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DATA SYSTEMS

Hitachi TagmaStore®
Adaptable Modular Storage
and Workgroup Modular Storage

Error Codes and Messages

MK-96DF788-02

Trademarks

Notice of Export Controls

Document Revision Level

Revision	Date	Description
MK-94RD788-00	March 2006	Initial Release
MK-94RD788-01	May 2006	Revision 01, supersedes and replaces MK-94RD788-00
MK-94RD788-02	May 2006	Revision 02, supersedes and replaces MK-94RD788-01

Source Document(s) for this Revision

- *Hitachi TagmaStore Adaptable Modular SNMP Agent Support User's Guide* (MK-95DF705).
- *Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage Storage Navigator Modular Graphical User Interface (GUI) User's Guide* (MK-95DF711).
- *Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage, Storage Navigator Modular for Web User's Guide* (MK-95DF719).

Changes in this Revision

- Added new Table 1.3.
- Updated CCI error codes
- Added TrueCopy Extended Distance DF700 error codes.
- Removed error codes for AMS200, AMS500, AMS1000, WMS100, CCI, Storage Navigator Modular CLI. Those error codes can now be found in the user guides for those products.

Preface

This document presents a list of the error codes and error messages for the program products running shown in **Source Document(s) for This Revision** using Hitachi Storage Navigator for TagmaStore, and provides recommended action for the error conditions. The document does not include equipment warning labels or lights, common log messages, informational or confirmation messages, or status messages including warnings; instead, this document is limited to showing error codes that appear and providing the related messages so the user can interpret their meaning.

This document assumes the following:

- The user has a background in data processing and understands storage subsystems, direct-access storage devices (DASD), and their basic functions, and
- The user is familiar with the Hitachi TagmaStore Adaptable Modular Storage (AMS) or Workgroup Modular Storage (WMS) array subsystem and has read and understands the manuals for the subsystem(s).
- The user is familiar with the operating system and web browser software on the system hosting the Storage Navigator Modular software.

Notes:

- In this document the term "Storage Navigator" refers to the Storage Navigator Modular, unless otherwise noted.
- In this document instructions with a "CAUTION" label indicate that failure to follow the instructions could result in damage to the subsystem or potential loss of data.
- The Storage Navigator windows shown in this document were captured on a Windows® system with the Internet Explorer web browser. The Storage Navigator screens may display differently on other operating systems and browsers.
- For further information, please contact your Hitachi Data Systems account team, or visit the Hitachi Data Systems worldwide web site at http://www.hds.com.
- For details on the applicable operating systems and web browser software, please refer to *Hitachi TagmaStore Universal Storage Platform and Network Storage Controller Storage Navigator User's Guide* (MK-94RD206).
- The first occurrence in the text of a word in the glossary is italicized.

Notice: The use of the Storage Navigator Modular program and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Microcode Level and Software Version

This document revision applies to Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage Products version 3.5 and higher.

Convention for Storage Capacity Values

Logical storage capacity values (e.g., logical devices, cache) on the TagmaStore AMS/WMS are calculated based on the following values:

1 KB (kilobyte) = 1,024 bytes
1 MB (megabyte) = $1,024^2$ bytes
1 GB (gigabyte) = $1,024^3$ bytes
1 TB (terabyte) = $1,024^4$ bytes
1 block = 512 bytes

Physical storage capacity values (e.g., hard disk drives) on the TagmaStore AMS/WMS are calculated based on the following values:

1 KB (kilobyte) = 1,000 bytes
1 MB (megabyte) = $1,000^2$ bytes
1 GB (gigabyte) = $1,000^3$ bytes
1 TB (terabyte) = $1,000^4$ bytes

Referenced Documents

- Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage
  - *Storage Navigator Modular Graphical User Interface (GUI) User's Guide* (MK-95DF711).
  - *Storage Navigator Modular for Web User's Guide* (MK-95DF719).
  - *SNMP Agent Support Function User's Guide* (MK-95DF705).

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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Thank you! (All comments become the property of Hitachi Data Systems Corporation.)

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Chapter 1 Storage Navigator Modular (GUI and Web) Error Monitoring

Error messages in the GUI and Web versions of Storage Navigator are reported in an error log and also, if enabled, via e-mail. For details, see *Storage Navigator Modular Graphical User Interface (GUI) User's Guide* (MK-95DF711) or *Storage Navigator Modular for Web User's Guide* (MK-95DF719).

