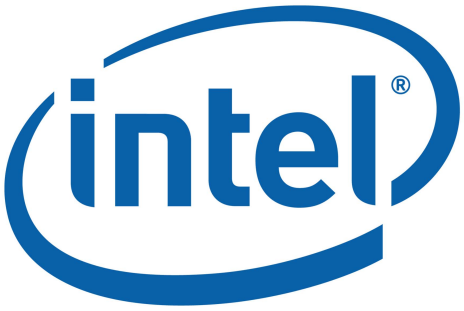

Intel® Ethernet Controller X550

Feature Support Matrix

Ethernet Networking Division (ND)

Revision 2.0
January 2020
335253-011

Revision History

Revision	Date	Comments
2.0	January 27, 2020	Updates include the following: • 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: • General updates in support of Software Release 24.4 and NVM 2.10. • Updated Table 1, "General Features". • Updated Table 2, "Virtualization Features". • Updated Table 3, "Operating System Support for Physical Function Driver". • Updated Table 4, "Virtualized Operating System". • Updated Table 5, "Software/NVM Compatibility". • Updated Table 6, "NVM Transition Support".
1.8	November 13, 2019	Updates include the following: • General updates in support of Software Release 24.3 and NVM 2.00. • Updated Table 1, "General Features". • Updated Table 2, "Virtualization Features". • Updated Table 5, "Software/NVM Compatibility". • Updated Table 6, "NVM Transition Support".
1.7	March 6, 2019	Updates include the following: • General updates in support of Software Release 23.5.2 and NVM 2.00. • Updated Table 5, "Software/NVM Compatibility".
1.6	November 19, 2018	Updates include the following: • General updates in support of Software Release 23.4 and NVM 2.00. • Updated Table 1, "General Features". • Updated Table 2, "Virtualization Features". • Updated Table 5, "Software/NVM Compatibility". • Updated Table 6, "NVM Transition Support".
1.5	June 14, 2018	Updates include the following: • Updated Table 3, "Operating System Support for Physical Function Driver".
1.4	June 8, 2018	Updates include the following: • 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: • General updates in support of Software Releases 23.1 and 23.2 and NVM 1.93. • Updated Table 1, "General Features". • Updated Table 2, "Virtualization Features". • Updated Table 3, "Operating System Support for Physical Function Driver". • Updated Table 5, "Software/NVM Compatibility".
1.2	January 19, 2018	Updates include the following: • 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
20.6 / 22.5	1.55
23.1 / 23.2	1.93
23.4	2.00
23.5.2	
24.3	
24.4	2.10

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

Table 1. General Features

Feature	Supported in Release		
	20.6/22.5	23.1/23.2	23.4/23.5.2/ 24.3/24.4
Operating Modes: • 10 Gb/s (10GBASE-T mode) • 5 Gb/s (NBASE-T mode) - Linux only • 2.5 Gb/s (NBASE-T mode) - Linux only • 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
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.

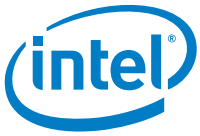

Table 2. Virtualization Features

Feature	Supported in Release		
	20.6/22.5	23.1/23.2	23.4/23.5.2/ 24.3/24.4
Rx, Tx, TSO Checksum Offload	X	X	X
SR-IOV and VMDQ co-existence	X	X	X
SR-IOV — Single queue per VF	X	X	X
SR-IOV — VF VLAN	X	X	X
VXLAN — Use HW offload and cloud filtering	---	---	---
VXLAN — Use offset base and NetQueue* UDP RSS	X	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	X
HW VLAN Filtering	X	X	X
Rx HW VLAN Stripping	X	X	X
Tx HW VLAN Inserting	X	X	X
Malicious Driver Detection (MDD)	X	X	X
Wake on LAN (WoL)	---	---	---

Operating Systems Supported

Table 3 and Table 4 list 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 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 6.9/6.10	No	64 bit only.
Linux: RHEL 7.5/7.6/7.7	Yes	64 bit only.
Linux: RHEL 8.0/8.1	Yes	64 bit only.
Linux: SLES 11 SP4	No	64 bit only.
Linux: SLES 12 SP3/SP4/SP5	Yes	64 bit only.
Linux: SLES 15	Yes	64 bit only.
Linux Stable Kernel version 2.6/3.x/4.x/5x	N/A	64 bit only.
Linux: Ubuntu 16.04.3 LTS[1]	N/A	64 bit only.
Linux: Ubuntu 18.04 LTS[1]	N/A	64 bit only.
VMware vSphere 2015 (ESXi 6.0)	No	Driver available at VMware website.
VMware vSphere 2016 (ESXi 6.5)	No	Driver available at VMware website.
VMware vSphere 6.7 (ESXi 6.7)	Yes	Driver available at VMware website.
Solaris		Contact Oracle for release details
FreeBSD 11.3/12.0		64 bit only.
UEFI 2.1/2.3/2.4/2.6	N/A	
Option ROM support: Legacy PXE, Legacy iSCSI, x64 UEFI driver	N/A	

