

Hitachi Virtual Storage Platform G1000 Release Notes

DKCMAIN version 80-04-21-00/00, SVP version 80-04-21/00

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About this document

This document provides information about the Hitachi Virtual Storage Platform G1000 microcode (DKCMAIN and SVP), including new features and functions and changes.

Revision	Date
RN-800421-M085-00	May 16 th , 2016

Intended audience

This document is intended for Hitachi Data Systems customers and authorized service providers who install, configure, operate, and maintain the Hitachi Virtual Storage Platform G1000 storage system.

Getting help

Hitachi Data Systems Support Connect is the destination for technical support of products and solutions sold by Hitachi Data Systems. To contact technical support, log on to Hitachi Data Systems Support Connect for contact information:

https://support.hds.com/en_us/contact-us.html.

About this release

This document describes the differences between the following versions:

Microcode/firmware	New version	Previous version
DKCMAIN	80-04-21-00/00	80-04-04-00/00
SVP	80-04-21/00	80-04-02/00

Supported features and functions

The following table lists the new features and functions in this DKCMAIN microcode release. For additional details (for example, affected components, operational notes), contact your Hitachi Data Systems representative.

Open and mainframe systems

No	Title and description
1-1	Support for relocation log export from CCI. Relocation log export from CCI using the report configuration/relocation log tool is available. Documented: System Administrator Guide
1-2	Support for Tiering Policy in increments of 1 percent. The Tiering Policy threshold value can be set in increments of 1 percent.
1-3	Support for tiering policy name setting function. Documented: Provisioning Guide for Open Systems, Provisioning Guide for Mainframe Systems
1-4	Support for Storage Navigator display in Google Chrome: Google Chrome version: 48.0.2564.97 m (64bit) and later OS: Windows 8.1 (64bit), Windows 10 (64bit) Documented: System Administrator Guide
1-5	Support for new chip for FMC drive. The flash module compression drive (FMC drive, NFHAE-Q) equipped with a new flash memory chip is supported.
1-6	Support for SOM 1021. System option mode 1021 is available to automatically recover blocked external volumes in Not Ready status, regardless of the external storage system model. Documented: Universal Volume Manager User Guide
1-7	Addition of Normal End (Optimization remains) to Result Status. "Normal End (Optimization remains)" is added to Result Status of relocation logs when tier relocation is canceled during optimization after tier relocation. Documented: Provisioning Guide for Open Systems, Provisioning Guide for Mainframe Systems
1-8	Support for drive microcode (DKS5H-J). The DKS5H-JxxxSS drive microcode (version 00-7F-A9) is supported.
1-9	Support for iSCSI Initiator information collection. A function to enable SMI-S Provider to obtain the iSCSI Initiator information is supported.

No	Title and description
1-10	<p>Support for new warning messages and icon.</p> <p>When the reduction rate against the compression rate of an FMC drive is not valid compared to the recommended expansion rate, warning messages and an icon are displayed to notify the user.</p>
1-11	<p>Support for encryption communication.</p> <p>Encryption communication between Hitachi Command Suite REST API and VSP G1000 is supported.</p> <p>Documented: Hitachi Command Suite Configuration Manager REST API Reference Guide</p>
1-12	<p>Support for openssl 1.0.1r.</p> <p>When using an SVP with a version earlier than 80-04-21/00 or Apache with an OSS version earlier than 80-04-22/00, a vulnerability might be exposed. To apply the support, remove the current Apache version and then install Apache 2.4.12 (openssl 1.0.1r). For the detailed procedure, refer to Maintenance Manual 08 WEB CONSOL.</p>
1-13	<p>Enhancement for security measures to comply with STIG.</p> <p>Security measures are enhanced to comply with the security policy (STIG) required for devices to be connected to the computer network in United States Department of Defense (DoD).</p>
1-14	<p>Support for processing with external authentication server equivalent to VSP.</p> <p>When the #7 External authentication compatibility option on the Edit Advanced System Settings window is selected, the processing performed with an external authentication server becomes equivalent to that of VSP.</p> <p>Documented: System Administrator Guide</p>

Mainframe systems

No	Title and description
2-1	<p>Support for zHyperWrite function (SOM 1091).</p> <p>New system option mode 1091 is available to enable the zHyperWrite function.</p> <p>Documented: TrueCopy for Mainframe User Guide, Universal Replicator for Mainframe User Guide, Compatible FlashCopy User Guide</p>

Open systems

No	Title and description
3-1	<p>Support for iSCSI connection.</p> <p>(1) iSCSI connection is supported for TrueCopy, Universal Replicator, Universal Volume Manager, and global-active device.</p> <p>(2) iSCSI connection between VSP G1000 and VSP Gx00/Fx00 models for TrueCopy and Universal Replicator is supported.</p> <p>(3) iSCSI connection with VSP Gx00/HUS/AMS 2000/AMS 200, 500, 1000 used as external storage for UVM is supported.</p> <p>Documented: TrueCopy User Guide, Universal Replicator User Guide, Universal Volume Manager User Guide, Global-Active Device User Guide</p>
3-2	<p>Support for Force Delete of GAD pairs from CCI.</p> <p>Force Delete from command control interface (CCI) for GAD pairs is available.</p> <p>Documented: Global-Active Device User Guide, Command Control Interface Command Reference</p>
3-3	<p>Support for Command Control Interface Ver. 01-37-03/04.</p> <p>This CCI version includes the following functions:</p> <ul style="list-style-type: none"> - Added the license and system_opt options for the raidcom -h command. - Added the options to forcibly delete GAD pairs. - Added functionality to set the IP address to External or MCU ports. - Added support for the iSCSI Initiator. - Applied the command to display PP licenses to VSP G1000. - Added the -lm option to the raidqry command. - Improved the raidcom modify port command to make the command able to change attributes of ports other than target ports. <p>Documented: Command Control Interface Command Reference</p>
3-4	<p>Support for Syslog and FTP setting information collection RMI API.</p> <p>The following RMI API to obtain Syslog and FTP setting information is supported:</p> <ul style="list-style-type: none"> - getAuditSyslogSetting() - getAuditFTPSetting()

