



Release Notes

MT25408 ConnectX[®] Firmware fw-25408

Supporting: InfiniBand, Ethernet, FCoE, VPI

Rev 2.7.000

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MT25408 ConnectX Firmware fw-25408 Release Notes

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1 Overview

These are the release notes for the ConnectX® and ConnectX® EN adapters firmware, fw-25408 Rev 2.7.000. This firmware supports the following protocols:

- InfiniBand
- Ethernet
- Fibre Channel over Ethernet (FCoE)
- Virtual Protocol Interconnect (VPI) – this capability enables ConnectX devices to support the InfiniBand, Ethernet and DCE network standards, including auto-sensing of the network protocol to which each device port is connected.

This firmware supports the devices and protocols listed in Table 1. For the most updated list of adapter cards supported, visit the firmware download pages via <http://www.mellanox.com>.

Note: After burning new firmware to an adapter card, reboot the machine so that the new firmware can take effect. If you do not reboot, you will get an error in the RUN_FW command.

Table 1 - PCI Device ID

PCI Device ID (Decimal)	Device Part Number	Device Name	Supported Protocols
25408	MT25408A0-FCC-SI	ConnectX, Dual Port 10Gb/s InfiniBand / 10GigE Adapter IC with PCIe 2.0 x8 2.5GT/s Interface	InfiniBand, Ethernet, FCoE, VPI
25418	MT25408A0-FCC-DI	ConnectX, Dual Port 20Gb/s InfiniBand / 10GigE Adapter IC with PCIe 2.0 x8 2.5GT/s Interface	
26418	MT25408A0-FCC-GI	ConnectX, Dual Port 20Gb/s InfiniBand / 10GigE Adapter IC with PCIe 2.0 x8 5.0GT/s Interface	
26428	MT25408A0-FCC-QI	ConnectX, Dual Port 40Gb/s InfiniBand / 10GigE Adapter IC with PCIe 2.0 x8 5.0GT/s Interface	
25448	MT25448A0-FCC-SE	ConnectX EN, Dual Port 10GigE Adapter IC with PCIe 2.0 x8 2.5GT/s Interface	Ethernet
26448	MT26448A0-FCC-TE	ConnectX EN, Dual Port 10GigE Adapter IC with PCIe 2.0 x8 2.5GT/s Interface	
25458	MT25458A0-FCC-SE	ConnectX EN, Dual Port 10BASE-T Adapter IC with PCIe 2.0 x8 2.5GT/s Interface	
26458	MT25458A0-FCC-TE	ConnectX EN, Dual Port 10BASE-T Adapter IC with PCIe 2.0 x8 5.0GT/s Interface	

The document consists of the following sections:

- “Revision Compatibility” (page 4)
- “Changes & Major New Features” (page 4)
- “Bug Fixes” (page 4)
- “Known Issues” (page 6)
- “Creating a Device Configuration (.ini) File” (page 7)
- “History of Fixed Issues” (page 8)

2 Revision Compatibility

- Firmware fw-25408 Rev 2.7.000 complies with the following programmer's reference manual:
 - *ConnectX Programmer's Reference Manual (PRM), Rev 0.39 or later*, which has Command Interface Revision 0x3. The command interface revision can be retrieved by means of the QUERY_FW command and is indicated by the field *cmd_interface_rev*.

3 Changes & Major New Features

3.1 Changes From Rev 2.6.900

- Support for extended port counters
- QUERY_DEV_CAP.local_ack_timeout is now taken from the .ini file
- Support for Ethernet loopback
- Support for ModStatCfg opcode modifiers 2,3 (query)
- Support for ModStatCfg.mac
- Bug fixes

3.2 Changes of Rev 2.6.900 From Rev 2.6.000

- Added the field *QUERY_PORT,port_type*
- Bug fixes

4 Bug Fixes

The following table describes known issues from previous releases of ConnectX® firmware which were fixed in this firmware release.

