PRIMECLUSTER™

Global File Services

Configuration and Administration Guide 4.1

（Linux)

December 2004

Preface

The Global File Services File System and its optional products are generically called "GFS product" or "GFS" in the document.
This manual explains the functions, settings, and operations of the entire GFS products.
For the available functions, refer to the installation guide of each GFS product.

Target Readers

This manual is intended for all the users operating the products with GFS File System (e.g. PRIMECLUSTER.)
The readers of this manual need to have a general knowledge of UNIX and Linux operating systems.

Organization

This manual organized as below.

Chapter 1 File System Functions
This chapter describes the functions and features of the GFS Shared File System.

Chapter 2 File System Structure
This chapter describes the structure of the GFS Shared File System.

Chapter 3 Failure Recovery
This chapter describes the following failure recovery functions of the GFS Shared File System.

Chapter 4 File System Design
This chapter describes the main features of the operational design of the GFS Shared File System.

Chapter 5 Management Partition
This chapter explains the management partition.

Chapter 6 Starting and Exiting the Management View
This chapter explains how to start and exit the GFS Management view.

Chapter 7 Operation Management View Screen Elements
This chapter describes the screen elements of the GFS Management view.

Chapter 8 File System Operations (GUI)
This chapter explains the operations of the GFS Management View.

Chapter 9 File System Operations (Command)
This chapter describes the GFS Shared File System executed by command.

Chapter 10 File System Management
This chapter describes the procedures for managing the GFS Shared File System using basic commands.

Chapter 11 File System Backing-up and Restoring
This chapter describes how to backing up and restoring data in the GFS Shared File System.

Chapter 12 Tuning
This chapter describes how to use a variety of utilities to optimize and make effective use of the GFS Shared File System.

Chapter 13 Migration to the GFS Shared File System

This chapter describes how to migrate from existing file systems such as the UFS and GFS Local File Systems to GFS Shared File Systems.

Appendix A List of Messages

This appendix explains GFS Shared File System messages.

Appendix B Reference Manual

This appendix is intended for use as a reference manual for the GFS Shared File System.

Appendix C Troubleshooting

This appendix explains messages for which emergency action is required.

Appendix D The changes in Each Version

This appendix explains the changes made to the specifications of GFS Shared File Services.

Glossary

The glossary defines the terms related to the GFS Shared File System.

Related documentation

The documents listed in this section contain information relevant to GFS file system.   Before beginning to work with GFS file system, read the following document:

- – PRIMECLUSTER Concept Guide
- – PRIMECLUSTER Installation Guide for Solaris
- – PRIMECLUSTER Cluster Foundation Configuration and Administration Guide
- – PRIMECLUSTER RMS Configuration and Administration Guide
- – PRIMECLUSTER Web-Based Admin View Operation Guide
- – PRIMECLUSTER Global Disk Services Configuration and Administration Guide
- – PRIMECLUSTER Global Link Services Configuration and Administration Guide

Manual Printing

Use the PDF file supplied in a CD-ROM for each product to print this manual.

Adobe Acrobat Reader Version 4.0 or higher is required to read and print this PDF file.

Online Manuals

To reference the online manual, use the Cluster management server to register the user name in user group wvroot, clroot, cladmin, or clmon.

To enter a user group and meaning thereof, see "PRIMECLUSTER Web-Based Admin View Operation Guide".

Notational Conventions

Notation

This document adopts the following notational conventions.

Prompts

Command line examples that require system administrator (or root) rights to execute are preceded by the system administrator prompt, the hash sign (#).   Entries that do not require system administrator rights are preceded by a dollar sign ($).

Manual page section numbers

References to the UNIX operating system commands are followed by their manual page section numbers in parentheses __ for example, cp(1).

The keyboard

Keystrokes that represent nonprintable characters are displayed as key icons such as [Enter] or [F1]. For example, [Enter] means press the key labeled *Enter*; [Cntl]+[B] means hold down the key labeled *Cntl* or *Control* and then press the [B] key.

– Symbol

Material of particular interest is preceded by the following symbols in this manual:

– Describes the contents of an important point.

– Describes the points the users should pay close attention to.

– Provides useful information related to the topic.

– Provides manuals for users' reference.

Abbreviated name

– Microsoft(R) Windows NT(R) Server operating System Version4.0 and Microsoft(R) Windows NT(R) Server workstation System Version4.0 are abbreviated as Windows NT(R).
– Microsoft(R) Windows(R) 95 operating system is abbreviated as Windows(R) 95.
– Microsoft(R) Windows(R) 98 operating system and Microsoft(R) Windows(R) 98 Second Edition operating system are abbreviated as Windows(R) 98.
– Microsoft(R) Windows(R) 2000 operating system is abbreviated as Windows(R) 2000.
– Windows(R) 95, Windows(R) 98, Windows NT(R), Windows(R) 2000, and Windows(R) Me are abbreviated as Microsoft(R) Windows.

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Chapter 1 File System Functions

This chapter describes the functions and features of the GFS Shared File System.

1.1   File System Overview

2

    The GFS Shared File System is a shared file system that allows simultaneous access from multiple Linux systems to which a **shared disk device** is connected. (A file system of this type is referred to as a shared file system. A file system such as ext2/ext3 that will be used only within a **node** is referred to as a local file system.)

    The GFS Shared File System is an optimum shared file system for business uses that are API-compatible with ext2/ext3, and provides high reliability and high performance.

    The GFS Shared File System maintains consistency of **data** even with updating from multiple nodes, enabling data transfer by a distributed application with a conventional API when the application is executed on multiple nodes.

    Also, contiguous file operation on other nodes is assured even though one node fails, making the GFS Shared File System especially suitable for an environment that requires high availability of the file system.

The GFS Shared File System has the following functions:

- Simultaneous shared access from multiple nodes to files or file systems
- Maintaining consistency for referring and updating file data from multiple nodes
- File access using a file cache on each node
- Continuous file operation on other nodes if one node fails while maintaining file system consistency
- High-speed file system recovery function
- High-speed I/O processing by continuous block assignment to areas in a file
- GUI-based file system operation using a Web browser

Like the ext2/ext3 file system, the following application interface is commonly available:

- **64-bit file system interface**

See

    For the functions that are unavailable with the GFS Shared File System, see "1.7.2 Unavailable functions."

1.1.1 Basic hardware configuration for use of file system

The following basic configuration is required to build the GFS Shared File System:

- Shared disk device, which provides simultaneous access between **node**s sharing the file system
- One or more LANs for cluster interconnect
- Remote Service Board
- GUI display personal computer
- Public LAN

**Figure Basic hardware configuration**
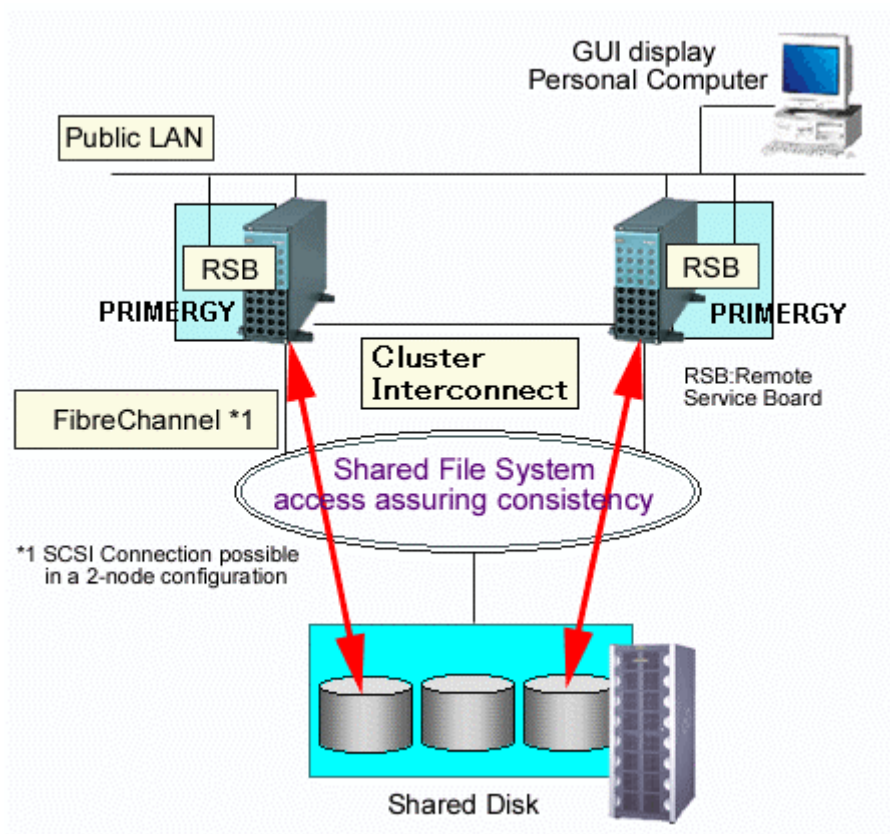
1.2 Simultaneous Shared Access Maintaining Coherency

The GFS Shared File System realizes simultaneous accessing and updating from multiple nodes to a file system on a shared disk device. The GFS shared File System maintains consistency in updating from multiple nodes to files or file systems.

In this way, applications on multiple nodes can modify data mutually and read the latest data. A conventional UNIX file system API makes such operations available.

Figure Distributed execution of file related application
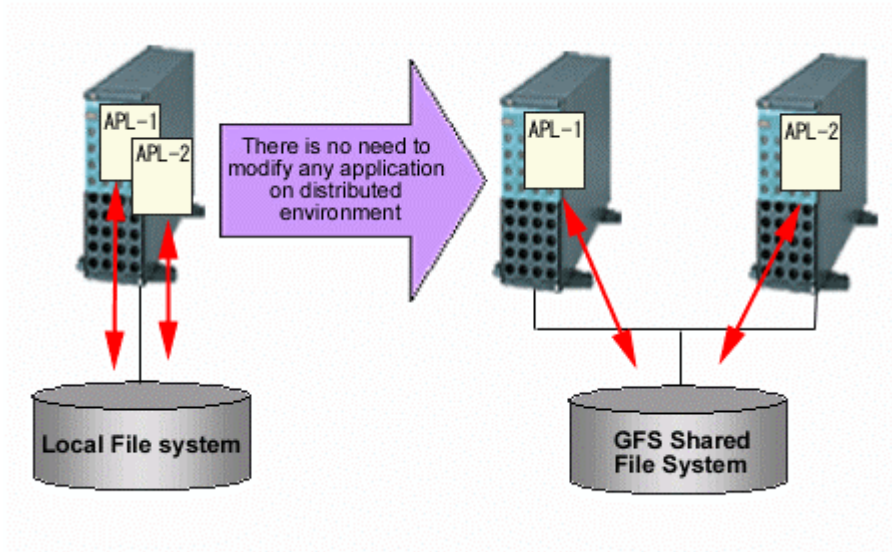
1.3 High Availability

The GFS Shared File System allows contiguous access to file systems if a node failure or disk block failure occurs.

1.3.1 Uninterrupted operation in case of node failure

If one **node** fails when the GFS Shared File System is being used from multiple nodes, file access from the other nodes can be continued. The file system data retained by the failing node is automatically recovered in consistency within the GFS Shared File System from the other nodes. In other words, the processing of the application programs operating on the other nodes can be continued without causing a file system operation error.

See

> For more information on the uninterrupted operation function, see "Chapter 3 Failure Recovery".

Figure Uninterrupted operation in case of node failure
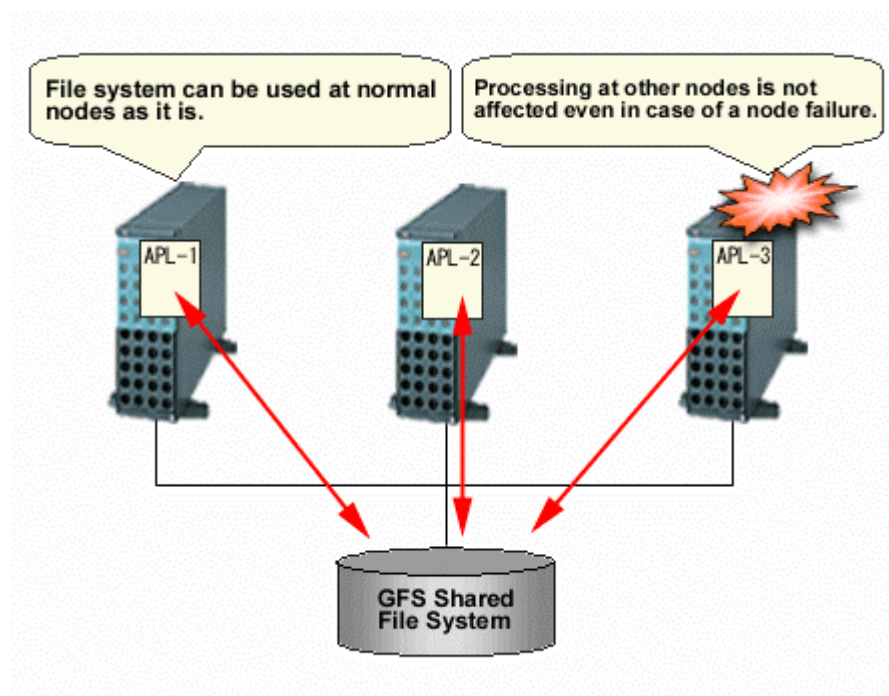
1.3.2 High-speed file system recovery

In case of a **node** failure, fsck (8) must be executed for an ordinary file system to recover consistency. In most file systems, it is necessary to inspect all of the **meta-data** for the systems in order to recover consistency. If a node failure occurs, considerable time may be required before the file system actually becomes available.

The GFS Shared File System records operations that have changed the file system structure in an area called updated log. These operations include file creation and deletion. Using the **data** in the **update log area** allows the file system to recover from a system failure in less than a minute.

When recovering from a system failure, the GFS Shared File System retrieves the **update log** in the recovery process. The file system then decides whether to invalidate or complete the file system operation that was done, and reflects the result. The file system structure can then be mounted and used without fully checking it.

As mentioned in the previous section, the GFS Shared File System operating on multiple **node**s does not require execution of sfcfsck(8) because consistency recovery processing is performed automatically in case of a node failure.

The sfcfsck(8) full check mode is also provided. To recover the file system from a hardware failure on the disk, execution of sfcfsck(8) in the full check mode may be required.

1.3.3 Area reassignment in case of disk block failure

The GFS Shared File System automatically assigns another disk block to a new **meta-data area** if a disk block hardware failure occurs.
Assignment allows continuous file system processing if a disk failure occurs only on a specific block.

This function only suppresses use of a block where an I/O error has occurred. If a request to use the same block is issued, however, an I/O error may occur again. In the case of an I/O error, the error must be corrected because the response time for that request increases. If block reassignment by such an I/O error occurs, back up the file system first. Then correct the hardware failure by replacing the failed disk with a new one, and restore the backed-up **data** to recover the file system.

1.4 Performance

The GFS Shared File System has the following functions for implementing file system access at high speed:

1.4.1 Data access performance

The GFS Shared File System allows access to the file system on the **shared disk device** from multiple **node**s. Conventional distributed file systems have transferred file system **data** from management servers to clients that have actually issued an access request via a LAN in the network. However, the GFS Shared File System accesses the disk directly from a request node, reducing network load and speeding up response time for a read or write request in comparison with NFS.

1.4.2 Contiguous block assignment

The GFS Shared File System assigns contiguous blocks to **file data** to take better advantage of batch I/O processing to improve the file system performance. The GFS Shared File System manages area on the **extent-base** for assigning contiguous blocks. For the range of blocks that can be acquired contiguously, the file system manages area assignment using a file offset, a start block number, and the number of blocks used.

The file system also takes into consideration the possibility of contiguous block assignment when extending the file.

Following picture shows a block assignment example that a file has three extents which locate 0, 64MB, 96MB file offset and 64MB, 32MB, 4MB extent length respectively.

Figure Contiguous block assignment
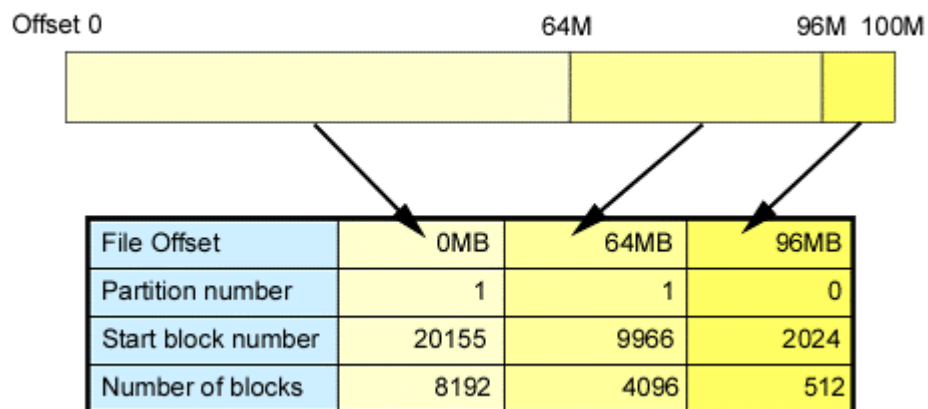
Empty file data areas are also managed in the extent base to implement high-speed assignment of optimum empty areas.

1.4.3 Individualized meta-cache management

The GFS Shared File System constructs its cache management of **meta-data** in an individualized manner. Many conventional file systems have managed meta-data in a uniform manner. However, the GFS Shared File System provides individualized management of **i-node**, directory block, and indirect block areas on disks, taking into consideration the characteristics of the access. As a result, it improves the cache-hit ratio and reducing resources used.

1.5 Extendability

1.5.1 Adding shared nodes

The GFS Shared File System has the capability of setting or adding up to 4 **node**s that can share the system.
If, at installation, two nodes had been set up to share a file system, it is possible to increase the number of shared nodes to three or four later.

Figure File system extension
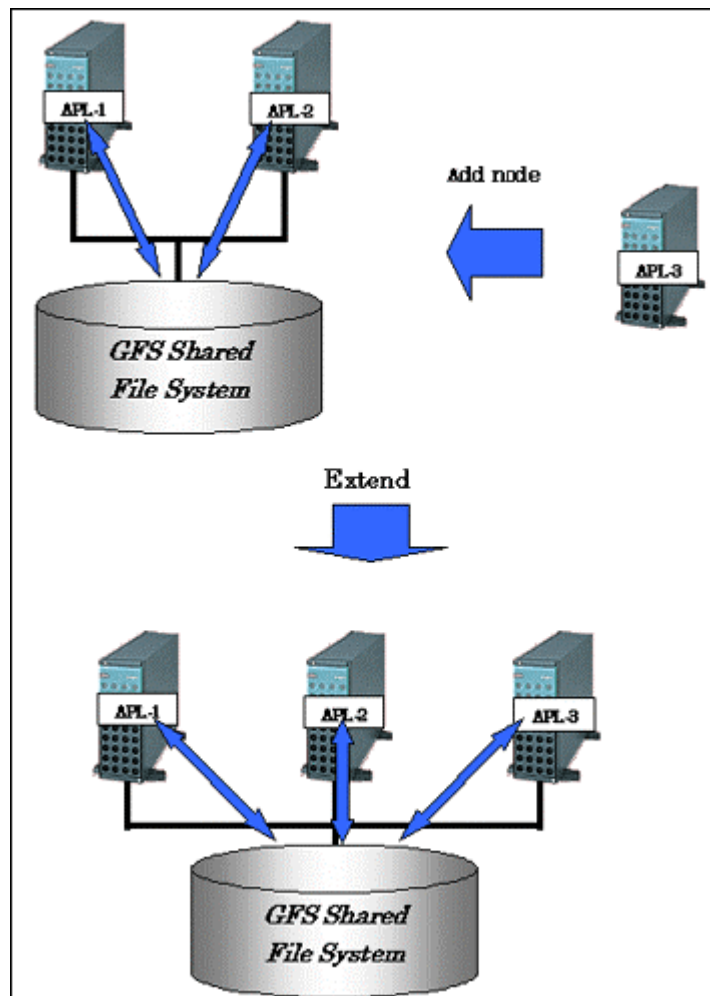
1.6 Operability

1.6.1 GUI

The GFS Shared File System uses a GUI that allows a Web browser to be used to create, delete, operate, and modify its data and monitor its status.

1.7   Upper Limits of the File System

The following table lists the upper limits of the GFS Shared File System on a file system basis:

Table Upper limits of file system

Item	Upper limit
Maximum file system capacity	Below 1 terabyte (1 terabyte per one partition)
Maximum file size	Below 1 terabyte
Maximum number of sharable nodes	2 nodes
Maximum directory size	Below 2 gigabytes
Maximum number of partitions consisting of a file system	1 partitions
Maximum number of i-nodes per file system	16 mega
Maximum number of directories per file system	1 mega

The maximum number of GFS Shared File Systems in a cluster system is 10.

Note

We recommend to lessen the number of the GFS Shared File Systems simultaneously used in one cluster system as much as possible. When you use many GFS Shared File Systems, please carry a sufficient number for a node of CPUs, and carry out system verification in advance.

1.8   Notes

Below are notes on using the GFS Shared File System.

1.8.1   Relationships with Other Components of PRIMECLUSTER

CIP must have been set up, as it is used for the file system monitoring facility (FsRM) of the GFS Shared File System.

See

For details, see the "*PRIMECLUSTER Cluster Foundation Configuration and Administration Guide*."

The **GDS** is used for the GFS Shared File System.

See

For details, see the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide.*"

1.8.2   Unavailable functions

The GFS Shared File System dose not provide the following functions:
- Use as a root file system, /usr, /var, /opt
- File lock
- Setting of hard link for a directory
- open(2) from another node to a file mapped by mmap(2)
- mmap(2) from another node to a writeable file opened by open(2)
- open(2) from another node to a mmap(2) file for which MAP_SHARED and PROT_WRITE are specified
- mmap(2) which specifies MAP_SHARED and PROT_WRITE from another node to a writable open(2) file
- Assurance of data consistency when open(2) is executed for mmap(2) files from other nodes
- Assurance of data consistency when mmap(2) is executed for open(2) files from other nodes
- The strict file terminal management in the case of write(2) for open(2) file for which specified **O_APPEND** compete with write(2) from other nodes
- File sharing with other nodes by an NFS
- Use of IPv6
- quota function
- Assuring consistency of file data, which is written by write(2) (The I/O size is specified over 8KB), when the file is modified by the following operation.
  write(2), writev(2), pwrite(2), truncate(2), ftruncate(2), creat(2), open(2) (with O_TRUNC)
- Creation of block or character device files
- Access of block or character device files
- File access from another node to an input file of sendfile(2) or sendfile64(2)
- To use as a mount point
- Asynchronous I/O function
- Direct I/O function
- ACL function

1.8.3   Service ports used by the GFS Shared File System

The GFS Shared File System reserves TCP service ports 9200 to 9300.
If these port numbers conflict with those for other applications, change the entry port number beginning with sfcfs- in the /etc/services file.

1.8.4   Notes on use of logical volumes of GDS

GDS is volume management software designed to improve the availability and operation manageability of information stored on disk units of the Storage Area Network (SAN). Various kinds of access controls can be performed on the logical volumes of GDS to protect data against damage due to unauthorized access.
To use a logical volume of GDS in the GFS Shared File System, make the following settings:
- The type of disk class to which the logical volume belongs is shared.
- All nodes sharing the GFS Shared File System are specified in the scope of the disk cluster to which the logical volume belongs.
- When the attribute lock mode of the logical volume is lock=off, the volume is started automatically.
- The attribute access mode of the logical volume is set as read-write.

When logical volumes of GDS are stopped, access is totally prohibited. Thus, commands of the GFS Shared File System can be used only when logical volumes of GDS are active.

Note

Set the stripe width of 256 blocks or more when the disk stripe of GDS is being used as GFS Shared File System.
Do not expand the volume of GDS including in the GFS Shared File System. When volume expansion is performed, using the file system becomes impossible because the volume size changes and reading the copy of super block and partition configuration data on GFS Shared File System becomes impossible.

See

For the operations of disk classes to which logical volumes of GDS belong, refer to the description of class operations under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*".
For the operations of logical volumes of GDS, refer to the description of volume operations under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*".

1.8.5   Unmounting a GFS Shared File System

You must use sfcumount(8) to unmount a GFS Shared File System.

If a file system is unmounted by umount(8), mounting and unmounting the file system becomes no longer available. Restoration of such a file system can be performed in the manner described in "Appendix C.4 Action to Be Taken When Unmounted by umount(8)".

1.8.6　　　Notes of updatedb(1L)

Function to retrieve the location of the file at high speed is provided in Linux as locate(1L). To update the file name data base used for it, updatedb(1L) is regularly executed. Updatedb(1L) retrieves the file on each file system, and updates the file name data base.

The file access performance might become remarkably slow while updatedb(1L) is being executed at GFS Shared File System. To evade it, it is recommended to set up not to register the files on GFS Shared File System to the file name data base.

The file on the GFS Shared File System can not be retrieved by locate(1L) when setting up it.

So as not to register the files on the GFS Shared File System to the file name data base, add "sfcfs" to PRUNEFS parameter (specifies the file system excluded from the retrieval object by updatedb(1L)) defined in /etc/updatedb.conf. It must be set up on all nodes which share the GFS Shared File System. The following shows an example of setting.

```
----------------------------------------------------------------
# cat /etc/updatedb.conf
PRUNEFS="devpts NFS nfs afs proc smbfs autofs auto iso9660 sfcfs"
PRUNEPATHS="/tmp /usr/tmp /var/tmp /afs /net"
export PRUNEFS
export PRUNEPATHS
----------------------------------------------------------------
```

Unavoidably, when the files on the GFS Shared File System is registered to the file name data base, deterioration in the file access performance can be reduced while updatedb(1L) operates by setting as follows.

- ▪ Set the execution time of updatedb(1L) to when GFS Shared File System is accessed fewer according to the user operation.
- ▪ Adjust the execution time of updatedb(1L) to avoid executing updatedb(1L) simultaneously by the nodes which shared GFS Shared File System.

Usually, updatedb(1L) is executed by the file that exists on the /etc/cron.daily directory. So the execution time of updatedb(1L) can be changed by changing the execution time of /etc/cron.daily that is specified in /etc/crontab.

For details of the contents of /etc/crontab, see crontab(5).

1.8.7 Open processing from other nodes to a file mapped by mmap(2)

Do not perform the following operation in GFS Shared File System.

- open(2) and creat(2) from other nodes to a file mapped by mmap(2)

If open(2) and creat(2) is executed from other nodes to a file mapped by mmap(2), the system call will fail to assure the data consistency.

- open(2) and creat(2) from other nodes to a mmap(2) file for which PROT_WRITE and MAP_SHARED are specified.
- open(2) and creat(2) with the write mode from other nodes to a mmap(2) file for which PROT_READ and MAP_SHARED are specified.

If creat(2) and open(2) with O_TRUNC is executed in the above-mentioned operation, the system call will fail and the target file will be truncated to length zero.

1.8.8 Changing the system time while a GFS Shared File System is working

Do not perform the following operation while a GFS Shared File System is working.

- Change the system time by the date command etc.

If the system time is changed by the date command, the file system will be blockaded. The monitoring mechanism on a GFS Shared File System might not be operated normally due to a sudden change of the system time.
To resume the system operation, mount again after unmounting the file system.

1.8.9 Creating a regular file by mknod(2)

Do not perform the following operation in a GFS Shared File System.

- Create a regular file by mknod(2)

If a regular file is created by mknod(2), the file open information cannot be managed normally. As a result, mmap(2) from other nodes to the file will fail, or the unused inode of the file will not be released when the file is deleted.
If the operation mentioned above is executed, mount again after unmounting the file system. It will resume the system operation.

1.8.10   Stopping the GFS Shared File System

Be sure to unmount all the GFS Shared File System in a node, before stopping the operation of a GFS Shared File System using the following command.

```
------------------------------------------------------------------
 # /etc/init.d/sfcfsrm stop
------------------------------------------------------------------
```

When the command mentioned above is executed with GFS Shared File System mounted, the mount information of GFS Shared File System remains, so mounting or unmounting the file system becomes impossible.   In this case, reboot the node to restarting the operation of GFS Shared File System.

Chapter 2   File System Structure

This chapter describes the structure of the GFS Shared File System.

2.1   Disk Structure of File System

This section describes the disk structure of the GFS Shared File System.
As illustrated below, the disk structure of the GFS Shared File System consists of the following elements:

- **super block**
- **partition configuration data**
- **meta-data area** (**area management data**, **i-node area**, **V-data area**)
- **update log area**
- **file data area**

Figure Disk structure of the GFS Shared File System
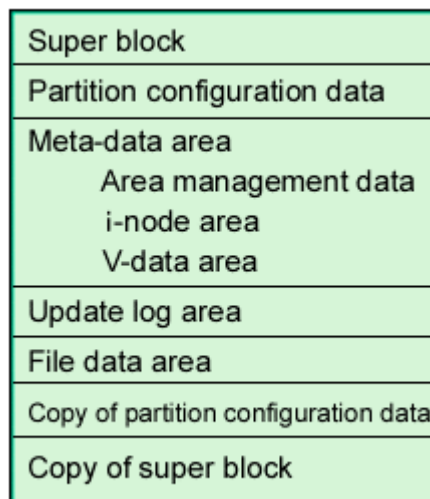
The GFS Shared File System manages the V-data area in units of 1,024 bytes and the file data area in unit of 8,192 bytes.

Conventional file systems have decentralized meta-data areas on their disks. However, the GFS Shared File System centralizes **meta-data** to improve meta-data access performance. Besides, localizing updated portions upon recovery of the file system allows the update log area to shorten the recovery time.

2.1.1   Super block

Super block contains a file system type, creation and update dates, label data, size and layout of the file system, and a data history of empty areas.
The **super block copy** at the end of the file system exists to allow contiguous processing if a disk device block failure occurs in the area where the super block is stored.

2.1.2　　　　Partition configuration data

The GFS Shared File System retains information about its configured partitions and the allocation of space in the partitions.

Similar to the super block, the partition configuration data is important for operation of the file system and is designed to have a partition copy at its end and to be resistant to disk device block failures.

2.1.3　　　　Meta-data area

The meta-data area is an area for storing meta-data, which exists only in a **representative partition**.

2.1.3.1　　　　Area management data

Area management data includes the allocation information of **i-node**, **V-data** and **file data**.

File data allocation information is managed in **extent-base** while combining a part to include extent information with a list managed with a degree of continuity.

A stable amount of i-node, V-data and area management information is assured upon "B.1.3 sfcmkfs(8)."

2.1.3.2　　　　i-node area

The i-node area is a data structure containing file data. Each i-node stores pointers to the extent attribute, which includes a file type, a file length, file owner and group IDs, access permissions, and file data. There is one i-node for each file.

2.1.3.3　　　　V-data area

The V-data area includes a directory block, a symbolic link path name, and an indirect block . An area is obtained from this area if necessary. The V-data area is managed in units of 1,024 bytes for efficient use of directory blocks.

2.1.4　　Update log area

The **update log area** stores a history of file system structure changes for high-speed file system recovery. This area is maintained as a cyclic log.
The update log area contains data about the following processes:

- Acquiring or releasing an **i-node**
- Updating i-node data
- Allocating or releasing an extent, which is a group of contiguous file system data blocks handled as a single unit
- Acquiring or releasing **V-data**
- Updating V data

The GFS Shared File System assures that data is written in the **V-data area** before the file system structure is updated. If a system failure occurs, file system consistency is restored by using "B.1.2 sfcfsck(8)" to either invalidate or re-execute unprocessed changes on the file system. Also, system failure recovery processing is conducted. Only changes to the file system structure are recorded in the update logs; file-data is not recorded.

2.1.5　　File data area

The file data area is an area for storing file data. In these areas, 8192 bytes areas defined as the minimum block, and blocks are managed for contiguous allocation in a file area.

2.1.6　　Partition configuration

The GFS Shared File System allocates one partition to one file system. This is referred to as a single partition configuration.
In a single partition configuration, an a meta-data area, update log area, and a file data area are allocated to one partition.

Figure Single partition configuration
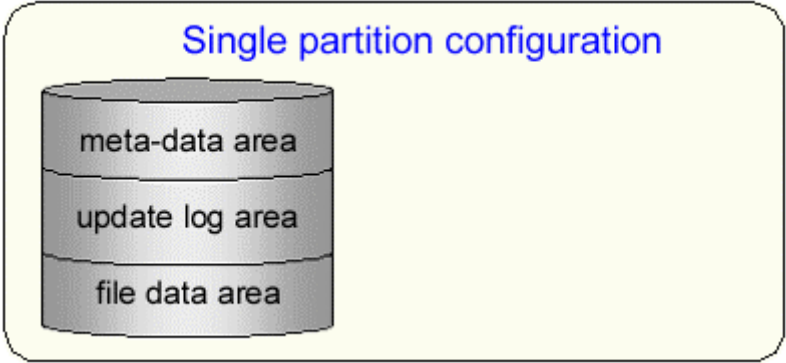
2.2   Component configuration

The component configuration of the GFS Shared File System is illustrated below.
The GFS Shared File System consists mainly of three components:

1. **MDS** (Meta-data server)
   The file system server function component (sfcfsmg) of the GFS Shared File System

2. **AC** (Access client)
   The file system client function component (kernel component AC) of the GFS Shared File System

3. Monitoring daemon
   sfcfrmd, sfcprmd, sfcfsd, sfchnsd, sfcpncd

Figure Component composition
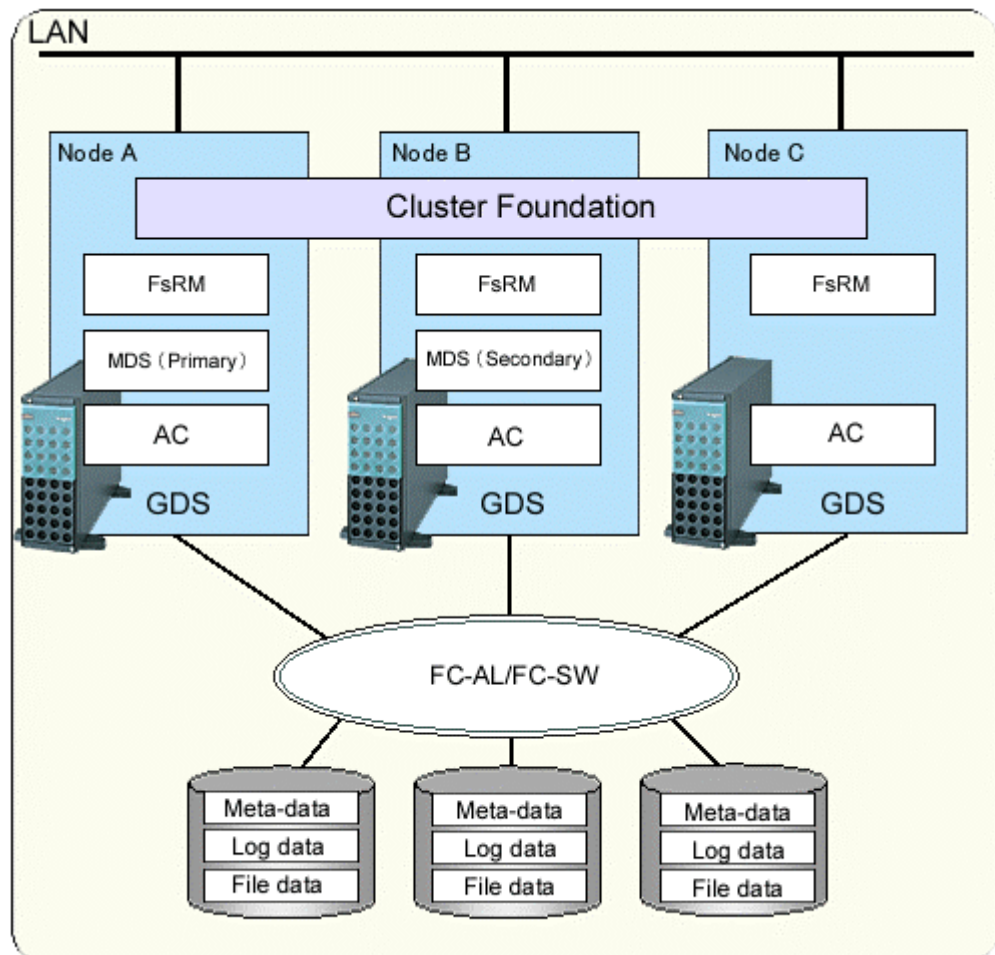
Each component is detailed in the following sections:

2.2.1　　　MDS(Meta-data Server)

The MDS is a server daemon that manages the meta-data of the GFS Shared File System and operates as a user process. Each file system has two processes: primary MDS and secondary MDS. Two or more nodes of those that constitute a file system are predefined as **MDS node**s and MDS operates on one of these nodes. If not set specifically, the MDS nodes are only the two nodes of the primary and secondary MDS node.

The secondary MDS is used for standby and runs on a different node from the primary MDS.

The MDS uses multithreading in order to execute processing requests from **AC** in parallel.

The MDS has the following major functions:

- Token management
- Meta-data area management
- Update log area management
- File data area management
- File system free area management
- AC node management

2.2.2　　　AC(Access Client)

This client processes requests from an application that accesses the GFS Shared File System. It operates within the kernel. Access clients exist on all the nodes of the scalable class where the GFS Shared File System is mounted. The AC allows cache management of meta-data and file data within the client.

2.2.3 Monitoring daemon

- **sfcfrmd**

  Receives a request from the sfcfsd command and provides the communication paths to enable execution of the sfcfsd and sfcprmd commands and inter-node communications. Configuration database management and the management partition I/O functions are also provided.

- **sfcprmd**

  Used to monitor the startup, stop, or failure of the processes that constitute the GFS Shared File System. When the configuration process starts or executes another daemon or command, a request is transmitted to sfcprmd, and then sfcprmd executes a daemon or a command as required.

  The process from which a request is transmitted is referred to as the client process, while the process to be started from sfcprmd as required is referred to as the target process.

  The target process is monitored by sfcprmd and, when the process terminates normally or abnormally, the status is posted to the client process.

- **sfcfsd**

  Provides MDS/AC control functions such as the GFS Shared File System operation start/stop, failover of MDS, online node addition/deletion, and failback (migration) to the definition state of the file system configuration.

- sfchnsd

  Used to provide functions such as node down event reception, and node state acquisition.

- sfcpncd

  Performs live monitoring of sfcprmd, sfcfrmd, or sfcclnd that is to be monitored. Used to instigate a panic in a node depending on the state (process down) of the process to be monitored.

2.3   File Access and Token Management

Each **AC** caches file data to improve file system performance. Since it is necessary to manage discard operation of cache to ensure consistency in each file system, the GFS Shared File System uses file-exclusive tokens (referred to hereafter as tokens) for management.

A token guarantees that the AC can access files. The token contains information that indicates how it accesses a particular file. An AC must have a token of a file when the AC accesses the file. Two types of tokens are provided: one that ensures **meta-data** access and another that ensures **file data** access.

- Meta-data access and token management

  The meta-data token required to access i-node and V-data.

- File data access and token management

  Tokens are used to access file data in ordinary files. The two types of available tokens (write authority and read authority) are managed in units of logical blocks. Such operations as simultaneously reading from the same block and simultaneously reading from/writing to different blocks in the same file can be performed simultaneously by multiple shared nodes without degrading performance.

  The file data token is required to access ordinary files.

Chapter 3 Failure Recovery

This chapter describes the following failure recovery functions of the GFS Shared File System:

- **MDS** failure recovery
- **AC** degeneration

3.1   MDS Failure Recovery

If an **MDS** fails, the GFS Shared File System automatically performs failure recovery to continue operation of the file system.
The following provides an overview of the operations performed if either the primary MDS or secondary MDS fails.

3.1.1   Automatic recovery for primary MDS failures

There is one case in which the standby secondary **MDS** becomes the primary MDS to continue operation. This case occurs if both the primary and secondary MDSs are set up as operable and the primary MDS process fails. In this case, the following process is performed:

1) Switching the secondary MDS to the primary MDS

The secondary MDS operates as the primary MDS in place of the primary MDS that has failed.
In a file system in which three or more MDS nodes are set, if the secondary MDS does not work as the primary MDS after the specified time, a primary MDS can be activated from another MDS node to continue operations.
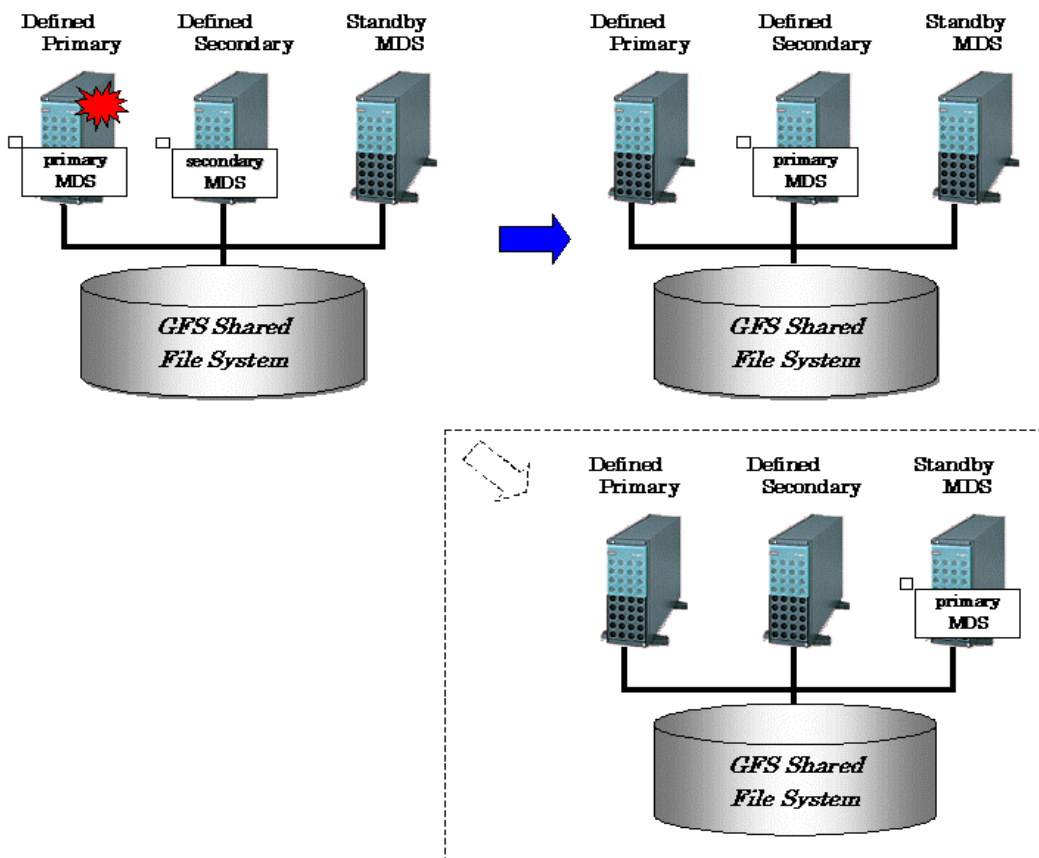
2) Replaying the update log

The new primary MDS replays the update log to ensure consistency of the file system.

3) Resuming processing after MDS switching

The AC sends a processing request to the new primary MDS. Until that request is accepted, all access to the file system is blocked.

4) Restarting the failed MDS

Usually, the MDS is restarted as the secondary MDS.
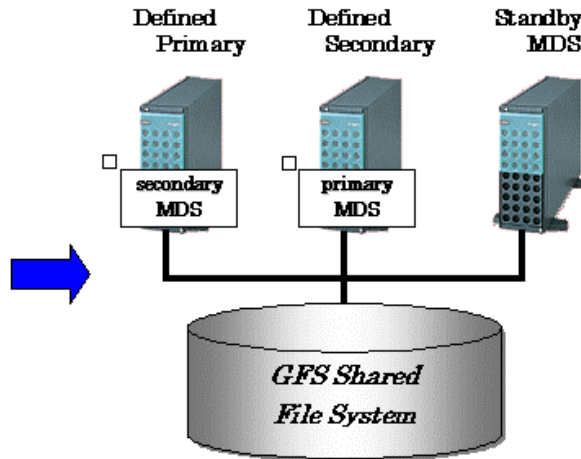
In a file system in which three or more MDS nodes are set, if the secondary MDS does not work after the specified time, a secondary MDS can be activated from another MDS node to continue operations.
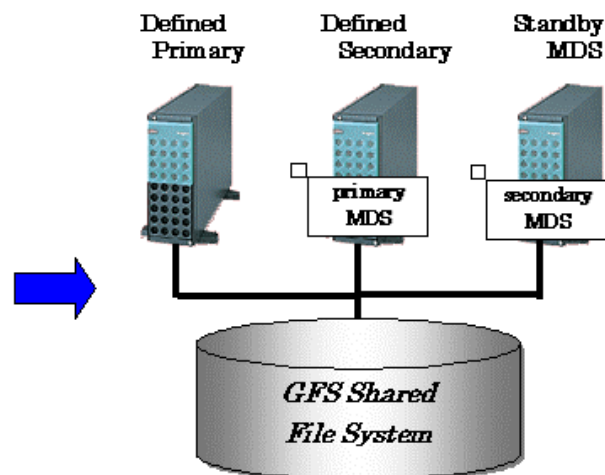
3.1.2　　Automatic recovery for secondary MDS failures

If the secondary **MDS** process fails, operation is not affected. The secondary MDS is automatically started again as the secondary MDS in preparation for a failure of the primary MDS process. In this case, the following process is performed:

1) Restarting the failed MDS

The MDS is restarted as a secondary MDS.
In a file system in which three or more **MDS node** are set, if the secondary MDS does not work after the specified time, a secondary MDS can be activated from another MDS node to continue operations.

2) Making the restarted secondary MDS effective

The AC performs the processing necessary for recognizing the restarted secondary MDS.

3.1.3　Automatic recovery in case primary MDS goes down during primary MDS operation only

If the primary **MDS** goes down in a state in which the MDS nodes are degraded only during primary MDS operation, the following processing is performed automatically.

1) Restarting the failed MDS

The MDS is started as the primary MDS again.

2) Replaying the update log

The new primary MDS replays the **update log** to ensure the consistency of the file system.

