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**Hitachi Freedom Storage™
Thunder 9500™ V Series
SGI™ IRIX® Host Installation Guide**

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Document Revision Level

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Source Documents for this Revision

The following source documents were used to produce this 9500V host installation guide:

- *Hitachi Freedom Storage™ Thunder 9200™ SGI™ IRIX® Host Installation Guide (Fibre), MK-92DF576*

Preface

The *Hitachi Thunder 9500™ V Series SGI™ IRIX® Host Installation Guide* describes and provides instructions for configuring the devices on the Hitachi 9500V disk array subsystem for operation with the SGI™ IRIX® operating system. This configuration guide assumes that:

- the user has a background in data processing and understands direct-access storage device subsystems and their basic functions,
- the user is familiar with the Hitachi 9500V array subsystem,
- the user is familiar with the SGI™ servers and the fibre-channel adapters, and
- the user is familiar with the SGI™ IRIX® operating system and the UNIX® file system, system commands, and utilities.

Note: The term “9500V” refers to the entire Hitachi Freedom Storage™ 9500™ V Series subsystem family, unless otherwise noted. Please refer to the *Hitachi Thunder 9500™ V Series User and Reference Guide (MK-92DF601)* for further information on the 9500V disk array subsystems.

Note: For further information on the SGI® IRIX™ operating system, please consult the SGI® IRIX™ online help and/or user documentation, or contact SGI® technical support.

COMMENTS

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Contents

Chapter 1	Overview of 9500V SGI™ IRIX® Configuration	1
1.1	9500V SGI™ IRIX® Configuration.....	1
1.2	9500V Subsystem.....	1
Chapter 2	Preparing for New Device Configuration	3
2.1	Configuration Requirements	3
2.2	Installing the 9500V Subsystem.....	4
2.3	Preparing to Connect the 9500V Subsystem to the Host	5
2.3.1	Setting the Host-Specific Parameters for the 9500V Ports.....	5
2.3.2	Verifying the Host Fibre-Channel Adapter Installation	6
2.4	Connecting the 9500V Subsystem to the SGI® System.....	7
2.5	Setting the Disk and Device Parameters	7
2.6	Setting and Recognizing the LUs	9
2.7	Configuring the Host Fibre-Channel Adapters.....	9
2.8	Rebooting the SGI® System	9
Chapter 3	Configuring the 9500V Devices	11
3.1	Verifying New Device Recognition	12
3.2	Partitioning the Disk Devices.....	13
3.3	Creating the File Systems	14
3.4	Creating the Mount Directories and Mounting the Devices.....	14
3.5	Verifying the File Systems	15
3.6	Setting the Auto-Mount Parameters	16
Chapter 4	Troubleshooting.....	17
4.1	Troubleshooting	17
4.2	Calling the Support Center	18
Appendix A	Acronyms and Abbreviations	19

List of Figures

Figure 2.1	Setting Disk and Device Parameters.....	8
Figure 3.1	Verifying New Device Recognition.....	12
Figure 3.2	Partitioning and Labeling the Disk Devices	13
Figure 3.3	Verifying a Partition	13
Figure 3.4	Creating the New File System.....	14
Figure 3.5	Verifying the New File Systems	15
Figure 3.6	Setting the Auto-Mount Parameters.....	16

List of Tables

Table 2.1	Fibre Port Addressing.....	6
Table 3.1	Auto-Mount Parameters	16
Table 4.1	Troubleshooting	17

Chapter 1 Overview of 9500V SGI™ IRIX® Configuration

1.1 9500V SGI™ IRIX® Configuration

This document describes the requirements and procedures for connecting the 9500V subsystem to a SGI® IRIX™ system and configuring the new 9500V devices for operation with the IRIX™ operating system.

Configuration of the 9500V disk devices for SGI™ operations includes:

- Verifying new device recognition (see section 3.1),
- Partitioning the devices (see section 3.2),
- Creating the file systems (see section 3.3),
- Creating the mount directories and mounting the devices (see section 3.4),
- Verifying the file systems (see section 3.5), and
- Setting the auto-mount parameters (see section 3.6).

