Intel® Ethernet Controller Products

29.1 Release Notes

May 2024

Revision 1.0

Revision History

Revision	Date	Comments
1.0	May 2024	• Initial release. • Release 29.1 (2024R1). Full OEM Gen container release for E810, E700 and E820.

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1.0 Overview

This document provides an overview of the changes introduced in the latest Intel® Ethernet Controller/ Adapter family of products. References to more detailed information are provided where necessary. The information contained in this document is intended as supplemental information only; it should be used in conjunction with the documentation provided for each component.

These release notes list the features supported in this software release, known issues, and issues that were resolved during release development.

1.1 New Features

1.1.1 Hardware Support

Release	New Hardware Support
29.1	• None for this release. Although Intel® 800 Series Ethernet Driver (AArch64) v4.2.34 option is presented in the BootUtil tool, ARM Servers are not supported in this release.

1.1.2 Software Features

Release	New Software Support
29.1	• Azure Stack HCI 23H2 OS support. • RX Timestamp support on E810. • Traffic Mirroring via tc-mirred on E810. • Control FW debug logs level via debugfs on E810. • Flexible VF loopback pacing configuration on E810. • SyncE4L NIC chaining improvements on E810. • PHY Statistics Dumps on E810. • Devlink health support for Tx hang debugging on E810. • HII VLAN function configuration support for E810 OEMGen devices. • DMA_buf w/o ODP support for Linux RDMA. • FreeBSD E810 - Count packets larger than RX MAX as Rx Oversize packets. • Print NIC FW version on E810. • FreeBSD X710 - Count packets larger than RX MAX as Rx Oversize packets. • Log FW Failure Critical Data in Recovery Mode. • NVMUpdate option to use FW Version to determine if update is upgrade or downgrade. • Driver can provide debug log when TX unit hang occurs on E810. • Set E810 debug level and UART option when driver is working. • Enable E810 GPUDirect community solution: DMA_BUF without ODP.

1.1.3 Firmware Features

Release	New Firmware Support
29.1	• Enable E700 X722 Tx signal to “always on”. • Enable E700 to store events details on the NVM in Recovery Mode.When entering the Recovery Mode, X710 will store the details of the event in the NVM. • Added native support for BIDI 100G PAM4 Compliance Code Modules (CAUI4 with No FEC). • Added native support for 10GBaseT 80m module (SFP). • Added to E810-CQDA2T adapters, 6 ports Mixed Mode 10G/25G. • Added RDE properties for PortMetrics.Transceivers. • Disable Optical Module Laser when Link/Port is disabled on E820. • Allow I2C 2 byte write access for PHY control on E820.

1.2 Removed Features

Release	Hardware/Feature Support
29.1	• None for this release.

1.3 Operating Systems Supported

1.3.1 Linux*

Operating Systems supported:

- Linux Real Time Kernel 5.x and 4.x (only on Intel Ethernet E810 Series)
- Linux, v2.4 kernel or higher
- Red Hat* Enterprise Linux* (RHEL) 9.3, 9.2
- Red Hat Enterprise Linux 8.9, 8.8
- SUSE* Linux Enterprise Server (SLES) 15 SP5
- SUSE Linux Enterprise Server 12 SP5
- Canonical* Ubuntu* 22.04 LTS
- Canonical Ubuntu 20.04 LTS
- Debian* 11

Table 1. Supported Operating Systems: Linux

Product	PF Driver	VF Driver	RDMA Driver
Intel® Ethernet 810/820 Series	1.14.9	4.11.1	1.14.17
Intel® Ethernet 700 Series	2.25.7	4.11.1	1.14.17
Intel® Ethernet 10 Gigabit Adapters	5.20.3	4.19.4	Not Supported
Intel® Ethernet Gigabit Adapters	5.16.3	Not Supported	Not Supported

1.4 Windows Server

Operating Systems supported:

- Microsoft Windows Server 2022
- Microsoft Windows Server 2019, Version 1903
- Microsoft Windows Server 2016
- Microsoft Azure Stack HCI

