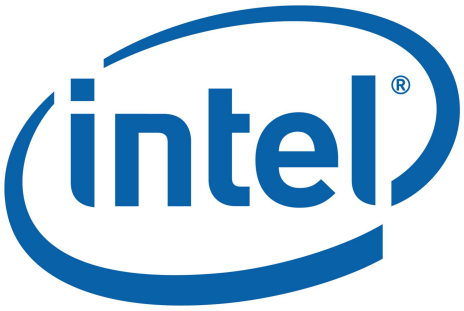

Intel® Ethernet Controller X710-TM4/ AT2

Feature Support Matrix

Ethernet Networking Division (ND)

Revision 1.1
February 2020
619407-002

Revision History

Revision	Date	Comments
1.1	February 20, 2020	Updates include the following: • Updated Section 6, "Software/NVM Compatibility for the X710-TM4/AT2".
1.0	January 31, 2020	Initial release (Intel public).

Features Supported

Table 1 through Table 3 list the feature support provided by the NVM and software drivers for a given release starting with the production release (Release 24.0, NVM 7.10). The *Intel® Ethernet Controller X710-TM4/AT2 Datasheet* reflects the silicon device capability, while this document reflects what is actually supported in the NVM and software for a given release.

Notes:

- Throughout this document:
  - The Intel® Ethernet Controller X710-TM4/AT2 is represented as "X710-TM4/AT2".
  - "X" = Supported with Intel NVM and software driver.
  - "---" = Not supported with Intel NVM and software driver.
- The following table lists software releases and associated NVMs:

Software Release Version	NVM Version
24.0	7.10
24.3	7.10
25.0	7.20

- Features and CFG_IDs not listed in this document are not officially supported.

Table 1. Interface and CFG_ID Supported for the X710-TM4/AT2

Feature	Supported in Release	
	24.0/24.3	25.0
Link Modes 4x10 GbE:		
10GBASE-T & Backplane (CFG_IDs supported):		
KR (14.0)	X	X
SFI and KR (14.01)	X	X
10GBASE-T & SFP+ (CFG_IDs supported):		
KR & SFI (14.01)	X	X
SFI (14.11)	X	X
10GBASE-T (CFG_IDs supported):[1]		
KR (14.2)	X	X
Link Modes 2x10 GbE:		
10GBASE-T (CFG_IDs supported):		
KR (14.3)	X	X
SFI (14.4)	X	X
Link Modes 1 GbE:		
SGMII	X	X
KX[2]	X	X

Table 1. Interface and CFG_ID Supported for the X710-TM4/AT2 [continued]

Feature	Supported in Release	
	24.0/24.3	25.0
Link Modes 100 Mb/s:		
SGMII	X	X

1. Only supported with external 10GBASE-T PHY device.
2. KX link can be achieved in any of the backplane images via auto-negotiation.

Table 2. Supported Media Types for the X710-TM4/AT2

Feature	Supported in Release	
	24.0/24.3	25.0
10 GbE Media Supported:		
SFP+ SR/LR single-speed (10 GbE)	X	X
SFP+ SR/LR multi-speed (1/10 GbE) optical modules	X	X
SFP+ DA twinaxial cables (up to 7m)	X	X
SFP+ AOCs (Active Optical Cables)[1]	X	X
SFP+ 10G-LRM, 10G-ER and 10G-ZR	---	---
10GBASE-T	X	X
SFP+ loopback modules[2]	X[3]	X[3]
1 GbE Media Supported:		
SFP 1GBASE-T Transceiver (single speed)[4,5]	---	---
SFP SX/LX optical modules (single speed)	---	---
SFP+ SR/LR multi-speed (1/10 GbE) optical modules	X	X

1. Only “Limiting Initialization” cables are supported.
2. Any loopback modules having an EEPROM configuration that matches any of the supported media of the device should achieve link.
3. Verification was done with SFP+: Amphenol SFP+ 3.5 dB APF14120016DKD P/N 610540001.
4. Support limited to: Finisar FCLF-8521-3, Kinnex A XSFP-T-RJ12-0101-DLL, Avago ABCU-5710RZ.
5. Finisar FCLF8521P2BTL is described to be functionally equivalent to Finisar FCLF-8521-3.

