Hitachi Virtual Storage Platform G200, G400, G600, G800 and Hitachi Virtual Storage Platform F400, F600, F800 Release Notes

SVOS 7.0.0

DKCMAIN 83-04-01-*x*0/00, SVP 83-04-01-*x*0/00, NAS OS 13.0.4323.02, SMU 13.0.4323.02

Contents

About this document

This document provides information about the VSP G200, G400, G600, G800 and VSP F400, F600, F800 firmware (DKCMAIN and SVP) and NAS module firmware (NAS OS and SMU), including new features and functions and changes.

Revision	Date
RN-830401-M038-00	October 17th, 2016

Intended audience

This document is intended for Hitachi Data Systems customers and authorized service providers who install, configure, operate, or maintain the VSP G200, G400, G600, G800 and VSP F400, F600, F800 storage systems.

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:

Product	Firmware/software	New version	Previous version
SVOS	-	7.0.0	6.4.1a
VSP G800 VSP F800	DKCMAIN	83-04-01-60/00	83-03-25-60/00
	SVP	83-04-01-60/00	83-03-24-60/00
VSP G400, G600 VSP F400, F600	DKCMAIN	83-04-01-40/00	83-03-25-40/00
	SVP	83-04-01-40/00	83-03-24-40/00
VSP G200	DKCMAIN	83-04-01-20/00	83-03-25-20/00
	SVP	83-04-01-20/00	83-03-24-20/00
NAS module	NAS OS	13.0.4323.02	12.7.4221.09
	SMU	13.0.4323.02	12.7.4221.09

Note:

An external SMU is not required but can be used to manage VSP G400, G600, G800 with NAS modules.

Supported features and functions

DKCMAIN and SVP firmware

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

<table>
<tr><th>No</th><th>Title and description</th></tr>
<tr><td>1</td><td>Improvement for microcode exchange performance

(1) The following are implemented to improve the microcode exchange performance:
(a) Firmware transfer performance improvement
(b) NASWINST firmware size reduction

(2) With the above performance improvement, the value of reference processing time displayed in the firmware update dialog when firmware update processing starts changes as follows.

<table>
<tr><td>Firmware</td><td>Before change</td><td>After change</td></tr>
<tr><td>Unified Hypervisor</td><td>100 min</td><td>90 min</td></tr>
<tr><td>HASFWINST</td><td>100 min</td><td>35 min</td></tr>
<tr><td>NASFW</td><td>100 min</td><td>90 min</td></tr>
<tr><td>GUM *</td><td>90 min</td><td>85 min*</td></tr>
</table>
*The time for GUM firmware is displayed only when the update type is “Online”.</td></tr>
</table>

No	Title and description
2	Support for Task Set Full response When the I/O issued to the storage is overloaded, returning a Task Set Full response from the storage to hosts is supported. The function is available when host mode option (HMO) 105 is set to ON. Public Mode – No Permission Required to Use
3	Update for SMI-S Provider The following items are supported for SMI-S Provider: - SMI-S version 1.7.0 - Collecting I/O information per parity group is available. - Collecting cumulative values of data transfer amount respectively for read and write I/Os as LDEV I/O information is available. The internal SMI-S version supporting the above items is 12.0.0 09/20/2016 14:12.
4	Support for global-active device (GAD) Active-Active at quorum disk blockage GAD Active-Active at quorum disk blockage is supported. With the support, the behavior of a GAD pair when a quorum disk is blocked changes as follows: <Before support> - The GAD pair is suspended due to failure, or - The GAD pair is not suspended and duplication continues but the S-VOL becomes inaccessible. <After support> The GAD pair is not suspended due to failure even when a quorum disk is blocked, and the S-VOL remains accessible (both P-VOL and S-VOL are active), but if all paths between the storage systems are cut off after the quorum disk blockage, the P-VOL is prioritized for access and the pair is suspended due to failure. Procedure to apply the support: (1) Upgrade the microcode of storage systems on primary and secondary sites to 83-04-01-x0/00 or later. (2) Create or resynchronize a GAD pair, or perform a swap resync operation for the GAD pair. Note: When a quorum disk is blocked, existing GAD pairs for which the above procedure was not performed are suspended due to failure or S-VOLs become inaccessible even when the GAD pairs are in PAIR status. After the microcode is upgraded to 83-04-01-x0/00 or later on storage systems at the primary and secondary sites, it is recommended to perform a resync or swap resync operation for all existing GAD pairs.

No	Title and description
5	Support for capacity saving (data deduplication and compression) The capacity saving function is supported. Compression: The compression function reduces the size of data by encoding without reducing the amount of data. Deduplication: When the same data is written in different addresses in the same pool, the deduplication function deletes the duplicated data while keeping the data only in one place.
6	Improvement for audit log The following are improved for audit logs: (1) Detailed information is added for an event related to a key for stored data encryption. (2) The information currently output in hexadecimal characters is output in text format to improve the readability of audit log information that is reported when a host or a PC where Command Control Interface works sends a command.
7	Support for requirement for iSCSI UNH IPv6 certification For iSCSI connection, the requirement for UNH IPv6 certification is supported. Displaying the behavior and address status of IPv6 global addresses corresponding to each of prefixes provided by two IPv6 routers is supported, which is the requirement for the UNH IPv6 certification. However, the UNH IPv6 certification is under application.