Note on the term “SCSI disk”: The 9500V logical devices are defined to the host as SCSI disk devices, whether the interface is SCSI or fibre-channel.

1.2 9500V Subsystem

The 9500V RAID subsystem supports concurrent attachment to multiple UNIX®-based and PC-server platforms. Please contact your Hitachi Data Systems account team for the latest information on platform support. The 9500V subsystem provides continuous data availability, high-speed response, scaleable connectivity, and expandable capacity for PC server and open-system storage. The 9500V subsystem can operate with multihost applications and host clusters, and is designed to handle very large databases as well as data warehousing and data mining applications that store and retrieve terabytes of data.

For further information on the 9500V subsystem, please refer to the *Hitachi Thunder 9500™ V Series User and Reference Guide* (MK-92DF601), or contact your Hitachi Data Systems account team.

Chapter 2 Preparing for New Device Configuration

2.1 Configuration Requirements

The requirements for 9500V SGI® IRIX®™ configuration are:

- **Hitachi 9500V subsystem.**
 - The Resource Manager 9500V software is required to configure the fibre-channel (FC) ports.
Note: The availability of 9500V features and functions depends on the level of microcode installed on the 9500V subsystem.
- **Server:** SGI™ Origin class servers. Please contact your Hitachi Data Systems account team for further information on server hardware requirements.
- **Operating system:** SGI™ IRIX® operating system minimum version 6.5.10. **Important:** Please contact Silicon Graphics® to make sure that the most current OS patches are installed on your SGI™ systems(s).
Note: For further information on SGI™ IRIX® version support, please contact your Hitachi Data Systems account team.
Note: Root (superuser) login access to the SGI™ IRIX® system is required.
- **High-availability (HA) software.** The 9500V currently supports the following software products. Please contact your Hitachi Data Systems account team for the latest information on supported software products.
 - SGI Multi-Path Failover, Hitachi Dynamic Link Manager and VERITAS® Volume Manager™ for path failover and logical volume management. XLV and XLV Plex modules are required.
- **Fibre-channel adapters.** Make sure to install all utilities, tools, and drivers that come with the adapter(s).
 - The 9500V subsystem supports full-speed (1 and 2 Gb/s), shortwave, non-OFC (open fibre control) optical fibre-channel interface and multimode optical cables with SC and/or LC connectors. Do not connect any OFC-type fibre-channel interface to the 9500V subsystem.

Note: This document does not cover SCSI connection for the 9500V subsystem.

2.2 Installing the 9500V Subsystem

The 9500V subsystem comes with all hardware and cabling required for installation. Installation of the 9500V subsystem involves the following activities:

Hardware installation. Perform hardware installation as specified in Hitachi Data Systems' documentation and Hitachi, Ltd. source documentation. Follow all precautions and procedures in this documentation. Check all specifications to ensure proper installation and configuration. Hardware installation includes:

- Assembling all hardware and cabling.
- Upgrading to the latest microcode level.
- Creating RAID groups and LUNs and formatting LUNs using the Resource Manager 9500V software. For information and instructions on using Resource Manager, please refer to the *Hitachi Thunder 9200™ Resource Manager User's Guide (MK-91DF552)*.
- Installing the fibre-channel adapters and cabling.

9500V FC Port: The fibre topology parameters for each 9500V fibre-channel port depend on the type of device to which the 9500V port is connected. Determine the topology parameters supported by the device, and set your topology accordingly (see section 2.7).

2.3 Preparing to Connect the 9500V Subsystem to the Host

Before connecting the 9500V subsystem, you must perform the following tasks:

- Set the host-specific parameters for the 9500V fibre-channel port(s) (see section 2.3.1), and
- Verify host fiber channel adapter installation (see section 2.3.2).

You will use the Resource Manager 9500V software to configure the 9500V fibre ports. For instructions on using Resource Manager, please refer to the *Hitachi Thunder 9200™ Resource Manager User's Guide* (MK-91DF552)

2.3.1 Setting the Host-Specific Parameters for the 9500V Ports

The 9500V ports must be configured for the connected operating system.