Table 2. Supported Operating Systems: Windows Server

Driver	Windows Server 2022	Windows Server 2019	Windows Server 2016
Intel® Ethernet 800 Series			
icea	1.15.121.0	1.15.121.0	1.14.104.0
scea	1.14.222.0	1.14.222.0	Not Supported

Table 2. Supported Operating Systems: Windows Server [continued]

Driver	Windows Server 2022	Windows Server 2019	Windows Server 2016
Intel® Ethernet 700 Series			
i40ea	1.19.164.0	1.19.164.0	1.18.369.0
i40eb	1.19.166.0	1.19.166.0	1.18.369.0
Intel® Ethernet Adaptive Virtual Function			
iavf	1.14.203.0	1.14.203.0	1.14.203.0
v40e	Not Supported	Not Supported	Not Supported
Intel® Ethernet 10 Gigabit Adapters and Connections			
ixs	4.1.254.0	4.1.254.0	4.1.254.0
sxa	4.1.254.0	4.1.254.0	4.1.249.0
sxb	4.1.254.0	4.1.254.0	4.1.249.0
ixt	Not Supported	4.1.228.0	4.1.229.0
ixn	Not Supported	4.1.254.0	4.1.254.0
vxs	2.1.252.0	2.1.252.0	2.1.232.0
vxn	Not Supported	2.1.252.0	2.1.252.0
Intel® Ethernet 2.5 Gigabit Adapters and Connections			
e2f	1.1.4.43	1.1.4.43	Not Supported
Intel® Ethernet Gigabit Adapters and Connections			
e1r	14.0.5.0	14.0.5.0	14.0.6.0
v1q	Not Supported	1.4.7.3	1.4.7.3

1.4.1 Windows Client

Operating Systems Supported:

- Microsoft Windows 11 22H2
- Microsoft Windows 11 21H2
- Microsoft Windows 10 21H2
- Microsoft Windows 10, Version 1809

Table 3. Supported Operating Systems: Windows Client

Driver	Windows 11	Windows 10 21H2 / Windows 10 RS5	Windows 10 RS1
Intel® Ethernet 800 Series			
icea	1.15.121.0	1.15.121.0	Not Supported
Intel® Ethernet 700 Series			
i40ea	1.19.164.0	1.18.370.0	Not Supported
Intel® Ethernet Adaptive Virtual Function			
iavf	1.14.203.0	1.14.203.0	1.14.203.0
Intel® Ethernet 10 Gigabit Adapters and Connections			
ixs	4.1.254.0	4.1.254.0	4.1.254.0
ixt	Not Supported	4.1.228.0	4.1.229.0
ixn	Not Supported	4.1.254.0	4.1.254.0
vxs	2.1.252.0	2.1.252.0	2.1.232.0
vxn	Not Supported	2.1.252.0	2.1.252.0
Intel® Ethernet 2.5 Gigabit Adapters and Connections			
e2fn	2.1.4.3	1.1.4.43	Not Supported
Intel® Ethernet Gigabit Adapters and Connections			
e1r	14.0.5.0	14.0.5.0	14.0.6.0
e1d	12.19.2.60	21H2: 12.19.2.60 RS5: 12.18.9.10	12.18.9.10
e1c	Not Supported	Not Supported	12.15.31.4
v1q	Not Supported	1.4.7.3	1.4.7.3

1.4.2 FreeBSD

Operating Systems supported:

- FreeBSD 14.0
- FreeBSD 13.3

Table 4. Supported Operating Systems: FreeBSD

Driver	PF Driver	VF Driver	RDMA Driver
Intel® Ethernet 810/820 Series	1.40.7	3.0.33	1.3.9
Intel® Ethernet 700 Series	1.14.2	3.0.33	1.3.9
Intel® Ethernet 10 Gigabit Adapters	3.3.38	1.5.38	Not Supported
Intel® Ethernet Gigabit Adapters	2.5.31	Not Supported	Not Supported

1.4.3 ESXi Drivers

Note: Intel® ESXi drivers are available from VMware.

- VMWare ESXi 8.0
- VMware ESXi 7.0

Refer to VMWare's download site for the latest ESXi drivers for Intel® Ethernet® devices.