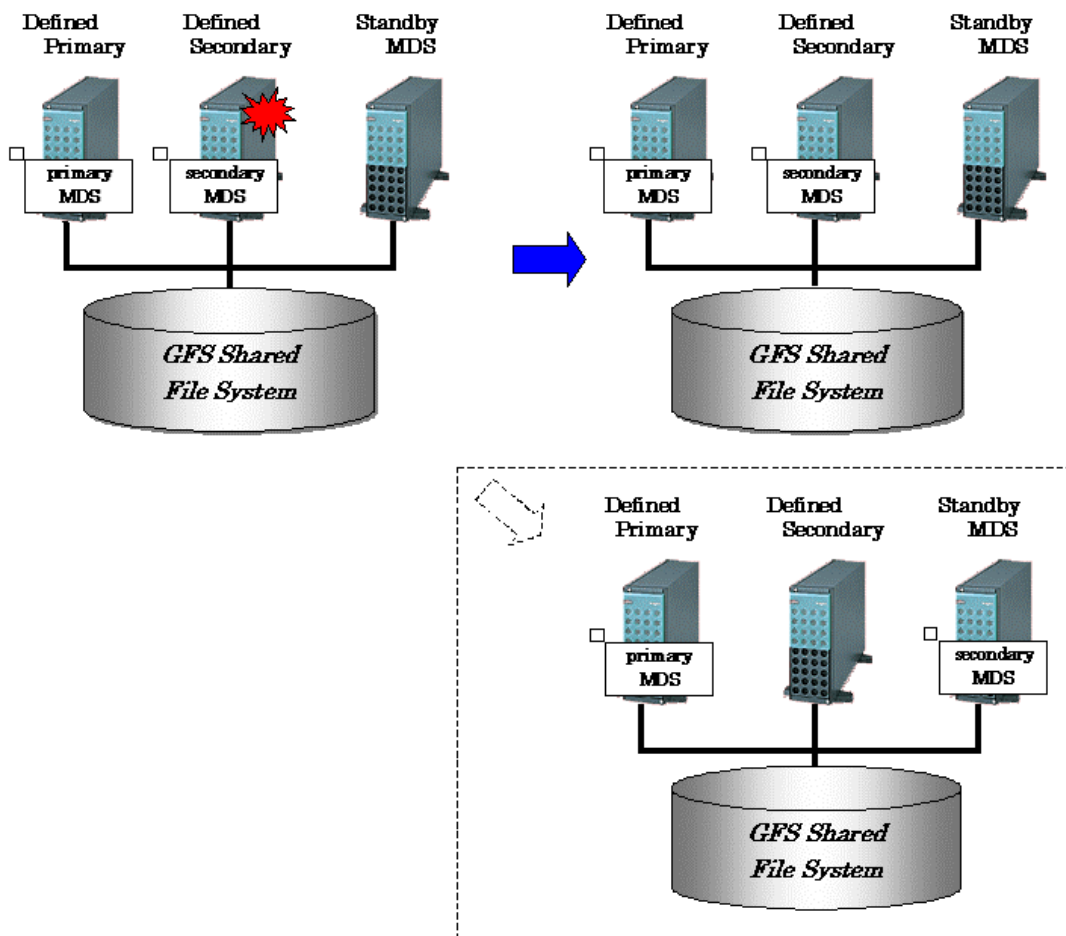**3) Resuming processing after MDS switching**

The AC makes a processing request to the new primary MDS.

3.1.4　Automatic recovery by standby MDS node

MDS normally operates on the predefined primary MDS node and secondary **MDS node**. By setting a standby MDS node (i.e., MDS node other than primary or secondary MDS node), however, the number of nodes on which MDS can operate can be increased.

If the primary MDS node or secondary MDS node, or both are not activated after the specified time, the standby MDS node activates MDS instead of the primary MDS node or secondary MDS node.

MDS operation is required for accessing a file system and increasing the number of MDS nodes is advantageous to ensure continued file system operation.

See

For details of the MDS node settings, see "Node layout" in this manual.

3.2 AC degeneration

If the GFS Shared File System is mounted, MDS will hold the information on the AC. When the node to which AC operates is downed, MDS cancels the information on the AC automatically, and continuation of management of the file system in a normal node is performed automatically.

Chapter 4 File System Design

This chapter describes the main features of the operational design of the GFS Shared File System.

4.1 Mount and unmount opportunity of the file system at the time of system starting and ending

In the GFS Shared File System, a setup for mounting and unmounting automatically at the time of system starting and exiting differs from ext2/ext3 settings.

The mount options field of /etc/fstab must contain noauto in the GFS Shared File System.

A setup of the automatic mount at system startup is specified by describing or omitting noatrc in the mount options field of /etc/fstab.

When noatrc is not described in the mount options field of /etc/fstab, the automatic mountiing is performed on startup. The mounting takes places at the moment of running S76sfcfsrm start, the startup script in run levels 2,3 and 5.

When noatrc is set in the mount options field of /etc/fstab, the automatic mounting is not performed on system startup.

The GFS Shared File System is automatically unmounted at the system shutdown. The unmounting takes places at the moment of running the shutdown script K36sfcfs stop.

Note

It is necessary to set up the **GDS** volume that arranges a management partition and the partition of the GFS Shared File System that performs automatic mount so that it may be automatically activated at the time of system starting.

See

For more information about GDS, see "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*."

4.2   System Design

This section describes the following items that must be considered in creating or using the GFS Shared File System:

- ▪ Effects of file system operation and system load
- ▪ Node layout
- ▪ LAN selection

4.2.1   Effects of file system operation and system load

To maintain strict file system consistency, the GFS Shared File System processing sometimes significantly slows down during the following operations:

- ▪ When frequently creating or deleting files and directories in the same directory from multiple nodes, and repeatedly monitoring the modification of such a directory with readdir(2), stat(2), and so on.
- ▪ When frequently updating the same block in the same file from multiple nodes.
- ▪ When frequently referencing from other nodes a file that is frequently updated from one or more nodes.
- ▪ When ls(1) with the -**l** option or such a command as cp(1), du(1) and tar(1) requiring the attributes of files under the directory is executed when one directory contains 10,000 or more files.

In the above cases, file system throughput may improve by changing the monitoring or access frequency or by dividing a target file.

CPU and I/O loads may be concentrated on the node where the **MDS** managing the file system **meta-data**. This can happen when such operations as file creation, deletion, and extension that cause the modification of the file system meta-data are frequently done. In such a case, file system throughput may be improved by increasing CPU throughput of the node where the MDS operates.

4.2.2   Node layout

In the GFS Shared File System, up to four nodes can share one file system simultaneously. Therefore, file system processing can continue even if the node (on which MDS manages file system meta-data) fails. For such operation, you must select two or more nodes on which MDS can operate and set these nodes as **MDS node**s. From the MDS nodes, select the primary MDS node (on which the primary MDS usually operates), the secondary MDS node (on which the secondary MDS usually operates), and all nodes as **standby MDS node**s (backup MDS nodes if primary and secondary MDS nodes are unavailable).

See

For details on the effects of MDS node settings, see "3.1 MDS Failure Recovery."

As previously described in "4.2.1 Effects of file system operation and system load," the following should be taken into consideration:

- CPU and I/O loads accompanying updating of the meta-data of the file system that occur on the node where MDS operates
- CPU throughput, I/O throughput, memory capacity, and swap area

To activate a node that accesses the GFS Shared File System, the node must have been set as an MDS node, or the primary MDS node, secondary MDS node, or standby MDS node (or all together) must be activated simultaneously or activated in advance. To stop all nodes set as MDS nodes, all nodes that access the relevant file system must have been stopped.

By setting all nodes that share a file system as MDS nodes (i.e., primary **MDS node**, secondary MDS node or **standby MDS node**), each node can be activated or stopped regardless of the state of the other nodes.

If both the primary and secondary MDS nodes are stopped during operation, the file system can still be used because standby MDS nodes will be activated as the primary MDS and secondary MDS nodes.

When activating the primary or secondary MDS on a standby MDS node, activation of the primary MDS or secondary MDS may take some time.

4.2.3 LAN selection

In the GFS Shared File System, the **MDS** communications needed to obtain **meta-data** and to maintain consistency are processed through the LAN.

The communication path is specified by a host name. The **GDS** LAN can be used as a communication path.

Set up the LAN path while keeping the following in mind.
- LAN traffic volume and LAN load
- Redundant Configuration Definition for a LAN fault

The GFS Shared File System has been designed in order not to increase the LAN load. But, the load intensity can be high under certain operation conditions. When a higher load is imposed on the LAN due to another processing, the more response time may be consumed in accessing the GFS Shared File System. The LAN load status can be checked with netstat(8).

The use of the following is recommended when the load on a file system is large or when the response time is more important than other factors.
- High-speed LAN
- Private LAN

The GFS Shared File System blocks the file system on a relevant node if communication between the MDS and the node's AC. This is done because AC determines file system processing cannot be continued. Establishing a multiplex communication path by integrating several LAN paths into one logical path using GLS is recommended in order to avoid problems in the communication paths.

4.3 Backup Design

Backing-up and restoring of the GFS Shared File System for each file system are performed with the following methods:

- Backing-up and restoring by file system with dd(1)
- Backing-up and restoring by file with tar(1) or cpio(1)

See

For more information about restoring backups in the GFS Shared File System, see "Chapter 11 File System Backing-up and Restoring."

Chapter 5　Management Partition

This chapter explains the management partition.

5.1   Management Partition

The management partition is used to administer the information that is necessary to the operation of the GFS Shared File System. The management partition is also used for the file system monitoring mechanism to maintain the consistency of information. The management partition contains the following information:

1. Information of each node constituting the GFS Shared File System.
2. Information linking to a shared node and a shared device in each GFS Shared File System
3. MDS allocation information for each GFS Shared File System

The node information of 1 must be set up using sfcsetup(8). The information of 2 and 3 can be set up and modified with sfcmkfs(8) and sfcadm(8). The sfcgetconf(8) command is available for backing-up the information within the management partition.

Figure Configuration of the connection between nodes and the management partition
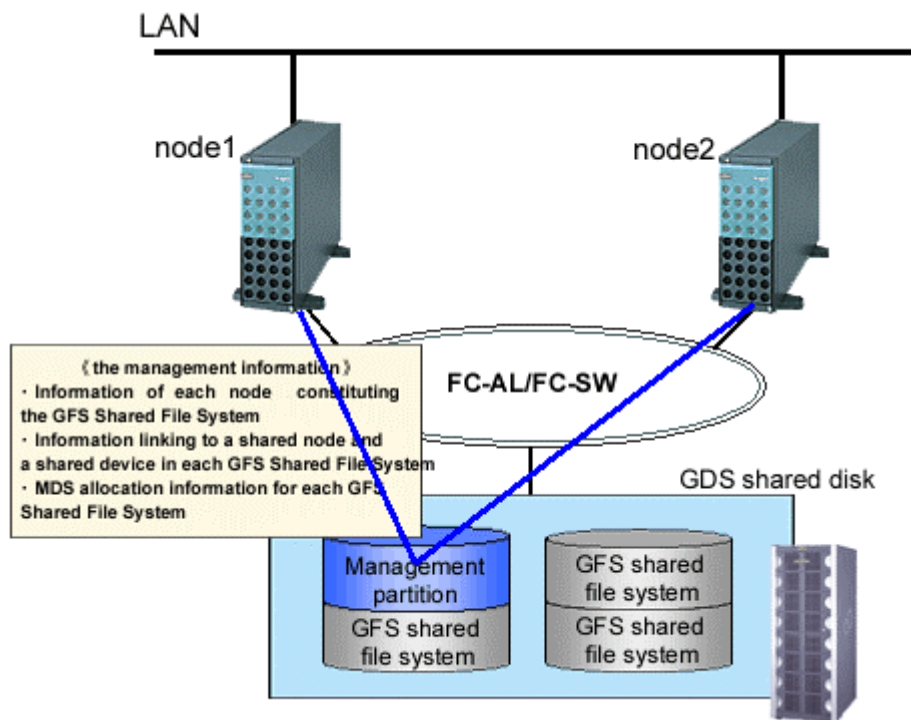
5.2 Resources Required for the Management Partition

The GFS Shared File System requires, in addition to the volumes that constitute the file system, one **GDS** Shared volume that is exclusively for the management partition for each cluster system. Even when using two or more file systems, the number of required management partitions is one.
Specify a volume size of at least 40 megabytes for the management partition.

See

For details on how to set up the GDS Shared disk system, see the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*."

Note

A setup of the volume, which creates the management partition should set to "shared" the type of a disk class with which volume belongs. Also, all the nodes that share the GFS Shared File System must be specified as the **scope** of the disk class to which the volume belongs. Moreover, the settings must be such that the volume is automatically activated when the node is started.

5.3   Notes on Management

If a failure occurs in the management partition, the GFS Shared File System within a cluster system stops. To overcome this, it is recommended to mirror the volumes within the management partition.

Also, prior to changing the configuration of the file system, make a backup of the management partition information with sfcgetconf(8).

5.4 Configuring the Management Partition and Starting the File System Monitoring Mechanism

The following sections explain the initialization of the management partition, addition/deletion of node information, and start/stop of the management partition.

Figure Setting up the management partition to start the file system monitoring mechanism
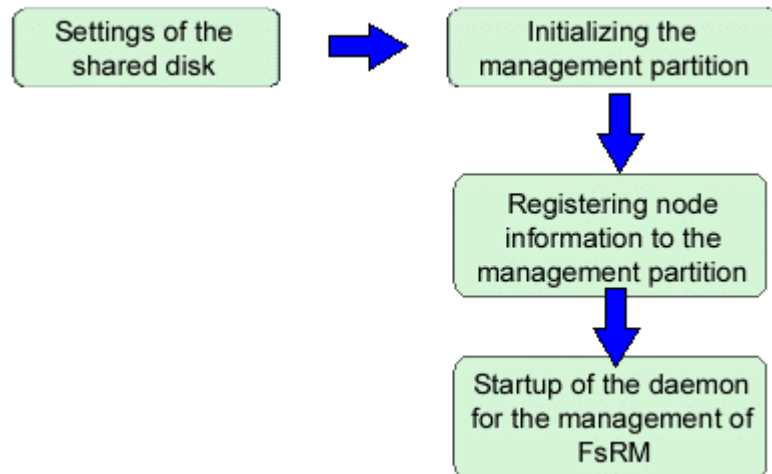
1. Initializing the management partition

Use the sfcsetup(8) to initialize the management partition.

The initialization of the management partition is explained below.

See

For details on sfcsetup(8), see B.2.9 sfcsetup(8) in this manual.

Note

To initialize the management partition, the file system monitoring mechanism must have already been stopped on the cluster system.

Specify a volume of the shared class created with GDS as the management partition. Note that a volume of at least 40 MB is necessary.

```
# sfcsetup -c /dev/sfdsk/gfs/rdsk/control
```

When a partition that is already initialized as the management partition is to be initialized again, execute the command with the **-f** option specified, as shown below:

```
# sfcsetup -c -f /dev/sfdsk/gfs/rdsk/control
```

2. Registering node information

When registering node information to the management partition, use sfcsetup(8).
An example of registering node information in the management information is explained below.

Note

Register the node information on all the nodes on which the file system monitoring mechanism is to be executed.

- Registering a node in the management partition

```
# sfcsetup -a /dev/sfdsk/gfs/rdsk/control
```

- The path name of the management partition that has been set up can be confirmed by executing the sfcsetup(8) command with the **-p** option specified.

```
# sfcsetup -p
/dev/sfdsk/gfs/rdsk/control
```

- Registered node information can be confirmed by executing sfcsetup(8) with no option specified.

```
# sfcsetup
HOSTID       CIPNAME       MP_PATH
80000000     sunnyRMS      yes
80000001     moonyRMS      yes
```

3. Node deletion

Use the sfcsetup(8) command, when delete node information from the management partition.
The procedure for deleting node information from the management partition is explained below.

Note

On the node that is to be deleted, the operation of the file system monitoring mechanism must have been stopped. Or, the operation of the file system monitoring mechanism for the entire cluster system must have been stopped.

On the node that is to be deleted, execute the command as shown below:

```
# sfcsetup -d
```

4. Starting the file system monitoring mechanism

Use the sfcfrmstart(8) command to start the file system monitoring mechanism.

See

For details on sfcfrmstart(8), see B.2.2 sfcfrmstart(8) in this manual.

Note

To start the file system monitoring mechanism, node information must have been registered in the management partition.

Execute a command as follows on the node that wants to start operation of the file system monitoring mechanism.

```
# sfcfrmstart
```

5. Stopping the file system monitoring mechanism

Use sfcfrmstop(8) to stop the file system monitoring mechanism.

See

For details on sfcfrmstop(8), see B.2.3 sfcfrmstop(8) in this manual.

Execute the command on the node on which the file system monitoring mechanism is to be stopped, as shown below:

```
# sfcfrmstop
```

5.5 Backup and restore of the management partition information

The following sections explain backup and restore of management partition.

1. Backup of management partition information

Use sfcgetconf(8) command to make a backup of the management partition information.

```
# sfcgetconf _backup_file_
```

See

For details on sfcgetconf(8), see B.2.4 sfcgetconf(8) in this manual.

Note

Make a backup of the management partition information when changing the configuration of the file system with such commands as sfcmkfs(8), sfcadm(8), and sfcnode(8).

sfcgetconf(8) generate a shell script named _backup_file_:

```
# cat _backup_file_
#!/bin/sh
# This file is made by:
#     sfcgetconf _backup_file_
# Tue Jun 18 09:08:06 2002

#---- fsid : 1 ----
# MDS primary    (port) : host1 (sfcfs-1)
# MDS secondary (port) : host2 (sfcfs-1)
# MDS other              :
# AC         : host1,host2
# options :
# device   : /dev/sfdsk/c1/dsk/v1
sfcadm -m host1,host2 -g host1,hostw -p sfcfs-1,sfcfs-1 /dev/sfdsk/c1/dsk/v1
...
```

Note

To make a backup of management partition information by sfcgetconf(8), the file system monitoring mechanism needs to run on the cluster. If file system monitoring mechanism has not run, please start by sfcfrmstart(8).

2. Setting up the new management partition and starting the file system monitoring mechanism

If a management partition is broken, then set up a new management partition on GDS volume and start the file system monitoring mechanism.

See

For the details of management partition setting and the file system monitoring mechanism starting, refer to "5.4 Configuring the Management Partition and Starting the File System Monitoring Mechanism ".

3. Restoration of management partition information

Shell script generated by sfcgetconf(8) in the procedure described in " Backup of management partition information" is used for the restoration of management partition information.

The method of restoration of the management partition information is explained below.

```
# sh _backup_file_
get other node information start ... end
```

Chapter 6   Starting and Exiting the Management View

GFS Management View operates under a Web environment.

As long as you have a web environment, you will have access via a browser from any location.

This chapter explains how to start and exit the GFS Management view.

For information about the following items, all of, which are necessary for using the GFS Management view, see the "*PRIMECLUSTER Web-Based Admin View Operation Guide*":

- Topology
- Preparation
- Operating Screen

6.1   Starting Web-Based Admin View

When all preparations are complete, start **Web-Based Admin View** using the following procedures.

1. Start the browser.

2. Specify the URL in the following format:

   http://host-name:port-number/Plugin.cgi

   Host name: The host name or IP address of the primary or secondary management server
   Port number: 8081

3. After starting the Web-Based Admin View, user input screen appears. Type the user name and password for the management server, and press <OK>. When certification terminates, the top menu of Web-Based Admin View appears.

Note   Usable client environment

For details about the environment in which the browser is started, refer to the "*PRIMECLUSTER Web-Based Admin View Operation Guide.*"

Note   When the Screen Stops Responding

With some browsers, the screen may stop responding.
– If the browser disappeared, restart the browser, and reconnect to the URL that the browser was connected to.
– If the browser does not work (the browser fails to respond), reload the URL, or restart the browser.
– If the screen turns black immediately after starting Web-Based Admin View, try to move the mouse on the browser may sometimes resume the process.

Note   Port Number

Initial value for port number is set to "**8081**".
To change the port number, see "*PRIMECLUSTER Web-Based Admin View Operation Guide.*"

Note   URL when setting the Swing class

When setting a Swing class file to the Web browser, you need to specify a different URL. For more information about Swing class files, see "*PRIMECLUSTER Web-Based Admin View Operation Guide.*"

6.2 Web-Based Admin View Top Menu

After starting **Web-Based Admin View** has started, the "Web-Based Admin View operation Screen" appears.
Web-Based Admin View allows you to operate and manage GFS, set environment from the WWW screen.
Top menu refers to the Web-Based Admin View operation menu.

6.2.1 Web-Based Admin View Operation Menu Functions

The Web-Based Admin View operation menu supports the following functions related with the GFS Shared File System.

Table Web-Based Admin View Operation Menu Description

Menu	Description
Global File Services	Set and operates GFS Shared File System.

Note that the contents of the Web-Based Admin View operation menu vary depending on the installed product.

– When a dialog is displayed because of an error in Web-Based Admin View, the picture on the right side of the Web-Based Admin View top menu also turns red. If other screens hide the dialog, clicking the red picture brings the dialog box to the front. To find some errors occurred surely, the picture on the right side of the Web-Based Admin View top menu must be always displayed.

6.3   Starting GFS Management View

Click the GFS Management icon on the Web-Based Admin View operation menu, the GFS Management screen (hereafter referred to as the main screen) opens.
From the main screen, you can create a file system, change a file system configuration, and delete a file system.

See

For more information, see "Chapter 8 File System Operations (GUI)," in this manual.

Figure GFS Management Main Screen
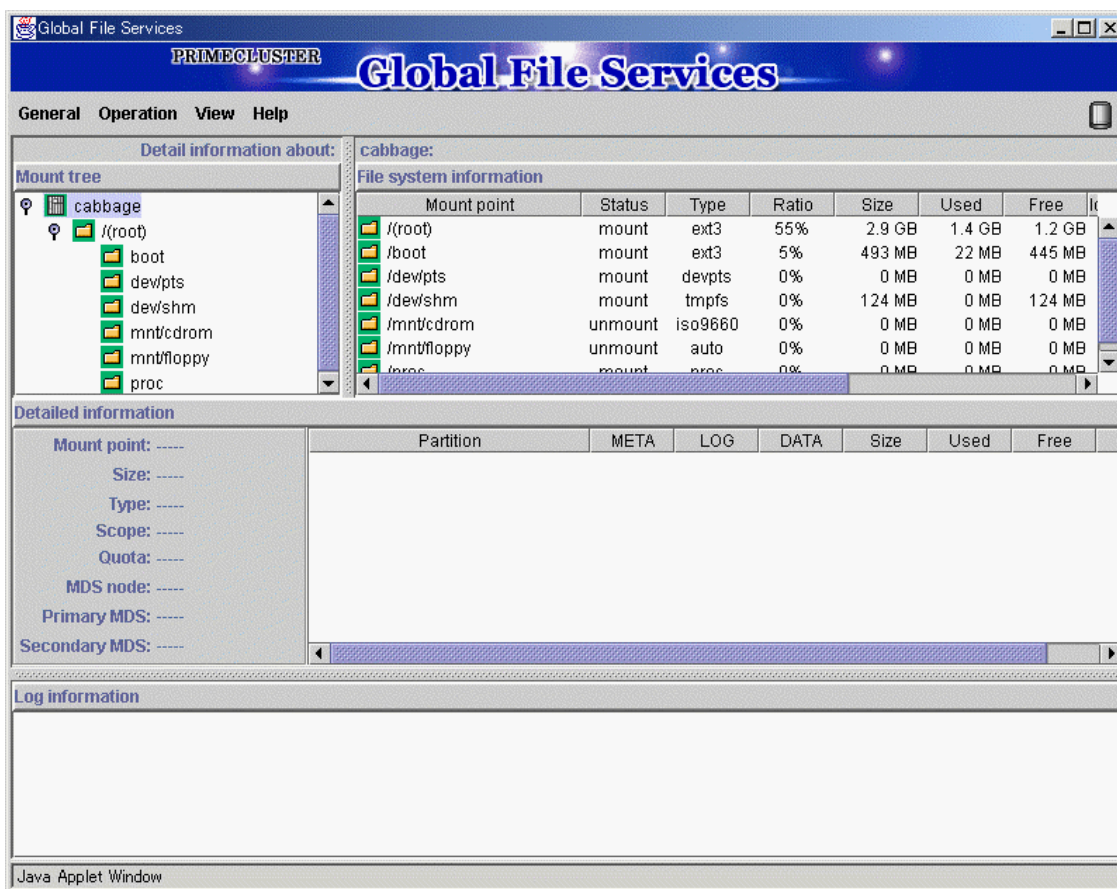
If there is more than one node, [Select Node] Screen appears on top of the main screen. Select the node you want to operate.

Figure Select Node Screen
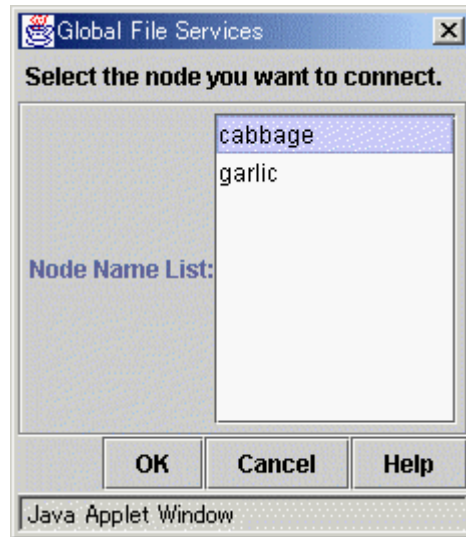
6.4   Exiting GFS Management View

To exit the **GFS Management View**, click [Exit] on the [General] menu. The following message will appear.

Figure Exit Screen

If you press <Yes>, the Web-Based Admin View Screen (top menu) is displayed.
If you press <No>, the main screen is displayed again.

6.5 Exiting Web-Based Admin View

Exit Web-Based Admin View, as follows:

- Select the [Logout] button on the top menu or common menu.
- When the login screen appears, exit the browser or use the [Back] feature of the to exit Web-Based Admin View.

Note **If the login screen continues to be displayed**

After the Web browser exits, the login screen will remain temporarily. But login screen will disappear, so just a minute.

Chapter 7 Operation Management View Screen Elements

This chapter describes the screen elements of the **GFS Management View**.

7.1 Screen Configuration

Main screen

Select Global File Services from **Web-Based Admin View**, and the screen below appears.
From this main screen, you can create a file system, change a file system's configuration, and delete a file system.
Screen configuration of main screen is shown below.

Figure GFS Management Screen (main screen)
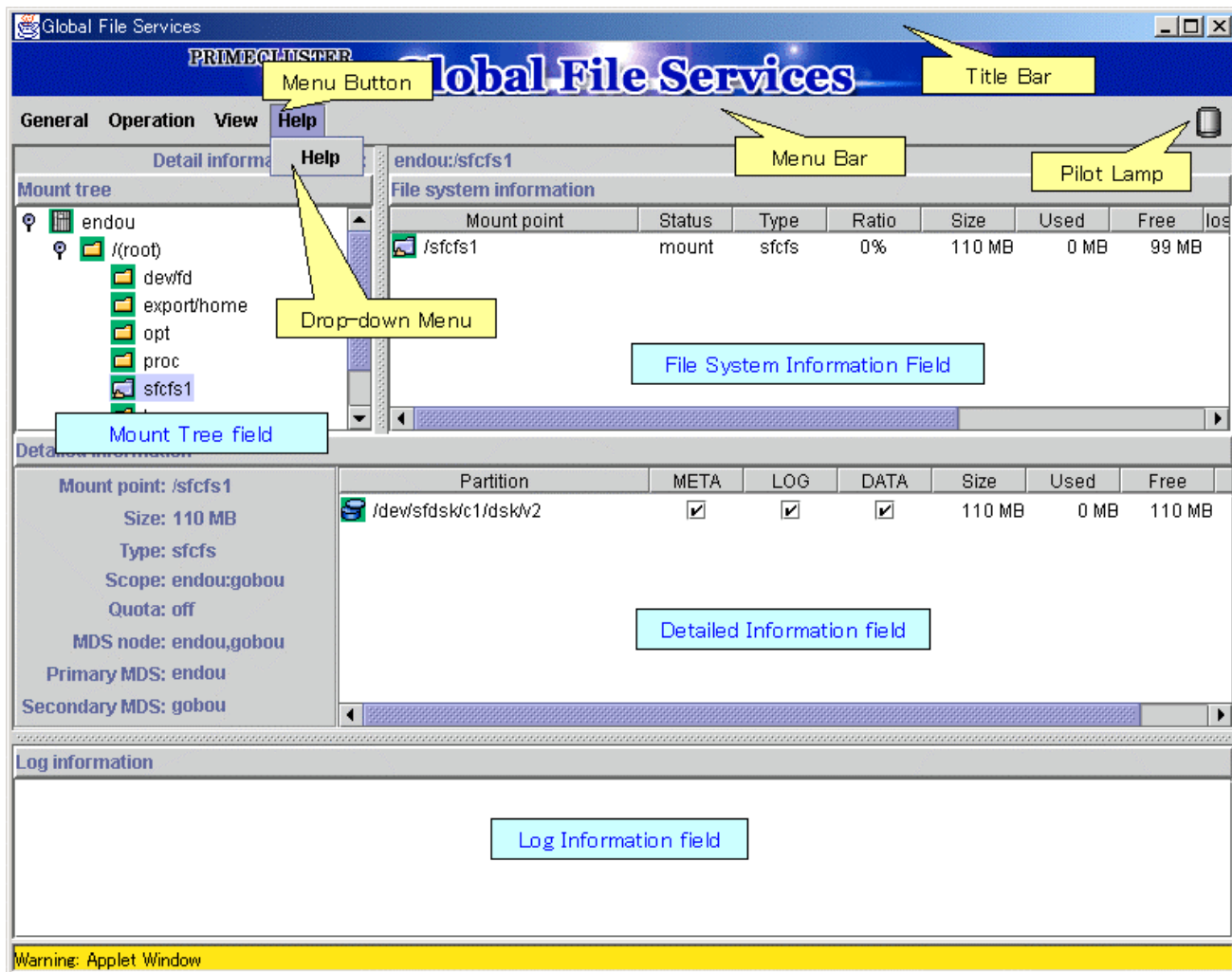
Mount tree field

File systems accessible from the node selected with [Select Node] in the [General] menu on the main screen can be displayed in the tree structure. The tree displays only file systems listed in /etc/fstab.
When the GFS Management appears, the [Select Node] screen appears first to select target node.

File System Information field

Displays the file systems for the node/directory selected from the Mount tree field. If the file system's status is unmount, 0 is displayed in the size.
Each object has an icon representing the object type. If the file system type is sfcfs, icons are color-coded so that the status of the objects can be determined at a glance.

For an explanation of icon types and object status, see "7.3 Icon Types and Object Status" in this manual.

Detailed Information field

When the file system type is sfcfs, detailed information such as the placement of the MDS selected in the Mount tree filed or the File system information field is displayed.

If the file system status is unmounted, 0 is displayed in the size in a left column.

The size of the data area is displayed in the size in the column of each right partition. Therefore, the size column is not displayed as for the partition without the data area.

Log Information field

Displays messages concerning the GFS Shared File System daemon program. The node name that the message was generated is added at the head of each message.

Title Bar

Displays screen title (Global File Services).

Menu Bar

Display the menu buttons.

Menu Button

Allow you to control the objects selected on screen.

There are <General>, <Operation>, <View>, and <Help>.

Drop-down Menu

When a menu button from the Menu Bar is selected, a Drop-down Menu will be appears.

For details on the Drop-down Menu, see "7.2 Menu Configurations and Functions" in this manual.

Pilot Lamp

Shown the status of monitored objects.

The lamp will indicate the following status.

Table Types of Pilot Lamp

Pilot Lamp	Status	Meaning
(Gray, lit up)	Normal	-
(Red, blinking)	Abnormal	The file system is abnormal. (Unavailable)
(Red, lit up)	Abnormal	When red blinking warning lamp is single-clicked
(Yellow, blinking)	Alarm	The utilization rate of the file system exceeds the threshold or the file system is abnormal at other node.

(Yellow, lit up)	Alarm	When yellow blinking warning lamp is single-clicked

Note

When a field cannot be fully displayed, move a mouse cursor to that part that is not being displayed clearly. A popup display will appear.

In a pop-up list of the scope, information on the nodes sharing the file system is displayed in the node (host) name format. When several host names are specified, they are displayed in parentheses.

7.2 Menu Configurations and Functions

Each menu button has a Drop-down Menu; you can operate the selected object on screen.
This section explains the menu configuration and functions.

7.2.1 General

Figure General menu

Select Node

Select the node you want to operate, and press <OK> button. Only one node can be selected at a time.
If you don't need selecting node, press <Cancel> button.

Figure [General]: [Select Node] Screen

Exit

Exits Global File Services.

Figure [General]: [Exit] Screen
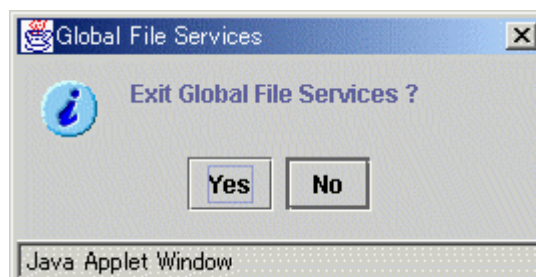
7.2.2　　　Operation

Figure Operation menu

Create

Creates a file system.

See

　　　For details, see" 8.2.1 Creating a file system" in this manual.

Figure [Operation]: [Create] Screen
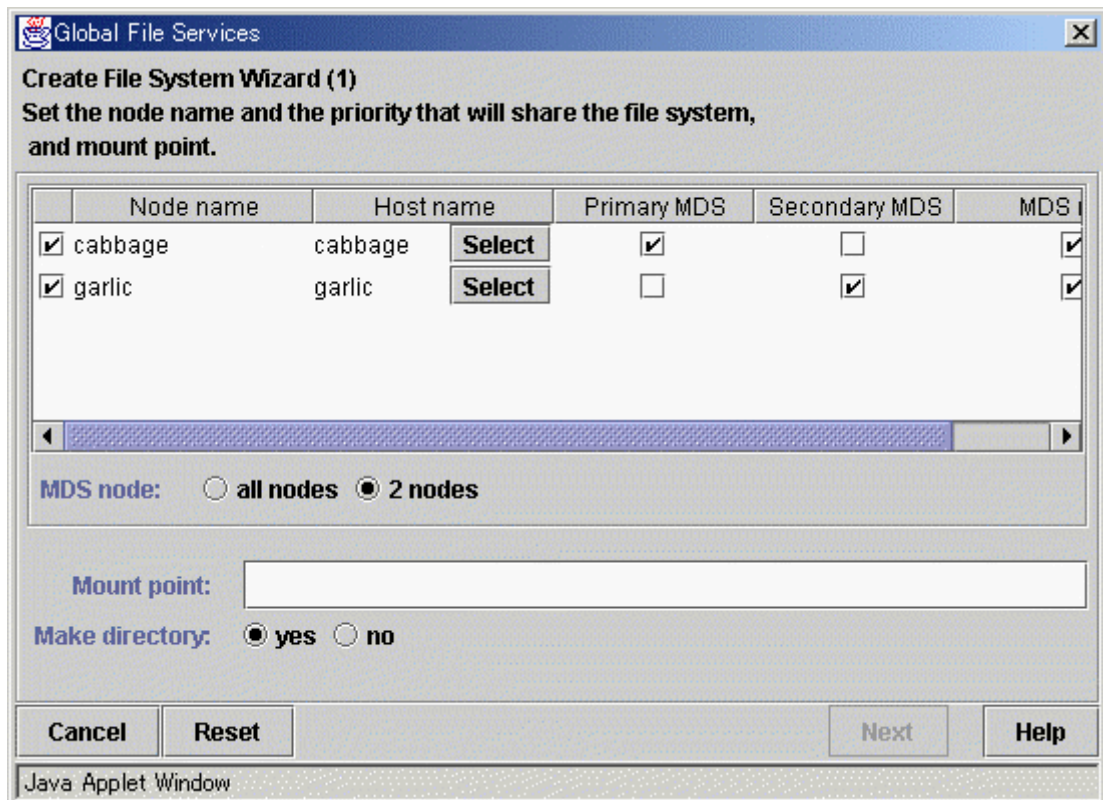
Delete

Deletes a file system.

For details, see "8.4.1 Deleting the file systems" in this manual.

Figure [Operation]: [Delete] Screen
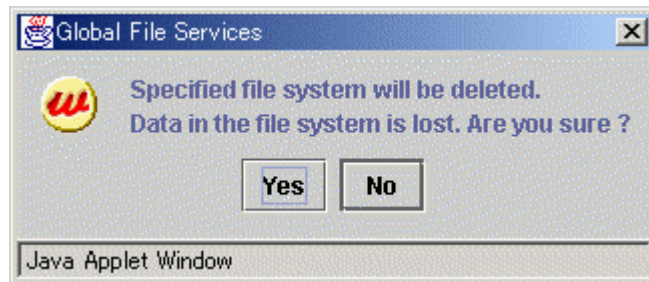
Change Attributes

Changes the mount information, share information, and detailed information for a file system.

For details, see "8.3.2 Changing the sharing-node information" "8.3.1 Changing in file system attributes" in this manual.

Figure [Operation]: [Change Attributes] Screen
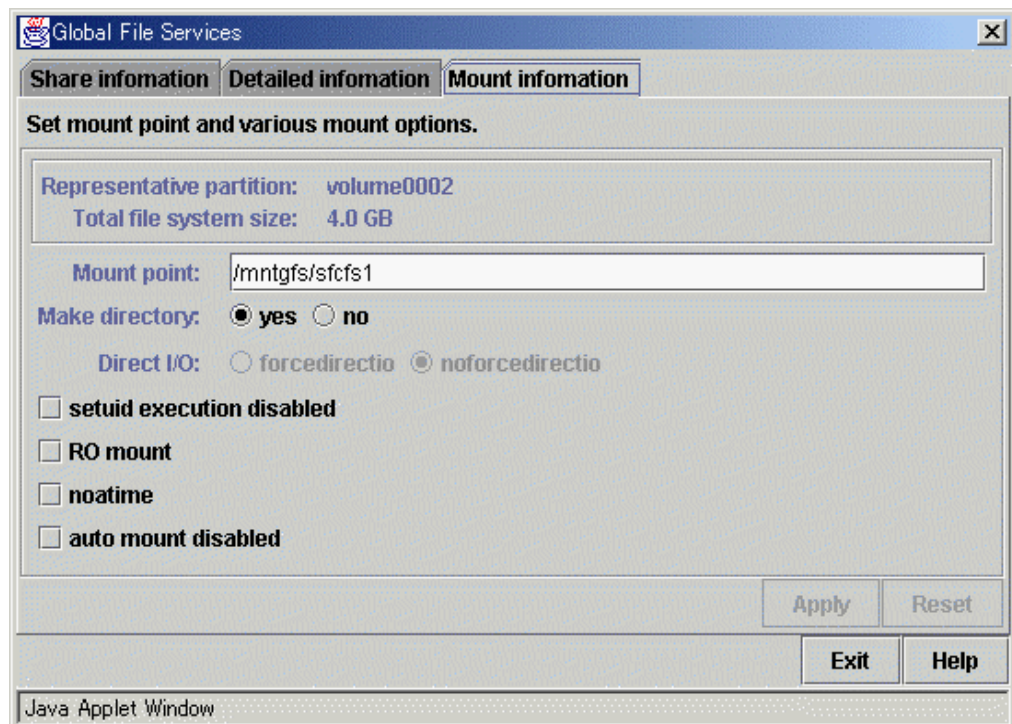
7.2.3 View

Figure View menu

Abnormal Only

Only displays file systems with abnormalities.

Update Now

Display the latest file system information.

7.2.4 Help

Figure Help menu

Help

Displays help information.

7.3 Icon Types and Object Status

GFS Management View uses icons to show object types and status.
The status and icons are shown below.

1. Node

Icon	Status	Meaning
	-	-

2. Adapter

Icon	Status	Meaning
	-	-

3. File system (sfcfs)

Icon	Status	Meaning
(Green)	Normal	The file system is working normally on all nodes.
(Yellow)	Alarm	The usage rate of the file system exceeds the threshold or an error occurred at another node.
(Red)	Abnormal	An error occurred in a node of the file system.
(Blue)	In transition	The file system is in mounted or unmounted.
(Light brown)	Inactive	The file system is in unmounted.

4. File system (ext2/ext3)

Icon	Status	Meaning
(Green)	Normal	-
(Red)	Abnormal	-

5. Physical Disk

Icon	Status	Meaning
	-	-

6. Partition

Icon	Status	Meaning
	-	-

> **Note**   **File system status**
>
> The GFS Shared (file system type: sfcfs) File System is displayed as normal until it is accessed, and then the abnormality is detected. Even if the file system is unmounted, the icon shows the status.
> When the file system type is ext2/ext3, the status is not shown under an unmounted status.

Chapter 8   File System Operations (GUI)

This chapter explains the operations of the GFS Management View.

Note

Before creating a file system, the management partition needs to be set up.

See

For details of the management partition, see "Chapter 5 Management Partition."

8.1 Flow of Operations

This section explains the flow of file system operations of the **GFS Management View**.

8.1.1   Creation

The following describes the flow creating file system with the figure below. For details of operations in the following figure, see "8.2 Creation."

Figure Flow of the create file system operation

《**Create file system**》

Set shared disk

↓

Create file system

↓
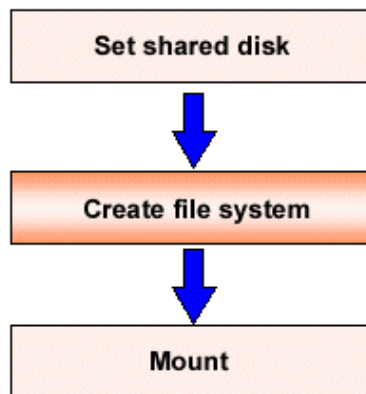
Mount

8.1.2 Change (in file system attributes)

The following describes the flow of changes in file system attributes. In **GFS Management View**, the following attributes can be changed:

- Mount information
- File system tuning

See

For details of the above changes and each operation in the flow described in the following figure, see "8.3 Change."

Figure Operation flow for change in file system attributes
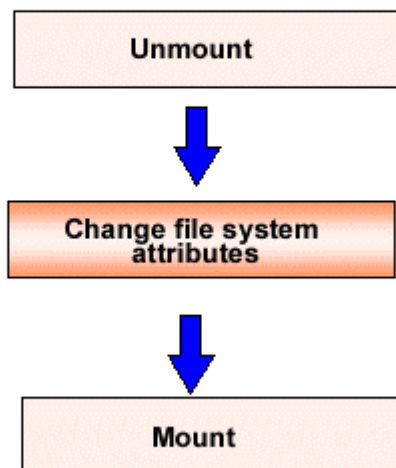
8.1.3 Change (shared node information)

The following describes the flow of operations to change information about nodes sharing a file system. Information about nodes sharing a file system can be changed only when unmounted of the file system. For details of each operation in the flow described in the following figure, see "8.3 Change."

Figure Operation flow of change shared node information
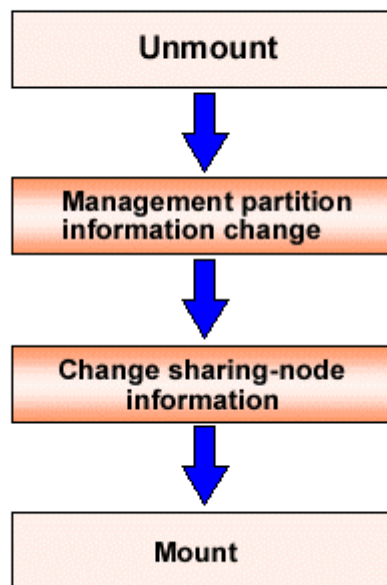
8.1.4   Deletion

The following describes the flow of operations to delete a file system. A file system can be deleted only when unmounted of the file system. For details of each operation in the flow described in the following figure, see "8.4 Deletion."

Figure Operation flow for delete a file system

《 Delete file system 》

Unmount
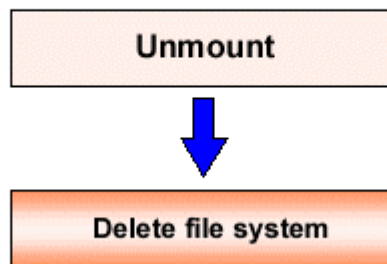
Delete file system

8.2 Creation

This section explains how to create a file system.

Because the file system can be created by using a wizard, it is easy to perform simply by selecting <Next>.

To start the file system creation wizard, Click [Create] on the [Operation] menu.

Note **Note of Operation**

- On a Wizard, press <Back> button and change parameters on the previous screen, assigned values are invalid and default values are newly set.
- The operation result in Management View is reflected in the display of the Main Screen by Click [Update Now] on the [View] menu.

8.2.1   Creating a file system

The following describes the procedure for creating a file system.

(1) Setting a shared disk device

The partition in which a GFS Shared file system is created and operated must be on a **shared disk** recognized by **PRIMECLUSTER**. To make a logical volume of GDS a target device, it must be operating.

Note

Check that the sharing disk is set for simultaneous access.

If a partition is set as a shared disk by automatic detection of shared disks before starting operation, it is already set as a shared disk for simultaneous access. Therefore, there is no need to set it again.

The partition used for creating a GFS shared file system must be on a shared disk recognized by PRIMECLUSTER. In addition, the GDS logical volume must be operating.

See

For operations of the disk class to which the logical volume of GDS belongs, see the applicable items under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide.*"

For the logical volume operations of GDS, see the applicable items under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide.*"

(2) Setting share information

Click [Create] on the [Operation] menu, and the Create File System Wizard (1) appears.
In the Create File System Wizard (1), set sharing **node** information, the mount information.

Figure Create File System Wizard (1)

For an explanation of each parameter, see "B.1.3 sfcmkfs(8)".in this manual.

Selecting node names
    In the "Node name" section, select the names of the sharing nodes. Be sure to select at least two nodes. It is not possible to deselect the local node.

Selecting host names
    When you want to select a host name other than the displayed host names, click a <Select> button and then select the host name(s) of the LAN for each node on the screen as below. When selection using <Select> is skipped, the LAN of the current displayed host name is used. When multiple host names are selected, all of the names pops-up as a mouse cursor is placed on the host name.

