



# ISP 23xx Firmware Release Notes

	Initiator, Target, Fabric	Expanded LUN	FC- TAPE (FCP-2)	IP	Management Server	Extended Memory (1MB, 2MB)	Extended Logins (2K logins)	Multiple Loop Id's	Chip Type
2300EF	X	X			X				ISP2310 ISP2312
2300TP	X	X	X		X				ISP2310 ISP2312
2300IP	X	X	X	X	X				ISP2310 ISP2312
2300EFX	X	X			X	X	X		ISP2310 ISP2312
2300TPX	X	X	X		X	X	X		ISP2310 ISP2312
2300IPX	X	X	X	X	X	X	X		ISP2310 ISP2312
2300MID	X (loop only)	X			X			X	ISP2310 ISP2312
2300MIDX	X (loop only)	X			X	X	X (512 logins)	X	ISP2310 ISP2312
2322TPX	X	X	X		X	X	X		ISP2322
2322IPX	X	X	X	X	X	X	X		ISP2322
2322MIDX	X	X			X	X	X	X	ISP2322

Firmware Build Type vs. Features Included

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**Changes to ISP23xx RISC firmware going from V3.03.10 to V3.03.11**

1. **Fix:** Corrected a condition where the firmware would not become Ready if the switch sent an RNID ELS while the firmware was attempting a login to one of the well-known addresses within the switch. [ER40547]
  
2. **Fix: SB2 Only.** Firmware could fail to gain sync on the incoming signal. [ER40576]
  
3. **Fix:** Corrected a condition where the firmware could incorrectly indicate Request Queue DMA Error in the Entry Status field when returning the Mailbox IOCB. [ER40557]
  
4. **Change:** Made improvements to the change associated with ER33516, added earlier in V3.02.21. [ER40519]

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**Changes to ISP23xx RISC firmware going from V3.03.09 to V3.03.10**

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1. **Fix:** Corrected problem where incorrect Port Name could be returned by Get Port/Node Name List (0075h) mailbox command. [ER39968]
  
2. **Fix: SB2 Only.** Optionally report discarding of IU's due to receive frame errors. See the SB2 Firmware Interface Specification for more information. [ER40168]
  
3. **Fix:** Ensure receive FIFO's are empty before processing received LR. [ER40260]
  
4. **Fix: SB2 Only.** Ensure firmware detects a received OLS for longer than 100ms. [ER40296]
  
5. **Fix: QLA200/210 Only.** Corrected problem that could result in an erroneous interrupt during probing by switch port when the login limit had been reached. This could result in target devices being lost after a cable pull. [ER39964]
  
6. **Fix:** Corrected spurious parity error being reported during fault injections on the link. [ER40030]
  
7. **Reported Problem: SB2 Only.** Firmware continues to report 4ch on subsequent IU for the OX\_ID that the firmware sent LBY to. This has been corrected. [ER40056]

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**Changes to ISP23xx RISC firmware going from V3.03.08 to V3.03.09**

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1. **Fix:** ISP2322 Only: Return correct interrupt status in RISC-to-Host Status register, bits 7-0, when reporting Checksum Error (4010h) during Execute Firmware (0002h) mailbox command. [ER39629]
  
2. **Fix:** Corrected a problem that could result in received FLOGI to be ignored in Nport-to-Nport topology. [ER39558]
  
3. **Fix:** SB2 Only: The firmware has been modified to not drop SB2 frames if there are no Receive Buffers available. [ER39683]
  
4. **Fix:** SB2 Only: Corrected Firmware Error (8002h) reported after cleanup due to fault injection. [ER39684]
  
5. **Fix:** ISP2322 Only: Corrected problem where ISP could transmit FCP\_CMND frame with a 4-byte payload. [ER39785]
  
6. **Customer specific changes:** [ER39108]
  
7. **Change:** SB2 Only: Added support for F\_RJT, F\_BSY and P\_BSY. [ER39864]

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**Changes to ISP23xx RISC firmware going from V3.03.07 to V3.03.08**

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1. **Fix:** Corrected Firmware Error (8002h) when an RRQ is received after the resources have been released. [ER39328]
  
2. **Fix:** MIDX Builds Only: Corrected problem where D\_ID was not being properly set. [ER39468]
  
3. **Fix:** ISP2322 Only: Corrected problem when ISP did not retry enough times after receiving an immediate CLS in response to an OPN. [ER39598]
  
4. **Fix:** Corrected cleanup handling when TPRLO is received. [ER39467]
  
5. **Fix:** IP Only: Corrected cleanup handling during error injections using LIP/OLS. [ER39197]
  
6. **Change:** Added support to abort an exchange when an ABTS is received from a FCP target device. [ER39033]

**Note the following interface change:**

*Status Type 0 IOCB, Status Flags Field, Bit 10:* When this bit is set, the IOCB has been aborted due to ABTS received from the FCP target device. The Completion Status Code is set to Timeout (06h).

