



Intel[®] Ethernet Connection X722 Feature Support Matrix

Ethernet Networking Division (ND)

Revision 1.3
November 2018
336882-004



Revision History

Revision	Date	Comments
1.3	November 19, 2018	Updates include the following: <ul style="list-style-type: none">• General updates in support of software release 23.4.• Updated Table 1, "Supported Link Modes".• Updated Table 2, "Supported Media Types".• Updated Table 3, "General Features".• Updated Table 4, "Operating System Support for Physical Function Driver".• Updated Table 6, "Virtualized Operating System".• Updated Table 7, "Software Compatibility".
1.2	July 10, 2018	Updates include the following: <ul style="list-style-type: none">• General updates in support of software releases 22.10, 23.1, and 23.2.• Updated Table 1, "Supported Link Modes".• Updated Table 2, "Supported Media Types".• Updated Table 3, "General Features".• Updated Table 7, "Software Compatibility".
1.1	January 19, 2018	Updates include the following: <ul style="list-style-type: none">• Updated Table 4, "Operating System Support for Physical Function Driver".• Updated Table 5, "Operating System Support for RDMA Driver".• Updated Table 6, "Virtualized Operating System".
1.0	December 13, 2017	Initial release (Intel public).



Features Supported

Table 1 and Table 3 list the feature support provided by the software drivers for a given release starting with the production release (Release 22.0.1). The Intel® C620 Series Chipset Platform Controller Hub Datasheet reflects the silicon device capability, while this document reflects what is actually supported in the software for a given release.

Notes:

- Throughout this document:
 - The Intel® Ethernet Connection X722 is represented as “X722”.
 - “X” = Supported with Intel software driver.
 - “---” = Not supported with Intel software driver.
- Features and CFG_IDs not listed in this document are not officially supported.

Table 1. Supported Link Modes

Feature	Supported in Release						
	22.0.1	22.2/ 22.5	22.7	22.9	22.10	23.1/ 23.2	23.4
10 Gb/s Native SFI/SFP+ ¹	X	X	X	X	X	X	X
KR+X557 10GBASE-T 2x10 GbE ²	X	X	X	X	X	X	X
KR+X557 10GBASE-T 4x10 GbE ²	X	X	X	X	X	X	X
KX+ Marvell* 88E1512 2x1 GbE ³	X	X	X	X	X	X	X
KX+ Marvell 88E1543 4x1 GbE ³	X	X	X	X	X	X	X
KR+ CS4223 SFI/SFP+ 4x10 GbE	X	X	X	X	X	X	X
KR+ CS4227 SFI/SFP+ 2x10 GbE	X	X	X	X	X	X	X
SFI/QSFP+ 4x10 GbE	X	X	X	X	X	X	X
KR/KX Backplane	X	X	X	X	X	X	X

1. Supports four 10 Gb/s SFI direct attach connections in a QSFP+ connector.
2. Only supported with Intel® Ethernet Connection X557 device.
3. KX link can be achieved in any of the backplane images via auto-negotiation.



Table 2. Supported Media Types

Feature	Supported in Release						
	22.0.1	22.2/ 22.5	22.7	22.9	22.10	23.1/ 23.2	23.4
10 GbE Media Supported:							
SFP+ SR/LR single-speed (10 GbE)	X	X	X	X	X	X	X
SFP+ SR/LR multi-speed (1/10 GbE) optical modules	X	X	X	X	X	X	X
SFP+ DA twinaxial cables (up to 7 meters)	X	X	X	X	X	X	X
SFP+ AOCs (Active Optical Cables)	X	X	X	X	X	X	X
QSFP+ DA twinaxial breakout cables	X	X	X	X	X	X	X
QSFP+ SR4 breakout cables	---	---	---	---	---	---	---
QSFP+ AOC breakout cables	---	---	---	---	---	---	---
SFP+ 10G-LRM, 10G-ER and 10G-ZR	---	---	---	---	---	---	---
QSFP+ SR4/LR multi-speed (1/10 GbE) optical module	---	---	---	---	---	---	---
1 GbE Media Supported:							
SFP+ SR/LR multi-speed (1/10 GbE) optical modules	X	X	X	X	X	X	X
SFP branded SFP SX/LX optical modules (single speed)	---	---	---	---	---	---	---
SFP 1GBASE-T Transceiver (single speed)	---	---	---	---	---	---	---
SFP+ legacy 1 GbE modules	---	---	---	---	---	---	---

Table 3. General Features

Feature	Supported in Release						
	22.0.1	22.2/ 22.5	22.7	22.9	22.10	23.1/ 23.2	23.4
Link Flow Control¹	X	X	X	X	X	X	X
Priority Flow Control	X	X	X	X	X	X	X
Transmit Allocation Buffers Driver Uses (Range 128-4096, default is 512)	X	X	X	X	X	X	X
Checksum Offload (IPv4/IPv6, SCTP, TCP, UDP, Tx/Rx)	X	X	X	X	X	X	X
Generic Receive Offloads	X	X	X	X	X	X	X
Large Send Offload (TSO) (Up to 64 KB)	X	X	X	X	X	X	X
Header split	X	X	X	X	X	X	X
VLANs	X	X	X	X	X	X	X
LBFO Teaming	X	X	X	X	X	X	X
ANS Teaming	---	---	---	---	---	---	---
Interrupt Moderation Rate	X	X	X	X	X	X	X
Message Signaled Interrupts (MSI)	X	X	X	X	X	X	X
Message Signaled Interrupts (MSI-X)	X	X	X	X	X	X	X



