



Release Notes

Product	LTO-4HH Serial Attached SCSI G9N1
Date	January 2017

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Introduction

These release notes apply to the Quantum LTO-4 Half Height Model C distribution product.

Terms

Types of changes:

- **Enhancements** - A given feature or algorithm of the product has been enhanced, to allow wider usability and/or to provide greater robustness
- **New Functionality** - A new piece of functionality is added.
- **Bug Fix** - Fixes a bug in the software.

Firmware Version Identification

These drives will have similar inquiry string as previous Quantum models and presented on the Standard Inquiry Page and Inquiry Device Identification Page 83h as:

- Vendor Identification = 8 bytes of ASCII data: "Quantum" followed by a space
- Product Identification = 16 bytes of ASCII data "ULTRIUM-HH4" followed by 5 spaces
- Product Revision Level = 4 bytes of ASCII data "YMDV"

Compatibility

LTO-4 HH compatibility requirements:

- The LTO-4 HH drive has a dual port SAS-2 6 Gbps interface
- Please use the Drive Compatibility Guide tool found on Quantum.com for software and hardware compatibility

New Features and Enhancements

This is a second FW release for LTO-4 HH SAS Model C drives. Changes described below are between E4J1 and G9N1 FW versions.

This update is intended, among other things, to increase overall reliability, improve tape handling, further reduce any possibility of error, and provide continued enhancements to diagnostic capabilities.

Description of Changes

Tape Handling/Media Errors

Type:	Bug Fix
Description:	Fix MLOI checking on Writes: Correctly set Early Warning based on maximum block number checks.
Type:	Bug Fix
Description:	Fix PEWZ break from MLOI changes: The Maximum Logical Object Identifier (MLOI) changes broke the Programmable Early Warning Zone (PEWZ) check - the PEWZ would only occur if it was due to block number (not position on media).
Type:	Bug Fix
Description:	ISM Panic on EOD reporting following FM detected at EOW: Fix code panic which occurred during a Space to EOD which terminated with a filemark at a wrap turn.
Type:	Bug Fix
Description:	Fix code panic for scenario with EOD at EOW: Fixes an additional code panic scenario involving an EOD at a wrap turn.
Type:	Bug Fix
Description:	Report "loading" as tape motion while unloading: Fix small window where the drive incorrectly reported loading status when it should have been unloading.
Type:	Bug Fix
Description:	MED_INVALID_TRIP on locating to partition 0: Fix FSC 7220 on switch to beginning of other partition
Type:	Bug Fix
Description:	Panic due to abort during flush: Fix code panic during a non-buffered Write which was aborted

Type:	Bug Fix
Description:	Setup HDPATH in Write abort case: Fix code panic from an aborted write sequence
Type:	Bug Fix
Description:	Fix false report of FSC 6600: Fixes a problem where incorrect parsing of DSIT contents caused a false report with FSC 6600
Type:	Bug Fix
Description:	Fix problem with false detect of BOT in MTR: Prevent a tape run-off scenario if BOT is falsely detected while executing mid-tape recovery
Type:	Bug Fix
Description:	Fix Ldr Blk park position after Idle Mode Unload: Fix the leader block park position after an Unload is issued while the drive is in Idle Mode and the tape is in the unthreaded state. This may help to prevent some cases of FSC 2E0C.
Type:	Bug Fix
Description:	Fix panic during space/locate sequence: Fix panic involved in handling buffer data flush in conjunction with degraded read performance during space/locate.
Type:	Bug Fix
Description:	Fix drive panic (reset) due to overlapping flush requests
Type:	Bug Fix
Description:	Drive failed unload with FSC 2E0C: Allow unthreading tape even when bottom sensor is off. Previously drive was fenced by 2E0C

Miscellaneous

Type:	Bug Fix
Description:	Fix wrongly returned emergency dump: Fix case where an emergency dump was returned when it was not requested
Type:	Bug Fix
Description:	FSC 78B5 on SendDiag for POST A: Fixed an issue where the drive could fail with a 78B5 when a SendDiag for a POST A test, and a cartridge was loaded in the drive.
Type:	Bug Fix
Description:	Timeout at unloading after LBP CRC error: Fix hang condition for certain command combinations following a CRC of LBP write.
Type:	Bug Fix
Description:	Avoid drive reset: Under certain timing related circumstances the drive would report two command completes, which would cause the drive to panic and reset.
Type:	Bug Fix
Description:	Timing of new write request vs error recovery reset: Fix code problem causing timeout.