No	Title and description
8	Support for 4HF32R CHB A new CHB, 4HF32R, that is capable of connecting VSP Gx00 and VSP Fx00 models with external devices using 16Gbps or 32Gbps (*5) Fibre Channel is supported. With the new CHB support, the following functions are available: - Displaying CHB mounting, configuration change, and maintenance statuses - LUN Manager (Fibre Channel configuration setting) (*1) - Using 16Gbps or 32Gbps (*5) Fibre Channel as an interface for hosts and program products (TC, UR, UVM, GAD) communication - SFP hardware configuration where 16Gbps or 32Gbps (*5) can be used as any interface - Firmware replacement of CHB (FC32G) that is the control firmware for the 4HF32R CHB, and data update of CHB Flash (*2) - Direct Point-to-Point connection with host systems and other vendor external storage systems (*3)(*6) - PCB type change replacement to extend configuration from 2-port 16G I/F to 4-port 16G I/F (*4) - Direct Point-to-Point connection with Hitachi external storage systems (VSP G1000, G1500, VSP F1500, VSP Gx00, and VSP Fx00). *1: 4HF32R CHB does not support Fibre Channel Authentication. *2: The function is also supported for CHB (FC16G) and CHB (iSCSI). *3: The function is available only for 16Gbps/32Gbps link. It is also supported on 2HF16 CHB. *4: The function supports the configuration change from 2HF16 CHB to 4HF32R CHB (4 port 16G SFP configuration). *5: 32G SFP is not supported yet. *6: The support can be applied to devices that have been evaluated at ITPD/HDS. For the information of support devices, refer to FRS.
9	Support for Quick Format for drives larger than 8TB With the support of 10TB NL-SAS and 14TB FMC drives, Quick Format for large-capacity drives over 8TB is supported. In particular, the number of parity groups for which a quick formatting operation can be performed at the same time is changed as follows: - G800 and F800: 72 parity groups (maximum no. of entries* = 72) - G400, G600, F400, and F600: 36 parity groups (maximum no. of entries* = 36) - G200: 18 parity groups (maximum no. of entries* = 18) *: The entry is an index to calculate the number of parity groups for which a quick formatting operation can be performed at the same time, and is defined as follows: - A parity group consisting of drives of 8TB or smaller uses 1 entry. - A parity group consisting of drives larger than 8TB uses 2 entries.
10	Support for external storage systems The following are supported as external storage systems: - VSP G1500 - VSP F1500 - PureFlashArray

No	Title and description
11	Support for 10TB NL-SAS drive The following 10TB NL-SAS drive is supported for VSP G200, G400, G600, G800: - DKR2H-H10RSS Note: This information is only intended to show microcode support for future drives not yet shipped out that will be compatible with existing models. When the drives are shipped, we will issue hardware ECNs containing more details about shipping dates and drive compatibility.
12	Support for new flash module compression (FMC) drives The following FMC drives are newly supported: (1) NFHAF-Q6R4SS Version 00-F0-81 (2) NFHAF-Q13RSS Version 00-F0-81
13	Message update due to reduction in time for SN initial startup With reduction in time for Storage Navigator initial startup, the time indicated in the message below that appears on the startup waiting window is changed from 30 minutes to 10 minutes. Storage Navigator start-up may take up to 10 minutes. If services do not become Ready (Normal) after 10 minutes, there may be a problem in the network connection between the SVP and the storage system. Please verify all of the following: - The environment allows accesses from the SVP to the IP address of the storage system specified at storage system registration. - The user name or password of the storage system specified at storage system registration is correct. - GUM of the storage system specified at system registration is not rebooting.
14	Support for Windows Server 2012 Windows Server 2012 is supported as an OS for a computer on which Storage Navigator runs.
15	Support for packet transfer to port #202 of NAS module A function to transfer packets that port #202 of a user LAN receives from a client PC to port #202 of NAS module is supported to support Volume Shadow Copy that is a NAS function.
16	Change to NAS platform login condition A user group to which a user account who logs into the NAS platform should belong is defined as Administrator User Group of the built-in user group. If the firmware version is 83-04-01-x0/00 or later, login to the NAS platform is enabled by using user accounts belonging to Administrator User Group of the built-in user group. If the firmware version is earlier than 83-04-01-x0/00, login to the NAS platform is enabled by using user accounts belonging to both Administrator User Group and Support Personnel Group of the built-in user group.

No	Title and description
17	Support for new flash module drive The following flash module drives are newly supported as compatible drives: (1) NFH1D-P1R6SS Version 00-L0-B0 (2) NFH1D-P3R2SS Version 00-L0-B0
18	Support for command control interface (CCI) Ver. 01-39-03/04 Supported functions from Ver. 01-38-03/01: - GAD Active-Active (VSP Gx00 only) - Deduplication and compression - Parity group creation and deletion - Spare drive setting and releasing - Drive information display - External volume forcible deletion (VSP Gx00 only) - Command device setting on a virtual storage machine (VSP Gx00 only) For details, see the Command Control Interface Release Notes (RN-90RD7194).
19	Enhancement for combining HCS REST API with VSP Gx00, VSP Fx00 The function to combine HCS Configuration Manager REST API with VSP Gx00, VSP Fx00 is enhanced. In particular, DTLS1.2 is available for encryption communication between Configuration Manager and VSP Gx00, VSP Fx00.
20	Improvement for Thin Image (TI) CTG ID reservation method The method to reserve free consistency group (CTG) IDs is modified. Currently, when CTGs are used for Thin Image, free CTG IDs are reserved from #0 in ascending order (up to 2047). On the other hand, CTG IDs that can be used for ShadowImage are only from #0 to #127. Therefore, if 128 CTGs are used for TI, CTG IDs from #0 to #127 are in use so that no CTG IDs are available for SI. To avoid the above issue, CTG IDs for TI are reserved in ascending order from #128 to #2047. If CTG IDs from #128 to #2047 are all reserved, then IDs are reserved in ascending order from #0 to #127. The above change applies only to the `raidcom add snapshot` command (unavailable for the `paircreate` command).
21	Support for OpenSSL 1.0.2h OpenSSL 1.0.2h is supported for the end of support for OpenSSL 1.0.1 as of December 31, 2016. To apply the support, remove the existing Apache software and then install Apache 2.4.16 (OpenSSL 1.0.2h). For the detailed procedure, refer to the Maintenance Manual (08 MAINTENANCE PC).

No	Title and description
22	Support for RAID Manager Library Ver. 01-22-03/01 Support function from Ver. 01-22-03/00: - Digital signing using SHA256 certificate is added to RAID Manager Library for Windows.
23	Support for shortest_queue attribute The shortest_queue attribute is supported for AIX MPIO ODM. MPIO_ODM 5.4.1.2 ODM 5.0.52.3
24	Support for storage management software installation in CCI environment Installation of storage management software in an environment where Command Control Interface is installed is supported. (1) The storage management software can be installed in the environment where CCI is installed. (2) The storage management software can be updated in the environment where CCI is installed. (3) At installation or update of storage management software, whether to update the installed CCI or not can be selected. (4) When removing the storage management software from the environment where CCI is installed, CCI is not removed.

