

Hitachi Virtual Storage Platform E Series

SVOS RF 9.8

SIM Reference Guide

This document describes the service information messages (SIMs) issued by Hitachi Virtual Storage Platform E series, provides instructions for handling SIMs, and provides lists of the SIM codes for troubleshooting by users and service personnel.

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Preface

This document describes the service information messages (SIMs) issued by Hitachi Virtual Storage Platform E series, provides instructions for handling SIMs, and provides lists of the SIM codes for troubleshooting by users and service personnel.

Please read this document carefully to understand how to use this product, and maintain a copy for reference purposes.

Intended audience

This document is intended for system administrators, Hitachi Vantara representatives, and authorized service providers who install, configure, and operate .

Readers of this document should be familiar with the following:

- Data processing and RAID storage systems and their basic functions.

Product version

This document revision applies the following product versions:

- VSP E series: 93-06-01 or later
- SVOS RF 9.8 or later

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document. Release notes are available on the Hitachi Vantara Support Website: <https://knowledge.hitachivantara.com/Documents>.

Changes in this revision





- Added a SIM regarding GUM configuration information corrupted.

Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	<ul style="list-style-type: none"> ▪ Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: Click OK. ▪ Indicates emphasized words in list items.
<i>Italic</i>	<ul style="list-style-type: none"> ▪ Indicates a document title or emphasized words in text. ▪ Indicates a variable, which is a placeholder for actual text provided by the user or for output by the system. Example: <code>pairdisplay -g group</code> <p>(For exceptions to this convention for variables, see the entry for angle brackets.)</p>
Monospace	Indicates text that is displayed on screen or entered by the user. Example: <code>pairdisplay -g oradb</code>
< > angle brackets	Indicates variables in the following scenarios: <ul style="list-style-type: none"> ▪ Variables are not clearly separated from the surrounding text or from other variables. Example: <code>Status-<report-name><file-version>.csv</code> ▪ Variables in headings.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a b] indicates that you can choose a, b, or nothing. { a b } indicates that you must choose either a or b.

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (for example, disruptive operations, data loss, or a system crash).
	WARNING	Warns the user of a hazardous situation which, if not avoided, could result in death or serious injury.

Accessing product documentation

Product user documentation is available on the Hitachi Vantara Support Website: <https://knowledge.hitachivantara.com/Documents>. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

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Thank you!

Chapter 1: Service Information Message (SIM) overview

SIMs are a type of messages issued from storage systems. You can configure when and how the SIMs (Service Information Message) are generated, and the notification methods.

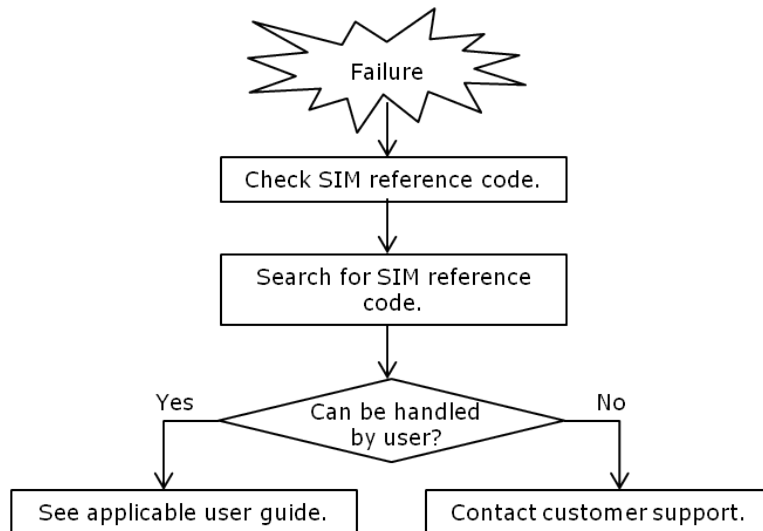
Message types

The following table lists the types of messages output from storage systems.

Message types	Description
Device Manager - Storage Navigator message	Output when Device Manager - Storage Navigator and maintenance utility are being used. For details, see the <i>Hitachi Device Manager - Storage Navigator Messages</i> .
SIM	Output from channels, paths, microprocessors of storage systems. For details, see SIM code lists (on page 10) .
Other messages	Output when Storage Device List is being used or when a batch command is being executed on the SVP. See the following HTML file in the SVP: <ul style="list-style-type: none">▪ <code><SVP installation directory>\wk\supervisor\sdl\help\sdl_message_ja.html</code>▪ The default <code><SVP installation directory></code> is "C:\Mapp".

Actions to take when a SIM is output

When a storage system requires maintenance, a message is output. This is called a failure of a storage system (SIM: Service Information Message). SIMs are output from channels, paths, microprocessors, and so on, of the storage system. The following figure illustrates actions to take after a failure occurs.



Checking SIM reference codes

All SIMs are recorded in the storage system. When a SIM is output, Warning or Failed is displayed at the upper left of the Maintenance Utility window to notify users.

You can check SIMs on the Alert tab in the Maintenance Utility window. For details, see the *System Administrator Guide*.

Searching for SIM reference codes

In the SIM code lists, SIM codes that begin with the same digits are listed as a single code. For example, 602001 is shown as 602xxx (xxx indicates a pool number) in the SIM code list. Therefore, when searching for a SIM code, use the first few digits, 602 in this case, as a key word.

Handling failures

There are two types of SIMs. One can be handled by users, and the other must be handled by service personnel. For SIMs that can be handled by users, see the recovery procedures of the SIMs described in the applicable user guide to solve the problem. For the SIMs that must be handled by service personnel, contact the customer support. See [SIM code list for troubleshooting by users \(on page 11\)](#) or [SIM code list for troubleshooting by service personnel \(on page 13\)](#) for the SIM code lists.

Setting failure notification methods

SIMs can be checked on the Alert tab. In addition, they can be notified by email messages, Syslog, SNMP, or Windows Event Log. For the procedures for setting email, Syslog, and Windows Event Log notifications, see the *System Administrator Guide*. For the procedure for configuring the SNMP notification, see the *Hitachi Alert Notification Guide*.

