a requirement for multi-adapter NAFO groups, and a strong recommendation for single adapter groups.

For example, assume `nafo0` is on the 75 subnet, and it consists of `qfe0` and `qfe4`. Suppose `/etc/hostname.qfe0` contains the hostname `schostname-1`, which maps to an IP address on the 75 subnet. In order to transition to IP Multipathing in the future, two more IP addresses on the 75 subnet must be allocated, to be used for each of `qfe0` and `qfe4`. See the *Solaris IP Multipathing Administration Guide* for more details.

- IP Multipathing requires that all interfaces in an IP Multipathing group must have distinct hardware (MAC) addresses; that is, setting the `eeeprom` property `local-mac-address?` to `true` is honored. Interface cards that do not support this include:

- X1018A SunSwift SBus Adapter

- X1059A SunFastEthernet Adapter 2.0 SBus Card

You must be prepared to replace these cards during the upgrade to the next feature release. While single-adapter IP Multipathing groups may function despite the lack of support for `local-mac-address?=true`, such configurations are not optimal for high availability setups. See the *Solaris IP Multipathing Administration Guide* for more details.

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# Sun Cluster AnswerBooks Installation

The Sun Cluster 3.0 12/01 user documentation is available online in AnswerBook2™ format for use with AnswerBook2 documentation servers. The Sun Cluster 3.0 12/01 AnswerBook2 documentation set consists of the following collections.

- The Sun Cluster 3.0 12/01 Collection, which includes the following manuals.
  - Sun Cluster 3.0 12/01 Software Installation Guide*
  - Sun Cluster 3.0 12/01 System Administration Guide*
  - Sun Cluster 3.0 12/01 Hardware Guide*
  - Sun Cluster 3.0 12/01 Data Services Developer's Guide*
  - Sun Cluster 3.0 12/01 Concepts*
  - Sun Cluster 3.0 12/01 Error Messages Manual*
- The Sun Cluster 3.0 12/01 Data Services Collection, which includes the following manual.
  - Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide*

# Setting Up the AnswerBook2 Documentation Server

The Solaris operating environment release includes AnswerBook2 documentation server software. The Solaris documentation CD-ROM, which is separate from the Solaris operating environment CD-ROM, includes the documentation server software. You need the Solaris documentation CD-ROM to install an AnswerBook2 documentation server.

If you have installed an AnswerBook2 documentation server at your site, you can use the same server for the Sun Cluster 3.0 12/01 AnswerBooks. Otherwise, install a documentation server on a machine at your site. We recommend that you use the administrative console as the administrative interface to your cluster for the documentation server. Do not use a cluster node as your AnswerBook2 documentation server.

For information on installing an AnswerBook2 documentation server, load the Solaris documentation CD-ROM on a server, and view the `README` files.

## Viewing Sun Cluster AnswerBooks

Install the Sun Cluster AnswerBook2 documents on a file system on the same server on which you install the documentation server. The Sun Cluster 3.0 12/01 AnswerBooks include a post-install script that automatically adds the documents to your existing AnswerBook library.

To setup your AnswerBook2 servers:

- Your server system must have approximately 34 Megabytes of disk space available for the server software and roughly 600 Megabytes of disk space available for installing document collections.
- You must have root (superuser) access to the documentation server.
- The AnswerBook2 server must have a CD-ROM drive.
- If you do not have an installed AnswerBook2 documentation server, you need the Solaris operating environment documentation CD-ROM, which contains the software instructions for installing an AnswerBook2 documentation server.
- The Sun Cluster 3.0 12/01 CD-ROM includes the Sun Cluster 3.0 12/01 Collection. The Sun Cluster 3.0 Agents 12/01 CD-ROM contains the Sun Cluster 3.0 12/01 Data Services Collection.

## ▼ How to Install the Sun Cluster AnswerBooks

Use this procedure to install the Sun Cluster AnswerBook packages for the Sun Cluster 3.0 12/01 Collection and Sun Cluster 3.0 12/01 Data Services Collection.

1. **Become superuser on the server that has an AnswerBook2 documentation server.**
2. **If you have previously installed the Sun Cluster AnswerBooks, remove the old packages.**

```
# pkgrm SUNWscfab SUNWscdab
```

If you have never installed Sun Cluster AnswerBooks, ignore this step.

3. **Insert the Sun Cluster 3.0 12/01 CD-ROM or Sun Cluster 3.0 Agents 12/01 CD-ROM into a CD-ROM drive attached to your documentation server.**

The Volume Management daemon, `vold(1M)`, mounts the CD-ROM automatically.

4. **Change directory to the CD-ROM location that contains the Sun Cluster AnswerBook package.**

The AnswerBook packages reside at the following locations.

- Sun Cluster 3.0 12/01 CD-ROM

```
/cdrom/suncluster_3_0_u2/SunCluster_3.0/Packages
```

- Sun Cluster 3.0 Agents 12/01 CD-ROM

```
/cdrom/scdataservices_3_0_u2/components/SunCluster_Data_Service_Answer_Book_3.0/Packages
```

5. **Use the `pkgadd(1)` command to install the package.**

```
# pkgadd -d .
```

6. **Select the Sun Cluster 3.0 12/01 Collection (`SUNWscfab`) and the Sun Cluster 3.0 12/01 Data Services Collection (`SUNWscdab`) packages to install.**
7. **From the `pkgadd` installation options menu, choose `heavy` to add the complete package to the system and update the AnswerBook2 catalog.**

Select either the Sun Cluster 3.0 12/01 Collection (`SUNWscfab`) or the Sun Cluster 3.0 12/01 Data Services Collection (`SUNWscdab`).

The document collection package on each CD-ROM includes a post-installation script that adds the collection to the documentation server's database and restarts the server. You can now view the Sun Cluster AnswerBooks from your documentation server.

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# PDF Files

The Sun Cluster CD-ROMs include a PDF file for each book in the Sun Cluster documentation set.

Similar to the Sun Cluster AnswerBooks, six PDF files reside on the Sun Cluster CD-ROM and one PDF file resides on the Agents CD-ROM. The PDF file names are abbreviations of the books (see [TABLE 0-3](#)).

The PDF files reside at the following locations.

- Sun Cluster 3.0 12/01 CD-ROM

`cdrom/suncluster_3_0_u2/SunCluster_3.0/Docs/locale/C/PDF`

- Sun Cluster 3.0 Agents 12/01 CD-ROM

`cdrom/scdataservices_3_0_u2/components/SunCluster_Data_Service_Answer_Book_3.0/Docs/locale/C/PDF`

**TABLE 0-3** Mapping of PDF Abbreviations to Book Titles

CD-ROM	PDF Abbreviation	Book Title
Sun Cluster 3.0 12/01 CD-ROM	CLUSTINSTALL	<i>Sun Cluster 3.0 12/01 Software Installation Guide</i>
	CLUSTNETHW	<i>Sun Cluster 3.0 12/01 Hardware Guide</i>
	CLUSTAPIPG	<i>Sun Cluster 3.0 12/01 Data Services Developer's Guide</i>
	CLUSTSYSADMIN	<i>Sun Cluster 3.0 12/01 System Administration Guide</i>
	CLUSTCONCEPTS	<i>Sun Cluster 3.0 12/01 Concepts</i>
	CLUSTERRMSG	<i>Sun Cluster 3.0 12/01 Error Messages Manual</i>
Sun Cluster 3.0 Agents 12/01 CD-ROM	CLUSTDATASVC	<i>Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide</i>