1.5 NVM Versions Supported

The following table shows the NVM versions supported in this release.

Table 5. Current NVM

Product	NVM Version
810 Series	
E810	4.50
820 Series	
E822	2.28
E823-C	2.28
E823-L	2.28
700 Series	
X710	9.50
X722	6.20
500 Series	
X550	3.60
X552NS	2.10
X552DE	2.10
X553	2.10
200 Series	
I210	2.00

1.6 DDP Versions Supported

The following table shows the versions supported in this release.

Table 6. Current DDP

Package	DDP Version
OS Package	1.3.35.0
Comms Package	1.3.45.0
Wireless Edge Package	1.3.13.0

2.0 Fixed Issues

2.1 Intel® Ethernet 800 Series Network Adapters

2.1.1 Intel® Ethernet 810 Series

2.1.1.1 Linux Driver

- Multicast promiscuous mode doesn’t work after PF-to-VF reset.
- E810 NIC cannot upgrade FW from V3.20 to V4.20.
- Fixed issue of unexpected FW logs during some special environments, such as tx_timeout or NVM update.
- Ice driver doesn't work when link-down-on-close is on.
- Input/output error shown after "link-down-on-close" priv-flags enabled.
- NULL pointer dereference happens in the ICE out-of-tree ICE driver. Determine if PF Reset is in progress before accessing the coalesce settings.
- It was observed that in some cases the TC rule is not removed when adapter works in the switchdev mode, what was caused by improper algorithm of TC rule removal method.
- Low receive performance using E810-XXVDA2. ICEA drivers provide low throughput numbers in Windows 11 due to the missing registries: RssBaseProcNumber, NumaNodeId, and MaxRssProcessors, in the INF file.
- "Scalable IOV" help text in Device Level Configuration is not expected.
- Traffic statistics reported by ice driver have been changed to also include RDMA traffic.
- Out-of-tree drivers don't support XDP redirect on v6.3. Report XDP functionality through XDP features flag.
- DVM mode is not configured in parser library for raw packet filter. Align the DVM configuration between kernel driver and hardware/DDP.
- Ice driver misc interrupt not getting generated for a interface. Re-enable timestamp at the end of the BH of the interrupt.
- Bug/Issue on ice-1.12.6 + Linux Red Hat 7.9 that is preventing kmod install - "weak-modules" RPM install/uninstall issue.
- JIT-288239 x-UEFI missing for Port Option Configuration form. Added x-UEFI string for Port Option Configuration form "INTEL_PortOptionConfig".

2.1.1.2 Windows Driver

- Seeing warning message Event ID : 101 with ICEA module, on Windows 2022 operating system.
- E810 physical adapter does not display RDMA counters.

2.1.1.3 Firmware/NVM/NVM Update

- To have the metrics data shown on the respective port, map the port to MAC address before accessing counter registers.
- Fixed an issue, when plugging DAC cables into two ports at the same time on Clifton Channel, it is possible for one port to be unable to establish link.

- All RDE events' MessageArgs have been changed to strings.
- Resolved an issue where 0x5089 was returned for command get_sff_temperature when only port1 had optics of E810.
- RDE Metrics fix - Counters were taken from different ports due to incorrect internal mapping.
- PLDM T2 NumericSensors didn't send async event when any threshold was crossed.
- NCSI1.2 command Get Transceiver Temperature(0x4A) returned incorrect temperatures due to wrong endianness.
- Module temp thresholds check running too early causes 0 return, which is taken as valid and shuts down port.
- GetSensorReading command returns error code 0x1 in case when plug temperature is higher than 78C (0x4E).
- E810 doesn't support non-contiguous TCs within the LLDP configuration. It may result in a hang situation if receiving such LLDP packets during power-on stage. A timeout was added to the firmware polling loop to trigger a core reset which clears the hang and allows the device to continue functioning.
- E810 4.3 NVMs use a common map, which introduces a change (new entries) to an immediate TLV in PFA. FW fails to interpret the new entries in this specific TLV, which results in adding those new entries again and again upon every update from the former 4.3 image to 4.3 and above. Eventually, due to the lack of space in that TLV, any normal attempt to update will fail.
- NetworkDeviceFunction.Ethernet.PermanentMACaddress should stay with factory setting if it has been programmed. Read relevant section from Factory Settings.