Table 2 - Bug Fixes (Sheet 1 of 2)

	Issue	Description	Discovered in	Fixed in
1.	InfiniBand auto-negotiation issues	Fixed	2.6.900	2.7.000
2.	MOD_STAT_CFG.port_en command does not apply to Ethernet	Fixed	2.6.000	2.6.900
3.	Mellanox auto-negotiation is not optimized for environments with significant crosstalk	Fixed	2.6.000	2.6.900
4.	CQ/EQ doorbell is lost in Configuration cycles	Fixed	2.6.000	2.6.900
5.	Congestion issues	Fixed	2.6.000	2.6.900
6.	SW2HW_MPT command may fail when MPT is in FREE state (used for FRWR)	Fixed	2.6.000	2.6.900
7.	Adapter may get stuck upon multicast traffic stress	Fixed	2.6.000	2.6.900

Table 2 - Bug Fixes (Sheet 2 of 2)

	Issue	Description	Discovered in	Fixed in
8.	IB Spec Release 1.2 link data-rate issues	Fixed	2.6.000	2.6.900
9.	Adapter may get stuck if QPC extended auxiliary table base address is not aligned to 1MB	Fixed	2.6.000	2.6.900
10.	Port mod_stat_cfg.disable does not take effect if the device is configured as an Ethernet device	Fixed	2.6.000	2.6.300
11.	HCA might hang when entering PCIe L1 mode	Fixed	2.6.000	2.6.200

5 Known Issues

The following table describes known issues in this firmware release and possible workarounds.

Table 3 - Known Issues

Index	Issue	Description	Current Implemented Workaround in FW	Possible Workaround	Scheduled Release (fix)
1.	UAR Bar is too small for 64k-page machines	The small BAR causes driver loading to fail	N/A	Change the "log2_uar_bar_megabytes" .ini parameter under the [HCA] section as follows: log2_uar_bar_megabytes = 5	N/A
2.	Change of memory bars on a disabled system	Changing memory bars size / addresses between SYS_DIS and SYS_EN may cause the device to hang (ID: 24206)	N/A	N/A	N/A
3.	BAR resizing on an enabled system	Changing bar sizes when a system is enabled may cause the device to hang (ID: 24208)	N/A	N/A	N/A
4.	Ethernet only: Must query all capabilities upon boot	If not all capabilities are queried upon boot, then the query command may fail. See the QUERY_CAP command in <i>ConnectX EN Programmer's Reference Manual</i>	N/A	Query all capabilities upon boot	N/A
5.	Disrupting QDR negotiation may lead to port rising as SDR	Disconnecting an IB cable (or closing the port) during QDR negotiation and then reconnecting (or reopening) may cause the adapter to bring up the port at SDR	N/A	Disconnect the cable (or close the port) again and then reconnect (reopen). To avoid this scenario, wait for QDR negotiation to finish prior to disconnecting the cable (or closing the port) and reconnecting (or reopening). The following are two possible methods to verify QDR negotiation is complete: a. The physical (green) LED is on. b. A query of LinkPhyState using a GetPortInfo MAD indicates LinkUp.	N/A
6.	Ethernet link issues with back-to-back setting on 5m Twinax cables				
7.	InfiniBand Static rate is not supported				
8.	Autosensing after cable reconnection to different port protocol	If you disconnect a cable from an IB/Eth port and reconnect it to an Eth/IB port (different protocol), the link may not rise	N/A	Restart the driver (openibd restart)	N/A

6 Creating a Device Configuration (.ini) File

Mellanox firmware burning tools enable setting and/or changing configuration variables by the use of an optional configuration (.ini) file. This is needed in case the default values of some variables do not suit a user's specific system requirements. This section describes how to create this configuration file.

To begin with, the .ini file is a text file is composed of one or several configuration sections (see Section 6.1 for the format and/or an example). It is recommended to include, under the appropriate sections, only those variables that need to be changed.

A firmware release includes a reference file called fw-25218-defaults.ref. This file contains the list of all variables which can be configured by a configuration (.ini) file. For each variable the reference file includes a short explanation, the [<section>] it should be under, the range of possible values, and a line with the default setting of the variable which is assumed by the firmware release.

To create the .ini file, simply copy the lines with the variables you wish to set, paste them under their appropriate [<section>] headings, and change the setting values as desired.