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# Restrictions

The following restrictions apply to the Sun Cluster 3.0 12/01 release:

- **Remote Shared Memory (RSM) transport types** – These transport types are mentioned in the documentation, but they are not supported. If you use the RSM API, specify `dlpi` as the transport type.
- **Scalable Coherent Interface (SCI)** – The SBus SCI interface is not supported as a cluster interconnect. However, the PCI-SCI interface is now supported.
- **Automatic disk path monitoring** – The disk path monitoring functionality is not supported. You must manually monitor disk paths to avoid double failures or loss of path to a quorum device. The monitor detects active disk path failures only, but not inactive disk paths.
- **Storage devices with more than two physical paths to the enclosure** – More than two paths are not supported. The Sun StorEdge A3500, for which two paths are supported to each of two nodes, is an exception.
- **SunVTS™** – This is not supported.
- **Multihost tape, CD-ROM, and DVD-ROM** – This is not supported.
- **Loopback File System** – Sun Cluster 3.0 software does not support the use of the loopback file system (LOFS) on cluster nodes.
- **Running client applications on the cluster nodes** – This is not supported. Switchover or failover of a resource group might cause a TCP (`telnet/rlogin`) connection to be broken. This switchover or failover includes connections that the cluster nodes initiated and connections that client hosts outside the cluster initiated.
- **Running high-priority process scheduling classes on cluster nodes** – This is not supported. Do not run, on any cluster node, any processes that run in the time-sharing scheduling class with a higher-than-normal priority or any processes that run in the real-time scheduling class. Sun Cluster 3.0 relies on kernel threads that do not run in the real-time scheduling class. Other time-sharing processes that run at higher-than-normal priority or real-time processes can prevent the Sun Cluster kernel threads from acquiring needed CPU cycles.
- **File system quotas** – Quotas are not supported in Sun Cluster 3.0 12/01 configuration.
- **Logical network interfaces** – These interfaces are reserved for use by Sun Cluster 3.0 12/01 software.

### ■ Cluster file system restrictions

- The command `umount -f` behaves in the same manner as the `umount` command without the `-f` option. It does not support forced unmounts.
- The command `unlink (1M)` is not supported on non-empty directories.
- The command `lockfs -d` is not supported. Use `lockfs -n` as a workaround.
- The cluster file system does not support any of the file system features of Solaris by which one would put a communication end-point in the file system name space. Therefore, you cannot create a UNIX domain socket whose name is a path name into the cluster file system, nor can you create fifos or named pipes, nor should you attempt to use `fattach`.
- It is not supported to execute binaries off file systems mounted by using the `forcedirectio` mount option.

### ■ Network Adapter Failover (NAFO) restrictions

- All public networking adapters must be in NAFO groups.
- Only one NAFO group exists per IP subnet for each node. Sun Cluster 3.0 software does not support even the weak form of IP striping, in which multiple IP addresses exist on the same subnet.
- Only one adapter in a NAFO group can be active at any time.
- Sun Cluster 3.0 software does not support setting `local-mac-address=true` in the OpenBoot™ PROM.

### ■ Service and application restrictions

- Sun Cluster 3.0 software can only provide service for those data services that are either supplied with the Sun Cluster product or set up with the Sun Cluster data services API.
- Do not use cluster nodes as mail servers because the Sun Cluster environment does not support the `sendmail(1M)` subsystem. Mail directories must reside on non-Sun Cluster nodes.
- Do not configure cluster nodes as routers (gateways). If the system goes down, the clients cannot find an alternate router and cannot recover.
- Do not configure cluster nodes as NIS or NIS+ servers. However, cluster nodes can be NIS or NIS+ clients.
- Do not use a Sun Cluster configuration to provide a highly available boot or install service on client systems.
- Do not use a Sun Cluster 3.0 configuration to provide an `rarpd` service.

### ■ Sun Cluster 3.0 HA for NFS restrictions

- No Sun Cluster node may be an NFS client of an HA-NFS exported file system being mastered on a node in the same cluster. Such cross-mounting of HA-NFS is prohibited. Use the cluster file system to share files among cluster nodes.

- Applications must not locally access file systems that are exported via NFS. Otherwise, local blocking (for example, `flock(3UCB)`, `fcntl(2)`) might interfere with the ability to restart the lock manager (`lockd`). During restart, a blocked local process may be granted a lock which may be intended to be reclaimed by a remote client. This would cause unpredictable behavior.
- Sun Cluster HA for NFS requires that all NFS client mounts be “hard” mounts.
- For Sun Cluster HA for NFS, do not use hostname aliases for network resources. NFS clients mounting cluster file systems using hostname aliases might experience `statd` lock recovery problems.
- Sun Cluster 3.0 software does not support Secure NFS or the use of Kerberos with NFS, in particular, the `secure` and `kerberos` options to the `share_nfs(1M)` subsystem.
- **Sun Cluster HA for NetBackup restrictions**
  - On the cluster running the master server, the master server is the only logical host that can be backed up.
  - Backup media cannot be attached to the master server, so one or more media servers are required.
- **Sun Cluster and NetBackup restrictions**
  - If the NetBackup client is a cluster, only one logical host can be configured as the client because there is only one `bp.conf` file.
  - If the NetBackup client is a cluster and if one of the logical hosts on the cluster is configured as the NetBackup client, NetBackup cannot back up the physical hosts.
- **Volume manager restrictions**
  - In Solstice DiskSuite configurations that use mediators, the number of mediator hosts configured for a diskset must be exactly two.
  - DiskSuite Tool (`metatool`) is not compatible with Sun Cluster 3.0 software.
  - Use of VxVM Dynamic Multipathing (DMP) with Sun Cluster 3.0 software to manage multiple paths from the same node is not supported.
  - Software RAID 5 is not supported.
- **Hardware restrictions**
  - With the exception of clusters using Sun StorEdge A3x00, a pair of cluster nodes must have at least two multihost disk enclosures.
  - RAID level 5 is supported on only the following hardware platforms at this time:
    - Sun StorEdge A5x00/A3500FC arrays.
    - Sun StorEdge T3 and T3+ arrays. However, note that if you are using these arrays in a single-controller configuration, an additional mechanism for data redundancy, such as host-based mirroring, must also be used. If these arrays are used in a partner-group configuration, the controllers are redundant and you can use RAID 5 without host-based mirroring.
  - Alternate Pathing (AP) is not supported.

- If you are using a Sun Enterprise 420R server with a PCI-card in slot J4701, the motherboard must be at dash-level 15 or higher (501-5168-15 or higher). To find the motherboard part number and revision level, look at the edge of the board closest to PCI slot 1.
- System panics have been observed in clusters when UDWIS I/O cards are used in slot 0 of a board in a Sun Enterprise 10000 server; do not install UDWIS I/O cards in slot 0 of a board in this server (see [“BugId 4490386”](#) on page 23.)

■ **Data Service Timeout Period recommendation**

When using data services that are I/O intensive and that have a large number of disks configured in the cluster, it is recommended that you increase the default timeout of the data service. This is to account for the large amount of time resulting from retries within the I/O subsystem during disk failures. If you need more information or help with increasing data service timeouts, contact your local support engineer.

■ **Data Service restrictions**

- Identify requirements for all data services before you begin Solaris and Sun Cluster installation. If you do not inform yourself of these requirements, you might perform the installation process incorrectly and thereby need to completely reinstall the Solaris and Sun Cluster software.

