



Intel[®] Ethernet Controller X550

Feature Support Matrix

Ethernet Products Group (EPG)

March 2021

Revision 2.5
335253-016

Revision History

Revision	Date	Comments
2.5	March 31, 2021	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 26.2 and NVM 3.30.
2.4	February 2, 2021	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 26.0 and NVM 3.15. General updates in support of Software Release 25.5 and NVM 3.15.
2.3	October 1, 2020	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 25.4 and NVM 3.10.
2.2	July 13, 2020	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 25.2 and NVM 3.00.
2.1	April 21, 2020	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 25.1 and NVM 2.20.
2.0	January 27, 2020	Updates include the following: <ul style="list-style-type: none"> Updated Table 3, "Operating System Support for Physical Function Driver". Updated Table 4, "Virtualized Operating System".
1.9	January 15, 2020	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 24.4 and NVM 2.10.
1.8	November 13, 2019	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 24.3 and NVM 2.00.
1.7	March 6, 2019	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 23.5.2 and NVM 2.00.
1.6	November 19, 2018	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Release 23.4 and NVM 2.00.
1.5	June 14, 2018	Updates include the following: <ul style="list-style-type: none"> Updated Table 3, "Operating System Support for Physical Function Driver".
1.4	June 8, 2018	Updates include the following: <ul style="list-style-type: none"> Updated Table 3, "Operating System Support for Physical Function Driver". Added Table 4, "Virtualized Operating System". Updated Table 5, "Software/NVM Compatibility". Added Table 6, "NVM Transition Support".
1.3	June 1, 2018	Updates include the following: <ul style="list-style-type: none"> General updates in support of Software Releases 23.1 and 23.2 and NVM 1.93.
1.2	January 19, 2018	Updates include the following: <ul style="list-style-type: none"> Updated Table 3, "Operating System Support for Physical Function Driver".
1.1	November 17, 2016	Updated some features and removed redundancies.
1.0	November 15, 2016	Initial public release.

Features Supported

Table 1 and Table 2 list the feature support provided by the software drivers at a given release, starting with the production release (Release 20.6). The *Intel® Ethernet Controller X550 Datasheet* reflects the silicon device capability, while this document reflects what is actually supported in the software at a given release.

Notes:

- Throughout this document:
 - The Intel® Ethernet Controller X550 is represented as “X550”.
 - “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	SRev
20.6	1.55	2
22.5		2
23.1 / 23.2	1.93	3
23.4	2.00	10
23.5.2		10
24.3		10
24.4	2.10	10
25.1	2.20	10
25.2	3.00	10
25.4	3.10	10
25.5	3.15	10
26.0		
26.2	3.30	20

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

Table 1. General Features

Feature	Supported in Release		
	20.6 through 23.2	23.4 through 26.0	26.2
Operating Modes: <ul style="list-style-type: none"> • 10 Gb/s (10GBASE-T mode) • 5 Gb/s (NBASE-T mode) • 2.5 Gb/s (NBASE-T mode) • 1 Gb/s (1000BASE-T mode) • 100 Mb/s (100BASE-TX mode) 	X	X	X
Link Flow Control	X	X	X
Priority Flow Control	X	X	X
Checksum Offload — IPv4/IPv6, SCTP, TCP, UDP, Tx/Rx	X	X	X
Large Send Offload (TSO) — Up to 64 KB	X	X	X
Rx Packet Header Split	X	X	X
VLANs	X	X	X
Message Signaled Interrupts (MSI)	X	X	X
Message Signaled Interrupts (MSI-X)	X	X	X
Jumbo Packet — 4088 and 9014 bytes	X	X	X
Receive Side Scaling (RSS)	X	X	X
OS2BMC	X	X	X
Fiber Channel over Ethernet (FCoE)	X	X	X
FCoE Boot	X	X	X
Receive Side Coalescing (RSC) — Windows only	X	X	X
IEEE 1588 — Linux only and session-based, not per packet	X	X	X
Flow Director (FD) — SW ATR & sideband Add filter cmd - Linux only	X	X	X
Secure NVM	X	X	X
TLP Processing Hints (TPH)	X	X	X
Low Power Link Up (LPLU)	X	X	X
Energy Efficient Ethernet (EEE)	---	---	---
Wake on LAN (WoL)	X	X	X
Data Center Bridging (DCB) with iSCSI and FCoE Boot	X	X	X
Jumbo Frames Support up to 15.5 KB	X	X	X
Full Duplex — All speeds	X	X	X
Recovery Mode ¹	---	X	X
Compliant with the 10 GbE and 1 GbE Ethernet/ 802.3ap (KX/KX4) Specification	---	---	---
Compliant with the 10 GbE 802.3ap (KR) Specification	---	---	---
Compliant with XFI/SFI Interface	---	---	---
Compliant with the 1000BASE-BX Specification	---	---	---

1. The design of Recovery Mode precludes rollback to prior versions of the NVM, as indicated in Table 6. 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.

