IBM TotalStorage® DS8800 Disk Storage
Microcode Bundle 86.31.95.0 Release Note Information v2

Release Date: December 18, 2013

VRMF Level Data Results:

VRMF level From:	86.31.86.0
VRMF Level To:	86.31.95.0
Report for:	All DS8700

Code Bundle Contents

DS8000 Code Bundle Level	SEA or LMC Version: Used with dscli *ver* command.	CLI Client Level	Storage Manager Code Level
86.31.95.0	7.6.31.1150	7.6.31.1150	5.6.31.1151

No new features and functions supported by Microcode Release 86.31.95.0 for DS8800, 242x model 951.

Features at a glance:

General:
• Problem fixes
• Serviceability enhancements
• Improvements

This new microcode release only supports the DS8800.

Select Modifications Included in this Release Note:
This is a list of some modifications contained across one or more LIC (License Internal Code) or microcode release(s). The potential impact is variable. Specific environments may aggravate or degrade the potential impact. Problem(s) fixed and reported in this release note may not be in higher levels of code bundles.

Definition of Problem Severity:
1 High Impact - Acute: An irrecoverable error with potential loss of data.
                  - Serious: An irrecoverable error with potential loss of access to data.
2 Moderate - A function not operational and/or performance might be degraded.
3 Service - A recoverable error (no impact) and service improvements.
4 Improvements - Improvement changes for better Usability and Serviceability.

HIPER: High Impact problem that is Pervasive: 3 or more occurrences

Acute: An irrecoverable error with potential loss of data.

DDM error analysis failed to reject DDM
1. **Problem Description:** During DDM error analysis, a microcode logic error prevented the analysis routines from proactively rejecting a failing DDM.
2. **Potential Impact of Problem:** loss of data
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No
ID#: 288717

0x7178 MLE, SEFLC target volume in FC08 state
1. **Problem Description:** After recovery from 0x7178 microcode logic error a Track-Space-Efficient Flash Copy target volume can be left in FC08 (unable to destage) state
2. **Potential Impact of Problem:** loss of data
3. **Problem Severity:** Hiper
4. **Pervasive Problem:** Yes
ID#: 286857

Device Adapter loop hang
1. **Problem Description:** During Device Adapter loop recovery, a command is sent that is no longer supported by firmware. While normally harmless, in this scenario, the command was not properly handled, causing the loop to hang, which interfered with the recovery process.
2. **Potential Impact of Problem:** loss of data
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No
ID#: 283044

Serious: An irrecoverable error with potential loss of access to data.

Host timeouts after mkpprc completion
1. **Problem Description:** After PPRC pairs were established, commands that were received during long busy were not properly handled at the conclusion of the long busy period.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No
ID#: 290927

Microcode logic Error on multiple Host Adapters
1. **Problem Description:** Microcode Logic Error caused by incorrect taskLogicalPathNumber.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** HIPER
Pervasive Problem: Yes
ID#: 288952

Setting 'E' bit masks channel protect check

1. **Problem Description:** When processing a SIDE command that did not provide any data (bytesTransferred= 0), the CU erroneously sets the 'E' bit in the status response to the channel. This causes the channel to not report a protection exception that prevented it from transferring the 5 bytes for the SIDE command.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No

ID#: 288582

Host bay fabric error recovery caused LoA

1. **Problem Description:** During fabric error recovery, a microcode logic error caused reset of last Device Adapter path to data.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No

ID#: 279049

DDM power shutdown during RPC replacement

1. **Problem Description:** During replacement of a failed RPC card, a microcode logic error caused register corruption in the good RPC card, which led to DDM power shutdown and firehose dump.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No

ID#: 273928

Emergency power off signal was sent to both clusters

1. **Problem Description:** The emergency power off signal was sent to both CECs when no loss of system input AC had occurred. This caused firehose dump and power off even though the system still had full AC input power
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** High Impact
4. **Pervasive Problem:** No

ID#: 260809

Moderate: A system path is not operational and performance might be degraded.

PPRC path utilization imbalance

1. **Problem Description:** A background task that collects path usage statistics, and maintains balanced path usage, is failing to run.
2. **Potential Impact of Problem:** Degraded performance
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** Yes

ID#: 291433

PPRC link errors cause host adapter to be fenced
1. **Problem Description:** Host adapter recovery can fence a host adapter that experiences CRC errors on a port used as a PPRC path.
2. **Potential Impact of Problem:** loss of path
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** No
ID#: 286001

Improve DA failover with RAID-6 ranks
1. **Problem Description:** When Device Adapter has a Compact Flash failure, and the adapter has RAID-6 ranks, DA failover of the ranks may post long busy for 90 seconds.
2. **Potential Impact of Problem:** loss of access
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** No
ID#: 283088

PPS failure prevents box IML
1. **Problem Description:** During box power up, a failed PPS can prevent the good PPS from configuring the rack batteries.
2. **Potential Impact of Problem:** Delayed access to data
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** No
ID#: 280857

Global Copy Collisions may impact system performance
1. **Problem Description:** Update writes for data that has not yet been committed to the secondary must wait for global copy commit. Customers with a high frequency of track updates may experience performance impact.