For example, the Oracle Parallel Fail Safe/Real Application Clusters Guard option of Oracle Parallel Server/Real Application Clusters has special requirements for the hostnames/node names that you use in the cluster. You must accommodate these requirements before you install Sun Cluster software because you cannot change hostnames after you install Sun Cluster software. For more information on the special requirements for the hostnames/node names, see the Oracle Parallel Fail Safe/Real Application Clusters Guard documentation.

---

# Patches and Required Firmware Levels

This section provides information about patches for Sun Cluster configurations.

## PatchPro

Sun Cluster software is an early adopter of PatchPro, a state-of-the-art patch-management solution from Sun. This new tool is intended to dramatically ease the selection and download of patches required for installation or maintenance of Sun Cluster software. PatchPro provides a Sun Cluster-specific Interactive Mode tool to make the installation of patches easier and an Expert Mode tool to maintain your configuration with the latest set of patches. Expert Mode is especially useful for those who want to get all of the latest patches, not just the high availability and security patches.

---

**Note** – You must have a SunSolve account registered to view and download the required patches for the Sun Cluster product. If you don't have an account registered, contact your Sun service representative or sales engineer, or register through the SunSolve Online Web site.

---

To access the PatchPro tool for Sun Cluster software, go to <http://www.sun.com/PatchPro/>, click on “Sun Cluster,” then choose either Interactive Mode or Expert Mode. Follow the instructions in the PatchPro tool to describe your cluster configuration and download the patches.

# SunSolve Online

The SunSolve Online<sup>SM</sup> Web site provides 24-hour access to the most up-to-date information regarding patches, software, and firmware for Sun products. Access the SunSolve Online site at <http://sunsolve.sun.com> for the most current matrixes of supported software, firmware, and patch revisions.

---

**Note** – You must have a SunSolve account registered to view and download the required patches for the Sun Cluster product. If you don't have an account registered, contact your Sun service representative or sales engineer, or register through the SunSolve Online Web site.

---

You can find Sun Cluster 3.0 patch information by using the SunSolve EarlyNotifier<sup>SM</sup> Service. To view the EarlyNotifier information, log into SunSolve and access the Simple search selection from the top of the main page. From the Simple Search page, click on the EarlyNotifier box and type `sun cluster 3.0` in the search criteria box. This will bring up the EarlyNotifier page for Sun Cluster 3.0 software.

Before you install Sun Cluster 3.0 software and apply patches to a cluster component (Solaris operating system, Sun Cluster software, volume manager or data services software, or disk hardware), review the EarlyNotifier information and any `README` files that accompany the patches. All cluster nodes must have the same patch level for proper cluster operation.

For specific patch procedures and tips on administering patches, see the *Sun Cluster 3.0 12/01 System Administration Guide*.

# Required SAP Patches for Sun Cluster HA for SAP

The latest patch for the executable `sapstart` (see OSS note 0396321) protects you from multiple startups of SAP instances when an instance is already active on one node. The patch is important because duplication of SAP instances crashes the instance that was already active. Furthermore, the crash prevents SAP shutdown scripts from clean shut down of the SAP instances, which might cause data corruption.

To overcome this problem, install the latest patch for the `sapstart` executable, and configure the new parameter in the SAP startup profile for the application server and central instance.

For example, edit the profile `SC3_DVEBMGS00` (the profile for the central instance) to add the new SAP parameter, `sapstart/lockfile`.

```
sapstart/lockfile =/usr/sap/SC3/DVEBMGS00/work/startup_lockfile
```

<code>sapstart/lockfile</code>	New parameter name.
<code>/usr/sap/SC3/DVEBMGS00/work</code>	Work directory for the central instance.
<code>startup_lockfile</code>	Lock file name that Sun Cluster HA for SAP uses.

---

**Note** – You must locate the lock file path on the cluster file system. If you locate the lock file path locally on the nodes, start ups of the same instance from different nodes cannot be prevented.

---

Even if you configure the lock file in the SAP profile, you do not have to manually create the lock file. The Sun Cluster HA for SAP data service will create the lock file.

With this configuration, when you start the SAP instance, the SAP software locks the file `startup_lockfile`. If you start up the SAP instance outside of the Sun Cluster environment and then try to bring up SAP under the Sun Cluster environment, the Sun Cluster HA for SAP data service will attempt to start up the instance. However, because of the file-locking mechanism, this attempt will fail. The data service will log appropriate error messages in `syslog`.

---

# SunPlex Agent Builder License Terms

SunPlex Agent Builder includes the following license terms.

**Redistributables:** The files in the directory `/usr/cluster/lib/scdsbuilder/src` are redistributable and subject to the terms and conditions of the Binary Code License Agreement and Supplemental Terms.

For more information on license terms, see the Binary Code License Agreement and Supplemental Terms that accompanies the Sun Cluster 3.0 media kit.

---

# Sun Management Center Software Upgrade

This section describes how to upgrade from Sun Management Center 2.1.1 to Sun Management Center 3.0 software on a Sun Cluster 3.0 12/01 configuration.

## ▼ How to Upgrade Sun Management Center Software

Perform this procedure to upgrade from Sun Management Center 2.1.1 to Sun Management Center 3.0 software on a Sun Cluster 3.0 12/01 configuration.

- 1. Have available the following items.**
  - **Sun Cluster 3.0 12/01 CD-ROM or the path to the CD-ROM image.** You will use the CD-ROM to reinstall the Sun Cluster module packages after you upgrade Sun Management Center software.
  - **Sun Management Center 3.0 documentation.**
  - **Sun Management Center 3.0 patches and Sun Cluster module patches, if any.** See [“Patches and Required Firmware Levels” on page 17](#) for the location of patches and installation instructions.
- 2. Stop any Sun Management Center processes.**
  - a. If the Sun Management Center console is running, exit the console.**

In the console window, select `File>Exit` from the menu bar.

- b. On each Sun Management Center agent machine (cluster node), stop the Sun Management Center agent process.

```
# /opt/SUNWsymon/sbin/es-stop -a
```

- c. On the Sun Management Center server machine, stop the Sun Management Center server process.

```
# /opt/SUNWsymon/sbin/es-stop -S
```

3. As superuser, remove Sun Cluster module packages from the locations listed in [TABLE 0-4](#).

You must remove all Sun Cluster module packages from all locations. Otherwise, the Sun Management Center software upgrade might fail because of package dependency problems. After you upgrade Sun Management Center software, you will reinstall these packages in [Step 5](#).

```
# pkgrm module-package
```

**TABLE 0-4** Locations to Remove Sun Cluster Module Packages

Location	Package to Remove
Each cluster node	SUNWscsam, SUNWscsal
Sun Management Center console machine	SUNWscscn
Sun Management Center server machine	SUNWscssv
Sun Management Center help server machine	SUNWscshl

4. Upgrade to Sun Management Center 3.0 software.

Follow the upgrade procedures in your Sun Management Center 3.0 documentation.

5. As superuser, reinstall Sun Cluster module packages to the locations listed in [TABLE 0-5](#).

For Sun Management Center 3.0 software, you install the help server package SUNWscshl on the console machine as well as on the help server machine.

```
# cd /cdrom/suncluster_3_0_u2/SunCluster_3.0/Packages  
# pkgadd module-package
```

**TABLE 0-5** Locations to Install Sun Cluster Module Packages

Location	Package to Install
Each cluster node	SUNWscsam, SUNWscsal
Sun Management Center console machine	SUNWscscn, SUNWscshl
Sun Management Center server machine	SUNWscssv
Sun Management Center help server machine	SUNWscshl

**6. Apply any Sun Management Center patches and any Sun Cluster module patches to each node of the cluster.**

**7. Restart Sun Management Center agent, server, and console processes on all involved machines.**

Follow procedures in “How to Start Sun Management Center” in the *Sun Cluster 3.0 12/01 Software Installation Guide*.

