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# Hitachi Freedom Storage™ LUNStat Utility Reference Guide

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## Document Revision Level

Revision	Date	Description
MK-94LSU001-00	May 2004	Initial Release
MK-94LSU001-01	July 2004	Revision 1, supersedes and replaces MK-94LSU001-00

## Source Documents for this Revision

- *LUNStat Utility Reference Guide*, GI-92GN184
- *LUNStat Utility Reference Guide*, mp-94lsu001-0-modified, version 2.0, May 2004

## Changes in this Revision

- Added support for the Hitachi TagmaStore™ Universal Storage Platform disk subsystem.
- Added the Solaris™ 8 OS with the JNI FCI-1063-2 HBA (driver 2.6.9) to the list of supported configurations (Table 2.1).
- Added a list of Hitachi storage arrays supported by LUNStat version 2.0 (Chapter 2).
- Updated report example 2, Report by OS SCSI Address (section 3.3.2).
- Added information on the SNIA HBA API (section 2.2).

## Referenced Documents

- *Hitachi TagmaStore™ Universal Storage Platform User and Reference Guide*, MK-94RD231
- *Hitachi Lightning 9900™ V Series User and Reference Guide*, MK-92RD100
- *Hitachi Lightning 9900™ User and Reference Guide*, MK-90RD008
- *Hitachi Freedom Storage™ 7700E User and Reference Guide*, BO-98DD845
- *Hitachi Thunder 9500™ V Series User and Reference Guide*, MK-92DF601
- *Hitachi Thunder 9200™ User and Reference Guide*, MK-90DF504

## Preface

This document describes the LUNStat utility for Hitachi RAID storage subsystems. This document assumes that the user is familiar with:

- RAID disk array subsystems and their basic functions,
- The Hitachi RAID subsystem (e.g., Hitachi TagmaStore™ Universal Storage Platform, Lightning 9900™ V Series, Thunder 9500™ V Series), and
- The operating system (e.g., Windows®, Solaris™) on the system which will host the LUNStat utility.

*Note:* For further information on the RAID storage subsystem, please refer to the user documentation for the subsystem (e.g., *Hitachi Lightning 9900™ V Series User and Reference Guide*, MK-92RD100), or contact your Hitachi Data Systems account team.

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## Software Version

This document revision applies to LUNStat version 2.0.

## Comments

Please send us your comments on this document. Make sure to include the document title, number, and revision. Please refer to specific section(s) and paragraph(s) whenever possible.

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# Contents

<b>Chapter 1</b>	<b>Overview of the LUNStat Utility</b> .....	<b>1</b>
1.1	Purpose.....	1
1.2	Reported Information.....	2
1.3	Command Usage.....	4
<b>Chapter 2</b>	<b>Installation</b> .....	<b>5</b>
2.1	Supported Host Configurations.....	5
2.2	Installation for Windows® Systems.....	6
2.3	Installation for UNIX® Systems.....	7
2.3.1	Solaris™ Systems.....	7
2.3.2	HP-UX® Systems.....	7
2.3.3	AIX® Systems.....	7
<b>Chapter 3</b>	<b>LUNStat Operations</b> .....	<b>9</b>
3.1	Document Type Definition for LUNStat.....	9
3.2	Messages.....	11
3.3	Example Reports.....	13
3.3.1	Example 1 - XML Output.....	13
3.3.2	Example 2 - Report by OS SCSI Address.....	14
3.3.3	Example 3 - Report by Array Serial Number, Device and Port.....	15
3.3.4	Example 4 - Report by Array Serial Number, Port, and Device.....	16
3.3.5	Example 5 - Report by Array Serial Number, Parity Group, and Device.....	17
3.3.6	Example 6 - Report by HBA, HBA Port, and OS SCSI Address.....	18
<b>Chapter 4</b>	<b>Troubleshooting</b> .....	<b>19</b>
	<b>Acronyms and Abbreviations</b> .....	<b>21</b>

## List of Tables

Table 2.1	Supported Configurations for LUNStat Version 2.0 . . . . .	5
Table 3.1	Messages. . . . .	11-12



# Chapter 1 Overview of the LUNStat Utility

## 1.1 Purpose

LUNStat is a command-line utility that gathers data from the host operating system, SCSI inquiries, and the SNIA HBA API to report the type of storage attached to a host. Supported host operating systems include Microsoft Windows 2000/XP, IBM AIX, Hewlett Packard HP-UX, and Sun Solaris. Host storage information is presented in [XML format](#) or plain text format. You can sort plain text reports according to one of the following sets of criteria:

- Ascending OS Bus Number, OS Target ID, and OS LUN ([example](#))
- Ascending Array Serial Number, LDEV, and Port Number ([example](#))
- Ascending Array Serial Number, Port Number, and LDEV ([example](#))
- Ascending Array Serial Number, Parity Group, and LDEV ([example](#))
- Ascending HBA Number, HBA Port Number, and SCSI ID ([example](#))

## 1.2 Reported Information

For all attached disks and logical units, LUNStat provides the following information collected from the host operating system:

- OS Bus Number
- OS Target ID
- OS LU Number
- File System Types
- File System Names
- Mount Points
- Capacity

For all attached SCSI disks and logical units, LUNStat provides the following information collected from SCSI Inquiry commands:

- Manufacturer
- Product ID
- SCSI Serial Number
- Revision Level

For Hitachi RAID logical units, LUNStat provides the following information collected from SCSI Inquiry commands:

- Emulation Type
- RAID Model
- RAID Serial Number
- RAID Port ID
- RAID Device ID
- RAID Level
- RAID Group
- RAID Sub System ID
- RAID CU Number
- RAID TC CTID
- TCA Role
- SI Role M0
- SI Role M1
- SI Role M2
- Host Group Number
- HBA Node WWN
- HBA Port WWN

For logical units attached through a host bus adapter, LUNStat provides the following information collected from the SNIA HBA API:

- HBA Adapter Number
- HBA Adapter Name
- HBA Manufacturer
- HBA Model
- HBA Hardware Version
- HBA Driver Version
- HBA Firmware Version
- HBA Node WWN
- HBA Port Number
- HBA Port WWN
- HBA Port Type
- HBA Port State
- HBA Port FCID
- HBA Port Supported COS
- HBA Port Supported Speed
- HBA Port Actual Speed
- HBA Port Discovered Port Count
- HBA Port Error Frames Per Minute
- HBA Port Link Failures Per Minute
- HBA RAID Sub System Port WWN

## 1.3 Command Usage

```
Correct usage is: LUNStat -x
                  or: LUNStat -t [-s] [-a] [-p] [-r] [-h]
where:
  -x: indicates to write an XML format report to stdout.
  -t: indicates to write a textual format report to stdout.
  -s: request SCSI ID report. (valid with -t).
  -a: request Hitachi array report. (valid with -t).
  -p: request Hitachi array port report. (valid with -t).
  -r: request Hitachi array RAID group report. (valid with -t).
  -h: request HBA report. (valid with -t).

examples:

  lunstat -ts 1> scsi_report.txt
  lunstat -ta 1> array_report.txt
  lunstat -tp 1> port_report.txt
  lunstat -tr 1> paritygroup_report.txt
  lunstat -th 1> hba_report.txt
```

## Chapter 2 Installation

The LUNStat program has few installation requirements. It is intended for use as a service tool with minimal impact on the target host system. LUNStat 2.0 supports the following Hitachi storage arrays:

- Hitachi TagmaStore™ Universal Storage Platform
- Hitachi Lightning 9900™ V Series (9900V)
- Hitachi Lightning 9900™
- Hitachi Freedom Storage™ 7700E
- Hitachi Thunder 9500™ V Series (9500V)
- Hitachi Thunder 9200™

### 2.1 Supported Host Configurations

Table 2.1 lists the configurations that support LUNStat version 2.0.

Table 2.1 Supported Configurations for LUNStat Version 2.0

Hardware Platform	Operating System (OS)	Host Bus Adapter (HBA)	Host Bus Adapter Driver
Intel x86	Windows NT 4.0 Windows 2000	Emulex LP8000	5-5.01A0 (lpxnds)
Sun Sparc	Solaris 8	JNI FCI-1063-2	2.6.9
Sun Sparc	Solaris 9	JNI FCE-6410	4.1.5 (jnic)
HP PA-RISC	HP-UX 11i	HP A6795A	B.11.22.01 (libtd.a)
Intel Itanium	HP-UX 11i	HP A5185A	B.11.11.09 (libtd.a)
IBM pSeries	AIX/L 5.2	IBM 6239	5.2.0.10 (efcdd)

## 2.2 Installation for Windows® Systems

Copy the LUNStat program binary to your system from your delivery media. For proper operation, LUNStat requires administrator privileges.