Fixed problems

The following table lists the bug fixes in this DKCMAIN microcode release. For additional details (for example, conditions of occurrence, severity, probability), contact your Hitachi Data Systems representative.

No	Category	Title and symptoms
1	Universal Volume Manager, TrueCopy, TrueCopy for Mainframe, Universal Replicator, Universal Replicator for Mainframe, global-active device	SSB=8BB0 logged at I/O. When an I/O was issued in UVM, TC/TCz, UR/URz, or GAD configuration, SSB=8BB0 might be logged.
2	Open or Mainframe	Incorrect name of Migration Recovery option of Local Replica Option.
3	Open or Mainframe	Failure of LDEV recovery. When LDEV recovery was performed in accordance with the Maintenance Manual to restore LDEVs blocked due to multiple-PDEV blockage, SVP message ONL0768E was displayed and the recovery failed.
4	Open	iSCSI port reset failure and iSCSI PCB blockage. An iSCSI port reset failed and an iSCSI PCB was blocked. SSB=BE83, BE0B SIM=2120XX
5	Open	Lower copy speed of XCOPY and ODX. In a concatenated parity group configuration consisting of LDEVs that were not DP volumes, the speed of XCOPY and ODX copy might be slower than the speed of the copy by read/write.
6	FlashCopy version2	Command reject of Reverse Restore. After creating FCv2 relationships (NOCOPY mode/Incremental) in FC-to-PPRC or FC-to-URz configuration, if a withdraw command (DDSW=YES) was run and the FC QUERY SHOWREL was confirmed, the source and target volumes seemed to be in COPY mode and NOCOPY mode, respectively. Under the above conditions, if Reverse Restore was performed after background copy was complete, the command was rejected. (SSB=96B8)
7	Open	No TOKEN information collected. For the ODX function, the information at TOKEN operation was not collected, so the analysis might be difficult in some cases.

No	Category	Title and symptoms
8	Universal Replicator, Universal Replicator for Mainframe	<p>UR/URz pair failure suspension at delta resync.</p> <p>When a delta resync operation was performed for a UR/URz pair without suspending the pair in 3DC configuration using UR/URz, a mirror changed from a HOLD mirror to a UR/URz mirror, and then the pair was suspended due to failure with SSB=8E11 logged.</p>
9	Open	<p>Drive overload and drive port blockage caused by excessive commands.</p> <p>When excessive commands were run on the same drive at the same time, the drive was overloaded.</p> <p>Depending on the number of commands to the drive, SSB=A410 was logged and the drive port might be blocked (SSB=A4B2).</p>
10	Universal Replicator, Universal Replicator for Mainframe	<p>UR/URz pair failure suspension at cache removal.</p> <p>When cache was removed while UR/URz was in use, SSB=EF10 was logged and the UR/URz pair was suspended due to failure.</p>
11	Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe	<p>Fluctuation of DP/DPz VOL usage rate.</p> <p>When the Storage Navigator window was refreshed during I/O or initial copy processing, the usage rate of DP/DPz volumes with Full Allocation enabled fluctuated.</p>
12	Universal Replicator, Universal Replicator for Mainframe	<p>Inadequate recommended action in SN message 06505-008701.</p> <p>When a UR/URz pair was created or resynchronized from Storage Navigator, the operation failed because the remote path was disabled and Storage Navigator message 06505-008701 below was displayed, but the recommended action of the message was not adequate.</p> <p>06505-008701</p> <p>The pair operation could not be performed due to one of the following reasons:</p> <ul style="list-style-type: none"> - The remote path between the local storage system and the remote storage system is invalid. - The status of the specified secondary volume is SMPL. <p>Verify the status of the remote path in the local storage system and the status of the remote path and the pair in the remote storage system, and then perform the following operations:</p> <ul style="list-style-type: none"> - If the LUN path is invalid, reestablish the remote path by an Edit Path operation. - If the status of the secondary volume is SMPL, delete the pair from the primary volume, and then retry Create Pairs.