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**Changes to ISP23xx RISC firmware going from V3.03.06 to V3.03.07**

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1. **Customer specific change:** [ER39196]
  
2. **Fix:** SB2 Only: Fixed LBY handling. [ER39048]
  
3. **Fix:** SB2 Only: Corrected problem that could result in dropped IU.  
[ER39153]
  
4. **Change:** SB2 Only: Added support for multiple concurrent exchanges on the  
same port. [ER39047]
  
5. **Fix:** SB2 Only: Corrected problem where Send IOCB could be returned with  
wrong IOCB Type. [ER38687]
  
6. **Fix:** Corrected erroneous parity error indication during heavy FCIP  
traffic. [ER39008]
  
7. **Change:** Allow PLOGI to be issued through Mailbox IOCB, command 74h,  
regardless of port login state. [ER39206]
  
8. **Fix:** Multi-Id Only: Add support for Command IOCB Type 4 (15h). [ER38784]
  
9. **Change:** Ignore port login state when using Management Server IOCB for ELS  
Passthrough. [ER39090]
  
10. **Change:** ISP2322 Only: Only value of 2h is supported in loopback point  
field of Diagnostics Loopback (0045h) mailbox command for ISP2322. Values  
of 0h or 1h will result in the command completing with Command Parameter  
Error (4006h) status. [ER39185]
  
11. **Fix:** Class 2 Only: Corrected Class 2 detection after receiving a PLOGI  
that enables support for both Class 2 and Class 3. [ER39106]
  
12. **Fix:** Corrected a condition where the firmware could return an invalid  
IOCB type on the Response Queue. [ER39032]
  
13. **Fix:** Corrected a problem where Mailbox IOCB for Abort Task Set would  
not complete. [ER38927]

14. **Fix:** Corrected a condition that prevented the ISP from sending any R\_RDY's after sending an FCP\_RSP frame. [ER39034]
  
15. **Fix:** Corrected possible Firmware Error (8002h) during IO cleanup after fault injection. [ER38598]

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**Changes to ISP23xx RISC firmware going from V3.03.05 to V3.03.06**

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1. **Fix:** Corrected problem with customer specific change associated with ER38738. [ER39086]
  
2. **Fix:** Corrected problem where Get Link Status (006Bh) mailbox command could return incorrect amount of data. [ER39091]
  
3. **Fix:** Corrected 8002h system error that could be encountered if FCP\_RSP frame closely follows the last data frame for a Tape I/O, FCP\_CONF is enabled, and the tape drive returns less than requested amount of data. This problem applies only to ISP2322. [ER39092]
  
4. **Fix:** Corrected problem with execution throttle handling, which could result in no new FCP\_CMND frames being sent out by the ISP. This problem applies only to ISP2322. [ER39097]

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**Changes to ISP23xx RISC firmware going from V3.03.04 to V3.03.05**

1. **Fix:** Corrected problem where Task Retry Id used during REC was word-swapped compared to the Task Retry Id used during FCP\_CMND. This problem applies only to ISP2322. [ER38940]
2. **Fix:** Corrected problem where a Tape I/O was not getting returned to the driver after an IOCB timeout. This problem applies only to ISP2322. [ER38935]

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**Changes to ISP23xx RISC firmware going from V3.03.03 to V3.03.04**

1. **Changes specific to SB2 builds:** [ER38626] [ER38643] [ER38615]
  
2. **Customer specific changes:** [ER38533] [ER38688] [ER38738]
  
3. **Fix:** Corrected ISP2322 specific FCP-2 error recovery related to re-sending of FCP\_CMND frame. [ER38760]
  
4. **Fix:** Corrected problem where the receive data FIFO's in ISP could get out of sync if a data frame is received with a partial frame header and EOFa delimiter. [ER38637]
  
5. **Fix:** Corrected problem where ISP could send LOGO in response to frames received while ISP is waiting for FLOGI ACC. This problem could occur only if the switch behaves incorrectly and forwards FCP\_CMND frames after it has received FLOGI but before it has sent FLOGI ACC. [ER38211]
  
6. **Fix:** Corrected a problem related to forcing a change in link speed through Mailbox Command 5Dh. [ER38639]
  
7. **Fix:** Return proper Port Option Flags for Mailbox Command 6Ah in Outgoing Mailbox Register 1. [ER38826]
  
8. **Change:** Made improvements to the change associated with ER33516, added earlier in V3.02.21. [ER38864]

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**Changes to ISP23xx RISC firmware going from V3.03.02 to V3.03.03**

1. **Changes specific to SB2 builds:** [ER38593] [ER38299] [ER38392]
  
2. **Fix:** Corrected problem where Mailbox IOCB for Login Loop Port (0074h) mailbox command is not returned when Port Logout (0056h) mailbox command is issued. This problem would only happen if Port Logout mailbox command were issued while the link is down. [ER38474]
  
3. **Fix:** Corrected 8002h system error. [ER38597]

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**Changes to ISP23xx RISC firmware going from V3.03.01 to V3.03.02**

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1. **Customer Specific Changes:** [ER36888]
  
2. **Changes specific to SB2 builds:** [ER38273] [ER38299] [ER38392]
  
3. **Fix:** Corrected problem where commands completing with SCSI status of "Reservation Conflict" could take up to 200ms before being returned to the driver. [ER38202]
  
4. **Fix:** Corrected link recovery problem with ISP2322 encountered during cable pull testing. [ER38340]
  
5. **Change:** Modified SERDES settings for ISP2322 to increase the amplitude of transmit signal. [ER38378]
  
6. **Fix:** Corrected problem where ISP could use inconsistent domain and area fields in SID when communicating with a local loop device. [ER38381]
  
7. **Fix:** Correctly time exchanges for RRQ ELS. [ER38475]
  
8. **Fix:** Corrected problem where ISP, in target mode, could reference an invalid memory location, resulting in bogus SRAM Parity Error. [ER38489]
  