   This change implements functionality that will release track access more quickly. This function is disabled by default, and can be enabled as required by CS pokeable setting.
2. **Potential Impact of Problem:** degraded performance
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** Yes
ID#: 276618

IO Priority Manager may cause unwarranted throttling
1. **Problem Description:** Elongated read hit data transfer times caused by Host Adapter or SAN congestion may cause IO Priority Manager to throttle system throughput.
2. **Potential Impact of Problem:** degraded performance
3. **Problem Severity:** Moderate
4. **Pervasive Problem:** No
ID#: 276608

IBM TotalStorage® DS8800 Disk Storage
Microcode Bundle 86.31.95.0 Release Note Information v2

Service: A recoverable error, Service improvements.

Incorrect FRU callout for empty loop on Megapack
1. **Problem Description:** Left side FCIC card was incorrectly called for an empty loop failure on a left loop. The analysis routines should have called the right side FCIC for this failure.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 287460

CDA process hang
1. **Problem Description:** After cloning the bos image and applying the updates, the CDA process hung while attempting to retrieve data from the active cluster. This phase of the process did not have a timeout value.
2. **Potential Impact of Problem:** CDA process required manual intervention
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 286925

BBUs logically fenced during battery test
1. **Problem Description:** During battery test, an incorrectly initialized variable causes a microcode logic error.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 286922

0x4159 MLE on CKD track metadata mismatch
1. **Problem Description:** When performing a CKD track prestage of only requested tracks, a metadata mismatch in the last track requested can cause 0x4159 microcode logic error.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 286692

DDM rejected state=10 when only 1 spare is available
1. **Problem Description:** Spare DDMs rejected by background media scan are not properly counted when determining whether the DDM should be marked for immediate or deferred replacement.
2. **Potential Impact of Problem:** Reduced redundancy
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 286692

Host Adapter port error causes warmstart

1. Problem Description: Intermittent parity errors cause adapter reset, which in turn causes warmstart. For these errors it is not necessary to reset the entire adapter.

2. Potential Impact of Problem: Warmstart

3. Problem Severity: Service

4. Pervasive Problem: Yes

ID#: 284345

Dual HMC deadlock

1. Problem Description: HMC deadlock can occur when -
  (a) HMCs are rebooted at the same time that IBM.EssStorageFacility detects a need for an attribute update on both HMCs, or,
  (b) Both HMCs query IBM.EssStoragePlex at the same time

2. Potential Impact of Problem: CDA or GUI hang

3. Problem Severity: Service

4. Pervasive Problem: No

ID#: 284056

Microcode Logic Error 0x0109

1. Problem Description: If a reconnection is occurring at the same time as a health status message or Summary event message is being presented on the same volume, there is a possibility for a deadlock situation caused by misuse of the regular pgcb lock.

2. Potential Impact of Problem: Warmstart

3. Problem Severity: Service

4. Pervasive Problem: No

ID#: 283984

Laptop HMC process hang

1. Problem Description: Change ACPI setting from 'off' to 'ht'

2. Potential Impact of Problem: Unable to monitor DDM status

3. Problem Severity: Service

4. Pervasive Problem: No

ID#: 283246

False SRC B1811111

1. Problem Description: During battery test I2C bus communication is temprorarily blocked between FSP and CEC operator panel. This SRC should be vetoed if it happens during battery test.

2. Potential Impact of Problem: none

3. Problem Severity: Service

4. Pervasive Problem: Yes

ID#: 281334

Host Adapter timeout
1. **Problem Description:** Host Adapter timeouts caused by excessive internal mailbox timeout interval.
2. **Potential Impact of Problem:** Delayed reset of Host Adapter
3. **Problem Severity:** Service
4. **Pervasive Problem:** Yes
ID#: 280474

Microcode Logic Error 0x5302
1. **Problem Description:** Initiator was removed, but wwnn/wwpn were not correctly unregistered from FB initiator table.
2. **Potential Impact of Problem:** Warmstart
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 280175

Unable to replace power component during rack installation
1. **Problem Description:** When installing an expansion rack, if one of the power components fails before it has been configured, the resulting serviceable event cannot be used to drive the repair.
2. **Potential Impact of Problem:** Manual intervention required to complete the rack installation
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 277212

Reduce power CDA duration
1. **Problem Description:** The power firmware update process currently invokes verification routines at various points in the update. These routines verify multiple resources, some of which do not need to be verified every time the process runs. This change will reduce the duration of the power firmware update, by implementing more selective verification methods during the power firmware update process.
2. **Potential Impact of Problem:** Elongated service window
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 275470