Chapter 2: SIM code lists

This chapter describes the lists of the SIM reference codes that are reported when failures occur in storage systems, and the procedure for obtaining drive box numbers.

Columns in the SIM code lists

The SIM code list tables have columns shown below.

Reference code	Failure		Alert level (Severity)	Host report ¹	Reference document
601.xxx ²	Pool utilization threshold excess	DKC environment	MODERATE	Yes	Thin Image

1 2 3 4 5 6

The description of each column is as follows:

- 1: SIM code number. *x* is a variable value.
- 2: Brief description of the failure
- 3: Failed location in the storage system
- 4: Severity of the failure

Item	Description
SERVICE	Mild failure
MODERATE	Partial failure
SERIOUS	The failure part stops operation.
ACUTE	The entire storage system stops operation.

5: With or without host report

6: Document to be referenced for troubleshooting by users. For the document title, see the legends for the table in [SIM code list for troubleshooting by users \(on page 11\)](#). Only that table has this column.

SIM code list for troubleshooting by users

The following table lists and describes SIM codes that require action or restoration by users. xxx in the following table indicates the port number.

If you select **Host Report** for **Notification Alert** in the **Set Up Alert Notifications** window, alert notification for SIMs that are reported to the host is sent. If you select **All**, alert notification for all SIMs is sent.

Reference code	Failure		Alert level (Severity)	Host report	Reference document
602xxx	Pool blocking	DKC environment	MODERATE	Yes	Thin Image
602ffe	Pools blocking by SM volatile	DKC environment	MODERATE	Yes	Thin Image
603000	SM Space Warning	DKC environment	MODERATE	Yes	Thin Image
604xxx	Exceeded Threshold of actual pool use rate	DKC environment	MODERATE	Yes	Thin Image
605xxx	Actual pool use rate reaches upper limit	DKC environment	MODERATE	Yes	Thin Image
606xxx	Exceeded Fixed outage Threshold of pool use rate	DKC environment	MODERATE	Yes	Thin Image
624000	SM Full	DKC environment	MODERATE	Yes	Provisioning
627xxx	The DP POOL LDEV blockade	DKC environment	SERIOUS	Yes	Provisioning
628000	DP Protect attribute setting of DRU	DKC environment	SERIOUS	Yes	Provisioning
629xxx	Exceeded Warning Threshold of DP pool use rate	DKC environment	MODERATE	Yes	Provisioning
62axxx	Actual DP pool use rate reaches upper limit	DKC environment	MODERATE	Yes	Provisioning
62b000	Threshold of DP pool use rate remains exceeded	DKC environment	MODERATE	Yes	Provisioning
62cxxx	Exceeded Depletion Threshold of DP pool use rate	DKC environment	MODERATE	Yes	Provisioning

Reference code	Failure		Alert level (Severity)	Host report	Reference document
62dxxx	Exceeded Fixed outage Threshold of DP pool use rate	DKC environment	MODERATE	Yes	Provisioning
62exxx	Exceeded DP pool depletion threshold for TI pairs	DKC environment	MODERATE	Yes	Provisioning
631xxx	Auto pool expansion failed due to system error	DKC environment	MODERATE	Yes	Provisioning
634xxx	Auto pool expansion failed due to no more LDEV IDs	DKC environment	MODERATE	Yes	Provisioning
641xxx	Tier relocation is not completed	DKC environment	SERVICE	Yes	Provisioning
660100	No free encryption key	DKC environment	MODERATE	Yes	Encryption License Key
660200	Remaining free encryption key warning	DKC environment	SERVICE	Yes	Encryption License Key
670000	Warning for depletion of cache management devices	Cache	MODERATE	Yes	Thin Image
681xxx	Operation error of deduplication system data volume automatic deletion was detected.	DKC environment	MODERATE	Yes	Provisioning
682000	Deduplication system data volume automatic deletion was suspended.	DKC environment	MODERATE	Yes	Provisioning
7c1xxx ¹	Error in server registered by using HSAE	DKC environment	MODERATE	Yes	CCI
7d030x ²	GUM AuditLog lost	DKC environment	MODERATE	Yes	Audit Log
7d040x ²	GUM AuditLog Warning Threshold was exceeded	DKC environment	MODERATE	Yes	Audit Log
ee0000	Volume I/O upper limit reached	QoS alert	SERVICE	Yes	Performance Manager
ee1000	Volume I/O lower limit not reached	QoS alert	SERVICE	Yes	Performance Manager

Reference code	Failure		Alert level (Severity)	Host report	Reference document
ee2000	Volume I/O response delay	QoS alert	SERVICE	Yes	Performance Manager
Legend:					
<ul style="list-style-type: none"> ▪ Yes: This SIM performs the host report. ▪ No: This SIM does not perform the host report. ▪ x: A hexadecimal number from 0 to f. ▪ Audit Log: SIM Codes in the <i>Hitachi Audit Log User Guide</i> ▪ Encryption License Key: Troubleshooting in the <i>Encryption License Key User Guide</i> ▪ Provisioning: Troubleshooting for provisioning in the <i>Provisioning Guide</i>. ▪ Thin Image: Troubleshooting Thin Image in the <i>Hitachi Thin Image User Guide</i>. ▪ CCI: Troubleshooting in the <i>Command Control Interface User and Reference Guide</i>. 					
Notes:					
<ol style="list-style-type: none"> 1. xxx indicates the server ID of Storage Advisor Embedded. 2. x = 1: An error occurred in CTL1. x = 2: An error occurred in CTL2. 					

SIM code list for troubleshooting by service personnel

The following table lists and describes the SIM codes that require action or restoration by service personnel. If a SIM in the table is output, contact customer support.

If you select **Host Report** for **Notification Alert** in the **Set Up Alert Notifications** window, alert notification for SIMs that are reported to the host is sent. If you select **All**, alert notification for all SIMs is sent.