Figure Host Name Selection Wizard
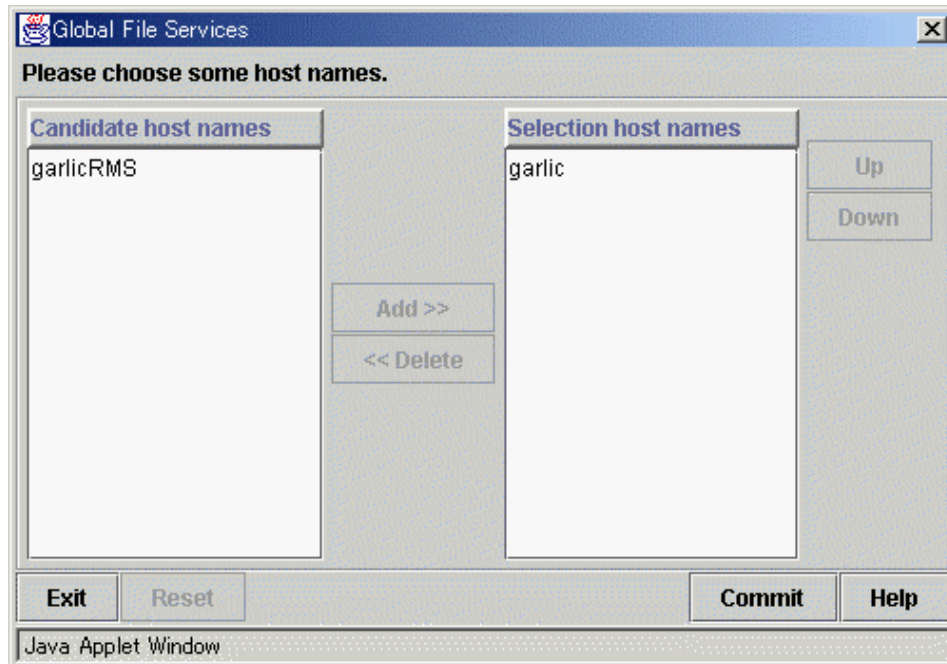
Please choose the host name of LAN used from a left-hand side candidate host name, and add to a right-hand side selection host name. When there are two or more selection host names, please decide the priority of the host name chosen down to <up> <down>. The host name arranged upwards is used preferentially.

Selecting the primary MDS and secondary MDS
> As the "Primary MDS" and "Secondary MDS ", specify the nodes on which shared file system management server is to be started. A single, unique node must be selected for each **MDS**.

Selection of "MDS placement target" and "MDS placement nodes"
> Specify the range of nodes on which MDS may execute. If all nodes are selected as "MDS placement nodes," MDS may execute on all shared nodes. In such case, priority will given to the nodes specified as "Primary MDS" and "Secondary MDS". If exactly two nodes are selected as "MDS placement nodes", they will be designated as the "Primary MDS" and "Secondary MDS" nodes.

Setting mount point and creating a directory
> Specify the full path name of a mount point in the "Mount point" field. If "yes" is selected for "Make directory", a directory is created with the following attributes:
>> Owner: root
>> Group: sys
>> Access right: 775

(3) Selecting a partition

In the Create File System Wizard (2), register the **partition** used for the file system.

Figure Create File System Wizard (2)
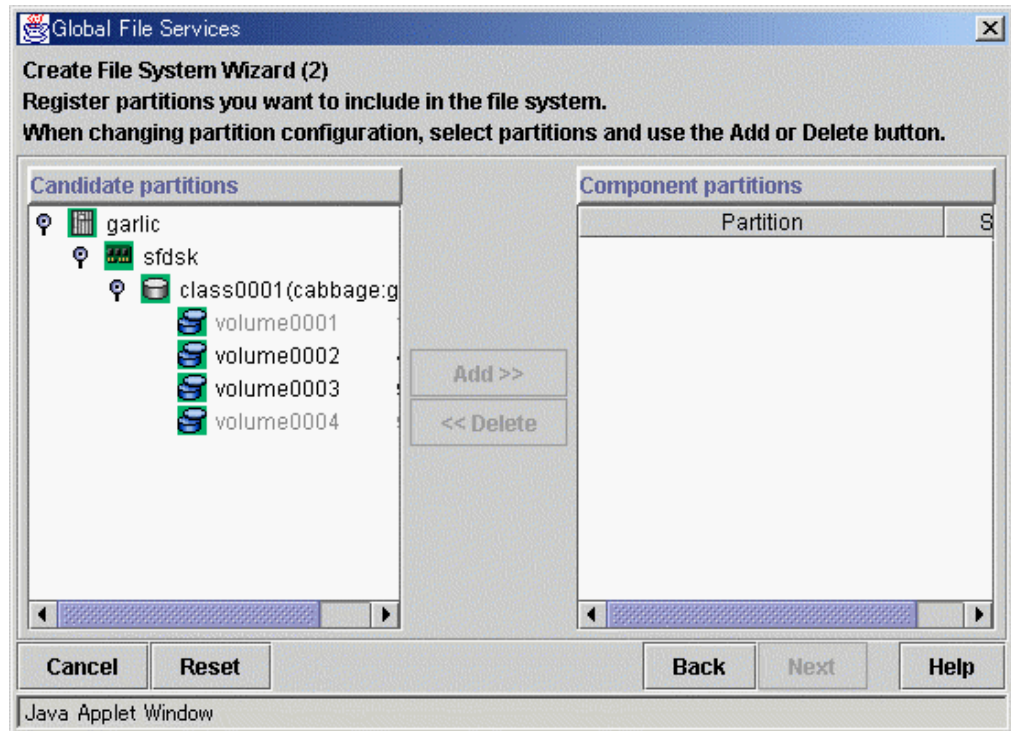
Select the partition from [Candidate partitions] list, and press <Add> button. Only one partition can be selected at a time. A partition in use as a file system or a management partition cannot be chosen.
After selecting a partition, press <Next> button to go to the Create File System Wizard (3).
To return to the Create File System Wizard (1), press <Back> button.
To cancel the file system creates operation, press <Cancel> button.

When the state of the logic volume of GDS is not operating, it cannot choose as a composition partition. When you choose as a composition partition, while operating, please carry out the state of logic volume.

(4) Setting partition information

In the Create File System Wizard (3), select the area (META/LOG/DATA) to be assigned to each partition selected in the Create File System Wizard (2).

The partition to which META is assigned becomes a **representative partition**.

Figure Create File System Wizard (3)
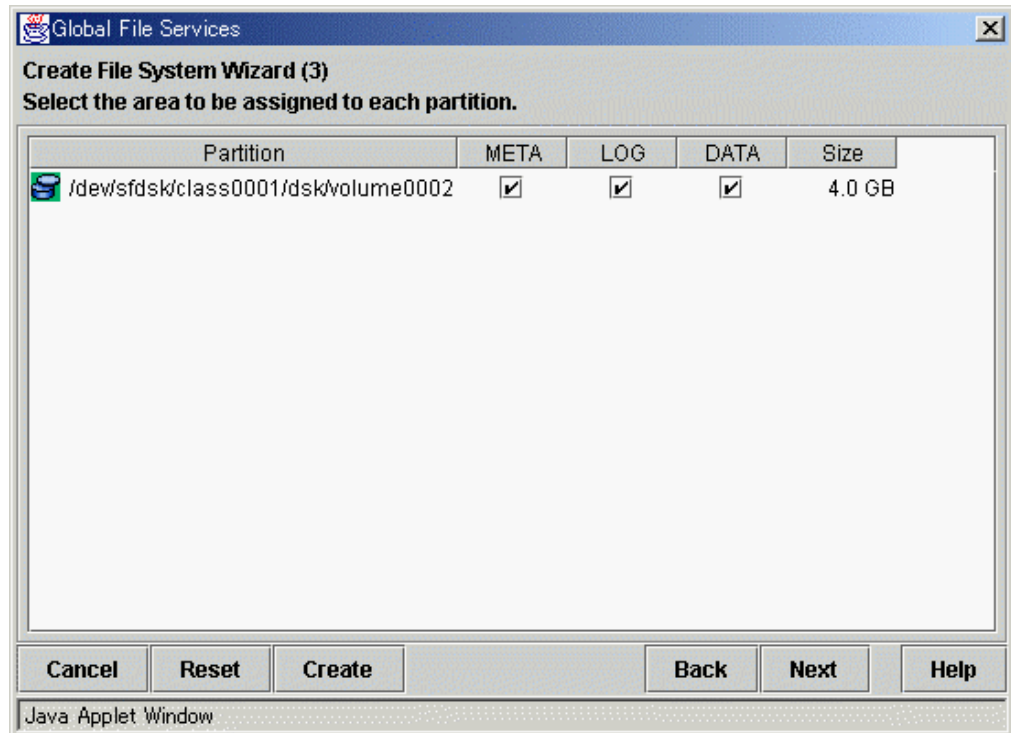
After setting the information items, press <Next> button to go to the Create File System Wizard (4).

To restore a setting to its default, press <Reset> button.

To return to the Create File System Wizard (2), press <Back> button.

To cancel the file system creates operation, press <Cancel> button.

If you don't need change extended information, detailed information and mount information, press <Create> button to create the file system.

(5) Setting detailed information

In the Create File System Wizard (5), set detailed information.

Figure Create File System Wizard (5)

See

For an explanation of each parameter, see "B.1.3 sfcmkfs(8)" in this manual.

Note

The file system application limit is the value obtained by subtracting, from 100, the minimum percentage of free space in the file system specified by the **-o free** option of sfcmkfs(8).
The V data area application limit is the value obtained by subtracting, from 100, the minimum percentage of free space of the V data area specified by the **-o free** option of sfcmkfs(8).

After setting the information items, press <Next> button to go to the Create File System Wizard (6).
To restore a setting to its default, press <Reset> button.
To return to the Create File System Wizard (4), press <Back> button.
To cancel the file system creates operation, press <Cancel> button.
If you don't need change mount information, press <Create> button to create the file system.

(6) Setting mount information

In the Create File System Wizard (6), set mount information.

Figure Create File System Wizard (6)
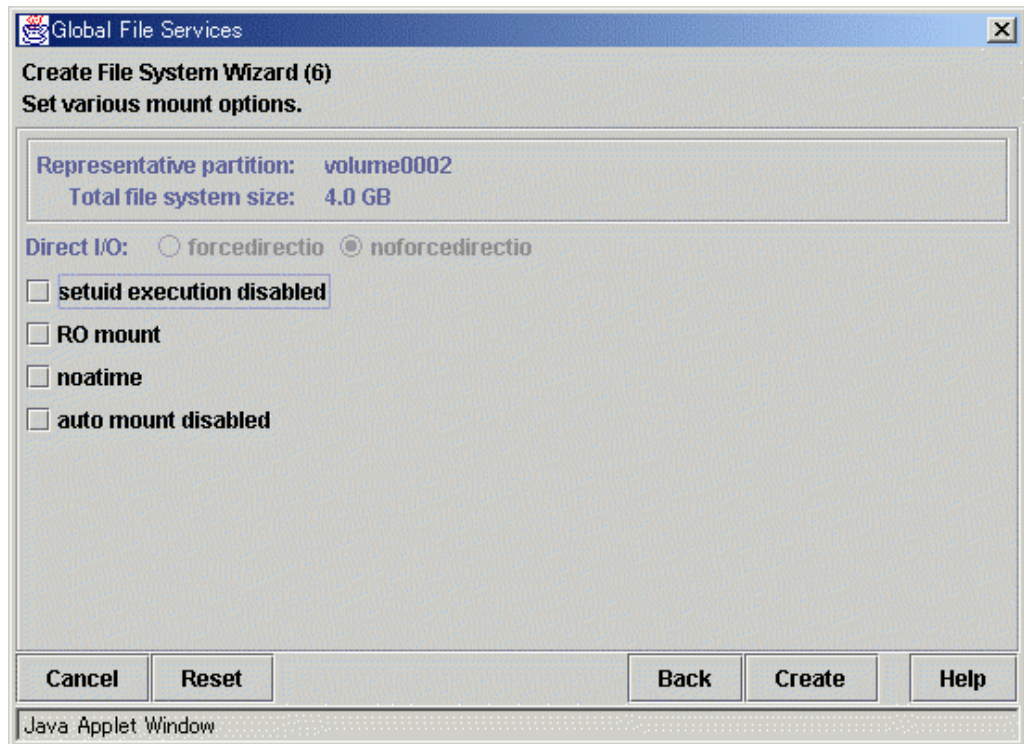
After setting the information items, press <Create> button to create the file system.
To restore a setting to its default, press <Reset> button.
To return to the Create File System Wizard (5), press <Back> button.
To cancel the file system creates operation, press <Cancel> button.

8.3 Change

The **GFS Management View** provides two change operations:
- Changing the file system attributes (mount information modification, file system tuning)
- Changing **shared node** information

![Note icon] **Note of Operation**

- The operation result in Management View is reflected in the display of the Main Screen by Click [Update Now] on the [View] menu.
- When you fail in acquisition of the information on the existing GFS Shared File System, you cannot perform change operation to the file system. Please cope with it according to the outputted error message.

8.3.1 Changing in file system attributes

The following describes the procedure for changing file system attributes using the **GFS Management View**.
Changing file system attributes includes modifying mount information and file system tuning.

(1) Unmount of a file system

Before change the file system attributes, a file system is in unmounted.

(2) Selecting a file system

From the [Mount tree] or [File System Information] field in the main screen, select the file system you want to change. Only file systems of the sfcfs type can be selected.
Click [Change Attributes] on the [Operation] menu, and the [File System Attributes] screen appears.
From the [File system Attribute] screen, the mount information, share information, and detailed information can be moved using the screen switching tabs.

(3) Changing the mount information

In the [Mount information] screen, the mount information can be changed.
To change settings, change the corresponding parameters.
To restore settings to their previous values, press <Reset> button.
To execute the mount information change operation, press <Apply> button.

Specify the full path name of a mount point in the "Mount point" field. If "yes" is selected for "Make directory", a directory is created with the following attributes:
    Owner: root
    Group: sys
    Access right: 775

Figure Mount information for file system attributes
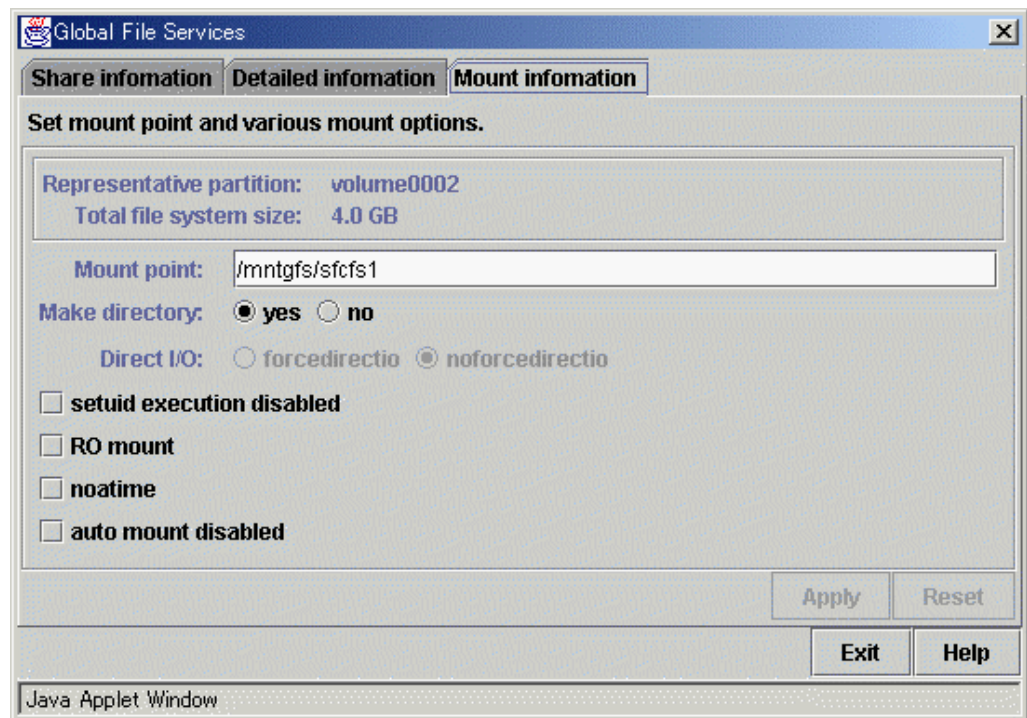
(4) Changing detailed information

On the [Detailed information] screen, change the settings of file system tuning.
To change settings, change the corresponding parameters.
To restore settings to their previous values, press <Reset> button.
To execute the detailed information change operation, press <Apply> button.
To close the [File System Attributes] screen, press <Exit> button.

Figure Detailed information for file system attributes
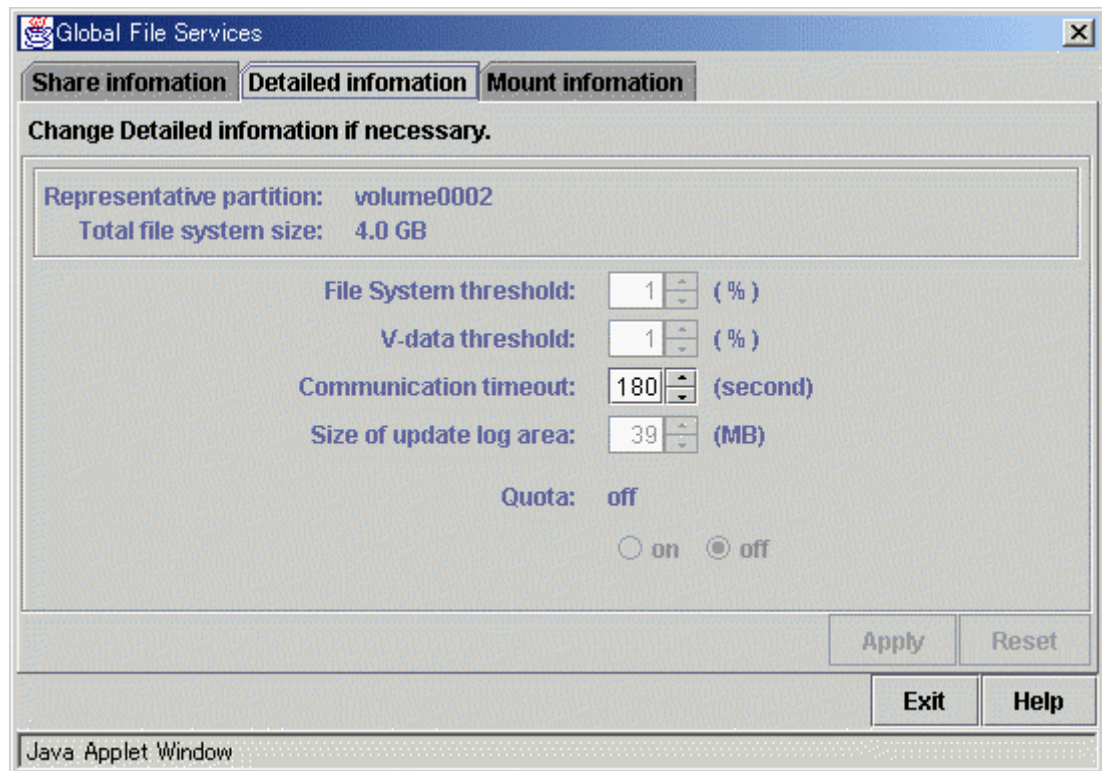
For an explanation of each parameter, see "B.2.1 sfcadm(8)" in this manual.

(5) Mount of a file system

After the completion of the file system attribute change operation, a file system is in mounted.

<div style="border: 2px solid black; padding: 10px;">

8.3.2   Changing the shared node information

</div>

The following describes the procedure for changing sharing-node information using the **GFS Management View**.

(1) Unmount a file system

Before change the **shared node** information, a file system is in mounted of all nodes.

(2) Selecting a file system

From the [Mount tree] or [File system Information] field in the main screen, select the file system you want to change. Only file systems of the sfcfs type can be selected.
Click [Change Attributes] on the [Operation] menu and go to [Share information] screen using the screen-switching tab.

(3) Changing share information

In the [Share information] screen, the information on the **node**s sharing the file system can be changed.
To change settings, change the corresponding parameters.
To restore settings to their previous values, press <Reset> button.

Figure Share information for file system attributes
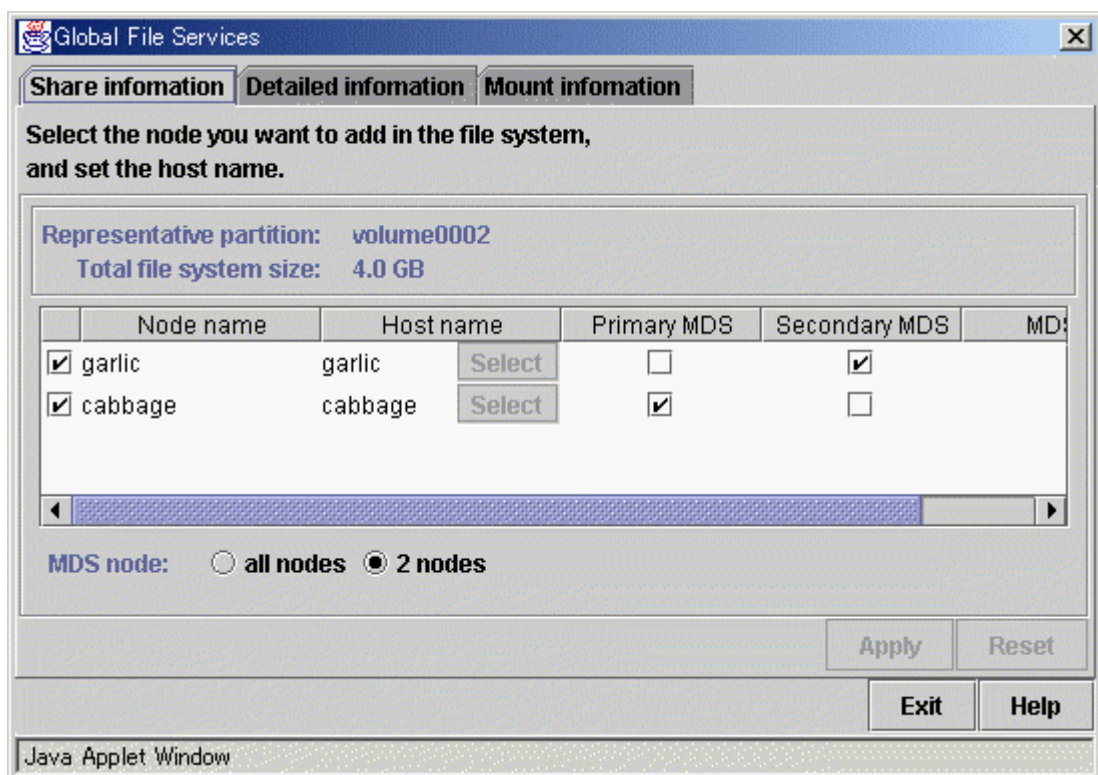
Selecting node names
In the "Node name" section, select the names of nodes to be shared. Be sure to select at least two nodes.
It is not possible to deselect the local node, the primary MDS and secondary MDS.

Selecting a host name

When you want to select a host name other than the displayed host name, click a <Select> button and then select the host name(s) of the LAN for each node on the screen as below. When selection using <Select> is skipped, the LAN of the current displayed host name is used. The host name for each node already selected cannot be changed.

Note **Primary MDS and secondary MDS**

A primary MDS and secondary MDS cannot be changed. If the change is necessary, please delete, and make the file system again.

See

For an explanation of each parameter, see "B.2.1 sfcadm(8)" in this manual.

(4) Confirming the sharing-node information change operation

To execute the sharing-node information change operation, press <Apply> button.
To close the [File System Attributes] screen, press <Exit> button.

(5) Mount a file system

After completion of the file system attributes change operation, a file system is mounted.

8.4 Deletion

8.4.1   Deleting the file system

The following describes the procedure for deleting the file system using the **GFS Management View**.

Note   **Note of Operation**

    – The operation result in Management View is reflected in the display of the Main Screen by Click [Update Now] on the [View] menu.
    – If you cannot get an sfcfs information, you cannot do the deletion operation to the file system. Please deal according to the output error message.

(1) Unmount a file system

Unmount a file system on all nodes before deletion.

See

       For detail of the unmount procedure, see "9.2.4.4 Unmount of all nodes."

(2) Selecting a file system

From the [Mount tree] or [File system Information] field in the main screen, select the file system you want to delete. Only file systems of the sfcfs type can be selected.

(3) Deleting the file system

Click [Delete] on the [Operation] menu, the following warning message appears.
To delete the file system, press <Yes> button.
To cancel the deletion of the file system, press <No> button.

Figure File system deletion warning message
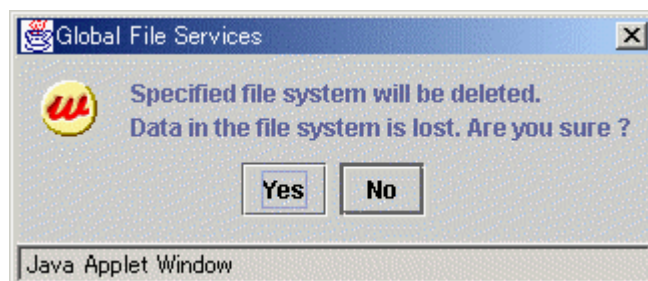
Chapter 9   File System Operations (Command)

This chapter describes the GFS Shared File System executed by command.

Note

Before creating a file system, the management partition needs to be set up.

See

For details of the management partition, see "Chapter 5 Management partition."

9.1 Operation flow

This section describes the flow of operations in the GFS Shared File System.

9.1.1 Creation

Figure Flow of the create file system operation
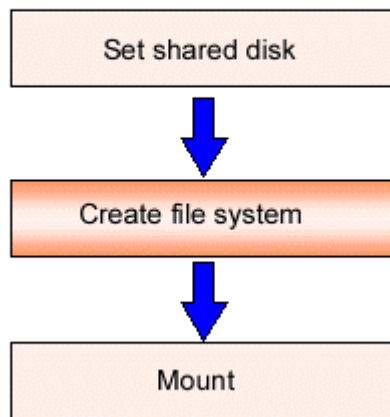
9.1.2   Change(in file system attributes)

Figure Operation flow for change in file system attributes

《 Change file system attributes 》

・Change in mount information
・file system tuning

```
┌─────────────────────────────┐
│          Unmount            │
└─────────────────────────────┘
              ⬇
┌─────────────────────────────┐
│  Change file system attributes │
└─────────────────────────────┘
              ⬇
┌─────────────────────────────┐
│           Mount             │
└─────────────────────────────┘
```
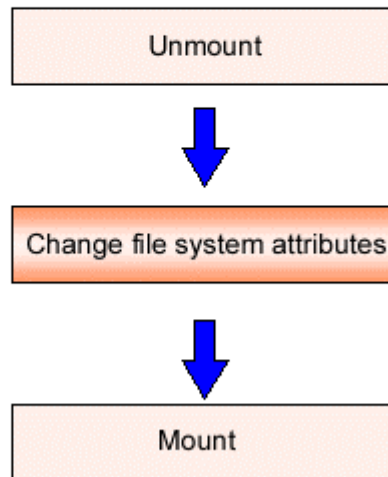
9.1.3　　Change(shared node information)

Figure Operation flow for change shared node information

《 Change sharing-node information 》

```
        ┌─────────────────────────┐
        │         Unmount         │
        └─────────────────────────┘
                    │
                    ▼
        ┌─────────────────────────┐
        │   Management partition  │
        │    information change   │
        └─────────────────────────┘
                    │
                    ▼
        ┌─────────────────────────┐
        │ Change sharing-node information │
        └─────────────────────────┘
                    │
                    ▼
        ┌─────────────────────────┐
        │          Mount          │
        └─────────────────────────┘
```
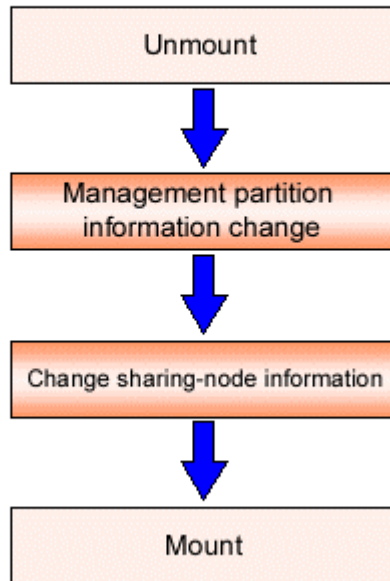
9.1.4   Change(re-creating a file system)

Figure Operation flow for re-creating a file system

《 Re-create file system 》
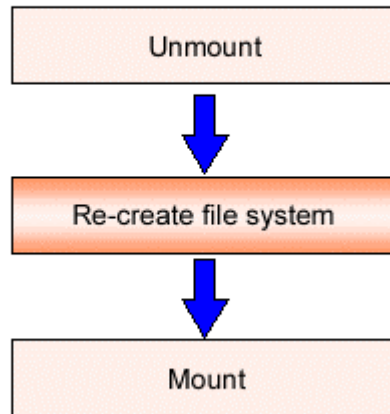
9.1.5   Change(MDS operational information)

Figure Operation flow for change MDS operational information

《 Change MDS operational information 》
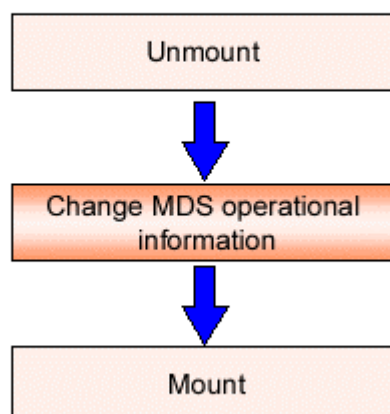
9.1.6 Deletion

Figure Operation flow for delete a file system

《 Delete file system 》
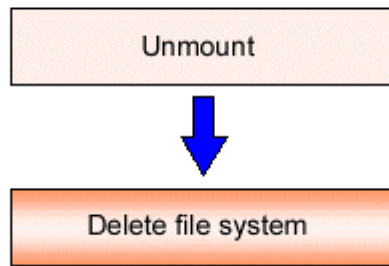
9.2 Flow from file system creation to mount/umount

The flow from the GDS File System creation to mount/umount is explained below, in the following order.

1. Setting up a shared disk
2. File system creation with sfcmkfs(8)
3. Setting up /etc/fstab
4. mount/umount/all nodes (u)mount

9.2.1 Setting shared disks

GFS Shared File System use GDS logical volumes as shared devices. Status of GDS logical volumes must be ACTIVE on each node.

Check that the sharing disk is set for simultaneous access.

If a partition is set as shared disk by automatic detection of shared disks before starting operation, it is already set as a shared disk for simultaneous access. Therefore, there is no need to set it again.

To set a logical volume of GDS, set the type of disk class to which the logical volume belongs as shared, and specifies all nodes that shared the GFS Shared File System within the scope of disk class to which the logical volume belongs.

For operations of the disk class to which the logical volume of GDS belongs, see the applicable items under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*."

For the logical volume operations of GDS, see the applicable items under "Operation using Global Disk Services Management View" in the "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*."

9.2.2 Creating a file system

To create the GFS Shared File System, use sfcmkfs(8).

See

For details of sfcmkfs(8), see "B.1.3 sfcmkfs(8)."

9.2.2.1 Defaults of parameters used in sfcmkfs(8)

The defaults of parameters used in sfcmkfs(8) are as follows.

Table Defaults of parameters used in sfcmkfs(8)

Parameter	Default
Data block size	Fixed to 8,192 byte
Minimum space area (**-o free=n**)	10% of the file data area
Number of i-nodes (**-o nbpi=n**)	One in an 8192-byte disk area
Update log area size (**-o logsz=n**)	1% of the file system size The available range is from 5 megabytes to 50 megabytes.
Meta-data area size Meta-data area size (**-o metasz=n**)	About 10% of the file system size
Number of MDS place in nodes (**-o mdsnode=all|num**)	2

Note

The use ratio of the meta-data area decreases by growing of the file system size when the meta-data area size is not specified.

When building a file system, the file system should be configured to operate MDS on all nodes.

9.2.2.2 Examples of creating a representative file system

The following is an example of creating a typical GFS Shared File System.

To create a GFS Shared File System, the partition where the file system is created must be specified. In this case, all type of data as the **meta-data area**, the **update log area**, and the **file data area** must be created for the **representative partition**.

The following shows an example of creating a file system using sfcmkfs(8).

```
# sfcmkfs -o mdsnode=all,node=mikan,karin,mango /dev/sfdsk/gfs/dsk/volume1

Representative partition (meta-date, log and data) : /dev/sfdsk/gfs/dsk/volume1
Shared hosts    :   mikan, karin and mango
Primary MDS    :   mikan
Secondary MDS :   karin
MDS operational nodes :   mikan, karin, and mango
```

Figure partition configuration

P－MDS : PrimaryMDS
S－MDS : SecondaryMDS
I－MDS: StandbyMDS
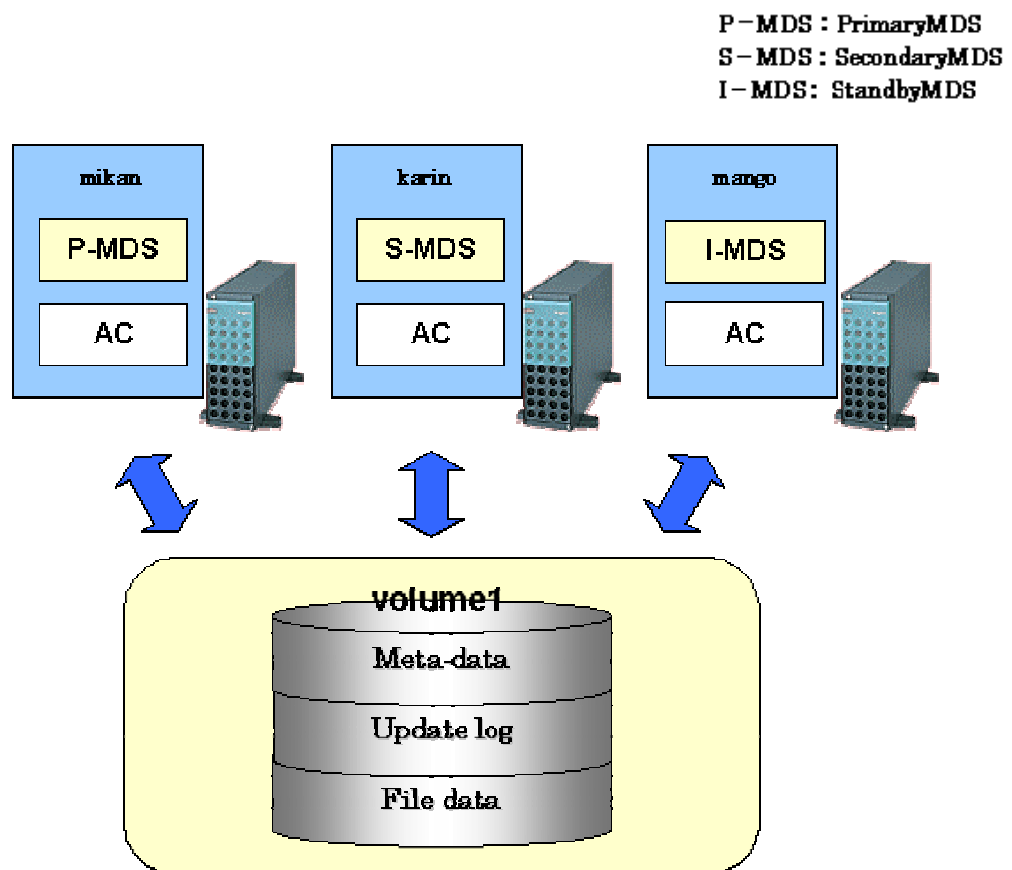
9.2.2.3　　　Customizing the GFS Shared File System

Parameters for customizing a file system are provided by sycmkfs(8), which creates a GFS Shared File System. Typical parameters are described below.

Update log area size (-o logsz=n)

This parameter specifies the size of the update log area with a value in the range from 5 to 100 megabytes. The default value is 1% of the file system size. If, however, 1% of the file system size is smaller than 5 megabytes, 5 megabytes is set. Also, if it is larger than 50 megabytes, 50 megabytes is set.

Meta-data area size (-o metasz=n)

This parameter specifies the size of the meta-data area in the representative partition. The default value is about 10% of the file system size. When the meta-data area size is not specified, the larger the file system size is, the smaller meta-data area is used.

9.2.2.4　　　Setting MDS operational information

The following is an example of creating a typical GFS Shared File System specifying MDS operation information to improve availability:

- – Priority settings of MDS placement

  The -o node option of sfcmkfs(8) specifies the priority of placing the primary MDS and the secondary MDS. The primary MDS and secondary MDS candidates are set according to order of specifying shared host names.

  The following shows an example of creating a file system using sfcmkfs(8) in the situation where mikan is placed as the primary MDS Candidate, and Karin, as the secondary MDS candidate.

  ```
  # sfcmkfs -o node=mikan,karin,mango,akebi /dev/sfdsk/gfs/dsk/volume1

  Representative partition (meta-data, log and data) : /dev/sfdsk/gfs/dsk/volume1
  Shared hosts    :   mikan, karin, mango, and akebi
  Primary MDS     :   mikan
  Secondary MDS   :   karin
  ```

- – Configuration that enables MDS placement on all nodes

  To enable MDS placement on all nodes, use the **-o mdsnode** option of the sfcmkfs(8) command.

  The following shows an example of creating a file system using sfcmkfs(8) when MDS is placed on all nodes.

  ```
  # sfcmkfs -o mdsnode=all,node=mikan,karin,mango,akebi /dev/sfdsk/gfs/dsk/volume1

  Representative partition (meta-data, log and data) : /dev/sfdsk/gfs/dsk/volume1
  Shared hosts    :   mikan, karin, mango, and akebi
  Primary MDS     :   mikan
  Secondary MDS   :   karin
  Host on which MDS can be placed :   mikan, karin, mango, and akebi
  ```

– Configuration that restricts the range of MDS placement

To restrict the MDS placement range to specific shared hosts, use the **-o mdsnode** option of the sfcmkfs(8) command to specify the number of nodes.

94

The following shows an example of creating a file system using sfcmkfs(8) with the placement range of MDS restricted to three nodes.

```
# sfcmkfs -o mdsnode=3,node=mikan,karin,mango,akebi /dev/sfdsk/gfs/dsk/volume1

Representative partition (meta-data, log and data) : /dev/sfdsk/gfs/dsk/volume1
Shared hosts     :   mikan, karin, mango, and akebi
Primary MDS      :   mikan
Secondary MDS    :   karin
Host on which MDS can be placed :   mikan, karin, and mango
```

9.2.3   Setting /etc/fstab

The GFS Shared File System required the description of entries to be mounted on /etc/fstab for all of the nodes that share the file system. Also, the description in the mount options field of /etc/fstab is used as the mount option when the mount command is executed. The mount options described in /etc/fstab for the same file system must be consistent on any nodes configuring the file system. Other than the mount option, noatrc can be specified in the mount options field. Specify the noatrc option when mounting is not to be performed when the node is started.

An example of setting /etc/fstab is shown below:

- When mounting in the rw mode on node startup:

Field	Value
special device	/dev/sfdsk/gfs/dsk/volume1
mount point	/mnt/fs1
filesystem type	sfcfs
mount options	rw, noauto
dump frequency	0
fsck pass	0

- when not mounting on node startup

Field	Value
special device	/dev/sfdsk/gfs/dsk/volume1
mount point	/mnt/fs1
filesystem type	sfcfs
mount options	rw, noauto, noatrc
dump frequency	0
fsck pass	0

Table Mount options

Option	Description
noatime	Does not update the file access time.
nosuid	A file system will be mounted with setuid execution permission. Note, however, that if nosuid is specified, mounting will be executed with setuid execution inhibited.
rw | ro	Mounts in read/write mode (rw) or read only mode (ro). By default, rw is used.
noauto	Required.
noatrc	Does not mount when a node is started. By default, mounting is performed when a node is started.

Note

Be sure to specify noauto in the mount options field and 0(zero) in the dump frequency field and the fsck field.

9.2.4   mount/umount/all nodes (u)mount

Use the sfcmount(8) and sfcumount(8) commands to mount or unmount the GFS Shared File System. Also, use sfcmntgl(8) and sfcumntgl(8) to mount or unmount all nodes. These commands can be executed from any node on which the GFS Shared File System can be used. The mounting (any or all nodes)results in that sfcfsd and MDS are activated while the unmounting (any or all nodes) causes that sfcfsd and MDS are terminated.

Note

If no entry is described in /etc/fstab, mounting will be disabled. Also, no mount option can be specified with the mount command. The contents of the mount options field in /etc/fstab at the execution of the mount command are used as the mount options.

You must use sfcumount(8) to unmount a GFS Shared File System.

9.2.4.1 Mount

For details about sfcmount(8), see "B.1.4 sfcmount(8)" in this manual.

Perform mounting as shown below :

- When the mount point is to be specified:

```
# sfcmount /mnt/fs1
Mount point: /mnt/fs1
```

- When a representative partition is to be specified:

```
# sfcmount /dev/sfdsk/gfs/dsk/volume1
Representative partition: /dev/sfdsk/gfs/dsk/volume1
```

- When both the mount point and a representative partition are to be specified:

```
# sfcmount /dev/sfdsk/gfs/dsk/volume1 /mnt/fs1
Representative partition: /dev/sfdsk/gfs/dsk/volume1
Mount point: /mnt/fs1
```

9.2.4.2   Mount of all nodes

For details about sfcmntgl(8), see "B.2.6 sfcmntgl(8)" in this manual.

Mount all nodes are shown below:

-    When the mount point is to be specified:

```
# sfcmntgl /mnt/fs1
Mount point: /mnt/fs1
```

-    When a representative partition is to be specified:

```
# sfcmntgl /dev/sfdsk/gfs/dsk/volime1
Representative partition: /dev/sfdsk/gfs/dsk/volime1
```

-    When both the mount point and a representative partition are to be specified:

```
# sfcmntgl /dev/sfdsk/gfs/dsk/volume1 /mnt/fs1
Representative partition: /dev/sfdsk/gfs/dsk/volume1
Mount point: /mnt/fs1
```

If mounting fails for a node, that name of the node on which the failure occurred is reported.

9.2.4.3　　　　Umount

See

For details about sfcumount(8),see "B.1.5 sfcumount(8)" in this manual.

Umounting must be performed as shown below:

- – When the mount point is to be specified:

```
# sfcumount /mnt/fs1
Mount point: /mnt/fs1
```

- – When a representative partition is to be specified:

```
# sfcumount /dev/sfdsk/gfs/dsk/volume1
Representative partition: /dev/sfdsk/gfs/dsk/volume1
```


Note

You must use sfcumount(8) to unmount a GFS Shared File System.

9.2.4.4　　　　Unmount of all nodes

See

For details about sfcumntgl(8), see "B.2.11 sfcumntgl(8)" in this manual.

- – When the mount point is to be specified:

```
# sfcumntgl /mnt/fs1
Mount point: /mnt/fs1
```

- – When a representative partition is to be specified:

```
# sfcumntgl /dev/sfdsk/gfs/dsk/volume1
Representative partition: /dev/sfdsk/gfs/dsk/volume1
```

If unmounting fails on a node, the name of the node on which the failure occurred is reported.

9.2.5 Checking file system status

Use sfcrscinfo(8) to check whether the GFS Shared File System became available by the mounting.

The following example shows how to check the status(mount status) of the GFS Shared File System whose **representative partition** is /dev/sfdsk/gfs/dsk/volume1 with sfcrscinfo(8).

```
# sfcrscinfo -m /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID    MDS/AC   STATE   S-STATE   RID-1   RID-2   RID-N   hostname
   2    MDS(P)    run       -         0       0       0      mikan
   2    AC        run       -         0       0       0     mikan
   2    MDS(S)    wait      -         0       0       0     mango
   2    AC        run       -         0       0       0     mango
   2    MDS(I)    imag      -         0       0       0     karin
   2    AC        run       -         0       0       0     karin
```

9.2.6 Notes applying when the partitions of a created file system are used

9.2.6.1 The GFS Shared File System

To use the **partition** that has already been created for an existing the GFS Shared File System for a new GFS Shared File System that will be created, first delete the existing file system, and then create the new file system.

For information about deleting a file system, see "9.6 Deleting"

9.2.6.2 File system other than GFS Shared File System

To use the partition where a file system other than a GFS Shared File System is created, make the relevant file system unmounted first, and perform the deletion in accordance with the procedure for the file system. Also delete the definition in /etc/fstab. Finally create a GFS Shared File System.

9.3 Change(shared node information)

9.3.1 Unmount

To changing the GFS Shared File System, unmount for the file system.

9.3.2 Changing the shared node information

The GFS Shared File System stores information about **node**s that share the file system in each partition.

The node information mainly contains the following information:

- – Host ID
- – Host name

Use sfcnode (8) to add and delete node information.

See

For details about sfcnode(8) options, see "B.2.7 sfcnode(8)" in this manual.

The following sections describe how to add and delete node information with sfcnode(8).

9.3.2.1   Adding node information

- Check the configuration of the current file system.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID      status   hostname
   1   80000000   STOP      mango
   1   80000001   STOP      karin
```

- Add the **node** information.

```
# sfcnode -a mikan /dev/sfdsk/gfs/dsk/volume1
```

- Confirm that the node information has been added.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID      status   hostname
   1   80000000   STOP      mango
   1   80000001   STOP      karin
   1   80000002   STOP      mikan
```

Use sfcadm(8) to enable MDS operation on an added node. For details about changing nodes that support MDS operations, see "9.5.2 Change the MDS operational information." In this manual.

9.3.2.2   Deleting node information

- Check the configuration of the current file system.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1

/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID      status   hostname
   1   80000000   STOP      mango
   1   80000001   STOP      karin
   1   80000002   STOP      mikan
```

- Delete the node information

```
# sfcnode -d -h mikan /dev/sfdsk/gfs/dsk/volume1
```

– Confirm that the node information has been deleted.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID     status   hostname
   1   80000000   STOP       mango
   1   80000001   STOP       karin
```


Note information about the primary MDS node and secondary MDS node cannot

be deleted. It can be deleted once the primary MDS node or the secondary MDS

node is changed to another node using sfcadm(8).

9.3.3   Mount

After the GFS Shared File System has been modified, mounted of the file system.

9.4 Change(re-creating a file system)

9.4.1   Unmount

To re-creating the GFS Shares File System, unmount of the file system.

9.4.2   Re-creating the file system

To re-create the file system, use sfcmkfs (8). Using sfcmkfs(8) with the –**o force** option enables the user to use mount for the file system.

The following is an example of using sfcmkfs(8) to re-create a file system with a single partition.

```
# sfcmkfs -o force,node=mikan,karin,mango /dev/sfdsk/gfs/dsk/volume1

Representative partition (meta-data, log, and data) :   /dev/sfdsk/gfs/dsk/volume1
Shared hosts    :   mikan, karin, mango
Primary MDS    :   mikan
Secondary MDS :   karin
```


Re-creating a file system means creating a new file system. Make backup copies because the data in the previous file system is deleted.

9.4.3   Mount

After the GFS Shared File System has been re-created, mount of the file system.

9.5 Change(MDS operational information)

9.5.1 Unmount

To modify the GFS Shared File System, unmount for the file system.

9.5.2 Change the MDS operational information

In the GFS Shared File System, information about all nodes that operate **MDS** is retained.