Table 2. Virtualization Features

Feature	Supported in Release	
	20.6 through 26.0	26.2
Rx, Tx, TSO Checksum Offload	X	X
SR-IOV and VMDQ co-existence	X	X
SR-IOV — Single queue per VF	X	X
SR-IOV — VF VLAN	X	X
VXLAN — Use HW offload and cloud filtering	---	---
VXLAN — Use offset base and NetQueue UDP RSS	X	X
Geneve (ESXi 6.5 and later) — Use HW offload and cloud filtering	---	---
Geneve (ESXi 6.5 and later) — Use offset base and NetQueue UDP RSS	---	---
NetQueue RSS	X	X
HW VLAN Filtering	X	X
Rx HW VLAN Stripping	X	X
Tx HW VLAN Inserting	X	X
Malicious Driver Detection (MDD)	X	X
Wake on LAN (WoL)	---	---

Operating Systems Supported

Table 3 and Table 4 lists the supported operating systems and virtualized operating systems, respectively. For the latest OS support, see <http://intel.com/support/ethernetos>.

Table 3. Operating System Support for Physical Function Driver

Operating System	In-box/ In-distro	Additional Notes
Windows Server 2019	No	64 bit only.
Windows Server 2016	No	64 bit only.
Windows Server 2012 R2	No	64 bit only.
Windows Server 2012	No	64 bit only. No SR-IOV support.
Linux: RHEL 8.3/8.2/8.1	Yes	64 bit only.
Linux: RHEL 7.9/7.8/7.7/7.6	Yes	64 bit only.
Linux: SLES 15 SP3/SP2	Yes	64 bit only.
Linux: SLES 12 SP5	Yes	64 bit only.
Linux Stable Kernel version 5.x/4.x/3.x/2.6	N/A	64 bit only.
Linux: Ubuntu 20.04 LTS ¹	N/A	64 bit only.
Linux: Ubuntu 18.04 LTS ¹	N/A	64 bit only.
VMware vSphere 7.0 (ESXi 7.0)	Yes	Driver available at VMware website.
VMware vSphere 6.7 (ESXi 6.7)	Yes	Driver available at VMware website.
VMware vSphere 2016 (ESXi 6.5)	No	Driver available at VMware website.
Solaris		Contact Oracle for release details
FreeBSD 12.2/11.4		64 bit only.
UEFI 2.8	N/A	
Option ROM support: Legacy PXE, Legacy iSCSI, x64 UEFI driver	N/A	

1. Out-of-tree driver compile support only.

Table 4. Virtualized Operating System

Virtualized OS	Host OS	PF Driver	Guest OS	Guest OS VF Driver
VMware vSphere	ESXi 7.0 (vSphere 7.0) ESXi 6.7 (vSphere 6.7) ESXi 6.5 (vSphere 2016)	ESX ixgben	RHEL 8.3/8.2/8.1 RHEL 7.8/7.7/7.6 SLES 15 SP3/SP2 SLES 12 SP5 Ubuntu 20.04 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2019 Windows Server 2016 Windows Server 2012 R2	vxs68x64 vxs65x64 vxs64x64
Linux	RHEL 8.3/KVM RHEL 8.2/KVM RHEL 8.1/KVM RHEL 7.9/KVM RHEL 7.8/KVM RHEL 7.7/KVM RHEL 7.6/KVM SLES 15 SP3/KVM SLES 15 SP2/KVM SLES 12 SP5/KVM Ubuntu 20.04 LTS/KVM Ubuntu 18.04 LTS/KVM	Linux ixgbe	RHEL 8.3/8.2/8.1 RHEL 7.8/7.7/7.6 SLES 15 SP3/SP2 SLES 12 SP5 Ubuntu 20.04 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2019 Windows Server 2016 Windows Server 2012 R2	vxs68x64 vxs65x64 vxs64x64
			FreeBSD 12.2/11.4	ixv
Windows Hyper-V	Windows Server 2019	ixs68x64	RHEL 8.3/8.2/8.1 RHEL 7.8/7.7/7.6 SLES 15 SP3/SP2 SLES 12 SP5 Ubuntu 20.04 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2019 Windows Server 2016 Windows Server 2012 R2	vxs68x64 vxs65x64 vxs64x64
	Windows Server 2016	ixs65x64	RHEL 8.3/8.2/8.1 RHEL 7.8/7.7/7.6 SLES 15 SP3/SP2 SLES 12 SP5 Ubuntu 20.04 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2016 Windows Server 2012 R2	vxs65x64 vxs64x64
	Windows Server 2012 R2	ixs64x64	Windows Server 2016 Windows Server 2012 R2	vxs65x64 vxs64x64