NAS OS and SMU firmware

No	Title and description
1	Asynchronous storage replication Asynchronous replication from a secondary to a tertiary target allows a replication target to be used as a source for another replication (the tertiary target). Previously, a replication target could only be promoted to a read/ write file system or used as a target for further incremental object replications. Now a replication target can not only be the source of yet another replication target, its file systems can also be browsed in a read-only state and be replicated to the tertiary target. This feature has the benefit of performing replications to a remote target via a WAN link without making heavy demands on the resources of the main server. Asynchronous Replication can offload the network demands of the slower WAN link away from the main server.
2	GAD Enhanced for NAS GAD Enhanced for NAS uses the Global-Active Device (GAD) feature to form a cluster of two VSP Gx00 systems with NAS modules. This synchronous disaster recovery configuration creates a four-node NAS cluster stretched across two sites within 100 km of each other. Contact your Hitachi Data Systems representative for more information about this special configuration.

No	Title and description
3	Support for UVM (External volume) The NAS server can support data on an external server using Hitachi Universal Volume Manager (UVM). UVM permits storage on external storage arrays to be presented to the server as if the storage is local. To subsequently migrate data from the external storage onto the local storage, the server also supports Hitachi Tiered Storage Manager (HTSM). UVM enables storage that is accessed by one cluster to be taken over by another cluster. Using UVM instead of Universal Migrator enables the NAS server to preserve snapshots, quotas and ACLs. It also has the ability to replicate a whole span in a single operation.

Note:

- Note that the NAS server now supports at least 20,000 shares per cluster.
- Some Management Audit events have been added and some have been removed. See the Server and Cluster Administration Guide for more information on Management Auditing.
- Do not use NAS deduplication and storage-based deduplication on the same LUs as this reduces performance.

Fixed problems

DKCMAIN and SVP firmware

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

No	Category	Title and symptoms
1	TrueCopy, Universal Replicator, global-active device	SSB=B6EB logged at delay or time-out When a delay or time-out occurred in the communication between MCU and RCU in TC, GAD, or UR configuration, SSB=B6EB might be logged.
2	TrueCopy, Universal Volume Manager, global-active device	SSB=BEF8 logged at I/O When an I/O was issued to an external volume, or a TC or GAD pair volume, if the condition of the external path or remote path was not stable, SSB=BEF8 was more likely to be logged.
3	Open	Failure of offline firmware update After startup was interrupted (SIM=EFFEXX) during initial installation and then a recovery operation with wrong procedure was performed, if offline firmware update was performed, message 30762-208001 was displayed and the offline firmware update failed.
4	Command Control Interface	Wraparound of trace storing area There was no visible phenomenon but internally the trace storing area was wrapped around in a day because traces for health check issued from GUM and CCI were collected.
5	Universal Volume Manger, TrueCopy, global-active device, Universal Replicator	SSB=B234 logged many times In UVM, TC, GAD, or UR environment, if ABTS between storage systems occurred frequently, SSB=B234 might be logged many times.
6	TrueCopy, Universal Replicator, global-active device, Universal Volume Manager	TC/UR/GA/UVM path blockage due to frequent ABTS ABTS occurred frequently and then a TC, UR, GAD, or UVM path might be blocked.
7	Command Control Interface	Display failure of pair status When commands were run for blocked GAD pair volumes, the command turned to error as follows. - pairvolchk command: LDEV=BLOCKED was not displayed. - pairdisplay command: A hyphen (-) was displayed instead of "B" in the EM column.

No	Category	Title and symptoms
8	Open	Failure MP not blocked but different MP blocked When an MP whose timer wrongly worked at high-speed due to a hardware failure waited for a resource lock release, the MP wrongly determined a different normal status MP that had obtained a lock for the resource as being hung up. As a result, the normal status MP was blocked but the failure MP was not blocked. SIM=3073XX, 3080XX SSB=1344, 1487, 32FE, 32FA
9	Global-active device	Increase in MP usage rate When GAD pairs belonging to a consistency group were defined, the MP usage rate might increase.
10	Open	Failure of operations due to duplicate IPv6 address If the same IPv6 address was used by 2 different devices on the same iSCSI network, the IPv6 address on the table managed by the microcode and the IPv6 address displayed on Storage Navigator or CCI did not match so that an IPv6 address different from the duplicate one might be displayed. In this case, operations using the displayed wrong IPv6 address (such as login and ping) failed.
11	Open	Unable to indicate problem of duplicate IPv6 address When the same iSCSI IPv6 address was used by 2 different devices on the same network, "DUP" was not displayed for the IPv6 address status on Storage Navigator and Command Control Interface (*). * IPv6 address auto setting: "INV" was displayed after 10 seconds. IPv6 address manual setting: "VAL" was displayed after 10 seconds. Even though the IPv6 address status was "" (valid status), login with the IPv6 address was disabled.
12	Open	Failure of PCB information collection When dsvp_GetPcbInfEx2() of Remote Maintenance API was used, an RMAPI_SVP_OTHER (0c000a) error occurred wrongly and the PCB information could not be obtained.
13	Dynamic Tiering, active flash	Display failure of TD_RANGE and TL_RANGE When raidcom get dp_pool -pool [pool#] -key opt was run for a DT or active flash pool, values of TD_RANGE and TL_RANGE became "0" and SSB=2EF6 was logged.
14	Open	SSB=BE83 logged at link-down immediately after link-up On a port of iSCSI CHB where a path was created, a link-down occurred immediately after link-up following link-down, a soft reset occurred and SSB=BE83 was logged.