Fibre Topology. You need to configure the 9500V FC ports to define the fibre topology parameters and port addresses (see Table 2.1). The 9500V subsystem supports up to 128 LUs. You will select the appropriate settings for each 9500V FC port based on the device to which the port is connected. Determine the topology parameters supported by the device, and set your topology accordingly.

Note: If you plan to connect different types of servers to the 9500V via the same fabric switch, you must use either **zoning** on the switch or the Hitachi SANTinel™ (LUN security) on the 9500V.

Port address. In fabric environments, the port addresses are assigned automatically by fabric switch port number and are not controlled by the 9500V port settings. In FC arbitrated-loop (FCAL) environments, the port addresses are set by entering an AL-PA (arbitrated-loop physical address, or loop ID, or port address). The host communicates with the devices comprising the loop with 8-bit AL-PA. See Table 2.1.

Table 2.1 shows the available AL-PA values and the corresponding SCSI TID address. The number of available port addresses is 126. (There are 127 port addresses, but address 00H is reserved for fibre connection.) Fibre-channel protocol uses the AL-PAs to communicate on the fibre-channel link, but the software driver of the platform host adapter translates the AL-PA value assigned to the 9500V port to a SCSI TID.

Devices communicate with hosts using individual port addresses. However, hosts map SCSI protocol to fibre channel devices. The hosts access the device's LUs using the device files /dev/dsk/dks*d*s* and /dev/rdisk/dks*d*s*. SCSI and fibre-channel devices are accessed the same way; however, the device files for SCSI and fibre-channel devices are configured differently. The exception is fabric devices where device names are /dev/dsk/<wwn>/lun*s*/c*p0 and /dev/rdsk/<wwn>/lun*s*/c*p0 where <wwn> is the worldwide name of the Hitachi controller port that the particular LUN is bound to.

Table 2.1 Fibre Port Addressing

AL-PA	TID	AL-PA	TID	AL-PA	TID	AL-PA	TID	AL-PA	TID	AL-PA	TID	AL-PA	TID	AL-PA	TID
EF	0	CD	16	B2	32	98	48	72	64	55	80	3A	96	23	112
E8	1	CC	17	B1	33	97	49	71	65	54	81	39	97	23	113
E4	2	CB	18	AE	34	90	50	6E	66	53	82	36	98	1F	114
E2	3	CA	19	AD	35	8F	51	6D	67	52	83	35	99	1E	115
E1	4	C9	20	AC	36	88	52	6C	68	51	84	34	100	1D	116
E0	5	C7	21	AB	37	84	53	6B	69	4E	85	33	101	1B	117
DC	6	C6	22	AA	38	82	54	6A	70	4D	86	32	102	18	118
DA	7	C5	23	A9	39	81	55	69	71	4C	87	31	103	17	119
D9	8	C3	24	A7	40	80	56	67	72	4B	88	2E	104	10	120
D6	9	BC	25	A6	41	7C	57	66	73	4A	89	2D	105	0F	121
D5	10	BA	26	A5	42	7A	58	65	74	49	90	2C	106	08	122
D4	11	B9	27	A3	43	79	59	63	75	47	91	2B	107	04	123
D3	12	B6	28	9F	44	76	60	5C	76	46	92	2A	108	02	124
D2	13	B5	29	9E	45	75	61	5A	77	45	93	29	109	01	125
D1	14	B4	30	9D	46	74	62	59	78	43	94	27	110		
CE	15	B3	31	9B	47	73	63	56	79	3C	95	26	111		

2.3.2 Verifying the Host Fibre-Channel Adapter Installation

Before the 9500V is connected to the SGI® system, you must verify the FC adapter installation. To ensure that the host fibre configuration is correct, you will verify recognition of the FCA and the FCA driver.

Note: For information on the HBA-specific text displayed on screen, please refer to the MAN pages and/or user documentation for the HBA.

