



# SUSE Linux Enterprise Server (SLES) 12 SP4 Inbox Driver Release Notes

---

SLES 12 SP4

NOTE:

THIS HARDWARE, SOFTWARE OR TEST SUITE PRODUCT ("PRODUCT(S)") AND ITS RELATED DOCUMENTATION ARE PROVIDED BY MELLANOX TECHNOLOGIES "AS-IS" WITH ALL FAULTS OF ANY KIND AND SOLELY FOR THE PURPOSE OF AIDING THE CUSTOMER IN TESTING APPLICATIONS THAT USE THE PRODUCTS IN DESIGNATED SOLUTIONS. THE CUSTOMER'S MANUFACTURING TEST ENVIRONMENT HAS NOT MET THE STANDARDS SET BY MELLANOX TECHNOLOGIES TO FULLY QUALIFY THE PRODUCT(S) AND/OR THE SYSTEM USING IT. THEREFORE, MELLANOX TECHNOLOGIES CANNOT AND DOES NOT GUARANTEE OR WARRANT THAT THE PRODUCTS WILL OPERATE WITH THE HIGHEST QUALITY. ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT ARE DISCLAIMED. IN NO EVENT SHALL MELLANOX BE LIABLE TO CUSTOMER OR ANY THIRD PARTIES FOR ANY DIRECT, INDIRECT, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES OF ANY KIND (INCLUDING, BUT NOT LIMITED TO, PAYMENT FOR PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY FROM THE USE OF THE PRODUCT(S) AND RELATED DOCUMENTATION EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



Mellanox Technologies  
350 Oakmead Parkway Suite 100  
Sunnyvale, CA 94085  
U.S.A.  
[www.mellanox.com](http://www.mellanox.com)  
Tel: (408) 970-3400  
Fax: (408) 970-3403

© Copyright 2019. Mellanox Technologies Ltd. All Rights Reserved.

Mellanox®, Mellanox logo, Connect-IB®, ConnectX®, CORE-Direct®, GPUDirect®, LinkX®, Mellanox Multi-Host®, Mellanox Socket Direct®, UFM®, and Virtual Protocol Interconnect® are registered trademarks of Mellanox Technologies, Ltd.

For the complete and most updated list of Mellanox trademarks, visit <http://www.mellanox.com/page/trademarks>.

All other trademarks are property of their respective owners.



# Table of Contents

- Table of Contents . . . . . 3**
- List Of Tables . . . . . 4**
- Chapter 1 Overview . . . . . 5**
  - 1.1 Supported HCAs Firmware Versions . . . . . 5
  - 1.2 SR-IOV Support . . . . . 6
  - 1.3 RoCE Support . . . . . 6
  - 1.4 VXLAN Support . . . . . 6
  - 1.5 DPDK Support . . . . . 6
  - 1.6 Open vSwitch Hardware Offloads Support. . . . . 7
- Chapter 2 Changes and New Features . . . . . 8**
- Chapter 3 Known Issues . . . . . 10**

## List Of Tables

Table 1:	Supported Uplinks to Servers . . . . .	5
Table 2:	Supported HCAs Firmware Versions . . . . .	5
Table 3:	SR-IOV Support. . . . .	6
Table 4:	RoCE Support . . . . .	6
Table 5:	VXLAN Support. . . . .	6
Table 6:	DPDK Support. . . . .	6
Table 7:	Open vSwitch Hardware Offloads Support . . . . .	7
Table 8:	Changes and New Features. . . . .	8
Table 9:	Known Issues . . . . .	10

# 1 Overview

These are the release notes of SUSE Linux Enterprise Server (SLES) 12 SP4 Inbox Driver. This document provides instructions on drivers for Mellanox Technologies ConnectX® based adapter cards with SUSE Linux Enterprise Server (SLES) 12 SP4 Inbox Driver environment.

This version supports the following uplinks to servers:

**Table 1 - Supported Uplinks to Servers**

HCA	Uplink Speed	Supported Driver
ConnectX®-5	<ul style="list-style-type: none"> <li>InfiniBand: SDR, QDR, FDR, FDR10, EDR</li> <li>Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, 56GigE<sup>a</sup>, and 100GigE</li> </ul>	mlx5_core (includes the ETH functionality as well), mlx5_ib
ConnectX®-4	<ul style="list-style-type: none"> <li>InfiniBand: SDR, QDR, FDR, FDR10, EDR</li> <li>Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, 50GigE, 56GigE<sup>a</sup>, and 100GigE</li> </ul>	mlx5_core (includes the ETH functionality as well), mlx5_ib
ConnectX®-4 Lx	<ul style="list-style-type: none"> <li>Ethernet: 1GigE, 10GigE, 25GigE, 40GigE, and 50GigE</li> </ul>	mlx5_core (includes the ETH functionality as well)
Innova™ IPsec EN	<ul style="list-style-type: none"> <li>Ethernet: 10GigE, 40GigE</li> </ul>	mlx5_core (includes the ETH functionality as well)
Connect-IB®	<ul style="list-style-type: none"> <li>InfiniBand: SDR, QDR, FDR10, FDR</li> </ul>	mlx5_core, mlx5_ib
ConnectX®-3/ConnectX®-3 Pro	<ul style="list-style-type: none"> <li>InfiniBand: SDR, QDR, FDR10, FDR</li> <li>Ethernet: 10GigE, 40GigE and 56GigE<sup>a</sup></li> </ul>	mlx4_core, mlx4_en, mlx4_ib

a. 56GbE is a Mellanox propriety link speed and can be achieved while connecting a Mellanox adapter cards to Mellanox SX10XX switch series or connecting a Mellanox adapter card to another Mellanox adapter card.