- Whether MDS placement on all nodes is set

- Number of nodes on which MDS is placed

- Priority of nodes on which to place MDS as primary or secondary MDS

Use sfcadm (8) to change information about nodes on which the MDS is placed.

See

For details about sfcadm(8) options, see "B.2.1 sfcadm(8)" in this manual.

The following sections describe how to change information about nodes on which the MDS is placed using sfcadm(8).

9.5.2.1　　　Enabling MDS placement on all nodes

    − Check the current file system configuration. Two nodes (mikan and karin) are currently in the MDS placement range.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID       status   hostname
   1   80000000   STOP      mikan
   1   80000001   STOP      karin
   1   80000002   STOP      mango
   1   80000003   STOP      ringo

# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mikan,karin
```

    − Change the MDS placement range to all shared hosts.

```
# sfcadm -c all /dev/sfdsk/gfs/dsk/volume1
```

    − Confirm that the MDS placement range has been changed. "**all**" is now displayed to confirm that the MDS placement range includes all nodes.

```
# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mikan,karin,mango,ringo
mdsnode=all
```

If all nodes are set in the MDS placement range, an added node is automatically integrated into the range when a shared node is subsequently added using sfcnode(8).

9.5.2.2　　　Changing the MDS placement range

Specify the MDS placement range using the number of nodes from the first node in the shared host list specified at file system creation.

    − Check the current file system configuration.　"**all**" is currently displayed to confirm that the MDS placement range includes all nodes.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID       status   hostname
   1   80000000   STOP      mikan
   1   80000001   STOP      karin
   1   80000002   STOP      mango
   1   80000003   STOP      ringo

# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mikan,karin,mango,ringo
mdsnode=all
```

    − Change the MDS placement range from all nodes to three nodes (mikan, karin, and

mango).

```
# sfcadm -c 3 /dev/sfdsk/gfs/dsk/volume1
```

– Confirm that the MDS placement range has been changed.

```
# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mikan,karin,mango
```

9.5.2.3 Changing the MDS placement priority

– Check the current file system configuration.

```
# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID    status   hostname
   1   80000000  STOP      mikan
   1   80000001  STOP      karin
   1   80000002  STOP      mango
   1   80000003  STOP      ringo

# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mikan,karin,mango
```

– Change the priorities of nodes on which MDS is placed.

```
# sfcadm -g mango,ringo,mikan /dev/sfdsk/gfs/dsk/volume1
```

– Confirm that the MDS placement range has been changed

```
# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
node=mango,ringo,mikan
```

9.5.3   Mount

After the GFS Shared File System has been modified, mount of the file system.

9.6 Deleting

9.6.1 Unmount

To delete the GFS Shared File System, unmount of the file system.

9.6.2 Deleting the file system

To delete a file system that is not being used in the GFS Shared File System, use the –**D** option of sfcadm(8).

See

For details about sfcadm(8) options, see "B.2.1 sfcadm(8)" in this manual.

The following shows how to delete a file system with sfcadm(8).

- Check the current file system information.

```
# sfcinfo -a
/dev/sfdsk/gfs/dsk/volume1:
FSID special                              size     Type     mount
   1 /dev/sfdsk/gfs/dsk/volume1(e721)    407144    META     -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)      5120    LOG      -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)   3761416    DATA     -----
/dev/sfdsk/gfs/dsk/volume2:
FSID special                              size     Type     mount
   2 /dev/sfdsk/gfs/dsk/volume2(e722)     51394    META     -----
   2 /dev/sfdsk/gfs/dsk/volume2(e722)      5237    LOG      -----
   2 /dev/sfdsk/gfs/dsk/volume2(e722)    523776    DATA     -----
```

- Delete the file system whose representative partition is /dev/sfdsk/gfs/dsk/volume2

```
# sfcadm -D /dev/sfdsk/gfs/dsk/volume2
```

- Confirm that the file system has been deleted.

```
# sfcinfo -a
/dev/sfdsk/gfs/dsk/volume1:
FSID special                                size   Type   mount
   1 /dev/sfdsk/gfs/dsk/volume1(e721)     407144   META   -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)       5120   LOG    -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)    3761416   DATA   -----
```

9.6.3   Removing the entry in /etc/fstab

Delete the entry for the deleted GFS shared file system from /etc/fstab.

Chapter 10　File System Management

This chapter describes the procedures for managing the GFS Shared File System using basic commands.

10.1   File System Management Commands

The GFS Shared File System provides exclusive management commands while file system management commands are multipurpose to support various types of file system.

The GFS Shared File System also provides specific management command for its unique features.

GFS Shared File System management commands

Command	Description
sfcdf	Informs the usage status of a GFS Shared File System.
sfcfsck	Checks a GFS Shared File System for consistency and repairs it.
sfcmkfs	Creates a GFS Shared File System.
sfcmount	Mounts the GFS Shared File System on a local node.
sfcumount	Unmounts the GFS Shared File System on a local node.

GFS Shared File System specific management commands

Command	Description
sfcadm	Changes partition information setting.
sfcfrmstart	Starts FsRM on a local node.
sfcfrmstop	Stops FsRM on a local node.
sfcgetconf	Makes a backup of the management partition.
sfcinfo	Displays partition information.
sfcmntgl	Mounts the GFS Shared File System on all modes.
sfcnode	Adds, deletes, and changes node configuration information.
sfcrscinfo	Displays file system information.
sfcsetup	Initializes the management partition, adds, deletes and displays node information, and displays the path to the management partition.
sfcstat	Reports statistical information of a GFS Shared File System.
sfcumntgl	Unmounts the GFS Shared File System from all nodes.

Commands of GFS Shared File System are classified as follows:

[used in mounted file system]
> sfcumount
> sfcstat

[used in mounted file system]
> sfcfsck, sfcmkfs(except -m), sfcmount
> sfcadm, sfcfrmstart, sfcfrmstop, sfcnode, sfcsetup

[used in mounted file system]
> sfcdf, sfcmkfs -m
> sfcgetconf, sfcinfo, sfcmntgl*1, sfcrscinfo, sfcumntgl

> (*1: An error occurs if the file system is mounted in all shared nodes.)

10.2 Checking a File System for Consistency and Repairing It

If a file system is damaged and its consistency is lost, for example, due to an automatic recovery error after a primary MDS failure, the file system must be checked and restored using sfcfsck(8).

By default, or when "-o log" is specified, sfcfsck(8) repairs the file system by replaying the update log.

If the update log data has been physically damaged, sfcfsck(8) does not execute update log replay, but automatically performs a full check on the file system. To meet the need for immediate system operation resuming, an option "-o elog" that avoids file system restoration while it provides update log replay. If this option is specified, sfcfsck(8) terminates immediately without performing check and recovery when the update log data has been physically damaged. In this event, the file system cannot be mounted unless check and recovery is performed using sfcfsck(8). The mounting on such a file system should be attempted after it is restored through full checking without update log replay by the "-o nolog" option.

The following example repairs a file system with log replay.

```
# sfcfsck /dev/sfdsk/gfs/dsk/volume1
```

The following example performs a full check on the file system and repairs it without log replay.

```
# sfcfsck -o nolog /dev/sfdsk/gfs/dsk/volume1
```


See

For details about sfcfsck(8) options, see "B.1.2 sfcfsck(8)" in this manual.

10.2.1 Action to be taken when fsck terminates abnormally

The following describes available solutions for sfcfsck(8) abnormal termination.

10.2.1.1 Memory allocation request error

The following message is displayed if sfcfsck(8) fails in requesting for memory allocation for the internal table.

Can't allocate memory

Add a swap area.

10.2.1.2 File system configuration information acquisition failure

The following message is output if acquisition of the file system configuration information fails.

Can not connect to FsRM other node information get error

See

See "Configuring the Management Partition and Starting the File System Monitoring Mechanism", and start the file system monitoring mechanism at all shared nodes of the file system.

10.2.1.3 File system partition configuration data error

This message indicates that the command terminated abnormally because a mismatch was found in the **partition configuration data** for the GFS Shared File System partitions.

Can't open <device-name>   <errno> setup: Volume information error setup: fsck quit due to unrecoverable error!

Recover the partition information using sfcadm(8).
Below is the example of /dev/sfdsk/gfs/dsk/volume1.

sfcadm -r -a /dev/sfdsk/gfs/dsk/volume1

10.2.1.4　　　Node addition not performed

The following message is displayed if a **node** cannot be added.

No node volume entry for localhost, file system access forbidden!

Execute sfcfsck(8) at the shared node of the file system.

10.2.1.5　　　Irreparable file system destruction

The following message indicates that the file system is irreparable because of the GFS Shared File System data has been destroyed.

BAD SUPER BLOCK

BAD VOLUME INFORMATION

No Meta volume information available!

No Log volume information available!

Only found <num> data volume(s), total <num> in superblock!

The file system cannot be repaired. If a backup of the file system is available, recover the file system from the backup.

10.2.1.6　　　Operation error

The following message is displayed if there are problems in the parameter or the execution environment of sfcfsck(8).

not super user

duplicate option

filesystem lock failed. errno(<error-number>)

<device-name> is a mounted file system

<device-name> is not for sfcfs

Can't check <device-name>

Can't open /etc/fstab

setmntent failed. errno(<error-number>)

fs_clean is not FSLOG. cannot log replay!

Confirm whether the parameter and the execution user of the command are correct or /etc/fstab and /etc/mtab exist.

10.2.1.7　　　Repairing of file system is non-completion

The following message is displayed if the file system was not repaired completely.

```
***** PLEASE RERUN FSCK *****

<device-name>: UNEXPECTED INCONSISTENCY; RUN sfcfsck MANUALLY.

Log Replay is failed.
```

Execute a full file system check using sfcfsck(8).
Below is the example of /dev/sfdsk/gfs/dsk/volume1.

```
# sfcfsck -o nolog /dev/sfdsk/gfs/dsk/volume1
```

10.2.1.8　　　Other messages

When the message which shows other abnormalities is outputted and sfcfsck(8) is terminates abnormally, please tell your local Customer Support the output message of sfcfsck after collecting the diagnostic data with pclsnap.

10.3 Displaying File System Information

10.3.1 Acquiring file system information

Information about a file system, including the usage status of disk blocks, the state of free disk blocks, and the number of files, can be acquired using sfcdf(8).

sfcdf(8) will display information about each area.
- Use of i-nodes (number of i-nodes, number of free i-nodes)
- Free **extent** status (maximum and unused leaves)
- V-data usage status(maximum and unused V-data blocks)

The following information items is displayed for a **file data area**:
- Total number of blocks and number of free blocks

Only the number of assigned blocks is displayed for an **update log area**.

The following example shows how to display the usage status of a file system using df(1) and sfcdf(8).

```
# df -k /mnt
Filesystem              kbytes     used    avail capacity   Mounted on
/dev/sfdsk/gfs/dsk/volume1
                        113992    62664    39936      62%   /mnt


# sfcdf -v /dev/sfdsk/gfs/dsk/volume1
Filesystem:/mnt
                    inodes      free     vdata     free      leaf      free     Type
/dev/sfdsk/gfs/dsk/volume1
                     14248     12192      4781     4615      7128      7127     META
                    kbytes
/dev/sfdsk/gfs/dsk/volume1
                      5120                                                     LOG
                    kbytes      used      free    %used
/dev/sfdsk/gfs/dsk/volume1
                    113992     62664     51328      55%                        DATA
```

For details about sfcdf(8) options, see "B.1.1 sfcdf(8)" in this manual.

10.3.2　　Displaying partition/node information

The partition information about the partition set configuring the GFS Shared File System can be displayed using sfcinfo(8). Node information can also be displayed.

The following example shows how to display the partition and node information for a file system using sfcinfo(8).

```
# sfcinfo /dev/sfdsk/gfs/dsk/volume1
FSID special                               size   Type   mount
   1 /dev/sfdsk/gfs/dsk/volume1(e721)      25986  META   /mnt
   1 /dev/sfdsk/gfs/dsk/volume1(e721)       5120  LOG    /mnt
   1 /dev/sfdsk/gfs/dsk/volume1(e721)     105751  DATA   /mnt


# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1
/dev/sfdsk/gfs/dsk/volume1:
FSID   hostID    status   hostname
   1   80000001  RUN      mikan
   1   80000002  RUN      karin
   1   80000003  RUN      mango
```

For details about sfcinfo(8) options, see "B.2.5 sfcinfo(8)" in this manual.

10.3.3 Displaying file system management state

The management state of the GFS Shared File System can be checked using sfcrscinfo(8).
Check the information displayed by this command before mounting file systems, unmounting file systems, or changing file system configuration.
The following example shows how to check the management state using sfcrscinfo(8).

```
# sfcrscinfo -am
/dev/sfdsk/gfs/dsk/volume2:
```

FSID	MDS/AC	STATE	S-STATE	RID-1	RID-2	RID-N	hostname
2	MDS(P)	run	-	0	0	0	shoga
2	AC	run	-	0	0	0	shoga
2	MDS(S)	wait	-	0	0	0	ichou
2	AC	run	-	0	0	0	ichou
2	MDS(I)	imag	-	0	0	0	karin
2	AC	run	-	0	0	0	karin

```
  MDS/AC

   MDS(P) :   The primary MDS on a definition

   MDS(S) :   The secondary MDS on a definition

   MDS(I) :   The other nodes to which MDS operates

   AC         :   The node that shares a file system

  STATE/SUB-STATE of MDS

   run   - :   The primary MDS is running

   wait - :   The secondary MDS is waiting for failure recovery of the primary MDS

   imag - :   Waiting for failure recovery of the primary MDS or the secondary MDS

   stop - :   MDS stopped

   none - :   no relation with MDS

   If SUB-STATE is other than "-", MDS is in state-transition.

  STATE/SUB-STATE of AC

   run   - :   file system is in mounted

   stop - :   file system is in unmounted

   If SUB-STATE is other than "-", AC is in state-transition.
```

See

For details about sfcrscinfo(8) options, see "B.2.8 sfcrscinfo(8)" in this manual.

10.4 Using the GFS Shared File System for RMS Cluster Operation

This section explains how to use the GFS Shared File System for RMS cluster operation.

10.4.1 Before using a GFS shared file system in RMS cluster operation

To use the GFS Shared File System in RMS cluster operation, the following RMS environment setting must be performed:

- Registering an RMS host name in /etc/hosts on each node
  RMS recognizes each node that constitutes the RMS cluster from the name of the host to which RMS is attached, as shown in the definition below:

192.168.0.1   sunny   sunnyRMS
192.168.0.2   moony   moonyRMS

- Setting of cluster.config file or .rhosts file with each node
    In order to distribute RMS composition definition information to each node, a RMS wizard uses CF remote services or rcp (1).
    For this reason, a setup of the RMS host name to a setup, .rhost, or hosts.equiv of a cluster.config file is needed.

See

For details on cluster operation, see to "security of CF" of a "*PRIMECLUSTER Cluster Foundation Configuration and Administration Guide*".

10.4.2 To enable use as a shared file system of RMS cluster operation

When the GFS Shared File System is to be used as the shared file system for RMS cluster operation, disk resource and mount point resources must not be defined at RMS application creation.
The GFS Shared File System requires mount information be defined in /etc/fstab, and "noauto" must be specified in the mount options filed.
Note, however, that "noatrc" must not be specified in the "mount options" field as a /etc/fstab description for a file system so that the file system registered in /etc/fstab is automatically mounted on after the GFS Shared File System activation processing.

10.4.3 Setup flow when the GFS Shared File System is to be used in RMS cluster operation

The following shows the flow of the setup procedure to be used when the GFS Shared File System for use in RMS cluster operation is to be created in the GDS volume for which the CIP settings have been completed:

Shared operation (to be executed on node A)	Node A (active node)	Node B (standby node)
Execution of automatic resource registration (See "Procedure 1" in "10.4.4.")	-	-
-	GDS volume creation (See "Procedure 2" in "10.4.4.") Creating the GFS Shared File System management partition (See "Procedure 3" in "10.4.4.")	-
-	Node registration to the GFS Shared File System (See "Procedure 3" in "10.4.4.")	Node registration to the GFS Shared File System (See "Procedure 3" in "10.4.4.")
-	Creating the GFS Shared File System (See "Procedure 3" in "10.4.4.")	-
-	Adding the relevant GFS Shared File System to /etc/fstab (See "Procedure 4" in "10.4.4.")	Adding the relevant GFS Shared File System to /etc/fstab (See "Procedure 4" in "10.4.4.")
RMS configuration definition settings (RMS application switchover definition) (See "Procedure 5" in "10.4.4.")	-	-
-	Start up RMS and check settings (See "Procedure 6" in "10.4.4.")	Start up RMS and check settings (See "Procedure 6" in "10.4.4.")

10.4.4   Setup procedure when the GFS Shared File System is to be used in the RMS cluster operation

This section explains the procedure through an example in the case of creating the GFS Shared File System used for the volume of GDS by RMS cluster employment from the state that a setup of CIP has completed.

🫳■
See

> For details on setting, see the "*PRIMECLUSTER RMS Configuration and Administration Guide*" and the "*PRIMECLUSTER Global Disk Service Configuration and Administration Guide*."

Procedure 1: Execution of automatic resource registration (common operation)

When automatic resource registration of disk equipment is not carried out yet, the following command is executed with a node, and a disk device is registered as a cluster resource.

```
# /etc/opt/FJSVcluster/bin/clautoconfig -r -n
```

Procedure 2: GDS volume creation (node A (active node), node B (standby node))

Create the GDS volume using the following method.
Note that a management partition exclusively for the GFS Shared File System must be prepared on the GFS Shared File System and a volume that differs from the disk class of the GDS volume that is to be used as the switchover file system must be allocated.
The following explanation assumes the node A (active node) host name to be sunny and the node B (standby node) host name to be moony.

[When a mirror volume is to be created]

- Register a disk in the disk class on sunny by using the sdxdisk command.
  In the cluster system, specify a node name as the scope of the **-a** option and then specify shared as the class type.

```
sunny #sdxdisk -M -c class0001 -d sda=DISK1,sdb=DISK2 -a scope=sunny:moony, type=shared
```

- On sunny, disk connection to the mirror disk group is performed with the sdxdisk command.

```
sunny # sdxdisk -C -c class0001 -g grp0001 -d DISK1,DISK2
```

- On sunny, GDS volume creation is performed with the sdxvolume command.
  Note that a volume of at least 40 M byte is necessary for the management partition of the GFS Shared File System.

```
sunny # sdxvolume -M -c class0001 -g grp0001 -v GFSctl -s 81920
```

```
sunny # sdxvolume -M -c class0001 -g grp0001 -v volume0001 -s 17563648
```

- On moony, activation of the GDS volume is performed with the sdxvolume command.

  > moony # sdxvolume -N -c class0001 -v GFSctl
  >
  > moony # sdxvolume -N -c class0001 -v volume0001

[When a single volume is to be created]

- On sunny, disk registration in the disk class is performed with the sdxdisk command.
  In the cluster system, specify a node name as the scope of the **-a** option and then specify shared as the cluster type.

  > sunny # sdxdisk -M -c class0001 -d sda=DISK1:single -a scope=sunny:moony, type=shared

- On sunny, GDS volume creation is performed with the sdxvolume command.
  Note that a volume of at least 40 MB is necessary for the management partition of the GFS Shared File System.

  > sunny # sdxvolume -M -c class0001 -d DISK1 -v GFSctl -s 81920
  >
  > sunny # sdxvolume -M -c class0001 -d DISK1 -v volume0001 -s 17563648

- On moony, activation of the GDS volume is performed with the sdxvolume command.

  > moony # sdxvolume -N -c class0001 -v GFSctl
  >
  > moony # sdxvolume -N -c class0001 -v volume0001

Procedure 3: GFS Shared File System creation (node A (active node), node B (standby node))

Create the GFS Shared File System on either one of the nodes.
Use sfcmkfs(8) to create the GFS Shared File System.
Note that a management partition that is exclusively for the GFS Shared File System must be prepared on the GFS Shared File System and a volume that differs from the disk class of the GDS volume that is to be used as the switchover file system must be allocated.
When the GFS Shared File System is created for the first time after installation, activation of the GFS Shared File System is necessary before file system creation.

- Create a management partition for the GFS Shared File System on either one of the nodes.

  > # sfcsetup -c /dev/sfdsk/class0001/rdsk/GFSctl

- Register node information in the management partition of the GFS Shared File System on each node.

  > sunny # sfcsetup -a /dev/sfdsk/class0001/rdsk/GFSctl
  >
  > moony # sfcsetup -a /dev/sfdsk/class0001/rdsk/GFSctl

- Activate the GFS Shared File System on each node.

  > sunny # sfcfrmstart
  >
  > moony # sfcfrmstart

- Create the GFS Shared File System on either one of the nodes.

  > # sfcmkfs -o node=sunny, moony /dev/sfdsk/class0002/dsk/volume0001

Procedure 4: Adding the relevant GFS Shared File System to /etc/fstab (node A (active node), node B (standby node))

Add the mount information for the relevant GFS Shared File System to /etc/fstab on each node.
Be sure to specify "noauto" in the "mount options" field as a parameter of the mount information to be added.

```
/dev/sfdsk/class0001/dsk/volume0001 /sfcfs sfcfs rw, noauto 0 0
```

Procedure 5: Setting the definition of switchover of the RMS application as the RMS configuration (node A (active node), node B (standby node))

Set up the RMS configuration by using the RMS wizard, as follows:

1. Start the RMS wizard by executing the hvw command.
2. Create the RMS application.
   – Select "Application-Create" on the main RMS management menu.
   – Select "GENERIC" on the application type selection menu.
   – Select "ApplicationName" on the GENERIC wizard menu and change the RMS application name.
   – Select "Machines+Basics" on the GENERIC wizard menu, add another node to operate the RMS application by using "AdditionalMachine" on the Machines+Basics menu, and then set the switchover attribute of the RMS application to "HostFailure|ResourceFailure|ShutDown" by executing "AutoSwitchOver".
   – And then add StartCommands and CheckCommands by using "CommandLines" on the "GENERIC" menu.
3. Create the RMS configuration definition of the RMS application.
   Select "Configuration-Generate" from the main RMS management menu.
4. Activate the RMS configuration definition of the RMS application.
   Select "Configuration-Activate" on the main RMS management menu.
5. End the RMS wizard.

Note

In GFS Shared File System, the following measures are necessary in order to always use GDS volume by active state.

– In RMS application setting, "Gds:Global-Disk-Services" as shared disk resource and "LocalFileSystems" as mount point resource must not set it as RMS target.
– For GDS volume, must not execute /usr/opt/reliant/bin/hvgdsetup.

Procedure 6. Confirming settings (node A (active node), node B (standby node))

After mounting the GFS Shared File System on each node, start RMS and then confirm whether the settings of the /etc/fstab file and the RMS application are proper, paying attention to the following points:

– Whether the GFS Shared File System can be mounted on both nodes according to the /etc/fstab file descriptions.
– Whether the RMS application switches over to a standby node at failover of the active node.

If mounting of the GFS Shared File System fails, the following may be the cause of the failure:

Apply the indicated countermeasure:
– The type of file system specified in /etc/fstab is incorrect.
Solution: Correct the /etc/fstab file.
– The GDS volume is deactivated.
Solution: Activate the GDS volume.

Chapter 11 File System Backing-up and Restoring

This chapter describes how to backing up and restoring data in the GFS Shared File System.

11.1 Type of Backing Up and Restoring

The following describes the backing-up and restoring of the GFS Shared File System using.

- Backing up and restoring file by file
    - General-purpose backing-up tools not dependent on the file system structure (ArcServe/OPEN, Solstice Backup, etc.)
    - Linux Standard commands cpio(1) and tar(1)

- Backing up and restoring entire file system
    - Linux Standard commands dd(1)

The following describes the backing-up and restoring data of the GFS Shared File System in this Chapter.

- Backing-up and restoring data by Linux Standard commands : cpio(1), tar(1) and dd(1) (11.2, 11.3)

11.2 Backing Up by Linux Standard commands

11.2.1 Backing up file by file

To back up a single file or all files under the directory while it is mounted, use cpio(1) or tar(1).
The following are examples of backing-up on tape using cpio(1) and tar(1).

- Backing-up method with cpio(1)

```
# cd /userdata
# find . -depth -print | cpio -oc > /dev/st0
```

- Backing-up method with tar(1)

```
# cd /userdata
# tar cvf /dev/st0.
```


Tapes used for data backup should be labeled for identifying the backing-up method. cron(8) can schedule backing-up startup.

For details about cpio(1) and tar(1), see the online manual.

11.2.2 Backing up entire file system

To back up the GFS Shared File System in file system unit, use dd(1). The following describes the backing-up procedure using dd(1).

Entire-file-system backing-up allows backing-up of the entire file system more quickly than file-by-file backing-up. However, a file system backed up with this method cannot be restored on a file-by-file basis during restoring.

When you back up entire file system, please carry out in the state where the file system was unmounted.

Before executing backing-up, use the following procedure to check the **partition** information for the desired GFS Shared File System. Estimate the backing-up media capacity required for backing-up and the number of required media and then unmount of the GFS Shared File System.

Use sfcinfo(8) to display partition information and make it sure that tape capacity is sufficient. The partition size can be estimated by adding 1 MB to the sum of the values displayed in the size field (in kilobytes).

```
# sfcinfo /dev/sfdsk/gfs/dsk/volume1
FSID special                                size   Type   mount
   1 /dev/sfdsk/gfs/dsk/volume1(e721)      12626   META   -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)       5120   LOG    -----
   1 /dev/sfdsk/gfs/dsk/volume1(e721)     113992   DATA   -----
# dd if=/dev/sfdsk/gfs/dsk/volume1 of=/dev/st0 bs=1024k
```

Tapes used for data backup should be labeled for identifying the backed up partition.

If the file system is too large to fit on a single tape, data needs to be divided and backed up.
Example: In the following example, a partition is backed up in 1 GB units.

```
# dd if=/dev/sfdsk/gfs/dsk/volume1 of=/dev/st0 bs=1024k count=1024
    -> Tape 1
  Tape change
# dd if=/dev/sfdsk/gfs/dsk/volume1 of=/dev/st0 bs=1024k count=1024 skip=1024
    -> Tape 2
  Tape change
# dd if=/dev/sfdsk/gfs/dsk/volume1 of=/dev/st0 bs=1024k count=1024 skip=2048
    -> Tape 3
   Tape change
# dd if=/dev/sfdsk/gfs/dsk/volume1 of=/dev/st0 bs=1024k count=1024 skip=3072
    -> Tape 4
    ...
```

dd(1) does not support multi-tape volumes. If the file system is too large to fit on a single tape, data needs to be divided and backed up. In such cases, set **bs** (block length) and **count** (number of blocks) and increase **skip** (input-side offset (number of blocks)) by the value of count.

11.3 Restoring by Linux Standard commands

The following describes the procedure for restoring a file system from the backup tapes prepared as described earlier.

Two restoring methods are available:
- Restoring file by file using the appropriate Linux Standard commands
- Restoring by file system using dd(1)

11.3.1 File-by-file restoring

Use cpio(1) or tar(1) to restore files saved on a backup tape onto the disk while it is mounted.

See

For details about cpio(1) and tar(1), see the online manual.

The following describes an example of restoring from a tape.

- Method for restoring using cpio(1)

```
# cd /userdata
# cpio -icdm < /dev/st0
```

- Method for restoring using tar(1)

```
# cd /userdata
# tar xvf /dev/st0
```

Restoring from a backup tape must be performed using the same command that was used for backing-up.

11.3.2   Entire-file-system restoring

Restore each partition saved on a backup tape onto the disk using dd(1).
Before executing restoring, unmount the desired GFS Shared File System from all the **node**s using the file system, and unmounted of the file system.

The following is an example.

```
# dd if=/dev/st0 of=/dev/sfdsk/gfs/dsk/volume1 bs=1024k
```

When the partition backed up by not installing the size of the filesystem on one tape volume, and dividing is restored and done, restoration does the partition from the tape in order dividing.
Example: The following is an example of restoring data backed up on separate tapes in units of 1 GB.

```
# dd if=/dev/st0 of=/dev/sfdsk/gfs/dsk/volume1 bs=1024k count=1024

      <- Tape 1

    Tape change

# dd if=/dev/st0 of=/dev/sfdsk/gfs/dsk/volume1 bs=1024k count=1024 seek=1024

      <- Tape 2

    Tape change

# dd if=/dev/st0 of=/dev/sfdsk/gfs/dsk/volume1 bs=1024k count=1024 seek=2048

      <- Tape 3

    Tape change

# dd if=/dev/st0 of=/dev/sfdsk/gfs/dsk/volume1 bs=1024k count=1024 seek=3072

      <- Tape 4

      ...
```

Note

dd (1) does not support multi-tape volumes. To restore data saved on separate backup tapes, specify the same values as those specified on backing-up for the **bs** and count parameters of dd(1). For **seek**, specify the same value as one specified for **skip** on backing-up.

Note

The device information must be updated by sfcadm(8) when restoring the file system to the partition besides the partition backed up. For details on sfcadm(8), see B.2.1 sfcadm(8) in this manual.

Chapter 12   Tuning

This chapter describes how to use a variety of utilities to optimize and make effective use of the GFS Shared File System.

12.1 Tuning Parameters

This section describes the tuning parameter of the **MDS**(Meta Data Server) of the GFS Shared File System.

12.1.1   Amount of Cache

It is possible to tune the following items:

- Amount of **extent-base**d management information to be cached in memory
    (**SFCFS_NCACHE_EXTENT**)
- Amount of directory information to be cached in memory
    (**SFCFS_NCACHE_DIRECTORY**)
- Number of **i-nodes** on the disk to be cached in memory
    (**SFCFS_NCACHE_INODE**)

These values can be specified using sfcadm(8).

For each file system, an area with a size equal to the specified value x 1 kilobytes is reserved for the extent-based management information and for the directory information, and an area with a size equal to the specified value x 4 kilobytes is reserved for i-nodes. All of these areas are in the **MDS** process space.

By the default, 8 megabytes (8192) of memory is secured as 10 megabytes (10240) and an i node as 2 megabytes (2048) and directory information as extent management information.

If the size of a directory exceeds directory cash size, the performance of the file creation to the directory or reference will fall. When the directory where size is big may be created, it recommends strongly setting up the amount of cash of directory information greatly.

Use sfcstat(8), the statistics command specific to the GFS Shared File System, to determine the cache hit ratios for the items above and perform tuning if necessary.

 (Example)

```
# sfcadm -o SFCFS_NCACHE_EXTENT=4096 /dev/sfdsk/gfs/dsk/volume1

# sfcadm -o SFCFS_NCACNE_DIRECTORY=20480 /dev/sfdsk/gfs/dsk/volume1

# sfcadm -o SFCFS_NCACHE_INODE=5120 /dev/sfdsk/gfs/dsk/volume1
```

12.1.2   Communication timeout value

It is possible to tune the following items:

Communcation timeout value of GFS Shared File System(**CON_TIMEOUT**)

CON_TIMEOUT set up time in seconds after a communicative response is lost until it estimates a partner node to be an abnormal state in the monitoring of the node by communication.
This value can be set for every file system.
It is possible to specify a value with sfcadm(8).

The default of a communication timeout value is 180 seconds.

It is not usually necessary to change communication timeout value.

When it is expected that the loading of system becomes high, please set the value of **CON_TIMEOUT** greatly. Please set up the value of **CON_TIMEOUT** small, when there are few file systems to be used and improve the response of the error return from a system call to the time of the blockade accompanying the abnormalities in communication etc. When the number of file system use are 10 or less and set a value of **CON_TIMEOUT** small, its value should be 60 seconds or more.

(Example)

```
# sfcadm -o CON_TIMEOUT=180 /dev/sfdsk/gfs/dsk/volume1
```

Chapter 13   Migration to the GFS Shared File System

This chapter describes how to migrate from the ext2/ext3 file system to the GFS Shared File System.

Note the following items when migrating from the existing ext2/ext3 file system to the GFS Shared File System:

> **Note**
>
> – When files with holes on the ext2/ext3 file system are transferred to the GFS Shared File System, some area is reserved on the storage device and such files no longer have holes.
> A file with a hole means a file containing a part to which no data block has been assigned.

File system migration first requires that files and directories on the ext2/ext3 file system be backed up on another location (for example, on a storage device or another file system). Then, a new GFS Shared File System should be configured, and the files and directories can be expanded. Take the following procedures:

a) Be sure the relevant ext2/ext3 file system is not in use.
b) Save all of the files on the ext2/ext3 file system on a backup device or another file system using a command such as tar(1) and cpio(1).
c) Create the GFS Shared File System, as described in "8.2 Creation", "9.2 Flow from file system creation to mount/unmount."
d) Expand the saved files on the created GFS Shared File System.

The following shows an example of migration on a same partition.

```
# cd /extmnt                  <- /extmnt is the mount point of ext2/ext3 from which migration is performed.

# tar cvpf - . > /data/backup.tar        <-Back up files.

# cd /

# umount /extmnt


Perform GDS settings and management partition settings.

(For details about GDS settings, see "PRIMECLUSTER Global Disk Services Configuration and Administration Guide.")

# sfcmkfs -o node=mikan,mango /dev/sfdsk/gfs/dsk/volume1     <- Configure GFS.

# sfcmount /dev/sfdsk/gfs/dsk/volume1 /sfcfs           <- Mount on GFS.

# cd /sfcfs                  <- Move to the GFS Shared File System mount point.

# tar xvf /data/backup.tar            <- Expand backup files on the GFS Shared File System.
```

Figure Migration from ext2/ext3

Appendix A List of Messages

This appendix explains GFS Shared File System messages.

If a message has an explanation and Response identical to another message, the description is omitted. In this case, see the explanation and Response for the last message.

A.1 AC Messages of the GFS File System

This section describes the AC messages of the GFS File System.

A.1.1 Panic messages

This subsection describes the AC panic messages of the GFS File System.

PANIC: sfcfs: 0001: *mountpoint*: procedure_num is invalid value: procedure_num = *procedure_num*

Explanation

An invalid request for a process was sent from MDS.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0002: *mountpoint*: it cannot found extent that should be found

Explanation

A failure occurred in extent information.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0003: *mountpoint*: It failed update META data. so happened PANIC for fear that the data be destroyed

Explanation

Updating meta-data failed. It resulted in a panic for fear of destroying the meta-data.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0004: *mountpoint*: failed to update extent

Explanation

Updating extent information failed.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0005: *mountpoint*: dirty buffer remaine in inode

Explanation

A panic occurred because the i-node in the writing process onto a physical device was found when blockading was attempted.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0006: *mountpoint*: failed to unmount

Explanation

Unmounting failed.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0007: Failed to XDR encode. xdrmbuf_clearbase: len = *len*: base = *base*: next = *next*

Explanation

XDR encoding failed.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0008: Failed to XDR encode. xdrmbuf_putbytes: has next prev = *has next prev*: prev next = *prev next*

Explanation

XDR encoding failed.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 0009: Failed to XDR encode. xdrmbuf_putbytes

Explanation

XDR encoding failed.

Response

Obtain a crash dump, and contact your local Customer Support.

PANIC: sfcfs: 00010: Failed to XDR encode. xdrmbuf_getpos: base = *base*: private = *private*: mlen = *mlen*: handy = *handy*

Explanation

XDR encoding failed.

Response

Obtain a crash dump, and contact your local Customer Support.

A.1.2   Warning messages

This sub-section describes the AC Warning messages of the GFS File System.

WARNING: sfcfs: 1001: argument address of mount(2) is invalid value. error occurred in copy_from_user() for mountpoint: error = *error*

Explanation

The mount point that the mount system call passed as an argument is an invalid value.

Response

Contact your local Customer Support.

WARNING: sfcfs: 1002: argument address of mount(2) is invalid value. error occurred in copy_from_user() for volumeeinfo: error = *error*

Explanation

The argument address retaining the volume information that the mount system call passed as an argument is an invalid value.

Response

Contact your local Customer Support.

WARNING: sfcfs: 1003: argument address of mount(2) is invalid value. error occurred in copy_from_user() for primaryMDS_saddr: error = *error*

Explanation

The argument address retaining the socket address of primary MDS that the mount system call passed as an argument is an invalid value.

Response

Contact your local Customer Support.

WARNING: sfcfs: 1004: argument address of mount(2) is invalid value. error occurred in copy_from_user() for secondaryMDS_saddr: error = *error*

Explanation

The argument address retaining the socket address of secondary MDS that the mount system call passed as an argument is an invalid value.

Response

Contact your local Customer Support.

WARNING: sfcfs: 1005: *mountpoint*: volume id from MDS is invalid value: volid = *volid*

Explanation

An inconsistency occurred in volid information.

Response

Unmount the relevant file system from all of the nodes, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1006: mountpoint: volume id from MDS is invalid value. so volume is busy: volid = *volid*

Explanation
> The specified volume has been used by another FS or mounted in a different mode.

Response
> Unmount the relevant file system from all of the nodes, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1007: *mountpoint*: failed to open volumes requested from MDS, no volume to open

Explanation
> Opening the volume failed.

Response
> Check the volume status.

WARNING: sfcfs: 1008: failed to read superblock information from disk associated device

Explanation
> Reading the volume information failed.

Response
> Check the connection status to the disk device.

WARNING: sfcfs: 1009: failed to read volume information from disk associated device

Explanation
> Reading the volume information failed.

Response
> Check the connection status to the disk device.

WARNING: sfcfs: 1010: failed to get volume information, when try to get extents: volid = *volid*

Explanation
> An inconsistency occurred in the data volume information management.

Response
> Collect the diagnostic data with pclsnap, and contact your local Customer Support.

WARNING: sfcfs: 1011: failed to access to volume information, when try to get extents: volid = *volid*

Explanation
> The data volume is not accessible.

Response
> Check the volume status, and contact your local Customer Support if it is in the accessible condition.

WARNING: sfcfs: 1012: filesystem is in blockade

Explanation

The file system was blockaded.

Response

Collect the diagnostic   data with pclsnap, and contact your local Customer Support.

WARNING: sfcfs: 1013: *mountpoint*: invalid MOUNT response, so failed to recover: sfi_file = *sfi_file*: mt_file = *mt_file*

Explanation

The call for MDS failure recovery of the file system (*mountpoint*) resulted in an error. The file system (*mountpoint*) becomes no longer available from the node.

Response

Unmount the relevant file system, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1014: *mountpoint*: invalid MOUNT response, so failed to recover: sfi_blksize = *8*: mt_blksize = *mt_blksize*

Explanation

The call for MDS failure recovery of the file system (*mountpoint*) resulted in an error. The file system (*mountpoint*) becomes no longer available from the node.

Response

Unmount the relevant file system, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1015: *mountpoint*: invalid MOUNT response, so failed to recover: sfi_volinfo_len = *sfi_volinfo_len*: mt_volinfo_len = *mt_volinfo_len*

Explanation

The call for MDS failure recovery of the file system (*mountpoint*) resulted in an error. The file system (*mountpoint*) becomes no longer available from the node.

Response

Unmount the relevant file system, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1016: *mountpoint*: invalid MOUNT response, so failed to recover: sfi_vli_blocks = sfi_vli_blocks: mt_volinfo.mt_volinfo_val[num].vli_blocks=*mt_volinfo.mt_volinfo_val[num].vli_blocks*

Explanation

The call for MDS failure recovery of the file system (*mountpoint*) resulted in an error. The file system (*mountpoint*) becomes no longer available from the node.

Response

Unmount the relevant file system, and check the file system configuration and the network, node, and IP address settings.

WARNING: sfcfs: 1017: *mountpoint*: **received header message is short: received size =** *received*

size: **required size =** *required size*

Explanation

> An illegal message was received in communication with MDS of the file system (*mountpoint*). The file system becomes no operational.

Response

> Unmount the relevant file system from the node on which the message was output, and check the network, node, and IP address settings.

WARNING: sfcfs: 1018: *mountpoint*: **received header message is bigger than Request-reply**

message came from MDS: received size = *received size*: **Request-reply message =**

Request-reply message

Explanation

> An illegal message was received in communication with MDS of the file system (*mountpoint:*). The file system becomes no operational.

Response

> Unmount the relevant file system from the node on which the message was output, and check the network, node, and IP address settings.

WARNING: sfcfs: 1019: *mountpoint*: **received body message is short: received size =** *received*

size: **required size =** *required size*

Explanation

> An illegal message was received in communication with MDS of the file system (*mountpoint:*). The file system becomes no operational.

Response

> Unmount the relevant file system from the node on which the message was output, and check the network, node, and IP address settings.

WARNING: sfcfs: 1020: *mountpoint*: **failed to send request to MDS: error =** *error*:

procedure_num = *procedure_num*

Explanation

> An error occurred in communication with MDS of the file system (*mountpoint:*).

Response

> The operation can be continued when no other error message is output.

WARNING: sfcfs: 1021: *mountpoint*: **failed to connect to PrimaryMDS: error =** *error*

Explanation

> Connecting to primary MDS failed. Mounting the file system (*mountpoint:*) fails.

Response

> Check the network, node, and IP address settings.

WARNING: sfcfs: 1022: *mountpoint*: failed to connect to SecondaryMDS: error = *error*

Explanation

Connecting to secondary MDS failed. Mounting the file system (*mountpoint:*) fails.

Response

Check the network, node, and IP address settings.

WARNING: sfcfs: 1023: *mountpoint*: no response of heartbeat from Server MDS, so blockade

Explanation

The system is blockaded because there is no heartbeat **Response** for the host name (hostname) of the file system (*mountpoint:*).

Response

Check the file system whether it is in continuous use. If it is no longer in continuous use, check and restore the network connection and the meta-data server, and then mount the file system again.

WARNING: sfcfs: 1024: *mountpoint*: cannot allocate memory space. so failed to create node for

mountpoint

Explanation

Memory allocation failed.

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1025: *mountpoint*: cannot allocate memory space. so failed to Spawn Xagent

to receive Request from MDS

Explanation

Generating Xagent failed on mounting the file system (*mountpoint:*).

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1026: *mountpoint*: cannot allocate memory space. so failed to run Xagent

Explanation

Activation of the daemon to control multiple hosts to the file system (*mountpoint:*) failed. The mounting fails.

Response

Check the memory and the swap space whether they are sufficient by looking up the console message and so on. If insufficient, increase the size, and then mount the file system again.

WARNING: sfcfs: 1027: *mountpoint*: cannot allocate memory space. so failed to run Clientds

Explanation

Activation of the daemon to control multiple hosts to the file system (*mountpoint:*) failed. The mounting fails.

Response

Check the memory and the swap space whether they are sufficient by looking up the console message and so on. If insufficient, increase the size, and then mount the file system again.

WARNING: sfcfs: 1028: *mountpoint*: cannot allocate memory space for pagecache

Explanation

Memory allocation failed.

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1029: *mountpoint*: cannot allocate memory space for Node

Explanation

Memory allocation failed.

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1030: *mountpoint*: cannot allocate memory space. so failed to allocate Call

Explanation

Memory allocation failed.

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1031: cannot allocate memory space for xdr

Explanation

Memory allocation failed.

Response

Increase the memory or the swap space.

WARNING: sfcfs: 1032: *mountpoint*: mount for fsid=*fsid* was failed, because MDS was releasing the node information which was previously mounted.

Explanation

Mount processing of the file system (*mountpoint*) fails, because MDS was releasing the node information which was previously mounted.

Response

Mount the file system (*mountpoint*) again after some interval.

A. 1. 3　　Information messages

This sub-section describes the AC information messages of the GFS Shared File System.

NOTICE: sfcfs: 2001: *mountpoint:* end of blockade mode

Explanation

The blockade of the file system was lifted.

Response

No Response.

NOTICE: sfcfs: 2002: *mountpoint*: end of recovery-in-progress mode

Explanation

The recovery process for the file system is complete.

Response

No Response.

NOTICE: sfcfs: 2003: *mountpoint*: disconnected from MDS

Explanation

MDS was disconnected and interruption of communication was detected.

Response

Check the communication path whether it has no defect and make it sure that MDS processes exist.

NOTICE: sfcfs: 2004: detect lan down.

Explanation

Network disconnection was detected.

Response

No Response.

NOTICE: sfcfs: 2005: try to disconnect, but XagentSender is now sending, so wait for 30 sec

Explanation

Disconnecting from primary MDS has been queued for thirty seconds because XagentSender is now processing communications.

Response

No Response.

NOTICE: sfcfs: 2006: try to reconnect, but XagentSender is now sending, so wait for 30 sec

Explanation

Re-connecting to primary MDS has been queued for thirty seconds because XagentSender is now processing communications.

Response

No Response.

NOTICE: sfcfs: 2007: *mountpoint*: **The host node tried to reconnect to MDS with modified information, which is not supported. So the mount point was blockaded.**

Explanation

The host node tried to reconnect to MDS with modified information in file system (*mountpoint*), which is not supported.

Response

Mount the file system again after lifting the blockade.

A.2 GFS Shared File System Daemon messages

This section explains the GFS Shared File System daemon messages.

A.2.1 Panic messages

This section explains the panic message of each GFS Shared File System daemon.

A.2.1.1 sfcfs_mds MDS(sfcfsmg daemon)

PANIC: sfcfs_mds:0001: v_count != 0 inode = *ino_pointer* ino = *ino_num*

Explanation

An error was detected in releasing the i-node (*ino_num*) in the file system.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

PANIC: sfcfs_mds:0002: *fsid*: hold count is invalid. type = *number* ino = *ino_num*

Explanation

An error was detected in the reference count of file system data.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

PANIC: sfcfs_mds:0003: *fsid*: Internal Error [*details*]

Explanation

An internal error occurred in the GFS file system. *details* provides the detailed information.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A. 2. 1. 2   sfcprmd daemon

sfcoptdrv:PANIC:Semaphore(semid=*num*) access error, panic for keep data integrity of GFS and continue cluster operation.

Explanation
Operation of a semaphore (*num*) went wrong and it changed into the state where the management continuation of the GFS Shared File System on this node cannot be carried out. Although the panic of this node is carried out for data protection, GFS Shared File System management is continued by other nodes.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcoptdrv:PANIC:sfcprmd(pid=*num*) was down, panic for keep data integrity of GFS and continue cluster operation.

Explanation
sfcprmd was downed and it changed into the state where the management continuation of the GFS Shared File System on this node cannot be carried out. Although the panic of this node is carried out for data protection, GFS Shared File System management is continued by other nodes.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcoptdrv:PANIC:*daemon*(pid=*num*) was down, panic for keep data integrity of GFS and continue cluster operation.

Explanation
The daemon shown by *daemon* was downed and it changed into the state where the management continuation of the GFS Shared File System on this node cannot be carried out. Although the panic of this node is carried out for data protection, GFS Shared File System management is continued by other nodes.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcoptdrv:PANIC:Panic for keep data integrity of GFS and continue cluster operation.

Explanation
Abnormalities occurred and it changed into the state where the management continuation of the GFS Shared File System on this node cannot be carried out. Although the panic of this node is carried out for data protection, GFS Shared File System management is continued by other nodes.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A.2.2 Error messages

This section explains the error messages of each GFS Shared File System daemon.