Table 3. General Features (Continued)

Feature	Supported in Release						
	22.0.1	22.2/ 22.5	22.7	22.9	22.10	23.1/ 23.2	23.4
Jumbo Packet (4088 and 9014 bytes)	X	X	X	X	X	X	X
Receive Side Scaling (RSS)	X	X	X	X	X	X	X
RSS Receive Queues (Linux: 128 RSS PF Queues / 4 VF Queues) (Windows: 182 RSS PF Queues / 4 VF Queues)	X	X	X	X	X	X	X
OS2BMC	X	X	X	X	X	X	X
Wake from S1–S4	---	---	---	---	---	---	---
Wake from S3, S4 (client OS only)	X	X	X	X	X	X	X
Wake from S5	X	X	X	X	X	X	X
DCB	X	X	X	X	X	X	X
Fiber Channel over Ethernet (FCoE)	---	---	---	---	---	---	---
FCoE Boot	---	---	---	---	---	---	---
Receive Side Coalescing (RSC)² (Done by software)	X	X	X	X	X	X	X
IEEE 1588³ (Linux* only and session-based, not per packet)	X	X	X	X	X	X	X
Intel® Ethernet Flow Director (Intel® Ethernet FD) (SW ATR and sideband Add Filter cmd – Linux only)	X	X	X	X	X	X	X
MFP	---	---	---	---	---	---	---
Remote Boot⁴: PXE	X	X	X	X	X	X	X
Remote Boot⁴: iSCSI	X	X	X	X	X	X	X
Secure NVM	X	X	X	X	X	X	X
TPH	X	X	X	X	X	X	X
LPLU⁵	X	X	X	X	X	X	X
EEE	---	---	---	---	---	---	---
Malicious Driver	X	X	X	X	X	X	X
Azure Stack Additional Qualification (AQ) Certification	---	X	X	X	X	X	X
IEEE Data Center Bridging (DCB):							
MSFT DCB (QoS support) 10 GbE	X	X	X	X	X	X	X
DCBx in FW	X	X	X	X	X	X	X
DCBx in SW (Linux only)	X	X	X	X	X	X	X
SW only DCB	---	---	---	---	---	---	---
Virtualization (SR-IOV):							
VMDq (For ESX and Hyper V Only)	X	X	X	X	X	X	X
SR-IOV (KVM and 2012 R2 Hyper V)	X	X	X	X	X	X	X
RSS in VF	X	X	X	X	X	X	X
4 queues per VM	X	X	X	X	X	X	X



Table 3. General Features (Continued)

Feature	Supported in Release						
	22.0.1	22.2/ 22.5	22.7	22.9	22.10	23.1/ 23.2	23.4
Cloud Offloads:							
VXLAN (Linux i40e only ⁶)	X	X	X	X	X	X	X
VXLAN (VMware driver)	---	---	X	X	X	X	X
NVGRE (Windows only)	X	X	X	X	X	X	X
GENEVE (ESX ⁷)	---	---	X	X	X	X	X
GENEVE (Linux)	---	---	X	X	X	X	X
Manageability Support:							
NC-SI	X	X	X	X	X	X	X
OS2BMC	X	X	X	X	X	X	X
SMBus	X	X	X	X	X	X	X
SR-IOV supported on 1 GbE PHY	---	---	---	---	---	---	---
DCB/DCBX for 1 GbE SKU	---	---	---	---	X	X	X
iWARP on 1 GbE SKU	X	X	X	X	X	X	X
iWARP on 10 GbE SKU							
NDK 1.0/NDK 2.0 mode 2	X	X	X	X	X	X	X
NDK 2.0 mode 3	---	---	---	---	---	---	---
Linux iWARP SR-IOV	X	X	X	X	X	X	X

1. A 10 GbE controller port can either be configured to receive 802.3x Link Flow Control (LFC) packets or 802.1Qbb/802.3bd PFC packets. It does not support the reception of both types of packets simultaneously over the same port.
2. Not supported in VF.
3. The device only processes PTP packets using the Layer 2 packet format.
4. X722 has an integrated flash. OROM is stored in the 10 GbE region of flash.
5. For 10GBASE-T applications only.
6. All Linux i40e support refers to the driver posted on intel.com and sourceforge.net. OS vendors may release feature on different schedules. Contact OS vendor for more information.
7. For ESX, only Native mode driver will support these features going forward.



Operating Systems Supported

Table 4, Table 5, and Table 6 list the supported operating systems and virtualized operating systems, respectively.