Much of the information that LUNStat reports is obtained using programmatic calls to the SNIA HBA API dynamic library. LUNStat does not require that this library be available, however, certain information regarding the host bus adapter and attached storage cannot be obtained without it. The SNIA HBA API is a standard application programming interface for management of fibre-channel host bus adapters and attached storage. Implementations of the SNIA HBA API are provided by vendors of fibre-channel HBAs, operating systems, storage subsystems, and SAN management software. The SNIA HBA API can normally be installed from the operating system installation media or the HBA driver installation media. Please contact your HBA or operating system vendor if you need assistance. For a list of information retrieved through the SNIA HBA API, see section 1.2.

By default, the LUNStat program attempts to dynamically load the SNIA HBA API library at runtime. If the library is present on the host system but is not loaded by LUNStat, verify that the environment variable `HBA_SNIA_API_LIB_PATH` specifies the library's complete pathname.

## 2.3 Installation for UNIX® Systems

Copy the LUNStat program binary to your system from your delivery media. Verify that the file has the execute attribute set. The LUNStat program file attributes should appear in the `ls -lF` command output as follows:

```
# ls -lF lunstat
-r-xr-xr-x    1 root other    81816 Sep 25 07:38 lunstat*
```

If the file attributes do not reflect this output, copy LUNStat to a disk location where the directory can be modified, then issue the following commands:

```
# chmod 555 lunstat
# chown root:other lunstat
```

For proper operation, LUNStat should be run with root user authority. Much of the information that LUNStat reports is obtained using programmatic calls to the SNIA HBA API dynamic library. LUNStat does not require that this library be available. However, certain information regarding the host bus adapter and attached storage cannot be obtained without it. For a list of information retrieved through the SNIA HBA API, see section 1.2.

### 2.3.1 Solaris™ Systems

The Solaris version of LUNStat attempts to dynamically load `HbaCommonLib.so`. This behavior can be modified by setting a `HBA_SNIA_API_LIB_PATH` environment variable to specify the complete pathname for the available SNIA HBA API shared objects library.

### 2.3.2 HP-UX® Systems

LUNStat for HP-UX is available for both HP PA-RISC and Intel Itanium system architectures. Copy the version of LUNStat that corresponds to your hardware to your system. LUNStat supports disks managed by the HP-UX logical volume manager. Mount points for disks under control of the Logical Volume Manager are obtained by determining which logical volume a mount point uses, then analyzing which disks contain the volume group extents that compose the logical volume.

### 2.3.3 AIX® Systems

LUNStat supports disks that are managed by the AIX logical volume manager. Mount points for disks under control of the Logical Volume Manager are obtained by determining which logical volume a mount point uses, then analyzing which disks contain the volume group physical partitions that compose the logical volume.





## Chapter 3 LUNStat Operations

### 3.1 Document Type Definition for LUNStat

When LUNStat is invoked using the `-x` option, it generates a report in XML format. These XML reports conform to the document type definition that is expressed in the following example.

```
<?xml version="1.0"?>

<!-- Document type Declaration (DTD) for XML produced by HDS LUNStat command. -->
<!-- Refer http://www.w3.org/TR/REC-xml#sec-prolog-dtd -->

<!DOCTYPE LUNStat [

<!-- The LUNStat document contains identifying attributes and four reports. -->

<!ELEMENT LUNStat(DiskEntry*)>

<!-- Here are the attributes that identify the LUNStat invocation instance. -->

<!ATTLIST LUNStat
hostname                CDATA#REQUIRED
OSType                  CDATA#REQUIRED
ipaddress               CDATA#IMPLIED
yyyymmdd               CDATA#REQUIRED
hhmmss                 CDATA#REQUIRED
vvrrmm                 CDATA#REQUIRED
<!--LUNStat version, release, and maint level -->
<!--This element contains disk information, common attributes, and
three types of optional elements. It is common to all 'report' types
to simplify parsing. -->
>

<!ELEMENT DiskEntry(HBAInfo?,HitachiRAID? PairInfo?)>
<!ATTLIST DiskEntry
VendorID                CDATA#REQUIRED
ProductID              CDATA#REQUIRED
MicrocodeLevel         CDATA#IMPLIED
SCSISerialNumber       CDATA#REQUIRED
SCSIBusNumber          CDATA#REQUIRED
SCSITID                CDATA#REQUIRED
SCSILUNumber           CDATA#REQUIRED
MountPoints            CDATA#IMPLIED
FileSystemTypes        CDATA#IMPLIED
FileSystemNames        CDATA#IMPLIED
ConfiguredCapacityGB  CDATA#REQUIRED
<!--This element is present in DiskEntry for disk
devices implemented on Hitachi RAID.-->
>
```