**8. Load the Sun Cluster module.**

Follow procedures in “How to Load the Sun Cluster Module” in the *Sun Cluster 3.0 12/01 Software Installation Guide*.

If the Sun Cluster module was previously loaded, unload the module and then reload it to clear all cached alarm definitions on the server. To unload the module, from the console’s Details window select Module>Unload Module.

---

# Known Problems

The following known problems affect the operation of the Sun Cluster 3.0 12/01 release. For the most current information, see the online *Sun Cluster 3.0 12/01 Release Notes Supplement* at <http://docs.sun.com>.

## BugId 4419214

**Problem Summary:** The `/etc/mnttab` file does not show the most current `largefile` status of a globally mounted VxFS file system.

**Workaround:** Use the `fsadm` command, rather than using the `/etc/mnttab` entry, to verify file system `largefile` status.

## BugId 4449437

**Problem Summary:** Global VxFS appears to allocate more disk blocks for the same filesize than Local VxFS. You observe this using the `ls -ls` command.

**Workaround:** Unmount and mount the file system. This results in the elimination of the extra disk blocks reported as allocated.

## BugId 4490386

**Problem Summary:** When using Sun Enterprise 10000 servers in a cluster, panics have been observed in these servers when a certain configuration of I/O cards is used.

**Workaround:** Do not install UDWIS I/O cards in slot 0 of an SBus I/O board in Sun Enterprise 10000 servers in a cluster.

## BugId 4492010

**Problem Summary:** In an  $N$ -node cluster configured with  $N$  interaction managers, if you bring down or halt the cluster node running an Interaction Manager (IM) that serves a client, you will cause the clients to lose the session. Further retries by the same client to reconnect to a different IM will take a long time. This is an issue with the BroadVision product and Broadvision engineers are working to resolve this problem. BroadVision does not support IM session failover capability.

**Workaround:** From a Netscape browser, click on the Stop/Reload button, and then click on Start Broadway Application button. The connection to BroadVision server should respond immediately. This workaround works most of the time for new connections, after halting the IM node. This workaround is less likely to work if you perform this workaround before halting the IM node. If this workaround does not work, clear the disk cache and memory cache in Netscape.

## BugId 4493025

**Problem Summary:** In a two-node cluster if you switch `oracle-rg` from Node 1 to Node 2, BroadVision One-To-One tries three times before it successfully registers a new user. The first try displays `Fail to create new user`. The second try displays copyright information. The third try succeeds with no problem. This problem occurs in any  $N$  node cluster running a failover Oracle database, either within the cluster or outside the cluster, and in a two node cluster where Node 1 is the primary for `http`, `oracle`, `roothost`, `backend`, and `backend2` and where Interaction Manager (IM) is running as `scalable`.

The problem is the new user's name is not displayed on the welcome page after login. This is a known issue with BroadVision One-To-One. There is a bug filed against BroadVision One-To-One to fix this problem: `BVNqa20753`.

**Workaround:** There is no workaround. The user will be created after three attempts.

## BugId 4494165

**Problem Summary:** VERITAS File System patch 110435-05 changes the default logging option for `mount_vxfs` from the `log` option to the `delaylog` option. Logging is necessary for VxFS support on Sun Cluster.

**Workaround:** Manually add the `log` option to the VxFS options list in the `vfstab` file.

## BugId 4499573

**Problem Summary:** When using data services that are I/O intensive and that are configured on a large number of disk in the cluster, the data services may time out because of the retries within the I/O subsystem during disk failures.

**Workaround:** Increase your data service's resource extension property value for `Probe_timeout`. If you need help determining the timeout value, contact your service representative.

```
# scrgadm -c -j resource -x Probe_timeout=timeout_value
```

## BugId 4501655

**Problem Summary:** `record locking` does not work correctly when the device to be locked is a global device (`/dev/global/rdisk/d4s0`). However, `record locking` works correctly when the program runs multiple times in the background on a specified node. After the first copy of the program locks a portion of the device, other copies of the program should `block waiting` for the device to be unlocked. However, when the program runs from a different node other than the node specified, the program locks the device again although it should `block waiting` for the device to be unlocked.

**Workaround:** There is no workaround.

# BugId 4504311

**Problem Summary:** When a Sun Cluster configuration is upgraded to Solaris 8 10/01 software (required for Sun Cluster 3.0 12/01 upgrade), the Apache start and stop scripts are restored. If an Apache data service is already present on the cluster and configured in its default configuration (the `/etc/apache/httpd.conf` file exists and the `/etc/rc3.d/S50apache` file does not exist), Apache starts on its own. This prevents the Apache data service from starting because Apache is already running.

**Workaround:** Do the following for each node.

1. Before you shut down a node to upgrade it, determine whether the following links already exist, and if so, whether the file names contain an uppercase K or S.

```
/etc/rc0.d/K16apache  
/etc/rc1.d/K16apache  
/etc/rc2.d/K16apache  
/etc/rc3.d/S50apache  
/etc/rcS.d/K16apache
```

If these links already exist and contain an uppercase K or S in the file name, no further action is necessary. Otherwise, perform the action in the next step after you upgrade the node to Solaris 8 10/01 software.

2. After the node is upgraded to Solaris 8 10/01 software, but **before** you reboot the node, move aside the restored Apache links by renaming the files with a lowercase k or s.

```
# mv /a/etc/rc0.d/K16apache /a/etc/rc0.d/k16apache  
# mv /a/etc/rc1.d/K16apache /a/etc/rc1.d/k16apache  
# mv /a/etc/rc2.d/K16apache /a/etc/rc2.d/k16apache  
# mv /a/etc/rc3.d/S50apache /a/etc/rc3.d/s50apache  
# mv /a/etc/rcS.d/K16apache /a/etc/rcS.d/k16apache
```

## BugId 4504385

**Problem Summary:** If you use interactive `scinstall(1M)`, which provides the cluster transport autodiscovery features, you might see the following the error message during the probe:

```
scrconf: /dev/clone: No such file or directory
```

This error message might result in the probe aborting and autodiscovery failing. The device might be a device that is not a network adapter. For example, the device might be `/dev/llc20`. If you encounter this problem, please ask your service representative to update the bug report with additional information that might be useful in reproducing this problem.

**Workaround:** Reboot the node, and then retry `scinstall`. If this does not solve the problem, select the non-autodiscovery options of `scinstall`.

## BugId 4505391

**Problem Summary:** When you upgrade the Sun Cluster software from Sun Cluster 2.2 to Sun Cluster 3.0 12/01 using the `scinstall -u begin -F` command, the `scinstall` command fails to remove patches with dependencies and aborts with the following messages:

```
scinstall: Failed to remove patch-id.rev  
scinstall: scinstall did NOT complete successfully!
```

A patch dependency is the cause of this failure.