9. **Fix:** Corrected problem where a CTIO IOCB was not being returned to the driver following a port discovery after LIP. This problem applies only to target-mode operation for multi-id firmware build. [ER38437]
  
10. **Fix:** Corrected problem where multi-id firmware was not acquiring an AL\_PA in the proper phase during LIP processing. [ER38493]
  
11. **Fix:** Corrected RR\_TOV handling for REC to resolve a problem where tape operation was failing when REC was jammed. [ER38518]

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**Changes to ISP23xx RISC firmware going from V3.03.00 to V3.03.01**

1. **Customer Specific Changes:** [ER38092] [ER38220] [ER38192]
  
2. **Fix:** Corrected problem with receiving IP frames. This fix only applies to ISP2322 firmware. [ER38136]
  
3. **Change:** Allow logins to other N-Ports having the same domain and area as the ISP. Fabric Login Mailbox IOCB has been modified to allow this capability [ER38056]
  
4. **Fix:** Corrected an invalid memory access that could result in spurious SRAM parity errors. This problem could happen if an ABTS is received when a LOGO is outstanding. [ER38194]
  
5. **Change:** ISP will now send LS\_RJT to a received PLOGI if the FLOGI has not yet completed (instead of sometimes ignoring the PLOGI). [ER38193]
  
6. **Fix:** Corrected ISP initiated LR handling that could cause receive FIFO overruns. [ER37915]

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Changes to ISP23xx RISC firmware going from V3.02.30 to V3.03.00

1. **Change:** Version number change only.

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**Changes to ISP23xx RISC firmware going from V3.02.29 to V3.02.30**

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1. **Customer Specific changes** [ER37207] [ER20355]
  
2. **Fix:** Multi-ID Only: Corrected a problem that could result in Execute Command IOCB (0012h and 0054h) mailbox commands to time out. [ER37966]
  
3. **Fix:** Multi-ID Only: Corrected a problem that could prevent the firmware from getting to READY state after enabling a VP. [ER37843]
  
4. **Fix:** Firmware may be unstable after driver aborts a Command Type 6 or Command Type 10 IOCB. [ER34772]
  
5. **Change:** Allow driver to perform PLOGI using Login Loop Port (0074h) mailbox command regardless of current Port State. [ER37844]
  
6. **Change:** About Firmware (0008h) mailbox command has been modified to return the ending address in SRAM. Bits 15-0 of the ending address are returned in Outgoing Mailbox 4 register, and Bits 31-16 of the ending address are returned in Outgoing Mailbox 5 register.  
**NOTE: Drivers should use this ending address instead of 01FFFFh (in Step 28) when performing a Debug Dump procedure.**
  
7. **Change:** Allow logins to other N-Ports having the same domain and area as the ISP. Login Fabric Port (006Fh) mailbox command has been modified to allow this capability. [ER37856]
  
8. **Fix:** Corrected problem where Get Link Status (006Bh) mailbox command could return invalid data. [ER37934]
  
9. **Fix:** Corrected condition where Mailbox IOCB would not be returned if an invalid PLOGI response was received. [ER37947]
  
10. **Change:** Execute Firmware (0002h) mailbox command is no longer supported by runtime firmware. This mailbox command is only supported by ROM firmware. [ER37595]

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**Changes to ISP23xx RISC firmware going from V3.02.28 to V3.02.29**

1. **Change:** Changes related to ISP2322. [ER36759]
  
2. **Fix:** Multi-ID Only. Corrected problem that could cause incoming FCP\_CMND frames to be ignored if the switch used FC-AL-2 TRANSFER state. [ER37032]
  
3. **Fix:** Correct a condition where a single Command Type 6 IOCB request could result in multiple FCP\_CMND frames being transmitted. [ER35884]
  
4. **Fix:** Return correct completion status if Mailbox IOCB for a task management command times out. [ER36572]
  
5. **Change:** Reduce latency between posting of IOCB on Response Queue and generation of interrupt to the driver. [ER34875]
  
6. **Fix:** Corrected handling of incoming PLOGI after transmitting a PRLO. [ER37058]
  
7. **Fix:** Fixed collision recovery with crossing PDISC's. [ER37108]
  
8. **Fix:** Corrected a problem that could result in the ISP transmitting an ELS frame with a header of all zeros. [ER37298]
  
9. **Fix:** Return correct completion status if Execute Command IOCB mailbox command (0054h) times out, and the target sends a LOGO. [ER36766]

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**Changes to ISP23xx RISC firmware going from V3.02.27 to V3.02.28**

1. **Change:** Changes related to QLA200 adapters.
  
2. **Fix:** Fixed a problem that could result in the Firmware not coming to 'Ready' state while connected to a SanBox2 switch. [ER35406]
  
3. **Fix:** Corrected a problem where ISP could OPN the FL port when trying to send a frame to a local loop device. This problem could only happen when connected to FL-port, and with other devices present on the local loop. [ER36231]

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**Changes to ISP23xx RISC firmware going from V3.02.26 to V3.02.27**

1. **Fix:** Corrected a problem with IPX builds that resulted in an unexpected interrupt status returned during initialization. [ER35823]
  
2. **Fix:** Class2 specific change. [ER35858]
  
3. **Fix:** Corrected a problem where an unexpected PDISC from a target could result in the target being logged out. [ER35489]

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**Changes to ISP23xx RISC firmware going from V3.02.25 to V3.02.26**

1. **Customer Specific changes** [ER34723] [ER35109]
  