No	Category	Title and symptoms
13	LUN Manager	<p>No display of error details.</p> <p>When an operation on the Edit Ports window on Storage Navigator failed, Storage Navigator message 01205-207001 was displayed on the Task Status window, but the result of each change was not displayed and users could not understand details of the error. The same phenomenon also occurred at an operation on the Add Hosts and Edit Hosts windows.</p>
14	Universal Replicator, Universal Replicator for Mainframe	<p>UR/URz pair failure suspension at delta resync and ownership migration.</p> <p>In 3DC multi-target configuration supporting delta resync, when a delta resync operation and ownership migration were performed, the UR/URz pair was suspended due to failure.</p> <p>SSB=CDE0, SIM=DC1XYY</p>
15	Universal Replicator, Universal Replicator for Mainframe	<p>Failure suspension of UR/URz pair.</p> <p>In 3DC cascade configuration with 3 UR/URz sites supporting delta resync, when the UR/URz pair between primary and intermediate sites was suspended and then a delta resync operation was performed for the UR/URz for delta resync pair, the latter UR/URz pair might be suspended due to failure.</p> <p>SSB=8E11, SIM=DC1XYY</p>
16	Open or Mainframe	<p>Unable to cancel disabling I/O at reset.</p> <p>Phenomenon 1</p> <p>When a reset (*) occurred during drive firmware exchange, the status where I/Os were disabled remained, and the processing to cancel the restriction (to disable I/Os) that worked in the periodic processing did not work in accordance with the specification (within 13.5 seconds after the I/O was disabled).</p> <p>If the status that I/Os were disabled continued, time-out (SSB=DD84) frequently occurred, and eventually abnormal response was returned to the host.</p> <p>Phenomenon 2</p> <p>When Phenomenon 1 occurred while SOM 875 to 882, or SOM 1025 to 1032 were set to ON, disabling I/O could not be canceled on odd-numbered MPs, and I/Os continued to be incorrectly disabled. In this case, time-out (SSB=DD84) occurred frequently, and eventually abnormal response was returned to the host.</p> <p>* Reset: CHK1B (SSB=1607), CHK3 (SSB=160F), hang-up reset (SSB=1609), SCSI reset (SSB=1619)</p>

No	Category	Title and symptoms
17	Universal Replicator, Universal Replicator for Mainframe, Disaster Recovery Extended	UR/URz removal rejected. While TrueCopy, TrueCopy for Mainframe, Universal Replicator, Universal Replicator for Mainframe, Disaster Recovery Extended were installed on a storage system, if only UR or URz was removed, message 00405-005073 was displayed and the removal operation was rejected.
18	Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe	Failure of SN refresh or dump collection. When SSB=3303 or 336A was logged, Storage Navigator could not be refreshed, or PM Dump, LM Dump, or Trace Dump could not be collected.
19	Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe	Delay in zero data page reclamation. When rebalance processing and zero data page reclamation of Write Same conflicted, the processing of zero data page reclamation was delayed.
20	Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe	Incorrect display of used capacity for physical capacity. Phenomenon 1 The used capacity of physical capacity displayed on Storage Navigator and CCI did not contain reserved page capacity. Phenomenon 2 If the used capacity of physical capacity containing reserved page capacity was larger than the threshold, the following problems occurred: - Threshold could be changed. - Rebalance could not be stopped. - Rebalance by pool shrinking could not be stopped. - Tier relocation could not be stopped.
21	LUN Manager	Incorrect LUN security information displayed. When a front-end director (FED) was removed and then installed, the LUN security information set before the removal was displayed.
22	ShadowImage, ShadowImage for Mainframe	Failure of SI pair operation in In-band connection environment. When an SI/SIz pair operation was performed from Command Control Interface in an environment where CCI and storage system were connected with In-band, SSB=2310 was logged and the operation might end abnormally.

No	Category	Title and symptoms
23	Mainframe	<p>Display failure of RMF Response Time.</p> <p>With HPF I/O, ZDevBsy (Device Busy time) of GTF (Generalized Trace Facility) might be larger than ZTotdev (Device Time).</p> <p>ZDevBsy should not exceed ZTotdev, but if it occurred, RMF (Resource Measurement Facility) Response Time showed an abnormally large value.</p>
24	Open	<p>Soft Reset and login failure.</p> <p>While the internal WWN resource was depleted (SSB=BEAD), if a port was logged in 657 times or more, Soft Reset (SSB=BE83) occurred and login after that was disabled.</p>
25	Dynamic Provisioning, Dynamic Provisioning for Mainframe, Dynamic Tiering, Dynamic Tiering for Mainframe	<p>Smaller value displayed in Saving (%).</p> <p>The value displayed in Saving (%) of FMC Pool Volumes Capacity in the Pools tab on the Pools window was smaller than the expected value.</p>
26	Mainframe	<p>FED blockage or LRC error at logic contradiction.</p> <p>When MFDMA transfer parameter logic contradiction occurred due to a microcode failure, the following failures occurred:</p> <p>(1) FED blockage (SSB=3480, 5820, 5904, 5865, 590F, 5839, 5ACF, 3481, 3482, SIM=CF88XX)</p> <p>(2) LRC error (SSB=5904, 5865, 590D, 5833, 5ACF)</p>
27	Open	<p>Port blockage at data transfer time-out or link-down (1/4).</p> <p>When one of the following failures occurred on an 8FC16 or 16FC16 FED, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480):</p> <p>(1) Data transfer time-out (SSB=DDA1) during I/O</p> <p>(2) Link-down during I/O</p>
28	Open	<p>Port blockage at frequent stop of data transfer (1/2).</p> <p>When data transfer was frequently stopped on an 8FC16 or 16FC16 FED in a high-load environment, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480).</p>
29	Open	<p>Port blockage at data transfer time-out or link-down (2/4).</p> <p>When one of the following failures occurred on an 8FC16 or 16FC16 FED in a configuration where 2 or more hosts were connected to the FED, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480):</p> <p>(1) Data transfer time-out (SSB=DDA1) during I/O</p> <p>(2) Link-down during I/O</p>