Table 4. Operating System Support for Physical Function Driver

Operating System	In-box/ In-distro	Additional Notes
Windows Server 2012 R2	No	64 bit only.
Windows Server 2016 RS3/RS4	No	64 bit only.
Windows 10 Client WS	No	64 bit only.
Windows Nano Server	No	64 bit only.
Windows PE	No	64 bit only.
Windows 10 (Client RS 3)	No	64 bit only.
Windows 10 (Client RS 4)	No	64 bit only.
Linux: RHEL 6.9	No	64 bit only.
Linux: RHEL 7.2/7.3/7.5	Yes	64 bit only.
Linux: SLES 11 SP4	Yes	64 bit only.
Linux: SLES 12 SP2	Yes	64 bit only.
Linux: SLES 15	Yes	64 bit only.
Linux: CentOS 6.9/7.3	No	64 bit only.
Linux: Ubuntu 15.10/16.04 LTS/18.04 LTS	Yes	64 bit only.
Linux Stable Kernel version 2.6/4.x	N/A	64 bit only.
Solaris		Contact Oracle for release details.
FreeBSD 11		64 bit only.
UEFI 2.1/2.3/2.4	N/A	
Option ROM support: Legacy PXE, Legacy iSCSI, x64 UEFI driver	N/A	

Table 5. Operating System Support for RDMA Driver

Operating System	In-box/ In-distro	Additional Notes
Windows Server 2012 R2	Yes	64 bit only.
Windows Server 2016	Yes	64 bit only.
Linux: RHEL 7.5	Yes	64 bit only.
Linux: SLES 11 SP4	No	64 bit only.
Linux: SLES 12 SP1	Yes	64 bit only.
Linux Stable Kernel version 2.6/4.x	N/A	64 bit only.



Table 6. Virtualized Operating System

Virtualized OS	Host OS	PF Driver	Guest OS	Guest OS VF Driver
Linux	RHEL 6.9/KVM RHEL 7.5/KVM SLES 11 SP4/KVM SLES 12 SP2/KVM SLES 15/KVM	Linux i40e	RHEL 6.9 RHEL 7.5 SLES 11 SP4 SLES 12 SP2 SLES 15	i40evf
			Windows Server 2012 R2 Windows Server 2016	V40E
			FreeBSD 11	iXLv
Windows Hyper-V	Windows Server 2012 R2	I40EB	Windows Server 2012 R2 Windows Server 2016	V40E
	Windows Server 2016	I40EB	RHEL 7	i40evf
Windows Server 2012 R2 Windows Server 2016			V40E	
VMware vSphere	ESX 6.0 U3 ESX 6.5 U1 ESX 6.7 GA	ESX i40en	RHEL 7	i40evf
			Windows Server 2012 R2 Windows Server 2016	V40E

NVM and Software Compatibility

With the X722 adapters, both the firmware (device NVM image) and network drivers are field-serviceable, and the NVM image and network driver are updated as a matched set. Updating the device image and driver together can increase key features including performance, manageability, media types, physical port counts, virtualization, offloads, remote boot options, VLAN support, teaming, and Receive Side Scaling.

Table 7 indicates the Intel Ethernet Connections Software releases. It is strongly recommend to update the NVM and Driver at the same time.

Note: Update to the device driver for the given release prior to updating the NVM.

Table 7. Software Compatibility

Software Release Version	i40e (Windows)	i40e (Linux) ¹	i40evf (Linux) ¹	ixl (FreeBSD)	i40iw/i40iwhv
22.0.1	22.0.1	2.0.19	2.0.16	1.7.11	0.7.50
22.2	22.2	2.0.23	2.0.22	1.7.11	0.7.50
22.5	22.5	2.0.30	2.0.30	1.7.12	0.7.52
22.7	22.7	2.2.4	3.1.4	1.7.39	1.0.22
22.9	22.9	2.3.6	3.2.5	1.8.1	1.2.0
22.10	22.10	2.4.3	3.4.2	1.9.5	1.2.9
23.1	23.1	2.4.6	3.5.6	1.9.7	1.4.5
23.2	23.2	2.4.10	3.5.13	1.9.8	1.6.16
23.4	23.4	2.7.12	3.6.11	1.10.4	1.7.6

1. These are out-of-tree versions.



NOTE: ***This page intentionally left blank.***



LEGAL

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.

This document (and any related software) is Intel copyrighted material, and your use is governed by the express license under which it is provided to you. Unless the license provides otherwise, you may not use, modify, copy, publish, distribute, disclose or transmit this document (and related materials) without Intel's prior written permission. This document (and related materials) is provided as is, with no express or implied warranties, other than those that are expressly stated in the license.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

The products and services described may contain defects or errors which may cause deviations from published specifications.

Copies of documents which have an order number and are referenced in this document may be obtained by calling 1-800-548-4725 or by visiting www.intel.com/design/literature.htm.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

* Other names and brands may be claimed as the property of others.

© 2017-2018 Intel Corporation.