6.1 Configuration (.ini) File Format

The .ini file is composed of one or more sections with variable settings. Each section in the file starts with its name between square brackets, e.g. [ADAPTER], [HCA], [IB], etc. The section name is followed by one or more lines of configuration settings and comments, as in the .ini file example shown below. Note that comment lines start with a semicolon.

Excerpt from fw-25408-defaults.ref:

```
;;;; VPD support can be Disabled/Enabled
;;;; Under [ADAPTER] section
;;;; Boolean parameter. Possible values: true, false .
vpd_enable = true
```

Example of a .ini file:

```
;Begin of .ini file
[ADAPTER]
vpd_enable = false
;This is a comment line
;End of .ini file
```

7 History of Fixed Issues

Table 4 - History of Bug Fixes (Sheet 1 of 5)

	Issue	Description	Discovered in	Fixed in
1.	MOD_STAT_CFG.port_en command does not apply to Ethernet	Fixed	2.6.000	2.6.900
2.	Mellanox auto-negotiation is not optimized for environments with significant crosstalk	Fixed	2.6.000	2.6.900
3.	CQ/EQ doorbell is lost in Configuration cycles	Fixed	2.6.000	2.6.900
4.	Congestion issues	Fixed	2.6.000	2.6.900
5.	SW2HW_MPT command may fail when MPT is in FREE state (used for FRWR)	Fixed	2.6.000	2.6.900
6.	Adapter may get stuck upon multi-cast traffic stress	Fixed	2.6.000	2.6.900
7.	IB Spec Release 1.2 link data-rate issues	Fixed	2.6.000	2.6.900
8.	Adapter may get stuck if QPC extended auxiliary table base address is not aligned to 1MB	Fixed	2.6.000	2.6.900
9.	Port mod_stat_cfg.disable does not take effect if the device is configured as an Ethernet device	Fixed	2.6.000	2.6.300
10.	HCA might hang when entering PCIe L1 mode	Fixed	2.6.000	2.6.200
11.	Link may come up as SDR instead of DDR on some systems	Fixed	2.5.000	2.6.000
12.	Possible live lock in QP upon retransmission stress	Fixed – (ID: 49870, 52066)	2.5.000	2.6.000
13.	Wrong link state reported during link speed negotiation	Fixed – (ID: 49951)	2.5.000	2.6.000
14.	CQs may be generated after CQ overrun error	Fixed – (ID: 49982)	2.5.000	2.6.000
15.	Slow handling of configuration cycles	Fixed – (ID: 49807)	2.5.000	2.6.000
16.	Wrong fields in CQE-w-Error on XRC QP	Fixed – (ID: 49742)	2.5.000	2.6.000
17.	Wrong handling of Remote Invalidate Error	Fixed	2.5.000	2.6.000
18.	Multiple RNR Nack may cause slowdown	Fixed – (ID: 49559)	2.5.000	2.6.000

Table 4 - History of Bug Fixes (Sheet 2 of 5)