**Workaround:** Manually back out the patch dependencies, then restart the upgrade process. Use the log file to identify the patch dependencies that caused the script to fail. Use can also use the `showrev` command to identify patch dependencies.

```
showrev -p | grep patch-id
```

## BugId 4509832

**Problem Summary:** If a Cluster Configuration Repository (CCR) is invalid in a cluster, it is neither readable nor writable. If you run the `ccradm -r -f` command on the invalid CCR in question, this command should make the invalid CCR readable as well as writable. However, after you run the `ccradm -r -f` command the CCR table is still not writable.

**Workaround:** Reboot the entire cluster.

## BugId 4511478

**Problem Summary:** When interactive `scinstall(1M)` runs a second time against the same JumpStart directory to set up a JumpStart server for installing a cluster, the cluster and JumpStart directory names might disappear. In the `scinstall` command-line invoked by this process, both of these names are missing.

**Workaround:** From your JumpStart directory, remove the `.interactive.log.3` file, and then rerun `scinstall`.

## BugId 4515780

**Problem Summary:** NLS files for Oracle 9.0.1 are not backward compatible for Oracle 8.1.6 and 8.1.7 software. Patch 110651-04 has been declared bad.

**Workaround:** Back out Patch 110651-04 and replace it with 110651-02.

## BugId 4517304

**Problem Summary:** If `syslogd` dies and you cannot restart it on a cluster node (for example, as a result of Bugid 4477565), this can cause `rgmd` to hang on one or more nodes. This in turn causes other commands such as `scstat(1M) -g`, `scswitch(1M) -g`, `scrgadm(1M)`, and `scha_*_get(1HA,3HA)` to hang and prevents resource group failovers from succeeding.

**Workaround:** Edit the `/etc/init.d/syslog` script, inserting a line to remove the symbolic link `/etc/.syslog_door` before the command that starts `/usr/sbin/syslogd`.

Inserted Line:

```
rm -f /etc/.syslog_door
```

## BugId 4517875

**Problem Summary:** After the installation of RSM (Remote Shared Memory) packages and the SUNWscrf package (the RSM API Path Manager package), some of the paths RSM API uses fail to come up to RSM\_CONNECTION\_ACTIVE state. If you dump the topology structure using `rsm_get_interconnect_topology (3rsm)`, interface `{rsmapi.h}` shows the state of each path.



---

**Caution** – Perform the following workaround on each path one at a time so that you do not isolate the node from the cluster.

---

**Workaround:** Run the following commands on any node of the cluster to bring up the paths that are in a state other than RSM\_CONNECTION\_ACTIVE (3).

```
# scconf -c -m endpoint=node:adpname,state=disabled
# scconf -c -m endpoint=node:adpname,state=enabled
```

*node:adpname*            An endpoint on the path that is experiencing this problem

## BugId 4522648

**Problem Summary:** As of the VxVM 3.1.1 release, the man-page path has changed to `/opt/VRTS/man`. In previous releases the man-page path was `/opt/VRTSvxvm/man`. This new path is not documented in the *Sun Cluster 3.0 12/01 Software Installation Guide*.

**Workaround:** For VxVM 3.1.1 and later, add `/opt/VRTS/man` to the MANPATH on each node of the cluster.

---

# Known Documentation Problems

This section discusses known errors or omissions for documentation and online help and steps to correct these problems.

## Sun Cluster HA for Oracle Packages

The introductory paragraph to “Installing Sun Cluster HA for Oracle Packages” in the Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide does not discuss the additional package needed for users with clusters running Sun Cluster HA for Oracle with 64-bit Oracle. The following section corrects the introductory paragraph to “Installing Sun Cluster HA for Oracle Packages” in the Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide.

### Installing Sun Cluster HA for Oracle Packages

Depending on your configuration, use the `scinstall(1M)` utility to install one or both of the following packages on your cluster. Do not use the `-s` option to non-interactive `scinstall` to install all of the data service packages.

- `SUNWscor`: Cluster running Sun Cluster HA for Oracle with 32 bit Oracle or 64-bit Oracle
- `SUNWscorx`: Cluster running Sun Cluster HA for Oracle with 64-bit Oracle

---

**Note** – `SUNWscor` is the prerequisite package for `SUNWscorx`.

---

If you installed the `SUNWscor` data service package as part of your initial Sun Cluster installation, proceed to [“Registering and Configuring Sun Cluster HA for Oracle” on page 30](#). Otherwise, use the following procedure to install the `SUNWscor` and `SUNWscorx` packages.

## Apache Packages Required for All Sun Cluster Software Installation Methods

SunPlex Manager software requires that Apache software packages already be installed on the node before you install SunPlex Manager. This is true whether you install SunPlex Manager manually or whether it is installed automatically by the

interactive `scinstall(1M)` method or the `scinstall` JumpStart method. If the Apache software is not installed before SunPlex Manager is installed, you will see a message similar to the following.

```
NOTICE: To finish installing the SunPlex Manager, you must install
the SUNWapchr and SUNWapchu Solaris packages and any associated
patches. Then run '/etc/init.d/initspm start' to start the server.
```

The *Sun Cluster 3.0 12/01 Software Installation Guide* procedure “How to Install SunPlex Manager Software” includes a step to ensure that Apache software packages are first installed. However, the procedures “How to Install Sun Cluster Software on the First Cluster Node (`scinstall`),” “How to Install Sun Cluster Software on Additional Cluster Nodes (`scinstall`),” and “How to Install Solaris and Sun Cluster Software (JumpStart)” do not include this step.

If you intend to use SunPlex Manager and you use either the interactive `scinstall(1M)` method or the `scinstall` JumpStart method to install Sun Cluster software, ensure that Apache software packages are installed on a node before you begin Sun Cluster software installation. See Step 3 of “How to Install SunPlex Manager Software” in the *Sun Cluster 3.0 12/01 Software Installation Guide* for instructions.

## New Man Page Path for VxVM

The *Sun Cluster 3.0 12/01 Software Installation Guide* omits the new man page path for later releases of VERITAS Volume Manager (VxVM). The `MANPATH` currently documented, `/opt/VRTSvxvm/man`, is valid for VxVM 3.0.4 and 3.1. For VxVM 3.1.1 and 3.2, use `/opt/VRTS/man` for the `MANPATH`.

## Generic Data Service Package Installation During Upgrade

Instructions to install the Sun Cluster 3.0 generic data service package, `SUNWscgds`, are missing from the upgrade procedures in the *Sun Cluster 3.0 12/01 Software Installation Guide*. This package is not installed automatically by the `scinstall(1M)` upgrade options. After you upgrade Sun Cluster software, use the `pkgadd(1M)` command to install the `SUNWscgds` package from the Sun Cluster 3.0 12/01 CD-ROM. You do not need to reboot the node after you install this package.

# VERITAS File System (VxFS) Commands to Create a VxFS File System

In the procedure “How to Add Cluster File Systems” in the *Sun Cluster 3.0 12/01 Software Installation Guide* and in the *Sun Cluster 3.0 12/01 System Administration Guide*, the step to use the `newfs(1M)` command to create a new file system is only valid for UFS file systems. To create a new VxFS file system, follow procedures provided in your VxFS documentation.

## ▼ How to Create More Than Three Disksets in a Cluster

If you intend to create more than three disksets in the cluster, perform the following steps before you create the disksets. Follow these steps regardless of whether you are installing disksets for the first time or you are adding more disksets to a fully configured cluster.