Reference code	Description	Section	Alert level (Severity)	Host report
1420xx	Transmitted data abnormality between MP and GUM	Processor	MODERATE	Yes
180000	Audit Log lost	DKC environment	MODERATE	Yes
1C0000	Detected a specific error code SSB	DKC environment	SERVICE	Yes
2120xx	Channel port blocking	DKC environment	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
2130xx	CHB blocking	DKC environment	MODERATE	Yes
2140xx	DKB blocking	DKC environment	MODERATE	Yes
2153xx	PECB blocking	DKC environment	MODERATE	Yes
2154xx	SWPK blocking	DKC environment	MODERATE	Yes
2157xx	PECB warning	DKC environment	MODERATE	Yes
2180xx	RIO path closed	DKC environment	MODERATE	Yes
2190xx	AL_PA value conflict	DKC environment	SERVICE	Yes
2193xx	Link failure1	DKC environment	SERIOUS	Yes
2194xx	Link failure2	DKC environment	SERIOUS	Yes
21a8xx	SFP wrong type	DKC environment	MODERATE	Yes
21aaxx	SFP TxFault	DKC environment	MODERATE	Yes
21abxx	SFP warning	Processor	MODERATE	Yes
21acxx	SFP alarm	Processor	MODERATE	Yes
21d0xx	External storage system connection path blocking	DKC environment	MODERATE	Yes
21d1xx	External storage system connection path restore	DKC environment	SERVICE	Yes
21d2xx	External subsystem path response timeout	DKC environment	SERVICE	Yes
3070xx	CHK1A threshold over	Processor	SERVICE	Yes
3071xx	CHK1B threshold over	Processor	SERVICE	Yes
3072xx	CHK3 threshold over	Processor	SERVICE	Yes
3073xx	Processor blocking	Processor	MODERATE	Yes
3075xx	CFM Failure	Cache	MODERATE	Yes
3076xx	Incorrect SUM value of FM	Processor	SERVICE	Yes
3077xx	Processor memory temporary error	Processor	SERVICE	Yes
3078xx	BFM error	Processor	SERIOUS	Yes
3080xx	WCHK1 dump	Processor	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
388f00	PS OFF impossible	PS(DKC)	MODERATE	Yes
389f00	PS OFF impossible (Device reserved)	PS(DKC)	MODERATE	Yes
3990xx	Undefined Package is mounted	Processor	MODERATE	Yes
3991xx	V-R or serial number is inconsistent	Processor	MODERATE	Yes
3993xx	Replace failed	Processor	MODERATE	Yes
399dxx	Injustice dc voltage control	DKC environment	MODERATE	Yes
399exx	Injustice CEMODE	DKC environment	MODERATE	Yes
399fxx	Injustice CEDT	DKC environment	MODERATE	Yes
39a000	The upper temperature limit was exceeded	DKC environment	SERVICE	Yes
39b0xx	MP patrol check error	DKC environment	SERVICE	Yes
3a0xxx	LDEV Blockade (Effect of microcode error)	Drive	MODERATE	Yes
3c9500	CHB/DKB Type disagreement	DKC environment	MODERATE	Yes
3c9600	No CHB mounted	Processor	MODERATE	Yes
3c97xx	iSCSI firmware update warning	DKC environment	MODERATE	Yes
410000	Format complete (Normal end)	Drive	SERVICE	Yes
410001	Format complete (Abnormal end)	Drive	SERVICE	Yes
410002	Format complete (Partial abnormal end)	Drive	SERVICE	Yes
410100	Quick Format finish	Drive	SERVICE	Yes
410200	Parity consistency check completed	Environment	SERVICE	No
410201	Parity consistency check suspended	Environment	SERVICE	No
410300	Parity consistency check abnormality detection	Environment	MODERATE	No
435xxx	Drive media error	Drive	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
43axxx	Drive blockade (media)(with redundancy)	Drive	SERIOUS	Yes
43dxxx	Drive blockade (media)(without redundancy)	Drive	SERIOUS	Yes
469xxx	Collection Copy/Copyback disabled(drive replace)	Drive	MODERATE	Yes
46axxx	Drive Copy/Correction Copy delay	Drive	MODERATE	Yes
46bxxx	Drive Copy/Correction Copy delay	Drive	MODERATE	Yes
47dxxx	Shadow Image Copy abnormal end	DKC environment	MODERATE	Yes
47e700	Forcible suspend by SM volatile	DKC environment	MODERATE	Yes
47ec00	Forcible suspend by SM volatile	DKC environment	MODERATE	Yes
47fxxx ³	Volume Migration abnormal end	DKC environment	MODERATE	Yes
491000	Cache overload condition	Cache	SERVICE	Yes
4a80xx	Expander Micro Exchange failed	DKC environment	MODERATE	Yes
4b3xxx	Thin Image Option abnormal end	DKC environment	MODERATE	Yes
4b6xxx	Correction copy start	Drive	SERVICE	Yes
4b7xxx	Correction copy start	Drive	SERVICE	Yes
4b8xxx	Correction copy normal end	Drive	SERVICE	Yes
4b9xxx	Correction copy normal end	Drive	SERVICE	Yes
4baxxx	Correction copy abnormal end	Drive	SERIOUS	Yes
4bbxxx	Correction copy abnormal end	Drive	SERIOUS	Yes
4bcxxx	Correction copy discontinued	Drive	SERVICE	Yes
4bdxxx	Correction copy discontinued	Drive	SERVICE	Yes
4bexxx	Correction copy warning end (With blockade LDEV or some error)	Drive	SERVICE	Yes
4bfxxx	Correction copy warning end (With blockade LDEV or some error)	Drive	SERVICE	Yes
4c5xxx	Flash module drive initialization failed	Drive	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
4c6xxx	Dynamic sparing start (Drive copy)	Drive	SERVICE	Yes
4c7xxx	Dynamic sparing start (Drive copy)	Drive	SERVICE	Yes
4c8xxx	Dynamic sparing normal end (Drive copy)	Drive	SERVICE	Yes
4c9xxx	Dynamic sparing normal end (Drive copy)	Drive	SERVICE	Yes
4caxxx	Dynamic sparing abnormal end (Drive copy)	Drive	MODERATE	Yes
4cbxxx	Dynamic sparing abnormal end (Drive copy)	Drive	MODERATE	Yes
4ccxxx	Dynamic sparing discontinued (Drive copy)	Drive	SERVICE	Yes
4cdxxx	Dynamic sparing discontinued (Drive copy)	Drive	SERVICE	Yes
4cexxx	Dynamic sparing warning end (With blockade LDEV or some error) (Drive copy)	Drive	SERVICE	Yes
4cfxxx	Dynamic sparing warning end (With blockade LDEV or some error) (Drive copy)	Drive	SERVICE	Yes
4d1xxx	Differential area blocking	Drive	SERIOUS	Yes
4d6xxx	PDEV Erase Start	Drive	SERVICE	Yes
4d7xxx	PDEV Erase Start	Drive	SERVICE	Yes
4d8xxx	PDEV Erase Normal End	Drive	SERVICE	Yes
4d9xxx	PDEV Erase Normal End	Drive	SERVICE	Yes
4daxxx	PDEV Erase Abnormal End	Drive	SERVICE	Yes
4dbxxx	PDEV Erase Abnormal End	Drive	SERVICE	Yes
4e0xxx	Drive blockade due to Media Sanitization start	Drive	SERVICE	Yes
4e2xxx	Media Sanitization start	Drive	SERVICE	Yes
4e4xxx	Media Sanitization normal end	Drive	SERVICE	Yes