No	Category	Title and symptoms
30	Open	<p>Taking time to link up with SSBs logged.</p> <p>When an 8FC16 or 16FC16 FED was connected to an FC switch with Point-to-Point topology, SSB=B369 and B67F were logged at link-up and the link-up might take several seconds.</p>
31	Open	<p>Port blockage at data transfer time-out or link-down (3/4).</p> <p>When one of the following failures occurred on a 16FE10 FED, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480):</p> <p>(1) Data transfer time-out (SSB=DDA1) during I/O</p> <p>(2) Link-down during I/O</p>
32	Open	<p>Port blockage at frequent stop of data transfer (2/2).</p> <p>When data transfer was frequently stopped on a 16FE10 FED in a high-load environment, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480).</p>
33	Open	<p>Port blockage at data transfer time-out or link-down (4/4).</p> <p>When one of the following failures occurred on a 16FE10 FED in a configuration where 2 or more hosts were connected to the FED, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480):</p> <p>(1) Data transfer time-out (SSB=DDA1) during I/O</p> <p>(2) Link-down during I/O</p>
34	Open	<p>Port blockage at FED installation or replacement.</p> <p>While an 8FC16 or 16FC16 FED was connected to an FC switch, if a FED was installed or replaced, a port might be blocked due to CHK4 (SIM=2120XX, SSB=3480).</p>
35	Open	<p>Port blockage when data transfer stopped (1/2).</p> <p>When data transfer was stopped during I/O on a port used as an Initiator port, the port might be blocked due to CHK4 (SIM=2120XX, SSB=3480).</p>
36	Open	<p>Port blockage when data transfer stopped (2/2).</p> <p>When data transfer was stopped during I/O on a port used as an Initiator port, the port might be blocked due to CHK4 (SIM=2120XX, SSB=3480).</p>
37	Open or Mainframe	<p>Failure of MPB replacement/MPB removal/DKC removal/PS OFF/microcode exchange.</p>

No	Category	Title and symptoms
38	Open	<p>Invalid termination of Storage Navigator.</p> <p>While the data direct mapping was enabled on all external volumes that met requirements for pool volume, if the Create Pools window was displayed on Storage Navigator, Storage Navigator message 03122-107007 was displayed and Storage Navigator was forcibly terminated.</p>
39	Mainframe	<p>WCHK1 during Mainframe I/O.</p> <p>Due to incorrect memory access during Mainframe I/O, WCHK1 occurred.</p> <p>SIM=3073XY (X=MPB#, Y=MP#)</p>
40	Universal Replicator, Universal Replicator for Mainframe	<p>Increase in JNL usage and Q-CNT.</p> <p>After USP V/VM UR RCU was replaced with VSP G1000, the values in the result of the raidvchkscan command increased as follows:</p> <ul style="list-style-type: none"> - JNL usage that was always 0% before the replacement became a one-digit figure. - Q-CNT that was 4-digit figure before the replacement became a 7-digit figure. <p>* The problem was not caused by the replacement from USP V/VM to VSP G1000, but by using VSP G1000 on the RCU side.</p>
41	Volume Shredder	<p>Unable to suspend shredding and to update information.</p> <p>During shredding from Storage Navigator, the following phenomena might occur:</p> <ul style="list-style-type: none"> - When trying to suspend the shredding on the Task Properties window, Storage Navigator message 03022-105273 was displayed and the task could not be suspended. - The information displayed on Storage Navigator was not updated.
42	Universal Volume Manager	<p>Dirty data on cache and failure of PS OFF/maintenance operation.</p> <p>When a DP/DPz volume was formatted or TC/TCz, UR/URz, or GAD initial copy was performed, invalid dirty data was generated on the cache and SSB=F47F, AF21, and 89F9 were logged.</p> <p>After the SSBs were logged, PS OFF and cache maintenance operations failed.</p>
43	Open or Mainframe	<p>Cold start trap issued twice at SVP OS reboot.</p> <p>When the OS of SVP was rebooted, a cold start trap was issued twice.</p>