This chapter covers the following topics:

- Error Messages (section 1.1)
- Error Reporting Using Log File (section 1.2)
- E-Mail Error Messages: Subject Line Briefly Describes the Error (section 1.3)

1.1 Error Messages

Table 1.1 Storage Navigator Modular (GUI and Web) Error Messages (AMS200/AMS500)

No.	Message Text	Meaning of Message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY FC Drive Detached. ARRAY Detached FC Drive Position Unit No.X HDU No.Y.	An FC drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
3	ARRAY SATA Drive Detached. ARRAY Detached SATA Drive Position Unit No.X HDU No.Y.	An SATA drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
4	ARRAY Battery Alarm. Position Battery No.X.	A battery voltage error occurred.
5	ARRAY Fan Alarm. Position Unit No.XX Fan No.X.	A fan failure occurred.
6	ARRAY CONTROLLER Detached. Position CONTROLLER No.X.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure. Position Unit No.XX AC Power No.X.	An AC power supply error occurs.
8	ARRAY Cache Memory Alarm.	A cache failure occurred.
9	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
10	ARRAY ENC Alarm. Position Unit No.XX ENC No.X.	An enclosure error occurred.
11	ARRAY SENC Alarm. Position Unit No.XX SENC No.X.	An SENC error occurred.
12	ARRAY Loop Alarm.	A loop error occurred.
13	ARRAY Path Alarm.	A path blockage occurred.
14	ARRAY Host Connector Alarm. Position CONTROLLER No.X.	A host connector error occurred.
15	ARRAY Warning.	The array unit entered the warning state.
16	ARRAY Storage Navigator Modular Interface error occurred	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
17	ARRAY NNC Detached. Position NNC No.X.	An NNC blockade occurred.
18	ARRAY NNC Warning. Position NNC No.X.	An NNC partial blockade occurred.

1.2 Error Reporting Using Log File

When a failure is detected in the array unit when error monitoring is executed, the function outputs the failure information to a log file.

The log file is output in the text file format with a file name of errlog.txt to the same directory in which the Web Navigator execution file is located. The output size of a log file is up to 520 KB. When the log information exceeds the limit, the log file is renamed to "errlog.txt.pre" and log file "errlog.txt" is newly created.

The string "--- end ---" comes at the end of the log information output. If the log information surpasses its limit again, the existing log file "errlog.pre.txt" is replaced with"errlog.txt" and then a new log file "errlog.txt" is created again.

Note: "Time when a failure is detected" is determined by the clock in the Web Server installing Web Navigator.

The log file is output in the text file format with a file name of errlog.txt to the same directory in which the Storage Navigator execution file is located. With respect to the file layout, the format for displaying the array unit state transition is shown below as an example.

Day, Mon. dd hh:mm:ss yyyy/DF Name/message text:

- **Day:** Day of the week
- **hh:mm:ss:** Hours, minutes, and seconds
- **Mon:** Month
- **yyyy:** Year
- **dd:** Date

A list of message texts is shown in Table 1.3 and Table 1.4.

1.3 E-Mail Error Messages: Subject Line Briefly Describes the Error

When reporting errors using e-mail, the e-mail subject line indicates the type of error). To set up error monitoring using e-mail, refer to the user guide for your version of Storage Navigator Modular.

Table 1.2 Subject Line of E-mail Indicates Error Type

No.	Subject	Meaning
1	Disk	A drive blockade occurred (for 9200).
2	FC Disk	An FC drive blockade occurred (for 9500V).
3	SATA Disk	An SATA drive blockade occurred.
4	DC Power	A DC power supply failure occurred.
5	Battery	A battery voltage error occurred.
6	Fan	A fan failure occurred.
7	Controller	A controller blockade occurred. (This occurs only in the dual controller configuration.)
8	AC Power	An AC power supply error occurred.
9	Cache Memory	A cache failure occurred.
10	Cache Backup Circuit	A backup circuit failure occurred.
11	ENC	An enclosure error occurred.
12	SENC	A SENC error occurred.
13	Loop	A loop error occurred.
14	Path	A path blockade occurred.
15	Warning	The array unit entered the warning state.
16	Array connection	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
17	Host Connector	A host connector error occurred (for AMS500/200).
18	NNC	An NNC blockade occurred (for AMS500/200).

1.3.1 E-Mail Message Text

When using E-Mail, the failed part is reported using message text in the subject. The format of the message text is shown below. A list of messages is shown in Table 1.3 and Table 1.4.