2. **Change:** Experimental Release flag, bit 13, has been added to Firmware Attributes. This bit is set only for experimental firmware builds. Experimental firmware builds are debugging purpose only and are supported for a limited time, as spelled out in the ".c" file. [ER35143]
  
3. **Fix:** Corrected a case where an internal Task Management Function cleanup would result in the request not completing. [ER35578]
  
4. **Fix:** Corrected problem, introduced by ER33541 in V3.02.21, that could cause incorrect handling of FCP\_RSP frames with greater than 32 bytes of Sense Data. [ER35392]
  
5. **Fix:** Corrected problem where Mailbox IOCB for Port Logout (0056h) mailbox command could incorrectly return with 4005h status if the LOGO was rejected or LOGO-ACC had incorrect payload. [ER35617]
  
6. **Fix:** Corrected a case in target mode where a PLOGI received after a TPRLO would be incorrectly rejected. [ER30847]

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Changes to ISP23xx RISC firmware going from V3.02.24 to V3.02.25

1. Customer Specific Changes

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**Changes to ISP23xx RISC firmware going from V3.02.23 to V3.02.24**

1. **Change:** Ensure that a single corrupted LISM frame does not result in LIP timeout. [ER34680]
  
2. **Fix:** Corrected problem, introduced by ER34071 in V3.02.22, that caused task management commands to be sent out with an invalid LUN value. This applies only to firmware builds that use FC-TAPE. [ER34781]
  
3. **Change:** Change related to ISP2322 only. [ER34831]
  
4. **Fix:** Fixed problem related to Host Memory Copy (0053h) mailbox command. [ER34791]
  
5. **Change:** Target Mode Only. Ensure Immediate Notify IOCB contains correct OXID value when the Status code indicates Abort Task (20h). [ER34842]
  
6. **Fix:** Multi-Id Only. Corrected LOGO handling when LOGO's for several different ID's are received in quick succession. [ER34599]

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Changes to ISP23xx RISC firmware going from V3.02.22 to V3.02.23

1. Customer Specific Changes

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**Changes to ISP23xx RISC firmware going from V3.02.21 to V3.02.22**

1. **Customer Specific Changes:** [ER33624, ER34239]
  
2. **Change:** Changes related to QLA200 adapters. [ER34154]
  
3. **Fix:** Corrected problem where timeout of task management commands could result in a corrupted firmware pointer, which could have unpredictable side effects. [ER34071]
  
4. **Fix:** Corrected SRR handling when ISP is operating in target mode, and initiator supports Task Retry Id. [ER34335]

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**Changes to ISP23xx RISC firmware going from V3.02.20 to V3.02.21**

1. **Change:** Changes related to QLA200 adapters. [ER33383]
  
2. **Workaround:** Modified firmware to work around an ISP2312 issue with PCI-X memory writes when these memory writes are intermixed with partial split completions for PCI-X memory reads. [ER33516]
  
3. **Fix:** Corrected problem where IOCB buffers were not getting properly de-allocated. [ER33541]
  
4. **Fix:** Multi-Id Only. Corrected loop hang condition that could occur when operating in target mode. [ER32472]
  
5. **Fix:** Corrected problem that could result in mailbox commands timing out when ISP is configured in Connection Mode 1 (Loop only) and connected to a switch configured as F-Port. [ER33642]
  
6. **Fix:** Corrected problem where Diagnostic Echo Test (0044h) mailbox command could time out if the ECHO ACC frame had a CRC error. [ER33862]
  
7. **Change:** Firmware has been modified to clearly indicate unrecoverable ISP hardware errors. A System Error (8002h) asynchronous event with Mailbox 0 register having a value of 8002h and Mailbox 1 register having a value of 0000h indicates an unrecoverable hardware error. [ER33873]  
**Note:** The driver should not use the ISP that reports an unrecoverable hardware error.

**Changes to ISP23xx RISC firmware going from V3.02.19 to V3.02.20**

1. **Change:** Multi-ID Only. Firmware provides VP Index in Mailbox Register 3 when reporting Asynchronous Event 8014h. [ER32946]
  
2. **New Feature:** Added Host Memory Copy (0053h) mailbox command. [ER32952]  
This mailbox command copies up to 128 bytes from one area in host memory to another.

Incoming Mailbox #	Contents
0	Host memory copy command (0053h)
1	Source address, bits 63 - 48
2	Source address, bits 47 - 32
3	Source address, bits 31 - 16
4	Source address, bits 15 - 0
5	Destination address, bits 63 - 48
6	Destination address, bits 47 - 32
10	Destination address, bits 31 - 16
11	Destination address, bits 15 - 0
9	Length

3. **Change:** Changes related to QLA200 adapters. [ER32993, ER33112, ER32954]
  
4. **Fix:** Corrected problem that could result in mailbox commands timing out when ISP is connected in certain "Quickloop" configurations. [ER33227]
  
5. **Fix:** Corrected problem where ISP fails to respond to FLOGI received in Class 2. [ER33231]
  
6. **Fix:** Corrected problem where ISP stops issuing new commands if multiple ULP timeouts are encountered. This problem occurred only if Option bit 13, Mailbox register 3 (return IOCB immediately after ULP timeout) is enabled in Set Firmware Options (0038h) mailbox command. [ER33114]
  
7. **Fix:** Corrected problem where receipt of a Class 1 frame with SOF11 delimiter could cause the frame header to be processed incorrectly. [ER32534]