No	Category	Title and symptoms
44	Open or Mainframe	<p>Failure of data de-staging from cache to drive.</p> <p>When the data on cache was de-staged to a drive, SSB=9216 was logged and the de-staging processing might fail.</p>
45	Mainframe	<p>Delay in I/O response at path failure.</p> <p>When a path failure occurred between FED and MPB or between host and storage system during Mainframe I/O, SSB=50FD was logged and I/O response might be delayed.</p>
46	Open or Mainframe	<p>Decrease in drive free capacity at SVP re-setup.</p> <p>When SVP was setup again, if there was an undeletable folder, the folder was moved to a temporary folder of Windows and the setup continued so that the free capacity of drive decreased (equal to the capacity of the undeletable folder) every time when SVP re-setup was performed.</p>
47	Open	<p>Failure of CHIP reset/port blockage or iSCSI FED blockage.</p> <p>When an MP that had been blocked due to WCHK1 was restored while a resource was locked by the MP, the resource lock could not be kept and the following phenomena might occur:</p> <p>(1) A CHIP reset of the iSCSI port failed and the setting change on the iSCSI port could not be reflected.</p> <p>(2) The iSCSI port blockage processing failed and the port seemed to be in normal status.</p> <p>(3) At port information change such as MTU value change, the iSCSI FED was blocked. (SIM=2120XX)</p>
48	Open or Mainframe	<p>Failure of LDEV removal.</p> <p>Due to repeated de-staging processing, LDEV removal might fail.</p>
49	TrueCopy, TrueCopy for Mainframe, Universal Replicator, Universal Replicator for Mainframe, global-active device	<p>TC/TCz, UR/URz, or GAD resync takes time.</p> <p>When a TC/TCz, UR/URz, or GAD pair was resynchronized, there was a little differential data between the P-VOL and S-VOL for the reason below, but it took time to complete the copy.</p>
50	Open or Mainframe	<p>FMC drive temperature increase and blockage.</p> <p>The temperature of FMC drive increased and the FMC drive was blocked in the following cases:</p> <p>(1) A dummy canister was not mounted in a free slot.</p> <p>(2) At power unit maintenance, the power unit was not mounted for many hours.</p> <p>SSB=AB32, AB27</p> <p>SIM=DF9XXX, DF8XXX, EF1XXX</p>

No	Category	Title and symptoms
51	FlashCopy V2, FlashCopy SE	SSB=F292 and 74D8 logged. SSB=F292 and 74D8 were logged when; (1) A withdraw command and FCQUERY were run at the same time, (2) An establish command with COPY mode specified and FCQUERY were run at the same time, or (3) DFSMSdss DEFRAG and FCQUERY were run at the same time.
52	Open	iSCSI login on all ports disabled. In an iSCSI connection environment, when the internal WWN resource was depleted (SSB=BEAD) and the condition could not be restored, login with iSCSI was disabled on all ports.
53	Thin Image	Failure of Invisible protection setting. When the Invisible protection was set to a TI volume as an Open LDEV guard volume, SSB=B9BF and B9C4 were logged and the setting failed.
54	Drive	HDD microcode enhanced to reduce replacements and recovery. The following phenomena occurred so that frequency of HDD replacement or recovery increased: (1) After continuous Head Health Check errors, a drive always reported an error to any command. (2) An HDD might be blocked suddenly due to continuous "Write & Verify" even though the data was still available to be read. (3) A temporary error could result in unnecessary running of Dynamic Sparing. (4) The probability of weak write might increase.
55	Audit Log	Error log output instead of audit log at running raidvchkset. When raidvchkset was run from CCI, an audit log was not output but an error log (Command=) was output.

No	Category	Title and symptoms
56	Audit Log	<p>Incorrect values output in audit log.</p> <p>When the following commands were run from CCI, values different from those specified in the commands were output:</p> <ul style="list-style-type: none"> - Add External Group: Path Group ID specified - Initialize Ldev (Shredding): Data specified - Modify Ldev (SSID): SSID specified - Delete SSID: SSID specified - Modify Port: Fabric, Connection specified - Resume Pair: Change CTGswitch specified - Delete LUN: LUN specified
57	Audit Log	<p>Incomplete output in audit log.</p> <p>When the following commands were run from CCI, some values specified in the command were not output:</p> <ul style="list-style-type: none"> - raidvchkset: Virtual Storage Machine serial number specified - Modify Pool (TierOpt): Attribute specified
58	Audit Log	<p>Incorrect value output in audit log.</p> <p>When Modify Journal was run with Timer Type specified from CCI, a hexadecimal number was output instead of a hyphen for an option that was not specified in the command.</p>
59	Audit Log	<p>Unnecessary item output in audit log.</p> <p>When Delete Host Group was run from CCI, an unnecessary item "Host Group Name", for which no value was output, was output.</p>
60	Audit Log	<p>Incorrect items and values output in audit log.</p> <p>When the commands below were run from CCI, incorrect items and values were output as follows.</p> <ul style="list-style-type: none"> - Modify Port: Instead of "P-to-P", "P to P" was output in Connection. - Map Resource (LDEV): Instead of "Reserve", "Reverse" was output in Map LDEV (LDKC:CU:LDEV) - Unmap Resource (LDEV): Instead of "Reserve", "Reverse" was output in Map LDEV (LDKC:CU:LDEV).
61	Audit Log	<p>Incorrect information output in audit log.</p> <p>The output information for Pairsplit -S command for remote copy was not correct as follows.</p> <ul style="list-style-type: none"> - Wordings and explanations for Delete Mode were the same as those of Force, instead of the operation target volumes.