No	Category	Title and symptoms
15	Open	Hardware diagnosis error at PS ON or maintenance operation After an internal loopback setting for CHB (2HS10S) hardware diagnosis at PS ON or maintenance operation, the path could not be linked up within the linkup time-out time, and a hardware diagnosis error occurred. SIM=760000, SSB=3306
16	Open	MP blockage at CHK1 When CHK1 occurred due to a failure, an MP might be blocked.
17	Open	Unintentional change of Server Priority Manager setting When PS ON was performed after performing Server Priority Manager setting change from Storage Navigator or Command Control Interface, performing forcible power OFF, and then placing the jumper for cache memory volatilization, the Server Priority Manager setting was turned back to the previous one.
18	Command Control Interface	Inadequate SSB logged at LDEV deletion When the raidcom delete ldev command was run from CCI to a DP volume associated with a blocked pool, the command turned to error as per specification, but if raidcom get command_status was run at the time, SSB=2EFF FFFF that indicated an internal error was logged.
19	Command Control Interface	Inadequate SSB logged at LDEV recovery When the raidcom modify ldev -status nml command was run from CCI to a DP volume associated with a blocked pool, the command turned to error as per specification, but raidcom get command_status was run at the time, SSB=2E30 000A (Volume is a virtual volume) was logged.
20	Drive	No response for command leading to frequent SSB log and drive blockage If LU reset processing could not be completed, no responses were returned for following commands. In this case, SSB=A9A3 was logged many times and a drive was blocked.
21	Open	Hardware diagnosis error At PS ON or CFM initial diagnosis in CFM maintenance, if response of CFM firmware was delayed, a time-out occurred and a hardware diagnosis error occurs. SIM=760000, SSB=3306
22	Open	Inadequate message 30762-208001 If the GUM firmware was updated at ADC startup, message 30762-208001 was displayed but the cause of error was unknown from the message.

No	Category	Title and symptoms
23	Global-active device	Failure of shared memory removal When shared memory removal was attempted on a storage system where 2,800 or more LDEVs were registered, message 30762-208001 was displayed and the operation failed.
24	Open	Failure of blocked path recovery In UVM configuration where VSP Gx00 or Fx00 was connected with HUS100 using an iSCSI path, when online microcode exchange was performed on HUS100 side, the UVM path was blocked and the path could not be recovered by auto path recovery. SIM=21D0XX, 2182XY
25	Open	SSB=B646 logged at CHB (FC16G) microcode exchange SSB=B646 was logged at CHB (FC16G) microcode exchange.
26	Open	Performance degradation of pair creation At communication from a remote site (approx. 500 km) in iSCSI GAD connection, the data was divided into every 64KB with iSCSI even when TCP window size was set to 128KB, so that response took a long time and the pair creation performance was 60% lower than the theoretical value. (Command response from MCU to RCU was about 150 msec.) (The problem may occur in other iSCSI connections, such as host, UVM, TC, UR.)
27	Global-active device	Failure of GAD pair creation During a controller maintenance operation, if the status of a GAD pair was changed, SSB=FA59 or FAFF was logged and creation of some GAD pairs failed.
28	Open	Failure of Auto Define Configuration If an MP was blocked during Auto Define Configuration (SIM=3073XX), Auto Define Configuration could not be completed.
29	Open	Unnecessary NAS restoring at NAS firmware installation At NAS firmware installation, unnecessary NAS restoring worked.
30	Open	Unable to release reservation In iSCSI connection, if a host using a reserve command was used, the reservation could not be released.

No	Category	Title and symptoms
31	Open	SSB=D34E and pinned slot During controller maintenance, SSB=D34E was logged and a pinned slot might occur. In this case, SIM=FF4XXX was reported.
32	Open	Failure information not collected properly When a controller failure occurred during dump collection, the failure information could not be collected properly. SSB=3250 was logged.
33	Open	Controller blockage at DIMM correctable errors In a configuration of storage system with NAS modules, if DIMM correctable errors occurred 4 times, the controller was blocked. SIM=CF88XX SSB=3471
34	Command Control Interface	Abend of raidcom get parity_grp When both options -parity_grp_id and -key were specified for raidcom get parity_grp command at the same time, the command ended abnormally.
35	Global-active device	Inconsistent reservation status When GAD pair initial copy was performed in a configuration consisting of GAD, AIX, PowerHA7.2, and MPIO (PR_Shared), the reservation status of S-VOL side became Normal while that of P-VOL was PGR/Key.
36	Global-active device	Failure of pair status display When the suspending processing occurred from the other side of a pair during the suspending processing per pair that worked due to a path failure between storage systems after quorum disk blockage, the pair status displayed after the suspending processing might be PSUS/PSUE.
37	Global-active device	Suspending processing not performed for pairs other than the pair receiving write I/O The suspending processing that worked due to a path failure between storage systems after quorum disk blockage was performed per pair for each pair in a CTG , but the suspending processing that worked when a write I/O was issued to the S-VOL of the pair was performed only for the pair volume that received the write I/O.

No	Category	Title and symptoms
38	Global-active device	I/O mode Block/Block if no response returned for 2 minutes or longer After the suspending processing per pair that worked due to a path failure between storage systems following quorum disk blockage was complete, if the suspending processing from the other side of the pair did not return any response for 2 minutes or longer, the I/O mode of the pair might become Block/Block.
39	Global-active device	Failure suspension of GAD pair When a GAD pair was suspended by an operation immediately after a quorum disk was blocked, the GAD pair might be suspended due to failure. SSB=FC08, SIM=DD2XYY
40	Global-active device	Failure of GAD pair deletion When a controller failure occurred at GAD pair deletion, SSB=FC01 was logged and the deletion might fail.
41	Global-active device	Failure suspension of GAD pair When a quorum disk failure was detected while there were 4000 or more GAD pairs in a CTG, the GAD pairs were suspended due to failure. SIM=DD2XYY
42	Global-active device	SSB=44E1 logged at quorum disk failure suspension When a quorum disk was suspended due to failure during I/O, SSB=44E1 was logged.
43	Global-active device	Wrong GAD pair status after pair deletion During the time period from after GAD pair deletion to before pair re-creation, the pair status before GAD pair deletion was displayed.
44	Global-active device	Incomplete status change disabling pair operations During suspending or deleting operation, if all paths from the storage system where the operation took place became unavailable and a quorum disk was inaccessible, the status change of the other storage system could not be completed. In this case, resync and deleting operations might fail.
45	Global-active device	Unintentional I/O mode change to Block/Block disabling access to pair When a failure occurred on paths in one direction, the I/O mode of pairs became Block/Block and accesses to the pairs were disabled.