4e6xxx	Media Sanitization abnormal end	Drive	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
4e8xxx	Media Sanitization warning end	Drive	MODERATE	Yes
500xxx	Drive temporary error	Drive	SERVICE	Yes
503xxx	Drive media error	Drive	SERVICE	Yes
505xxx	Flash module drive internal battery error (ORM)	Drive	SERVICE	Yes
508xxx	Flash module drive internal battery error	Drive	MODERATE	Yes
50axxx	Flash drive End of life	Drive	SERVICE	Yes
50dxxx	Flash module drive End of life	Drive	SERVICE	Yes
50exxx	Flash module drive battery capacity shortage	Drive	MODERATE	Yes
50f000	Flash module drive micro-program version warning	Drive	MODERATE	Yes
610001	Backup/restore SM Information failed (Backup)	SM	MODERATE	Yes
610002	Backup/restore SM Information failed (Restore)	SM	MODERATE	Yes
623xxx	The DP POOL error is detected	DKC environment	MODERATE	Yes
623ffe	DP Pools blocking by Shared Memory volatile	DKC environment	MODERATE	Yes
632xxx	Auto pool expansion failed due to pool error	DKC environment	MODERATE	Yes
633xxx	Failed to create, expand, or delete pools	DKC environment	MODERATE	Yes
660100	No free encryption key	DKC environment	MODERATE	Yes
660200	Remaining free encryption key warning	DKC environment	SERVICE	Yes
6610xx	Acquisition of encryption key from KMS failed	DKC environment	MODERATE	Yes
6620xx	Encryption key setting abnormality	DKC environment	SERIOUS	Yes
6800xx ¹	Dedupe and compression abnormality detect	DKC environment	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
689xxx	dedupe system volume change comp_acl abnormal end	DKC environment	MODERATE	Yes
760000	CUDG detected error	DKC environment	MODERATE	Yes
7900xx	BOOT detected error	DKC environment	MODERATE	Yes
7d000x	GUM error	DKC environment	MODERATE	Yes
7d010x	LAN error (Internal Network)	DKC environment	MODERATE	Yes
7d020x	LAN error (CTL1-CTL2)	DKC environment	MODERATE	Yes
7d050x	Notification of Alert failed	DKC environment	MODERATE	Yes
7d06xx	MP error	Processor	MODERATE	Yes
7d07xx	GUM security error detected	DKC environment	MODERATE	Yes
7d08xx	Failed to recover GUM configuration information	DKC environment	MODERATE	Yes
7d0900	DKC warning	Processor	SERIOUS	Yes
7d0axx	GUM version warning	DKC environment	MODERATE	Yes
7d0bxx	Configuration backup failed	DKC environment	MODERATE	Yes
7d0dxx	GUM configuration information corrupted	DKC environment	MODERATE	Yes
7ff102	SI	DKC environment	SERVICE	No
7ff104	TI	DKC environment	SERVICE	No
7ff106 ³	Volume Migration Pair	DKC environment	SERVICE	No
7ff7xx	The term of validity is over	DKC environment	MODERATE	Yes
7ff8xx	The capacity of validity is over	DKC environment	MODERATE	Yes
7ff9xx	The PP is invalid by assumption PP invalidity	DKC environment	MODERATE	Yes
7ffa00	Synchronization time failure	DKC environment	SERVICE	Yes
ac50xx	DB power off	PS(DKU)	MODERATE	Yes
ac51xx	DB power recovered	PS(DKU)	SERVICE	Yes
ac6000	DKC was set to power error mode	PS(DKC)	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
ac6100	DKC was released from power error mode	PS(DKC)	SERVICE	Yes
ac6200	Destaging startup normal	PS(DKC)	SERVICE	Yes
ac6300	Destaging startup failed	PS(DKC)	MODERATE	Yes
ac800x	Server failure	DKC environment	SERIOUS	Yes
af00xx	Injustice JP Warning	DKC environment	MODERATE	Yes
af10xx	MP Temperature abnormality warning	DKC environment	MODERATE	Yes
af11xx	External temperature warning	DKC environment	MODERATE	Yes
af12xx	External temperature alarm	DKC environment	MODERATE	Yes
af13xx	Thermal monitor warning	DKC environment	MODERATE	Yes
af20xx	DKCPS warning	PS(DKC)	MODERATE	Yes
af21xx	DKCPS input voltage abnormality	PS(DKC)	MODERATE	Yes
af30xx	Environmental microcomputer warning	DKC environment	MODERATE	Yes
af31xx	Device movement mode warning	DKC environment	MODERATE	Yes
af32xx	Environmental Firmware Update warning	DKC environment	MODERATE	Yes
af33xx	Voltage change setting warning	PS(DKC)	MODERATE	Yes
af40xx	BKM/BKMF warning	DKC environment	MODERATE	Yes
af41xx	Battery replacement should be scheduled	Battery	MODERATE	Yes
af42xx	CHBB environmental microcontroller warning	DKC environment	MODERATE	Yes
af43xx	SCM environmental microcontroller warning	DKC environment	MODERATE	Yes
af44xx	CHBB environmental firmware update warning	DKC environment	MODERATE	Yes
af45xx	SCM environmental firmware update warning	DKC environment	MODERATE	Yes
af46xx	SWPK temperature warning	DKC environment	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
af48xx	CHBB voltage change failure warning	DKC environment	MODERATE	Yes
af49xx	SCM voltage change failure warning	DKC environment	MODERATE	Yes
af4axx	CHBBPS warning	DKC environment	MODERATE	Yes
af4bxx	CHBBPS abnormal input voltage	DKC environment	MODERATE	Yes
af4cxx	CHBBFAN warning	DKC environment	MODERATE	Yes
af4dxx	Panel switch warning	DKC environment	MODERATE	Yes
af4exx	Invalid PS ON warning	DKC environment	MODERATE	Yes
af50xx	DBPS warning	PS(DKU)	MODERATE	Yes
af51xx	DBPS-1 warning	PS(DKU)	MODERATE	Yes
af52xx	DBPS-2 warning	PS(DKU)	MODERATE	Yes
af60xx	DBPS input voltage abnormality	PS(DKU)	MODERATE	Yes
af61xx	DBPS-1 input voltage abnormality	PS(DKU)	MODERATE	Yes
af62xx	DBPS-2 input voltage abnormality	PS(DKU)	MODERATE	Yes
af7000	DB External temperature warning	DKU environment	MODERATE	Yes
af7100	DB External temperature Alarm	DKU environment	MODERATE	Yes
af80xx	ENC warning	DKU environment	MODERATE	Yes
af81xx	ENC-1 warning	DKU environment	MODERATE	Yes
af82xx	ENC-1 warning	DKU environment	MODERATE	Yes
afa0xx	CHBB environmental firmware update started	DKC environment	SERVICE	Yes
afa1xx	CHBB environmental firmware update is complete	DKC environment	SERVICE	Yes
afa2xx	CHBB environmental firmware update was applied	DKC environment	SERVICE	Yes
afb9xx	ECTL warning	DKC environment	MODERATE	Yes