## 1.1 Supported HCAs Firmware Versions

SUSE Linux Enterprise Server (SLES) 12 SP4 Inbox Driver SLES 12 SP4 supports the following Mellanox network adapter cards firmware versions:

**Table 2 - Supported HCAs Firmware Versions**

HCA	Recommended Firmware Rev.
Connect-IB®	10.16.1200
ConnectX®-5	16.23.1020
Innova™ IPsec EN	14.23.1020
ConnectX®-4 Lx	14.23.1020
ConnectX®-4	12.23.1020
ConnectX®-3 Pro	2.42.5000
ConnectX®-3	2.42.5000

## 1.2 SR-IOV Support

**Table 3 - SR-IOV Support**

Driver	Support
mlx4_core, mlx4_en, mlx4_ib	Eth InfiniBand: Technical Preview <sup>a</sup>
mlx5_core (includes ETH functionality), mlx5_ib	Eth InfiniBand: Technical Preview <sup>a</sup>

a. Technical Preview is not fully supported production feature.

## 1.3 RoCE Support

**Table 4 - RoCE Support**

Driver	Support
mlx4 - RoCE v1/v2	Yes
mlx5 - RoCE v1/v2	Yes

## 1.4 VXLAN Support

**Table 5 - VXLAN Support**

Driver	Support
mlx4 - VXLAN offload	Yes
mlx5 - VXLAN offload	Yes (without RSS)

## 1.5 DPDK Support

**Table 6 - DPDK Support**

Driver	Support
mlx4	Yes
mlx5	Yes

## 1.6 Open vSwitch Hardware Offloads Support

**Table 7 - Open vSwitch Hardware Offloads Support**

Driver	Support
mlx4	No
mlx5	Yes

## 2 Changes and New Features

**Table 8 - Changes and New Features**

Feature/Change		Description
General	Innova IPsec Adapter Cards	Added support for Mellanox Innova IPsec EN adapter card, which provides security acceleration for IPsec-enabled networks.
DPDK	Mellanox PMDs enabled by default	Mellanox PMDs (Poll Mode Driver) are open source upstream drivers, embedded within DPDK releases which are integrated with major Linux distribution releases. Mellanox PMDs enable advanced ConnectX NIC hardware offload capabilities freeing up the server CPU cores for application needs.
mlx5	On Demand Paging	Added On-Demand-Paging (ODP), a technique to alleviate much of the shortcomings of memory registration.
	Support 4K User Access Regions (UAR)	Allow a more efficient use of device memory mapped I/O as UAR (User Access Region). Each process requires an area from the device memory in order to trigger operations on the device such as sending a message to the wire. This area is taken from the memory covered by BAR0-1 of the device. This kind of memory is called UAR. This feature will make more efficient use of this area allowing more processes to run concurrently. The effect is especially significant on PPC machines since they use 64KB for a system page.
	SR-IOV Bandwidth Share for Ethernet/RoCE	Added the ability to guarantee the minimum rate of a certain VF in SR-IOV mode.
	RoCE Diagnostics and ECN Counters	Added support for additional RoCE diagnostics and ECN congestion counters under <code>/sys/class/infiniband/mlx5_0/ports/1/hw_counters/</code> directory.
	Local Loopback	Improved performance by rendering Local loopback (unicast and multicast) disabled by mlx5 driver by default while local loopback is not in use. The mlx5 driver keeps track of the number of transport domains that are opened by user-space applications. If there is more than one user-space transport domain open, local loopback will automatically be enabled.
	Enhanced IPoIB	Added support for Enhanced IPoIB feature, which enables better utilization of features supported in ConnectX-4 adapter cards, by optimizing IPoIB data path and thus, reaching peak performance in both bandwidth and latency. Enhanced IPoIB is enabled by default

**Table 8 - Changes and New Features**

Feature/Change		Description
mlx5	Precision Time Protocol (PTP)	Added support for PTP feature in IPoIB offloaded devices. This feature allows for accurate synchronization between the distributed entities over the network. The synchronization is based on symmetric Round Trip Time (RTT) between the master and slave devices. The feature is enabled by default.
	Tag Matching Offload	Added support for hardware Tag Matching offload with Dynamically Connected Transport (DCT).
	GRE Tunnel Offloads	Added support for the following GRE tunnel offloads: <ul style="list-style-type: none"> <li>• TSO over GRE tunnels</li> <li>• Checksum offloads over GRE tunnels</li> <li>• RSS spread for GRE packets</li> </ul>
	Dropless Receive Queue (RQ)	Added support for the driver to notify the FW when SW receive queues are overloaded.
	OVS enhancements	<ul style="list-style-type: none"> <li>• Ipv6 support for VXLAN offloads (encap/decap)</li> <li>• Encapsulation flow enhancement</li> <li>• Expose min-inline mode to libmlx5</li> <li>• mlx5 offloading of TC pedit (header re-write) action</li> <li>• mlx5 neigh update</li> <li>• Add support for drop action for steering rules</li> <li>• Header re-write</li> <li>• Flow counters</li> </ul>
mlx4	RSS Support	RSS (Receive Side Scaling) technology allows to spread incoming traffic between different receive descriptor queues. Assigning each queue to different CPU cores allows to better load balance the incoming traffic and improve performance.



### 3 Known Issues

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

**Table 9 - Known Issues**

Internal Ref.	Description
1284059	<p><b>Description:</b> BW degradations due to Page Table Isolation (PTI) Intel's CPU security fix.</p> <p><b>Workaround:</b> Disable the PTI at run time by:</p> <ul style="list-style-type: none"><li>• writing 0 to <code>/sys/kernel/debug/x86/pti_enabled</code>.</li></ul> <p>or</p> <ul style="list-style-type: none"><li>• adding "nopti" or "pti=off" to <code>grub.conf</code></li></ul> <p><b>Keywords:</b> Performance</p>