No	Category	Title and symptoms
46	Global-active device	SSB=FCE1 logged at GAD pair suspension When a GAD pair belonging to a CTG received an I/O while the path between MCU and RCU was disconnected, the write I/O that the GAD pair received could not be copied so that the pair was suspended as per specification. As the path between MCU and RCU was not available, a quorum disk was used for communication to notify the suspending request, but SSB=FCE1 was logged when the quorum disk suspending was detected on the remote side.
47	Global-active device	Failure suspension of GAD pair During recovery from a quorum disk failure on MCU side, if a failure occurred on a path between storage systems and a write I/O failed so that GAD pairs were in process to be suspended due to failure, some of GAD pairs whose I/O mode was not yet Block might be suspended while P-VOLs and S-VOLs were in PSUE (Local) status. SSB=FC83 (at quorum disk blockage)
48	Global-active device	Failure of GAD pair operations for CTG Phenomenon1 When pairs were created, SSB=FB41 was logged and the creation failed. Phenomenon2 When pairs were resynchronized with CTG specified, the status of some pairs did not change to COPY even though a quorum disk was recovered. Phenomenon3 When pairs were resynchronized with LDEV specified, SSB=FB50 was logged and the operation failed even though a quorum disk was recovered. Phenomenon4 When pairs were suspended with CTG specified, SSB=FB64 was logged and the operation failed. Phenomenon5 When pairs were suspended with LDEV specified, SSB=FB64 was logged and the operation failed. Phenomenon6 When pairs were deleted, SSB=FB70 was logged and the operation failed.
49	Universal Replicator	Abend or delay of UR pair deletion When a UR pair was deleted in a configuration including a UR pair, SSB=8E43 was logged and the pair deletion ended abnormally or took a long time.

No	Category	Title and symptoms
50	Global-active device	Failure of GAD swap resync operation At GAD swap resync operation with CTG specified, if a quorum disk was blocked on the storage system from which the swap resync operation was requested before the status of all pairs in the CTG changed to COPY, the swap resync operation could not be completed.
51	Global-active device	No explanation for forcible deletion in message 21021-209028 Message 21021-209028 displayed when deleting GAD pairs with Force specified for Delete Mode did not clearly mention that Force should be selected only when the I/O mode of pairs to be deleted was Block/Block.
52	Universal Replicator	UR pair failure suspension When splitting a UR pair with Flush specified, the UR pair might be suspended due to failure. SSB=ED08
53	Open	Delay in response If an MP was occupied by the communication between the MP and GUM, a response delay might occur.
54	Command Control Interface	Spelling error in title of total capacity column When raidcom get parity_grp -key opt was run from CCI, the displayed title of total capacity column was TOTA_CAP (GB). (It should be TOTAL_CAP (GB))
55	TrueCopy, global-active device	TC path blockage When link-down and link-up occurred repeatedly, a TC path was blocked. SSB=CA3A
56	Open	Failure of online microcode exchange Online microcode exchange while receiving link frames such as ABTS from hosts failed. SSB=1094
57	Open	Blockage of all iSCSI ports When an MP was blocked during PS ON, all iSCSI ports might be blocked. SIM=2120XX

No	Category	Title and symptoms
58	Command Control Interface	Inadequate SSBs logged SSB=2EE8 and 00E7 logged in the following cases were not inadequate. (1) Performing zero data page reclamation from CCI for a DP volume being formatted (2) Performing zero data page reclamation from CCI while SOM755 was set to ON.
59	Open	Abend of online microcode exchange Online DKCMAIN or RAMBOOT microcode exchange turned to time-out and ended abnormally. Message 33361-201403: 30863-200030 was displayed.
60	Open	Failure of starting-up storage system When a storage system was turned on after the following events occurred in the listed order, the storage system did not become Ready and SIM=EFFEXX was reported. (1) Controller replacement failed. (2) Power outage occurred or forced power off was performed. (3) The power was recovered.
61	Open	Pinned slot at CHK1B When CHK1B (SSB=32FD) occurred, data transfer time-out (SSB=BFCC) occurred frequently and a pinned slot (SIM=FF4XXX) occurred.
62	Open	Failure of PCB recovery When a maintenance operation whose targets were multiple PCBs (CHB, DKB, eIOM) was performed, if recovery for one of the PCBs failed, other PCBs for which recovery was not yet performed could not be recovered and the following messages were reported. 30762-208767 SSB=39B0, 39B4
63	Open	Failure of controller replacement At controller replacement, message 30762-208330 was displayed and the replacement failed. As a result, the status of the controller whose replacement failed remained Failed.
64	Open	Port blockage at correctable iSCSI PCIe error A correctable iSCSI PCIe error occurred on a 2HS10S or 2HS10B CHB, and the port was blocked. SIM=2120XX SSB=BE24

No	Category	Title and symptoms
65	Open	Frequent I/O interruption and link-up/link-down in iSCSI connection In iSCSI connection with a host in high load I/O environment, or in UR configuration using iSCSI paths, I/O interruption (SSB=1699), and link-up and link-down might occur frequently.
66	Open	SSB=3448 logged frequently At a failure on a specific HFB, SSB=3448 might be logged frequently.
67	Open	Controller failure at CHB failure At a CHB failure, a controller failure occurred after the chip reset processing was performed. SIM=3072XX SSB=3250
68	Open	Display failure of port status When the port status was checked on the View Port Location window on Storage Navigator, a port that was linked up seemed to be blocked.
69	Open	Inadequate SSB logged SSB=2E00 6002 that was logged when the following operations from CCI turned to time-out was not adequate. (1) Creating a DP volume whose capacity exceeded the subscription limit set to the specified pool (2) Changing the subscription limit to a value that was less than the total capacity of DP volumes associated with the specified pool.
70	Open	Incorrect parity group allocation at resource group creation or deletion Phenomenon1 When a parity group was created, it should have been allocated to a meta-resource but was allocated to a resource group other than the meta-resource. Phenomenon2 When resource group deletion was performed from Storage Navigator, message 20705-077104 was displayed and the operation was disabled even though the resource group did not contain any resources. Phenomenon3 When resource group deletion was performed from CCI, SSB=2E22 and 2202 were logged and the operation was disabled even though the resource group did not contain any resources.