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**Changes to ISP23xx RISC firmware going from V3.02.18 to V3.02.19**

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1. **Fix:** Corrected a problem with Management Server IOCB when multiple Response DSD's are specified. [ER32073]
  
2. **Customer Specific Change:** [ER32083]
  
3. **Fix:** Corrected a problem with Diagnostic Loopback (0045h) mailbox command where status code 4005h could be returned erroneously. [ER32465]
  
4. **Fix:** Corrected loop hang condition that could occur when operating in target mode. [ER32472]
  
5. **Fix:** Corrected FAN handling in multi-id firmware builds. [ER32480]
  
6. **Fix:** Corrected problem where IOCB buffers were not getting properly de-allocated. [ER32484]
  
7. **Change:** Added support for QLA200 adapters. [ER32248]
  
8. **Change:** Ensure parity is enabled on all hardware RAM's. [ER32558, ER32571]  
**Note:** Parity is now enabled on RAM associated with Mailbox registers. If driver tries to read an un-initialized mailbox register, it may result in System Error (8002h) due to parity error. It is recommended that drivers issue Mailbox Register Test (0006h) mailbox command during initialization to ensure parity is properly initialized for all mailbox registers.
  
9. **Change:** Allow Management Server IOCB for ELS Pass-through commands to be issued using Execute IOCB A64 (0054h) mailbox command. [ER32700]

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**Changes to ISP23xx RISC firmware going from V3.02.17 to V3.02.18**

1. **Customer Specific Changes:** [ER30786][ER30675][ER30669][ER31768]
2. **Fix:** Multi-ID Only. Corrected problem where LOGO could be sent with SID of 000000h during fabric login. [ER31656]
3. **Fix:** Multi-ID Only. Correct condition that would cause a PRLI reject to be sent after FAN. [ER31679]
4. **Fix:** Multi-ID Only. Corrected a condition where repeated PLOGI's would be sent to the Directory Server. [ER32009]
5. **Fix:** Multi-ID Only. Corrected problem where incorrect AL\_PA could be used during OPN. [ER31180]
6. **Fix:** Multi-ID Only. Fixed system error (8002h) case that could occur when firmware ran out of resources. [ER30949]
7. **Fix:** Corrected timer management during Diagnostic Loopback (0045h) mailbox command. [ER30805]
8. **Fix:** Corrected a potential firmware hang when building a FARP response. [ER31258]
9. **Change:** Enhanced FCP-2 error recovery across fault injections. [ER30788][ER31847][ER31989]
10. **Fix:** Enhanced recovery of received frame errors. [ER30951][ER31639]
11. **Fix:** Corrected a condition that could result in Exchange resources not being released properly during Target Reset handling. [ER30998]
12. **Fix:** Multi-ID Only. Corrected a condition in target mode that could result in a firmware hang after sending an auto FCP\_RSP frame. This condition could happen only in public loop topology. [ER31651]
13. **Fix:** Corrected a condition in target mode where a XFR\_RDY or FCP\_RSP frame could be sent with all 0's. [ER31654]

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**Changes to ISP23xx RISC firmware going from V3.02.16 to V3.02.17**

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1. **Fix:** Ensure that ISP responds to LIPs within AL\_TIME when it is in old-port mode. This change only applies to Connection Mode 2 (Loop Preferred). [ER29938]
2. **Change:** Added TPRLO Pass Through support. Contact Qlogic for details. [ER26952]
3. **Change:** Corrected handling of LUN Reset Task Management command when the firmware is operating in target mode. Firmware now terminates all I/O's to the targeted LUN from all initiators. The terminated CTIO's are now returned with Request aborted by Host status (Status = 02h) instead of LUN Reset Received status (Status = 48h) [ER29927].
4. **Change:** Per FCP-2, a SCSI target is prohibited from sending PRLI. In Nport-to-Nport topology, the Nport with higher Portname initiates the PLOGI. By default, if the ISP firmware initiates PLOGI, then it also sends a PRLI after the PLOGI completes. A new option has been added option to instruct the firmware to not send PRLI in Nport-to-Nport topology. This option is enabled by setting Bit 4 of Mailbox Register 3 during the Set Additional Firmware Options Mailbox (0038h) Command. [ER29926]
5. **Fix:** Corrected a problem where crossing logins could cause a device to have two Port Database entries. [ER29203]
6. **Fix:** Corrected problem with Multi-ID firmware when attached to a Loop that does not support Loop Map. [ER30544]
7. **Fix:** Corrected problem with Multi-ID firmware continually trying to open non-existent device at AL\_PA 00. [ER30543]
8. **Fix:** Corrected problem where the Firmware would not send FLOGI-ACC in a Nport-to-Nport topology. [ER30520]
9. **Fix:** Corrected a condition where the Firmware would not respond to a received XFR\_RDY frame for 2 seconds in Loop topology. [ER30478]
10. **Fix:** Corrected an incorrect LOGO response sent in response to a REC in extended memory builds. [ER30184]
11. **Fix:** Corrected hang in Multi-ID Firmware after receiving a LOGO. [ER30531]

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12. **Fix:** Corrected system error (8002h) associated with CTIO timeout handling. [ER30529]
  
  13. **Fix:** Corrected RISC getting paused as a result of erroneous reporting of GP Parity Error. [ER30477]
  
  14. **Fix:** Corrected problem where ABTS would not get sent during abort handling. [ER30496]
  
  15. **Fix:** Improved Receive Abort process to minimize link resets. [ER27776]