PRELIMINARY RELEASE

```
<!ELEMENT HitachiRAID EMPTY >
<!ATTLIST HitachiRAID
Model          CDATA#REQUIRED
SerialNumber   CDATA#REQUIRED
PortID         CDATA#REQUIRED
DeviceID       CDATA#REQUIRED
EmulationType  CDATA#REQUIRED
RAIDType       CDATA#REQUIRED
ParityGroup    CDATA#REQUIRED
SubSysID       CDATA#REQUIRED
CUNumber       CDATA#REQUIRED
HostGroupNumber CDATA#IMPLIED
<!-- This element is present in DiskEntry for disk
devices that are attached by HBAs supporting the
SNIA Management API . ->
>
<!ELEMENT HBAInfo EMPTY >
<!ATTLIST HBAInfo
Adapter        CDATA#REQUIRED
NodeWWN        CDATA#REQUIRED
Name           CDATA#REQUIRED
Mfg            CDATA#REQUIRED
Model          CDATA#REQUIRED
HardwareVersion CDATA#REQUIRED
DriverVersion  CDATA#REQUIRED
FirmwareVersion CDATA#REQUIRED
PortNumber     CDATA#REQUIRED
PortWWN        CDATA#REQUIRED
PortType       CDATA#REQUIRED
PortState      CDATA#REQUIRED
PortFCID       CDATA#REQUIRED
PortSupportedCOS CDATA#REQUIRED
PortSupportedSpeed CDATA#REQUIRED
PortSpeed      CDATA#REQUIRED
DiscoveredPortCount CDATA#REQUIRED
PortErrorFramesPerMinute CDATA#REQUIRED
PortLinkFailuresPerMinute CDATA#REQUIRED
<!-- This element is present in DiskEntry for
Hitachi RAID that supports TC and SI status
in the SCSI Inquiry pages . -->
>
<!ELEMENT PairInfo EMPTY >
<!ATTLIST PairInfo
TCPairStatus   (SMPL|PVOL|SVOL)
TCACTID        CDATA#REQUIRED
SIPairStatusMU0 (SMPL|PVOL|SVOL)
SIPairStatusMU1 (SMPL|PVOL|SVOL)
SIPairStatusMU2 (SMPL|PVOL|SVOL)
>
] >
```

## 3.2 Messages

Table 3.1 lists the messages output by LUNStat and where applicable, provides recommended actions for the conditions. Condition severity is indicated as follows:

- Warning (W)
- Error (E)

**Note:** LUNStat runs in verbose mode. This mode is intended for debugging purposes—not for end-users.

Table 3.1 Messages (continues on the next page)

ID	Message
5000E	LUNStat was unable to find any disks. If HDS LUs are known to be attached please contact your local HDS support team.
5001E	For Windows operating systems, LUNStat scans for logical volumes, first using drive letter volume names and then rescan points. This message indicates that no such volumes were found. If HDS LUs are known to be attached, please contact your local HDS support team.
5002E	LUNStat must dynamically allocate storage from the memory heap. Under conditions where very large configurations exist or severe virtual memory shortage, LUNStat may not be able to allocate the required amount of memory.
5003W	The named system service failed. The result code values indicate the nature of the error and the disk resource in question.
5004E	A security access exception was encountered in dealing with the named resource. Evaluate the security context and take appropriate action.
5007W	LUNStat was unable to open the named volume. Some information regarding file system type and volume label may be missing from the resulting reports.
5008E	For UNIX systems, LUNStat was not able to open the named device directory. Evaluate the reported error. Contact your local HDS support team for further assistance.
5009W	For UNIX systems, LUNStat was unable to obtain disk mount point information because of the indicated error.
5010W	For UNIX systems, LUNStat was unable to obtain operating system based capacity information because of the stated error.
5011W	For UNIX systems, LUNStat was unable to relate the /dev/rdisk device name to the actual device path name. In such cases, LUNStat will be unable to report information obtained by SCSI Inquiry.
5012W	For UNIX systems, LUNStat was unable to close the device because of the indicated error.
5013W	The standard SCSI command interface reports the indicated error for the named file. This error may prevent reporting of SCSI Inquiry information for the named disk resource.
5014W	A SCSI Inquiry operation completed with unusual status and/or sense. See T10 SPC3 for Inquiry status and sense code values. This document may be found at <a href="http://www.t10.org/scsi-3.htm">http://www.t10.org/scsi-3.htm</a> .
5015W	A SCSI Inquiry operation failed for the indicated code page and indicated device.
5016W	A SCSI Inquiry operation completed with unusual status and/or sense. See T10 SPC3 for Inquiry status and sense code values. This document may be found at <a href="http://www.t10.org/scsi-3.htm">http://www.t10.org/scsi-3.htm</a> .
5017W	An open request for the indicated SCSI file failed with the indicated reason. This device may be a non-SCSI device, or be exclusively allocated for system use.