No	Category	Title and symptoms
71	Open	Unintentional lock release System lock/resource lock on SVP/MPC was unintentionally released and the lock status became inconsistent between SVP/MPC (unlocked) and DKC (locked), so that obtaining and releasing lock failed after that and operations requiring lock were unavailable.
72	Command Control Interface	Unintentional iSCSI name registration When converting an iSCSI name into internal WWN from RAID Manager Library, the conversion ended normally even when an iSCSI name was not specified, and the iSCSI name was registered to length0 unintentionally.
73	Global-active device	Increase in response time When a GAD pair was created with an iSCSI path and then an I/O was issued, the response time between the host and VSP Gx00/Fx00 increased.
74	Open	Port blockage at setting change When the setting was changed for a CHB (2HF16) port connected to a cable, the port was blocked. SIM=2120XX
75	Open	Data transfer time-out When an FC16G (2HF16) port received I/Os with multiplicity of over 2048, the data transfer tuned to time-out. (SSB=DDA1, B6DA)
76	ShadowImage	Check Condition returned after read I/O time-out A read I/O to P-VOL of an SI pair in the SPLIT PEND process turned to time-out (45 seconds), SSB=DD88, D034, or 14DC was logged, and Check Condition (0b/c000) was returned.
77	Open	SSB=B5AA logged When a path was created on a port where HMO51 was set to ON, if Bad FCP_CMND Status=02h was received, SSB=B5AA was logged.
78	Open	Time-out of wait for internal resource release While the ownership of LDEV used for GAD, TC, or UR was set to a controller other than controller #0, a time-out of wait for internal resource release might occur wrongly. SSB=DD02, F58B, or F502
79	Open	Frequent SSB=BE48 In iSCSI connection with a host in high load I/O environment, SSB=BE48 might be logged frequently.

No	Category	Title and symptoms
80	Open	UVM path disconnected when sending NopIn After a UVM path was created in a configuration of VSP Gx00/Fx00 (Initiator) and a storage system that was not a Hitachi model (Target), when NopIn was sent from the Target storage system, the path disconnection occurred. The path disconnection was recovered immediately but it repeatedly occurred when NopIn was sent, which might cause performance degradation.
81	Open	WCHK1 and MP blockage At Auto Dump collection, WCHK1 occurred and an MP was blocked. SIM=3073XX SSB=32FE
82	Open	Wrong setting of BB_Credit_Management Bit When PLOGI/PLOGI-ACC was issued in Point-to-Point connection, BB_Credit_Management Bit that should be enabled in Loop connection was set to ON.
83	Thin Image	TI pair in PSUE status When TI differential data of 1.5TB or more was created, a pool seemed to be full and the TI pair became PSUE status. SSB=97E1
84	Open	Drive response error and drive blockage A data drive response error (SSB=A401, A403, or A404) and drive blockage (SIM=EF1XXX) occurred.
85	Server Priority Manager	Display failure of monitoring information When the SPM information was set to a TI S-VOL, and then an I/O was issued to the S-VOL, the monitoring information that was obtained by running raidcom monitor spm_ldev from CCI could not be displayed.
86	Open	Audit log format corruption and invalid character string display In the Set Up Syslog Server tab on the Audit Log Setting window on Maintenance Utility, when TLS1.2/RFC5424 was selected for Transfer Protocol and then the server setting was enabled, the format of output audit log was corrupted and invalid character strings were displayed.
87	Open	Display failure of audit log When selecting [Audit Log Setting] form Administration, and then GUM from Export Audit Log on the Audit Log Setting window on Maintenance Utility, the displayed audit logs were not displayed in chronological manner.

No	Category	Title and symptoms
88	SNMP Agent	Incorrect OID value and Test Trap content Phenomenon1 The value for the OID below obtained by SNMP Get was different from what described in the user guide. - sysObjectID(1.3.6.1.2.1.1.2) Phenomenon2 Scalar values for the OIDs below obtained by SNMP Get were different from those of the MIB definition file. - raidExMibName(1.3.6.1.4.1.116.5.11.4.1.1.1) - raidExMibVersion(1.3.6.1.4.1.116.5.11.4.1.1.2) - raidExMibAgentVersion(1.3.6.1.4.1.116.5.11.4.1.1.3) - raidExMibDkcCount(1.3.6.1.4.1.116.5.11.4.1.1.4) - raidExMibRaidListTable(1.3.6.1.4.1.116.5.11.4.1.1.5) - raidExMibDKCHWTable(1.3.6.1.4.1.116.5.11.4.1.1.6) - raidExMibDKUHWTable(1.3.6.1.4.1.116.5.11.4.1.1.7) Phenomenon3 Contents set to Test Trap were not correct as follows. - eventTrapPartsID(1.3.6.1.4.1.116.5.11.4.2.4) was not set. - reported contents of eventTrapDescription(1.3.6.1.4.1.116.5.11.4.2.7) were different from those of previous models.
89	Open	SSB=1424/1422/1420 logged When an I/O was issued or the function of TC, UR, GAD, SI, VM, or TI was enabled, logical contradiction of internal resource reservation might occur and SSB=1424, 1422, or 1420 was logged.
90	Open	SSB=142D logged When an I/O was issued or the function of TC, UR, GAD, SI, VM, or TI was enabled, a time-out of wait for internal resource release might occur and SSB=142D was logged.
91	ShadowImage, Volume Migration	SSB=1292 logged at SI/VM pair creation Local replica initialization was performed while SI or VM copy was running. After the local replica initialization was complete, SSB=1292 was logged at SI or VM pair creation.
92	Open	Display failure of Port Status Even when port status was link-up on CCI, the status was displayed as link-down.
93	Universal Replicator	Failure of delta resync with SSB=EBE2 logged In a TC-UR 3DC configuration, a delta resync operation after unplanned TC Hyperswap failed with SSB=EBE2 logged.