afe4xx	Life expiry warning for DB air filter	DKU environment	SERVICE	Yes
aff0xx	UPS warning	PS(DKC)	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
aff1xx	GUM warning	DKC environment	MODERATE	Yes
aff2xx	CFM error	Cache	MODERATE	Yes
aff3xx	FAN warning	Fan(DKC)	MODERATE	Yes
aff400	Life expiry warning for DKC air filter	DKC environment	SERVICE	Yes
bfc010	DKC ALARM LED light on	Processor	SERIOUS	Yes
cf10xx	SAS CTL blocking	DKC environment	MODERATE	Yes
cf11xx	SAS Port (WideLink) is partially blocked	DKC environment	SERVICE	Yes
cf12xx ²	SAS PORT BLOCK	DKC environment	MODERATE	Yes
cf13xx	SAS-CTL Error detection	DKC environment	SERIOUS	Yes
cf14xx ²	Recovered from ENC temporary failure successfully	DKC environment	SERVICE	Yes
cf20xx	PSW blockade	DKC environment	MODERATE	Yes
cf22xx	NVMe port blockade	DKC environment	MODERATE	Yes
cf88xx	CTL blocking	DKC environment	MODERATE	Yes
cf8axx	CTL blockade due to CTL interconnect path failure	DKC environment	MODERATE	Yes
d00xxx	Remote Copy start	DKC environment	SERVICE	Yes
d01xxx	Remote Copy normal end	DKC environment	SERVICE	Yes
d02xxx	Pair end	DKC environment	SERVICE	Yes
d10xxx	HRC pair status change(MCU command), SMPL -> COPY	DKC environment	SERVICE	Yes
d11xxx	HRC pair status change(MCU command), SMPL -> PAIR	DKC environment	SERVICE	Yes
d12xxx	HRC pair status change(MCU command), COPY -> PAIR	DKC environment	SERVICE	Yes
d13xxx	HRC pair status change(MCU command), COPY -> PSUx	DKC environment	SERVICE	Yes
d14xxx	HRC pair status change(MCU command), PAIR -> PSUx	DKC environment	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
d15xxx	HRC pair status change(MCU command), PAIR -> SMPL	DKC environment	SERVICE	Yes
d16xxx	HRC pair status change(MCU command), COPY -> SMPL	DKC environment	SERVICE	Yes
d17xxx	HRC pair status change(MCU command), PSUx -> SMPL	DKC environment	SERVICE	Yes
d18xxx	HRC pair status change(MCU command), PSUx -> COPY	DKC environment	SERVICE	Yes
d19xxx	HRC pair status change(MCU command), COPY -> PSUx	DKC environment	SERVICE	Yes
d1axxx	HRC pair status change(MCU command), COPY -> PSUx	DKC environment	SERVICE	Yes
d1bxxx	HRC pair status change(MCU command), PSUx -> PSUx	DKC environment	SERVICE	Yes
d1zxxx	Status of the R-VOL is changed	DKC environment	SERVICE	Yes
d40xxx	Pair suspend(RIO path closed)	DKC environment	SERIOUS	Yes
d41xxx	Pair suspend(P-VOL error)	DKC environment	SERIOUS	Yes
d42xxx	Pair suspend(S-VOL error)	DKC environment	SERIOUS	Yes
d44xxx	Pair suspend(RVOL Suspend report)	DKC environment	SERIOUS	Yes
d45xxx	Pair suspend(S-VOL Simplex report)	DKC environment	SERIOUS	Yes
d46xxx	Pair suspend(Communication error at RCU)	DKC environment	SERIOUS	Yes
d47xxx	Pair suspend(Error detected at RCU)	DKC environment	SERIOUS	Yes
d4fxxx	Pair status incorrect	DKC environment	SERIOUS	Yes
d80xxx	Volume to be used by UR was defined	DKC environment	SERVICE	Yes
d81xxx	Volume used by UR began copying	DKC environment	SERVICE	Yes
d82xxx	Volume used by UR completed copying	DKC environment	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
d83xxx	Volume used by UR received suspension request	DKC environment	SERVICE	Yes
d84xxx	Volume used by UR completed suspension transaction	DKC environment	SERVICE	Yes
d85xxx	Volume used by UR received request for deletion	DKC environment	SERVICE	Yes
d86xxx	Volume used by UR completed deletion	DKC environment	SERVICE	Yes
d87xxx	Volume used by UR was defined	DKC environment	SERVICE	Yes
d88xxx	Volume used by UR was defined in hold	DKC environment	SERVICE	Yes
d89xxx	PVOL used by UR was defined in hold	DKC environment	SERVICE	Yes
d90xxx	Change to SVOL was received from MCU, SMPL -> COPY	DKC environment	SERVICE	Yes
d91xxx	Change to SVOL was received from MCU, SMPL -> PAIR	DKC environment	SERVICE	Yes
d92xxx	Change to SVOL was received from MCU, COPY -> PAIR	DKC environment	SERVICE	Yes
d93xxx	Change to SVOL was received from MCU, COPY -> PSUx	DKC environment	SERVICE	Yes
d94xxx	Change to SVOL was received from MCU, PAIR -> PSUx	DKC environment	SERVICE	Yes
d95xxx	Change to SVOL was received from MCU, PAIR -> SMPL	DKC environment	SERVICE	Yes
d96xxx	Change to SVOL was received from MCU, COPY -> SMPL	DKC environment	SERVICE	Yes
d97xxx	Change to SVOL was received from MCU, PSUx -> SMPL	DKC environment	SERVICE	Yes
d98xxx	Change to SVOL was received from MCU, PSUx -> COPY	DKC environment	SERVICE	Yes
d99xxx	Change to SVOL was received from MCU, HOLD -> PAIR	DKC environment	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
d9axxx	Change to SVOL was received from MCU, HOLD -> COPY	DKC environment	SERVICE	Yes
d9bxxx	Change to SVOL was received from MCU, HOLD -> SMPL	DKC environment	SERVICE	Yes
d9cxxx	Change to SVOL was received from MCU, SMPL -> PSUx	DKC environment	SERVICE	Yes
d9dxxx	Change to SVOL was received from MCU, SMPL -> HOLD	DKC environment	SERVICE	Yes
d9exxx	Change to SVOL was received from MCU, PSUx -> HOLD	DKC environment	SERVICE	Yes
d9fxxx	Change to SVOL was received from MCU, PAIR -> COPY	DKC environment	SERVICE	Yes
da0xxx	Change to SVOL was received from RCU, SUSPEND REQ.	DKC environment	SERVICE	Yes
da1xxx	Change to SVOL was received from RCU, SUSPEND END	DKC environment	SERVICE	Yes
da2xxx	Change to SVOL was received from RCU, PSUx -> SMPL	DKC environment	SERVICE	Yes
da3xxx	Change to SVOL was received from RCU, COPY -> SMPL	DKC environment	SERVICE	Yes
da4xxx	Change to SVOL was received from RCU, PAIR -> SMPL	DKC environment	SERVICE	Yes
da5xxx	Change to SVOL was received from RCU, DELETING END	DKC environment	SERVICE	Yes
da6xxx	Change to SVOL was received from RCU, HOLD -> SMPL	DKC environment	SERVICE	Yes
db0xxx	Drive port temporary error (Drive path: Boundary 0)	Drive	SERVICE	Yes
db1xxx	Drive port temporary error (Drive path: Boundary 0)	Drive	SERVICE	Yes