Day, Mon.dd hh:mm:ss yyyy/DF Name/message text

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy:** Year **dd:** Date

Table 1.3 List of E-Mail Message Texts (AMS200 and AMS500)

No.	Message text	Meaning of message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY FC Drive Detached. ARRAY Detached FC Drive Position Unit No.X HDU No.Y.	An FC drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
3	ARRAY SATA Drive Detached. ARRAY Detached SATA Drive Position Unit No.X HDU No.Y.	An SATA drive blockade occurred. (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
4	ARRAY Battery Alarm. Position Battery No.X.	A battery voltage error occurred.
5	ARRAY Fan Alarm. Position Unit No.XX Fan No.X.	A fan failure occurred.
6	ARRAY CONTROLLER Detached. Position CONTROLLER No.X.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure. Position Unit No.XX AC Power No.X.	An AC power supply error occurs.
8	ARRAY Cache Memory Alarm.	A cache failure occurred.
9	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
10	ARRAY ENC Alarm. Position Unit No.XX ENC No.X.	An enclosure error occurred.
11	ARRAY SENC Alarm. Position Unit No.XX SENC No.X.	An SENC error occurred.
12	ARRAY Loop Alarm.	A loop error occurred.
13	ARRAY Path Alarm.	A path blockage occurred.
14	ARRAY Host Connector Alarm. Position CONTROLLER No.X.	A host connector error occurred.
15	ARRAY Warning.	The array unit entered the warning state.
16	ARRAY Storage Navigator Modular Interface error occurred	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.
17	ARRAY NNC Detached. Position NNC No.X.	An NNC blockade occurred.
18	ARRAY NNC Warning. Position NNC No.X.	An NNC partial blockade occurred.

Table 1.4 List of E-Mail Message Texts (9200 and 9500V)

No.	Message text	Meaning of message
1	ARRAY Alert Started.	The error monitoring is started.
2	ARRAY Drive Detached. ARRAY Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (9200: The blocked drive is indicated with a set of a Port No. and a Row No.)
3	ARRAY FC Drive Detached. ARRAY Detached FC Drive Position Unit No.X HDU No.Y.	An FC drive blockade occurred (for 9500V). (The blocked drive is indicated with a set of a Unit No. and an HDU No.)
4	ARRAY SATA Drive Detached.	An SATA drive blockade occurred (for 9500V).

	ARRAY Detached SATA Drive Position Unit No.X HDU No.Y.	(The blocked drive is indicated with a set of a Unit No. and an HDU No.)
5	ARRAY Battery Alarm.	A battery voltage error occurred.
6	ARRAY Fan Alarm.	A fan failure occurred.
7	ARRAY CONTROLLER Detached.	A controller blockade occurred. (This occurs only in the dual controller configuration.)
8	ARRAY AC Power Supply Failure.	An AC power supply error occurs.
9	ARRAY Cache Memory Alarm.	A cache failure occurred.
10	ARRAY Cache Backup Circuit Alarm.	A backup circuit failure occurred.
11	ARRAY ENC Alarm.	An enclosure error occurred.
12	ARRAY SENC Alarm.	An SENC error occurred.
13	ARRAY Loop Alarm.	A loop error occurred.
14	ARRAY Path Alarm.	A path blockage occurred.
15	ARRAY Warning.	The array unit entered the warning state.
16	ARRAY Storage Navigator Modular Interface error occurred	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

The output size of a log file is up to 520 KB. When the log information exceeds the limit, the log file is renamed to “errlog.txt.pre” and a log file “errlog.txt” is newly created.

The string "--- end ---" comes at the end of the log information output. If the log information surpasses its limit again, the existing log file "errlog.pre.txt" is replaced with“errlog.txt" and then a new log file "errlog.txt" is created again.

Note: “Time when a failure is detected” is that of a clock in the system installing the Storage Navigator.

Chapter 2 SNMP Agent Support Function Error Codes

For further information on the *SNMP* Agent support function see *SNMP Agent Support Function User's Guide* (MK-95DF705).

2.1 SNMP Agent Error Status

When an error in a request from the SNMP manager is detected, the subsystem sends an SNMP message (GET RESPONSE) to the manager, together with the error status, as shown in Table 2.1.

Table 2.1 SNMP Agent Error Status

No.	Error Status (Code)	Meaning
1	noError (0)	No error detected. Normal case. In this case, the requested MIB object value is placed in the SNMP message to be sent.
2	tooBig (1)	The SNMP message is too large to contain the operation result. Maximum size is 484 bytes.
3	noSuchName (2)	The requested MIB object could not be found. The GETNEXT REQUEST for which the identifier of an object following the last supported MIB object had been specified was received. The requested MIB object value is not set in the SNMP message. The requested process (SET REQUEST) is not executed also.
4	badValue (3)	(Does not occur.)
5	readOnly (4)	(Does not occur.)
6	genErr (5)	The requested operation cannot be executed for any reason other than the above.