No	Category	Title and symptoms
62	TrueCopy for Mainframe, Universal Replicator for Mainframe, ShadowImage for Mainframe, Volume Migration	<p>Delay in initial copy or performance degradation after pair creation.</p> <p>At SIz or VM pair creation, initiation of initial copy might be delayed. As a result, starting pair operation immediately after the pair creation might be delayed. Also, the delay in pair operation initiation caused the command to be rejected and SSB=2140, 2230, and 23FF might be logged.</p> <p>In the case of TCz or URz pair creation, the performance after pair creation might degrade.</p>
63	Open or Mainframe	<p>Login failure.</p> <p>Login to Storage Navigator failed with the message "Failed to login".</p> <p>Login to SVP failed with SVP message SVP4250W.</p>
64	TrueCopy for Mainframe	<p>Incorrect relation output of TCz and CTG on RMI.</p> <p>A TCz pair belonging to a consistency group for TCz only was output on RMI as if it did not belong to a consistency group.</p>
65	Mainframe	<p>Insufficient dump information.</p> <p>In zLinux environment, when SSB=6D7C and 6D7D were logged and an I/O to an alias was rejected, the information collected in dump might not be sufficient.</p> <p>Host side: HCPERP6303I SENSE=80000000 0500000F E2000000 00000000 6D7C0000</p> <p>Storage system side: SSB=6D7D</p>
66	Mainframe	<p>EQC reported at Full Track I/O to VM Minidisk.</p> <p>When a Full Track I/O was issued to a VM Minidisk, an EQC might be reported to a host.</p> <p>SSB=6709 or 6376</p>
67	Universal Replicator, Universal Replicator for Mainframe	<p>UR/URz pair failure suspension at cache failure.</p> <p>When a cache failure occurred in a UR/URz configuration, the UR/URz pair was suspended due to failure.</p> <p>SSB=EDC5, EDDC, EDDF</p> <p>SIM=DC1XYY</p>
68	Open	<p>Connection cut off due to multiple TMFs.</p> <p>When multiple TMFs (cancel) were received from a host or an Initiator due to a delay in I/O, the connection might be cut off because of invalid response to the TMFs.</p> <p>SSB=BE81</p>

No	Category	Title and symptoms
69	Audit Log	<p>Invalid information output in audit log.</p> <p>Phenomenon 1</p> <p>When a Delete CTG command was run from a BCM host, an unnecessary item, SCP Time (sec.), was output.</p> <p>Phenomenon 2</p> <p>When the following commands were run from CCI, values different from those specified in commands were output:</p> <ul style="list-style-type: none"> - Add RCU iSCSI port, Delete External iSCSI Name: IP Address (IPv6) <p>Phenomenon 3</p> <p>When the Delete SSID command was run from CCI, the SSID that should have been output as a hexadecimal number was output as a decimal number.</p>
70	Audit Log	<p>Opposite information output in audit log.</p> <p>When the following commands were run from a BCM host, the result of specific items were opposite to what was specified:</p> <ul style="list-style-type: none"> - Add Pair, Add RCU, Change Tier Option, Delete Pair, Delete RCU, FREEZE, Resume Pair, RUN, Suspend Pair: Receive Device was specified for Execute Type but Cmd. Device was output, and vice versa. - Resume Pair (TCMF): Enable was specified for SCP but Disable was output, and vice versa.
71	Drive	<p>Performance degradation of read/write I/O to FMC drive.</p> <p>Read or write I/O performance of an FMC drive degraded.</p>
72	Drive	<p>Failure of FMC drive activation.</p> <p>When the power switch of FBX was turned OFF and then ON, SSB=A404 was logged and starting FMC drive failed, and the FMC drive might be blocked. (SIM=EFOXXX, EF1XXX)</p>
73	Global-active device	<p>Round trip reduction function did not work.</p> <p>When HMO 51 was set to ON on MCU and RCU ports in GAD configuration, the round trip reduction function did not work.</p>
74	Open	<p>Failure of iSCSI target creation.</p> <p>At iSCSI target creation from Storage Navigator, Storage Navigator message 01005-002084 was displayed and the operation failed.</p>

No	Category	Title and symptoms
75	Open	<p>WCHK1, MP blockage and Discovery Login failure.</p> <p>Phenomenon 1</p> <p>If a link-down and link-up occurred repeatedly in high load I/O environment, WCHK1 occurred and an MP was blocked.</p> <p>Phenomenon 2</p> <p>When HMO 80 was set to ON, Discovery Login from a host to VSP G1000 failed with time-out and SSB=1408 and 1410 were logged.</p>
76	Open or Mainframe	<p>Unable to solve DKCMAIN version inconsistency.</p> <p>When performing volatile PS ON to start a storage system, the DKCMAIN microcode version differed between MPBs. After that, the MPB with older microcode version was replaced but the version inconsistency could not be solved.</p>
77	TrueCopy, TrueCopy for Mainframe, Universal Replicator, Universal Replicator for Mainframe	<p>Failure of reflecting differential data to S-VOL.</p> <p>When failures occurred on primary and secondary sites in TC-UR/TCz-URz 3DC multi-target or cascade configuration, if a recovery operation that did not comply with the specified procedure was performed, the differential data might not be reflected to the S-VOL.</p>
78	Storage Navigator	<p>Failure of report downloading.</p> <p>When downloading a report whose name contained a consecutive-dot (..), message 20020-107035 was displayed and the download failed.</p>
79	Global-active device	<p>SSBs logged when UA returned.</p> <p>In GAD configuration where an HBA recognized both the P-VOL and S-VOL via a switch, when PGR OUT S.A=CLEAR was performed, UA might be incorrectly returned.</p> <p>It caused SSB=D05E and D544 to be logged on the storage system that received PGR OUT S.A=CLEAR, and SSB=86D2 to be logged on the other storage system.</p>
80	Open or Mainframe	<p>Failure of collecting version information of FHTP and FFCDG.</p> <p>When RMI API dsvp_List_MicrocodeEX() was run to obtain version information, versions of FHTP and FFCDG could not be obtained.</p>
81	Open or Mainframe	<p>Drive port failure.</p> <p>A drive port failure occurred.</p> <p>SIM=D6XXX, DF7XXX, DF8XXX, DF9XXX</p>