A.2.2.1 sfcfrmd daemon

ERROR: sfcfrmd:0001: not super-user

Explanation

sfcfrmd is not performed by super-user

Response

Please start sfcfrmd by **sfcfrmstart** command as a super-user.

ERROR: sfcfrmd:0002: associated with a terminal device

Explanation

The direct module is performed.

Response

Please start by **sfcfrmstart**.

ERROR: sfcfrmd:0003: cannot read *pathname*, or something wrong

Explanation

Since there was injustice or file reading of *pathname* went wrong, sfcfrmd starting went wrong.

Response

Please check whether the file of *pathname* is set up correctly.

ERROR: sfcfrmd:0004: cannot get node version *string*

Explanation

Since the version information on *string* could not be acquired, sfcfrmd starting went wrong.

Response

Make sure that /var/opt directory has a space by df(1) command and re-start the node.

ERROR: sfcfrmd:0005: something wrong in *pathname*

Explanation

Since setting injustice was in *pathname*, sfcfrmd starting went wrong.

Response

Please check whether a setup of *pathname* is right.

ERROR: sfcfrmd:0006: cannot allocate memory space

Explanation

Since acquisition of a memory went wrong, sfcfrmd starting went wrong.

Response

Please check the state of a system, and wait for the end of other processes, or increase and reboot a swap domain.

ERROR: sfcfrmd:0007: cannot start service

Explanation

sfcfrmd starting went wrong.

Response

Collect the diagnostic data with "/opt/FJSVsfcfs/sbin/sfcsnap.sh -c output_dir" and pclsnap in all the nodes, and contact your local Customer Support.

ERROR: sfcfrmd:0008: I/O error or data corruption of management partition: *pathname*

Explanation

sfcfrmd failed in reading and writing of *pathname*.

Response

Please check whether a setup as a management partition domain of the GFS Shared File System is right, or a disk operates normally.

ERROR: sfcfrmd:0009: something wrong in cluster settings

Explanation

Since a cluster was not started, sfcfrmd starting went wrong.

Response

Please start a cluster.

ERROR: sfcfrmd:0010: cannot get host name

Explanation

The host name was not able to be acquired.

Response

Please check a setup of an IP address.

ERROR: sfcfrmd:0011: cannot connect to sfcprmd

Explanation

Connection with sfcprmd went wrong.

Response

Please check whether sfcprmd is started.

ERROR: sfcfrmd:0012: cannot connect to sfchnsd

Explanation

Connection with sfchnsd went wrong.

Response

Please check whether sfchnsd is started.

ERROR: sfcfrmd:0013: cannot activate sfchnsd

Explanation

sfchnsd is not activated.

Response

Collect the diagnostic data with "/opt/FJSVsfcfs/sbin/sfcsnap.sh -c output_dir" and pclsnap, and contact your local Customer Support.

ERROR: sfcfrmd:0014: cannot get service port

Explanation
A service port is not able to be acquired.

Response
Please check whether service is set as **/etc/services**.

ERROR: sfcfrmd:0015: cannot get limit of newly created descriptor

Explanation
The maximum value of file descriptor generation was not able to be acquired.

Response
Please check the maximum value of a file descriptor.

ERROR: sfcfrmd:0019: no node information on *special*

Explanation
The node information for this node is not registered into the management partition *special*.

Response
Register the node information using sfcsetup command.

A.2.2.2　　　MDS(sfcfsmg) daemon

ERROR: sfcfs_mds:1001: MDS is failed.

Explanation

MDS failed in recovery mounting.

Response

Contact your local Customer Support.

ERROR: sfcfs_mds:1002: primary MDS is terminated.

Explanation

Primary MDS was terminated abnormally.

Response

Contact your local Customer Support.

ERROR: sfcfs_mds:1003: secondary MDS is terminated.

Explanation

Secondary MDS was terminated abnormally.

Response

Contact your local Customer Support.

ERROR: sfcfs_mds:1004: can't execute primary MDS

Explanation

Starting up primary MDS failed.

Response

Check following points.

- Quantity of memory is enough.
    - Check MemFree and SwapFree of /proc/meminfo.
- State of a network is normal.
    - Check whether DNS server is operating normally.
    - Check whether connection of LAN is normal.
    - Check whether network interface card is normal by ifconfig command.
- Setting of network is normal.
    - Check whether nodes sharing filesystem are described in /etc/hosts.
    - Check whether IP address of a DNS server is described in /etc/resolv.conf.
    - Check whether /etc/host.conf is described correctly.
    - Check whether fire wall is set up correctly so that access of port used by GFS may not be refused.
- State of volume of GDS is normal.
    - Check state of volume of GDS by sdxinfo command. Refer to manual of GDS for details.
- Isn't the disk breakdown?
    - Confirm whether the error message of GDS or a disk driver is outputted to /var/log/messages. When the error message is outputted, please perform disposal corresponding to the message. Refer to the manual of GDS or disk units for details.
- Is the file system configuration information normal?
    - Please execute the following commands and check that the host name of the share node which the sfcinfo(8) command and the sfcrscinfo(8) command display and the host name specified to be -m option of the sfcadm(8) command execution line obtained by the sfcgetconf(8) command are the same.
    - sfcinfo -n <representative partition of the file system>
    - sfcrscinfo -m <representative partition of the file system>
    - sfcgetconf -d <representative partition of the file system> <output destination file name>
    When not the same, please perform the command line which changed into -u option -m option of the sfcadm(8) command execution line obtained by the sfcgetconf(8) command.

When unsolvable by the above methods, collect the diagnostic data with pclsnap, and contact your local Customer Support.

For details on above commands, see "B.2.5 sfcinfo(8)", "B.2.8 sfcrscinfo(8)", and "B.2.4 sfcgetconf(8)" in this manual. Moreover for the details of the sfcadm(8) command execution line obtained by sfcgetconf(8), see "5.5 Backup and restore of the management partition information" in this manual.

ERROR: sfcfs_mds:1005: can't execute secondary MDS

Explanation

Starting up secondary MDS failed.

Response

Check following points.

- Quantity of memory is enough.
    - − Check MemFree and SwapFree of /proc/meminfo.
- State of a network is normal.
    - − Check whether DNS server is operating normally.
    - − Check whether connection of LAN is normal.
    - − Check whether network interface card is normal by ifconfig command.
- Setting of network is normal.
    - − Check whether nodes sharing filesystem are described in /etc/hosts.
    - − Check whether IP address of a DNS server is described in /etc/resolv.conf.
    - − Check whether /etc/host.conf is described correctly.
    - − Check whether fire wall is set up correctly so that access of port used by GFS may not be refused.
- State of volume of GDS is normal.
    - − Check state of volume of GDS by sdxinfo command. Refer to manual of GDS for details.
- Isn't the disk breakdown?
    - − Confirm whether the error message of GDS or a disk driver is outputted to /var/log/messages. When the error message is outputted, please perform disposal corresponding to the message. Refer to the manual of GDS or disk units for details.
- Is the file system configuration information normal?
    - − Please execute the following commands and check that the host name of the share node which the sfcinfo(8) command and the sfcrscinfo(8) command display and the host name specified to be -m option of the sfcadm(8) command execution line obtained by the sfcgetconf(8) command are the same.
      - sfcinfo -n <representative partition of the file system>
      - sfcrscinfo -m <representative partition of the file system>
      - sfcgetconf -d <representative partition of the file system> <output destination file name>
      When not the same, please perform the command line which changed into -u option -m option of the sfcadm(8) command execution line obtained by the sfcgetconf(8) command.

When unsolvable by the above methods, collect the diagnostic data with pclsnap, and contact your local Customer Support.

For details on above commands, see "B.2.5 sfcinfo(8)", "B.2.8 sfcrscinfo(8)", and "B.2.4 sfcgetconf(8)" in this manual. Moreover for the details of the sfcadm(8) command execution line obtained by sfcgetconf(8), see "5.5 Backup and restore of the management partition information" in this manual.

ERROR: sfcfs_mds:1006: can't execute MDS

Explanation

Starting up MDS failed.

Response

Contact your local Customer Support.

ERROR: sfcfs_mds:1007: MDS terminated because logreplay failed errcode = *errcode*

Explanation

The log replay by MDS of the file system failed.

Response

Contact your local Customer Support.

ERROR: sfcfs_mds:1008: *fsid*: Filesystem status is FSBAD, so MDS can not run. fs_clean =

fs_clean

Explanation

Starting up MDS failed, because MDS detected a error in file system.

Response

Unmount the relevant file system from all of the nodes, and execute sfcfsck(8) specifying -o nolog.

ERROR: sfcfs_mds:1009: *fsid*: MDS terminated abnormally because I/O error occurred

continuously on meta-data area of the disk.

Explanation

MDS terminated abnormally because I/O error occurred continuously on meta-data area of the disk.

Response

To resume the system operation, execute sfcfsck(8) in the full check mode first.
Then back up the file system and correct the hardware failure by replacing the failed disk with a new one,
and restore the backed-up data to recover the file system.

A.2.2.3   sfcfsd daemon

ERROR: sfcfsd: 0001: gfs monitor daemon for mountpoint:(*mountpoint:*) abort: *detail*

ERROR: sfcfsd: 0002: gfs monitor daemon for fsid(*fsid*) abort: *detail*

ERROR: sfcfsd: 0003: gfs monitor daemon abort: *detail*

Explanation

The GFS Shared File System monitoring daemon ended abnormally.
The error explained in detail occurred.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0004: can't execute primary MDS: mountpoint:(*mountpoint:*)

Explanation

Starting up the primary MDS has failed.

Response

Please confirm whether the message of sfcfs_mds is output at the same time as this message.   When the message of sfcfs_mds is output, please cope with it according to the message.   Otherwise, collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0005: can't execute secondary MDS: mountpoint:(*mountpoint:*)

Explanation

Start up of the secondary MDS has failed.

Response

Please confirm whether the message of sfcfs_mds is output at the same time as this message.   When the message of sfcfs_mds is output, please cope with it according to the message.   Otherwise, collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0006: can't take over MDS: mountpoint:(*mountpoint:*)

Explanation

Switchover of the MDS failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0007: primary MDS down: mountpoint:(*mountpoint:*)

Explanation

The primary MDS has failed.

Response

Please confirm whether the message of sfcfs_mds is output at the same time as this message.   When the message of sfcfs_mds is output, please cope with it according to the message.   Otherwise, collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0008: secondary MDS down: mountpoint:(*mountpoint:*)

Explanation

The secondary MDS has failed.

Response

Please confirm whether the message of sfcfs_mds is output at the same time as this message.   When the message of sfcfs_mds is output, please cope with it according to the message.   Otherwise, collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0009: can't mount to primary MDS. gfs monitor daemon stop: mountpoint:(*mountpoint:*)

Explanation

Mounting on the primary MDS failed. The GFS Shared File System monitoring daemon terminates.

Response

message.
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0010: can't mount to secondary MDS: mountpoint:(*mountpoint:*)

Explanation

Mounting on the secondary MDS failed.

Response

There is no problem with the file system operation. Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsd: 0011: blockade: mountpoint:(*mountpoint:*)

Explanation

The file system (*mountpoint:*) has been closed.

Response

The target mountpoint: is unavailable and only unmounting can be performed. Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A.2.2.4　　　　sfcfs_mount command

This section explains the sfcfs_mount command messages that is called sfcfsd daemon.

ERROR: sfcfs_mount:0001:*special* : cannot allocate memory

Explanation

The mounting failed due to a memory allocation failure.

Response

Check the system status and wait for the termination of another process or increase the swap space, and re-execute the command.

ERROR: sfcfs_mount:0002:*special* : signal(2) is error:*errmsg*

Explanation

The mounting failed due to an internal error.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

ERROR: sfcfs_mount:0003:*special* : cannot connect to FsRM

Explanation

The file system monitoring mechanism is not operating.

Response

Check whether the file system monitoring mechanism is running.

ERROR: sfcfs_mount:0004:*special* is not found in file system configuration information

Explanation

The specified partition (special) does not exist in the file system configuration information.

Response

Check whether the specified partition is correct.

ERROR: sfcfs_mount:0005:*special* : cannot read file system configuration information

Explanation

Reading the file system configuration information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfs_mount:0006:*special* : Cannot get port number of sfcfs-n for [P-MDS| S-MDS], not found in /etc/services

Explanation

The port number definition used in Ac-to-MDS communication is not found.

Response

Review the port number definition in /etc/services.

ERROR: sfcfs_mount:0007:*special* : Cannot get host address of *hostname* for [P-MDS| S-MDS], not found in /etc/hosts

Explanation

The host name information for AC-to-MDS communication cannot be obtained.

Response

Review the host name definition in /etc/hosts, or change the host name with sfcadm(8).

ERROR: sfcfs_mount:0009:*special* : can not make directory path: *errmsg*

Explanation

Creating a directory failed.

Response

Take action according to errmsg.

ERROR: sfcfs_mount:0010: *special* is already mounted, *mount_point* is busy

Explanation

The mounting fails because it has already been mounted.

Response

Check whether the mounting has not been done with mount(8), and take action.

ERROR: sfcfs_mount:0011:*special* : recovery mount is in progress

Explanation

The mounting cannot be performed because recovery processing is in progress.

Response

No particular action is required.

ERROR: sfcfs_mount:0012:*special* : cannot connect to Primary-MDS

ERROR: sfcfs_mount:0013:*special* : cannot connect to Secondary-MDS

Explanation

Access Client cannot connect to meta-data server. Therefore, mount the file system will be failed.

Response

Check meta-data server down. In this case, try mount again.

ERROR: sfcfs_mount:0014:*special* : sfcfs is not supported by kernel

Explanation

The sfcfs module has not been loaded.

Response

Check whether the sfcfs module has been loaded.

ERROR: sfcfs_mount:0015:*special,mountpoint*: mount(2) is error: *errmsg*

Explanation
An unexpected error was detected on the mounting.

Response
Check whether special and mountpoint actually exist. When it does not exist, it is possible that the specification of a directory or a file is error, or the directory of mountpoint is not created.
When an error is in specification, please specify the correct file and directory.
Please create a directory, when the directory of mountpoint is not created.
When each of the file and the directory exists, the host name of the sharing node of the relevant file system may not be a thing on the same network. Please confirm host name of the node information with the sfcinfo (8) command with -an option.
Please perform sfcfs_mount again after changing into the host name on the same network by the sfcadm (8) command with -u option, when the specification host name is wrong.

When unsolvable by the above methods, collect the diagnostic data with pclsnap, and contact your local Customer Support.

For details on sfcinfo(8),sfcadm(8), see "B.2.5 sfcinfo(8)","B.2.1 sfcadm(8)" in this manual.

ERROR: sfcfs_mount:0016:*special* : cannot add mount information to /etc/mtab

Explanation
The mounting succeeded, but adding the mount information to /etc/mtab failed.

Response
Check the /etc/mtab settings and add the relevant mount information to /etc/mtab.

ERROR: sfcfs_mount:0017:*special* : cannot delete mount information in /etc/mtab

Explanation
Deleting the mount information from /etc/mtab failed.

Response
Check the /etc/mtab settings and delete the relevant mount information from /etc/mtab.

ERROR: sfcfs_mount:0018:*special* : unknown error(*errno*)

Explanation
An unknown error was detected.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A.2.25 sfcpncd daemon

ERROR: sfcpncd:0001: Permission denied. Abort.

Explanation
Execution was attempted with other than super-user permission.

Response
Do not execute the module directly.

ERROR: sfcpncd:0002: Initialize fail. Abort.

Explanation
sfcpncd failed booting.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcpncd:0003: Cannot create the semaphore. Abort.

Explanation
Creation of the semaphore failed.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcpncd:0004: Fatal error. Abort.

Explanation
sfcpncd terminated abnormally.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A.2.2.6　　　sfcprmd daemon

ERROR: sfcprmd:0001: Permission denied. Abort.

Explanation

Execution was attempted with other than super-user permission.

Response

Do not execute the module directly.

ERROR: sfcprmd:0002: Initialize failed. Abort.

Explanation

sfcprmd failed booting.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcprmd:0003: Cannot open /dev/null. Abort.

Explanation

Opening **/dev/null** failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcprmd:0004: Cannot access to the /var/opt/FJSVsfcfs/.sfcprmd_uds. Abort.

Explanation

Accessing /var/opt/FJSVsfcfs/.sfcprmd_uds failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcprmd:0005: Memory not enough. Abort.

Explanation

There is insufficient memory to allow sfcprmd to boot.

Response

Increase the amount of memory or the size of the swap area.

ERROR: sfcprmd:0007: Cannot access to the semaphore of sfcpncd. Abort.

Explanation

The semaphore created by sfcpncd cannot be accessed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

A. 2. 3　　Warning messages

This section explains the Warning message of each daemon of the GFS Shared File System.

A. 2. 3. 1　　MDS(sfcfsmg) daemon

WARNING: sfcfs_mds:2001: *fsid*: daemon create failed(lock_init failed). errcode = *errcode*

Explanation

Generating the daemon failed at mounting the file system (fsid) due to a failure in the lock object initialization.

Response

Increase memory or the size of the swap area.

WARNING: sfcfs_mds:2002: daemon create failed(can't create thread).

Explanation

A daemon could not be created when mount file system.

Response

Increase memory or the size of the swap area.

WARNING: sfcfs_mds:2003: *fsid*: daemon create failed (can't create thread).

Explanation

A daemon could not be created when mount file system (*fsid*).

Response

Increase memory or the size of the swap area.

WARNING: sfcfs_mds:2004: *fsid*: bad dir: invalid offset. ino = *ino-num* offset = *offset*

WARNING: sfcfs_mds:2005: *fsid*: bad dir: ino = *ino-num*

WARNING: sfcfs_mds:2006: *fsid*: bad dir: invalid flags. ino = *ino-num* flags= *flags*

WARNING: sfcfs_mds:2007: *fsid*: bad dir: size error. ino = *ino-num* size= *size*

Explanation

An error was detected in a directory entry of *fsid*

Response

Unmount the relevant file system from all of the nodes, and execute sfcfsck(8) specifying -o nolog.

WARNING: sfcfs_mds:2008: *fsid*: meta data read error. type = *number* dev = *dev_num* block =

block_num size = *size*   errcode = e*rrcode*

WARNING: sfcfs_mds:2009: *fsid*: meta data read error. type = *number* dev = *dev_num* block =

block_num size = *size*   errcode = e*rrcode*

Explanation
> An error occurred during an attempt to read the meta-data area from a device *dev_num*.

Response
> Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2010: *fsid*: bitmap read error. type = *number* dev = *dev_num* block =

block_num size = *size*   errcode = e*rrcode*

WARNING: sfcfs_mds:2011: *fsid*: bitmap read error. type = *number* dev = *dev_num* block =

block_num size = *size*   errcode = e*rrcode*

Explanation
> An error occurred during an attempt to read the bitmap area from a device *dev_num*.

Response
> Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2012: bitmap read error. type = *number* dev = *dev_num* block =

block_num size = *size*   errcode = e*rrcode*

Explanation
> An error occurred during an attempt to read the bitmap area from a device *dev_num.*

Response
> Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2013: *fsid*: bitmap write error. type = *number* dev = *dev_num*   block =

block_num size = *size*

Explanation
> An error occurred during an attempt to write to the bitmap area on a device *dev_num*.

Response
> Unless message sfcfs_mds: 2014 or sfcfs_mds: 2015 is issued, recovery by retry processing was
> successful, so no Response is required.

WARNING: sfcfs_mds:2014: *fsid*: **bitmap write error information was lost. type =** *number* **dev =** *dev_num* **block =** *block_num* **size =** *size*   **errcode =** *errcode*

Explanation

An error occurred during an attempt to write to the bitmap area on a device *dev_num*. Part of the file system (*fsid*) information was lost.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2015: bitmap write error information was lost. type = *number* **dev =** *dev_num* **block =** *block_num* **size =** *size*   **errcode =** *errcode*

Explanation

An error occurred during an attempt to write to the bitmap area on a device *dev_num*. Part of the file system (*fsid*) information was lost.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2016: *fsid*: **meta data write error. type =** *number* **dev =** *dev_num* **block =** *block_num* **size =** *size* **errcode =** *errcode*

Explanation

An error occurred during an attempt to write to the meta-data area on a disk.

Response

Unless message sfcfs_mds: 2017 is issued, recovery by retry processing was successful, so no **Response** is required.

WARNING: sfcfs_mds:2017: *fsid*: **meta data write error. information was lost. type =** *number* **dev =** *dev_num* **block =** *block_num* **size =** *size*   **errcode =** *errcode*

Explanation

An error occurred during an attempt to write to the meta-data area on a disk. Part of the file system information was lost.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2018: *fsid*: **super block write error. dev =** *dev_num* **block =** *block_num* **size =** *size*   **errocede =** *errcode*

Explanation

An error occurred during an attempt to write a super block to a disk.

Response

Unless message sfcfs_mds: 2019 is issued, recovery was performed by retry processing, so no **Response** is required.

WARNING: sfcfs_mds:2019: *fsid*: super block write error. information was lost. dev = *dev_num*

block = *block_num* size = *size*   errocode = *errcode*

Explanation

An error occurred during an attempt to write a super block to a disk.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2020: *fsid*: LOG daemon is dead.

Explanation

The log daemon stopped processing because it could not recover from a failure to write to the update log area.

Response

Because of an I/O error, the update log daemon was not able to operate and terminated. The file system access performance is degraded because operation is continued without the update log available. Back up the file system, and take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2021: *fsid*: cannot access: too many I/O errors. dev = *dev_num*

Explanation

The file system was blockaded due to a writing error to the super block on the device number dev_num in the file system (*fsid*). In the future, access to this file system will be an error return.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2022: *fsid*: volume information write error. dev = *dev_num* block =

block_num* size = *size* errcode = *errcode

WARNING: sfcfs_mds:2023: *fsid*: volume information write error. dev = dev_num block =

block_num size = size errcode = errcode

Explanation

An error occurred during an attempt to write a partition configuration data to a disk.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2024: *fsid*: cannot delete extent. ino = *number* offset = *offset* block =

block* errcode = *errcode

Explanation

An error in extent-based management of a file system (*fsid*) was detected.

Response

Unmount the relevant file system from all of the nodes, and execute **sfcfsck(8)** specifying **-o nolog**.

WARNING: sfcfs_mds:2025: *fsid*: no extent exists. ino = *number* subnode = *subnode* errcode = *errcode*

Explanation

An error in extent-based management of a file system (*fsid*) was detected.

Response

Unmount the relevant file system, and execute **sfcfsck(8)** specifying **-o nolog**.

WARNING: sfcfs_mds:2026: *fsid*: super block read error. dev = *dev_num* errcode = *errrcode*

Explanation

An error in extent-based management of a file system (*fsid*) was detected.

Response

Unmount the relevant file system, and execute **sfcfsck(8)** specifying **-o nolog**.

WARNING: sfcfs_mds:2027: super block read error. errcode = *errrcode*

Explanation

A super block could not be read when the mount the file system (*fsid*) started

Response

Unmount the relevant file system, and execute sfcfsck(8) specifying -o nolog.

WARNING: sfcfs_mds:2028: *fsid*: partition configuration read error. dev = *dev_num* errcode = *errcode*

Explanation

Partition configuration data could not be read when mount the file system (*fsid*) started.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2029: partition configuration read error. errcode = *errcode*

Explanation

Partition configuration data could not be read when mount the file system started.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2030: *fsid*: node information not found for *node*

Explanation

Information for *node* was not found in the file system (*fsid*).

Response

Register correct node information using **sfcsetup(8)**.

WARNING: sfcfs_mds:2031: *fsid*: primary and secondary super blocks are different. dev = *dev_num*

Explanation

An inconsistency was detected between the contents of the primary super block and the contents of the secondary super block on the indicated device.

Response

Specify the partition of device number *dev_num* using **sfcinfo(8)**, and perform the procedure of "C.5 Action to be taken when the file system configuration information is inconsistent"

sfcinfo -d *dev_num*

WARNING: sfcfs_mds:2032: *fsid*: primary and secondary volume informations are different. dev=*dev_num*

Explanation

An inconsistency was detected between the contents of the primary partition configuration data and the contents of the secondary partition configuration data on the device.

Response

Specify the partition of device number *dev_num* using **sfcinfo(8)**, and perform the procedure of "C.5 Action to be taken when the file system configuration information is inconsistent"

sfcinfo -d *dev_num*

WARNING: sfcfs_mds:2033: *fsid*: super blocks differ. dev *dev_num* to *dev_num*

Explanation

An inconsistency was found in the super block information in the indicated file system (*fsid*) in a multiple partition configuration.

Response

Specify the partition of device number *dev_num* using **sfcinfo(8)**, and perform the procedure of "C.5 Action to be taken when the file system configuration information is inconsistent"

sfcinfo -d *dev_num*

WARNING: sfcfs_mds:2034: mmap can't access between other nodes. mnt= *mount_point*, ino=*i-number*, nodename(*node1*, *node2*), mode(*mode1*,*mode2*)

Explanation

open(2) and **mmap(2)** that cannot be maintain the consistency of the data were issued to the same file.

Response

Please wait for the termination of the process running on the "*node1*" indicated this message, and execute again.
To determine the process using the *i-number*, act according to the following sequence:
 i) determine the filename of the *i-number*, using **find(1)** with **-inum** option.
 ii) determine the process ID that uses the filename, using fuser(1).
 iii) determine the command name of the process ID, using **ps(1)**.

WARNING: sfcfs_mds:2035: MDS(recover) is timed out.

Explanation

MDS detected a timeout at recovery mounting.

Response

Reboot the system and perform the mounting again.

WARNING: sfcfs_mds:2036: can't allocate memory in primary

Explanation

Memory could not be allocated on the file system.

Response

Increase memory or the size of the swap area.

WARNING: sfcfs_mds:2037: read error on log partition (errno = *errno* errcode = *error_code*):

mount_point

Explanation

An error occurred during an attempt to read the log partition.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2038: read error on meta partition (errno = *errno* errcode = *error_code*):

mount_point

Explanation

An error occurred during an attempt to read the meta partition.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2039: write error on log partition (errno = *errno* errcode = *error_code*):

mount_point

Explanation

An error occurred during an attempt to write the log partition.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2040: write error on meta partition (errno = *errno* errcode = *error_code*):

mount_point

Explanation

An error occurred during an attempt to write the meta partition.

Response

Take action according to the instructions in "C.2.1 Action for I/O errors."

WARNING: sfcfs_mds:2041: can't receive heartbeat procedure. status = *status*

Explanation

Communication with the AC was lost. The file system cannot be used from the node.

Response

Unmount the indicated file system. Check the network, node, and IP address settings.

WARNING: sfcfs_mds:2042: *fsid*: The size of the partition might have been changed after the file system was made.

Explanation

The size of the partition which constitutes the filesystem (*fsid*) might have been changed.

Response

Please perform the procedure (from step 6 on) described on "C.5 Action to be taken when the file system configuration information is inconsistent".

The file system can keep on using. But GFS Shared File System can not be expanded by size expansion of the partition which constitutes the GFS Shared File System. Please perform the procedure above promptly.

A.2.3.2   sfcfsd daemon

WARNING: sfcfsd: 0001: invalid parameter(*param*), so it is ignored

Explanation

An invalid value was detected in tunable parameters for the file system, and it is ignored.

Response

Review the file system's tunable parameters.

A. 2. 4　Information messages

This section explains the information messages of each GFS Shared File System daemon.

A. 2. 4. 1　sfcfrmd daemon

NOTICE: sfcfrmd:0001: serve as master

Explanation

sfcfrmd was started as a master.

Response

None.

NOTICE: sfcfrmd:0002: serve as slave

Explanation

sfcfrmd was started as a slave.

Response

None.

NOTICE: sfcfrmd:0003: service start

Explanation

Service of sfcfrmd was started.

Response

None.

NOTICE: sfcfrmd:0004: service stop

Explanation

Service of sfcfrmd was completed.

Response

None.

NOTICE: sfcfrmd:0029: element node = *CIPname(hostid)*

Explanation

The system recognized the configuration node with *CIPname*(CIP host name) and *hostid*(host ID)

Response

None.

A. 2. 4. 2　　　　MDS(sfcfsmg) daemon

NOTICE: sfcfs_mds:3001: *fsid*: file system full

Explanation

There is no more space in file data area of the file system (*fsid).*

(For an ordinary user, this message is also output when space drops below the **minfree** limit.)

Response

Expand the file system, delete unnecessary files, or move files to a file system that has enough space. To expand the file system, use **sfcsetup(8)**.

NOTICE: sfcfs_mds:3002: *fsid*: out of inodes

Explanation

There is no more space in i-node area of the file system (*fsid*).

Response

Expand the file system, delete unnecessary files or move files to a file system that has enough space. To expand the file system, use **sfcsetup(8)**.

NOTICE: sfcfs_mds:3003: *fsid*: file system meta data full (Vdata) type = *number*

Explanation

There is no more space in V-data area of the file system (*fsid*).

Response

Expand the file system, delete unnecessary files or directories, or move files to a file system that has enough space. To expand the file system, use **sfcsetup(8)**.

NOTICE: sfcfs_mds:3004: *fsid*: too much fragment (extent)

Explanation

There is no more area for managing unused space in the file system (*fsid*) because of area fragmentation. An area released by subsequent area release processing may become an invalid area.

Response

Back up the file system, and then re-create and restore it to unfragment the fragmented areas in the file system.

NOTICE: sfcfs_mds:3005: *fsid*: bad namelen == 0 parent ino = *number*

Explanation

An illegal path name request was made in a directory operation of the file system (*fsid)..*

Response

No Response is required because the system rejected the illegal request and continues processing. If this error occurs frequently, identify the target directory using parent ino and the operation making the illegal request, and take appropriate action.

NOTICE: sfcfs_mds:3006: *fsid*: I/O error on log: dev = *dev_num* block = *block_num* size = *size* errcode = *errcode*

Explanation

The system could not write an update log on device *dev_num* of the file system (*fsid*).

Response

Unless message sfcfs_mds: 2020 is issued, recovery by retry processing was successful, so no Response is required.

NOTICE: sfcfs_mds:3007: *fsid*: primary super block read failed, but secondary read. dev = *dev_num* block = *block_num* size = *size* errcode = *errcode*

Explanation

The primary super block on the device *dev_num* of the file system (*fsid*) could not be read. Processing was continued because the secondary super block was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3008: primary super block read failed, but secondary read.errcode = *errcode*

Explanation

The primary super block on the device of the file system could not be read. Processing was continued because the secondary super block was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3009: *fsid*: secondary super block read failed, but primary read. dev = *dev_num* block = *block_num* size = *size*

Explanation

The secondary super block on the device *dev_num* of the file system (*fsid*) could not be read. Processing was continued because the primary super block was read correctly.

Response

File system manipulation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3010: secondary super block read failed, but primary read.*errcode* = errcode

Explanation

The secondary super block on the device of the file system could not be read. Processing was continued because the primary super block was read correctly.

Response

File system manipulation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3011: *fsid*: primary partition configuration read failed, but secondary read.

dev = *dev_num* block = *block_num* size = *size* errcode = *errcode*

Explanation

Primary partition configuration data on the device *dev_num* of the file system (*fsid*) could not be read. Processing was continued because the secondary partition configuration data was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3012: primary partition configuration read failed, but secondary read.

errcode = *errcode*

Explanation

Primary partition configuration data on the device of the file system could not be read. Processing was continued because the secondary partition configuration data was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3013: *fsid*: secondary partition configuration read failed,   but   primary

read. dev = *dev_num* block = *block_num* size = *size* errcode = *errcode*

Explanation

Secondary partition configuration data on the device *dev_num* of the file system (*fsid*) could not be read. Processing was continued because the primary partition configuration data was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3014: secondary partition configuration read failed,   but   primary   read.

errcode = *errcode*

Explanation

Secondary partition configuration data on the device of the file system could not be read. Processing was continued because the primary partition configuration data was read correctly.

Response

File system operation can be continued. However, because a block error occurred, promptly take action according to the instructions in "C.2.1 Action for I/O errors."

NOTICE: sfcfs_mds:3015: *fsid*: can't get partition size.dev = *dev_num*: errcode = *errcode*

Explanation

The size of the specified partition on the device *dev_num* of the file system (*fsid*) could not be obtained. Processing was continued because the primary super block was read correctly.

Response

Unmount the file system, and make the super blocks consistent using sfcadm(8).

NOTICE: sfcfs_mds:3016: can't get partition size.

Explanation

The size of the specified partition on the device of the file system could not be obtained. Processing was continued because the primary super block was read correctly.

Response

Unmount the file system, and make the super blocks consistent using sfcadm(8).

NOTICE: sfcfs_mds:3017: nodename mismatch. *node <-> node*

Explanation

A node with an existing hostid and nonexistent node name was registered in the file system.

Response

Unless sfcfs_mds: 2030 is issued, no **Response** is required.

A. 2. 4. 3   sfcprmd daemon

NOTICE: sfcprmd:0006: *daemon* **was respawn fail.**

Explanation

The daemon indicated by *daemon* failed to reboot.

Response

None.

A.3 GFS Shared File System Exclusive Management Command Messages

This section describes messages that can be output when GFS Shared File System exclusive management commands are used.

A.3.1 sfcdf command

sfcdf: ERROR: cannot open *special*: *errmsg*

Explanation

Opening the partition (special) failed.

Response

Take action according to errmsg.

sfcdf: ERROR: cannot allocate memory

Explanation

Memory allocation failed.

Response

Wait for the termination of another process or increase the swap space, and re-execute the command.

sfcdf: ERROR: cannot connect to FsRM

Explanation

The file system monitoring mechanism is not operating.

Response

Check whether the file system monitoring mechanism is running.

sfcdf: ERROR: cannot read file system configuration information

Explanation

Reading the file system configuration information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcdf: ERROR: *special* file system configuration information is full of entry

Explanation

The file system configuration information has reached the limit.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcdf: ERROR: *special* is not a sfcfs file system

Explanation

The specified partition (special) is not an sfcfs file system partition.

Response

Check whether the specified partition is an sfcfs file system partition.

sfcdf: ERROR: unknown error = *errid*

Explanation

An unexpected error was detected.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcdf: ERROR: filesystem(*special*) is already locked

Explanation

The partition (special) is unavailable because another command is using it.

Response

Upon termination of the other command, re-execute the command.

sfcdf: ERROR: cannot read the {superblock | volume information} of *special*

Explanation

Reading the superblock or volume information on the partition (special) failed.

Response

Delete the target file system where it is unnecessary. For details, see "9.6 Deleting" in this manual. When it is a necessary file system, restore it running a full scan with sfcfsck(8). For details, see "C.2.1 Action for I/O errors" in this manual.

sfcdf: ERROR: cannot stat *special*: *errmsg*

Explanation

Obtaining the attribute of the specified partition (special) failed.

Response

Take action according to errmsg.

sfcdf: ERROR: filesystem(*special*) is not shared for this node

Explanation

The command was executed on a node other than the nodes sharing the file system.

Response

Execute the command on a file system sharing node.

sfcdf: ERROR: meta volume is not found

Explanation

An error was detected in volume information.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcdf: ERROR: invalid magic word 0x*magic*

Explanation

The partition configuration data of the specified partition is invalid.

Response

Check whether the specified partition is an sfcfs file system partition.

sfcdf: ERROR: invalid device: special

Explanation

The specified partition (special) is invalid.

Response

Check whether the specified partition is correct.

sfcdf: ERROR: cannot ioctl(BLKGETSIZE) *special*: *errmsg*

Explanation

Obtaining the size of the device (special) failed.

Response

Take action according to errmsg.

sfcdf: ERROR: lseek64 error *retval*: *errmsg*

Explanation

An error occurred in the special file (special) I/O operation.

Response

Take action according to errmsg.

sfcdf: ERROR: {primary | secondary} {superblock | volinfo} read error: *errno*

Explanation

A read error occurred with the {primary | secondary} superblock.

Response

Check the disk status.

sfcdf: ERROR: fs structure is wrong

Explanation

The specified file system is not an sfcfs file system.

Response

Check whether the specified file system is an sfcfs file system.

sfcdf: ERROR: volume information for this node is not found

Explanation

The command was executed on a node other than the nodes sharing the file system.

Response

Execute this command on a file system sharing node.

sfcdf: ERROR: *special* is not a block device

Explanation

special is not a block device.

Response

Check whether the specified partition is correct.

A. 3. 2　　sfcfsck command

For details about sfcfsck(8) error messages, see "10.2.1 Action to be taken when fsck terminates abnormally".

A. 3. 3　　sfcmkfs command

sfcmkfs:ERROR: {Node| Mds | Partition} is not same

Explanation

The specified configuration is not the same as the configuration of the previously created file system.

Response

When specifying the **-o force** option, specify the same configuration as that of the previously created file system and re-execute the command.

sfcmkfs:ERROR: Argument out of range: *value*

Explanation

An overflow occurred because the value *value* specified for an option was too large.

Response

Specify a correct value within the range allowed for each option, and re-execute the command.

sfcmkfs:ERROR: Bad numeric arg: *string*

Explanation

The nonnumeric character string *string* was specified for an option parameter for which a numeric value must be specified.

Response

Specify a correct parameter value.

sfcmkfs:ERROR: Cannot find {any| free} port of sfcfs in *file*

Explanation

A failure occurred because all communication port numbers have been used.

Response

Add a new communication port number for sfcfs to /etc/services.

sfcmkfs:ERROR: Cannot connect to cluster

sfcmkfs:ERROR: can not connect to CLUSTER SYSTEM

Explanation

Connecting to the cluster control mechanism failed.

Response

Make sure that the cluster control mechanism is operating using the ps command, and re-execute the command.

sfcmkfs:ERROR: Cannot look up *raw_device_file*

Explanation

Specified raw_device_file was not found.

Response

Check whether the specified special file name is correct, and re-execute the command.

sfcmkfs:ERROR: Cannot look up *raw_device_file* in *node*

Explanation

The specified raw device file raw_device_file could not be found.

Response

Specify the name of a special file that can be shared by the specified hosts, and re-execute the command.

sfcmkfs:ERROR: Cannot open file : *filename*

Explanation

Opening the file filename failed.

Response

Check whether the file filename exists, and re-execute the command.

sfcmkfs:ERROR: Data area is too small, can't mkfs

Explanation

The file data area is not sufficient in size, and therefore, a file system cannot be created.

Response

Review parameters so that a sufficiently large file data area can be reserved.

sfcmkfs:ERROR: can not open special: *filename(errmsg)*

Explanation

Opening the special file filename failed.

Response

Take action according to the detailed information errmsg.

sfcmkfs:ERROR: sfcfs_synctab : Cannot write to file system configuration information : *errmsg*

Explanation

Updating the file system configuration information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of errmsg.

sfcmkfs:ERROR: Illegal option: *option*

Explanation

An illegal option was specified.

Response

Specify a correct option and argument.

sfcmkfs:ERROR: Invalid magic word 0x*magic*

Explanation

Part of the management data of the specified GFS Shared File System was destroyed.

Response

Restore it with sfcfsck(8) or delete it properly with sfcadm(8).

sfcmkfs:ERROR: raw_device_name is not full path name

Explanation

Specified raw_device_name is not the absolute path name.

Response

Specify the absolute path name for raw_device_name, and re-execute the command.

sfcmkfs:ERROR: Master partition is small, log area space not enough

Explanation

The update log area cannot be created because the representative partition is too small.

Response

Check the specified parameter, allocate enough space for the representative partition, and re-execute the command.

sfcmkfs:ERROR: Master partition is small, meta area not enough

Explanation

The meta-data area cannot be created because the representative partition is too small.

Response

Review the specified parameter, secure sufficient space on the representative partition, and re-execute the command.

sfcmkfs:ERROR: Metasz small, can't mkfs

Explanation

Creation of a file system stops because the meta-data area is too small for managing the specified data area and file.

Response

Specify a larger value for a metasz parameter in order to increase the size of the meta-data area, or review such a parameter as nbpi for less meta-data space.

sfcmkfs:ERROR: No response from *node*

Explanation

Communication for the host specified for *node* has not been enabled.

Response

When communication for the host has been enabled, re-execute the command.

sfcmkfs:ERROR: Not super-user

Explanation

The user executing this command is not a super-user.

Response

Re-execute the command as a super-user.

sfcmkfs:ERROR: Number of file system is over *count*

Explanation

The new GFS Shared File System could not be added because the maximum number of file systems in the same domain indicated by **count** was exceeded.

Response

Delete an unnecessary GFS shared file system where it is possible and re-execute the command. For details about deleting a file system, see "B.2.1 sfcadm(8)" and "B.2.5 sfcinfo(8)".

sfcmkfs:ERROR: Number of hostname is over *num*

Explanation

The number of specified sharing hosts exceeds the maximum *num* for GFS Shared File System.

Response

Specify no more than *num* hosts that will share the file system.

sfcmkfs:ERROR: Number of mdsnode is over *num*

Explanation

The MDS operational information exceeds the limit of num that can be specified.

Response

Limit the MDS operational information to num.

sfcmkfs:ERROR: not entry file system

Explanation

No corresponding file system exists while the -o force option was specified.

Response

Specify the same configuration as the file system configuration previously created the -o force option should be set, and re-execute the command.

sfcmkfs:ERROR: No more add filesystem

Explanation

The number limit of registrable GFS Shared File Systems was exceeded, and any more file system cannot be added.

Response

Delete an unnecessary GFS shared file system where it is possible and re-execute the command. For details about deleting a file system, see "B.2.1 sfcadm(8)" and "B.2.5 sfcinfo(8)".

sfcmkfs:ERROR: Same hostname *string* is specified more than once

Explanation

The specified host name indicated by **string** has already been specified.

Response

Specify a unique host name for the **–o node** option.

sfcmkfs:ERROR: failed to check service is stopped : *errmsg*

Explanation

Mount state acquisition of a special file went wrong.

Response

Please perform management according to the detailed information errmsg.

sfcmkfs:ERROR: fstat(2) failed *raw_device_file*: *errmsg*

Explanation

Obtaining the status of the special file raw_device_file failed.

Response

Take action according to detailed information indicated by *errmsg*. For details, see the description of fstat(2).

sfcmkfs:ERROR: ioctl(2) { BLKGETSIZE } error: *errmsg*

Explanation

Obtaining the device size failed.

Response

Take action according to the detailed information errmsg.

sfcmkfs:ERROR: lseek(2) failed *raw_device_file*: *errmsg*

Explanation

lseek(2) could not be executed for *raw_device_file*.

Response

Take action according to detailed information indicated by *errmsg*. For details, see the description of lseek(2).

sfcmkfs:ERROR: malloc(3C) failed: *errmsg*

Explanation

Memory could not be allocated.

Response

Wait for the termination of another process or increase the swap space according to the detailed information errmsg.

sfcmkfs:ERROR: *raw_device_file* is already used

Explanation

The specified special device raw_device_file has been used in another GFS Shared File System.

Response

Re-execute the command after taking one of the following actions:
- Use an unused special device.
- Delete the file system if it is not being used.
- Specify **-o force** to re-create a file system with exactly the same configuration.

sfcmkfs:ERROR: Cannot add data, file *filetable*

Explanation

The number limit of registrable GFS Shared File Systems was exceeded, and any other file system cannot be added in *filetable*.

Response

Delete an unnecessary GFS shared file system where it is possible and re-execute the command. For details about deleting a file system, see "B.2.1 sfcadm(8)" and "B.2.5 sfcinfo(8)".

sfcmkfs:ERROR: *raw_device_file* is mounted, can't mkfs

Explanation

The specified partition indicated by *raw_device_file* cannot be changed because the file system is mounted.

Response

Unmount the file system and re-execute the command specifying -o force, or delete the file system with sfcadm(8) and re-execute the command.

sfcmkfs:ERROR: *special* is not a sfcfs file system

Explanation

The special device special is not a GFS Shared File System device while the -m option was specified.

Response

Specify a special file created already as a GFS Shared File System, and re-execute the command.

sfcmkfs:ERROR: *raw_device_file* is not special device, can't mkfs

Explanation

Specified raw_device_file is not a special device file.

Response

Specify a special file.

sfcmkfs:ERROR: read(2) error at *raw_device_file*: *errmsg*

Explanation

read(2) for raw_device_file failed.

Response

Take action according to detailed information indicated by *errmsg*. For details, see the description of read(2).

sfcmkfs:ERROR: write(2) error at *raw_device_file*: *errmsg*

Explanation

The write(2) operation for raw_device_file failed.

Response

Take action according to detailed information indicated by *errmsg*. For details, see the description of write(2).

sfcmkfs:ERROR: Fsid out of range

Explanation

An error was detected in the internal processing.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: raw_device_name partition size is over 1TB

Explanation

The size of the partition of raw_device_name has exceeded 1 TB.

Response

Reduce the size of raw_device_name or specify another partition when it is exceeding the maximum partition size, and re-execute the command.

sfcmkfs:ERROR: fsid bad entry

Explanation

An internal error was detected in the process of newly adding a file system.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: Not enough memory

Explanation

Memory allocation failed.

Response

Wait for the termination of another process or increase the swap space.

sfcmkfs:ERROR: Not read file system configuration table

Explanation

Obtaining the file system configuration information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcmkfs:ERROR: Fsid already in use

Explanation

An internal error was detected in the process of newly adding a file system.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: can not sfcfs_lock

Explanation

Obtaining the lock in the file system failed.

Response

Re-execute the command after some interval because another process may currently retain the lock.

sfcmkfs:ERROR: can not unlock

Explanation

Releasing the lock in the file system failed.

Response

Re-execute the command after the sfcmkfs termination releases the lock.

sfcmkfs:ERROR: can not get fsid

Explanation

Obtaining Fsid for newly adding a file system failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: can not configlock

Explanation

Obtaining the lock in the domain failed.

Response

Re-execute the command after some interval because another process may currently retain the lock.

sfcmkfs:ERROR: raw_device_name is already used for the management partition.

Explanation

Specified raw_device_name has been used for the file system management.

Response

Specified raw_device_name is not available because it is in use for the file system management.
Specify another special file to execute the command.

sfcmkfs:ERROR: can not acquire fsid

Explanation

An internal error was detected in the process of newly adding a file system.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: no entry fsid = *fsidnumber*

Explanation

Obtaining the file system configuration information of fsid number failed.

Response

Specify the same configuration as the file system configuration previously created where the -o force option is set, or specify the representative partition of the file system configured already where the -m option is set.

sfcmkfs:ERROR: *raw_device_name* is not Master Partition

Explanation

raw_device_name is not the representative partition.

Response

Specify the representative partition of the file system created already.

sfcmkfs:ERROR: Global Memory Broken

Explanation

An error was detected in the internal processing.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: cluster error

Explanation

An error was detected in the internal processing with the cluster control mechanism.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: The specified device does not exist

Explanation

The specified special file is not found.