Type:	Bug Fix
Description:	Remove TA filter blocking TA1 on FSC 7071: Fix problems with correctly reporting FSC 7071 – set TA1 and add entry to Engineering Error log if combined with FSC 6353.
Type:	Bug Fix
Description:	Panic when entering power down mode: Fix code panic due to inconsistent power amp state
Type:	Bug Fix
Description:	Dump formatting is incorrect for non-IBM writing drive: Correctly save non-IBM writing drive s/n for dump
Type:	Bug Fix
Description:	Add FSC to Engineering Log for Code Panics: For any code panic, this change will cause an entry to be added to the VPD Engineering Error log with an FSC 1055
Type:	Bug Fix
Description:	Prevent command abort from forcing dump: Fix potential cause of a command abort because a REC is held off too long while creating a dump.
Type:	Bug Fix
Description:	FSC 2E01 in Standalone applications: A change was made to the cartridge in sensor to stop the load if the cartridge is removed from the drive. Previously the drive would continue loading and fail with a 2E01.
Type:	Bug Fix
Description:	Drive failed READ with FSC 7060: Failure to find BOP on rewind was mishandled and always reported, when it should have been conditional based on command sequence. The result was FSC 7060 incorrectly getting reported to the host.
Type:	Bug Fix
Description:	Fix panic during ERP at wrap turn: Fix panic caused by duplicate dataset numbers on a wrap turn, due to incorrect internal error handling.
Type:	Bug Fix
Description:	FSC 78B0 improvement (over rotation at stoplock): Two changes to fix some causes of FSC 78B0 – 1) do not modify DAC offset values set by Mfg, and 2) filter out sudden invalid calculated radius values.
Type:	Bug Fix
Description:	FSC 78B5 improvement (BOT_EOT shutdown): Prevent some cases of FSC 78B5 with improved handling of a “stuck LPOS” condition near wrap turns.
Type:	Bug Fix
Description:	Rewind failure from corrupted servo variable: Fixes a code problem where an unbounded log trace overwrote a servo control variable trace, resulting in a Rewind failure

Interface

Type:	Bug Fix
Description:	ASC/ASCQ incorrect for CDB=0xA3: Fix to correctly report 5/2000 when the op-code is not supported and 5/2400 when the op-code is supported but the specified service action is not supported.
Type:	Bug Fix
Description:	Read Attribute command returns 0MB when cartridge unload hold: Read Attribute parameters 0220 thru 0223 are getting cleared, even though the cartridge was still mounted. Since the CM was still accessible the parameter values should have been maintained
Type:	Bug Fix
Description:	Fix inconsistency between SCSI Reference and drive operation: According to the SCSI Reference Manual, The PS bit should be set in ModePage 2Fh
Type:	Bug Fix
Description:	Request Sense did not return in progress sense: The drive was returning incorrect sense datafor a VERIFY command in progress.
Type:	Bug Fix
Description:	Changeable Mode Page PS bit: Correctly report PS bit in Mode Sense data for MP 30h[02h]
Type:	Bug Fix
Description:	Report D/0002 on all cases of write into physical EOT
Type:	Bug Fix
Description:	Sense data masking wrongly performed on tape load from host
Type:	Bug Fix
Description:	Fix reporting of PEWS: Fix problem where the PEWS CC was incorrectly cleared
Type:	Bug Fix
Description:	Panic due to incorrect mac queue operations: Fix code panic from sequence with a paused Write command and aborted Log Sense
Type:	Bug Fix
Description:	Panic during a Write command: Drive reset due to a race condition in which the previous command was aborted but did not complete before the next command started to execute.
Type:	Bug Fix
Description:	Fix Drive Panic: Fixed a drive panic due to MAC queue sequencing issues. Caused by a command being aborted while a WRITE is paused.
Type:	Bug Fix
Description:	Do not set TA54 for LTO and only set TA1 away from BOT: No longer set TA54 (No Start of Data) for LTO drives, and only set TA 1 (Read Warning) when positioned away from BOT. Some ISV's do not correctly handle these TA's, resulting in job exits.