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**Changes to ISP23xx RISC firmware going from V3.02.15 to V3.02.16**

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1. **Fix:** Corrected problems related to timeout during Port Discovery. [ER29432]
  
2. **Fix:** Send PRLO if FCP\_CMD frame is received prior to PRLI. [ER29436]
  
3. **Fix:** Do not reject Management Server IOCB's for pass-through ELS even if PRLI has not been performed. [ER29434]
  
4. **Fix:** Mailbox IOCB should return status of 4006h instead of 4005h for unsupported mailbox commands. [ER29325]
  
5. **Fix:** Corrected problem where Mailbox IOCB could return with Status IOCB type (03h) instead of Mailbox IOCB type (39h). [ER28733]
  
6. **Fix:** Corrected handling of RSCN notifications with more than 9 entries. [ER29039]
  
7. **Change:** FC-FS requires a Port ID in the RLS payload, but older devices require a port number. By default, the Firmware sends the RLS with the port number. The driver can request the FC-FS compliant format by setting Bit 3 of Mailbox Register 1 when issuing a Get RLS (006bh) Mailbox Command. [ER27023]
  
8. **Change:** Added ability to have persistent Link Status counts. Contact Qlogic for additional information. [ER28556]
  
9. **Fix:** Execute Command IOCB (0012h) Mailbox Command did not return correct status if LOGO was received. [ER29229]
  
10. **Fix:** Corrected FCP-2 Error recovery logic when multiple errors are received for the same receive sequence. [ER29280] [ER29391]
  
11. **Change:** Due to inconsistencies between FC-PH2 and FC-FS, the firmware now accepts TPRLO requests with payload of either 10h bytes or 14h bytes. The payload length for TPRLO-ACC matches that of TPRLO request. [ER29438]

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**Changes to ISP23xx RISC firmware going from V3.02.14 to V3.02.15**

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1. **Customer Specific Changes:** [ER28303] [ER28556] [ER28591]
  
2. **Fix:** Corrected command timeouts when using Management Server IOCB for ELS pass-through during FC-SP authentication. [ER28220]
  
3. **Fix:** Corrected a problem with extended memory builds where invalid sense data could be returned. [ER28178]
  
4. **Fix:** Corrected problem where Mailbox IOCB for Target Reset (0066h) was not being returned. [ER28052]
  
5. **Fix:** Corrected problem in target mode operation where CTIO's were not being returned until a new FCP\_CMND frame was received. [ER28255]
  
6. **Fix:** Corrected handling of PURE IOCB requests if driver does not respond within allotted time. [ER28375]
  
7. **Change:** Validate that the driver uses Loop ID's 7Fh and 80h for N-Port ID's FFFFFDh and FFFFFCh respectively. [ER28641]

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**Changes to ISP23xx RISC firmware going from V3.02.13 to V3.02.14**

1. **Customer Specific Changes:** [ER27135] [ER26830] [ER27495] [ER27277]
  
2. **Change:** Validate Control Block Length passed from driver for Send SNS (006Eh) and Send LFA (007Dh) mailbox commands. [ER28065]
  
3. **Fix:** Corrected problem where ISP could incorrectly advertise non-zero login BB-credit in loop topology. [ER27946]
  
4. **Fix:** Corrected problem where Loop Port Bypass (0040h) and Loop Port Enable (0041h) mailbox commands could be issued to wrong AL\_PA. [ER24291]
  
5. **Fix:** Correct originator S\_ID in RRQ payload when connected in Fabric Mode. [ER27861]
  
6. **Fix:** Corrected problem where Mailbox IOCB for Port Logout (0056h) was not being returned after an implicit logout. [ER27260]
  
7. **Fix:** Corrected problem where some IOCB's were not getting returned if drives were unplugged in the middle of data transfer. [ER27862]
  
8. **Fix:** Corrected system error (8002h) that could happen during handling of data overrun during Read command. [ER27859]

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**Changes to ISP23xx RISC firmware going from V3.02.12 to V3.02.13**

1. **Customer Specific Changes:** [ER27135] [ER27192] [ER27602] [ER26893]  
[ER27038] [ER26953]
  
2. **Change:** Added support for FC-SP. [ER26308]
  
3. **Fix:** Corrected a problem where the Vendor Unique ECHO ELS could fail.  
[ER27573]
  
4. **Fix:** Corrected problems in Extended Memory builds with Diagnostic Loopback (0044h) mailbox command (when using Data Segment List), and with CTIO Type 4 IOCBs. [ER27623]
  
5. **Fix:** Corrected hang condition if frame error encountered during Receive IP Broadcast. [ER27561]

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**Changes to ISP23xx RISC firmware going from V3.02.11 to V3.02.12**

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1. **Fix:** Corrected problem where Management Server IOCB to send ECHO using Pass-Through ELS option would not complete. [ER26970]
  
2. **Fix:** Corrected return status for Mailbox IOCB for extended memory builds. Also corrected problem when using Mailbox IOCB for Get Port Database mailbox command when force ADISC option is not set. [ER26817]
  
3. **Fix:** Corrected Send LFA (007Dh) mailbox command for extended memory builds. [ER27081]
  
4. **Change:** Option added to disable DMA of the frame header into memory when using Management Server IOCB for ELS Pass-Through. This feature is enabled by setting bit 13 of the Control Flags in the Management Server IOCB. [ER26872]
  