2.1.1.4 Application Device Queues (ADQ)

- None for this release.

2.1.1.5 Pre-Boot

- Fixed an issue where the UEFI HII interface could not save the setting of virtualization mode.

2.1.2 Intel® Ethernet 820 Series

2.1.2.1 Firmware/NVM/NVM Update

- Previously, in some cases Tx Pipe Config was wrong.
- Previously, GetSensorReading command (executed for sensorId = 503, Plug Temp sensor) returns error code 0x1 in case when plug temperature is higher than 78C (0x4E).
- Previously, EPCT Incorrectly reports port-option for 2x40G on ICX-D LCC.

2.1.2.2 Linux Driver

- Encrypted packets not getting delivered by ice driver.
- Tx Timestamp timeout errors seen on E820 ports upon linkup.
- ts_pll_cfg not getting updated properly. Changed TS PLL params initialisation to happen before TS PLL init.
- ICE driver crashed - Bad EEPROM checksum detected, err -28. Fix order of error path such that the memory access don't conflict.

2.1.2.3 Windows Driver

- None for this release.

2.1.2.4 FreeBSD Driver

- None for this release.

2.1.2.5 LANConf Tool

- None for this release.

2.2 Intel® Ethernet 700 Series Network Adapters

2.2.1 Linux Driver

- ixgbe 5.15.2 - mq core affinity reset on interface link lost/link state. Remove irq_set_affinity_hint() calls to make driver honor user affinity settings.
- i40e 2.20.12 - mq core affinity reset on interface link lost. Removes irq_set_affinity_hint() calls to make driver honor user affinity settings.
- Fixed an issue, I40e driver report "vf may be used uninitialized in this function" during make process.
- 100M speed has been removed from Speed and Duplex in Device Manager.
- IXGBE License , ixgbe.spec file. There is an "@" symbol on the license entry where it should read GPL – 2.0. Implement RPM_LICENSE variable in driver makefiles.

2.2.2 Firmware/NVM/NVM Update

- Previously, after configuring "ifconfig ethX down" command on Marvell devices series 88E1512/ 88E1514, the peer side (loopback configuration) was still reporting link up.
- Fixed an issue. Unexpected EMP Reset occurred in a rarely BMC request combination in a very low probability, which may cause: 'tx_timeout' or 'ARQ: Unknown event 0x0000 ignored' or 'bond down' if bonding is configured.
- Firmware upgrades/downgrades for Intel I350 always reset SR-IOV settings to None. Add SRIOV bit in IOV control word to shared code protected_blocks_I350 array.

2.2.3 Windows Driver

- None for this release.

2.2.4 Pre-Boot

- SUP0550 unable to update firmware Intel® Ethernet 10G 4P X710 SFP+ rNDC (Foster Flat, DPN 68M95). 14020727595

2.3 Intel® Ethernet 500 Series Network Adapters

2.3.1 Tool Fix

- Fixed an issue, where eeupdate failed to keep the X550 serial Mac address. After eeupdate updates the NVM image, the serial Mac address of the X550 is reset to default values.

3.0 Known Issues

3.1 Intel® Ethernet 800 Series Network Adapters

3.1.1 Intel® Ethernet 810 Series

3.1.1.1 Firmware/NVM/NVM Update

- RDE property (AutoSpeedNegotiationEnabled) needs to be reimplemented to align up with the internal Link Establishment State Machine (LESM).
- When link goes down, recovered clock switches to an incorrect frequency, and the external DPLL shifts the system timing.
- FW incorrectly mapped NC-SI channels to Physical ports when responding to the Intel OEM NC-SI command 0x26 (no other command affected).
- At the absence of MFG modification process, PLDM Type 4 may return incorrect values for Part Number, Serial Number, Manufacturing Date/Time and SKU.
- Host overwrites MTU configuration on startup with AQ commands.