	Issue	Description	Discovered in	Fixed in
19.	QUERY_DEV_CAP.apm bit was fixed at 0 even though APM was active	Fixed – (ID: 49548)	2.5.000	2.6.000
20.	PCIe physical errors upon entering L1 state	Fixed – (ID: 52025)	2.5.000	2.6.000
21.	PCI_CFG.interrupt_disable has no impact	Fixed – (ID: 53350)	2.5.000	2.6.000
22.	Non-default setting of VLCAp via .ini does not take effect	Fixed	2.5.000	2.6.000
23.	SET_PORT may lead to non-optimal RX buffer reallocation if opvl was less than vlcap	Fixed	2.5.000	2.6.000
24.	Modified PLL parameter settings in .ini	Some PLL parameter settings were changed to allow a longer period for PLL stabilization	2.5.000	2.6.000
25.	Adapter may generate PCIe transactions with wrong function ID	Fixed	2.5.000	2.6.000
26.	Adapter may generate PCIe ERR_NON_FATAL in case of an unsupported request	Fixed	2.5.000	2.6.000
27.	<u>Ethernet only</u> : Different VLAN priorities for WQE and QP may cause wrong SchedQ allocation	Fixed	2.5.000	2.6.000
28.	Wrong VLAN Priority in PPP mode	The ConnectX device may send pause frames for the wrong priority in PPP mode (ID: 49533)	2.5.000	2.5.900
29.	Wrong aliasing in address steering mode	This issues applies only to the VMware [®] Infrastructure 3 v3.5 operating system in netq mode	2.5.000	2.5.900
30.	Possible packet dropping though the pause policy is set	Fixed	2.5.000	2.5.900
31.	Wrong PCI Class Code for Ethernet Network Controller	This issue applies to Ethernet devices only. Fixed.	2.5.000	2.5.900
32.	Bringing up/down of an adapter port may lead to PHY errors on the second adapter port	Applies only to dual-port adapter cards. Fixed (ID: 51356)	2.5.000	2.5.900
33.	PPP does not work for an MTU of 9600	Fixed	2.5.000	2.5.900
34.	PCI Express compliancy issues	<ul style="list-style-type: none"> Fixed L1 and L0s power states compliancy issues Fixed PCIE-CV test completion_timeout failure Fixed interoperability issue with all available PCIe Gen. 2.0 servers (Ref. ID: 43852)	2.3.000	2.5.000
35.	INTA may be lost under stress	Fixed. (Ref. ID: 44473)	2.3.000	2.5.000
36.	Modifying SRQ number using RTS2RTS	Modifying SRQ number using RTS2RTS does not guarantee that no new CQEs will be generated using the old SRQ number. Fixed.	2.3.000	2.5.000

Table 4 - History of Bug Fixes (Sheet 3 of 5)

	Issue	Description	Discovered in	Fixed in
37.	QP may get stuck upon Responder Gather Error	Fixed.	2.3.000	2.5.000
38.	Wrong handling of SL mismatch between WQE and MLX QP	An SL mismatch between WQE and MLX QP may cause the QP to get stuck. Fixed.	2.3.000	2.5.000
39.	UC QP CQE with Error causes corruption	Fixed.	2.3.000	2.5.000
40.	Query_CQ/Query_EQ commands may return the old consumer_index	Fixed.	2.3.000	2.5.000
41.	CQ error may cause corruption	A CQ error such as an overrun may cause CQ corruption, leading to a wrong CQ number in the CQ error event or to an internal FW error. Fixed.	2.3.000	2.5.000
42.	Possible FW internal error on a very noisy link	Fixed. (Ref. ID:41526)	2.3.000	2.5.000
43.	QueryDebugMSG command returns wrong status	Fixed. (Ref. ID: 44744)	2.3.000	2.5.000
44.	Dropping a ReadResponse packet may lead to 'retry exceeded'	Fixed.	2.3.000	2.5.000
45.	CQ moderation parameters are wrongly configured	Fixed. (Ref. ID: 45570)	2.3.000	2.5.000
46.	False generation of CQE with error (vendor code 0x6f) upon large stress	Fixed. (Ref. ID: 45317)	2.3.000	2.5.000
47.	Bandwidth degradation if SetPort command is not called	Fixed.	2.3.000	2.5.000
48.	SQERR2RTS command followed by an error causes QP to be unfunctional	Fixed. (Ref. ID: 45828 45848)	2.3.000	2.5.000
49.	QUERY_FW fails after RUN_FW	The command QUERY_FW fails after running the RUN_FW command	2.2.000	2.3.000
50.	HCA stall	The HCA might stall in any of the following scenarios: <ul style="list-style-type: none"> • If running the command SET_DEBUG_MESSAGE (ID:42128) • Under large stress (ID: 43385, 43378) • Upon closing a large number of QPs (ID: 43697) • If the WQE SL is different than the QP Context SL in a UD QP (ID: 41423) • Upon multiple retransmissions 	2.2.000	2.3.000
51.	QUERY_QP errors	Wrong QUERY_QP command in the following cases: <ul style="list-style-type: none"> • Returns wrong values (ID: 42078, 40707) • Enters the error state erroneously (ID: 43110) 	2.2.000	2.3.000
52.	IB & PCI Express links quality	General improvements	2.2.000	2.3.000
53.	Incomplete support for PCI Express 2.0 configuration header	Fixed	2.2.000	2.3.000
54.	Wrong trap generation rate	The HCA might exceed the maximum trap generation rate upon processing different trap types	2.2.000	2.3.000