Response

Check whether the special file exists on any node of the file system.

sfcmkfs:ERROR: partition [*raw_device_name*] is small, can't acquire data area

Explanation

Securing the file data area failed because the size of the partition raw_device_name is small.

Response

Specify the bigger partition for raw_device_name or adjust such parameters as metasz and logsz for smaller size in order to secure the file data area, and re-execute the command.

sfcmkfs:ERROR: cannot read the FsRM configuration file: errno = *value*

Explanation

Obtaining the FsRM management information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: Can not get host informations

Explanation

Obtaining the file system management information failed.

Response

Check whether the specified host name is correct.

sfcmkfs:ERROR: cannot update the management partition: errno = *value*

Explanation

Registration to the file system management information failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:ERROR: Unknown error: *value*

Explanation

An unexpected error was detected in the internal processing.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support submitting it along with text of the error message displayed.

sfcmkfs:WARNING: *value* : bogus logsz reset to system set value

Explanation

The parameter value, value, specified by the logsz option lies outside the valid range, and the value is automatically calculated to create the file system.

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : bogus maxnode reset to 16

Explanation

The parameter value, value, specified by the maxnode option lies outside the valid range, and the default value 16 is applied to create the file system.

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : bogus metasz reset

Explanation

The value value specified for the metasz option is outside the valid range. The file system is created using a calculated size.

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : bogus mminfree reset to 10%

Explanation

The value value specified for the mfree option is outside the valid range. The file system is created using the default value (10%).

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : bogus nblkpext reset to 1

Explanation

The value value specified for the nblkpext option is outside the valid range. The file system is created using the default value (1).

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : bogus nbpi reset to 8192

Explanation

The value value specified for the nbpi option is outside the valid range. The file system is created using the default value (8192).

Response

If there is a problem, specify a correct parameter value, and re-execute the command.

sfcmkfs:WARNING: *value* : logsize of partition is over: Retry Auto size

Explanation

The log area of the size (value) specified by the logsz option cannot be secured because the capacity of the partition is insufficient. The log area size is automatically calculated to create the file system.

Response

When this action comes to an issue, specify a proper parameter value and re-execute the command.

sfcmkfs:WARNING: *value* : metasize of partition is over: Retry Auto size

Explanation

The meta-data area of the size (value) specified by the metasz option cannot be secured because the capacity of the partition is insufficient. The meta-data area size is automatically calculated to create the file system.

Response

When this action comes to an issue, specify a proper parameter value and re-execute the command.

sfcmkfs:WARNING: *value* **: bogus free reset to 10%**

Explanation

The parameter value, value, specified by the free option lies outside the range, and the default value 10% is applied to create the file system.

Response

When this action comes to an issue, specify a proper parameter value and re-execute the command.

sfcmkfs:WARNING: *value* **: bogus free reset to 10%**

Explanation

A.3.4　sfcmount command

ERROR: sfcmount: 0001: Permission denied

Explanation
Execution was attempted with other than super-user permission.

Response
Retry execution with super-user permission.

ERROR: sfcmount: 0002: Cannot open fstab file

Explanation
/etc/fstab could not be opened.

Response
Check the status of /etc/fstab.

ERROR: sfcmount: 0003: Both *special* and *mount_point* need to be specified in fstab

Explanation
Special file *special*, or mountpoint *mount_point* is not described in /etc/fstab.

Response
Check the status of /etc/fstab.

ERROR: sfcmount: 0004: {*special* | *mount_point*}: Cannot connect to cluster foundation

Explanation
Connection to the cluster control facility failed.

Response
Confirm that the cluster control facility has started.

ERROR: sfcmount: 0005: {*special* | *mount_point*}: Cannot allocate memory

Explanation
Memory acquisition failed.

Response
Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcmount: 0006: {*special* | *mount_point*}: signal(2) is error: *errmsg*

Explanation
Signal handling failed.

Response
Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcmount: 0007: {*special* | *mount_point*}: Cannot get lock: config

Explanation

The lock to change the file system (*mount_point*) configuration information cannot be obtained. In an optional process within the cluster configuration, the lock to change the file system configuration information is being obtained.

Response

Execution must be performed after waiting for the lock to change the domain configuration information to be released.

ERROR: sfcmount: 0008: {*special* | *mount_point*}: Read error on management partition to get

fsid

Explanation

Reading of the management partition to obtain the file system (*mount_point*) id has failed.

Response

After confirming the state of sfcfrmd by using the like of the ps command, contact local Customer Support.

ERROR: sfcmount: 0009: {*special* | *mount_point*}: Cannot get lock: fsid

Explanation

Exclusive lock for fsid within the domain cannot be acquired. The exclusive lock for fsid has been acquired by another process running on a node in the cluster.

Response

Wait for the exclusive lock for fsid to be released, and then retry.

ERROR: sfcmount: 0010: {*special* | *mount_point*}: Read error on management partition to get

node information

Explanation

Reading of the management partition to obtain the cluster configuration node information has failed.

Response

After confirming the state of sfcfrmd by using the likes of the ps command, contact local Customer Support.

ERROR: sfcmount: 0011: {*special* | *mount_point*}: Node information for this node was not found

Explanation

Although reading from the management partition containing the cluster node data was successful, no self-node information was present.

Response

Check the cluster configuration, and then contact local Customer Support.

ERROR: sfcmount: 0012: Cannot mount *special*

Explanation

Mount processing for *special* failed.

Response

Check the status of the specified special file and mountpoint:, and then retry mount processing.

ERROR: sfcmount: 0013: {*special* | *mount_point*}: sfcfrmd may not exist

Explanation

A communications channel with sfcfrmd could not be established.

Response

Check whether sfcfrmd is operating, and then contact local Customer Support.

ERROR: sfcmount: 0015: {*special* | *mount_point*}: No such file or directory

Explanation

Special file *special*, or mountpoint: *mount_point* does not exist.

Response

Check whether the specified special file and mount point exists on any node.

ERROR: sfcmount: 0016: {*special* | *mount_point*}: stat(2) is error: *errmsg*

Explanation

Obtaining the status of the special file *special*, or mount point *mount_point* failed.

Response

Take action according to detailed information indicated by *errmsg*. For details, see the description of stat(2).

ERROR: sfcmount: 0017: *special*: Character device can not be specified as mount point.

Please specify block device.

Explanation

The character device was specified.

Response

Specify the block device.

ERROR: sfcmount: 0018: *special* is already mounted, *mount_point* is busy, or the allowable

number or mount points has been exceeded

Explanation

Special file *special* may have already been mounted, or the mountpoint: *mount_point* may be in use.

Response

Check the status of the specified special file and mountpoint:, and then retry mount processing.

ERROR: sfcmount: 0019: {*special* | *mount_point*}: Mount demand processing to sfcfrmd went

wrong

Explanation

Mount processing request to sfcfrmd has failed.

Response

After confirming the state of sfcfrmd by using the likes of the ps command, contact local Customer Support.

ERROR: sfcmount: 0020: {*special | mount_point*}: Time out occurred in mount demand processing to sfcfrmd

Explanation

Timeout occurred for a mount processing request to sfcfrmd.

Response

After confirming the state of sfcfrmd by using the likes of the ps command, contact local Customer Support.

ERROR: sfcmount: 0021: *special* is not block device

Explanation

The specified *special* is not a block device.

Response

Check whether specified special file and described special file in /etc/fstab is a block device.

ERROR: sfcmount: 0022: *mount_point* is not directory

Explanation

The specified *mount_point* is not a directory.

Response

Check whether specified mount point and described mount point in /etc/fstab is a directory.

ERROR: sfcmount: 0023: fstype is described as an invalid value in fstab

Explanation

An unexpected error was detected in the fstype field in /etc/fstab.

Response

Check the contents of /etc/fstab.

ERROR: sfcmount: 0024: fstype is described not as sfcfs but as *fstype* in fstab

Explanation

The specified file system is not the GFS shared File System.

Response

Check the contents of /etc/fstab and specify the GFS Shared File System.

ERROR: sfcmount: 0025: The description form of fstab is wrong

Explanation

The description format of /etc/fstab is incorrect.

Response

Confirm the contents of /etc/fstab.

ERROR: sfcmount: 0026: {*special | mount_point*}: filesystem may not be created

Explanation

The specified file system was not registered in the management partition.

Response

After confirming that the file system has already been created, re-execute the mount command.

ERROR: sfcmount: 0029: {*special | mount_point*}: self-node is already processing mount or umount

Explanation

In the self-node, mount or umount processing has already been performed.

Response

Please set time a little and execute a command again.

ERROR: sfcmount: 0030: {*special | mount_point*}: *mount_point* need to be representative partition

Explanation

The special block device specified as a mountpoint: was not a representation partition.

Response

Please specify a representation partition name and execute a command again.

ERROR: sfcmount: 0031: *special* not in fstab

Explanation

Special file *special* is not described in /etc/fstab.

Response

Check the contents of /etc/fstab.

WARNING: sfcmount: 0027: mount_optoin *mntopts* is ignored, used *vfs_mntopts* in fstab

Explanation

Although mount option *mntopts* has been specified as the mount command parameter, mount processing was performed with mount option *vfs_mntopts,* described by /etc/fstab.

Response

To specify the mount option and perform mount processing, describe the mount option for the mountpoint: in question in /etc/fstab.

WARNING: sfcmount: 0028: mount_option *mntopts* is ignored

Explanation

Although mount option *mntopts* has been adopted as the mount command parameter, it was ignored and mount processing was performed with no parameters.

Response

To specify the mount option and perform mount processing, describe the mount option for the mountpoint: in question in /etc/fstab.

A.3.5   sfcumount command

ERROR: sfcumount: 0001: Permission denied

Explanation
Execution was attempted with other than super-user permission.

Response
Retry execution with super-user permission.

ERROR: sfcumount: 0002: Cannot open mtab file

Explanation
/etc/mtab could not be opened.

Response
Check the status of /etc/mtab.

ERROR: sfcumount: 0003: Both *special* and *mount_point* need to be specified in mtab

Explanation
It needs to be described by /etc/mtab when both the special file *special* and *mount_point* are specified as an operand.

Response
Check the status of /etc/mtab.

ERROR: sfcumount: 0004: {*special* | *mount_point*} not in mtab

Explanation
Although a special file or {*special* | *mount_point* } has been specified for the mountpoint:, neither is described in /etc/mtab.

Response
Check the status of /etc/mtab.

ERROR: sfcumount: 0005: {*special* | *mount_point*}: Cannot allocate memory

Explanation
Memory acquisition failed.

Response
Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcumount: 0006: {*special* | *mount_point*}: Cannot connect to cluster foundation

Explanation
Connection to the cluster control facility failed.

Response
Confirm that the cluster control facility has already been started.

ERROR: sfcumount: 0007: {*special | mount_point*}: Read error on management partition to get fsid

Explanation

Reading of the management partition to obtain the file system id failed.

Response

After confirming the state of sfcfrmd by using the likes of the ps command, contact local Customer Support.

ERROR: sfcumount: 0008: {*special | mount_point*}: Cannot get lock: fsid

Explanation

Exclusive lock for the file system id within the domain cannot be obtained. Exclusive lock for the file system id within the domain is being obtained with an optional process within the cluster configuration.

Response

Try to re-execute after the release of exclusive lock of fsid within the domain.

ERROR: sfcumount: 0009: {*special | mount_point*}: Read error on management partition to get node information

Explanation

Reading of the management partition to obtain the cluster configuration node information has failed.

Response

After confirming the state of sfcfrmd by using the likes of the ps command, contact local Customer Support.

ERROR: sfcumount: 0010: {*special | mount_point*}: Node information for this node was not found

Explanation

Although the management partition containing the cluster node information was read successfully, no self-node information was found to exist.

Response

Check the cluster configuration, and then contact local Customer Support.

ERROR: sfcumount: 0011: {*special | mount_point*}: sfcfrmd may not exist

Explanation

A communication path to sfcfrmd could not be established.

Response

After confirming the state of sfcfrmd by using the likes of the ps command , contact local Customer Support.

ERROR: sfcumount: 0012: *special* not mounted

Explanation

Special had already been unmounted.

Response

None.

ERROR: sfcumount: 0013: *special*: mount is in progress

Explanation

Mount processing had already been performed to special.

Response

Either wait a short while and retry the unmount processing, or perform the unmount processing in forced mode.

ERROR: sfcumount: 0014: *special*: fail over is in progress

Explanation

Unmount processing was attempted as failover processing was being performed for *special*.

Response

Either wait a short while and retry the unmount processing, or perform the unmount processing in forced mode.

ERROR: sfcumount: 0015: *special*: umount is in progress

Explanation

Unmount processing had already been performed to special.

Response

None.

ERROR: sfcumount: 0016: {*special* | *mount_point*} busy

Explanation

Unmount processing for special file *special* or mountpoint *mount_point* failed.

Response

In the command execution node, try to find a process that is using the file system by fuser(1) command (for example, "fuser -m *mount_point*"). If such a process exists, kill the process and unmount the file system again. Otherwise, collect the diagnostic data with pclsnap, and collect the kernel dump by push the NMI button and contact your local Customer Support.

ERROR: sfcumount: 0017: *device:* Umount demand processing to sfcfrmd went wrong

Explanation

The unmount processing request for sfcfrmd failed.

Response

Check the status of sfcfrmd, and then contact local Customer Support.

ERROR: sfcumount: 0018: *device:* Time out occurred in umount demand processing to sfcfrmd

Explanation

A timeout occurred for the sfcfrmd unmount processing request.

Response

Check the status of sfcfrmd, and then contact local Customer Support.

ERROR: sfcumount: 0019: {*special* | *mount_point*}: No such file or directory

Explanation

Special file *special*, or mountpoint: *mount_point* does not exist.

Response

Check whether the specified special file and mount point exists on any node.

ERROR: sfcumount: 0020: {*special* | *mount_point*}: stat(2) is error: *errmsg*

Explanation

Obtaining the status of the special file *special*, or mount point *mount_point* failed.

Response

Check whether the specified special file and mount point exists on any node.

ERROR: sfcumount: 0021: *special*: Character device can not be specified as mount point.

Please specify block device.

Explanation

The character device was specified.

Response

Specify the block device.

ERROR: sfcumount: 0022: *special* is not block device

Explanation

As the argument of the umount command, a block device was not specified.

Response

Specify a block device.

ERROR: sfcumount: 0023: *mount_point* is not directory

Explanation

The specified *mount_point* is not a directory.

Response

Check whether specified mount point and described mount point in /etc/fstab is a directory.

ERROR: sfcumount: 0024: fstype is described as an invalid value in {fstab | mtab}

Explanation

An unexpected error was detected in the fstype field in /etc/fstab or /etc/mtab.

Response

Check the contents of /etc/fstab or /etc/mtab.

ERROR: sfcumount: 0025: fstype is described not as sfcfs but as *fstype* in {fstab | mtab}

Explanation

The specified file system is not the GFS shared File System.

Response

Check the contents of /etc/fstab and /etc/mtab and specify the GFS Shared File System.

ERROR: sfcumount: 0027: {*special | mount_point*}: self-node is already processing mount or umount

Explanation

In the self-node, mount or umount processing has already been performed.

Response

Please set time a little and execute a command again.

ERROR: sfcumount: 0028: {*special | mount_point*}: *mount_point* need to be representative partition

Explanation

The special block device specified as a mountpoint: was not a representation partition.

Response

Please specify a representation partition name and execute a command again.

WARNING: sfcumount: 0026: {*special | mount_point*}: Cannot get lock: fsid, but processing is continued compulsorily

Explanation

Although exclusive lock could not be acquired for fsid within the domain, processing was performed forcibly.

Response

None.

A.4 GFS Shared File System Specific Management Command Messages

This section describes messages that can be output when GFS Shared File System exclusive management commands are used.

A.4.1 libsfcfs library

libsfcfs: ERROR: can not get nodeid by the clgetnode command

Explanation

The node ID cannot be obtained.

Response

Check whether the node ID can be displayed with clgetnode(8).

A. 4. 2   sfcadm and sfcnode commands

{sfcadm | sfcnode}: all node entry delete, can't sfcnode

Explanation

The command cannot be executed because information about all nodes sharing the file system will be deleted.

Response

Reduce the specified host information, and re-execute the command.

{sfcadm | sfcnode}: too many host count

Explanation

Too many host names were specified.

Response

Check whether the number of specified host names is correct, and re-execute the command.

{sfcadm | sfcnode}: too many partition count

Explanation

Too many special files were specified.

Response

Check whether the number of specified partitions is correct, and re-execute the command.

{sfcadm | sfcnode}: argument error

Explanation

The specified command format is wrong.

Response

Check the command specification format, and re-execute the command.

{sfcadm | sfcnode}: cannot allocate memory

Explanation

Memory could not be allocated.

Response

Wait for the termination of another process or increase the size of the swap area, and re-execute the command.

{sfcadm | sfcnode}: cannot get host information

Explanation

The acquisition of host information failed.

Response

Confirm that the FsRM control facility is running normally and that the target host has not failed.

{sfcadm | sfcnode}: Cannot connect to FsRM

Explanation
FsRM is not running.

Response
Confirm that FsRM is running.

{sfcadm | sfcnode}: *filename* cannot open

Explanation
Relevant file (*filename*) does not exist.

Response
Confirm if *filename* is available.
Note that, if the management cannot be found, restore it from a backup or create a new one.

{sfcadm | sfcnode}: FSID(*fsid_num*) is invalid

Explanation
File system identification numbers (*fsid_num*) are not registered in the management partition.

Response
Check whether the relevant FSID number has been registered with sfcinfo(8).

{sfcadm | sfcnode}: hostid (*hostid*) not found in volume information

Explanation
The specified host ID (*hostid*) is not a host ID of the node which constitutes the GFS Shared File System. Otherwise, the node which executed command is not a node which constitutes the GFS Shared File System.

Response
Specify the host ID of the node which constitutes the GFS Shared File System. Otherwise, execute the command again in the node which constitutes the GFS Shared File System.

{sfcadm | sfcnode}: invalid hostname

Explanation
An invalid host name was specified.

Response
Check the specified host name.

{sfcadm | sfcnode}: hostname(*hostname*) is not found

Explanation
The specified host name (*hostname*) was not found in the node information.

Response
Check whether the specified host name exists in the node information.

{sfcadm | sfcnode}: *hostname* is not shared

Explanation

The specified host (*hostname*) does not share the device.

Response

Verify the system environment whether the file system monitoring mechanism is operating and the target host is available.

{sfcadm | sfcnode}: *hostname* registered as MDS, can't sfcnode -d

Explanation

The specified host (*hostname*) could not delete, because it is registered as the meta-data server.

Response

Change the meta-data server host by sfcadm -g.

{sfcadm | sfcnode}: invalid devicename

Explanation

An invalid partition name was specified.

Response

Check whether the specified partition name is correct.

{sfcadm | sfcnode}: invalid magic word *magic_no*

Explanation

The partition configuration data of the specified partition is invalid.

Response

Check whether the specified partition belongs to an sfcfs file system.

{sfcadm | sfcnode}: ioctl(BLKGETSIZE) error

Explanation

Device information could not be obtained.

Response

Check the system environment to see whether device information is correct.

{sfcadm | sfcnode}: I/O error

{sfcadm | sfcnode}: read error (*block_no*)

{sfcadm | sfcnode}: seek error (*block_no*)

{sfcadm | sfcnode}: write error (*block_no*)

Explanation

Special file I/O processing failed.

Response

Check whether the specified special file is correct.

{sfcadm | sfcnode}: log partition size too small

Explanation

The specified log size exceeds the size of the entire log partition.

Response

Check the size of the log partition.

{sfcadm | sfcnode}: log partition is not separated

Explanation

The size could not be changed because the log partition is not separated.

Response

Check whether the specified partition is correct.

{sfcadm | sfcnode}: *logsize* is illegal size

Explanation

An illegal log size was specified.

Response

Check whether the specified log size is correct.

{sfcadm | sfcnode}: major number get error

Explanation

The major number could not be obtained.

Response

Check whether the system environment is correct.

{sfcadm | sfcnode}: invalid MDS hostname

Explanation

The specification of MDS contains an error.

Response

Confirm the management partition and specified MDS information.

{sfcadm | sfcnode}: node full, can't {sfcadm | sfcnode}

Explanation

The number of nodes sharing the file system exceeded the upper limit.

Response

The value specified for the maxnode parameter of sfcmkfs(8) determines the number of nodes sharing a file system. Re-configure the file system when the number exceeds the upper limit.

{sfcadm | sfcnode}: node name length is too long

Explanation

The specified node name is too long.

Response

Check whether the specified node name is correct. To specify multiple node names, delimit each name by a comma.

{sfcadm | sfcnode}: file system configuration information is full of entry

Explanation

No more file system information could be added.

Response

Delete unnecessary data with sfcadm(8) and re-execute the command.

{sfcadm | sfcnode}: not enough element of sfcfs partition

Explanation

Not all the partitions belonging to the file system were specified.

Response

Specify all partitions belonging to the file system.

{sfcadm | sfcnode}: this node entry not found

Explanation

Local node information was not found in the information for nodes sharing the file system.

Response

Check whether local node information exists.

{sfcadm | sfcnode}: not super-user

Explanation

The command cannot be executed without super-user authority.

Response

Execute the command with super-user authority.

{sfcadm | sfcnode}: not support command

Explanation

The specified command is not supported.

Response

Check the specified command name.

{sfcadm | sfcnode}: now locked, can't {sfcadm|sfcnode}

Explanation

The command could not be executed because another command is being executed.

Response

Upon termination of the other command, re-execute the command.

{sfcadm | sfcnode}: please specify MDS setting

Explanation

A meta-data server name must be specified.

Response

Specify a meta-data server name, and re-execute the command.

{sfcadm | sfcnode}: please specify PORTNAME setting

Explanation

A service port name must be specified.

Response

Specify a service port name, and re-execute the command.

{sfcadm | sfcnode}: same device is specified more than once

Explanation

A partition that is the same as the one specified was found.

Response

Check whether the specified partition name is correct.

{sfcadm | sfcnode}: invalid service portname

Explanation

An invalid service port name was specified.

Response

Check the specified service port name.

{sfcadm | sfcnode}: file system configuration information sync error

Explanation

Distribution to another node sharing the file system failed.

Response

Check that a file system watch mechanism works normally, and re-execute the command.

{sfcadm | sfcnode}: *special* cannot open

Explanation

A special file (*special*) could not be opened.

Response

Check whether the specified special file is correct.

{sfcadm | sfcnode}: *special* fstat64 error

Explanation

The status of a special file (*special*) could not be obtained.

Response

Check whether the specified special file is correct.

{sfcadm | sfcnode}: *special* is illegal device

Explanation

An invalid partition (*special*) that is not part of the file system configuration was specified.

Response

Specify all partitions configuring the file system.

{sfcadm | sfcnode}: *special* is mounted, can't {sfcadm | sfcnode}

Explanation

The command could not be executed because the specified partition (*special*) has already been mounted.

Response

Unmount the file system, and re-execute the command.

{sfcadm | sfcnode}: *special* is not character special device

Explanation

The specified file (*special*) is not a character special file.

Response

Specify a character special file.

{sfcadm | sfcnode}: *special* is not found in file system configuration information

Explanation

The specified partition (special) is not included in the file system configuration information.

Response

Reexamine whether the specified partition is correct.

{sfcadm | sfcnode}: *special* is not shared device

Explanation

The specified partition(*special*) is not shared by nodes.

Response

Check whether the system environment is correct.

{sfcadm | sfcnode}: system error(*function_name*)

Explanation

A system error occurred.

Response

Contact local Customer Support.

{sfcadm | sfcnode}: unknown error(*error_code*)

Explanation

An invalid error was detected.

Response

Contact local Customer Support.

{sfcadm | sfcnode}: FSID(*fsid_num*) is already exist

Explanation

The file system with the file system ID fsid_num has already been created.

Response

Check whether the relevant FSID number has been registered with sfcinfo(8), and re-execute the command.

{sfcadm | sfcnode}: too many option

Explanation

Overfull options were specified.

Response

Make sure that the number of specified options is proper, and re-execute the command.

{sfcadm | sfcnode}: *hostid* is illegal hostid

Explanation

The specified host ID is illegal.

Response

Check whether the specified host ID is correct executing sfcsetup(8).

{sfcadm | sfcnode}: option is illegal option

Explanation

The specified tunable parameter for the file system cannot be registered to the file system configuration information.

Response

Check whether the specified file system's tunable parameter is correct.

{sfcadm | sfcnode}: *filename*: stat(2) is error: *errmsg*

Explanation

The stat(2) operation for filename failed.

Response

Take action according to errmsg.

{sfcadm | sfcnode}: *devicename* is already used in file system configuration information

Explanation

The specified partition already exists in the file system configuration information.

Response

Check whether the specified partition is proper.

{sfcadm | sfcnode}: file system configuration information not found

Explanation

The file system configuration information cannot be obtained.

Response

See "Chapter 5 Management Partition" in this manual and restore the file system configuration information.

{sfcadm | sfcnode}: *special* is not sfcfs file system

Explanation

The specified partition (*special*) is not the GFS shared File System.

Response

Specify a partition of the GFS Shared File System.

sfcadm: ERROR: number of mdsnode is over num

Explanation

The MDS operational information specified exceeds the number of shared nodes.

Response

Specify a value equal to or less than the number of shared nodes or **all**.

sfcadm: The size of the partition(*devicename*) might have been changed after the file system was made.

Explanation

The size of the partition (*devicename*) which constitutes the GFS Shared File System might have been changed.

Response

Please perform the procedure (from step 2 on) described on "C.5 Action to be taken when the file system configuration information is inconsistent".
The file system can keep on using. But GFS Shared File System can not be expanded by size expansion of the partition which constitutes the GFS Shared File System.
Please perform the procedure above promptly.

sfcadm: The size of the partition(*devicename*) might have been reduced

Explanation

The size of the partition (*devicename*) currently used for a GFS Shared File System may have been reduced

Response

The file system cannot be repaired. If a backup of the file system is available, recover the file system from the backup.

A. 4. 3　　sfcfrmstart command

ERROR: sfcfrmstart: 0001: Permission denied

Explanation

Execution was attempted with other than super-user permission.

Response

Retry execution with super-user permission.

ERROR: sfcfrmstart: 0002: Cannot open file *path*: *errmsg*

Explanation

File open processing for command lock failed.

Response

Apply countermeasures as described in ***errmsg***.

ERROR: sfcfrmstart: 0003: sfcfrmstart or sfcfrmstop is already running

Explanation

Execution of this command failed as another sfcfrmstart or sfcfrmstop command was being executed.

Response

Once execution of the other command has terminated, re-execute this command.

ERROR: sfcfrmstart: 0004: Cannot connect to cluster foundation

Explanation

Connection with the cluster control facility failed.

Response

Confirm that the cluster control facility has already been started.

ERROR: sfcfrmstart: 0005: Operation of management partition may be performed

Explanation

The management partition may be being used on either the self-node or another node.

Response

Wait for the operation of the management partition to end, and then retry.

ERROR: sfcfrmstart: 0006: Cannot allocate memory

Explanation

Memory acquisition failed.

Response

Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcfrmstart: 0007: Read error on sfcfsrm.conf: *errmsg*

Explanation

Setting file sfcfsrm.conf could not be read.

Response

Perform management according to *errmsg*.

ERROR: sfcfrmstart: 0008: Read error on management partition

Explanation

Reading of the management partition failed.

Response

Check that a disk has not failed, and then contact local Customer Support.

ERROR: sfcfrmstart: 0009: Self-node does not belong to host group

Explanation

The self-node does not belong to a host group.

Response

Using the sfcsetup command, add the self-node to a host group.

ERROR: sfcfrmstart: 0010: Starting processing of sfcfrmd went wrong

Explanation

Start processing for sfcfrmd failed.

Response

After confirming the state of the self-node and that sfcprmd is available, contact local Customer Support.

ERROR: sfcfrmstart: 0011: sfcfrmd has already existed

Explanation

The sfcfrmd has already been started.

Response

No particular countermeasure is necessary.

ERROR: sfcfrmstart: 0012: sfcsetup may not be performed

Explanation

As no setting is made to the management partition, the management partition cannot be accessed.

Response

Use the sfcsetup command to set up the management partition.

ERROR: sfcfrmstart: 0013: sfcprmd may not exist

Explanation

The communication path to sfcprmd cannot be established.

Response

After confirming the state of the self-node and that sfcprmd is available, contact local Customer Support.

ERROR: sfcfrmstart: 0014: State check processing to sfcprmd went wrong

Explanation

State confirmation processing for sfcprmd using several different daemons failed.

Response

After confirming the state of self-node and that sfcprmd is available, contact local Customer Support.

ERROR: sfcfrmstart: 0015: Write error on management partition

Explanation

Write processing for the management partition failed.

Response

After confirming that no disk error occurred, contact local Customer Supports.

ERROR: sfcfrmstart: 0016: filename: open(2) error: *errmsg*

Explanation

File open processing for editing the sfcfsrm.vers file failed.

Response

Apply countermeasures as described in *errmsg*.

ERROR: sfcfrmstart: 0017: filename: write(2) error: *errmsg*

Explanation

File write processing for editing the sfcfsrm.vers file failed.

Response

Apply countermeasures as described in *errmsg*.

ERROR: sfcfrmstart: 0018: filename: rename(2) error: *errmsg*

Explanation

File rename processing for editing the sfcfsrm.vers file failed.

Response

Apply countermeasures as described in *errmsg*.

A. 4. 4   sfcfrmstop command

ERROR: sfcfrmstop: 0001: Permission denied

Explanation

Execution was attempted with other than super-user permission.

Response

Retry execution with super-user permission.

ERROR: sfcfrmstop: 0002: Cannot open file *path*: *errmsg*

Explanation

File open processing for command lock failed.

Response

Apply countermeasures as described in *errmsg*.

ERROR: sfcfrmstop: 0003: sfcfrmstart or sfcfrmstop is already running

Explanation

Execution of this command failed as another sfcfrmstart or sfcfrmstop command was being executed.

Response

Once execution of the other command has terminated, re-execute this command.

ERROR: sfcfrmstop: 0004: Cannot allocate memory

Explanation

Memory acquisition failed.

Response

Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcfrmstop: 0005: sfcprmd may not exist

Explanation

The communication path to the process monitoring daemon sfcprmd cannot be established.

Response

After confirming the state of the self-node and that sfcprmd is available, contact local Customer Support.

ERROR: sfcfrmstop: 0006: stop processing of sfcfrmd went wrong

Explanation

Stop processing for sfcfrmd failed.

Response

The GFS may be mounted on the self-mode. Perform unmount processing, and then re-execute the sfcfrmstop command.

ERROR: sfcfrmstop: 0007: Self-node is still mounted

Explanation

The GFS Shared File System is mounted by the self-node.

Response

Please execute a command again after unmounting all the GFS Shared File Systems of a self-node.

ERROR: sfcfrmstop: 0011: Cannot open sfcfsrm.conf

Explanation

File open processing for the sfcfsrm.conf file failed.

Response

Check the status for the sfcfsrm.conf file.

ERROR: sfcfrmstop: 0012: No entry of management partition path in sfcfsrm.conf

Explanation

The sfcfsrm.conf file contains no entry that indicates the path to the management partition.

Response

Confirm the contents of the setup file sfcfsrm.conf.

ERROR: sfcfrmstop: 0013: Read error occured on sfcfsrm.conf

Explanation

Error occurred when reading of the sfcfsrm.conf file..

Response

Check the status of the sfcfsrm.conf file.

INFO: sfcfrmstop: 0004: wait for other node to stop

Explanation

The completion of the stop of sfcfrmd in another node is waited.

Response

None.

INFO: sfcfrmstop: 0005: wait for LEFTCLUSTR elimination

Explanation

A recovery from a LEFTCLUSTER state is waited because there is a node that is in a LEFTCLUSTER state in the cluster system.

Response

None.

A.4.5　sfcgetconf command

ERROR: sfcgetconf: 0001: Permission denied

Explanation
Execution was attempted with other than super-user permission.

Response
Perform execution with super-user permission.

ERROR: sfcgetconf: 0002: Cannot allocate memory

Explanation
Memory allocation failed to execute the command.

Response
Wait for another application to end, and then retry.

ERROR: sfcgetconf: 0003: Invalid `-i ' parameter: "*iparam*"

Explanation
The parameter specified for the "i" option is invalid.

Response
Re-execute the command with a valid (numerical) parameter in the "i" option.

ERROR: sfcgetconf: 0004: Invalid parameter

Explanation
The format of the command parameter is invalid.

Response
Re-execute the command with a valid parameter according to the format.

ERROR: sfcgetconf: 0005: *backupfile* is already exist

Explanation
The specified file as a backup (*backupfile*) has already existed.

Response
Re-execute the command with a file that does not exist.

ERROR: sfcgetconf: 0006: Cannot open *backupfile*: open(2) returned errcode=*errno*

Explanation
The open(2) processing for the backup file (*backupfile*) failed.

Response
Re-execute the command with the correct name of the backup file after checking the location where the backup file will be created.

ERROR: sfcgetconf: 0007: Cannot fdopen *backupfile*: fdopen(3C) returned errcode= *errno*

Explanation

The fdopen(3) processing for the backup file (*backupfile*) failed.

Response

Re-execute the command with the correct name of the backup file after checking the location where the backup file will be created.

ERROR: sfcgetconf: 0008: Cannot access to cluster foundation: frm_cl_open() returned errcode=*errno*

Explanation

Communication with the cluster control could not be established.

Response

Check whether the cluster control is operating normally.

ERROR: sfcgetconf: 0009: Cannot get domain wide lock: config

Explanation

Execution of this command failed as another command is currently being executed.

Response

Re-execute this command after the execution of the other command.

ERROR: sfcgetconf: 0010: Cannot open *path_to_sfcfrm*.conf: fopen(3C) returned errcode=*errno*

Explanation

The attempt to get a backup of the sfcfsrm.conf file according to the -a option setting, but sfcfsrm.conf failed in but fopen(3).

Response

Check whether the path indicated by a message is destined for sfcfsrm.conf. If the file does not exist, there is a possibility that sfcsetup has not been conducted yet.

ERROR: sfcgetconf: 0011: file system configuration information parse error: frm_tabent() returned errcode=*errno*

Explanation

There is invalid data in file system configuration information of the management partition.

Response

Use the backup of the management partition that was acquired previously to restore the management partition.

NOTICE: sfcgetconf: 0012: fsid=*fsid* is not found

Explanation
The file system configuration information that corresponds to *fsid*, which was specified as the target of the search with the '-I' option, could not be found.
Backup processing of the file system configuration information, that corresponds to the specified *fsid,* was ignored by the command.

Response
By eliminating the target of the *fsid* specification from the command argument specification, message output can be disabled.

NOTICE: sfcgetconf: 0013: dev=*raw_device_file* is not found

Explanation
The file system configuration information that corresponds to *raw_device_file*, which was specified as the target of the search with the '-d' option, could not be found.
Backup processing of the file system configuration information that corresponds to the specified *raw_device_file* was ignored by the command.

Response
By eliminating the target of the *raw_device_file* specification from the command argument specification, message output can be disabled.

ERROR: sfcgetconf: 0014: Cannot open sfcfsrm.conf

Explanation
File open processing for the sfcfsrm.conf file failed.

Response
Check the status for the sfcfsrm.conf file.

ERROR: sfcgetconf: 0015: No entry of management partition path in sfcfsrm.conf

Explanation
The sfcfsrm.conf file contains no entry that indicates the path to the management partition.

Response
Confirm the contents of the setup file sfcfsrm.conf.

ERROR: sfcgetconf: 0016: Read error occured on sfcfsrm.conf

Explanation
Error occurred when reading of the sfcfsrm.conf file.

Response
Check the status of the sfcfsrm.conf file.

A. 4. 6　　sfcinfo command

sfcinfo: ERROR: Cannot allocate memory

Explanation
Failed to allocate memory. Processing cannot be continued.

Response
Wait until other processes are finished, or increase a swap area, then re-execute the command.

sfcinfo: ERROR: Cannot get major number of *drivename*

Explanation
Failed to get major number of drivename. Processing cannot be continued.

Response
Check the system environment of device driver.

sfcinfo: ERROR: Cannot open {/etc/mtab|/etc/fstab}: *errmsg*

Explanation
Failed to open /etc/mtab or /etc/fstab file because of **errmsg**. Processing cannot be continued.

Response
Restore the system environment file.

sfcinfo: ERROR: file system configuration information not found: *special*

Explanation
Failed to get the file system configuration information in the management partition.

Response
Restore the file system configuration information. For detail, see "Chapter 5 Management Partition."

sfcinfo: ERROR: Invalid device number *device_no*

Explanation
User specified a invalid device number.

Response
Correct device number and this command is re-executed.

sfcinfo: ERROR: Unknown error(error_code)

Explanation
Failed work with unknown error.

Response
Contact local Customer Support.

sfcinfo: ERROR: Cannot connect to FsRM

Explanation

The file system monitoring mechanism is not operating.

Response

Make sure that the file system monitoring mechanism is running.

sfcinfo: ERROR: cannot read file system configuration information: *special*

Explanation

A read error occurred with the management partition.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcinfo: ERROR: system error(gethostid)

Explanation

The obtained host ID is illegal.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

sfcinfo: WARNING: Cannot open { *special* | *mntpoint*}: *errmsg*

Explanation

Failed to open *special* or *mntpoint* because of **errmsg**. Other file systems are processed continuously.

Response

Check the arguments of command or the system environment file.

If the logical volume of the GFS Shared File System is used, information is displayed only when the logical volume of the GFS Shared File System is activated. If the logical volume is not activated, retry after activating it.

If the GFS Shared File System management view is used for operation, retry after activating the logical volume.

sfcinfo: WARNING: Invalid magic word 0x*magic* in *special*

Explanation

Configuration data of the specified partition is invalid. Other file systems are processed continuously.

Response

Check the specified partition to determine if it is an **sfcfs** file system.

sfcinfo: WARNING: ioctl(BLKGETSIZE) failed in *special*: *errmsg*

Explanation

Failed to obtain the device data of partition *special*. Other file systems are processed continuously.

Response

Check the system environment to determine if partition *special* is correct.

sfcinfo: WARNING: Not a block device(*special*)

Explanation

The specified partition must be a block-type special file but it is a character-type special file. Other file systems are processed continuously.

Response

Specify a block-type special file as a partition.

sfcinfo: WARNING: Not a directory(*file*)

Explanation

The specified *file* must be a block-type special file or a directory. Other file systems are processed continuously.

Response

Specify a block-type special file or mountpoint: directory.

sfcinfo: WARNING: lseek error at *special: errmsg*

Explanation

Failed to lseek(2) at partition *special*. Other file systems are processed continuously.

Response

Check whether the specified partition belongs to an sfcfs file system.

sfcinfo: WARNING: read error in {super block|volume information} of *special*: *errmsg*

so try to read alternative block

Explanation

Failed to read normal super block data. Therefore, redundant data is read out.

Response

Delete the target file system where it is unnecessary. For details, see "9.6 Deleting" in this manual. When it is a necessary file system, restore it running a full scan with sfcfsck(8). For details, see "C.2.1 Action for I/O errors" in this manual.

sfcinfo: WARNING: read error in alternative {super block | volume information} of *special*:

errmsg

Explanation

Reading the redundant volume information on special failed.

Response

Delete the target file system where it is unnecessary. For details, see "9.6 Deleting" in this manual. When it is a necessary file system, restore it running a full scan with sfcfsck(8). For details, see "C.2.1 Action for I/O errors" in this manual.

A. 4. 7   sfcmntgl command

ERROR: sfcmntgl: 0001: Permission denied

Explanation

Execution was attempted with other than super-user permission.

Response

Retry execution with super-user permission.

ERROR: sfcmntgl: 0002: Cannot open fstab file

Explanation

/etc/fstab could not be opened.

Response

Check the status of /etc/fstab.

ERROR: sfcmntgl: 0003: Both *special* and *mount_point* need to be specified in fstab

Explanation

Special file *special*, or mountpoint: *mount_point* is not described in /etc/fstab.

Response

Check the status of /etc/fstab.

ERROR: sfcmntgl: 0004: {*special* | *mount_point*} not in fstab

Explanation

The specified *filename* cannot be found in fstab.

Response

Check the status of /etc/fstab.

ERROR: sfcmntgl: 0005: {*special* | *mount_point*}: Cannot allocate memory

Explanation

Memory acquisition failed.

Response

Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcmntgl: 0006: {*special* | *mount_point*}: signal(2) is error: errmsg

Explanation

Signal handling failed.

Response

Collect the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcmntgl: 0007: {*special | mount_point*}: Cannot connect to cluster foundation

Explanation

Connection to the cluster service failed.

Response

Confirm that the cluster control facility has already been started.

ERROR: sfcmntgl: 0008: {*special | mount_point*}: Cannot get lock: config

Explanation

The lock to change the file system configuration information cannot be obtained. The lock to change the file system configuration information is now being obtained in an optional process of the node within the cluster configuration.

Response

Release the lock for changing the domain configuration information, and then re-execute.

ERROR: sfcmntgl: 0009: {*special | mount_point*}: Read error on management partition to get

fsid

Explanation

Reading of the management partition to obtain the file system id failed.

Response

Confirm, using the likes of the ps command, that sfcfrmd is available.

ERROR: sfcmntgl: 0010: {*special | mount_point*}: Cannot get lock: fsid

Explanation

Exclusive lock for fsid within the domain cannot be acquired. The exclusive lock for fsid has been acquired by another process running on a node in the cluster.

Response

Wait for the exclusive lock for fsid to be released, and then retry.

ERROR: sfcmntgl: 0011: {*special | mount_point*}: Read error on management partition to get

node information

Explanation

Reading of the management partition to obtain the cluster configuration node information failed.

Response

Confirm, using the likes of the ps command, that sfcfrmd is available.

ERROR: sfcmntgl: 0012: *special* was not able to mount. Other process performed umount or

some error occurred. Refer console information on each node for detailed error information.

Explanation

The mount processing for special file *special* failed.

Response

Check the status of special file *special*, and then contact local Customer Support.

ERROR: sfcmntgl: 0013: {*special* | *mount_point*}*:* sfcfrmd may not exist

Explanation
A communications channel with sfcfrmd could not be established.

Response
Check whether FsRM is operating, and then contact local Customer Support.

ERROR: sfcmntgl: 0015: {*special* | *mount_point*}*:* No such file or directory

Explanation
Special file *special*, or mount point *mount_point* does not exist.

Response
Check whether the specified special file and mount point exists on any node.

ERROR: sfcmntgl: 0016: {*special* | *mount_point*}: stat(2) is error: *errmsg*

Explanation
Obtaining the status of the special file *special*, or mount point *mount_point* failed.

Response
Take action according to detailed information indicated by *errmsg*. For details, see the description of stat(2).

ERROR: sfcmntgl: 0017: *special*: Character device can not be specified as mount point. Please specify block device.

Explanation
The character device was specified.

Response
Specify the block device.

ERROR: sfcmntgl: 0018: The description form of fstab is wrong

Explanation
The description format of /etc/fstab is incorrect.

Response
Confirm the contents of /etc/fstab.

ERROR: sfcmntgl: 0019: {*special* | *mount_point*}: filesystem may not be created

Explanation
The specified file system {*special* | *mount_point*} was not registered in the management partition.

Response
After confirming that the file system has been created, re-execute the sfcmntgl command.

ERROR: sfcmntgl: 0021: *special* is not block device

Explanation
The specified *special* is not a block device.

Response
Check whether specified special file and described special file in /etc/fstab is a block device.

ERROR: sfcmntgl: 0022: *mount_point* is not directory

Explanation

The specified *mount_point* is not a directory.

Response

Check whether specified mount point and described mount point in /etc/fstab is a directory.

ERROR: sfcmntgl: 0023: fstype is described as an invalid value in fstab

Explanation

An unexpected error was detected in the fstype field in /etc/fstab.

Response

Check the contents of /etc/fstab.

ERROR: sfcmntgl: 0024: fstype is described not as sfcfs but as *fstype* in fstab

Explanation

The specified file system is not the GFS shared File System.

Response

Check the contents of /etc/fstab and specify the GFS Shared File System.

ERROR: sfcmntgl: 0028: {*special | mount_point*}: *hostname* is already processing mount or umount

Explanation

In the hostname, mount or umount processing has already been performed.

Response

Please set time a little and execute a command again.

ERROR: sfcmntgl: 0029: {*special | mount_point*}: *mount_point* need to be representative partition

Explanation

The special block device specified as a mountpoint: was not a representation partition.

Response

Please specify a representation partition name and execute a command again.

WARNING: sfcmntgl: 0020: *hostname*: *special* is already mounted, *mount_point* is busy, or the allowable number or mount point:s has been exceeded

Explanation

Either special file *special* has already been mounted in *hostname,* or mountpoint: *mount_point* is already in use. Mount processing is not performed for *hostname*.

Response

None.

WARNING: sfcmntgl: 0025: *hostname*: {*special | mount_point*}: Send mount demand processing to sfcfrmd went wrong

Explanation

Transmission processing for sfcfrmd of the mount processing request made to *hostname* failed.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

WARNING: sfcmntgl: 0026: {*special | mount_point*}: Waiting processing for a Response mount demand went wrong

Explanation

Reception processing of the mount processing request made to sfcfrmd failed.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

WARNING: sfcmntgl: 0027: {*special |mount_point*}: Time out occurred in mount demand processing to sfcfrmd

Explanation

A timeout occurred in the reception processing of the mount processing request made to sfcrmd.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

A.4.8 sfcsetup command

ERROR: sfcsetup: 0001: Permission denied

Explanation

Execution was attempted with other than super-user permission.

Response

Perform execution with super-user permission.

ERROR: sfcsetup: 0002: Cannot connect to cluster foundation

Explanation

Communication with the cluster control could not be established.

Response

Check whether the cluster control is operating normally.

ERROR: sfcsetup: 0003: sfcfrmd is active within cluster foundation

Explanation

FsRM is operating within a cluster.

Response

Stop FsRM and then re-execute the command.

ERROR: sfcsetup: 0004: Cannot get lock: config

Explanation

Execution of this command failed as another command was being executed.

Response

Once execution of the other command has terminated, re-execute this command.

ERROR: sfcsetup: 0005: Too many arguments

Explanation

Too many arguments have been specified.

Response

Check the command format, and then re-execute.

ERROR: sfcsetup: 0006: A few option

Explanation

Too few arguments have been specified.

Response

Check the command format, and then re-execute.

ERROR: sfcsetup: 0007: Wrong command format

Explanation

The command format is invalid.

Response

Check the command format, and then re-execute.

ERROR: sfcsetup: 0008: Cannot get cipname

Explanation

The CIP host name for the node executing the command could not be acquired.

Response

Check the cluster system settings.