No	Category	Title and symptoms
94	Open	CHK2 due to T10DIF error When UNMAP command was run with a specific I/O pattern (from LBA of DP page boundary to TL across DP pages (e.g. LBA: 0x2A000, TL: 0x15001)) while SOM905 was set to ON, CHK2 (SSB=B2C8, B2FF, B253) due to a T10DIF error occurred.
95	Open	Failure of login to Storage Navigator Even when a server certificate updated on the LDAP server was registered to SVP while external authentication ldaps (LDAP over SSL/TLS) was enabled, login to Storage Navigator failed with the message "Failed to login".
96	Open	Inadequate expression of LDEV creation option (Offset Boundary) "Offset Boundary" that was an option for LDEV creation was not adequate.
97	Open	Unknown recovery procedure from message at login/logout failure When a user logged into or out from Storage Navigator while the CPU usage of SVP was 100%, the login or logout failed and message 20624 107005 was displayed but the recovery procedure was not clear from the message and login was unavailable after that.
98	Global-active device	Failure suspension of GAD pair A GAD pair creation or resynchronization operation ended normally but the GAD pairs might be suspended due to failure. SIM=DD2XXX, SSB=FA08
99	Open	Failure of NAS new installation NAS new installation might fail and message 35261-207000 was displayed.
100	Open	Inadequate troubleshooting in message When connecting to Storage Navigator while Flash Player was not available, the message below was displayed but the troubleshooting in the message was not adequate. Alternate HTML content should be placed here. This content requires the Adobe Flash Player. Get Flash.
101	Open	Failure of synchronization time obtained by JSON API When the system time setting information was obtained by JSON API (Action: getSystemSetting: DateTime), the result of synchronization time was -1.

No	Category	Title and symptoms
102	Open	Display failure of available parity group for NAS installation Even though NAS installation could not be performed for parity groups with accelerated compression enabled, the parity groups were listed as available parity groups on the NAS installation window.
103	Open	Display failure of syslog priority value The output priority value of audit log syslog was fixed to 139 (Facility_Local1, Severity: Error). The output priority value of SIM syslog was fixed to 147 (Facility_Local2, Severity: Error).
104	Open	Failure of updating message data to the latest version The message data (CSV file) that GUM provided to HCS for searching messages from the JSON API error codes was not the latest version.
105	Dynamic Provisioning, Dynamic Tiering	Display failure of UR pair status Even after refreshing the storage system display by Replication Manager, the UR pair status shown was "Unknown".
106	Universal Replicator	WCHK1 and MP blockage Due to frequent CHK1B (SSB=EA3F), WCHK1 occurred and an MP was blocked. SSB=1606 or 1607 was also logged.
107	Open	Inadequate message 308/63-200012 displayed at system lock release failure Message 308/63-200012 that was displayed when system lock release had failed was not adequate.
108	Dynamic Provisioning, Dynamic Tiering	Failure of pool volume shrinking A pool volume shrinking operation failed when the used pool capacity was at a certain level.
109	Open	Processing time-out due to continuous high CPU usage rate When performing microcode exchange, dump collection, or SVP reboot, the SMI-S CPU usage rate was continuously kept at around 80%, so that other processing could not be run and a time-out occurred.

No	Category	Title and symptoms
110	Open	I/O from normal drive disabled after drive port/SAS port blockage When no response was returned for a reset command issued to a drive and a drive port or SAS port was blocked due to threshold exceedance, drive I/Os could not be issued from both controllers. Also even if an ENC/DKB was replaced in accordance with the action code so that the blocked drive port/SAS port seemed to be recovered on the configuration window, the status in which drive I/Os from one controller in normal state were disabled still continued. By replacing the drive from which no response was returned for the reset command, drive I/Os from both controllers were enabled. SSB=AB0F, F7DC, 14FF, 14DC, A7D1, DD88, D031, D034, or DD84 SIM=DF8XXX, DF9XXX, or CF12XX
111	Open	Failure of Target search and SSB=BE81 wrongly logged Phenomenon1 While an iSCSI port was used as a Target port, IPv6 Neighbor Discovery failed and target search using an IPv6 address from a host was unavailable. Phenomenon2 When an iSCSI port was used, SSB=BE81 was logged wrongly.
112	Thin Image	Delay in TI copy or I/O time-out at WCHK1 During write I/O to P-VOL or S-VOL of a TI pair in the PSUS status or restore copy processing for the pair, if WCHK1 occurred on an MP belonging to an MPU that had the ownership of the TI P-VOL or S-VOL, SSB=F5AD or E569 was logged, and the copy might be delayed or the I/O to the slot in copy process might turn to time-out.
113	Open	Failure of zero data writing When LDEV formatting was performed for a DP volume, the data of pages being used could not change to zero.
114	Open	Failure of LDEV formatting/maintenance operation When LDEV Format, LDEV Quick Format, Volume Shredder, Parity Group Format, Block LDEVs, or Restore LDEVs was performed from Storage Navigator or CCI, one of the following messages was displayed and the operation failed. Storage Navigator: 03005-002011 CCI with raidcom get command_status command: SSB=2EE8, FFFF