1. **Ensure that the value of the `md_nsets` variable is set high enough to accommodate the total number of disksets you intend to create in the cluster.**
  - a. **On any node of the cluster, check the value of the `md_nsets` variable in the `/kernel/drv/md.conf` file.**
  - b. **If the total number of disksets in the cluster will be greater than the existing value of `md_nsets` minus one, on each node increase the value of `md_nsets` to the desired value.**

The maximum permissible number of disksets is one less than the value of `md_nsets`. The maximum possible value of `md_nsets` is 32.
  - c. **Ensure that the `/kernel/drv/md.conf` file is identical on each node of the cluster.**



---

**Caution** – Failure to follow this guideline can result in serious Solstice DiskSuite errors and possible loss of data.

---

- d. **From one node, shut down the cluster.**

```
# scshutdown -g0 -y
```

**e. Reboot each node of the cluster.**

```
ok> boot
```

**2. On each node in the cluster, run the `devfsadm(1M)` command.**

You can run this command on all nodes in the cluster at the same time.

**3. From one node of the cluster, run the `scgdevs(1M)` command.**

**4. On each node, verify that the `scgdevs` command has completed before you attempt to create any disksets.**

The `scgdevs` command calls itself remotely on all nodes, even when the command is run from just one node. To determine whether the `scgdevs` command has completed processing, run the following command on each node of the cluster.

```
% ps -ef | grep scgdevs
```

## SunPlex Manager Online Help Correction

A note in the SunPlex Manager's online help is inaccurate. The note appears in the Oracle data service installation procedure. The correction is as follows.

**Incorrect:**

Note: If no entries exist for the `shmsys` and `semsys` variables in the `/etc/system` file when SunPlex Manager packages are installed, default values for these variables are automatically put in the `/etc/system` file. The system must then be rebooted. Check Oracle installation documentation to verify that these values are appropriate for your database.

**Correct:**

Note: If no entries exist for the `shmsys` and `semsys` variables in the `/etc/system` file when you install the Oracle data service, default values for these variables can be automatically put in the `/etc/system` file. The system must then be rebooted. Check Oracle installation documentation to verify that these values are appropriate for your database.



# Sun Cluster Installation and Configuration Worksheets

---

This appendix provides worksheets to plan various components of your cluster configuration and examples of completed worksheets for your reference. See [Appendix B](#) for configuration worksheets for resources, resource types, and resource groups.

---

# Installation and Configuration Worksheets

If necessary, make additional copies of a worksheet to accommodate all the components in your cluster configuration. Follow planning guidelines in the *Sun Cluster 3.0 12/01 Software Installation Guide* to complete these worksheets. Then refer to your completed worksheets during cluster installation and configuration.

---

**Note** – The data used in the worksheet examples is intended as a guide only. The examples do not represent a complete configuration of a functional cluster.

---

The following table lists the planning worksheets and examples provided in this appendix, as well as the titles of sections in Chapter 1 of the *Sun Cluster 3.0 12/01 Software Installation Guide* that contain related planning guidelines.

**TABLE A-1** Cluster Installation Worksheets and Related Planning Guidelines (Sheet 1 of 2)

Worksheet	Example	Section Titles of Planning Guidelines
<a href="#">“Local File System Layout Worksheet” on page 38</a>	<a href="#">“Example—Local File System Layout, With and Without Mirrored Root” on page 39</a>	“System Disk Partitions” “Mirroring the Root Disk”
<a href="#">“Cluster and Node Names Worksheet” on page 40</a>	<a href="#">“Example—Cluster and Node Names” on page 41</a>	“Cluster Name” “Node Names” “Private Network” “Private Hostnames”
<a href="#">“Cluster Interconnect Worksheet” on page 42</a>	<a href="#">“Example—Cluster Interconnect” on page 43</a>	“Cluster Interconnect”
<a href="#">“Public Networks Worksheet” on page 44</a>	<a href="#">“Example—Public Networks” on page 45</a>	“Public Networks” “NAFO Groups”
<a href="#">“Local Devices Worksheet” on page 46</a>	<a href="#">“Example—Local Devices” on page 47</a>	---
<a href="#">“Disk Device Group Configurations Worksheet” on page 48</a>	<a href="#">“Example—Disk Device Group Configurations” on page 49</a>	“Disk Device Groups” “Planning Volume Management”

**TABLE A-1** Cluster Installation Worksheets and Related Planning Guidelines (Sheet 2 of 2)

<b>Worksheet</b>	<b>Example</b>	<b>Section Titles of Planning Guidelines</b>
<a href="#">“Volume Manager Configurations Worksheet” on page 50</a>	<a href="#">“Example—Volume Manager Configurations” on page 51</a>	“Planning Volume Management” Your volume manager documentation
<a href="#">“Metadevices Worksheet (Solstice DiskSuite)” on page 52</a>	<a href="#">“Example—Metadevices (Solstice DiskSuite)” on page 53</a>	“Planning Volume Management” Your Solstice DiskSuite documentation

# Local File System Layout Worksheet

Node name \_\_\_\_\_

## Mirrored root

Volume Name	Component	Component	File System	Size
			/	
			swap	
			/globaldevices	

## Non-mirrored root

Device Name	File System	Size
	/	
	swap	
	/globaldevices	

## Example—Local File System Layout, With and Without Mirrored Root

Node name     **phys-schost-1**    

### Mirrored root

Volume Name	Component	Component	File System	Size
<b>d1</b>	<b>c0t0d0s0</b>	<b>c1t0d0s0</b>	/	<b>1168MB</b>
<b>d2</b>	<b>c0t0d0s1</b>	<b>c1t0d0s1</b>	swap	<b>750MB</b>
<b>d3</b>	<b>c0t0d0s3</b>	<b>c1t0d0s3</b>	/globaldevices	<b>100MB</b>
<b>d7</b>	<b>c0t0d0s7</b>	<b>c1t0d0s7</b>	<b>SDS replica</b>	<b>10MB</b>

### Non-mirrored root

Device Name	File System	Size
<b>c0t0d0s0</b>	/	<b>1168 MB</b>
<b>c0t0d0s1</b>	swap	<b>750MB</b>
<b>c0t0d0s3</b>	/globaldevices	<b>100MB</b>
<b>c0t0d0s7</b>	<b>SDS replica</b>	<b>10MB</b>

# Cluster and Node Names Worksheet

**Cluster name** \_\_\_\_\_

Private network address: \_\_\_\_\_ . \_\_\_\_\_ . 0 . 0 (default: 172 . 16 . 0 . 0)

Private network mask: 255 . 255 . \_\_\_\_\_ . \_\_\_\_\_ (default: 255 . 255 . 0 . 0)

**First-installed node name** \_\_\_\_\_

Private hostname

Default name: clusternode\_\_\_\_-priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

**Additional node name** \_\_\_\_\_

Private hostname

Default name: clusternode\_\_\_\_-priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

**Additional node name** \_\_\_\_\_

Private hostname

Default name: clusternode\_\_\_\_-priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

**Additional node name** \_\_\_\_\_

Private hostname

Default name: clusternode\_\_\_\_-priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

# Example—Cluster and Node Names

Cluster name sc-cluster

Private network address: 172 . 16 . 0 . 0 (default: 172 . 16 . 0 . 0)

Private network mask: 255 . 255 . 0 . 0 (default: 255 . 255 . 0 . 0)

First-installed node name phys-schost-1

Private hostname

Default name: clusternode 1 -priv  
nodeID#

Change name to: phys-schost-1-priv  
(optional)

Additional node name phys-schost-2

Private hostname

Default name: clusternode 2 -priv  
nodeID#

Change name to: phys-schost-2-priv  
(optional)