3.1.1.2 Linux

- CGU state handler continuously fails to receive CGU state from FW after NVM update.
  Workaround: Driver can be reloaded.
- The Intel SIOV does not work on Rhel, due to backports applied by Red Hat.
- DPDK traffic is stopped after FLR reset. This issue has been documented in the rte_eth_dev_reset API.

  Workaround: testpmd can be used to recover a VF after a reset.

  — When a VF reset happens, testpmd will print out "port reset" event to the console.

  — Use the “port reset’ command to call rte_eth_dev_reset, and everything will go back to normal.
- During TC configuration, using the "ethtool -S <vf_interface>" command results in a crash due to invalid memory access during reconfiguration of queues.
- In FreeBSD-13.0, iavf virtual interfaces guests may experience poor receive performance during stress.
- Celo process may not be ended or killed while exiting application. As the result current console is non responsive. Stability of the system is not endangered and user can start next console session.
- Changing the inner or outer VLAN tag protocols after setting the private flag "vf-true-promisc-support" disables the promiscuity on the VF's VLAN interfaces.
- When trust in enabled on VF with more than 8 VLAN filters, disabling trust makes all VLAN filters non functional.
- When Firmware is operating in mode when LLDP is ON, the DCB-MAP is not reflecting as configured in both switch and back to back.

  Workaround: The workaround for this behavior is to do the power cycle of the setup to see the assigned DCB-MAP is reflecting.

3.1.1.3 FreeBSD Driver

- During traffic in RoCEv2 mode, using large number of QPs (>64), a PE Critical Error may occur. In such circumstances the card may become inoperational, and reboot is required to restore RDMA capability.

3.1.1.4 RDMA Driver

- None for this release.

3.1.1.5 VMware Driver

- None for this release.

3.1.1.6 Windows Driver

- When Large Send Offload (LSO) V2 is enabled, the network adapter is unable to transmit frames larger than the MTU, which can impact network performance. Additionally, the incorrect incrementing of checksums OID_INTEL_OFFLOAD_LARGE_SEND_VXLAN_COUNT may lead to inaccurate network statistics.

  Workaround: Users can temporarily disable Large Send Offload V2 on their network adapters to allow the transmission of frames larger than the MTU. However, note that this workaround may impact other aspects of network performance. We recommend using this workaround only if absolutely necessary and awaiting the software update for a comprehensive solution.

3.1.1.7 Application Device Queues (ADQ)

3.1.1.8 Pre-Boot

- It is expected that after modifying port options the user is not able to apply any additional configuration changes before the platform is rebooted. Due the error in the driver no warning messages are displayed and the user is able to perform additional changes that can lead to incorrect card configuration.

3.1.2 Intel® Ethernet 820 Series

3.1.2.1 General

- None for this release.

3.1.2.2 Firmware/NVM/NVM Update

- The 100 MB option, is visible in Windows* Device Manager. However, when it is selected, a link cannot be established.
- There is a limitation that the NVM update tool doesn't allow the user to program PHY FW on Quad 1.
- Using the EPCT tool to change port configuration requires 2 reboots to complete the programming process. Blank mode or PTP initialization failures may be observed after a single reboot and will be resolved after performing a second reboot.
- Allow I2C multiple byte write access for PHY control (device address 0xAC).
- Disable Optical Module Laser when Link/Port is disabled.

3.1.2.3 Linux Driver

- None for this release.

3.1.2.4 FreeBSD Driver

- None for this release.

3.1.2.5 Windows Driver

- None for this release.

3.1.2.6 VMware Driver

- None for this release.

3.2 Intel® Ethernet 700 Series Network Adapters

3.2.1 Windows Driver

- None for this release.

3.2.2 Intel® Ethernet Controller V710-AT2/X710-AT2/TM4

- None in this release.

3.2.3 Linux Driver

- In some cases ./nvmupdate64e can't initialize the XL710 card in recovery mode.

```
Intel® Ethernet NVM Update Tool
NVMUpdate version 1.41.3.1
Copyright © 2013 - 2024 Intel Corporation.

Config file read.

Warning: Cannot initialize port: [00:059:00:00] Intel® Ethernet Converged Network
Adapter XL710-Q2
Warning: Cannot initialize port: [00:059:00:01] Intel® Ethernet Controller XL710
Generic ID
```

3.2.4 Pre-Boot

- The blink LED test executed from the UEFI setup menu may not work correctly for 10G speed when the link is up for the given port.