Table 3.1 Messages (continued)

ID	Message
5018W	For Windows systems, the named physical drive was previously opened successfully during a disk scan, but cannot be re-opened for SCSI Inquiry operations due to the indicated CreateFile() error.
5019W	For Windows systems, a DeviceIOControl() IOCTL SCSI_GET_ADDRESS request failed with the indicated code for the indicated device.
5021W	SCSI Inquiry page 83 appears to contain invalid port information for the indicated disk.
5023W	The named SNIA HBA API library was not found. The LUNStat program will be unable to report any HBA information.
5024W	The SNIA HBA API GetAdapterName function failed with the indicated error code for the indicated HBA. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5025W	The SNIA HBA API OpenAdapter function failed with the indicated error code for the indicated HBA. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5026W	The SNIA HBA API GetAdapterAttributes function failed with the indicated error code for the indicated HBA. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5027W	The LUNStat program must dynamically allocate storage from the memory heap. Under conditions of very-large configurations or severe virtual memory shortage, LUNStat may not be able to process normally and present this warning. In this case, LUNStat will not be able to issue capacity requests directly to the SCSI devices.
5028W	The SNIA HBA API GetAdapterPortAttributes function failed with the indicated error code for the indicated HBA. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5029W	The installed HBA API library does not support the GetPortStatistics() function. LUNStat cannot report port error statistics.
5030W	The SNIA HBA API FreeLibrary function failed with the indicated error code. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5031W	For Windows operating systems, the GetComputerNameEx function was unable to provide the host name. Host name will be missing from LUNStat reports.
5032W	The SNIA HBA API GetNumberofAdapters function indicates that no Host Bus Adapters are present. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> .
5033W	The SNIA HBA API library named in message 5023W was not found. The LUNStat program is unable to report any HBA information. If you can locate these libraries on this host, you may set the HBA_SNIA_API_LIB_PATH environment variable to indicate the correct complete library pathname.
5034W	The SNIA HBA API ReadCapacity function failed for the indicated fabric device. See T11/1568-D "Fibre Channel HBA API" at <a href="http://www.t11.org/index.htm">http://www.t11.org/index.htm</a> . LUNStat may be able to determine LU capacity using OS system calls.
5035W	A composite information field has exceeded the capacity of intermediate receiving fields. Please contact your HDS support team.
6021E	Early releases of the LUNStat program included a drop-dead date, to insure that they were replaced with GA versions. This LUNStat is no longer usable and must be replaced with a more recent version.
6050E	LUNStat must dynamically allocate storage from the memory heap to support sorted reports. Under conditions of very-large configurations or severe virtual memory shortage, LUNStat may not be able to allocate the required amount of memory.
6051W	An invalid character has been encountered while converting the named string type to wide character format.
6053W	An invalid character has been encountered while converting the named string type from wide character format.