Additional node name \_\_\_\_\_

Private hostname

Default name: clusternode \_\_\_\_\_ -priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

Additional node name \_\_\_\_\_

Private hostname

Default name: clusternode \_\_\_\_\_ -priv  
nodeID#

Change name to: \_\_\_\_\_  
(optional)

# Cluster Interconnect Worksheet

## Adapters

## Cabling

## Junctions

*Draw lines between cable endpoints*

Node name \_\_\_\_\_

Adapter Type	Adapter Name

Junction name \_\_\_\_\_

Junction type \_\_\_\_\_

Port Name

Node name \_\_\_\_\_

Adapter Type	Adapter Name

Node name \_\_\_\_\_

Adapter Type	Adapter Name

Junction name \_\_\_\_\_

Junction type \_\_\_\_\_

Port Name

Node name \_\_\_\_\_

Adapter Type	Adapter Name

# Example—Cluster Interconnect

## Adapters

## Cabling

## Junctions

Draw lines between cable endpoints

Node name phys-schost-1

Adapter Type	Adapter Name
<b>dlpi</b>	<b>hme0</b>
<b>dlpi</b>	<b>hme1</b>

Junction name switch1  
Junction type switch

Port Name
<b>1</b>
<b>2</b>

Node name phys-schost-2

Adapter Type	Adapter Name
<b>dlpi</b>	<b>hme0</b>
<b>dlpi</b>	<b>hme1</b>

Junction name switch2  
Junction type switch

Port Name
<b>1</b>
<b>2</b>

Node name \_\_\_\_\_

Adapter Type	Adapter Name

Node name \_\_\_\_\_

Adapter Type	Adapter Name

# Public Networks Worksheet

**Node name** \_\_\_\_\_

Primary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

**Node name** \_\_\_\_\_

Primary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number:   nafo\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(*optional*)

Network name \_\_\_\_\_

## Example—Public Networks

Node name phys-schost-1

Primary hostname phys-schost-1

NAFO group number: nafo\_0

Adapter name qfe0

Backup adapter(s): qfe4  
(optional)

Network name net-85

Secondary hostname phys-schost-1-86

NAFO group number: nafo\_1

Adapter name qfe1

Backup adapter(s): qfe5  
(optional)

Network name net-86

Secondary hostname \_\_\_\_\_

NAFO group number: nafo\_\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(optional)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number: nafo\_\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(optional)

Network name \_\_\_\_\_

Node name phys-schost-2

Primary hostname phys-schost-2

NAFO group number: nafo\_0

Adapter name qfe0

Backup adapter(s): qfe4  
(optional)

Network name net-85

Secondary hostname phys-schost-2-86

NAFO group number: nafo\_1

Adapter name qfe1

Backup adapter(s): qfe5  
(optional)

Network name net-86

Secondary hostname \_\_\_\_\_

NAFO group number: nafo\_\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(optional)

Network name \_\_\_\_\_

Secondary hostname \_\_\_\_\_

NAFO group number: nafo\_\_\_\_\_

Adapter name \_\_\_\_\_

Backup adapter(s): \_\_\_\_\_  
(optional)

Network name \_\_\_\_\_

# Local Devices Worksheet

**Node name** \_\_\_\_\_

**Local disks**

Disk name \_\_\_\_\_ Size \_\_\_\_\_

**Other local devices**

Device type \_\_\_\_\_ Name \_\_\_\_\_

-----

**Node name** \_\_\_\_\_

**Local disks**

Disk name \_\_\_\_\_ Size \_\_\_\_\_

**Other local devices**

Device type \_\_\_\_\_ Name \_\_\_\_\_

# Example—Local Devices

**Node name** phys-schost-1

## Local disks

Disk name c0t0d0 Size 2G

Disk name c0t1d0 Size 2G

Disk name c1t0d0 Size 2G

Disk name c1t1d0 Size 2G

Disk name \_\_\_\_\_ Size \_\_\_\_\_

## Other local devices

Device type tape Name /dev/rmt/0

Device type \_\_\_\_\_ Name \_\_\_\_\_

Device type \_\_\_\_\_ Name \_\_\_\_\_

Device type \_\_\_\_\_ Name \_\_\_\_\_

-----  
**Node name** \_\_\_\_\_

## Local disks

Disk name \_\_\_\_\_ Size \_\_\_\_\_

## Other local devices

Device type \_\_\_\_\_ Name \_\_\_\_\_

# Disk Device Group Configurations Worksheet

## Volume manager

Solstice DiskSuite

VERITAS Volume Manager

**Disk group/diskset name** \_\_\_\_\_

Node names (1) \_\_\_\_\_

(5) \_\_\_\_\_

(2) \_\_\_\_\_

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

**Disk group/diskset name** \_\_\_\_\_

Node names (1) \_\_\_\_\_

(5) \_\_\_\_\_

(2) \_\_\_\_\_

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

**Disk group/diskset name** \_\_\_\_\_

Node names (1) \_\_\_\_\_

(5) \_\_\_\_\_

(2) \_\_\_\_\_

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

# Example—Disk Device Group Configurations

Volume manager

Solstice DiskSuite

VERITAS Volume Manager

Disk group/diskset name **dg-schost-1**

Node names (1) **phys-schost-1**

(5) \_\_\_\_\_

(2) **phys-schost-2**

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

Disk group/diskset name \_\_\_\_\_

Node names (1) \_\_\_\_\_

(5) \_\_\_\_\_

(2) \_\_\_\_\_

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

Disk group/diskset name \_\_\_\_\_

Node names (1) \_\_\_\_\_

(5) \_\_\_\_\_

(2) \_\_\_\_\_

(6) \_\_\_\_\_

(3) \_\_\_\_\_

(7) \_\_\_\_\_

(4) \_\_\_\_\_

(8) \_\_\_\_\_

Ordered priority?  Yes  No

Failback?  Yes  No

# Volume Manager Configurations Worksheet

**Volume manager:**

Solstice DiskSuite

VERITAS Volume Manager

Name	Type	Component	Component

## Example—Volume Manager Configurations

Volume manager:       Solstice DiskSuite       VERITAS Volume Manager

Name	Type	Component	Component
<b>dg-schost-1/d0</b>	<b>trans</b>	<b>dg-schost-1/d1</b>	<b>dg-schost-1/d4</b>
<b>dg-schost-1/d1</b>	<b>mirror</b>	<b>c0t0d0s4</b>	<b>c4t4d0s4</b>
<b>dg-schost-1/d4</b>	<b>mirror</b>	<b>c0t0d2s5</b>	<b>c4t4d2s5</b>







# Data Service Configuration Worksheets and Examples

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This appendix provides worksheets for planning resource-related components of your cluster configuration and examples of completed worksheets for your reference. See [Appendix A](#) for worksheets for other components of your cluster configuration.

---

# Configuration Worksheets

If necessary, make additional copies of a worksheet to accommodate all the resource-related components in your cluster configuration. Follow planning guidelines in the *Sun Cluster 3.0 12/01 Software Installation Guide* and the *Sun Cluster 3.0 12/01 Data Services Installation and Configuration Guide* to complete these worksheets. Then refer to your completed worksheets during cluster installation and configuration.

---

**Note** – The data used in the worksheet examples is intended as a guide only. The examples do not represent a complete configuration of a functional cluster.