2.4 Connecting the 9500V Subsystem to the SGI® System

The 9500V subsystem comes with all the hardware and cabling required for connection to the host system(s). Connection of the 9500V subsystem involves the following activities:

1. Verify subsystem installation. Verify that the status of the fibre/SCSI adapters and LUNs is NORMAL.
2. Connect the 9500V to the SGI® system. Install the fibre-channel cables between the 9500V subsystem and the SGI® system.

After connecting the 9500V subsystem to the IRIX™ host, you need to perform the following task before rebooting the host if SGI Multi-Path Failover is used:

- Configure the host fibre-channel adapters if applicable (see section 2.7).

2.5 Setting the Disk and Device Parameters

Once the 9500V is installed and connected, you must enable and set the queue depth parameter for each 9500V devices as shown in Figure 2.1.

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```
fx -x
fx version 6.5, Oct 11, 2000
fx: "device-name" = (dksc)
fx: ctlr# = (0)
fx: drive# = (1)
fx: lun# = (0)
...opening dksc(0,1,0)

fx: partitions in use detected on device
fx: devname          seq owner  state
fx: /dev/rdisk/dks0dls0  1 xfs   already in use
...drive selftest...OK
Scsi drive type == QUANTUM XP39100J          LYK8
----- please choose one (? for help, .. to quit this menu)-----
[exi]t          [d]ebug/          [l]abel/          [a]uto
[b]adblock/     [ex]ercise/         [r]epartition/
fx> l

----- please choose one (? for help, .. to quit this menu)-----
[sh]ow/         [sy]nc          [se]t/          [c]reate/
fx/label> set

----- please choose one (? for help, .. to quit this menu)-----
[para]meters    [part]itions    [s]giinfo
[g]eometry      [m]anufacturer_params  [b]ootinfo
fx/label/set> para
fx/label/set/parameters: Error correction = (enabled)
fx/label/set/parameters: Data transfer on error = (enabled)
fx/label/set/parameters: Report recovered errors = (disabled)
fx/label/set/parameters: Delay for error recovery = (enabled)
fx/label/set/parameters: Err retry count = (8)
fx/label/set/parameters: Transfer of bad data blocks = (disabled)
fx/label/set/parameters: Auto bad block reallocation (write) = (disabled)
fx/label/set/parameters: Auto bad block reallocation (read) = (disabled)
fx/label/set/parameters: Read ahead caching = (enabled)
fx/label/set/parameters: Write buffering = (disabled)
fx/label/set/parameters: Drive disable prefetch = (65535)
fx/label/set/parameters: Drive minimum prefetch = (0)
fx/label/set/parameters: Drive maximum prefetch = (357)
fx/label/set/parameters: Drive prefetch ceiling = (357)
fx/label/set/parameters: Enable CTQ = (disabled) enable
fx/label/set/parameters: CTQ depth = (2) 32
fx/label/set/parameters: Read buffer ratio = (0/256)
fx/label/set/parameters: Write buffer ratio = (0/256)
* * * * * W A R N I N G * * * * *
about to modify drive parameters on disk dksc(0,1,0)! ok? y
```

Figure 2.1 Setting Disk and Device Parameters

Note: Command Tagged Queuing = 256/(number of LUNs on the 9500V port)

Save your changes and exit. You will not have to reboot the system to apply the above settings.

2.6 Setting and Recognizing the LUs

To set and recognize the new LUs:

1. Reboot the system, or Run the `scsiha -r <controllernum>` command, then the `scsiha -p <controllernum>` command to reset the adapter and to probe for LUNs.
2. Run the `ioconfig -f /hw` command to rebuild the hardware graph and populate the drive numbers.

2.7 Configuring the Host Fibre-Channel Adapters

Modify `/var/sysgen/master.d/qlfc` to add the appropriate time-out and topology values.

Drivers for the host bus adapters are included in the operating system. For third-party HBAs, please contact your Hitachi Data System representative for assistance.

2.8 Rebooting the SGI® System

After setting the disk and device parameters, setting and recognizing the LUs, and configuring the HBAs, you are ready to reboot the SGI® system.

To reboot the SGI® System, go to the command prompt, and enter: `init 6`

After rebooting, you are now ready to configure the new LUs as described in Chapter 3.

Chapter 3 Configuring the 9500V Devices

After 9500V installation and connection are complete, the devices on the 9500V subsystem are ready to be configured for use. Configuration of the 9500V devices is performed by the user and requires root access to the SGI® system. The activities involved in device configuration are:

- Verifying new device recognition (see section 3.1),
- Partitioning the devices (see section 3.2),
- Creating the file systems (see section 3.3),
- Creating the mount directories and mounting the devices (see section 3.4),
- Verifying the file systems (see section 3.5), and
- Setting the auto-mount parameters (see section 3.6).

Troubleshooting: Chapter 4 provides troubleshooting information.

3.1 Verifying New Device Recognition

The first step in configuring the 9500V devices for SGI™ IRIX® operations is to verify that the SGI™ system recognizes the new devices on the 9500V subsystem. The SGI™ IRIX® system creates device files for new devices automatically during server startup.

WARNING: Make sure that LUN 0 is defined for each target ID. If LUN 0 is not defined, SGI™ IRIX® will not recognize the rest of the LUs on that target ID.

To verify that the SGI™ IRIX® system recognizes the new 9500V devices:

1. Log in to the SGI™ system as **root**.
2. Display the peripheral device information using the command `/hinv` (see Figure 3.1).
3. Verify that the system recognizes all new 9500V devices.

Note: LUN 0 is implied when no LU number is listed.