### 3.3 Example Reports

#### 3.3.1 Example 1 – XML Output

```
<?xml version="1.0" encoding="UTF-8" ?>
- <LUNStat hostname="MyHost" OSType="" GMTyyyymmdd="20040204" GMTThmms="162548"
level="lunstat 2.0 for SUN Solaris">
  <DiskEntry VendorID="NON-SCSI" ProductID="" MicrocodeLevel="" SCSISerialNumber=""
SCSIBusNumber="0" SCSITID="2" SCSILUNumber="0" MountPoints="" FileSystemTypes=""
FileSystemNames="" ConfiguredCapacityGB="0.00" />
  <DiskEntry VendorID="NON-SCSI" ProductID="" MicrocodeLevel="" SCSISerialNumber=""
SCSIBusNumber="0" SCSITID="0" SCSILUNumber="0" MountPoints="/" FileSystemTypes="ufs"
FileSystemNames="" ConfiguredCapacityGB="8.44" />
- <DiskEntry VendorID="HITACHI" ProductID="DF600F" MicrocodeLevel="0000"
SCSISerialNumber="D60H000F0000" SCSIBusNumber="1" SCSITID="1" SCSILUNumber="0"
MountPoints="/mnt/lun0" FileSystemTypes="ufs" FileSystemNames=""
ConfiguredCapacityGB="270.22">
  <HitachiRAID Model="D60H" SerialNumber="0015" PortID="1" DeviceID="0" RAIDType=""
ParityGroup="" SubSysID="" CUNumber="" HostGroupNumber="" />
  <HBAInfo Adapter="0" NodeWWN="F0F0F0E069F00875" Name="com.jni-FCE-6410" Mfg="JNI
Corporation" Model="FCE-6410" HardwareVersion="Emerald III - A4" DriverVersion="JNIC v4.1.5
(03021000)" FirmwareVersion="Version 2.15" PortNumber="0" PortWWN="20EEE0E069F00875"
PortType="LPORT" PortState="Online" PortFCID="00000001" PortSupportedCOS="00000018"
PortSupportedSpeed="1GBS" PortSpeed="1GBS" DiscoveredPortCount="1"
PortErrorFramesPerMinute="" PortLinkFailuresPerMinute="" />
</DiskEntry>
</LUNStat>
```

[\(back to top\)](#)

### 3.3.2 Example 2 – Report by OS SCSI Address

```
-----  
Report: OS SCSI Address  
Host: zx2000  
OS: HP-UX  
Version: U  
Release: B.11.22  
Machine: ia64  
Level: lunstat 2.0 for HP-UX (Itanium/ILP32)  
Date: 06/10/2004  
Time: 11:27:15  
-----  
BUS: 0 TID: 0 LUN: 0  
-----  
Device File: /dev/rdisk/c3t0d0  
Manufacturer: HITACHI  
Product ID: OPEN-8  
Revision Level: 5001  
SCSI Serial Number: 50 0271A0000  
Capacity(GB): 6.84  
RAID Model: R500  
RAID Serial Number: 271A  
RAID Subsystem ID: 0004  
RAID CU Number: 0  
RAID Host Group: 0000  
RAID Port ID: EF  
RAID Device ID: 0000  
RAID Group: 1-1  
RAID Level: 5  
HBA Node WWN: 50060B000023ACF3  
HBA Port WWN: 50060B000023ACF2  
HBA Adapter Number: 0  
HBA Port Number: 0  
HBA Port Type: NLPORT  
HBA Port State: Online  
TrueCopy CTID: FF  
TrueCopy Vol: SMPL  
ShadowImage MU0: SMPL  
ShadowImage MU1: SMPL  
ShadowImage MU2: SMPL  
-----  
BUS: 1 TID: 0 LUN: 0  
-----  
Device File: /dev/rdisk/clt0d0  
Manufacturer: Maxtor 6  
Product ID: E040L0  
Revision Level: NAR6  
File System Types: vxfs  
Capacity(GB): 38.29  
Mount Point(s): /, /stand, /var, /usr, /tmp, /opt, /home  
-----  
End of report.  
-----
```

[\(back to top\)](#)