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- [“Resource Types” on page 58](#)
- [“Resource Groups—Failover” on page 60](#)
- [“Network Resources” on page 62](#)
- [“Resource Groups—Scalable” on page 64](#)
- [“Application Resources” on page 66](#)



# Resource Types

(other than logical host or shared address)  
Indicate the nodes on which the resource type will run.

**Resource type name** \_\_\_\_\_

Node names \_\_\_\_\_  
\_\_\_\_\_

# Example: Resource Types

(other than logical host or shared address)

**Resource type name** SUNW.nshttp

Node names phys-schost-1 phys-schost-2 \_\_\_\_\_  
\_\_\_\_\_

**Resource type name** SUNW.oracle\_listener

Node names phys-schost-1 phys-schost-2 \_\_\_\_\_  
\_\_\_\_\_

**Resource type name** SUNW.oracle\_server

Node names phys-schost-1 phys-schost-2 \_\_\_\_\_  
\_\_\_\_\_

**Resource type name** \_\_\_\_\_

Node names \_\_\_\_\_  
\_\_\_\_\_

**Resource type name** \_\_\_\_\_

Node names \_\_\_\_\_  
\_\_\_\_\_

**Resource type name** \_\_\_\_\_

Node names \_\_\_\_\_  
\_\_\_\_\_

## Resource Groups—Failover

**Resource group name** \_\_\_\_\_

*(Must be unique within the cluster.)*

Function of this resource group \_\_\_\_\_

Failback?  Yes  No

*(Will this resource group switch back to the primary node, after the primary node has failed and been restored?)*

Node names (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_ (4) \_\_\_\_\_  
*(ordered list)*  
(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

*(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)*

Disk device groups upon which this resource group depends \_\_\_\_\_

*(If the resources in this resource group need to create files for administrative purposes, include the subdirectory they use.)*

## Example: Resource Groups—Failover

Resource group name rg-oracle

*(Must be unique within the cluster.)*

Function of this resource group Contains the Oracle resources

Failback?  Yes  No

*(Will this resource group switch back to the primary node, after the primary node has failed and been restored?)*

Node names (1) phys-schost-1 (2) phys-schost-2 (3) \_\_\_\_\_ (4) \_\_\_\_\_  
(ordered list)  
(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

*(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)*

Disk device groups upon which this resource group depends schost1-dg

*(If the resources in this resource group need to create files for administrative purposes, include the subdirectory they use.)*





# Resource Groups—Scalable

**Resource group name** \_\_\_\_\_

*(Must be unique within the cluster.)*

Function of this resource group \_\_\_\_\_

Maximum number of primaries \_\_\_\_\_

Desired number of primaries \_\_\_\_\_

Failback?  Yes  No

*(Will this resource group switch back to the primary node, after the primary node has failed)*

Node names (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_ (4) \_\_\_\_\_

(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

*(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)*

Dependencies \_\_\_\_\_

*(Does this resource depend upon another resource group.)*

**Resource group name** \_\_\_\_\_

*(Must be unique within the cluster.)*

Function of this resource group \_\_\_\_\_

Maximum number of primaries \_\_\_\_\_

Desired number of primaries \_\_\_\_\_

Failback?  Yes  No

*(Will this resource group switch back to the primary node, after the primary node has failed)*

Node names (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_ (4) \_\_\_\_\_

(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

*(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)*

Dependencies \_\_\_\_\_

*(Does this resource depend upon another resource group.)*

## Example: Resource Groups—Scalable

Resource group name rg-http

(Must be unique within the cluster.)

Function of this resource group Contains the web server resources

Maximum number of primaries 2

Desired number of primaries 2

Failback?  Yes  No

(Will this resource group switch back to the primary node, after the primary node has failed)

Node names (1) phys-schost-1 (2) phys-schost-2 (3) \_\_\_\_\_ (4) \_\_\_\_\_  
(ordered list)

(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)

Dependencies rg-shared

(Does this resource depend upon another resource group.)

Resource group name rg-shared

(Must be unique within the cluster.)

Function of this resource group Contains the shared address resources

Maximum number of primaries 1

Desired number of primaries 1

Failback?  Yes  No

(Will this resource group switch back to the primary node, after the primary node has failed)

Node names (1) phys-schost-1 (2) phys-schost-2 (3) \_\_\_\_\_ (4) \_\_\_\_\_  
(ordered list)

(5) \_\_\_\_\_ (6) \_\_\_\_\_ (7) \_\_\_\_\_ (8) \_\_\_\_\_

(Indicate the cluster nodes that may host this resource group. The first node in this list should be the primary, with others being the secondaries. The order of the secondaries will indicate preference for becoming primaries.)

Dependencies \_\_\_\_\_

(Does this resource depend upon another resource group.)







## Sun Management Center 3.0

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This section describes undocumented information about the Sun Cluster 3.0 module of the Sun Management Center GUI. For information about upgrade to Sun Management Center 3.0, see [“Sun Management Center Software Upgrade”](#) on page 20.

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# Accessing the New Features in the Sun Cluster Module

There are new locations within the Sun Cluster module console from which you can create, change the state of, or delete resources and resource groups. You can access them by opening the Sun Cluster Details window and choosing the options from the hierarchy (tree) or topology views.

- You can now access the resource and resource group creation wizards from the Resource Group subtree in the hierarchy (tree) view.
- You can now create, change the state of, or delete resources and resource groups from a pop-up menu available at each table shown below.

## **New Pop-Up Menu Items and Associated Tables**

Access from the Resource Group Status table and Resource Group

Properties table:

- Bring Online
- Take Offline
- Delete Selected Resource Group
- Create New Resource Group
- Create New Resource

Access from the Resource Status table and Resource Configuration table:

- Enable
- Disable
- Delete Resource
- Create New Resource Group
- Create New Resource

## ▼ How to Access the Creation Wizards From the Tree View

Complete the following steps to access the wizards to create a resource or resource group.

1. In either the hierarchy (tree) or topology view, double-click Operating System>Sun Cluster.
2. Click the right mouse button on the Resource Groups item, or on any item within the Resource Groups subtree.
3. Choose “Create New Resource Group” or “Create New Resource” from the pop-up menu.

## ▼ How to Access the New Menu Options

The new menu options allow you to create, change the state of, or delete resources and resource groups.

### Creating Resources and Resource Groups

Complete the following procedure to use the creation wizard on the pop-up menus, accessible from the resource and resource group tables.

1. Display either the resource or resource group table.
2. Point to any cell entry in the table, excluding the header row.
3. Click the right mouse button.
4. Choose the action you want from the pop-up menu.

## Deleting or Modifying Resources and Resource Groups

Complete the following procedure to alter the state of a resource or to delete a resource or resource group. Use the pop-up menus from the resource and resource group tables to enable or disable a resource, or to bring a resource group online or take it offline.

1. Display either the resource or resource group table.
2. Select the item that you want to modify.
  - a. To delete an entry, select the resource or resource group to be deleted
  - b. To change the state of an entry, select the state cell in the row of the resource or resource group to be changed.
3. Click the right mouse button.
4. Choose from the pop-up menu one of the following tasks to perform.

- Bring Online
- Take Offline
- Enable
- Disable
- Delete Selected Resource Group
- Delete Resource

---

**Note** – When you delete or edit status of a resource or resource group, the Sun Cluster module launches a Probe Viewer window. If the Sun Cluster module successfully performs the task that you choose, the Probe Viewer window displays the message, “Probe command returned no data.” If the task is not completed successfully, the window displays an error message.

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See Sun Management Center documentation and online help for more information about Sun Management Center.