ERROR: sfcsetup: 0009: Bad data exists in management partition

Explanation

The management partition contain invalid data.

Response

Contact local Customer Support.

ERROR: sfcsetup: 0010: Cannot write to sfcfsrm.conf

Explanation

Writing to the sfcfsrm.conf file failed.

Response

Check the status of the sfcfsrm.conf file.

ERROR: sfcsetup: 0011: Cannot open management partition

Explanation

The management partition could not be opened.

Response

Check whether the path to the management partition, specified in the sfcfsrm.conf file, is correct.

ERROR: sfcsetup: 0012: Node information area is full

Explanation

The maximum possible amount of node information has already been stored.

Response

Delete any node information that is no longer necessary, and then re-execute the command.

ERROR: sfcsetup: 0013: Cannot write node information

Explanation

An error occurred when trying to write new node information.

Response

Contact local Customer Support.

ERROR: sfcsetup: 0014: Wrong argument format

Explanation

The format of an argument specified with the command is invalid.

Response

Check the format of the argument, and then re-execute the command.

ERROR: sfcsetup: 0015: Invalid argument

Explanation

An argument specified with the command contains an invalid character string.

Response

Check the argument, and then re-execute the command.

ERROR: sfcsetup: 0016: Cannot get lock: master. sfcfrmd may be working now

Explanation

The command cannot be executed, either because another command is being executed, or because sfcfrmd is operating.

Response

Wait for execution of the other command to terminate or, after executing sfcfrmstop on all the nodes, re-execute the command.

ERROR: sfcsetup: 0017: Node(hostid=0x*hostid*) is busy

Explanation

Node (hostid=0x*hostid*) has still file system information in management partition. It is configured as sharing node of a GFS shared file system. **sfcsetup -d** did not do anything.

Response

Delete node information by following procedures:
1) Execute sfcfrmstart(8).
2) Check sharing node information of all GFS shared file system by **sfcinfo -an**.
3) Reconfigure sharing node information of GFS shared file system by **sfcadm -u**, or delete file system information by **sfcadm -D**.
4) Execute sfcfrmstop(8).
5) Retry **sfcsetup -d**.

ERROR: sfcsetup: 0018: Communication initialize error

Explanation

Communication could not be initialized.

Response

Contact local Customer Support. Or, review your system environment.

ERROR: sfcsetup: 0019: socket open error to *filename*

Explanation

A communication channel with the daemon could not be opened.

Response

Check that sfcfrmd or sfcprmd are operating normally.

ERROR: sfcsetup: 0020: data(*data*) is not found

Explanation

No information could be found for a node that was to be deleted.

Response

First check that the input data is correct, and then re-execute the command.

ERROR: sfcsetup: 0021: ERROR occurred. errcode= *errcode*

Explanation

An internal error occurred.

Response

Contact local Customer Support.

ERROR: sfcsetup: 0022: Cannot allocate memory

Explanation

Memory acquisition failed due to a shortage of memory.

Response

Terminate any applications that are not required, and then re-execute the command.
Alternatively, review the system environment

ERROR: sfcsetup: 0023: Read error of sfcfsrm.conf

Explanation

Reading of sfcfsrm.conf failed.

Response

Check the status of the sfcfsrm.conf file.

ERROR: sfcsetup: 0024: Cannot get status of sfcfrmd on this node

Explanation

The process monitor daemon could not acquire the status of the file system recovery manager daemon.

Response

Check whether the process monitor daemon is operating normally.

ERROR: sfcsetup: 0025: sfcfrmd is active on this node

Explanation

The file system recovery manager daemon is running on a node for which an attempt was made to execute a command.

Response

Execute sfcfrmstop, and then re-execute the command.

ERROR: sfcsetup: 0026: Cluster function may not be working

Explanation

The cluster system may not be operating normally

Response

Contact local Customer Support.

ERROR: sfcsetup: 0027: Input error

Explanation

An input error was made.

Response

Contact local Customer Support.

ERROR: sfcsetup: 0028: *raw_device_file* is already used as management partition

Explanation

The specified character device (raw_device_file) has already been initialized as a management partition.

Response

After checking whether this device really should be initialized, re-execute the command with the –f option specified.

ERROR: sfcsetup: 0029: Management partition read error

Explanation

Reading of the management partition failed.

Response

Check the status of the disk containing the management partition.

ERROR: sfcsetup: 0030: Management partition write error

Explanation

Writing to the management partition failed.

Response

Check the status of the disk containing the management partition.

ERROR: sfcsetup: 0031: Cannot initialize management partition. errcode=*errno*

Explanation

Initialization of the management partition failed.

Response

Check the status of the disk containing the management partition.

ERROR: sfcsetup: 0032: *raw_device_file* is invalid disk device

Explanation

Either the specified device (raw_device_file) does not exist, or is not a GDS volume.

Response

Check that the specified device is a GDS volume and whether it does, in fact, exist.

ERROR: sfcsetup: 0033: Cannot open fstab

Explanation

The /etc/fstab file could not be opened.

Response

Check the status of /etc/fstab, and whether the file actually exists.

ERROR: sfcsetup: 0034: *raw_device_file* is already exist in fstab

Explanation

The device specified (raw_device_file) in the management partition may already be being used by the system.

Response

Either specify a different device in the management partition or, if an entry in /etc/fstab is not needed, delete it and then re-execute the command.

WARNING:sfcsetup: 0035: Illegal line exists in fstab

Explanation

An invalid row is included in /etc/fstab.

Response

Confirm the contents of /etc/fstab and correct it if necessary.

ERROR: sfcsetup: 0036: Cannot open mtab

Explanation

The /etc/mtab file could not be opened.

Response

Check the status of the /etc/mtab file and whether it does, in fact, exist.

ERROR: sfcsetup: 0037: *raw_device_file* is already exist in mtab

Explanation

The device specified (raw_device_file) in the management partition may already be being used by the system.

Response

Either specify a different device in the management partition or, if an entry in the /etc/mtab file is not needed, delete it and then re-execute the command.

ERROR: sfcsetup: 0038: Illegal line exists in mtab

Explanation

An error occurred while /etc/mtab was being read.

Response

Check the contents of /etc/mtab.

ERROR: sfcsetup: 0039: Cannot open *raw_device_file*

Explanation

The specified device file (raw_device_file) could not be opened.

Response

Check whether the physical connection to the disk is satisfactory.

ERROR: sfcsetup: 0040: Cannot get the disk size for the management partition

Explanation

The size of the disk on which the management partition resides could not be obtained.

Response

Check the status of the disk.

ERROR: sfcsetup: 0041: Cannot get major number

Explanation

The major number of disk containing the management partition could not be obtained.

Response

Check whether the system environment is satisfactory, and whether the specified special file is correct.

ERROR: sfcsetup: 0042: Cannot get driver name

Explanation

The diver name for the disk containing the management partition could not be obtained.

Response

Check whether the system environment is satisfactory, and whether the specified special file is correct.

ERROR: sfcsetup: 0043: Cannot get node information

Explanation

Node information could not be acquired from the management partition.

Response

Check the status and contents of sfcfsrm.conf.

ERROR: sfcsetup: 0044: Node information does not exist

Explanation

The information for the node for which the command was executed has already been deleted.

Response

None.

ERROR: sfcsetup: 0045: *raw_device_file* is not raw_device_file

Explanation

The specified device (raw_device_file) is other than a character special device.

Response

Check the device name, and then re-execute the command.

ERROR: sfcsetup: 0046: Illegal entry exists, or no entry of path to management partition in sfcfsrm.conf

Explanation

The sfcfsrm.conf file contains no entry that indicates the path to the management partition. Either node information has not yet been added to the management partition, or it was on a node that has already been deleted.

Response

Check whether node information has not yet been added to the management partition, or whether the node containing the entry has already been deleted.

ERROR: sfcsetup: 0047: *raw_device_file* does not exist

Explanation

The specified special file (raw_device_file) does not exist in the system environment.

Response

Check whether the specified special file is correct.

ERROR: sfcsetup: 0048: Too small disk size, need more than 40MB

Explanation

The size of the device specified in the management partition is too small.

Response

Specify a shared disk with a volume size of 40 MB or more.

ERROR: sfcsetup: 0049: Illegal entry exists ,or no entry of path to management partition in sfcfsrm.conf

Explanation

An invalid row is included in setup file sfcfsrm.conf.

Response

Confirm the contents of the setup file sfcfsrm.conf.

ERROR: sfcsetup: 0050: Cannot open sfcfsrm.conf: *message*

Explanation

Due to the reason displayed in the message, opening of the FsRM setup file sfcfsrm.conf failed.

Response

Apply the countermeasures described in the message.

ERROR: sfcsetup: 0051: *raw_device_file* is not management partition

Explanation

The volume of the specified shared disk (raw_device_file) is not initialized for the management partition.

Response

Initialize the volume of the shared disk and then re-execute.

ERROR: sfcsetup: 0052: sfcfsrm.conf does not exist. sfcsetup may not be executed

Explanation

The setup file sfcfsrm.conf cannot be found. Node information may not be registered in the node.

Response

Register node information in the management partition by using the sfcsetup command.

ERROR: sfcsetup: 0053: Volume(*raw_device_file*) may not be active. Please activate volume

Explanation

The volume of the shared disk that has been specified in the management partition may not be valid.

Response

Confirm the state of the volume of the shared disk by executing the sdxinfo(8) command to validate the volume, and then re-execute.

INFO: sfcsetup: 0002: Waiting to be able to get lock: master

Explanation

The acquisition of domain-wide lock is in progress.

Response

Wait for a short while.

INFO: sfcsetup: 0003: Waiting to be able to get lock: config

Explanation

The acquisition of domain-wide lock is in progress.

Response

Wait for a short while.

A.4.9   sfcstat command

sfcstat: missing entry of sfcfs fstotal

Explanation

Statistical information could not be obtained.

Response

Check whether the file system is normal.

sfcstat: no active sfcfs

Explanation

The file system is not mounted.

Response

Mount the file system.

sfcstat: *special* not mounted

Explanation

special is not mounted.

Response

After mount the file system, re-execute the command.

sfcstat: *special* is not a sfcfs file system

Explanation

The specified partition (special) is not an sfcfs file system partition.

Response

Check whether the specified partition is an sfcfs file system partition.

sfcstat: Can't get information about mounted file systems

Explanation

Reading /etc/mtab failed.

Response

Check the /etc/mtab settings and the access right to the file.

sfcstat: can't open *mnt_pnt*

Explanation

Opening the mountpoint: mnt_pnt failed.

Response

Check the access right to the mountpoint:. When you have the access right or an I/O error occurs in accessing the mountpoint:, collect the diagnostic data with pclsnap and contact your local Customer Support.

A. 4. 10   sfcumntgl command

ERROR: sfcumntgl: 0001: Permission denied

Explanation

Execution was attempted with other than super-user permission.

Response

Retry execution with super-user permission.

ERROR: sfcumntgl: 0002: Cannot open fstab file

Explanation

/etc/fstab could not be opened.

Response

Check the status of /etc/fstab.

ERROR: sfcumntgl: 0003: Both *special* and *mount_point* need to be specified in fstab

Explanation

It needs to be described by /etc/fstab when both the special file *special* and mountpoint: *mount_point* are specified as an operand.

Response

Check the status of /etc/fstab.

ERROR: sfcumntgl: 0004: {*special* | *mount_point*} not in fstab

Explanation

It was not described by /etc/fstab although {*special* | *mount_point*} was specified as a special file or a mountpoint:.

Response

Check the status of /etc/fstab.

ERROR: sfcumntgl: 0005: *device:* Cannot allocate memory

Explanation

Memory acquisition failed.

Response

Either wait for another process to end, or increase the size of the swap area.

ERROR: sfcumntgl: 0006: {*special* | *mount_point*}: Cannot connect to cluster foundation

Explanation

Connection with the cluster control facility failed.

Response

Confirm that the cluster control facility has already been started.

ERROR: sfcumntgl: 0007: {*special* | *mount_point*}: Cannot get lock: config

Explanation

The lock to change the file system configuration information cannot be obtained. The lock to change the file system configuration information is now being obtained in an optional process of the node within the cluster configuration.

Response

Re-execute after releasing the lock for changing the domain configuration information.

ERROR: sfcumntgl: 0008: {*special* | *mount_point*}: Read error on management partition to get

fsid

Explanation

Reading of the management partition to obtain the file system id failed.

Response

Confirm, using the likes of the ps command, that sfcfrmd is available.

ERROR: sfcumntgl: 0009: *device:* Cannot get lock: fsid

Explanation

Exclusive lock for fsid within the domain cannot be acquired. The exclusive lock for fsid has been acquired by another process running on a node in the cluster.

Response

Wait for the exclusive lock for fsid to be released, and then retry.

ERROR: sfcumntgl: 0010: {*special* | *mount_point*}: Read error on management partition to get

node information

Explanation

Reading of the management partition to obtain the cluster configuration node information failed.

Response

Confirm, using the likes of the ps command, that sfcfrmd is available.

ERROR: sfcumntgl: 0011: {*special* | *mount_point*}: sfcfrmd may not exist

Explanation

A communication path to sfcfrmd could not be established.

Response

Confirm, using the likes of the ps command, that sfcfrmd is available.

ERROR: sfcumntgl: 0012: *hostname:* {*special* | *mount_point*} busy

Explanation

Unmount processing for special file *special* or mountpoint *mount_point* failed.

Response

In the command execution node, try to find a process that is using the file system by fuser(1) command (for example, "fuser -m *mount_point*"). If such a process exists, kill the process and unmount the file system again. Otherwise, collect the diagnostic data with pclsnap, and collect the kernel dump by push the NMI button and contact your local Customer Support.

ERROR: sfcumntgl: 0013: The description form of fstab is wrong

Explanation

The description format of /etc/fstab is incorrect.

Response

Confirm the contents of /etc/fstab.

ERROR: sfcumntgl: 0019: {*special* | *mount_point*}: No such file or directory

Explanation

Special file *special*, or mountpoint: *mount_point* does not exist.

Response

Check whether the specified special file and mount point exists on any node.

ERROR: sfcumntgl: 0020: {*special* | *mount_point*}: stat(2) is error: *errmsg*

Explanation

Obtaining the status of the special file *special*, or mount point *mount_point* failed.

Response

Check whether the specified special file and mount point exists on any node.

ERROR: sfcumntgl: 0021: *filename*: Character device cannot be specified as mountpoint:.

Please specify block device

Explanation

Character-type special device name *filename* was specified as the mountpoint:.

Response

Specifying a block-type special device name and then re-execute.

ERROR: sfcumntgl: 0022: *special* is not block device

Explanation

A block device was not specified as the argument of the sfcumntgl command.

Response

Specify a block device.

ERROR: sfcumntgl: 0023: *mount_point* is not directory

Explanation

The specified *mount_point* is not a directory.

Response

Check whether specified mount point and described mount point in /etc/fstab is a directory.

ERROR: sfcumntgl: 0024: fstype is described as an invalid value in {fstab | mtab}

Explanation

An unexpected error was detected in the fstype field in /etc/fstab or /etc/mtab.

Response

Check the contents of /etc/fstab or /etc/mtab.

ERROR: sfcumntgl: 0025: fstype is described not as sfcfs but as *fstype* in {fstab | mtab}

Explanation

The specified file system is not the GFS shared File System.

Response

Check the contents of /etc/fstab and /etc/mtab and specify the GFS Shared File System.

ERROR: sfcumntgl: 0029: {*special | mount_point*}: self-node is already processing mount or umount

Explanation

In the self-node, mount or umount processing has already been performed.

Response

Please set time a little and execute a command again.

ERROR: sfcumntgl: 0030: {*special | mount_point*}: *mount_point* need to be representative partition

Explanation

The special block device specified as a mountpoint: was not a representation partition.

Response

Please specify a representation partition name and execute a command again.

WARNING:sfcumntgl: 0014: *device:* Cannot get lock: fsid, but processing is continued compulsorily

Explanation

Exclusive lock for fsid within the domain could not be acquired, but processing is performed forcibly.

Response

None.

WARNING: sfcumntgl: 0015: *hostname: special* not mounted

Explanation

special had already been unmounted at hostname.

Response

None.

WARNING: sfcumntgl: 0016: *hostname: special*: mount is in progress

Explanation

Mount processing had already been performed to special at hostname

Response

Either wait a short while and retry the unmount processing, or perform the unmount processing in forced mode.

WARNING: sfcumntgl: 0017: *hostname: special*: fail over is in progress

Explanation

Failover processing had already been performed to *special* at *hostname*

Response

Either wait a short while and retry the unmount processing, or perform the unmount processing in forced mode.

WARNING: sfcumntgl: 0018: *hostname: special*: umount is in progress

Explanation

Umount processing had already been performed to *special* at *hostname*

Response

None.

WARNING: sfcumntgl: 0026: *hostname*: {*special | mount_point*}: Send umount demand processing to sfcfrmd went wrong

Explanation

Transmission of the unmount processing request to sfcfrmd failed with *hostname*.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

WARNING: sfcumntgl: 0027: {*special | mount_point*}: Waiting processing for a Response umount demand went wrong

Explanation

Reception processing of the unmount processing request to sfcfrmd failed.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

WARNING: sfcumntgl: 0028: {*special | mount_point*}: Time out occurred in umount demand processing to sfcfrmd

Explanation

A timeout occurred in the reception processing of the unmount processing request made to sfcfrmd.

Response

After confirming the state of sfcfrmd with the likes of the ps command, contact local Customer Support.

A. 4. 11   sfcrscinfo command

sfcrscinfo: *special* is not a representative partition of GFS shared file system

Explanation
special is not the GFS Shared File System's representative partition.

Response
Specify the representative partition and re-execute the command.

sfcrscinfo: fsid(*FSID*) is out of range

Explanation
The specified fsid value lies outside the valid range.

Response
Review specified FSID and re-execute the command.

sfcrscinfo: There is not GFS shared file system with fsid(*FSID*)

Explanation
A GFS Shared File System identified by the specified fsid does not exist.

Response
Check specified FSID is correct.

sfcrscinfo: Cannot allocate communication buffer

Explanation
The initialization processing of communication failed due to insufficient memory or swap space.

Response
Check the system environment whether memory or swap space insufficiency has not occurred.

sfcrscinfo: Cannot connect to fsrm

Explanation
The file system monitoring mechanism is not operating.

Response
Check whether the sfcfrmd process exists using the ps command.
When it does not exist, activate the file system monitoring mechanism using the sfcfrmstart command.

sfcrscinfo: Fs(*FSID*) config db broken

Explanation
Illegal data exists in the file system configuration information for the file system whose fsid is FSID.

Response
Restore the management partition using its backup previously saved.

sfcrscinfo: Cannot get device name of fsid(*FSID*)

Explanation
Obtaining the device name for the file system whose fsid is FSID failed.

Response
Check the system environment whether it is proper.

sfcrscinfo: File system config data of fsid(*FSID*) is broken

Explanation

Illegal data exists in the file system configuration information for the file system whose fsid is FSID.

Response

Restore the management partition using its backup previously saved.

sfcrscinfo: Cannot open /etc/mtab: *errormsg*

Explanation

Opening /etc/mtab failed.

Response

Check the system environment using errormsg.

sfcrscinfo: Fsrm is not active

Explanation

The file system monitoring mechanism is not operating.

Response

Check whether the file system monitoring mechanism is running.

A.5　　GFS Shared File System Script Messages

This section describes the script messages of the GFS File System.

A.5.1　　sfcfsrm script

ERROR: sfcfsrm:0001: can not execute *file_name*

Explanation

file_name is not executable.

Responce

See "Installation Guide for PRIMECLUSTER(TM) for Linux(TM) Environment" and reinstall the package.

ERROR: sfcfsrm:0002: *management_partition* is not available

Explanation

The status of the GDS volume that was specified as the management partition is not ACTIVE. Or, there is a possibility that the GDS volume is deleted without deleting node configuration information from the management partition by sfcsetup -d on the target node when the use of GFS is stopped.

Responce

If GFS is used
Check whether the volume exists by executing the following procedure:
ls -l *management_partition*
- If the volume does not exist
  Create a volume according to the instructions in "Operation" of the "PRIMECLUSTER Global Disk Services Configuration and Administration Guide."
  – If there is a backup of the management partition information
    Restore the management partition according to the instructions in "5.5 Backup and restore of the management partition information" in this manual.
  – If there is no backup of the management partition information
    See "Chapter 5 Management Partition" and set up the management partition.
- If the volume exists
  If the volume status is not ACTIVE, change the status to ACTIVE. For instructions on how to change the volume status, see the "Operation" of the "PRIMECLUSTER Global Disk Services Configuration and Administration Guide."

If GFS is not used
Check whether the volume exists by executing the following procedure:
ls -l *management_partition*
- If the volume does not exist
  Delete information on the deleted GDS volume by executing the following procedures:

  1. Create a temporary GDS volume of 40 MB or more. (GDS volume name is arbitrary)
  2. sfcsetup -c temporary_GDS_volume (GDS volume name made at 1.)
  3. sfcsetup -a temporary_GDS_volume (GDS volume name made at 1.)
  4. sfcsetup -d
- If the volume exists
  Delete the node configuration information from the management partition by executing the following procedures:
  1. Set the volume status to ACTIVE.
  For instructions on how to change the volume status, see "Operations" of the "PRIMECLUSTER Global Disk Services Configuration and Administration Guide."

2. See "5.4 Configuring the Management Partition and Starting the File System Monitoring Mechanism" and delete the node configuration information from the management partition.

ERROR: sfcfsrm:0003: sfcfrmstart failed

Explanation
sfcfrmd daemon failed booting.

Response
Check the error message of sfcfrmstart displayed on the console, and cope with it about the error message with reference to "A.4.3 sfcfrmstart command."

ERROR: sfcfsrm:0004: can not terminate *daemon*

Explanation
The *daemon* could not be stopped.

Response
Collect the diagnostic data with pclsnap and contact local Customer Support.

ERROR: sfcfsrm:0005: can not load *module*

Explanation
Loading of *module* were failed.

Response
Please use the ls command and check whether module exists. When it does not exist, see "PRIMECLUSTER(TM) Installation Guide for Linux(TM) Environment" to re-install packages. When it does exist, collect the crash dump and the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsrm:0006: can not unload *module*

Explanation
Unloading of *module* were failed.

Response
Collect the crash dump and the diagnostic data with pclsnap, and contact your local Customer Support.

ERROR: sfcfsrm:0007: cluster is not available

Explanation
Cluster resource management is not started.

Response
Please follow the procedure in an error message of the Cluster resource management outputted to /var/log/messages. For details, see the "Resoucce Database Messages" of "PRIMECLUSTER(TM) Cluster Foundation Configuration and Administration Guide".

A.6   GFS Shared File System Management View Messages

This appendix provides information on message dialog associated with GFS Shared File System Management View, and wherever possible, a recovery procedure is provided to locate and correct the problem.

A.6.1   Error messages

6000: Executing the command was unsuccessful.

Explanation

Executing the command was unsuccessful.

Response

To proceed with operation, press <Yes> button. To cancel press <No> button.

6001: Command line output: (detailed information)

Explanation

The error given in (detailed information) occurred when executing the command.

Response

Identify the cause referring to the command line output. When you cannot identify the cause, contact local Customer Support.

6002: Abnormality occurred in the log monitoring mechanism on node *node*. Monitoring will stop. Restart Global File Services.

Explanation

Abnormality occurred in the log monitoring mechanism on node *node*.

Response

Restart GFS management.

6003: Specified meta partition is not found at server side.

Explanation

The specified meta partition could not be found.

Response

Specify the name of a meta partition that can be shared by the specified hosts, and re-execute the command.

6004: Specified data partition is not found at server side.

Explanation

The specified data partition could not be found.

Response

Specify the name of a data partition that can be shared by the specified hosts, and re-execute the command.

6005: Specified log partition is not found at server side.

Explanation

The specified log partition could not be found.

Response

Specify the name of a log partition that can be shared by the specified hosts, and re-execute the command.

6006: Specified File system is not found at server side.

Explanation

The specified file system has been registered in /etc/fstab.

Response

Specify the name of a file system that can be shared by the specified hosts, and re-execute the command.

A.6.2   Warning messages

6001: Command line output: (detailed information)

Explanation

The error given in (detailed information) occurred when executing the command.

Response

Identify the cause referring to the command line output.

6200: The file system is active. Cannot change the status.

Explanation

The active file system cannot delete or change.

Response

Unmount the file system, and do again.

6201: Specified file system has error status, so can not modify status.

Explanation

Specified file system has error status.

Response

Investigate the cause of abnormalities by reference of a Log.

6202: There is no enough update log area in the specified configuration. Please do reconfiguration.

Explanation

The update log area is too small.

Response

Change partition configuration to get enough update log area, and press <Next> or <Create> button.

6203: The input mountpoint: is not available. Change the mountpoint.

Explanation

The input mountpoint: is not available.

Response
>Change the mountpoint:, and press <Next> button.

6204: There is no disk shared by the specified node. Please change the selection of the node.

Explanation
>There is no disk shared by the specified node.

Response
>Please change the selection of the node.

6205: There is no disk shared by the specified node. Please change the selection of the node.

Explanation
>There is no disk shared by the specified node.

Response
>Please change the selection of the node.

6206: There are no unused disks. so You can not create new file system.

Explanation
>There are no unused disks.

Response
>Nothing.

Specified file system will be deleted. Data in the file system is lost. Are you sure?

Explanation
>When the file system is deleted, data in the file system is lost.

Response
>To delete the file system, press the <Yes> button. To cancel the deletion of the file system, press the <No> button.

Do you want to quit file system creation?

Explanation
>Quit file system creation.

Response
>To quit, press the <Yes> button; otherwise, press the <No> button.

A. 6. 3　Information messages

A file system has been created.

Explanation
>A file system was created.

Response
>Press the <OK> button to close the message.
>Start the cluster service to make available the file system.

Changing configuration was completed.

Explanation
Changing configuration of the file system was completed.

Response
Press the <OK> button to close the message.

Changing attribution was completed.

Explanation
Changing attribution of the file system was completed.

Response
Press the <OK> button to close the message.

A file system has been deleted.

Explanation
A file system was deleted.

Response
Press the <OK> button to close the message.

Exit GFS management?

Explanation
Exits GFS management.

Response
Press <Yes> to exit, <No> to continue operation.

A. 7　Web-Based Admin View Messages

For information about the Web-Based Admin View error messages displayed when GFS Shared File System is active, see "*PRIMECLUSTER Web-Based Admin View Operation Guide*."

A.8   Log Reference Messages

For information about the Log Reference Messages, see "*PRIMECLUSTER Cluster Foundation Configuration and Administration*" or "*PRIMECLUSTER Installation Guide for Linux*."

A.9   Operating Environment Setting Messages

For information about the error messages output during operating environment setting, see "*PRIMECLUSTER Installation Guide for Linux*."

Appendix B Reference Manual

This appendix is intended for use as a reference manual for the GFS Shared File System.

B.1   Commands for Common File System Management

B.1.1   sfcdf(8) Display the GFS Shared File System use status and configuration

information

SYNOPSIS

    sfcdf -v [*device* ...]
    sfcdf -m *device*

DESCRIPTION

The **sfcdf** command displays detailed information about the use status and the configuration of a **GFS** Shared File System.

A block special `device` or a character special device can be specified for device to indicate the partition of a file system. When no value is specified for `device`, information on the mounted file system is displayed.

The following information can be displayed for file system use statuses.
For the meta-data area, the following information is displayed:
- –   i-node use status (used i-node count, free i-node count)
- –   Free extent status (used leaf count, free leaf count)
- –   V-data use status (used block count, free block count)

For the file data area, the following information is displayed:
- –   Free file data area size

For the update log area, the following information is displayed:
- –   Update log area size

OPTIONS

The following options can be specified:

-v

    Displays the file system use status by area.

-m

    Displays the superblock and the partition configuration data on the partition.

OPERANDS

The following operands can be specified:

device

    Specifies the path to a block special device or a character special device on the partition of the **GFS** Shared File System.

EXAMPLES

```
# sfcdf -v /dev/sfdsk/gfs/dsk/volume1

Filesystem:/mnt

                       inodes   free   vdata   free   leaf   free   Type
/dev/sfdsk/gfs/dsk/volume1

                        14248  12192   4781    4615   7128   7127   META

                  kbytes
/dev/sfdsk/gfs/dsk/volume1

                         5120                                        LOG

                  kbytes    used    free  %used
/dev/sfdsk/gfs/dsk/volume1

                       113992  62664  51328    55%                  DATA
```

FILE

/etc/mtab

The table of a mounted system file

SEE ALSO

df(1), getmntent(3) and mount(8) in the online manual.

B.1.2   sfcfsck(8) Verify and restore GFS Shared File System consistency

SYNOPSIS

    sfcfsck [*generic_options*] [**-o** *specific_options*] *special*

DESCRIPTION

    The **sfcfsck** command checks the **GFS** Shared File System for consistency and restores the file system.

    The **GFS** Shared File System can perform high-speed recovery by using the update log function. Specify whether to perform high-speed recovery by executing an update log replay when sfcfsck is executed. If an update log replay cannot be executed because of a damage or for some other reason, sfcfsck executes a full file system check. A file system to be checked can be specified by setting a block special device or a character special device, or it is determined by the mount point of the file system whose entry is contained in /etc/fstab.

    For special, specify a block special device or a character special device where the file system has been configured, or specify the mount point. sfcfsck is not executed when a block special device has been mounted.

    If there is a serious inconsistency, the operator is prompted to reply **yes** or **no** to repair before sfcfsck executes recovery. If the operator does not have write permission for the file system, sfcfsck executes the operation with the -n option (no corrections are made).
sfcfsck executes automatic recovery for minor inconsistencies such as:
- i-node not referenced
- Too many links in an i-node
- An incorrect block included in a free list
- A block appearing in both a free list and a file
- An invalid value detected in a super block

After the inconsistency is corrected, a message is displayed. When recovery of the file system is successful, sfcfsck displays the number of files on the file system, the counts for used blocks and free blocks, and the fragmentation rate.

    A full check is executed for the following inconsistencies:
- A block acquired by multiple i-nodes or free lists.
- A block requested by an i-node or free list outside the range of the file system.
- Invalid link count
- Invalid directory size
- i-node with invalid syntax
- A block not referenced from anywhere
- Directory check, a file pointing to an unallocated i-node, i-node number falling outside the range, the first two entries (. and ..) in a directory
- Super block check: i-node blocks exceeding the number of blocks in the file system.
- A free block list with invalid syntax
- An invalid total for the free block count and free i-node count

    Independent files and directories (allocated, but not referenced) are placed in a `lost+found` directory and reunited with the operator's consent. They are assigned i-node numbers as names. If a **lost+found** directory does not exist, create it. If area for the **lost+found** directory is not sufficient, expand the directory.

OPTIONS

    The *generic-options* consist of the following options:

    -v

        Displays a command line, but does not execute the command.

-m

> Executes a check, but does not make corrections.
> One of the following messages is outputted at the time of execution.
> **sfcfsck: sanity check:** *device* **okay**
>> *device* is consistent.
> **sfcfsck: sanity check:** *device* **need log replay**
>> *device* needs to perform update log replay.
> **sfcfsck: sanity check:** *device* **needs checking**
>> *device* needs to perform full check of file system.
> Update log replay is automatically performed if needed at the time of mount.
> The performing method of the update log replay or full check by sfcfsck is described in **-o** option.

-n|N

> Automatically replies "**no**" to all inquiries. Does not open the file system for writing.

-y|Y

> Automatically replies **yes** to all inquiries.

-o specific_options

> Allows options specific to the **GFS** Shared File System to be specified. Insert a comma delimiter between options.

> **f**

>> Executes a forcible check, regardless of the super block status flag.

> **P**

>> Checks for non-conversational synopsis and makes corrections.

> **w**

>> Checks only for write-enabled file systems.

> **log|elog|nolog**

>> Specifies whether to perform an update `log` replay.
>> The default is `log`.
>> **log**
>>> Executes an update log replay. Executes a full file system check if the log data is physically destroyed.
>> **elog**
>>> Executes an update log replay. The command terminates immediately if the log data is physically destroyed without a full file system check being executed.
>> **nolog**
>>> Executes a full file system check without executing an update log replay.

OPERAND

> The following operand can be specified:

special

> Specifies the path to a block special device or a character special device on the representative partition of the GFS Shared File System or the path to the mount point.

EXAMPLES

```
# sfcfsck /dev/sfdsk/gfs/dsk/volume1

# sfcfsck -o nolog /dev/sfdsk/gfs/dsk/volume1
```

EXIT STATUS

    0   No recovery was necessary.

    1   File system recovery has been completed normally.

    2   The system must be rebooted.

    4   The file system error has left unrepaired.

    8   The processing has terminated because of an abnormal event occurring during command execution.

    16   An incorrect parameter was specified.

SEE ALSO

"B.1.3 sfcmkfs(8)"

reboot(8), stat(2), and fstab(5) in the online manual.

NOTE

▪   A file system can be checked only when all hosts that share the file system have started operation. The reason is that the information for these hosts is required.

B.1.3   sfcmkfs(8) Construct the GFS Shared File System

SYNOPSIS

sfcmkfs [**-m**] [**-o** *specific_options*] *device_file*

DESCRIPTION

The sfcmkfs command builds the **GFS** Shared File System on specified disks.

Once the **GFS** Shared File System has been created, its entry is added to file system configure information in a management partition. Thereafter, file system configure information in a management partition is used to manage the **GFS** Shared File System.

OPTIONS

The following options can be specified.

-m

> Outputs command lines of file system creation time. The file system needs to be present.

- o *specific_options*

> Allows options specific to **GFS** Shared File System to be specified. Insert a comma delimiter between options.

> **N**

> > Displays parameters used for creating a file system. Does not actually create a file system.

> **free=n**

> > Specifies the minimum percentage of free area in the file system.
> > The default is **10**%.
> > A value can be specified in the range from **0** to **99**.

> **force**

> > Specifies the force option to re-create a file system previously registered in file system configure information in a management partition when its configuration is unchanged. If, however, the target file system is being mounted, specifying this option results in an error.

> **logsz=n**

> > Specifies the size of the update log area. The unit is megabytes.
> > The default is about **1**% of the file system size. If the specified value is smaller than **5** megabytes, 5 megabytes is set. If the specified value is greater than **50** megabytes, **50** megabytes is set.
> > A value can be specified in the range from **5** to **100**.

> **maxnode=n**

> > Specifies the maximum number of nodes, including expanded nodes by sfcnode(8) in the future, that are shared in the file system configuration on disks.
> > The default is **16**.
> > A value can be specified in the range from **1** to **32**.

> **mdsnode=all|num**

> > Specifies the number of MDS placing nodes. MDS placing nodes are selected from head of the host names specified with **node** option. When **all** is specified, all nodes are set up as MDS placing node.If and only if **all** is specified, the node added to node information by sfcnode(8) after constructing the file system is also set up as a MDS placing node.
> > The default is **2**.
> > **0** or less value and value bigger than the number of nodes specified with **node** option cannot be specified.

> **metasz=n**

> > Specifies the size of the meta-data area. The unit is megabytes.
> > The default is about **10**% of the file system size.
> > The use ratio of the meta-data area decreases by growing of the file system size when the meta-data area size is not specified.

The size of the meta-data area shall not exceed the size of the representative partition.

`mfree=n`

Specifies the minimum percentage of free V-data area.

The default is **10**%.

A value can be specified in the range from **0** to **99**.

`nblkpext=n`

Specifies an average number of blocks to be managed by one extent.

This parameter is used as a fragmentation factor for the file data area.

The default is **1**.

A value can be specified in the range from **1** to **100**.

`nbpi=n`

Specifies the byte count of data per i-node. Specify a larger value for this parameter if the meta-data area is to be saved.

The default is **8192**.

A value can be specified by the *N* power of 2. (*N* is a range from 9 to 20.)

`node=host,...`

Registers the name of a host that will share the file system. If multiple nodes should share the file system, specify multiple entries for this parameter using commas. Hosts whose names are to be specified for host must be able to communicate with each other. **MDS** (meta-data server) placing nodes are selected in order of descriptions for this option.

Unless this option is specified, only the host name of the local node is registered.

OPERAND

The following operand can be specified:

_device_file_

Specifies a block special device or a character special device on the representative partition of the **GFS** Shared File System.

EXAMPLES

```
# sfcmkfs –o node=host1,host2 /dev/sfdsk/gfs/dsk/volume1
```

FILE

`/etc/fstab`

Environment file for the file system.

SEE ALSO

"B.2.7 sfcnode(8)", "B.2.9 sfcsetup(8)"

fstab(5) in the online manual.

NOTES

- *host* must be the host name of the node configuring the **GFS** Shared File System registered on the management partition by "B.2.9 sfcsetup(8)" in advance.
- A file system can be created only when all hosts that share the file system have started operation and **GFS** Shared File System has been installed. The reason is that the information for these hosts is required.
- If another option is specified after a comma (,) that follows a *node* option, the option will have no effect because it will be interpreted as a host name.
- In the **GFS** Shared File System, the data block size is fixed at **8192** bytes and cannot be altered.
- To re-create a **GFS** Shared File System by modifying its configuration, first delete the file system with "B.2.1 sfcadm(8)".

B.1.4   sfcmount(8) Mount the GFS Shared File System on the local node

SYNOPSIS

sfcmount *special|mount_point*
sfcmount *special mount_point*

DESCRIPTION

The **sfcmount** command mounts the **GFS** Shared File System on the local node only. This command can be executed from any nodes that can access the **GFS** Shared File System.
During the mount processing, this command activates sfcfsd and, if necessary, **MDS**. Pre-defining /etc/fstab is necessary.
Only a super user can perform mount processing.
When mount processing goes wrong, error information is outputted to a console. Please perform management according to the outputted error information.

OPTIONS

The following options can be specified in the "**mount options**" field in /etc/fstab. Multiple options must be delimited with commas.

atime|noatime
     Mount in the manner of updating (atime) or not updating (noatime) the last access time of files.
     The default is atime.
defaults
     Synonymous with rw,suid, dev, exec, and async.
dev|nodev
     Mounts making character special devices and block special devices available(dev) or unavailable(nodev).
     The default is dev.
exec|noexec
     Mounts giving permission(exec) or no permission(noexec) to execute binary files on the file system.
     The default is exec.
suid|nosuid
     Mounts giving permission(suid) or no permission(nosuid) to execute setuid.
     The default is suid.
rw|ro
     Mounts the file system as read/write enabled (rw) or read only (ro). The default is rw.
async
     Mounts in the manner of processing any **I/O** for the file system asynchronously.
     The default is async.
atrc|noatrc
     Specifies whether to mount (atrc) or not to mount (noatrc) at the node startup.
     The default is atrc.

OPERANDS

The following operands can be specified:

special
     Specifies the block special device name of a representative partition of the file system to be mounted.

mount_point
>   Specifies the name of the directory to be mounted.

EXAMPLES

```
# sfcmount /dev/sfdsk/gfs/dsk/volume1 /mount_point

# sfcmount /dev/sfdsk/gfs/dsk/volume1

# sfcmount /mount_point
```

FILES

/etc/mtab
>   Table for the currently mounted file system.

/etc/fstab
>   Environment file for the file system.

SEE ALSO

"B.1.5 sfcumount(8)", "B.2.6 sfcmntgl(8)", "B.2.11 sfcumntgl(8)".

mount(8) and fstab(5) in the online manual.

NOTES

- **sfcfrmd** daemon must be running to enable the execution of this command.
- The same set of the descriptions for *special* and *mount_point* must be contained in /etc/fstab.
- Mount processing is always performed using the mount options for the mount point described in /etc/fstab. When no mount options are described in /etc/fstab, mount processing without any options is performed.
- Nodes outside the MDS positioning range alone cannot be mounted.

B.1.5   sfcumount(8) Unmount the GFS Shared File System from the local node

SYNOPSIS

sfcumount *special*|*mount_point*

DESCRIPTION

The sfcumount command unmounts the **GFS** Shared File System from a local node.

During the unmount processing, stop sfcfsd and **MDS** when running on the node.

Only a superuser can perform unmount processing.

When umount processing goes wrong, error information is outputted to a console. Please perform management according to the outputted error information.

OPERANDS

The following operands can be specified:

special

Specifies the name of the block special device of a representative partition of the file system to be mounted.

mount_point

Specifies the name of the directory to be mounted.

EXAMPLES

```
# sfcumount /dev/sfdsk/gfs/dsk/volume1

# sfcumount /mount_point
```

FILES

/etc/mtab

Table for the currently mounted file system.

/etc/fstab

Environment file for the file system.

SEE ALSO

"B.1.4 sfcmount(8)", "B.2.6 sfcmntgl(8)", "B.2.11 sfcumntgl(8)".

umount(8) and fstab(5) in the online manual.

B.2   GFS Shared File System Specific Management Commands

B.2.1   sfcadm(8) Change partition information setting

SYNOPSIS

    sfcadm -r [**-a**] *device_file*
    sfcadm -N *device_file*
    sfcadm -u *host*,... [**-g** *p_mds*[,*s_mds*,*mds*,...]] [**-p** *p_port*[,*s_port*]] [**-o**
    keyword=value,...]*device_file*,...
    sfcadm -m *host*,... **-g** *p_mds*[,*s_mds*,*mds*,...]**-p** *p_port*[,*s_port*] [**-o**
    keyword=value,...]*device_file*
    sfcadm -g *p_mds*[,*s_mds*,*mds*,..]*device_file*
    sfcadm -o *keyword=value*,... *device_file*
    sfcadm -p *p_port*[,*s_port*] *device_file*
    sfcadm -h *ohost nhost*
    sfcadm -D *device_file*,...
    sfcadm -c {**all** | *num*} *raw_device_file*
    sfcadm *device_file*

DESCRIPTION

The **sfcadm** command changes the partition information settings for the **GFS** Shared File System.

In the **GFS** Shared File System, the information about the group of partitions that makes up the file system is retained in each partition.

Partition information settings must be changed in the following cases:

- – Device information (path name, device number) for the file system is changed.
- – Information about the nodes sharing the file system is changed.
- – The node name is changed
- – The file system is migrated to another system.

Use the command in the following cases:

- – Recovery for a super block and partition configuration data.
- – For the partition configuration data and copying of a super block
- – Recovery if a copy of the partition configuration data no longer matches the original information
- – Changing the information in the file system configure information in a management partition and deleting the file system that is specified
- – Changing the number of placing MDS (meta-data server) nodes.
- – Changing the priority of nodes that places **MDS** (meta-data server) as primary MDS or secondary **MDS**.

The **sfcadm** updates the entries in the file system configure information in a management partition, which changes the partition information for the **GFS** Shared File System and/or the file system environment information. If changes are made to the partition information settings, the information retained in each of the partitions is updated.

This command can only be used if the file system is unmounted in all nodes beforehand.

OPTIONS

The following options can be specified:

-D *device_file,...*

Deletes the **GFS** Shared File System in which the representative partition provided by file system configure information in a management partition has been registered. Use a comma delimiter to specify multiple files.

-N or no options specified

Updates the node and device information for all nodes in the partition configuration data. Use this option if the minor numbers of the specified devices on each nodes are different after the special file name of the file system in use has been changed or copying between partitions is performed. If all nodes have the same minor number, specify only the device information, without specifying the -N option. Then updates the file system configure information in a management partition.

-a

When the *-r* option is specified, performs the recovery using a copy of the super block in the partition of the recovery source and a copy of the partition configuration data.

-c {all|*num*}

Change the MDS placing information. **Zero** or less value and value bigger than the number of nodes that share the file system cannot be specified. When **all** is specified, all nodes are set up as MDS placing node. If and only if **all** is specified, the node added to node information by [sfcnode(8)](#) after changing the MDS placing information is also set up as a MDS placing node. The file system configure information in a management partition is also updated.

-g *p_mds,s_mds,mds,...*

Specifies the node name that **MDS** can place delimited with a comma. Primary MDS and secondary **MDS** can be specified in order of the descriptions of node names. To change either primary **MDS** or secondary **MDS**, use the "*p_mds,*" or "*,s_mds*" and specify the new node name. In order to change node except primary and secondary, all nodes must be specified.

To change a configuration with only a primary **MDS**, specify only "*p_mds*" (a comma delimiter is not required). The file system configure information in a management partition is also updated.

The node name to be specified needs to be a node which is sharing the file system. When specified with the option **-u** or **-m** at the same time, it can only specify the node name specified as either **-u** or **-m** option.

-h *o_host n_host*

Changes a node name to be changed. Use the "*o_host n_host*" syntax and specify the node names. In the file system configure information in a management partition, then, all occurrences of *o_host* are changed to *n_host*.

The node names registered in the partition configuration data also change.

-m *host...*

Changes the node and device information in the partition configuration data to the information specified. Use a comma delimiter to specify multiple node names.

The **MDS** node name can be specified with the *-g* option.

This option also updates the file system configuration information on the management partition. Use this option to migrate from the current file system to another system.

-p *p_port,s_port*

Specifies the primary port name and the secondary port name delimited with a comma. To change either port name, use the "*p_port*"," *,s_port*" syntax and specify the new port name.

To change only the primary port name, specify only *p_port* (a comma delimiter is not required).

And specifies the *-g* options for **MDS** node. The file system configure information in a management partition is also updated.

-o *keyword=value,...*

Specifies a variable setting that can be tuned in the **GFS** Shared File System using the syntax "*variable-name=value*" syntax. Use a comma delimiter to specify multiple variables. When deleting a registered variable, use the specification "*variable-name=*". You can specify the timeout of communication between nodes such as follow. In the following example, the timeout of communication between nodes is set to **180** seconds.

-o CON_TIMEOUT=180

Changes the time after a communicative response is lost until it estimates a partner node to be an abnormal state in the monitoring of the node by communication. Please set the large value in the above-mentioned timeout of communication when it is forecast that the load of the system rises.

-r *device_file*

Specifies the character-special device that will be the recovery source when a super block and partition configuration data are restored. When the -a option is specified, redundant blocks in the specified source partition are used for restoring the data into other partitions.

-u *host,...*

Changes the node and device information in the partition configuration data to the information specified. Use a comma delimiter to specify multiple node names.

In addition, **MDS** node name and a port name need to be changed by the **-g** and **-p** options.

The file system configure information in a management partition is also updated. Use this option when the node and device information must be rewritten after the special device name of the file system in use has been changed or copying between partitions is performed.

OPERANDS

The following operands can be specified:

device_file

Specifies a block special device or a character special device on the representative partition of the **GFS** Shared File System.

EXAMPLES

- ▪ Perform recovery of another partition using a partition information of the recovery source.

```
# sfcadm -r /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Perform recovery of another partition using a copy of a partition information of the recovery source.

```
# sfcadm -r -a /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Update the node and device information for all nodes in the partition information.

```
# sfcadm /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Rewrite the node and device information in the partition information.