No	Category	Title and symptoms
115	Command Control Interface	Display failure of hexadecimal LDEV# Even when the -fx option was specified for raidcom get spm_ldev command, LDEV# was displayed in decimal number but not in hexadecimal number. For example, if LDEV# was 1000, it should be displayed as 3e8.
116	Command Control Interface	Command rejected at UR pair creation/resync When a command to create a UR pair was run while specifying an HUS VM virtual storage machine as the secondary side, the command was rejected and SSB=D004 and 8F04 were logged.
117	Open	Failure of Svp_send.dll loading and application error When running ADTRcv.exe, loading Svp_send.dll failed and an application error (event ID: 1000, exception code: 0xc0000142, module path where the failure occurred: Svp_Send.dll) occurred.
118	Drive	Failure of drive replacement for pinned slot recovery Drive replacement for pinned slot recovery failed with message 30762-208312 displayed.
119	Open	Incorrect memory access and MP blockage When an SI, VM or NDM pair operation was performed while the monitoring switch was ON, an incorrect memory access occurred and an MP might be blocked.
120	Open	Failure of maintenance operation after CHK1 When CHK1 occurred on a storage system in TC, GAD, UR, TI, or SI configuration, a maintenance operation (such as PS OFF, controller maintenance, and firmware exchange) after that failed. (When PS OFF failed, SIM=388F00 and SSB=80E9 were reported.)
121	ShadowImage	SI copy processing stopped While Local Replica Option; Quick/Steady Split Multiplexing was enabled, when Quick Split was performed for an SI pair and then Resync was performed for the pair in the Split Multiplexing copy process, the SI copy processing stopped.
122	Dynamic Provisioning	Unclear action at shared memory removal The action in message 30762-208288 that appeared at shared memory removal, which was "Contact customer support.", was not clear.

No	Category	Title and symptoms
123	Open	Controller blockage during firmware update and failure of blocked controller replacement Phenomenon1 During firmware update, SSB=39BA and SIM=CF88XX were reported, the update failed, and the controller was blocked. Phenomenon2 If the blocked controller was replaced after phenomeon1, SSB=39B4 was logged and the replacement failed.

NAS OS and SMU firmware

Issue ID	Severity	Description
121303	B	SMB signing now causes less heap fragmentation.
65263	C	Added improved diagnostics to detect performance issues.
88521	C	Fixed an issue where enumerating a large number of shares caused warnings to be issued to the console.
90214	C	The nim-cifs-perf command now always gathers CIFS stats correctly on a busy system.
93275	C	NAS server communication with Windows domain controllers has been improved in order to remove the possibility of a memory leak.
103697	C	Fixed an issue which caused the NAS server to become unresponsive during high parallel load by dropping new requests from clients which already have too many pending responses.
103978	C	The size of localgroup diagnostics output is now capped to prevent performance issues.
121875	C	Fixed an issue where the NAS server attempted to read or write to a deleted stream. The server now checks to see if a named stream has been deleted before reading or writing to it.
123584	D	The heap-info command’s output has been improved in the case of pool over-allocation.
123635	D	Event 1363 has been updated to provide a better explanation of tuning maximum heap allocation for a pool.
123809	D	Fixed a transient error which caused the cluster number to acquire the default number of zero when a SCSI inquiry command was sent when the server booted. This issue only affected VSP G1000 storage arrays.
108102	E	Fixed an issue where a SCSI command sent after the port had initialized was erroneously logged. This caused the SCSI trouble reporter to report that a failed LUN had been detected by the port. As the port initialization had completed, the error did not clear down until the next port state refresh occurred.

Acronyms and abbreviations

3DC	three data center
AMS	Hitachi Adaptable Modular Storage
ASP	authorized service provider
BEM	back-end module (also called disk adapter)
CCI	command control interface
CL	cluster
CLI	command line interface
CM	cache memory
CRC	cyclical redundancy checking
CSV	Cluster Shared Volumes
CTG	consistency group
CU	control unit
CUDG	control unit diagnosis
DB	drive box
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 (refers to the entire storage system)
DKCMAIN	disk controller main (refers to the microcode/firmware)
DP	Hitachi Dynamic Provisioning
DP-VOL	Dynamic Provisioning V-VOL
DRU	Hitachi Data Retention Utility
DS	dynamic sparing
DT	Hitachi Dynamic Tiering
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
ECN	engineering change notice
EQC	equipment check
FC	fibre channel
FCoE	fibre channel over ethernet
FEM	front-end module (also called channel adapter)
FMC	flash module compression (another name for the FMD DC2 drives)
FMD	flash module drive
FRS	Feature Release Schedule
GPFS	General Parallel File System
GUM	gateway for unified management (another name for the maintenance utility)
HA	high availability
HAM	Hitachi High Availability Manager
HCS	Hitachi Command Suite

HDD	hard disk drive
HDS	Hitachi Data Systems
HDP	Hitachi Dynamic Provisioning
HDT	Hitachi Dynamic Tiering
HDVM	Hitachi Device Manager
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
HNAS	Hitachi Network-Attached Storage
HTI	Hitachi Thin Image
HUS VM	Hitachi Unified Storage VM
JNL	journal
JNLG	journal group
LBA	logical block address
LDEV	logical device
LU	logical unit
LUSE	logical unit size expansion
MCU	main control unit
MP	microprocessor
MPC	maintenance PC
MSCS	Microsoft Cluster Server
NASFW	NAS module firmware
PDEV	physical device
PS, P/S	power supply
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, G1500, and Hitachi Virtual Storage Platform F1500
RC	reference code
RCU	remote control unit
SAS	serial-attached SCSI
SI	Hitachi ShadowImage
SIM	service information message
SMU	system management unit
SOM	system option mode
SPM	Hitachi Server Priority Manager
SSB	sense byte
SSD	solid-state drive (also called flash drive)
S-VOL	secondary volume
SVOS	Storage Virtualization Operating System
SVP	service processor
TC	Hitachi TrueCopy
TI	Hitachi Thin Image
TOV	time-out value

TS	Technical Support
UR	Hitachi Universal Replicator
UVM	Hitachi Universal Volume Manager
VM	Volume Migration
VSP	Hitachi Virtual Storage Platform
VSP F1500	Hitachi Virtual Storage Platform F1500
VSP Fx00	Hitachi Virtual Storage Platform F400, F600, F800
VSP G1000	Hitachi Virtual Storage Platform G1000
VSP G1500	Hitachi Virtual Storage Platform G1500
VSP Gx00	Hitachi Virtual Storage Platform G200, G400, G600, G800
V-VOL	virtual volume
WWN	worldwide name

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