db2xxx	Drive port temporary error (Drive path: Boundary 1)	Drive	SERVICE	Yes
db3xxx	Drive port temporary error (Drive path: Boundary 1)	Drive	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
db4xxx	Drive port blockade (Drive path: Boundary 0)	Drive	MODERATE	Yes
db5xxx	Drive port blockade (Drive path: Boundary 0)	Drive	MODERATE	Yes
db6xxx	Drive port blockade (Drive path: Boundary 1)	Drive	MODERATE	Yes
db7xxx	Drive port blockade (Drive path: Boundary 1)	Drive	MODERATE	Yes
db8xxx	LDEV blockade (Drive path: Boundary 0/Effect of Drive port blockade)	Drive	SERIOUS	Yes
db9xxx	LDEV blockade (Drive path: Boundary 0/Effect of Drive port blockade)	Drive	SERIOUS	Yes
dbaxxx	LDEV blockade (Drive path: Boundary 1/Effect of Drive port blockade)	Drive	SERIOUS	Yes
dbbxxx	LDEV blockade (Drive path: Boundary 1/Effect of Drive port blockade)	Drive	SERIOUS	Yes
dbcxxx	Drive Link Rate Abnormality (Drive path: Boundary 0)	Drive	SERVICE	Yes
dbdxxx	Drive Link Rate Abnormality (Drive path: Boundary 0)	Drive	SERVICE	Yes
dbexxx	Drive Link Rate Abnormality (Drive path: Boundary 1)	Drive	SERVICE	Yes
dbfxxx	Drive Link Rate Abnormality (Drive path: Boundary 1)	Drive	SERVICE	Yes
dc0xxx	Pair suspend(RIO path closed)	DKC environment	SERIOUS	Yes
dc1xxx	Pair suspend(M-VOL error)	DKC environment	SERIOUS	Yes
dc2xxx	Pair suspend(R-VOL error)	DKC environment	SERIOUS	Yes
dc4xxx	Pair suspend(Suspend report)	DKC environment	SERIOUS	Yes
dc5xxx	Pair suspend(Simplex report)	DKC environment	SERIOUS	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
dc6xxx	Pair suspend(Communication error at RCU)	DKC environment	SERIOUS	Yes
dc7xxx	Pair suspend(Error detected at RCU)	DKC environment	SERIOUS	Yes
dc8xxx	Pair suspend(MCU P/S OFF)	DKC environment	SERVICE	Yes
dc9xxx	Pair suspend(Delta volume error)	DKC environment	SERIOUS	Yes
dcaxxx	Pair suspend(Spread by error of another affiliate)	DKC environment	SERIOUS	Yes
dce0xx	UR M-JNL Meta overflow warning	DKC environment	MODERATE	Yes
dce1xx	UR M-JNL Data overflow warning	DKC environment	MODERATE	Yes
dce2xx	UR R-JNL Meta overflow warning	DKC environment	MODERATE	Yes
dce3xx	UR R-JNL Data overflow warning	DKC environment	MODERATE	Yes
dcf0xx	HUR read JNL was interrupted for 1 minute (at MCU)	DKC environment	MODERATE	Yes
dcf1xx	HUR read JNL was interrupted for 5 minute (at MCU)	DKC environment	SERIOUS	Yes
dcf2xx	HUR read JNL was interrupted for 1 minute (at RCU)	DKC environment	MODERATE	Yes
dcf3xx	HUR read JNL was interrupted for 5 minute (at RCU)	DKC environment	SERIOUS	Yes
dcf4xx	URxUR M-JNL Meta full Warning	DKC environment	MODERATE	Yes
dcf5xx	URxUR M-JNL Data full Warning	DKC environment	MODERATE	Yes
dd0xxx	GAD for this volume was suspended (Due to an unrecoverable failure on the remote copy connections)	Failure with paired volumes	SERIOUS	Yes
dd1xxx	GAD for this volume was suspended (Due to a failure on the volume)	Failure with paired volumes	SERIOUS	Yes
dd2xxx	GAD for this volume was suspended (Due to an internal error condition detected)	Failure with paired volumes	SERIOUS	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
dd3xxx	Status of the P-VOL was not consistent with the S-VOL	Failure with paired volumes	SERIOUS	Yes
dee0xx	Quorum Disk Restore	Drive	SERVICE	Yes
def0xx	Quorum Disk Blocked	Drive	SERIOUS	Yes
dfexxx	Response late Drive	Drive	SERVICE	Yes
eb0xxx	Drive blockade (drive)(with redundancy)	Drive	SERIOUS	Yes
eb1xxx	Drive blockade (drive)(with redundancy)	Drive	SERIOUS	Yes
eb2xxx	Drive blockade (drive)(without redundancy)	Drive	SERIOUS	Yes
eb3xxx	Drive blockade (drive)(without redundancy)	Drive	SERIOUS	Yes
eb4xxx	Drive blockade(Effect of Dynamic sparing normal end)	Drive	SERVICE	Yes
eb5xxx	Drive blockade(Effect of Dynamic sparing normal end)	Drive	SERVICE	Yes
eb6xxx	Correction access occurred	Drive	SERIOUS	Yes
eb7xxx	Correction access occurred	Drive	SERIOUS	Yes
eb8xxx	Reboot stopped due to much write pending data	Drive	SERVICE	Yes
eb9xxx	Reboot stopped due to much write pending data	Drive	SERVICE	Yes
ef4xxx	Pinned slot	Drive	MODERATE	Yes
ef5xxx	External VOL Write Error	Drive	MODERATE	Yes
ef8xxx	LDEV blockade (Effect of drive blockade)	Drive	SERIOUS	Yes
efbxxx	Drive temporary error	Drive	SERVICE	Yes
efd000	External storage system connection device blockade	Drive	SERIOUS	Yes
effbxx	NSW failure	DKC environment	SERIOUS	Yes
effcxx	PCI cable connection error	DKC environment	MODERATE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
effdx	Expander failure	DKC environment	SERIOUS	Yes
effexx	UNIT connection error	DKC environment	MODERATE	Yes
fe0000	Cache battery is being charged	Cache	SERIOUS	Yes
fe0100	End of Cache Write Through	Cache	SERVICE	Yes
fe0200	Start of Cache Write Through	Cache	MODERATE	Yes
fe030x	CFM type error or CFM shortage	Cache	SERIOUS	Yes
fe040x	Mounting Battery shortage	Battery	SERIOUS	Yes
ff21xx	LANB blocking	DKC environment	MODERATE	Yes
ff4xxx	Pinned slot	Cache	MODERATE	Yes
ff5xxx	External VOL Read Error	Drive	MODERATE	Yes
ffc30x	Cache Package Blockade Processing end	Cache	SERVICE	Yes
ffcbxx	CTL patrol check error	DKC environment	SERVICE	No
ffccxy	CFM patrol check error	Cache	MODERATE	Yes
ffcd0x	Area is volatilized	Cache	SERVICE	Yes
ffcfxx	Module group is volatilized	Cache	SERVICE	Yes
ffd400	Hard implementation out of the definition	DKC environment	MODERATE	Yes
ffe20x	SM area blocking	SM	SERIOUS	Yes
ffe40x	Replace failed	SM	SERIOUS	Yes
ffe700	Shared memory is volatiled	SM	SERIOUS	Yes
ffe800	Definition/Installation mismatch	Cache	ACUTE	Yes
ffea0x	Recovery of area blocked temporarily was completed	SM	SERVICE	Yes
ffeb00	Configuration information restore by backup failed	SM	SERIOUS	Yes
ffee0x	Area temporary blocking	SM	SERVICE	Yes
ffef00	Rebooted without volatilization	SM	SERVICE	Yes
fff0xx	Cache correctable error	Cache	SERVICE	Yes