3.2.5 VMware Driver

- None for this release.

3.2.6 Firmware/NVM/NVM Update

- Incorrectly reported version for NC-SI over MCTP - reports 1.0.1 and 1.1.0 instead of correct 1.0.0 and 1.1.0.

- Missing functionality. NCSI command 'Get ASIC temperature' returns (0x4b) - returns not supported.
- LLDP receive property preserves the last received data, even when LLDP traffic doesn't contain the TLV item/data.
- NetworkDeviceFunction schema Ethernet. The MACAddress property is not updated to the value in PATCH JSON. This is a regression. The issue is under investigation.
- PATCH request with request to to change FlowControlConfiguration property returns success, but do not really apply changes. The issue is under investigation.

3.3 Intel® Ethernet 500 Series Network Adapters

- None for this release.

3.4 Legacy Devices

- None for this release.

4.0 NVM Upgrade/Downgrade 800 Series/700 Series and X550

Refer to the Feature Support Matrix (FSM) links listed in Feature Support Matrix for more detail. FSMs list the exact feature support provided by the NVM and software device drivers for a given release.

5.0 Languages Supported

Note: This only applies to Microsoft Windows and Windows Server Operating Systems.

This release supports the following languages:

Languages	
English French German Italian Japanese	Spanish Simplified Chinese Traditional Chinese Korean Portuguese

6.0 Related Documents

Contact your Intel representative for technical support about Intel® Ethernet Series devices/adapters.

6.1 Feature Support Matrix

These documents contain additional details of features supported, operating system support, cable/modules, etc.

Device Series	Support Link
Intel® Ethernet 800 Series: — E810 — E820 Intel® Ethernet Controller E810 and Intel® Ethernet Connection E82X Feature Comparison Matrix	 https://cdrdv2.intel.com/v1/dl/getContent/630155 https://cdrdv2.intel.com/v1/dl/getContent/739764 https://cdrdv2.intel.com/v1/dl/getContent/751546
Intel® Ethernet 700 Series: — X710/XXV710/XL710 — X722 — X710-TM4/AT2 and V710-AT2	 https://cdrdv2.intel.com/v1/dl/getContent/332191 https://cdrdv2.intel.com/v1/dl/getContent/336882 https://cdrdv2.intel.com/v1/dl/getContent/619407
Intel® Ethernet 500 Series	https://cdrdv2.intel.com/v1/dl/getContent/335253

6.2 Specification Updates

These documents provide the latest information on hardware errata as well as device marking information, SKU information, etc.

Device Series	Support Link
Intel® Ethernet 800 Series	https://cdrdv2.intel.com/v1/dl/getContent/616943
Intel® Ethernet 700 Series: — X710/XXV710/XL710 — X710-TM4/AT2 and V710-AT2	 https://cdrdv2.intel.com/v1/dl/getContent/331430 https://cdrdv2.intel.com/v1/dl/getContent/615119
Intel® Ethernet 500 Series — X550 — X540	 https://cdrdv2.intel.com/v1/dl/getContent/333717 https://cdrdv2.intel.com/v1/dl/getContent/334566
Intel® Ethernet 300 Series	https://cdrdv2.intel.com/v1/dl/getContent/333066
Intel® Ethernet 200 Series — I210 — I211	 https://cdrdv2.intel.com/v1/dl/getContent/332763 https://cdrdv2.intel.com/v1/dl/getContent/333015

6.3 Software Download Package

The release software download package can be found here.

6.4 SourceForge Ethernet Drivers and Utilities

For additional information regarding Linux kernel drivers, refer to the *Intel® Ethernet Drivers and Utilities* SourceForge project page.

6.5 Intel Product Security Center Advisories

Intel product security center advisories can be found at:

https://www.intel.com/content/www/us/en/security-center/default.html

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