Note: If any of the following errors is detected in the SNMP manager's request, the subsystem will not respond:

- The community name does not match the setting.

  The subsystem does not respond but does send a standard trap, (Authentication Failure ([incorrect community name)), to the manager.

- The SNMP request message exceeds 484 bytes.

  Since the subsystem cannot send or receive SNMP messages that are more than 484 bytes, it does not respond to any SNMP messages it receives exceeding this limit.

Chapter 3 TrueCopy Extended Error Codes and Messages

3.1 Message Contents

In the message, a time when an error occurred, a controller number, a message, and an error code are displayed. The error message for pairresync is "The change of the remote pair status failed".

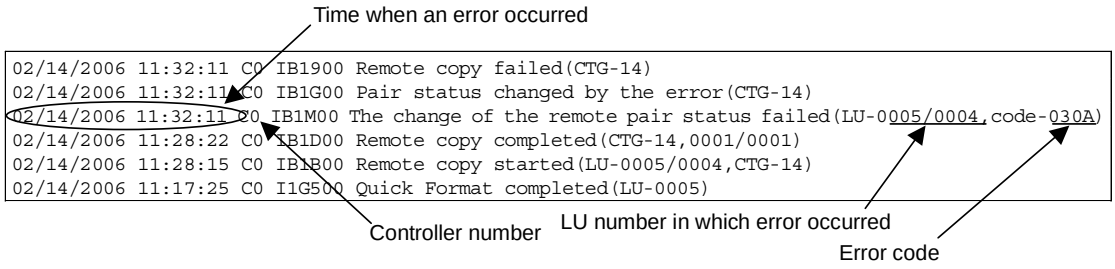

Figure 3.1 Error Message Example

The error code for pairresync that can be checked in the information message in Navigator and the Web window is shown in Table 3.1.

Table 3.1 Error Codes and Actions to be Taken

Error Code	Error Contents	Actions to be Taken
0307	The serial number of the remote subsystem cannot be specified.	Check the serial number of the remote subsystem.
0308	The LU assigned to a TCE pair cannot be specified.	The resynchronization cannot be performed. Create a pair again after deleting the pair.
0309	Restoration from the POOL is in progress.	Retry after waiting for a while.
030A	The target S-VOL of TCE is a P-VOL of SnapShot. Besides, the SnapShot pair is being restored or reading/writing is not allowed.	When the SnapShot pair is being restored, execute it after the restoration is completed. When reading/writing is not allowed, execute it after enabling the reading/writing.
030C	The TCE pair cannot be specified in the CTG.	The resynchronization cannot be performed. Create a pair again after deleting the pair.
0310	The status of the TCE pair is SSWS.	
0311	The status of the TCE pair is SMPL.	
031F	The LU of the S-VOL of the TCE is S-VOL Disable.	Check the LU status of in the remote subsystem, release the S-VOL Disable, and execute it again.
0320	The target LU in the remote subsystem is undergoing the parity correction.	Retry after waiting for a while.
0321	The status of the target LU in the remote subsystem is other than normal or regressed.	Execute it again after restoring the target LU status.
0322	The number of unused bits is insufficient.	Retry after waiting for a while.

0323	The LU status of the POOL is other than normal or regressed.	Execute it again after restoring the LU status of the POOL.
0324	The LU of the POOL is undergoing the parity correction.	Retry after waiting for a while.
0325	The expiration date of the temporary key is expired.	The resynchronization cannot be performed because the trial time limit is expired. Purchase the permanent key.

Acronyms and Abbreviations

AMS	Adaptable Modular Storage
API	application program interface
CCI	Command Control Interface
CU	control unit
DASD	direct-access storage device
DKA	disk adapter
IP	internet protocol
LU	logical unit
MIB	message information block
NNC	network node controller
NVS	nonvolatile storage
P-VOL	primary volume
SATA	Serial-ATA, advanced technology attachment
SIM	service information message
SM	shared memory
SMPL	simplex
SNMP	simple network management protocol
SSID	subsystem ID
S-VOL	secondary volume (TrueCopy), source volume (ShadowImage – z/OS®)
T-VOL	target volume
USP	Hitachi TagmaStore Universal Storage Platform
WMS	Workgroup Modular Storage