Reference code	Description	Section	Alert level (Severity)	Host report
fff400	Area blocking	Cache	SERIOUS	Yes
fff50x	Both area failed	Cache	MODERATE	Yes
fff7xx	GUM blocking	DKC environment	MODERATE	Yes
fff90x	Replace failed	Cache	SERVICE	Yes
fffaxx	Battery warning	Battery	MODERATE	Yes
fffexx	Warning for forcible volatile mode	DKC environment	MODERATE	Yes

Legend:

- **Yes:** This SIM performs the host report.
- **No:** This SIM does not perform the host report.
- **x:** A hexadecimal number from 0 to f.

Notes:

1. **xx = 01:** An error was detected while dedupe and compression is being performed.
xx = 02: An error was detected while capacity saving-enabled DP-VOLs were being deleted without blocking or formatting processing.
2. "Recovered from ENC temporary failure successfully" (cf14xx) indicates that "SAS PORT BLOCK" (cf12xx) occurred due to a temporary failure of ENC at the location indicated by the SAS-PORT number (xx) was recovered automatically. Therefore, no action by service personnel is required. However, if the SAS-PORT number indicated by SAS PORT BLOCK (cf12xx) is different from the one in cf14xx, action must be taken by service personnel.
3. These SIMs might be handled by users. For details, contact customer support.