1. Out-of-tree driver only.

Table 4. Virtualized Operating System

Virtualized OS	Host OS	PF Driver	Guest OS	Guest OS VF Driver
VMware vSphere	ESXi 6.0 (vSphere 2015) ESXi 6.5 (vSphere 2016) ESXi 6.7 (vSphere 6.7)	ESX ixgben	RHEL 6.9/6.10 RHEL 7.5/7.6/7.7 RHEL 8.0/8.1 SLES 11 SP4 SLES 12 SP3/SP4/SP5 SLES 15 Ubuntu 16.04.3 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	vxs64x64 vxs65x64 vxs68x64
Linux	RHEL 6.9/KVM RHEL 6.10/KVM RHEL 7.5/KVM RHEL 7.6/KVM RHEL 7.7/KVM RHEL 8.0/KVM RHEL 8.1/KVM SLES 11 SP4/KVM SLES 12 SP3/KVM SLES 12 SP4/KVM SLES 12 SP5/KVM SLES 15/KVM Ubuntu 16.04.3 LTS/KVM Ubuntu 18.04 LTS/KVM	Linux ixgbe	RHEL 6.9/6.10 RHEL 7.5/7.6/7.7 RHEL 8.0/8.1 SLES 11 SP4 SLES 12 SP3/SP4/SP5 SLES 15 Ubuntu 16.04.3 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	vxs64x64 vxs65x64 vxs68x64
			FreeBSD 11.3/12.0	ixv
Windows Hyper-V	Windows Server 2012 R2	ixs64x64	Windows Server 2012 R2 Windows Server 2016	vxs64x64 vxs65x64
	Windows Server 2016	ixs65x64	RHEL 6.9/6.10 RHEL 7.5/7.6/7.7 RHEL 8.0/8.1 SLES 11 SP4 SLES 12 SP3/SP4/SP5 SLES 15 Ubuntu 16.04.3 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2012 R2 Windows Server 2016	vxs64x64 vxs65x64
	Windows Server 2019	ixs68x64	RHEL 6.9/6.10 RHEL 7.5/7.6/7.7 RHEL 8.0/8.1 SLES 11 SP4 SLES 12 SP3/SP4/SP5 SLES 15 Ubuntu 16.04.3 LTS Ubuntu 18.04 LTS	ixgbevf
			Windows Server 2012 R2 Windows Server 2016 Windows Server 2019	vxs64x64 vxs65x64 vxs68x64

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. It is strongly recommend to update the NVM and Driver at the same time.

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 Update Package Version	NDIS (Windows)	ixgbe (Linux)	ixgben (ESXi)	igbevf (Linux)	ix (FreeBSD)
20.6	1.55	3.12.11.1	4.2.1	For ESX 6.0: 1.6.5 For ESX 6.5: 1.6.5 For ESX 6.7: 1.7.1	3.0.2	3.1.6
22.5	1.55	3.12.11.1	5.2.1	For ESX 6.0: 1.6.5 For ESX 6.5: 1.6.5 For ESX 6.7: 1.7.1	4.2.1	3.2.15
23.1	1.93	3.14.75.0	5.3.5	For ESX 6.0: 1.6.5 For ESX 6.5: 1.6.5 For ESX 6.7: 1.7.1	4.3.3	3.2.17
23.2	1.93	3.14.75.0	5.3.7	For ESX 6.0: 1.6.5 For ESX 6.5: 1.6.5 For ESX 6.7: 1.7.1	4.3.5	3.2.18
23.4	2.00	3.14.132.0	5.5.1	1.7.10	4.5.1	3.3.6
23.5.2	2.00	3.14.132.0	5.5.3	1.7.10	4.5.2	3.3.6
24.3	2.00	3.14.132.0	5.6.3	1.7.20	4.6.1	3.3.10
24.4	2.10	For NDIS 6.3: 3.14.206.0 For NDIS 6.4: 3.14.214.0 For NDIS 6.5: 4.1.196.0 For NDIS 6.8: 4.1.196.0	5.6.5	1.8.7	4.6.3	3.3.10

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
1.55	N/A[3]	Yes[4]	Yes[5,6]	Yes[5,6]
1.93	No	N/A[3]	Yes[5]	Yes[5,6]
2.00	No	No	N/A[3]	Yes[5]
2.10	No	No	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.

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