### 3.3.3 Example 3 – Report by Array Serial Number, Device and Port

```

-----
Report: Array Serial Number, Device, and Port
Host: myhost
  OS: AIX
Version: 5
Release: 2
Machine: 0005639F4C00
  Level: lunstat 2.0 for IBM AIX
  Date: 05/08/2004
  Time: 17:03:33
-----

RAID Serial Number: 20025
  Manufacturer: HITACHI
  RAID Model: R451
  RAID Port ID: EF
  Microcode Level: 2109
-----

DISK: hdisk2  PARENT: fscsi5  LOCATION: 2D-08-01
-----

  Device File: /dev/rhdisk2
  LDEV: 0030
  RAID Group: 1-1
  RAID Level: 5
RAID Subsystem ID: 9970
  RAID CU Number: 0
  Product ID: 3390-3A
  Capacity(GB): 2.78
  TrueCopy CTID: FF
  TrueCopy Vol: SMPL
  ShadowImage MU0: SMPL
  ShadowImage MU1: SMPL
  ShadowImage MU2: SMPL
  RAID Port ID: EF
Host Group Number: 0000
  HBA Node WWN: 20000000C93885E7
  HBA Port WWN: 10000000C93885E7
-----

DISK: hdisk3  PARENT: fscsi5  LOCATION: 2D-08-01
-----

  Device File: /dev/rhdisk3
  LDEV: 0031
  RAID Group: 1-1
  RAID Level: 5
RAID Subsystem ID: 9970
  RAID CU Number: 0
  Product ID: 3390-3A
  Capacity(GB): 2.78
  TrueCopy CTID: FF
  TrueCopy Vol: SMPL
  ShadowImage MU0: SMPL
  ShadowImage MU1: SMPL
  ShadowImage MU2: SMPL
  RAID Port ID: EF
Host Group Number: 0000
  HBA Node WWN: 20000000C93885E7
  HBA Port WWN: 10000000C93885E7
-----

End of report.
-----

```

[\(back to top\)](#)

### 3.3.4 Example 4 – Report by Array Serial Number, Port, and Device

```
-----  
Report: Array Serial Number, Port, and Device  
Host: myhost  
  OS: AIX  
Version: 5  
Release: 2  
Machine: 0005639F4C00  
  Level: lunstat 2.0 for IBM AIX  
  Date: 05/08/2004  
  Time: 17:05:28  
-----  
RAID Serial Number: 20025  
  Manufacturer: HITACHI  
  RAID Model: R451  
  Microcode Level: 2109  
-----  
RAID Port ID: EF  
-----  
DISK: hdisk2  PARENT: fscsi5  LOCATION: 2D-08-01  
-----  
  Device File: /dev/rhdisk2  
  LDEV: 0030  
  RAID Group: 1-1  
  RAID Level: 5  
RAID Subsystem ID: 9970  
RAID CU Number: 0  
Host Group Number: 0000  
  Product ID: 3390-3A  
  Capacity(GB): 2.78  
  HBA Node WWN: 20000000C93885E7  
  HBA Port WWN: 10000000C93885E7  
  TrueCopy CTID: FF  
  TrueCopy Vol: SMPL  
ShadowImage MU0: SMPL  
ShadowImage MU1: SMPL  
ShadowImage MU2: SMPL  
-----  
DISK: hdisk3  PARENT: fscsi5  LOCATION: 2D-08-01  
-----  
  Device File: /dev/rhdisk3  
  LDEV: 0031  
  RAID Group: 1-1  
  RAID Level: 5  
RAID Subsystem ID: 9970  
RAID CU Number: 0  
Host Group Number: 0000  
  Product ID: 3390-3A  
  Capacity(GB): 2.78  
  HBA Node WWN: 20000000C93885E7  
  HBA Port WWN: 10000000C93885E7  
  TrueCopy CTID: FF  
  TrueCopy Vol: SMPL  
ShadowImage MU0: SMPL  
ShadowImage MU1: SMPL  
ShadowImage MU2: SMPL  
-----  
End of report.  
-----
```

[\(back to top\)](#)



### 3.3.5 Example 5 – Report by Array Serial Number, Parity Group, and Device

```
-----  
Report: Array Serial Number, Parity Group, and Device  
Host: myhost  
OS: AIX  
Version: 5  
Release: 2  
Machine: 0005639F4C00  
Level: lunstat 2.0 for IBM AIX  
Date: 05/08/2004  
Time: 16:53:35  
-----  
RAID Serial Number: 20025  
Manufacturer: HITACHI  
RAID Model: R451  
Microcode Level: 2109  
-----  
Parity Group: 1-1  
-----  
DISK: hdisk2 PARENT: fscsi5 LOCATION: 2D-08-01  
-----  
Device File: /dev/rhdisk2  
LDEV: 0030  
RAID Group: 1-1  
RAID Level: 5  
RAID Subsystem ID: 9970  
RAID CU Number: 0  
Host Group Number: 0000  
Product ID: 3390-3A  
Capacity(GB): 2.78  
HBA Node WWN: 20000000C93885E7  
HBA Port WWN: 10000000C93885E7  
TrueCopy CTID: FF  
TrueCopy Vol: SMPL  
ShadowImage MU0: SMPL  
ShadowImage MU1: SMPL  
ShadowImage MU2: SMPL  
-----  
DISK: hdisk3 PARENT: fscsi5 LOCATION: 2D-08-01  
-----  
Device File: /dev/rhdisk3  
LDEV: 0031  
RAID Group: 1-1  
RAID Level: 5  
RAID Subsystem ID: 9970  
RAID CU Number: 0  
Host Group Number: 0000  
Product ID: 3390-3A  
Capacity(GB): 2.78  
HBA Node WWN: 20000000C93885E7  
HBA Port WWN: 10000000C93885E7  
TrueCopy CTID: FF  
TrueCopy Vol: SMPL  
ShadowImage MU0: SMPL  
ShadowImage MU1: SMPL  
ShadowImage MU2: SMPL  
-----  
End of report.  
-----
```