Type:	Bug Fix
Description:	Log Page 14h serial numbers are incorrect: Put the correct drive s/n in Log Page 14h, parameter 0041h
Type:	Bug Fix
Description:	FSC 7015 is reported even without fatal reason: Fixes a problem during Read ERPs where FSC 7015 was incorrectly reported
Type:	Bug Fix
Description:	Multi-initiator sense data collision: Fixed an issue where the sense data in a multi initiator environment can be overwritten and incorrectly reported.
Type:	Bug Fix
Description:	Write Burst trigger doesn't clear due to failed IFC: Fixes a problem where an FSC 7067 was incorrectly reported, due to a prior Write ERP not cleaning up completely
Type:	Bug Fix
Description:	Did not report PEW with data_safe mode: Fixes a problem where drive did not report the EOT warning, for a scenario where the early warning zone was reached in data safe mode, but then the mode was changed to allow overwrite
Type:	Bug Fix
Description:	Drive incorrectly reports Verify in Progress: Fixes a problem where the drive reported Verify In Progress when no Verify is on-going
Type:	Bug Fix
Description:	Properly increment persistent reserve generation: Fixes two issues - the generation is not incremented on REGISTER AND MOVE, and the generation is wrongly incremented on failed REGISTER [+AND IGNORE]
Type:	Bug Fix
Description:	Read Buffer returned more data than requested: Prevents causing the HBA an issue if more data is returned on Read Buffer than was requested
Type:	Bug Fix
Description:	Prevent incorrect multi-initiator turbo setup: Fixes a case where the wrong initiator was set up for turbo mode (which could allow errors to be missed or reservations bypassed)
Type:	Bug Fix
Description:	Timeout space command: Fixed a problem which resulted in a drive hang and host timeout on a Space command.
Type:	Bug Fix
Description:	UNLOAD should return GOOD status when cart already ejected
Type:	Bug Fix
Description:	LP34h parm 19h not reported correctly: Fix problem counting Overruns in LP 34h parm 19h.
Type:	Bug Fix
Description:	Fix drive panic during aborted Write commands

Type:	Bug Fix
Description:	Fix queue hang after abort: A Write Filemarks was aborted and the code did not clean up the queue correctly. This hung the queue, and the drive.
Type:	Bug Fix
Description:	Media motion hours of log page 16h is wrongly zero: MMH in bytes 8-11 (Lifetime Media Motion Hours) in Log Page 16h was not getting reported correctly.
Type:	Bug Fix
Description:	Drive returning previous cleaning cart data: Drive was returning previous cleaning cartridge data when reading log page 0x30 for thread count when an expired cleaning cartridge is loaded
Type:	Bug Fix
Description:	Fix thread count in LP 17h and 30h for WP carts: Sets the thread counts to 0 when an uninitialized write protected cart is loaded.
Type:	Bug Fix
Description:	Correct FELO/FULO during media read: Fixes a problem where incorrect encryption status was reported on a read, following a Rewind which completed but with suppressed errors
Type:	Bug Fix
Description:	FCR 3255: Correct Load Unload command: Match standard behavior regarding interaction between the load and hold bits in the SCSI Load/Unload command (although retain historical behavior of PAMR)
Type:	Bug Fix
Description:	Add Support for Inquiry LBP VPD page B5h
Type:	Bug Fix
Description:	LME Encryption fails with a FSC 112A (Encryption - Key Service Timeout): The failure could be seen by anyone using the ILEP (internal Label Encryption policies method) encryption, which is common with Netbackup and Networker ISV applications, A race condition was present which caused the drive to fail with a FSC 112A (Encryption - Key Service Timeout)
Type:	Bug Fix
Description:	T10-OOB reassert EPR as needed on writes after demount: If an EPR request is answered by CEPR=1 without a SPO 20:0010 w/CKOD=1, encryption will likely be disabled until the drive is reset, or until a different key is used for decryption.
Type:	Bug Fix
Description:	Activate deferred crypto config change properly: Fix problem with handling a dynamic encryption mode change, which is deferred until tape is unloaded
Type:	Bug Fix
Description:	Handle default crypto mode transition to non-T10: Fix problem for specific scenario with mode change from AME to LME-ILEP while a tape was loaded
Type:	Bug Fix
Description:	T10-OOB: on KM timeout use correct FSC and set KME bit