Obtaining drive box and drive numbers (for VSP E series)

For certain SIM reference codes, the last 13 bits of a reference code (in binary) can be converted to the number of the drive box and drive where the error occurred.

Procedure

1. Convert the last 13 bits of a reference code from binary to decimal.
 For example, the last 13 bits of eb75a5 (in hexadecimal) is 1010110100101 (in binary), which can be converted to 5,541 (in decimal).
2. Divide the number obtained in step 1 by 32.
 For example, 5,541 / 32 = 173 (quotient) with a remainder of 5.

3. Divide the quotient obtained in step 2 by 2. The obtained quotient is the drive box number.
For example, $173 / 2 = 86$ (quotient) with a remainder of 1. Therefore, the drive box number is 86 (DB-86).
4. The drive number can be obtained by the following equation:
Drive number = *remainder-obtained-in-step3* x 12 + *remainder-obtained-in-step2*
For example, if the reference code is eb75a5 (in hexadecimal):
Drive number = 1 x 12 + 5 = 17
Therefore, the drive number is 17 (HDD86-17).

Examples

The following table provides examples of reference codes and their corresponding drive box and drive numbers.

Reference code (Hex)	Reference code (Binary)	Last 13bits (Decimal)	Last 5bits (Decimal)	13bits/32	Quotient/2	Drive box number	Drive number
				Quotient	Remainder		
602ffe	01100000 001011111 1111110	4094	30	127	1	DB-63	HDD63-42
603000	01100000 00110000 00000000	4096	0	128	0	DB-64	HDD64-00
cf11FB	110011110 001000111 111011	4603	27	143	1	DB-71	HDD71-39

Obtaining drive box and drive numbers (for VSP E590, VSP E790 with the expansion drive box)

Perform the following procedure to obtain the HDD location corresponding to a reference code.

Procedure

1. Extract the last four digits of a reference code (in hexadecimal).
For example, if the reference code is "4347DA", the last four digits "47DA" is extracted.
2. Replace the last digit with "x".
For example, "47DA" is converted to "47Dx", and "B7C3" is converted to "B7Cx".

3. If the first digit is an even number, replace that digit with "0". If the first digit is an odd number, replace that digit with "1".
 - For example, "47Dx" is converted to "07Dx" because the first digit "4" is an even number.
 - For example, "B7Cx" is converted to "17Cx" because the first digit "B" is an odd number.
4. In the tables in the following *Reference tables*, search for the four-digit character string obtained in step 3.

Check and take note of the corresponding DB number (in decimal) and value to be added to the HDD number (in decimal).

For example, if the four-digit character string obtained in step 3 is "07Dx", search the table for "07Dx".

- The DB number can be found at the leftmost of the row (in the DB number column).
For example, if the four-digit character string is "07Dx", the DB number is "65" (in decimal).
- The value to be added to the HDD number can be found at the top of the column.
For example, if the four-digit character string is "07Dx", the value to be added to the HDD number is "16" (in decimal).

5. Convert the last digit of the reference code in step 1 from hexadecimal to decimal.
For example, if the reference code is "4347DA", the last digit "A" (in hexadecimal) is converted to "10" (in decimal).

6. Calculate the HDD number.

Add the "value to be added to the HDD number" that you took note of in step 4 to the decimal number obtained in step 5.

For example, if the decimal number obtained in step 5 is "10" and the value to be added to the HDD number that you took note of in step 4 is "16" (in decimal), you can add both and obtain "26" (in decimal).

7. Apply the DB number (in decimal) you took note of in step 4 and the HDD number (in decimal) obtained in step 6 to the following equation:

HDD-location-number = "HDD" + DB-number(in decimal) + "-" + value-obtained-in-step6(in decimal)

For example, if the DB number is "65" (in decimal) as obtained in the example in step 4 and the HDD number is "26" (in decimal) as obtained in the example in step 6, the HDD location number is HDD65-26.

Reference tables

The following tables list the DB numbers and the values used for calculating the HDD numbers. Both the DB numbers and the values used for calculation correspond to reference codes.

Table 1 VSP E590 or VSP E790 with the expansion drive box

DB number	Value to be added to the HDD number	
	0	12
00	000x	002x

DB number	Value to be added to the HDD number			
	0	16	32	48
50	008x	009x	108x	109x
51	00Cx	00Dx	10Cx	10Dx
52	018x	019x	118x	119x
53	01Cx	01Dx	11Cx	11Dx
54	028x	029x	128x	129x
55	02Cx	02Dx	12Cx	12Dx
56	038x	039x	138x	139x
57	03Cx	03Dx	13Cx	13Dx
58	048x	049x	148x	149x
59	04Cx	04Dx	14Cx	14Dx
60	058x	059x	158x	159x
61	05Cx	05Dx	15Cx	15Dx
62	068x	069x	168x	169x
63	06Cx	06Dx	16Cx	16Dx
64	078x	079x	178x	179x
65	07Cx	07Dx	17Cx	17Dx
66	088x	089x	188x	189x
67	08Cx	08Dx	18Cx	18Dx
68	098x	099x	198x	199x
69	09Cx	09Dx	19Cx	19Dx
70	0A8x	0A9x	1A8x	1A9x
71	0ACx	0ADx	1ACx	1ADx

Obtaining drive box and drive numbers (for VSP E590, VSP E790 with the expansion drive box)

DB number	Value to be added to the HDD number			
	0	16	32	48
72	0B8x	0B9x	1B8x	1B9x
73	0BCx	0BDx	1BCx	1BDx

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