Table 3. General Features for the X710-TM4/AT2

Feature[1]	Supported in Release	
	24.0/24.3	25.0
Link Flow Control	X	X
Priority Flow Control	X	X
Transmit Allocation Buffers Driver Uses (Range 128-4096, default is 512)	X	X
Checksum Offload (IPv4/IPv6, SCTP, TCP, UDP, Tx/Rx)	X	X
Large Send Offload (TSO) (Up to 64 KB)	X	X
Header split	---	---
VLANs	X	X
Teaming	X	X
Interrupt Moderation Rate	X	X
Message Signaled Interrupts (MSI)	X	X
Message Signaled Interrupts (MSI-X)	X	X
Jumbo Packet (4088 and 9014 bytes for Windows)	X	X
Receive Side Scaling (RSS)	X	X
RSS Receive Queues (Linux: 64 RSS PF queues / 4 VF queues[2]) (Windows: 32 RSS PF queues / 4 VF queues)	X	X
OS2BMC	X	X
Wake from S1–S4	---	---
Wake from S5	X	X
DCB CEE	---	---
Fiber Channel over Ethernet (FCoE)	---	---
FCoE Boot	---	---
Receive Side Coalescing (RSC) (Done by software)	X	X
IEEE 1588[3] (Linux* only and session-based, not per packet)	X	X
Intel® Ethernet Flow Director (Intel® Ethernet FD) (SW ATR and sideband Add Filter cmd – Linux only)	X	X
Remote Boot[4]: PXE	X	X
Remote Boot[4]: iSCSI	---	---
Secure NVM	X	X
TPH	---	---
LPLU	---	---
EEE	X	X
Malicious Driver	X	X
Recovery Mode[5]	X	X

Table 3. General Features for the X710-TM4/AT2 [continued]

Feature[1]	Supported in Release	
	24.0/24.3	25.0
IEEE Data Center Bridging (DCB):		
MSFT DCB (QoS support) 10 GbE	---	---
MSFT DCB (QoS support) 40 GbE	---	---
DCBx in FW	---	---
DCBx in SW (Linux only)	---	---
SW only DCB	---	---
Virtualization (SR-IOV):		
VMDq (for ESXi and Hyper-V only)	X	X
SR-IOV (ESXi, KVM, and 2012 R2 Hyper-V)	X	X
RSS in VF	X	X
4 queues per VM[2]	X	X
Intel® Ethernet Adaptive Virtual Function iavf 3.7.34 or later (out-of-tree version)	X	X
Cloud Offloads:		
VXLAN (Linux i40e only[6])	X	X
VXLAN (Windows Server 2016)	---	---
VXLAN (VMware driver)	---	---
NVGRE (Windows only)	X	X
GENEVE	---	---
Manageability Support:		
NC-SI	X	X
OS2BMC	X	X
SMBus	X	X

1. For features supported with DPDK drivers please refer to dpdk.org.
2. 16 queues per VF is supported using Linux Kernel PF and poll mode VF only.
3. The device only processes PTP packets using the Layer 2 packet format.
4. Pre-Boot Option ROM should be stored in the Flash attached to the XL710.
5. The design of Recovery Mode precludes rollback to prior versions of the NVM, as indicated in Table 7. This is because the addition of the Recovery Mode capability changed the definition of some regions of the NVM to be write-protected. Rollback to a prior version requires access to these write-protected regions, and thus, the rollback would fail.
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.

Operating Systems Supported

Table 4 and Table 5 list the supported operating systems and virtualized operating systems, respectively. For the latest OS support, see http://intel.com/support/ethernetos.

Table 4. Operating System Support for Physical Function Driver for the X710-TM4/AT2

Operating System	In-box/ In-distro	Additional Notes
Windows Server 2012	No	64 bit only. No SR-IOV support.
Windows Server 2012 R2	No	64 bit only.
Windows Server 2016	No	64 bit only.
Windows Server 2019	No	64 bit only.
Linux: RHEL 6.10/7.5	No	64 bit only.
Linux: SLES 12 SP3	No	64 bit only.
Linux: SLES 15/15 SP1	No	64 bit only.
Linux Stable Kernel version 2.6/3.x/4.x/5.x	N/A	64 bit only.
Linux: Ubuntu 16.04 LTS[1]	N/A	64 bit only.
Linux: Ubuntu 18.04 LTS[1]	N/A	64 bit only.
Linux: CentOS 6.10/7.5	No	64 bit only.
VMware vSphere 2016 (ESXi 6.5)	No	Driver available at VMware website.
VMware vSphere 6.7 (ESXi 6.7)	No	Driver available at VMware website.
FreeBSD 11.3/12.0		64 bit only.
UEFI 2.1/2.3/2.4/2.6/2.7	N/A	
Option ROM support: Legacy PXE	N/A	