No	Category	Title and symptoms
82	Mainframe	SSB=7A20 and HTPLog=27C8 logged. When host message IOS050I (CHANNEL DETECTED ERROR) or IOS1076E (MISSING CHANNEL AND DEVICE END,START PENDING) was reported for an HPF write I/O, SSB=7A20 and HTPLog=27C8 might be logged.
83	Audit Log	Errors in audit logs. Phenomenon 1 An audit log for paircreate (remote copy) contained the following errors: - M-JNL and R-JNL values might not be output for a UR pair. - 1 was added to the value of quorum disk ID. Also, the value was output for pairs that were not GAD pairs. Phenomenon 2 An audit log for pairsplitS (local copy) or pairsplitS (remote copy) contained the following error. - Values of P-VOL and S-VOL port numbers and LUNs were different from the setting values.
84	Global-active device	Unclear message at swap suspend with LDEV specified for GAD pair in CTG. Message 6205-208080 that was displayed when swap suspend was performed with LDEV specified from Storage Navigator for a GAD pair belonging to a consistency group did not clearly indicate the situation.
85	Global-active device	SSB=1293 logged at communication time-out. In GAD configuration, if communication between MCU and RCU timed out, SSB=1293 might be logged.
86	Open	Failure of FED link-up causing hardware diagnosis error. After loopback setting in hardware diagnosis for FED at PS ON or maintenance operation, the FED was not linked up within the linkup time-out time, and the hardware diagnosis indicated an error. SIM=760000 SSB=3306
87	Dynamic Tiering, Dynamic Tiering for Mainframe, active flash	Small amount page allocation to Tier1 causing performance degradation. In a DT/DTz pool using FMC drives, the amount of page allocation to Tier1 became small in the case of high load I/O, which caused the overall pool performance degradation.

No	Category	Title and symptoms
88	Open	<p>SSB=BEA8 logged at logout and then login and reservation release disabled.</p> <p>In iSCSI configuration, when logging out from multiple hosts and MCUs at the same time and then trying to log in, SSB=BEA8 was logged.</p> <p>In this case, if a host that used a reserved command was used, the reservation could not be released.</p>
89	Command Control Interface	<p>Display failure of Device Option in audit log.</p> <p>When paircreate or pairresync was run with -d option specified from CCI, "Disable" was displayed in Device Option in audit log regardless of the option setting.</p>
90	Open or Mainframe	<p>Failure of LDEV format.</p> <p>When LDEVs in a parity group that consisted of FMC drives and the accelerated compression was enabled were formatted, SSB=98C1 was logged and the format might fail.</p>
91	Open	<p>Disabled data transfer causing frequent I/O error/SSB=BE48.</p> <p>In iSCSI connection, data transfer for an MPB that was restored or installed was disabled. (Both Target and Initiator)</p> <p>As a result, the following phenomena occurred:</p> <ul style="list-style-type: none"> - I/O errors might occur frequently in the case of host connection. - SSB=BE48 might be logged frequently because data sending from storage system was disabled.
92	Command Control Interface	<p>Incorrect error message and host group display failure.</p> <p>Phenomenon 1</p> <p>An error message displayed when the raidcom discover lun command was run while specifying an unregistered iSCSI name was incorrect.</p> <p>Phenomenon 2</p> <p>When the raidcom get host_grp -allports command was run, some host groups were not displayed.</p>
93	Drive	<p>LDEV blockage due to multiple FMC blockage.</p> <p>The following phenomena might occur when using FMC drive.</p> <p>Phenomenon 1</p> <p>LDEV blockage might occur with SIM=EF9XXX reported because of multi-FMC drive blockage. After that, Read/Write access from a host becomes unavailable, and a customer operation is stopped.</p> <p>Phenomenon 2</p> <p>Parity group might lose redundancy because of FMC drive blockage with SIM=EF0XXX/DF1XXX reported.</p>

Acronyms and abbreviations

3DC	three data center
ABTS	ASCII Block Terminal Services
ALUA	asymmetric logical unit access
AMS	Hitachi Adaptable Modular Storage
AOU	allocation on use (another name for Dynamic Provisioning)
ASP	authorized service provider
BCM	Hitachi Business Continuity Manager
BED	back-end director (also called disk adapter)
CC	correction copy
CCI	Command Control Interface
CHA	channel adapter (another name for front-end director)
CL1/2	cluster 1/2
CLI	command line interface
CLPR	cache logical partition
CM	cache memory
CMA	cache memory adapter
CPC	cache path control adapter
CPK	cache package
CRM	Cache Residency Manager
CSV	Cluster Shared Volumes
CTG	consistency group
CU	control unit
CUDG	control unit diagnosis
CVS	custom volume size (another name for Virtual LVI/LUN)
DCR	dynamic cache residency (another name for Cache Residency Manager)
DF700	factory model number for Hitachi Adaptable Modular Storage 200, 500, 1000
DF800	factory model number for Hitachi Adaptable Modular Storage 2000
DF850	factory model number for Hitachi Unified Storage
DKA	disk adapter (another name for back-end director)
DKAF	DKA firmware
DKC	disk controller (also used to refer to the entire storage system)
DKU	disk unit
DP	Dynamic Provisioning
DP-VOL	Dynamic Provisioning virtual volume (V-VOL for Dynamic Provisioning)
DPz	Dynamic Provisioning for Mainframe
DRU	Hitachi Data Retention Utility
DS	dynamic sparing
DT	Dynamic Tiering
DTz	Dynamic Tiering for Mainframe
DW700	factory model number for Hitachi Unified Storage VM
DW800	factory model number for Hitachi Virtual Storage Platform Gx00 and Fx00
ECC	error checking and correction
EQC	equipment check
ESW	express switch
FC	fibre channel, FlashCopy®