NVM and Software Compatibility

With the newest line of Intel® 10 GbE 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 5 indicates the sets of NVM images and Intel Ethernet Connections 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 5. Software/NVM Compatibility

SW Release Version	NVM Version	NDIS (Windows)	ixgbe (Linux)	ixgben (ESXi)	ixgbev (Linux)	ix (FreeBSD)
20.6	1.55	20.6	4.2.1	1.7.10	3.0.2	3.1.6
22.5	1.55	22.5	5.2.1	1.7.10	4.2.1	3.2.15
23.1	1.93	23.1	5.3.5	1.7.10	4.3.3	3.2.17
23.2	1.93	23.2	5.3.7	1.7.10	4.3.5	3.2.18
23.4	2.00	23.4	5.5.1	1.7.10	4.5.1	3.3.6
23.5.2	2.00	23.5.2	5.5.3	1.7.10	4.5.2	3.3.6
24.3	2.00	24.3	5.6.3	1.7.20	4.6.1	3.3.10
24.4	2.10	24.4	5.6.5	1.8.7	4.6.3	3.3.10
25.1	2.20	25.1	5.7.0	1.8.9.0	4.7.1	3.3.14
25.2	3.00	25.2	5.8.0	1.8.9.0	4.8.0	3.3.14
25.4	3.10	25.4	5.9.4	1.8.9.0	4.9.3	3.3.18
25.5	3.15	25.5	5.9.4	1.8.9.0	4.9.3	3.3.18
26.0	3.15	26.0	5.10.2	1.9.8.0	4.10.2	3.3.22
26.2	3.30	26.2	5.11.3	1.9.12.0	4.11.1	3.3.24

Additionally, the NVM update package that comes with the Intel Ethernet Controllers Software Release allows updates from older NVM versions. Table 6 indicates the version of NVM from which the tool allows updates.

Table 6. NVM Transition Support

Current (Old) NVM	New NVM (with Associated Tools, and Base Driver Version) ^{1,2}								
	1.55	1.93	2.00	2.10	2.20	3.00	3.10	3.15	3.30
1.55	N/A ³	Yes ⁴	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}
1.93	No	N/A ³	Yes ⁵	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}	Yes ^{5,6}
2.00	No	No	N/A ³	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵
2.10	No	No	Yes ⁴	N/A ³	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵
2.20	No	No	Yes ⁴	Yes ⁴	N/A ³	Yes ⁵	Yes ⁵	Yes ⁵	Yes ⁵
3.00	No	No	Yes ⁴	Yes ⁴	Yes ⁴	N/A ³	Yes ⁵	Yes ⁵	Yes ⁵
3.10	No	No	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	N/A ³	Yes ⁵	Yes ⁵
3.15	No	No	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	N/A ³	Yes ⁵
3.30	No	No	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	N/A ³

1. NVM transition must be done with the Tools and Base Driver from the latest release. Refer to [Table 5](#) 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. Updating to same image again is allowed.
4. Rollback is allowed between supported versions and NVM configuration versions where the rollback version is the same.
5. Rollback version is incremented when performing this update, therefore downgrade is not permitted to previous version.
6. This transition requires a A/C power cycle of the device.

Note: The MinSRev on your device determines if you can downgrade to an older SRev. For details on how this works see the *Minimum Security Revision Control for Intel® Ethernet Products Application Note* (Doc ID: 635205).



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.

© 2016-2021 Intel Corporation.