Table 4 - History of Bug Fixes (Sheet 4 of 5)

	Issue	Description	Discovered in	Fixed in
55.	Client Reregister event not generated	The HCA might fail to generate a Client Reregister event under large stress. (ID: 42232)	2.2.000	2.3.000
56.	Possible ICM corruption	Possible ICM (Interconnect Context Memory) corruption upon large stress (ID: 42529)	2.2.000	2.3.000
57.	Performance	HCA performance improvements for the following cases: <ul style="list-style-type: none"> • Upon receiving multiple ACK packets • Upon multiple QPs in error state (ID:43377) • Upon multiple RNR NACKs 	2.2.000	2.3.000
58.	Wrong wqe_index in Receive CQE with Error	This can occur when running stress IPoIB CM tests. (ID: 43076)	2.2.000	2.3.000
59.	Possible multicast corruption	Fixed (ID: 43301)	2.2.000	2.3.000
60.	Wrong limit on number of supported EQ UARs	The HCA now supports the requested number of EQ UARs specified in INIT_HCA	2.2.000	2.3.000
61.	SchedQueue corruption	Fixed (ID: 43289)	2.2.000	2.3.000
62.	Wrong SL2VL mapping upon set_sl2vl	Fixed	2.2.000	2.3.000
63.	False MAD packet drops	The HCA might drop MAD packet erroneously under large stress	2.2.000	2.3.000
64.	PCI Express 2.0 x1 link fails to rise	Fixed	2.2.000	2.3.000
65.	Command timeouts	The HCA times out commands while closing multiple QPs	2.2.000	2.3.000
66.	False internal error generation	Fixed	2.2.000	2.3.000
67.	Transport timeouts	Multiple RNR NACKs may lead to transport timeouts (ID: 44160)	2.2.000	2.3.000
68.	Opcode/Input Modifier verification	Command Opcode/Input Modifier values are now checked for correctness. If a wrong value is provided, the command status indicates the error.	2.2.000	2.3.000
69.	Wrong <i>sl</i> and/or port number returned	The QUERY_QP command may return a wrong <i>sl</i> value and/or a wrong port number (ID: 40707)	2.1.000	2.2.000
70.	HCA stall	The HCA might stall upon stress involving RNR Nacks and RDMA reads (ID: 41918)	2.1.000	2.2.000
71.	QP corruption	QP corruption may occur following a CQ_overrun	2.1.000	2.2.000
72.	Sched Queue corruption	Sched Queue corruption may occur upon multiple re-transmissions	2.1.000	2.2.000
73.	False SRQ WQE limit event	A false SRQ WQE limit event is generated due to a race condition	2.0.164	2.1.000
74.	Wrong Dt value returned	The QUERY_FW command may return a wrong Dt value	2.0.164	2.1.000
75.	HCA hangs	The device hangs in one of the following cases: <ul style="list-style-type: none"> • upon retry – due to local_ack_timeout • upon retry – due to RNR Nack • upon ringing a CQ doorbell for an invalid QP • upon stress conditions (IDs: 41543,732/6,755,778) 	2.0.164	2.1.000

Table 4 - History of Bug Fixes (Sheet 5 of 5)

	Issue	Description	Discovered in	Fixed in
76.	High ACK latency	Delays in ACK may cause multiple local ACK timeouts	2.0.164	2.1.000
77.	HCA performance	HCA performance may be impacted in the following conditions: <ul style="list-style-type: none">• QPs in error state• Slow QP context handling	2.0.164	2.1.000
78.	IB link stability issues		2.0.164	2.1.000
79.	High QP closing duration	Closing QPs with outstanding posted WQs may take a long time due to slow CQE with error generation	2.0.164	2.1.000