Type:	Bug Fix
Description:	T10-OOB: SPO 20/0010 wrongly handles EPR configured
Type:	Bug Fix
Description:	T10-OOB: improve handling of ESR with timeout
Type:	Bug Fix
Description:	Limit early MAC crypto calls to T10-IB: Fixes an encryption mode issue caused by a previous change
Type:	Bug Fix
Description:	Panic on next write after abort/late CRP T10-OOB response
Type:	Bug Fix
Description:	T10-OOB does not fail DPRP disabled encryption properly: When T10-OOB was active but DRPR was disabled, the wrong code path was taken which resulted in a request timeout
Type:	Bug Fix
Description:	Drive not reporting correct encryption status in MP25: Report legacy encryption as LME (rather than AME) when T10-OOB. This was found in a TSM environment.
Type:	Bug Fix
Description:	Limit retries for ambiguous key index: This change limits the key request retries when an ambiguous key index is detected and sends a Check Condition for the Read to the host. That will prevent time out on Read due to endless key requests.
Type:	Bug Fix
Description:	Only clear specific interrupts in turbo transfer cleanup
Type:	Bug Fix
Description:	Fix SAS HBA error recovery issue
Type:	Bug Fix
Description:	Fix multi-initiator problem when on same port: Fixes problem where a frame was sent to the wrong initiator when multiple initiators were on the same port
Type:	Bug Fix
Description:	Clear WWN Entry on session removal: SAS Unable to re-enable primary port after disablement via ADI, because the WWN entry in the link registers was not cleared on bypass
Type:	Bug Fix
Description:	Allow opportunistic transfers when end device attached: This fix allows the iSCSI card to act as "end device" from a drive standpoint and the way the drive talks to it over the SAS interface.
Type:	Bug Fix
Description:	Update supported TM for SAS to match actual support: Report Supported Task Management Functions had incorrect bit set for SAS drives.

Type:	Bug Fix
Description:	FSC 6000 on SAS Hard Reset: Fix write state cleanup when a SAS hard reset occurs.

Cartridge Memory/ EEPROM

Type:	Bug fix
Description:	Check CRC before decoding CM page tables
Type:	Bug Fix
Description:	CM usage info cannot be updated at WriteCM: Fix problem with updating the CM Usage Information pages

Performance Improvements

Type:	Bug Fix
Description:	Performance degradation: Fix performance problem caused by incorrect switching from slowest speed

Servo

Type:	Bug Fix
Description:	Bad Servo track cannot be detected: Implement new Invalid LPOS counters to allow detection of drives with one bad servo.
Type:	Bug Fix
Description:	Change criteria for PES range error during read operation
Type:	Bug Fix
Description:	Fix servo amplitude check
Type:	Bug Fix
Description:	MsgQueue overflow: Fix code panic from hang during channel calibration step

Type:	Bug Fix
Description:	Fix 78E3 Unknown Translation: Fix code problem causing additional servo errors following FSC 78E3 rechuck failure
Type:	Bug Fix
Description:	FSC 2E0D (Go To Home Error) on HH drives: For HH drives that have semi-flangeless tape path, improve positioning into the servo track on initial acquire during tape load
Type:	Bug Fix
Description:	Fix Unload hangs: Additional fixes for a race condition in the code where an Unload was started but the servo state got out of sequence and hung the command
Type:	Bug Fix
Description:	CHN calibration hang: Fix hang during calibration sequence which resulted in FSC 6017