1. Out-of-tree driver only.

Table 5. Virtualized Operating System for the X710-TM4/AT2

Virtualized OS	Host OS	PF Driver	Guest OS	Guest OS VF Driver
VMware vSphere	ESXi 6.5 (vSphere 2016) ESXi 6.7 (vSphere 6.7)	ESX i40en	RHEL 6.10 RHEL 7.5 SLES 12 SP3 SLES 15 SLES 15 SP1 Ubuntu 16.04.4 LTS Ubuntu 18.04 LTS	iavf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	iavf
Linux	RHEL 6.10/KVM RHEL 7.5/KVM SLES 12 SP3/KVM SLES 15/KVM SLES 15 SP1/KVM Ubuntu 16.04.4 LTS/KVM Ubuntu 18.04 LTS/KVM	Linux i40e	RHEL 6.10 RHEL 7.5 SLES 12 SP3 SLES 15 SLES 15 SP1 Ubuntu 16.04.4 LTS Ubuntu 18.04 LTS	iavf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	iavf
			FreeBSD 11.3/12.0	iavf
Windows Hyper-V	Windows Server 2012 R2	I40E	Windows Server 2012 R2 Windows Server 2016	iavf
	Windows Server 2016	I40E	RHEL 6.10 RHEL 7.5 SLES 12 SP3 SLES 15 SLES 15 SP1 Ubuntu 16.04.4 LTS Ubuntu 18.04 LTS	iavf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	iavf
	Windows Server 2019	I40E	RHEL 6.10 RHEL 7.5 SLES 12 SP3 SLES 15 SLES 15 SP1 Ubuntu 16.04.4 LTS Ubuntu 18.04 LTS	iavf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	iavf

NVM and Software Compatibility

With Intel® Ethernet Network 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 6 indicates the sets of NVM images and Intel Ethernet Controllers Software releases that go together. Intel recommends that you update the NVM and Software Driver to compatible versions.

Note: Update to the device driver for given release prior to running the NVM update tool.

Table 6. Software/NVM Compatibility for the X710-TM4/AT2

Software Release Version	NVM Version	NVM Update Tool Version	i40e (Windows)	i40e (Linux)[1]	iavf (Linux)[1,2]	i40en (ESX)	ixl (FreeBSD)	QSFP Config. Utility (QCU)	Ethernet Port Config. Tool (EPCT)
24.0	7.10	1.33.15.1	24.0	2.9.21	3.7.53	1.8.6	1.11.9	2.34.04.0	N/A
24.3	7.10	1.34.17.3	24.3	2.10.19.30	3.7.61.20	1.9.5	1.11.20	2.34.17.3	1.34.17.5
25.0	7.20	1.34.22.6	25.0	2.10.19.82	3.7.61.20	1.10.6	1.11.22	2.34.17.3	1.34.22.5

1. These are out-of-tree versions.
2. For devices that are AVF compliant as described here (https://www.intel.com/content/www/us/en/products/docs/network-io/ethernet/controllers/ethernet-adaptive-virtual-function-hardware-spec.html), AVF base mode features are supported across NVM/PF combinations. Advanced features for VF drivers might require an update to NVM and PF/AVF drivers.

Additionally, the NVM update package that comes with the Intel Ethernet Controllers Software Release allows updates from older NVM versions. Table 7 indicates the version of NVM from which the tool allows updates.

Table 7. NVM Transition Support for the X710-TM4/AT2

Current (Old) NVM	New NVM (with Associated Tools, and Base Driver Version)[1,2]		
	7.10[3]	7.10[4]	7.20
7.10[3]	N/A[5]	Yes	Yes
7.10[4]	Yes	N/A[5]	Yes
7.20	Yes	Yes	N/A[5]

1. NVM transition must be done with the Tools and Base Driver from the latest release. Refer to Table 6 for supported NVM, Tools, and Base Driver versions.
2. Each step of a NVM transition requires a reboot (PCIe reset) and in rare cases a power cycle.
3. NVM for Software Release 24.0.
4. NVM for Software Release 24.3.
5. Updating to same image again is allowed.

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