5. **Change:** When using Mailbox IOCB for Login, the firmware will return a value of 0Dh in Mailbox 1 register if LS\_RJT is received in response to PLOGI. [ER27079]
  
6. **Fix:** Corrected problem where invalid completion status was being returned in Status IOCB. This problem could occur if the option to return an IOCB immediately upon ULP timeout is selected, and FCP-2 Error Recovery is in progress (sending ABTS in response to SRR Reject). [ER26824]
  
7. **Fix:** Corrected possible Firmware Error (8002h) when using Mailbox IOCB for Login Fabric Port (006Fh) mailbox command. [ER27110]

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**Changes to ISP23xx RISC firmware going from V3.02.10 to V3.02.11**

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1. **Customer Specific Changes:** [ER25476] [ER26549] [ER25946] [ER25947]  
[ER26346] [ER26243] [ER26577] [ER26581]
  
2. **Change:** The Mailbox Command Diagnostic Loopback 45h will fail with Mailbox 0 = 4005h and Mailbox 1 = 17h to indicate a Loopback Failure that requires the ISP to be reset immediately. [ER26134] [ER26588]
  
3. **Fix:** Corrected false failures of Diagnostic Loopback. [ER26585] [ER26141]  
[ER26772]
  
4. **Fix:** Corrected 4006h error returned when sending Mailbox Command Get RLS 6Bh for Loop ID FFFFh (Extended Memory builds only). [ER26359]
  
5. **Fix:** Improved buffer management under heavy IO loads. [ER25353]
  
6. **Change:** Use priority allocation for resources when doing Mailbox Command Login Loop Port 74h. [ER26619]
  
7. **Fix:** Corrected ZIO Mode 6 handler for FCP\_RSP completion. [ER26691]
  
8. **Fix:** Various fixes for Extended Memory builds: [ER26650] [ER26751]
  
9. **Change:** Provide additional information in Mailbox 1 when the Mailbox Command completes with a 4005h Error status. The following Mailbox Commands are included: Get Loop ID 20h, Send Change Request 70h, Get Port/Node Name List 75h, Send LFA 7Dh. Mailbox 1 will contain: [ER26710]  
0001h No Loop is present  
0002h No IOCB Resources Available  
0003h No Exchange Resources Available  
0004h Command Failed  
0007h Firmware Not Ready

- 10. **Fix:** Corrected a problem where the Firmware may stop giving credits if a LIP occurs during received frame error processing. [ER26726]
  
- 11. **Fix:** Remove transmit delay after sending BACC to received ABTS. [ER26091]
  
- 12. **Fix:** Corrected abort procedure in target mode when the driver requested to abort an IO. [ER26093]
  
- 13. **Fix:** Processing a REC RJT can lead to Continuation IOCB's being posted to the Response Queue. This has been corrected. [ER26673]
  
- 14. **Fix:** Corrected condition where an incoming CLS could be lost. [ER26586]

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**Changes to ISP23xx RISC firmware going from V3.02.09 to V3.02.10**

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1. **Fix:** Setup correct AL\_PD for private loop devices when using Management Server IOCB for pass-through ELS. Setup correct OX\_ID/RX\_ID fields when using Management Server IOCB for responses to PURE IOCB. [ER25296]
  
2. **Fix:** Return correct error code when the firmware is out of resources while processing Login Fabric Port (006Fh) and Login Loop Port (0074h) mailbox commands. [ER25265]
  
3. **Fix:** Do not free the special Loop ID's 7Eh, 7Fh, 80h and FFh. [ER25347]
  
4. **Fix:** When using Management Server IOCB, correctly handle ELS requests that expect no response. [ER23718]
  
5. **Fix:** Ensure that Mailbox Commands are serviced during Loss of Sync and Link Recovery states. [ER25536]
  
6. **Change:** Return 4005h error when Diagnostic Loopback (0045h) mailbox command is executed while in point-to-point topology. [ER25966]
  
7. **Change:** Return 4005h error for non-responding FL\_PORT during Get Loop ID (0020h) mailbox command. [ER25728]
  
8. **Fix:** Correct topology reporting in Get Loop ID (0020h) mailbox command when FAN is received, FAN times out, or FLOGI fails. [ER25897][ER25728][ER25897]
  
9. **Fix:** Corrected a problem that resulted in Mailbox IOCB and Management Server IOCB requests to timeout. [ER25762][ER25666][ER25762][ER25683]
  
10. **Fix:** Corrected a problem related to loop initialization when the ISP is not Loop Master and the Loop Map is not supported by another device on the loop. [ER24920]
  
11. **Fix:** Fixed IO hang after error recovery during heavy IO load. [ER25158]

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**Changes to ISP23xx RISC firmware going from V3.02.08 to V3.02.09**