[\(back to top\)](#)

## 3.3.6 Example 6 – Report by HBA, HBA Port, and OS SCSI Address

```

-----
Report: HBA, Port, and OS SCSI Address
Host: myhost
  OS: AIX
Version: 5
Release: 2
Machine: 0005639F4C00
  Level: lunstat 2.0 for IBM AIX
  Date: 05/08/2004
  Time: 19:09:13
-----
HBA Number: 5
-----
  HBA Manufacturer: IBM
    HBA Model: df1080f9
    HBA Name: com.ibm.df1080f9
  HBA Driver Version: 5.2.0.0
HBA Firmware Version: HD100X5
-----
HBA Port Number: 0
-----
  HBA Node WWN: 20000000C93885E7
  HBA Port WWN: 10000000C93885E7
  HBA Port Type: LPORT
  HBA Port State: Online
    HBA FCID: 00000001
  SupportedCOS: 00000006
  SupportedSpeed: 2GBS
  ActualSpeed: 1GBS
  DiscoveredPortCt: 1
-----
DISK: hdisk2  PARENT: fscsi5  LOCATION: 2D-08-01
-----
  Device File: /dev/rhdisk2
  Manufacturer: HITACHI
  Product ID: 3390-3A
  Microcode Level: 2109
SCSI Serial Number: 04514E390030
  Capacity(GB): 2.78
  RAID Model: R451
RAID Serial Number: 20025
  RAID Subsystem ID: 9970
  RAID CU Number: 0
  Host Group Number: 0000
  RAID Port ID: EF
  RAID Device ID: 0030
  RAID Port WWN: 50060E80034E3901
  RAID Group: 1-1
  RAID Level: 5
  HBA Node WWN: 20000000C93885E7
  HBA Port WWN: 10000000C93885E7
HBA Adapter Number: 5
  HBA Port Number: 0
  HBA Port State: Online
  TrueCopy CTID: FF
  TrueCopy Vol: SMPL
  ShadowImage MU0: SMPL
  ShadowImage MU1: SMPL
  ShadowImage MU2: SMPL
-----
End of report.
-----

```

[\(back to top\)](#)

## Chapter 4 Troubleshooting

If you need to call the Hitachi Data Systems Support Center, please provide as much information about the problem as possible.

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  
61-2-9325-3300



## Acronyms and Abbreviations

API	application program interface
ATT	attribute
CTID	consistency group ID (for TCA)
CU	control unit
DF600	another name for the Thunder 9500V subsystem
DF500	another name for the Thunder 9200 subsystem
DTD	document type declaration
FCID	fibre-channel ID
GB	gigabyte
HBA	host bus adapter
HDS	Hitachi Data Systems
hhmmss	hour, minute, second
LDEV	logical device
LU	logical unit
LUN	logical unit number
MU	mirror unit
OS	operating system
PVOL	primary volume
RAID	redundant array of independent disks
R400, RAID400	another name for the Lightning 9900 subsystem
R450, RAID450	another name for the Lightning 9900V subsystem
R500, RAID500	another name for the TagmaStore™ Univeral Storage Platform
SCSI	small computer system interface
SI	ShadowImage
SMPL	simplex
SNIA	Storage Networking Industry Association
SVOL	secondary volume
TC	TrueCopy
TCA	TrueCopy Asynchronous
TID	target ID
vrrmm	version, release, maintenance level
WWN	worldwide name
XML	extensible markup language
yyyymmdd	year, month, day