FCA	fibre control adapter
FCoE	fibre channel over ethernet
FCSE	FlashCopy® Space Efficient
FCU	File Conversion Utility
FCv2	FlashCopy® version 2
FDM	FICON® data migration
FED	front-end director (also called channel adapter)
FMC	flash module compression (another name for the FMD DC2 drives)
FMD	flash module drive
FOEF	FCoE firmware
FRS	Feature Release Schedule
GAD	global-active device
grp	group
HA	high availability
HCS	Hitachi Command Suite
HDD	hard disk drive
HDEV	host device
HDS	Hitachi Data Systems
HDvM	Hitachi Device Manager
HLDE	hold-error
HM700	factory model number for Hitachi Unified Storage VM
HM800	factory model number for Hitachi Virtual Storage Platform Gx00 and Fx00
HMO	host mode option
HPAV	Hitachi Parallel Access Volume (another name for Hitachi Compatible PAV)
HPF	High Performance FICON®
HPtM	Hitachi Protection Manager
HPvM	Hitachi Provisioning Manager
HRpM	Hitachi Replication Manager
HTP	hyper transfer program (controls the FICON channel links)
HTSM	Hitachi Tiered Storage Manager
HUS	Hitachi Unified Storage
HUS VM	Hitachi Unified Storage VM
I-site	intermediate site
JNL	journal
JNLG	journal group
LDEV	logical device
LDKC	logical disk controller
Lib	Library
LRC	longitudinal redundancy check
LSI	large-scale integration, refers to an integrated circuit (IC)
L-site	local site
LU	logical unit
LUN	logical unit number
LVI	logical volume image
MCU	main control unit, refers to a primary storage system
MDKC	main storage system (contains MCUs)
MFC	multimode fiber connection

MIH	missing interrupt handler
MP	microprocessor
MPB	MP blade
MSCS	Microsoft Cluster Server
MTO	mainframe-to-open
NDM	nondisruptive migration
ODX	Offload Data Transfer
ORM	online read margin
OTM	open-to-mainframe
PAV	Parallel Access Volume
PB	petabyte
PCB	printed circuit board
PDEV	physical device
PP	program product
PPC	prioritized port control
PS	power supply
P-site	primary site
P-VOL	primary volume
RAID600	factory model number for Hitachi Universal Storage Platform V/VM
RAID700	factory model number for Hitachi Virtual Storage Platform
RAID800	factory model number for Hitachi Virtual Storage Platform G1000
RC	remote console
RCU	remote control unit, refers to a secondary storage system
RDKC	remote storage system (contains RCUs)
RIO	remote I/O
RM	RAID Manager (another name for Command Control Interface)
RSCN	registered state-change notification
RSD	Hitachi RAID Systems Division
R-site	remote site
SAS	serial-attached SCSI
SCP	state change pending
SFP	small form-factor pluggable
SI	Hitachi ShadowImage
SIM	service information message
SIz	ShadowImage for Mainframe
SM	shared memory
SMPL	simplex
SN	Storage Navigator
SOM	system option mode
SPM	Hitachi Server Priority Manager
SSB	sense byte
SSD	solid-state device (another name for flash drive)
SSID	storage subsystem identifier
SSL	secure socket layer
SSW	standard switch adapter
SUS	suspended
S-VOL	secondary volume, source volume
SVP	service processor
TC	Hitachi TrueCopy

TCz	Hitachi TrueCopy for Mainframe
TI	Hitachi Thin Image
TOV	time-out value
TPF	Transaction Processing Facility
TS	Technical Support
TSE-VOL	track-space-efficient volume
T-VOL	target volume
UR	Hitachi Universal Replicator
URz	Hitachi Universal Replicator for Mainframe
USP V/VM	Hitachi Universal Storage Platform V/VM
UVM	Universal Volume Manager
VM	Volume Migration
VSP	Hitachi Virtual Storage Platform
VSP Fx00	Hitachi Virtual Storage Platform F400, F600, F800
VSP G1000	Hitachi Virtual Storage Platform G1000
VSP Gx00	Hitachi Virtual Storage Platform G200, G400, G600, G800
V-VOL	virtual volume

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Hitachi Data Systems

Corporate Headquarters

2845 Lafayette Street
Santa Clara, California 95050-2639
U.S.A.

www.hds.com

Regional Contact Information

Americas

+1 408 970 1000

info@hds.com

Europe, Middle East, and Africa

+44 (0) 1753 618000

info.emea@hds.com

Asia Pacific

+852 3189 7900

hds.marketing.apac@hds.com