Glossary

Asynchronous	The term asynchronous is used to describe data communications between computers and devices which occurs intermittently rather than in a steady stream. Communication within a computer, however, is usually synchronous and is governed by the microprocessor clock.
Attribute	As used in this document, an attribute is one or more qualities possessed by an object.
Cache	Cache is a temporary, high-speed storage mechanism. It can be either a reserved section of main memory or an independent high-speed storage device. Two types of caching are found in computers: memory caching and disk caching. Memory caches are built into the architecture of microprocessors and often computers have external cache memory. Disk caching works like memory caching; however, it uses slower, conventional main memory that on some devices is called a memory buffer.
Capacity	Capacity is the amount of information (in bytes) that can be stored on a disk drive. The capacity of a hard disk drive is usually expressed in megabytes. Capacity is the measure of the potential contents of a device; the volume it can contain or hold. In communications, capacity refers to the maximum possible data transfer rate of a communications channel under ideal conditions.
Channel	A channel is the path data communication follows between two nodes of a network. It is the link between the central processor and the peripherals. A channel can be the physical cabling that connects the nodes on a network, an electronic signal traveling over a pathway, or a sub-channel in a carrier frequency.
Configuration	Configuration for hardware involves setting various switches and jumpers. For software it means defining the values of parameters. For hardware and software respectively, configuration is the arrangement of the components that make up the system or the set up and set values of the software.
Logical	Logical is used to describe a user's view of the way data or systems are organized. The opposite of logical is physical, which refers to the real organization of a system. A logical description of a file is that it is a quantity of data collected together in one place. The file appears this way to users. Physically, the elements of the file could live in segments across a disk.
Logical Unit	See User Logical Unit (LU)

Logical Volume	An area on a disk consisting of device files that are logically integrated using a volume manager.
Microcode	Microcode is the lowest-level instructions directly controlling a microprocessor. Microcode is generally hardwired and cannot be modified.
Pair	See ShadowImage pair.
Parity	The quality of being either odd or even. The fact that all numbers have a parity is commonly used in data communications to ensure the validity of data. This is called parity checking. So parity provides an error detection scheme that uses an extra checking bit, called the parity bit, to allow the receiver to verify that the data is error free.
Permission	Using SMB/CIFS, HTTP, WebDAV, and SMTO gateways, permissions are granted from the owner to members of a group or other users to allow access to data files or directories in an archive. Read, write, and execute permissions can be granted for files, directories, or symbolic links.
Remote or target site	A site that has the mirrored data of the production site.
SATA	Serial ATA is a serial link, a single cable with a minimum of four wires creates a point-to-point connection between devices. ATA is a computer bus technology primarily designed for transfer of data to and from a hard disk. SATA is the successor to the legacy Advanced Technology Attachment standard (ATA, also known as IDE or Integrated Drive Electronics).
Service	A service is the set of functions that one of the seven (7) Open Systems Interconnection (OSI) model layers delivers to the layer above it. For example, the TCP layer provides a reliable byte-stream service to the application layer above it.
Server set identifier	The SSID is an alphanumeric name that is 1-32 bytes. The purpose of an SSID is to help hardware clients find and connect to an access point (AP) on the correct network.
ShadowImage	ShadowImage is a software program that replicates user data on TagmaStore USP disks, bypassing the host system.
ShadowImage Pair	A disk is a Logical Volume Image (LVI). S-VOLs and T-VOLs are ShadowImage volumes for Source and Target. Data is physically copied from the S-VOL to the T-VOL.
SNMP	Simple Network Management Protocol is a protocol used to facilitate monitoring and management of clusters through an external interface. SNMP sends notifications to IP addresses whenever certain types of events occur.

Snapshot	A term used to denote a copy of the data and data-file organization on a node in a disk file system. A snapshot is a replica of the data as it existed at a particular point in time.
Target site	See Remote or target site.
TrueCopy	TrueCopy is a software program that replicates user data between two TagmaStore USP disks, bypassing the host system.
User Logical Unit (LU)	A user logical unit is a term used to describe any device file located on an external disk subsystem connected to the TagmaStore USP or NSC by a fibre channel.
Volume	A volume is the basic unit of storage that includes recovery logs and storage pools. A volume can be a logical volume management (LVM) logical volume, a standard file system file, a tape cartridge, or an optical cartridge. The various types of defined volumes include: external, internal, copy source, copy destination, reserve, data, journal, virtual, pool, system, LUSE, copy pair, and USP.