8Gb Host Adapter ECC single-bit error threshold causes HA reset
1. **Problem Description:** When the Host adapter cache soft error log exceeds threshold, the microcode currently resets the adapter, which in turn causes a warmstart. These soft errors are normally benign, and do not require any action. The microcode behavior is changed to treat these soft error threshold events as a 'Class B' recovery, which will no longer reset the adapter.
2. **Potential Impact of Problem:** Warmstart
3. **Problem Severity:** Service
4. **Pervasive Problem:** Yes
ID#: 274931

Microcode Logic Error 0x4B20
1. **Problem Description:** For Cache to Cache operation, when Data Mover is waiting for DMA Read of the sectors to finish, the task is aborted. When C2C DMA Read completed, DM shutdown code path didn't free the DDs that were allocated, causing resource leakage and MLE.
2. **Potential Impact of Problem:** Warmstart
3. **Problem Severity:** Service
4. **Pervasive Problem:** Yes
ID#: 272720

Reduce size of heartbeat data collection
1. **Problem Description:** Currently, heartbeat collects all files that are in /var/esshmc/levels. This change will select only those files that are actually part of the heartbeat data collection.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 268253

Reset internal host bay fence bits during bay config
1. **Problem Description:** CDA pre-checks erroneously indicated a host bay internal fence condition that had already been resolved.
2. **Potential Impact of Problem:** Delay of microcode update
3. **Problem Severity:** Service
4. **Pervasive Problem:** No
ID#: 262924

Improvements: Improvement for better usability

PER Mode notification
1. **Problem Description:** Implement erProduct switch to send Health Status notification whenever a device is in Pre-Emptive Reconstruct mode
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 289800

New recovery routines for 8Gb Host Adapter cache single-bit errors
1. **Problem Description:** 284774 introduces a new ESC 2837. This implements the error handling changes necessary to support the new ESC.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 288251

Read Track Data, Write Track Data, and SLI CCW Flag
1. **Problem Description:** Provide z/OS with a method to determine if the Control Unit supports Write Track Data and Read Track Data accurate CCW byte counts. When the Control Unit indicates support, software does not need to set the SLI (Suppression of Possible Incorrect Length Indication CCW Flag.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 287281

Easytier algorithm improvement
1. **Problem Description:** Improve the calculations to better account for large sequential workloads.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 287117

FICON Dynamic Routing enablement
1. **Problem Description:** Adds Receive Configuration Data flag to indicate support for FICON Dynamic Routing, AKA Exchange-Based Routing (EBR).
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 287077

New error handling for 8Gb Host Adapter cache single-bit errors
1. **Problem Description:** With the changes in 274931, a new error type is added to the error recovery routines to enable reporting new ESC 2837 where appropriate.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 284774

Frequent Easytier rebalance on tiers with low activity
1. **Problem Description:** On rank tiers with low overall activity, Easytier may react to small workload imbalances, and attempt to rebalance the ranks.
2. **Potential Impact of Problem:** none
3. **Problem Severity:** Improvement
4. **Pervasive Problem:** No
ID#: 283977

PCR 6910/6972/7109 Support

1. Problem Description:

PCR 6910 -

When performing disaster recovery failover, provide the means to detect SCSI reserves on devices, identify the server that holds a reserve, and provide a means to reset the reserve.

PCR 6972 -

Reduce the possiblity of erroneously erasing contents of a CKD volume that belongs to another host image.

PCR 7109 -

Prevent accidental loss of data when restoring or initializing CKD volumes, by providing validation whether the volume is online.

2. Potential Impact of Problem: None

3. Problem Severity: Improvement

4. Pervasive Problem: No

ID#: 275206

Trademarks

The following terms are trademarks of the International Business Machines
Corporation in the United States, other countries, or both.
> AIX
> Enterprise Storage Server
> ESCON
> FICON
> i5/OS
> iSeries
> IBM
> pSeries
> S/390
> System Storage
> TotalStorage
> z/OS
> zSeries

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of
International Business Machines Corp., registered in many jurisdictions worldwide.
Other product and service names might be trademarks of IBM or other companies.
A current list of IBM trademarks is available on the web at Copyright and
trademark information at http://www.ibm.com/legal/us/en/copytrade.shtml.
Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered
trademarks or trademarks of Adobe Systems Incorporated in the United States,
and/or other countries.
Java and all Java-based trademarks and logos are trademarks or registered
trademarks of Oracle and/or its affiliates.
Linux is a trademark of Linus Torvalds in the United States, other countries, or
both.
Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in
the United States, other countries, or both.

Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products,
services, or features discussed in this document in other countries. Consult your local IBM representative for
information on the products and services currently available in your area. Any reference to an IBM product, program, or
service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally
equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead.
However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or
service. IBM may have patents or pending patent applications covering subject matter described in this document. The
furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:
IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.