```
# /hinv ↵                               ← Display device info.
2 180 MHZ IP27 Processors
CPU: MIPS R10000 Processor Chip Revision: 2.6
FPU: MIPS R10010 Floating Point Chip Revision: 2.6
Main memory size: 768 Mbytes
Instruction cache size: 32 Kbytes
Data cache size: 32 Kbytes
Secondary unified instruction/data cache size: 1 Mbyte
Integral SCSI controller 0: Version QL1040B (rev. 2), single ended
  Disk drive: unit 1 on SCSI controller 0
  Disk drive: unit 2 on SCSI controller 0
  Disk drive: unit 3 on SCSI controller 0
  Disk drive: unit 4 on SCSI controller 0
  Disk drive: unit 5 on SCSI controller 0
  Disk drive: unit 6 on SCSI controller 0

Integral SCSI controller 1: Version QL1040B (rev. 2), single ended
  CDROM: unit 7 on SCSI controller 1
Integral SCSI controller 2: Version Fibre Channel QL2200A
Fabric Disk: node50060e800001234 port 0 lun 0 on SCSI controller 2
Fabric Disk: node50060e800001234 port 0 lun 1 on SCSI controller 2
Fabric Disk: node50060e800001234 port 0 lun 2 on SCSI controller 2
Fabric Disk: node50060e800001234 port 0 lun 3 on SCSI controller 2
Fabric Disk: node50060e800001234 port 0 lun 4 on SCSI controller 2
Fabric Disk: node50060e800001234 port 0 lun 5 on SCSI controller 2

Integral SCSI controller 3: Version QL1040B (rev.2), single ended
Integral SCSI controller 4: Version QL1040B (rev.2), single ended
Tape drive: unit 1 on SCSI controller 4: DLT
Jukebox: unit 6 on SCSI controller 4
IOC3 serial port: tty1
IOC3 serial port: tty2
IOC3 parallel port: plp1
Integral Fast Ethernet: ef0, version 1, module 1, slot MotherBoard, pci
2
Origin 200 base I/O, module 1 slot 1
IOC3 external interrupts: 1
#
```

Figure 3.1 Verifying New Device Recognition

3.2 Partitioning the Disk Devices

After new device recognition has been verified, you need to partition the new SCSI disk devices using the `fx -x` utility (see Figure 3.2). After setting the partitions for a device, verify the partitions using the `prtvtoc` command (see Figure 3.3).

WARNING: Do not partition or label devices which will be accessed as raw devices.