```
# sfcadm -u host1,host2 -g host1,host2 -p port1,port2
/dev/sfdsk/gfs/dsk/volume1
```

- ▪ Migrate a specific file system to another system.

```
# sfcadm -m host1,host2,host3 -g host1,host2 -p port1,port2
/dev/sfdsk/gfs/dsk/volume1
```

- ▪ Change the number of nodes placing MDS.
  < Change the number of the nodes placing MDS to 3.>

```
# sfcadm -c 3 /dev/sfdsk/gfs/dsk/volume1
```

< Place MDS to the all nodes.>

```
# sfcadm -c all /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Change the priority ranking of nodes placing MDS.
  <Change primary MDS to host1>.

```
# sfcadm -g host1, /dev/sfdsk/gfs/dsk/volume1
```

<Change secondary MDS to host2.>

```
# sfcadm -g ,host2 /dev/sfdsk/gfs/dsk/volume1
```

<Change the priority ranking of nodes placing MDS>

```
# sfcadm -g host1,host2,host3 /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Assign the same port name to the primary and secondary ports.

```
# sfcadm -p sfcfs-1 /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Register the variable XXX=60.

```
# sfcadm -o XXX=60 /dev/sfdsk/gfs/dsk/volume1
```

- ▪ Change the node name host1 to host2.

```
# sfcadm -h host1 host2
```

- ▪ Delete a specific file system.

```
# sfcadm -D /dev/sfdsk/gfs/dsk/volume1
```

SEE ALSO
"B.2.5 sfcinfo(8)", "B.1.3 sfcmkfs(8)", "B.2.7 sfcnode(8)", "B.2.9 sfcsetup(8)".

NOTES
- ▪ A file system can be changed only when all nodes that share the file system have started operation and **GFS** Shared File System has been installed. The reason is that the information for these nodes is required.
- ▪ *host* must be the node name of the node configuring the **GFS** Shared File System registered on the management partition by "B.2.9 sfcsetup(8)" in advance.
- ▪ Using -u option with specified new node name or device name, -g options must be specified.
- ▪ When the name of the representative partition of a **GFS** Shared File System is changed or migration from the file system to another file system is performed with sfcadm, /etc/fstab needs to be set.
- ▪ When only one node is specified as MDS node by the -g option, the file system can not be mounted on the other node individually. In this case, the file system must be mounted on all node by using sfcmntgl(8). And note, the file system will be blockaded on the node which is not MDS node, when unmount, shutting down or panic occurs on the MDS node.

B.2.2   sfcfrmstart(8) Start FsRM on the local node

SYNOPSIS
sfcfrmstart

DESCRIPTION
The **sfcfrmstart** command is used to perform **sfcfrmd** daemon start processing on the self-node.
Only a super user performs **sfcfrmd** daemon start processing.

EXAMPLES
```
# sfcfrmstart
```

FILE
/var/opt/FJSVsfcfs/sfcfsrm.conf
>   Environment file of sfcfrmd daemon

SEE ALSO
"B.2.3 sfcfrmstop(8)", "B.2.9 sfcsetup(8)".

NOTES
- To enable the use of this command, the self-node must be multi user mode. This command cannot be used by single user mode.
- Within a given node, this command cannot be executed more than once.
- Within a given node, this command cannot be executed concurrently with "B.2.3 sfcfrmstop(8)".

B.2.3   sfcfrmstop(8) Stop FsRM on the local node

SYNOPSIS
    `sfcfrmstop`

DESCRIPTION
    The `sfcfrmstop` command is used to stop FsRM operation on the self-node.
    The **GFS** Shared File System can perform only in the state where it is not mounted by the applicable node.
    Only a super user can performs FsRM stop processing.

EXAMPLE

```
# sfcfrmstop
```

SEE ALSO
    "B.2.2 sfcfrmstart(8)".

NOTES
- To enable the use of this command, the self-node must be multi user mode. This command cannot be used by single user mode.
- Within a given node, this command cannot be executed more than once.
- Within a given node, this command cannot be executed concurrently with "B.2.2 sfcfrmstart(8)".

B.2.4   sfcgetconf(8) Make a backup of the management partition

SYNOPSIS

sfcgetconf *backupfile*
sfcgetconf -a *backupfile*
sfcgetconf -i *fsid*[**-i** *fsid*] *backupfile*
sfcgetconf -d *raw_device_file*[**-d** *raw_device_file*] *backupfile*

DESCRIPTION

The **sfcgetconf** command outputs next items to *backupfile:*
- – The file system configuration information in management partition.
- – The procedure for using the "B.2.1 sfcadm(8)" command to reconfigure the file system.
- – The contents of the **sfcfsrm.conf** file when the –a option is specified.

The output backup file contains the procedure for executing the "B.2.1 sfcadm(8)" command in the **sh(1)** shell script format.

Management partition recovery can be done using the script output by **sfcgetconf(8)** after it is initialized with "B.2.9 sfcsetup(8)".

OPTIONS

The following options can be specified:

-a

> Outputs the contents of **sfcfsrm.conf** to the first part of the backup file in the form of comments. (The output for no –a option will follow.)

-i *fsid*

> Outputs only information about the file system corresponding to a specified *fsid* value and the procedure for executing the "B.2.1 sfcadm(8)" command that re-creates information on the management partition for that file system when this option is specified (not for all the file systems).

-d *raw_device_file*

> Specifies a character special device on the partition configuring the file system. When this option is specified (not for all the file systems), only information about the file system corresponding to a specified device, and the procedure for executing the "B.2.1 sfcadm(8)" command that re-creates information on the management partition for that file system, are output.

OPERANDS

The following operands can be specified:

backupfile

> Specifies the name of the output destination file. When the output destination file already exists, backup is not performed.

EXAMPLES

When a backup of the entire file system is to be output to file sfccfg.bkup.1.

```
# sfcgetconf sfccfg.bkup.1
```

When the contents of the **sfcfsrm.conf** file are to be recorded at the head of the backup file, and the backup for the entire file system is to be output to sfccfg.bkup.2.

```
# sfcgetconf -a sfccfg.bkup.2
```

When backups of the file systems corresponding to fsid values 1 and 2 are to be output to sfccfg.bkup.3

```
# sfcgetconf -i 1 -i 2 sfccfg.bkup.3
```

When backups of the file system corresponding to /dev/sfdsk/gfs/dsk/volume1 are to be output to sfccfg.bkup.4.

```
# sfcgetconf -d /dev/sfdsk/gfs/rdsk/volume1 sfccfg.bkup.4
```

FILE

/var/opt/FJSVsfcfs/sfcfsrm.conf

Environment file of sfcfrmd daemon

SEE ALSO

"B.2.1 sfcadm(8)", "B.2.9 sfcsetup(8)".

NOTE

▪ To enable the use of this command, the self-node must be multi user mode.

B.2.5   sfcinfo(8) Display partition information

SYNOPSIS

sfcinfo [**-V**] [**-n**] {*block_special*|*mount_point*} [{*block_special*|*mount_point*} ...]
sfcinfo [**-V**] [**-n**] **-d** *dev*[,*dev*,...]
sfcinfo -a [**-V**][**-n**]
sfcinfo -c {*block_special*|*mount_point*} [{*block_special*|*mount_point*} ...]
sfcinfo -c [**-a**]
sfcinfo -e {*block_special*|*mount_point*}
sfcinfo -e [**-a**]

DESCRIPTION

sfcinfo displays the partition information and the **MDS** (metadata server) placing information of the GFS Shared File System specified by *block_special* or *mount_point*.

block_special indicates the partition configuring the file system by a block special device name.

mount_point indicates the path to the mount point of the file system. To use the path to the mount point, the file system must already be described in /etc/fstab.

If neither *block_special* nor *mount_point* is specified and the -a option is omitted, **sfcinfo** displays the information on all GFS Shared File Systems being mounted in the command execution node.

The **GFS** Shared File System retains information on the partition configuring the file system. **sfcinfo** outputs the following detailed information.

[Partition information]
- **FS** identification number
- Special device name (device number)
- Partition size (in kilobytes)
- Usage of partitions
  (**META**: meta-data area | **DATA**: file data area | **LOG**: update log area)
- Mount point in a command execution node
  "-----" when no file system is mounted

[Node information]
- **FS** identification number
- Host **ID**
- Start status (**RUN** or **STOP**)
- Node name

[MDS placing information]
- Special device name of the representative partition
- Node names of the placing **MDS** (meta-data server)
- Whether **MDS** is placed on all nodes

OPTIONS

The following options can be specified:

–V

Displays the version of the **GFS** Shared File System.

-a

Displays the information for all file systems described in the file system configure information in a management partition.

-c

Displays the node names of placing **MDS** (meta-data server).

-d *dev[,dev,...]*

        Specifies a device number in hexadecimal for the partition to be displayed.

        Use a comma delimiter to specify multiple device numbers.

-e

        Displays file system variables set by "B.2.1 sfcadm(8)".

-n

        Displays node information.

        If no parameters are specified, the information for all mounted file systems is displayed.

OPERAND

The following operand can be specified:

mount_point|block_special

        Specifies a block special device on the partition configuring the file system or the path to the mount point of the file system. Use a space delimiter to specify multiple block special files or paths.

EXAMPLES

```
# sfcinfo /dev/sfdsk/gfs/dsk/volume1

/dev/sfdsk/gfs/dsk/volume1:

FSID special                                   size   Type   mount

   1 /dev/sfdsk/gfs/dsk/volume1(e721)        711874   META   /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)         51200   LOG    /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)       6578704   DATA   /mnt


# sfcinfo -V /dev/sfdsk/gfs/dsk/volume1

sfcfs v1.1 file system

/dev/sfdsk/gfs/dsk/volume1:

FSID special                                   size   Type   mount

   1 /dev/sfdsk/gfs/dsk/volume1(e721)        711874   META   /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)         51200   LOG    /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)       6578704   DATA   /mnt


# sfcinfo /mnt

/dev/sfdsk/gfs/dsk/volume1:

FSID special                                   size   Type   mount

   1 /dev/sfdsk/gfs/dsk/volume1(e721)        711874   META   /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)         51200   LOG    /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)       6578704   DATA   /mnt


# sfcinfo -d e701

/dev/sfdsk/gfs/dsk/volume1:

FSID special                                   size   Type   mount

   1 /dev/sfdsk/gfs/dsk/volume1(e721)        711874   META   /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)         51200   LOG    /mnt

   1 /dev/sfdsk/gfs/dsk/volume1(e721)       6578704   DATA   /mnt


# sfcinfo -n /dev/sfdsk/gfs/dsk/volume1

/dev/sfdsk/gfs/dsk/volume1:

FSID   hostID     status   hostname

   1  80000000  RUN       prime01

   2  80000001  STOP      prime02
```

```
# sfcinfo -a

/dev/sfdsk/gfs/dsk/volume1:

FSID special                                      size   Type  mount

   1 /dev/sfdsk/gfs/dsk/volume1(e721)          711874   META  -----

   1 /dev/sfdsk/gfs/dsk/volume1(e721)           51200   LOG   -----

   1 /dev/sfdsk/gfs/dsk/volume1(e721)         6578704   DATA  -----


/dev/sfdsk/gfs/dsk/volume2:

FSID special                                      size   Type  mount

   2 /dev/sfdsk/gfs/dsk/volume2(e722)           25418   META  /mnt2

   2 /dev/sfdsk/gfs/dsk/volume2(e722)            5120   LOG   /mnt2

   2 /dev/sfdsk/gfs/dsk/volume2(e722)          232256   DATA  /mnt2
```

Example of displaying the MDS placing information

```
# sfcinfo -c /dev/sfdsk/gfs/dsk/volume1

/dev/sfdsk/gfs/dsk/volume1:

node=node1,node2,node3,node4

mdsnode=all


# sfcinfo -c /dev/sfdsk/gfs/dsk/volume2

/dev/sfdsk/gfs/dsk/volume2:

node=node1,node2,node3
```

FILES
/etc/mtab
> Mounted file system table

/etc/fstab
> List of default parameters for each file system

SEA ALSO
"B.2.1 sfcadm(8)"
fstab(5) in the online manual.

B.2.6   sfcmntgl(8) Mount the GFS Shared File System on all nodes

SYNOPSIS
sfcmntgl *special*|*mount_point*
sfcmntgl *special mount_point*

DESCRIPTION
The **sfcmntgl** mounts all nodes sharing the same file system according to the specified operands. sfcfsd and **MDS** (if necessary) will be started.

sfcmntgl can be executed from any nodes as the **GFS** configuring nodes that are specified with "B.2.9 sfcsetup(8)". The pre-definitions in /etc/fstab are necessary.

Only a super user can perform mount processing.

When mount processing goes wrong, error information is outputted to the console of each node. Please perform management according to the outputted error information.

OPERAND
The following operand can be specified:

special
> Specifies the block special device name of a representative partition of the file system to be mounted.

mount_point
> Specifies the name of the directory to be mounted.

EXAMPLE
```
# sfcmntgl /dev/sfdsk/gfs/dsk/volume1 /mount_point

# sfcmntgl /dev/sfdsk/gfs/dsk/volume1

# sfcmntgl /mount_point
```

FILES
/etc/mtab
> Table for the currently mounted file system.

/etc/fstab
> Environment file for the file system.

SEE ALSO
"B.1.4 sfcmount(8)", "B.2.9 sfcsetup(8)", "B.2.11 sfcumntgl(8)", "B.1.5 sfcumount(8)"
mount(8) and fstab(5) in the online manual.

NOTES
- **sfcfrmd** daemon must be running to enable the execution of this command.
- When both *special* and *mount_point* are specified, the same set of the descriptions must be contained in /etc/fstab for all nodes sharing the file system.
- Mount processing is always performed using the mount options for the mount point described in /etc/fstab. When no mount options are described in /etc/fstab, mount processing without any options is performed.

B.2.7   sfcnode(8) Add, delete, and change node configuration information

SYNOPSIS

```
sfcnode -a host,... device_file
sfcnode -d [-h host,...|-i hostid,...]device_file
```

DESCRIPTION

The `sfcnode` command adds, deletes, and changes **GFS** Shared File System node information.

To add or update node information, specify the `-a` option. If a specified host name already exists, `sfcnode` updates node and device information for the host. If the host does not exist, `sfcnode` adds the node and device information. Use a comma delimiter to specify multiple host names.

To delete node information, specify the **-d** option. For the **-h** or **-i** option, specify the host name (*host*) or host ID (*hostid*) of the host to be deleted. **sfcnode** deletes the node information of the host. If neither the **-h** nor **-i** option is specified, **sfcnode** deletes the node information for the host on which the **sfcnode** is executed. Use a comma delimiter to specify multiple host names or IDs. The **-h** and **-i** options cannot be specified together.

The value which took the logical sum of the nodes **ID** obtained by `clgetnode(8)` and **'0x80000000'** is specified as Host ID. That is, when the node **ID** obtained by `clgetnode(8)` is **1**, **'0x80000001'** is specified as Host **ID**.

After the **sfcnode** command changes the **GFS** Shared File System node information, the entries in the file system configure information in a management partition are updated. The information retained in the partitions is also changed.

OPTIONS

The following options can be specified:

-a *host,...*

Specifies the name of a host whose node information is to be added.

-d

Deletes node information.

-h *host,...*

Specifies the name of a host whose node information is to be deleted. The host must be one that can be used by the **GFS** Shared File System.

-i *hostid,...*

Specifies the **ID** in hexadecimal of a host to be deleted from node information. The host must be one that can be used by the **GFS** Shared File System. Note that a host **ID** specified for this option differs from a host **ID** obtained with `hostid(1)`.

OPERAND

The following operand can be specified:

device_file

Specify a block special device or a character special device on the representative partition of the **GFS** Shared File System whose node information is to be updated.

EXAMPLES

Add new node that was added by "B.2.9 sfcsetup(8)" to the sharing nodes of GFS Shared File System.

```
# sfcnode -a host2 /dev/sfdsk/gfs/dsk/volume1
```

Add or update node/device information for hosts by specifying host names.

```
# sfcnode -a host1, host2 /dev/sfdsk/gfs/dsk/volume1
```

Delete node/device information for hosts by specifying host names.

```
# sfcnode -d -h host2 /dev/sfdsk/gfs/dsk/volume1
```

Delete node/device information for a host by specifying its ID.

```
# sfcnode -d -i 80000000 /dev/sfdsk/gfs/dsk/volume1
```

Delete node/device information for the local host.

```
# sfcnode -d /dev/sfdsk/gfs/dsk/volume1
```

SEE ALSO

"B.1.3 sfcmkfs(8)", "B.2.1 sfcadm(8)", "B.2.5 sfcinfo(8)", "B.2.9 sfcsetup(8)"

NOTES

- A file system can be changed only when all hosts that share the file system have started operation and GFS Shared File System has been installed. The reason is that the information for these hosts is required.
- *host* must be the host name of the node configuring the **GFS** Shared File System registered on the management partition by "B.2.9 sfcsetup(8)" in advance.
- If sfcnode fails outputing a message as "**node full, can't sfcnode**," the number of nodes has exceeded the maximum number of sharing nodes set when the **GFS** Shared File System was created with "B.1.3 sfcmkfs(8)". Check the registered node information with "B.2.5 sfcinfo(8)", and then add nodes after deleting node information no longer necessary using sfcnode with the -d option.
- Cannot delete node information of host that placing primary **MDS**, and secondary **MDS**.

B.2.8   sfcrscinfo(8) Display file system information

SYNOPSIS
> `sfcrscinfo -m` [`-a`|`-i` *fsid*|*special*]

DESCRIPTION
> The `sfcrscinfo` command outputs file system information for **GFS** Shared File Systems.

OPTIONS
> The following options can be specified:

> `-a`
>> Outputs information for all **GFS** Shared File Systems that have been created.

> `-m`
>> Outputs the **MDS** and **AC** information for **GFS** Shared File Systems. If `-m` specified with `-a`, outputs information for all **GFS** Shared File Systems that have been created. If only specified `-m`, outputs information for **GFS** Shared File System which status is mounted.

> `-i` *fsid*
>> Displays the information for the file system specified by *fsid*.

OPERAND
> The following operand can be specified:

> *special*
>> Displays information for the file system specified by *special*.
>> Specifies the block special device name of a representative partition of the file system to be mounted.

EXAMPLES

```
# sfcrscinfo -m /dev/sfdsk/gfs/dsk/volume1

/dev/sfdsk/gfs/dsk/volume1:

FSID  MDS/AC   STATE   S-STATE   RID-1   RID-2   RID-N   hostname

  1   MDS(P)   run      -         0       0       0      prime01

  1   AC       run      -         0       0       0      prime01

  1   MDS(S)   wait     -         0       0       0      prime02

  1   AC       run      -         0       0       0      prime02

  1   MDS(I)   imag     -         0       0       0      prime03

  1   AC       run      -         0       0       0      prime03
```

- MDS/AC
  - MDS(P) : The primary MDS on a definition
  - MDS(S) : The secondary MDS on a definition
  - MDS(I) : The other nodes to which MDS operates
  - AC   : The node that mount the file system
- STATE/SUB-STATE of MDS
  - run - : The primary MDS is running
  - wait - : The secondary MDS is waiting for failure recovery of the primary MDS
  - imag - : Waiting for failure recovery of the primary MDS or the secondary MDS
  - stop - : MDS stopped
  - none - : no relation with MDS
  - If SUB-STATE is other than "-", MDS is in state-transition.
- STATE/SUB-STATE of AC
  - run - : file system is in mounted
  - stop - : file system is in unmounted
  - If SUB-STATE is other than "-", AC is in state-transition.

B.2.9 sfcsetup(8) Initialize the management partition, add, delete and display node information, and display the management partition path

SYNOPSIS

```
sfcsetup -c [-f] raw_device_file
sfcsetup -a raw_devece_file
sfcsetup -d
sfcsetup -p
sfcsetup
```

DESCRIPTION

The **sfcsetup** command is used to initialize the management partition, and to add, delete, and display node information in the management partition, and display the path of management partition.

To initialize the management partition, specify the `-c` option and the character device. When the specified device seems to have been user for the management partition, perform initialization with the `-f` option specified. The size of a management partition needs to be **40** Mbyte or more.

To add node information, specify the `-a` option. When the specified character device has already been initialized for the management partition, node information is added to the management partition for which the command was executed.

To delete node information, specify the `-d` option. Note, however, that `sfcfrmd` demon must be stopped in all node of the cluster foundation.

When the command is executed with no options specified, a listing of the node information recorded in the management partition is displayed.

When addition of node information and deletion are performed by the `sfcsetup` command, add/delete entries of management partition to/from the `sfcfsrm.conf` file.

OPTIONS

The following options can be specified:

-c *raw_device_file*
>   Initializes the partition specified in *raw_device_file* for use as a management partition.

-a *raw_device_file*
>   Adds node information.

-d
>   Deletes node information.

-f
>   Initialize a character special device that has been used as a management partition.

-p
>   Display the path name of a management partition.

OPERAND

The following operand can be specified:

raw_device_file

Specifies the character special device to be used for the management partition.

EXAMPLES

Initializing a management partition

```
# sfcsetup -c /dev/sfdsk/gfs/rdsk/control
```

Initializing a parturition that has previously been used as a management partition.

```
# sfcsetup -c -f /dev/sfdsk/gfs/rdsk/control
```

When sfcfrmd is not running in all node of the cluster and adding information for a node.

```
# sfcsetup -a /dev/sfdsk/gfs/rdsk/control
```

When sfcfrmd is not running in the cluster and deleting information for a node.

```
# sfcsetup -d
```

FILE

/var/opt/FJSVsfcfs/sfcfsrm.conf

Environment file of sfcfrmd daemon

SEE ALSO

"B.2.1 sfcadm(8)", "B.2.3 sfcfrmstop(8)".

NOTE

- Initialization of a management partition, addition and deletion of node information cannot be performed when the **sfcfrmd** demon has started.
- Node information shared by a file system cannot be deleted. Please first delete the node information in the file system configuration data on the management partition by using "B.2.1 sfcadm(8)".

B.2.10 sfcstat(8) Report statistics on GFS Shared File Systems

SYNOPSIS
```
sfcstat [-abcdefghijklmnopqrstA] [interval[count]] [mount_point...]
```

DESCRIPTION
The `sfcstat` command displays statistics about **GFS** Shared File Systems.

If `sfcstat` is used without parameters, it reports statistical information recorded after the file system is mounted. The next time, it reports the information recorded since the last report.
If `interval` is specified, the command reports statistical information each number of seconds defined by `interval`.
If `count` is specified, the command reports statistical information repeatedly for the value defined by `count`.
If `mount_point` is specified, the command reports the information for the specified file system.

OPTIONS
The following options can be specified:

-A

Reports all information.

-a

Reports **AC** information about read/write operations. Reports the number of RPC messages for the following purposes:
- To change file atime or mtime
- To change file attributes
- To access file attributes
- To access file size
- To acquire tokens when changing file size
- To change file size
- To purge tokens when changing file size
- To access information about extent allocations
- To change information about extent allocations

-b

Reports **AC** information about meta-data management buffers. Reports the number of buffer allocations, the number of dynamic buffer allocations, and the number of sleep occurred during buffer requests.

-c

Reports **MDS** information about meta-data management buffers. Reports the number of buffer allocations, the number of dynamic buffer allocations, and the number of sleep occurred during buffer requests.

-d

Reports **AC** information about direct **I/O**. Reports the following information:
- Number of direct I/O read operations
- Number of direct I/O write operations
- Number of blocks read
- Number of blocks written
- Number of read requests changed to normal **I/O**
- Number of write requests changed to normal **I/O**
- Number of page flush after reading
- Number of page flush after writing

-e

Reports MDS information about purging tokens. Reports the following information:
- Number of purging tokens
- Number of AC that purged tokens
- Number of purging tokens (by token type)
- Number of AC that purged tokens (by token type)

-f

Reports **AC** information about **VFS** operations. Reports the number of RPC messages for the following purposes:
- To access file handle
- To access file attributes
- To purge tokens

-g

Reports the number of times **MDS** was received requests for tokens (by token type).

-h

Reports **MDS** information about the meta-daemon. Reports the number of times the meta-daemon was activated, the number of buffers in the meta-daemon **I/O** queues, the number of times the meta-daemon was activated because the disk was full, and the number of times the meta-daemon was activated because the meta-cache was full.

-i

Reports **AC** information about actual **I/O**. Reports the number of actual **I/O** reading, the number of actual I/O writing, the number of I/O blocks actually read, and the number of **I/O** blocks actually written.

-j

Reports **MDS** information about the log daemon. Reports the following information:
- Number of times log daemon was activated
- Number of `sync` requests
- Number of `fsync` requests
- Number of times log buffer full
- Number of requests issued from meta-write daemon
- Number of times sleep occurs because transaction limit exceeded
- Number of times sleep occurs because log disk full
- Number of times sleep occurs because of a preceding large transaction
- Number of times sleep occurs because a preceding transaction enlarged
- Number of requests for **I/O** operation issued from log daemon
- Time(msec) required for writing
- Number of blocks written
- Number of valid blocks
- Number of requests to log transactions
- Number of parallel operation transactions to be logged
- Average number of parallel operation transactions
- Number of times huge buffer was used
- Number of sub-transactions generated

-k

Reports **MDS** information about operations for free extents. Reports the number of search requests, the number of times blocks acquired, the number of acquired blocks, the number of blocks acquisition failed, the number of times blocks released, the number of released blocks, the number of times released blocks successfully linked, the number of division of free extent management, and the number of joining free extent management.

-l

Reports **AC** information about file and record locks. Reports the number of RPC messages for the following purposes:
- To open file
- To close file
- To map file to address space
- To read file
- To write file
- To set lock, clear lock, or get lock information
- To set mandatory lock, or clear mandatory lock

-m

Reports **MDS** information about meta cache (by meta type). Reports the number of accesses, the number of cache hits, the number of updates, the number of read operations, the number of write operations, writing time, and average time(msec).

-n

Reports **AC** information about **RNODE** operations. Reports the number of RPC messages for the following purposes:
- To be requested to purge tokens
- To be requested to purge tokens of freed **RNODE**
- To purge tokens to free **RNODE**

-o

Reports **AC** information about **VNODE** operations. Reports the following information:
- Number of RPC messages to open file
- Number of RPC messages to close file
- Number of access to file attributes
- Number of RPC messages to access file attributes
- Number of re-sent RPC messages to access file attributes
- Number of RPC messages to access the number of blocks of regular file
- Number of access to symbolic link
- Number of RPC messages to access symbolic link
- Number of RPC messages to move modified attributes to storage devices
- Number of access to directory
- Number of RPC messages to access directory
- Number of re-sent RPC messages to access directory

-p

Reports **MDS** information about file operation. Reports the following information:
- Number of requests to operate files (by operation type)
- Size of RPC messages to operate files (by operation type)
- Number of successful replies (by operation type)
- Size of successful replies (by operation type)
- Number of failed replies (by operation type)
- Time(msec) required for operating files (by operation type)

-q

Reports **MDS** information about operations for allocated extents. Reports the number of search requests, the number of times blocks acquired, the number of acquired blocks, the number of blocks acquisition failed, the number of times blocks released, the number of released blocks, the number of times released blocks successfully linked, the number of division of free extent management, and the number of joining free extent management.

-r

Reports **AC** information about file operation. Reports the following information:
- Number of sending requests to operate files
- Number of receiving replies
- Number of timeouts while receiving replies
- Number of requests waiting to be sent (by operation type)
- Time for requests to wait to be sent (by operation type)
- Number of sending requests (by operation type)
- Time(msec) to wait to receive replies (by operation type)

- Number of successful replies (by operation type)
- Number of replies failed because no file existed (by operation type)
- Number of replies failed because file attributes changed (by operation type)
- Number of replies failed because file existed (by operation type)
- Number of replies failed because of other error (by operation type)
- Number of failure to receive replies (by operation type)

-s

Reports **MDS** information about operations for reserving extents. Reports the number of requests to reserve extents, the number of reserved extents, the number of reserved blocks, the number of requests to reserve extents contiguously, and the number of extents failed to reserve.

-t

Reports the number of times MDS is request to purging tokens. Reports the following information:
- Number of changing information about extent allocations
- Number of extents whose allocation information were changed
- Number of blocks whose allocation information were changed
- Number of changing information about extent allocations partially
- Number of extents whose allocation information were changed partially
- Number of blocks whose allocation information were changed partially
- Number of purging tokens (by token type)

If the options are omitted, the command reports all information.

OPERAND

The following operand can be specified:

mount_point

Specifies the path name of the mount point where the file system has been mounted.

EXAMPLE

```
# sfcstat 5 /mnt
```

SEE ALSO

sar(1) in the online manual.

B.2.11   sfcumntgl(8) Unmount the GFS Shared File System from all nodes

SYNOPSIS

    sfcumntgl *special│mount_point*
    sfcumntgl *special mount_point*

DESCRIPTION

    The **sfcumntgl** unmounts all nodes sharing the same file system according to the specified operands. sfcfsd and **MDS** will be stoped.

    sfcumntgl can be executed from any nodes as the **GFS** configuring nodes that are set with "B.2.9 sfcsetup(8)".

Only a super user can perform unmount processing.

When umount processing goes wrong, error information is outputted to the console of each node. Please perform management according to the outputted error information.

OPERANDS

    The following operands can be specified:

special

    Specifies the block special device name for a representative partition of the file system to be mounted.

mount_point

    Specifies the name of the directory to be mounted.

EXAMPLES

```
# sfcumntgl /dev/sfdsk/gfs/dsk/volume2 /mount_point

# sfcumntgl /dev/sfdsk/gfs/dsk/volume2

# sfcumntgl /mount_point
```

FILES

    /etc/mtab
    Table for the currently mounted file system.
    /etc/fstab
    Environment file for the file system.

SEE ALSO

    "B.2.6 sfcmntgl(8)", "B.2.9 sfcsetup(8)", "B.1.5 sfcumount(8)".
    umount(8) and fstab(5) in the online manual.

NOTES

    ▪ **sfcfrmd** daemon must be running to enable the execution of this command.
    ▪ When both *special* and *mount_point* are specified, the same set of the descriptions must be contained in /etc/fstab for all nodes sharing the file system.

Appendix C Trouble shooting

This appendix explains messages for which emergency action is required.

C.1 Action for a Panic

Where a system dump is generated when a node panic occurs, it should be obtained for later analysis. A system dump is saved to a file when the node is started after the panic. By default, the storage directory lies under "/var/crash/*number*."

C.2 Action for Error Messages

This section explains error messages that require urgent response in the GFS Shared File System.

See

For details about actions to be taken concerning respective command, daemon, and kernel messages, see " Appendix A" in this manual.

For more information on how to respond to PRIMECLUSTER error, see "11. The message and code of CF" in the "*PRIMECLUSTER Configuration and Administration Guide*"

C.2.1 Action for I/O errors

If message "sfcfs...:read error" or "sfcfs...:write error" is output

The "sfcfs...:read error" message indicates that an I/O error occurred while file system data was being read from a disk. The "sfcfs...:write error" message indicates that an I/O error occurred while file system data was being written to a disk.

If the messages are displayed, recovery processing is required because an I/O path or device is faulty. Perform the recovery processing using the following procedures:

1. Locate the file system and partition in which the error occurred.
Pinpoint it with sfcinfo (8), a GFS Shared File System management command, using the device number in the error message as a key.

```
# sfcinfo -d device-number
```

2. If an sfcfs...:write error occurs
This error indicates that file system information updated in memory cannot be reflected on the disk. If this happens, files in the file system should be backed up before unmounting to prevent the updated information from being lost by unmounting.

3. Unmount the file system service in which the error occurred.
Unmount the file system service.

4. Correct the file system in which the error occurred.
Make a copy of the file system data on the partition where the error occurred, change the partition, then use sfcfsck(8) to restore the consistency of the file system. sfcfsck(8) must be executed with the setting to perform a full check.

```
# sfcfsck -o nolog special-device-name
```

5. If the file system in which the error occurred cannot be corrected
When step 4 cannot repair the file system, swap the faulty part, re-create the file system, and restore the backed up data.

C.2.2 Collecting information for troubleshooting

Collect following material for investigation when you request troubleshooting to local Customer Support and if your manual instructs you to do so.

6. Material acquired in /opt/FJSVpclsnap/bin/pclsnap –a *filename* (Need to be executed with root access privilege)
7. /var/crash/*/*
8. sfcfsck –N –o nolog *raw_device*   * When file system restoration is necessary

If the investigation material must urgently be sent, prepare the followings at least. This material is a part of material collected by pclsnap and required for the initial investigation of GFS Shared file system.

- Material collected by /etc/opt/FJSVsfcfs/bin/sfcsnap.sh –a *dirname* (Collect by executing with a root access privilege)
- /var/log/messages*

- All material above should be collected from all nodes where the GFS Shared file system is shared.
- This material should be collected as soon as the symptom occurred. Some material might not be collected after rebooting the system.
- For the directory *dirname* designated in sfcsnap.sh, specify the existing directory. Material is stored in the sub-directory.
- Above-mentioned materials are only for initial investigation. Be sure to collect all what are described in No.1 to 3.

C.3 GFS Shared File System Management View Abnormality

See "*PRIMECLUSTER Installation Guide*" for details of the GFS Management View abnormality.

C.4 Action to Be Taken When Unmounted by umount(8)

This section describes the action to be taken when a GFS Shared File System is unmounted by umount(8). Perform the recovery processing taking the following procedures.

1. Unmount all of the file systems on the node where the file system was unmounted using umount(8).

```
# mount
 :
/dev/sfdsk/gfs/dsk/volume1 on /mnt/fs1 type sfcfs (rw)
/dev/sfdsk/gfs/dsk/volume2 on /mnt/fs2 type sfcfs (rw)
# sfcumount /mnt/fs1
# sfcumount /mnt/fs2
```

2. Stop the operation of the GFS Shared File System.

```
# sh /etc/init.d/sfcfsrm stop
```

3. Start the operation of the GFS Shared File System.

```
# sh /etc/init.d/sfcfsrm start
```

C.5   Action to be taken when the file system configuration information is inconsistent

This section explains procedure when it becomes impossible to mount the GFS Shared File System because super block or partition configuration data differ from each copy data.

Perform the recovery in accordance with the following procedures.

1. Recover the file system configuration information.

```
# sfcadm -r /dev/sfdsk/gfs/dsk/volume1
```

2. Recover the consistency of the file system.

```
# sfcfsck /dev/sfdsk/gfs/dsk/volume1
  :
# sfcfsck -o f,nolog /dev/sfdsk/gfs/dsk/volume1
  :
#
```

3. Mount the recovered file system.

```
# sfcmntgl /dev/sfdsk/gfs/dsk/volume1
```

4. Confirm that the recovered file system can be mounted on all nodes sharing GFS Shared File System.

```
# mount
```

5. Confirm on all nodes that the following messages are not output in /var/log/messages when sfcmntgl was performed in step 3. No need the following operations if the message is not output.

```
WARNING: sfcfs_mds:2042: fsid: The size of the partition might have been changed after the file
system was made.
```

> If the message is output, there is a possibility that the GDS volume used for the GFS Shared File system was expanded. The file system can keep on using, but please perform the following operations promptly because GFS does not deal with expanded volume of GDS.

6. Back up the files in the recovered file system. For the way to back up, refer to "11.2.1 Backing up file by file".

Note

> Please be sure to perform the backup with each file.

7. Unmount the recovered file system.

```
# sfcumntgl /dev/sfdsk/gfs/dsk/volume1
```

8. Confirm that the recovered file system can be unmounted on all nodes sharing GFS Shared File System.

```
# mount
```

9. The parameter information on a GFS Shared File System is evacuated.

```
# sfcmkfs -m /dev/sfdsk/gfs/dsk/volume1 &gt; /tmp/mkfs_cmd
```

> The command line used when the file system was created is stored in /tmp/mkfs_cmd by the above procedure.

10. Delete the recovered file system.

```
# sfcadm -D /dev/sfdsk/gfs/dsk/volume1
```

11. Confirm the file system is deleted.

```
# sfcinfo -a
```

12. Depending on the situation, re-create the partition.

Please re-create GDS volume only when you will return to the volume size before expanding GDS volume and resume manipulation.
It is not necessary to re-create if resume manipulation in the volume size after expanding GDS volume.

> Please refer to "operation" in the "PRIMECLUSTER Global Disk Services Configuration and Administration Guide" about the operation method of GDS volume.

13. Create the GFS Shared File System using the same partition or the partition created in step 12.

```
# sfcmkfs -o node=sunny,moony /dev/sfdsk/gfs/dsk/volume1
```

> When creating the GFS Shared File System with the same parameters that used before volume expansion of GDS is performed, it is created using the information which evacuated in step 9.

```
# sh /tmp/mkfs_cmd
```

14. Confirm that the GFS Shared File System is created.

```
# sfcinfo -a
```

15. Mount the created file system.

```
# sfcmntgl /dev/sfdsk/gfs/dsk/volume1
```

16. Restore the file backed up in step 6. For the way to restore, refer to "11.3.1 File-by-file restoring".

Appendix D The changes in Each Version

This chapter explains the changes made to the specifications of GFS Shared File Services.

D.1 Latest changes in updated from GFS Shared File Systems 4.1A20 to 4.1A30

The changes are listed in the following table.

Figure The list of changes from table 4.1A20 to 4.1A30

Type	Item	Version
Incompatible functions	Communication timeout value between nodes	(Before)GFS Shared File Systems 4.1A20 (After)GFS Shared File Systems 4.1A30
Incompatible Daemon	sfcfrmd daemon	(Before)GFS Shared File Systems 4.1A20 (After)GFS Shared File Systems 4.1A30

D.1.1 Incompatible function

In the GFS Shared File System 4.1A30, the function which serves incompatibility from the previous version is as follows.

D.1.1.1 Communication timeout value between nodes

[Incompatible contents]
In the monitoring of the node by communication, the default of timeout value is changed after a communicative response is lost until it estimates a partner node to be an abnormal state.

[Changes]
Before upgrading
60 seconds
After upgrading
180 seconds

[Note]
Please refer to "8.3.1 Changing in file system attributes" about the change method of the communication timeout value between nodes.

D.1.2 Incompatible Daemon

In the GFS Shared File System 4.1A30, the demon which serves Incompatibility from the previous version is as follows.

D.1.2.1 Information message of sfcfrmd demon

[Incompatible contents]
The information message outputted at the time of starting sfcfrmd is deleted.

[Changes]
Before upgrading
The following messages are outputted at the time of starting sfcfrmd.

sfcfrmd[pid]: INFO: sfcfrmd:0001: set number of threads 16

sfcfrmd[pid]: INFO: sfcfrmd:0002: set service port number 9300

sfcfrmd[pid]: INFO: sfcfrmd:0003: set connection timeout value 30 [sec]

After upgrading
The above message is not outputted.

Glossary

[Numerics]

64-bit file system interface
>This interface can handle files that exceed 2 gigabytes.
>For details, see largefile(5) in the "*Solaris X Reference Manual Collection*" or the online manual.

[A]

AC
>Access client.   Module which operates in the kernel layer (file system layer) on each node sharing GFS Shared File System.   An AC communicates with the MDS if a user application operating on the node sends an access request in a system call.   File operations are performed using meta-data sent from the MDS and direct access to the real.

ACCL
>The term ACCL refers to an AC.

alternate file system
>The file system that made on the shared disk device is exclusive used in active node and the standing node in RMS Cluster.

area management data
>Area management data includes information on i-nodes, V-data, and file data allocation information.   It is stored in the meta-data area.

array disk
>A disk file unit that is capable of handling an array of physical disks as a single virtual disk. By distributing access to multiple physical disks, it realizes performance improvement and high reliability. Ordinarily, several access systems are provided, which are referred to as RAID (Redundant Array of Independent Disks) systems. Principal RAID levels are RAID0 (disk striping), RAID1 (disk mirroring), RAID5 (disk striping with parity), and RAID0+1 (both disk striping and disk mirroring).

[C]

copy of partition structure information
>If a block failure on a disk device destroys partition structure information, a copy is available for continued processing of the file system.

[D]

data

The term data refers to file data.

data area

The term data area refers to a file data area.

direct I/O

Direct I/O refers to a mode of data input/output that does not use kernel buffering.

[E]

extent

An extent is a group of contiguous data blocks of the file system that are handled as a single unit. Each extent is defined by its start block and length.

extent-base

The extent base is a method of managing file system data based on extents.

[F]

fibre channel

One of the interfaces using optical fibre cables as transmission media. In a cluster system, a fibre channel is used to connect a array disk and the computer.

file data

File data is the data part of a file.

file data area

The area storing file data. It is also referred to as the data area.

file lock

File lock is a means for synchronization among processes that concurrently access data in the same file. There are two types of file locks: mandatory locks and advisory locks.

[G]

GDS

GDS(Global Disk Services).
Volume management software for protecting data by managing a disk storage device totally within a SAN environment. For details, refer to "*PRIMECLUSTER Global Disk Services Configuration and Administration Guide*" .

GFS Management View

Software which allows various operations including GFS Shared File System configuration setting and operation management using the Web screen.

GLS

GLS(Global Link Services) software provides High Reliability of network communications by duplexing network communication paths using redundant NIC(Network Interface Card)s. For details, refer to "*PRIMECLUSTER Global Link Services Configuration and Administration Guide*."

[I]

i-node

The i-node contains information on the file locations on the disk, on file sizes, and on the time when the respective files were last.　It also includes other information for identification.

i-node area

The i-node area contains an i-node.　It is located in the meta-data area.

[M]

management partition

Required information is managed when employing the GFS Shared File System. Moreover, this is used in order for sfcfrmd to maintain informational adjustment. The following information is included in the management partition.

    1.Information on each node that constitutes the GFS Shared File System.

    2.Correspondence information on common node of each GFS Shared File System, and shared device.

3.MDS arrangement information on each GFS Shared File System.

MDS

Meta-data server.　Program that centrally manages the control information of a file system (meta-data). This program operates on the primary server and secondary server.　Each AC communicates with the MDS and performs file operations according to the meta-data sent from the MDS.

MDS node

The node with the possibility that MDS performs. MDS performs in either node that it is defined as MDS node in nodes that share the file system. The default MDS node is 2 for the primary and secondary MDS.

meta area

Same as the meta-data area

meta-data

A generic term for management data on a file system. The meta-data includes free space information, i-nodes, indirect extent blocks, directry information, and symbolic link information.

meta-data area

The meta-data area contains meta-data.　It is allocated in the representative partition.

[N]

node

A node is a computer system that runs under one operating system.

node identifier

The node identifier is a universal name that is assigned to each node in the PRIMECLUSTER system. For each node, the node identifier is normally the same as the node name.　However, if the node name was assigned to the standby node such as in hot standby mode, the correspondence between physical name and node name is temporarily disrupted.　In this event, the node can be managed via the node identifier, which is the name for the physical device.　The node identifier is displayed as each node name using PRIMECLUSTER Management View.

node name

The node name is the name of a node that is displayed with the "uname -n" command and identified in the communication network. For details see uname(1) in the online manual.

[P]

partition

The partition is a physical or logical disk slice.

partition configuration data

This information refers to the partitions that constitute the GFS Shared File System.   It includes information about the size of the meta-data area, update log area, file data area (data area) and on their layout in the configuration partition.

primary management server

Node on which the management server daemon of the Web-Based Admin View operates during normal operation.   The primary management server uses the menus of the GFS management view to accept operation and display requests from the client and to transfer the requests to the monitored nodes.

primary server

Node on which the MDS operates during normal operation in a cluster system.   This server should be set during file system registration.

[R]

representative partition

The partition configuring a file system. It can be specified when a file system is created. Operations for a file system can be conducted by specifying its representative partition.

[S]

scope

A range of node set that can share an object when a disk class is shared.

secondary management server

Node on which the Web-Based Admin View management server daemon operates if an error occurs on the primary management server.   A secondary management server is set when the Web-Based Admin View operating environment is set.   If an error occurs on the primary management server, the management server function of the Web-Based Admin View passes to the secondary management server.

secondary server

Server that takes over the MDS function if an error occurs on the primary server in a cluster system.   The secondary server must be set during file system registration before it can assume the MDS function when an error occurs on the primary server.   The file system status is restored to assure contiguous access from each AC.

sfcfrmd

The demand from the commands or sfcfsd is received and the communication way for realizing commands sfcfsd, commands sfcprmd, and communication between nodes is offered. Management of a composition database and a management partition I/O function are offered.

sfcfsd

A daemon providing MDS/AC control functions such as GFS Shared File System operation start/stop, failover of MDS, and so forth.

sfcprmd

Starting and stop, down surveillance of the process which constitutes a GFS Shared File System is performed. When a composition process starts and executes other demons and commands, a demand is transmitted to sfcprmd and sfcprmd executes a demon and a command according to a demand.

The process which transmits a demand is called client process and the process started from sfcprmd according to a demand is called target process.

A target process notifies the situation to a client process, when it is supervised by sfcprmd and a process carries out a normal end and unusual end.

shared disk

One of operation modes of a shared disk device. Applications in each node can simultaneously access a shared disk device on their own. (Note that the terms shared disk device and shared disk have different meanings. To distinguish between the two terms, a "shared disk" may be referred to as a "shared disk for simultaneous access.")

shared disk device

Disk device connected to multiple nodes. FDU/FUs and disk arrays are available as PRIMECLUSTER shared disk devices. Shared disk devices can be designated as shared disks or switched disks according to whether multiple nodes are allowed to access them simultaneously. (Note that the terms shared disk device and shared disk has different meanings.)

shared node

A node sharing a GFS Shared File System. Up to 4 nodes are allowed.

shared objects

Object set which belongs to shared disk class. Each object may also be referred to as shared class, shared group and shared disk.

slice

A slice is an alias of a partition.

standby MDS node

MDS node other than primary or secondary MDS node.

super block

The super block contains information on the type of the file system, dates of creation and updating, label information, information on size and layout of the file system, and summary information on free areas.

super block copy

A copy of the super block is created so that file system processing can continue even if the original super block is damaged by a block fault in the disk device.

system disk

The installation disk for a running Linux operating system. The system disk indicates the entire disk containing one of the following file system areas.

- /
- /usr
- /var
- swap area

[U]

update log

The update log contains the history of updates made to the file system structure. The history information is used to make a high-speed recovery of a file system possible. The area that contains the update log is called the update log area. Data in this area is overwritten cyclically.

update log area

The area storing update logs.

update log buffer

        Update log data that was loaded into memory.

update log replay

        Update log replay updates meta-data in the update log area for which an update had been interrupted. This feature is used to recover the file system in the case of failures.

[V]

V-data

        Directory blocks, symbolic link path names, and indirect blocks are collectively referred to as V-data. This data is stored in the V-data area that was allocated in the meta-data area.

V-data area

        The V-data area contains V-data.   It is allocated in the meta-data area.

[W]

Web-Based Admin View

        Software for system operation and management using the Web screen.