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1. **Fix:** Corrected a problem where a Notify Acknowledge IOCB could be returned with status of 0. [ER24598]
2. **Fix:** Corrected problem where LUN Reset (007Eh) mailbox comamnd may not clean up all the outstanding exchanges. [ER16923]
3. **Fix:** Improved handling of SCSI commands completing with valid residual under run. [ER24289]
4. **Fix:** Customer specific change. [ER24815]
5. **Change:** Mailbox Command Login Loop Port (0074h) has been updated to return the FCP-2 information in Mailbox 1 if Mailbox 0 is 4000h (Good Completion). See Mailbox Command Login Fabric Port (006Fh) for more information. [ER25008]
6. **Fix:** Corrected problem with Management Server IOCB when used for pass-through ELS. Also corrected problem with Login Fabric Port (006Fh) mailbox command and Login Loop Port (0074h) mailbox command completing with return status of 4006h. [ER25296][ER25265]
7. **Fix:** Corrected condition where Mailbox Command Login Loop Port (0074h) may not complete. [ER24988]
8. **Fix:** Corrected condition where the ISP would stop giving credits on the wire. [ER24793]
9. **Fix:** Changes for FC-AL-2 compliance. [ER24814][ER24921][ER24920]
10. **Fix:** Recover from what was reported as Fatal Firmware Errors 8002h. [ER25222][ER24953]
11. **Fix:** Corrected Mailbox IOCB Get Port Data Base 64h return with IOCB type 3h. [ER24987]
12. **Fix:** Corrected invalid failures in ECHO ELS and Loop Back Mailbox Commands. [ER25023][ER25244]

13. **Fix:** Corrected Login state corruption of LOGO is in progress.  
[ER24835]

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**Changes to ISP23xx RISC firmware going from V3.02.07 to V3.02.08**

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1. **Change:** Added support to login to the fabric controller using Login Fabric Port (006Fh) mailbox command. This capability is also supported using Mailbox IOCB. [ER19441]
  
2. **Change:** Added option to Get Link Status (006Bh) mailbox command to return local error counts, regardless of loop id provided. Setting bit 6 in Mailbox 1 enables this option. [ER23575]
  
3. **Fix:** Ensure FLOGI is not passed to the driver if PURE IOCB option is enabled. [ER23714]
  
4. **Fix:** Corrected handling of Command Type 6 IOCB when issued using Execute IOCB A64 (0054h) mailbox command. [ER24369]
  
5. **Change:** Added option to send SCR with registration option 3. This feature is enabled by setting bit 12 of Mailbox 3 during Set Firmware Options (0038h) mailbox command. [ER24221][ER23718]
  
6. **Change:** Allow MSIOCB requests to the fabric controller (NportId FFFFDh, LoopId 7Fh) without requiring an explicit PLOGI. [ER24220]
  
7. **Fix:** Corrected a problem with Diagnostic Loopback (0045h) mailbox command that could result in erroneous PCIX Master Aborts. [ER24163]
  
8. **Fix:** Corrected condition where a FCP\_RSP frame may not get transmitted when ISP is operating in target mode. [ER24072]
  
9. **Fix:** Corrected invalid completion status returned for Command Type 3 IOCB. [ER24052]
  
10. **Change** Added support for RNID E0 format. [ER23994]
  
11. **Fix:** Send LOGO if RNC ELS is received from a device that the ISP is not logged in with. [ER23986]

12. **Change:** Send LS\_RJT when ADISC, PLOGI or PDISC is received while the ISP is waiting for FAN. [ER24329]
  
13. **Fix:** Corrected erroneous parity errors reported during Loop Port Bypass (0040h) and Loop Port Enable (0041h) mailbox commands. [ER24291]

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**Changes to ISP23xx RISC firmware going from V3.02.06 to V3.02.07**

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1. **Fix:** Ensure LIP Reset Asynchronous Event is generated when LIP is received in OPEN\_INIT state. [ER22669]
2. **Feature Request:** Customer Specific changes. [ER23171]
3. **Fix:** Corrected operation of Login Loop Port (0074h) mailbox command when "disable automatic PLOGI on local loop" option is enabled. [ER22926]
4. **Fix:** Corrected problem where incorrect IOCB entry type could be returned during completion of Mailbox IOCB. This could happen when Mailbox IOCB is used for Task Management functions. [ER23170].
5. **Fix:** Corrected return status of Target Reset (0066h) and Logout Fabric Port (0071h) mailbox commands. [ER23220]
6. **Change:** Send LS\_RJT if FLOGI received in loop topology. [ER23186]
7. **Fix:** Correct timeout problem with Loop Port Bypass (0040h) and Loop Port Enable (0041h) mailbox commands. [ER21035]
8. **Fix:** Ensure that Task Management commands issued as an initiator do not affect any commands received as a target. This problem could happen only when the ISP is behaving both as a SCSI initiator and SCSI target simultaneously. [ER23216]
9. **Change:** Corrected RR\_TOV values per FCP-2 Rev 8. [ER22590]
10. **Change:** Various changes per UNH test requirements. [ER23234]
11. **Fix:** Corrected problem where Port Data Base entries could contain invalid WWN. [ER22396]
12. **Change:** Sync with 3.1.20 code base.

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**Changes to ISP23xx RISC firmware going from V3.02.05 to V3.02.06**

1. **Customer specific changes:** [ER21861] [ER22283] [ER22094] [ER22107]
  
2. **Change:** Added support for Task Retry ID, per FCP-2. [ER21583]
  
3. **Fix:** Turn on Laser via GPIO pins after Initialize Firmware Mailbox Command (60h). [ER22052]
  
4. **New Feature:** Added feature to optionally wait for FCP\_RSP from the target before completing mailbox commands related to Task Management commands. This feature can be enabled by setting bit 10 of Mailbox Register 3 using the Set Firmware Options (0038h) mailbox command. [ER21876]
  
5. **Change:** Sync with 3.1.19 code base.

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Changes to ISP23xx RISC firmware going from V3.02.04 to V3.02.05

1. **Customer specific changes:** [ER21233] [ER21238] [ER21873]
  
2. **Change:** Sync with 3.01.18 code base.