```
# fx -x -d ↵
fx version 6.5, Apr 10, 2001
fx: "device-name" =(dksc)
fx: ctlr# = (0) 17 ↵
fx: drive# = (1) 0 ↵
fx: lun# = (0) 0 ↵
...opening dksc(17,0,0)
...drive selftest... OK
fx: Warning: invalid label on disk, ignored
Scsi drive type == HITACHI DFXXXXF
fx: Warning: can't read sgilabel on disk
creating new sgilabel
...creating default bootinfo
...created default partitions,use /repartition menu to change
...creating default volume directory
```

Figure 3.2 Partitioning and Labeling the Disk Devices

```
# prtvtoc /dev/rdisk/dks17d0s0 ↵
* /dev/rdisk/dks17d0s0 (bootfile "/unix")
* 512 bytes/sector
Partition Type Fs Start: sec Size: sec Mount directory
0 xfs yes 4096 2097152
1 xfs yes 2101248 4194304
2 xfs yes 6295552 8388608
3 xfs yes 14684160 16777216
4 xfs yes 31461376 33554432
5 xfs yes 65015808 67108864
6 xfs yes 132124672 7620608
8 volhdr 0 4096
10 volume 0 139745280
#
```

Figure 3.3 Verifying a Partition

3.3 Creating the File Systems

To create the new file systems, use the **mkfs** command as shown in Figure 3.4.

```
# mkfs /dev/rdisk/ dks17d0s0 ↵
meta-data=/dev/rdisk/dks17d0s0      isize=256          agcount=8,      agsize=32768
blks
data      =                          bsize=4096      blocks=262144, imaxpct=25
log       =internal log              bsize=4096      blocks=1000
realtime  =none                       extsz=65536     blocks=0,rttextents=0
#
```

Figure 3.4 Creating the New File System

3.4 Creating the Mount Directories and Mounting the Devices

After you have created the file systems for the new 9500V SCSI disk devices, you can create the mount directories and mount the new devices. Make sure to choose a unique directory name which identifies the logical volume.

To create the mount directories and mount the new SCSI disk devices:

1. Create the desired new mount directories using the **mkdir** command. For example, to create a mount directory for logical unit 0 on the 9500V, enter:
mkdir /9200_LU00
2. Mount all new **9500V** devices using the **mount** command. For example, to mount partition 0 of LUN 15, drive (TID) 0, controller 8, enter:
mount /dev/dsk/dks8d0l15s0 /9200_LU00

3.5 Verifying the File Systems

Verify the file systems for the new 9500V disk devices using the `df -k` command (see Figure 3.5).

Make sure that the capacity value (**Kbytes**) for each device is correct.

```
# do -k ↵
Filesystem      Type  kbytes  use    avail  %use  Mounted on
/dev/root       xfs   4307148 2969969 1337184 69    /
/dev/dsk/dks17d0s0 xfs   1044576 144 1044432 1     /array1
/dev/dsk/dks17d0s1 xfs   2093152 144 2093008 1     /array2
/dev/dsk/dks17d0s2 xfs   4190304 144 4190160 1     /array3
/dev/dsk/dks17d0s3 xfs   8384608 144 8384464 1     /array4
/dev/dsk/dks17d0s4 xfs   16773216 272 16772944 1     /array5
/dev/dsk/dks17d0s5 xfs   33550432 528 33549904 1     /array6
/dev/dsk/dks17d0s6 xfs   3806304 144 3806160 1     /array7
#
```

Figure 3.5 Verifying the New File Systems

3.6 Setting the Auto-Mount Parameters

The final step in configuring the 9500V devices for SGI™ IRIX® operations is to set the auto-mount parameters for the new devices. You will add each device to be auto-mounted to the system auto-mount table (*/etc/fstab* file).

Note: If you do not plan to auto-mount any of the 9500V devices, you can skip this section.

To add new devices to the system auto-mount table:

1. First make a backup copy of the mount table:
cp /etc/fstab /etc/fstab.backup

Add each desired new device to the mount table as shown in Figure 3.6. Table 3.1 describes the auto-mount parameters.

```
# cp /etc/fstab /etc/fstab.backup ← Make backup.
# vi /etc/fstab ↓ ← Edit mount table.
/dev/root / xfs rw,rw=/dev/rroot 0 0
/dev/dsk/dks17d0s0 /array1 xfs rw 0 1
/dev/dsk/dks17d0s1 /array2 xfs rw 0 1
/dev/dsk/dks17d0s2 /array3 xfs rw 0 1
/dev/dsk/dks17d0s3 /array4 xfs rw 0 1
/dev/dsk/dks17d0s4 /array5 xfs rw 0 1
/dev/dsk/dks17d0s5 /array6 xfs rw 0 1
/dev/dsk/dks17d0s6 /array7 xfs rw 0 1
① ② ③ ④ ⑤ ⑥ ← See Table 3.1.
:
```

Figure 3.6 Setting the Auto-Mount Parameters

Table 3.1 Auto-Mount Parameters

No.	Description
①	Device to mount (device file name).
②	Mount point (mount directory).
③	File system (FS) type.
④	Mount options (usually [rw,noquota]).
⑤	Enhance – enter 0 for 9500V devices.
⑥	fsck pass – order in which FS checks are to be performed.

Chapter 4 Troubleshooting

4.1 Troubleshooting

The Hitachi 9500V disk array subsystems provide continuous data availability.

Table 4.1 lists potential error conditions during 9500V SGI® IRIX™ configuration and provides instructions for resolving each condition. If you are unable to resolve an error condition, please contact your Hitachi Data Systems representative or VAR for help, or call the Hitachi Data Systems Support Center for assistance.

Table 4.1 Troubleshooting

Error Condition	Recommended Action
The logical devices are not recognized by the system.	<p>Make sure that the READY indicator lights on the 9500V subsystem are ON.</p> <p>Make sure that the fibre cables are correctly installed and firmly connected.</p> <p>Make sure that the LUNs are properly configured. The LUNs for each target ID must start at 0 and continue sequentially without skipping any numbers.</p> <p>Make sure that the SCSI IDs (unit IDs) on each bus are unique. Do not connect two devices with the same SCSI ID on the same bus.</p>
The SGI™ system does not reboot properly after hard shutdown	<p>If the SGI™ system is powered off without executing the shutdown process, wait three minutes before restarting the SGI™ system. This allows the 9500V's internal time-out process to purge all queued commands so that the 9500V is available (not busy) during system startup. If the SGI™ system is restarted too soon, the 9500V will continue trying to process the queued commands, and the SGI™ system will not reboot successfully.</p>
The SGI™ system hangs	<p>Make sure that the target IDs are set 0 through 6 and 8 through 15, and that target ID 7 has been reserved for the fast-wide SCSI controller card.</p>

4.2 Calling the Support Center

If you need to call the Hitachi Data Systems Support Center, make sure to provide as much information about the problem as possible, including the circumstances surrounding the error or failure and the exact content of any error messages displayed on the host system(s).

The worldwide Hitachi Data Systems Support Centers are:

- Hitachi Data Systems North America/Latin America
San Diego, California, USA
1-800-348-4357
- Hitachi Data Systems Europe
Contact Hitachi Data Systems Local Support
- Hitachi Data Systems Asia Pacific
North Ryde, Australia
011-61-2-9325-3300

Appendix A Acronyms and Abbreviations

AL	arbitrated loop
AL-PA	arbitrated loop physical address
FC	fibre-channel
FCA	fibre-channel adapter
FC-AL	fibre-channel arbitrated loop
fx	IRIX [®] disk utility
HBA	host bus adapter
I/O, IO	input/output
LDEV	logical device
LU	logical unit
LUN	logical unit number, logical unit
OFC	open fibre control
PA	physical address
PC	personal computer system
RAID	redundant array of independent disks
SCSI	small computer system interface
SGI	Silicon Graphics, Incorporated
TID	target ID
XFS [™]	IRIX [®] extended file system

