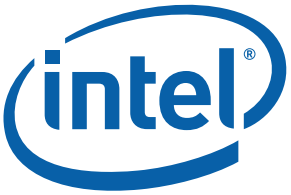

Intel® Ethernet 800 Series Controllers

Migration Guide

Ethernet Products Group (EPG)

July 2020

Revision 2.0
615266-001

Revision History

Revision	Date	Comments
2.0[1]	July 23, 2020	Initial public release.

1. There are no previous publicly-available versions of this document.

Contents

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1.0 Introduction

1.1 Nomenclature

For the purposes of this document:

- The Intel® Ethernet 700 Series Controllers (700 Series) includes the following devices:
  - Intel® Ethernet Controller X710 (X710)
  - Intel® Ethernet Controller XXV710 (XXV710)
  - Intel® Ethernet Controller XL710 (XL710)

  Note: Note that the Intel® Ethernet Connection X722 is not included in this document.
- The Intel® Ethernet 800 Series Controllers (800 Series) includes the following devices:
  - Intel® Ethernet Controller E810-CAM1 (E810-CAM1)
  - Intel® Ethernet Controller E810-CAM2 (E810-CAM2)
  - Intel® Ethernet Controller E810-XXVAM2 (E810-XXVAM2)

1.2 Overview

The Intel® Ethernet 800 Series Controllers are Intel's first multi-speed 100 Gigabit Ethernet Controllers supporting rates between 100 Mb/s and 100 Gb/s. The key features supported in the 800 Series include:

- 100 Gigabit throughput performance.
- Enhanced programmable packet processing pipeline.
- Virtualization: Enhanced SR-IOV
- RDMA (iWARP and RoCEv2).

The purpose of this document is to provide an overview for software developers who want to upgrade from the Intel® 82599 10 Gigabit Ethernet Controller (82599) or the Intel® Ethernet 700 Series Controllers to the Intel® Ethernet 800 Series Controllers.

For more details on the 800 Series supported features, refer to the *Intel® Ethernet Controller E810 Feature Support Matrix*, located at:

https://cdrdv2.intel.com/v1/dl/getContent/630155

Access the *Intel® Ethernet Controller E810 Datasheet* at:

https://cdrdv2.intel.com/v1/dl/getContent/613875

2.0 Software Feature Comparison: 82599/700 Series/ 800 Series

Table 1 provides software feature comparison among the 82599, 700 Series, and 800 Series products.

For more details on the 800 Series supported features, refer to the *Intel® Ethernet Controller E810 Feature Support Matrix*, located at https://cdrdv2.intel.com/v1/dl/getContent/630155.

Table 1. Software Feature Comparison

Feature	82599	700 Series	800 Series
Device Capability[1]	2x10 Gb/s 2x1 Gb/s 2x100 Mb/s	2x40 Gb/s 2x25 Gb/s 4x10 Gb/s 4x1 Gb/s	2x100 Gb/s 2x50 Gb/s 4x25 Gb/s 8x10 Gb/s 8x1 Gb/s 8x100 Mb/s
PCIe Interface	PCIe v2.0 x8	PCIe v3.0 x8	PCIe v3.0 x16 PCIe v4.0 x16
Power (highest speed enabled)	4.5 W (Typical) 5.4 W (Max)	3.82 W (Typical) 6.47 W (Max)	12.80 W (Typical) 15.43 W (Max)
Energy Efficient Ethernet (EEE)	No	No	No
Secure & Digitally-Signed NVM	No	Yes	Yes
RSS Table per VF	No	Yes	Yes
Malicious Driver Protection	No	Yes	Yes
MCTP over PCIe (pass-through and control)	No	Yes	Yes
FCoE Support	Yes	No	No
NC-SI Flow Control	No	Yes	Yes
Flexible TCO Filters	Yes	Yes	Yes
TLP Processing Hints (TPH)	No	Yes	Yes
Latency Tolerance Reporting (LTR)	No	Yes	Yes
ID-Based Ordering (IDO)	No	Yes	Yes
VEPA Support (on top of VEB support)	No	Yes	Yes
Application Device Queues (ADQ)	No	Yes[2] (Functional only)	Yes
Dynamic Device Personalization (DDP)	No	Yes[3]	Yes
Remote Direct Memory Access (RDMA)	No	No	iWARP and RoCEv2
Rx Queues (per device)	128	1536	2048
Tx Queues (per device)	128	1536	2048
Tx Completion Queues (per device)	No	No	512
Tx Doorbell Queues (per device)	No	No	256

Table 1. Software Feature Comparison [continued]

Feature	82599	700 Series	800 Series
Receive Side Scaling (RSS)	Fixed queue assignment: • Up to 16 RSS queues per PF. • 2 or 4 RSS queues per VF (total of 2x128). • Single RSS indirection table for all functions on each port. • Algorithms: — Toeplitz	Flexible queue assignment: • Up to 64 RSS queues per PF. • Up to 16 arbitrary or 256 contiguous RSS queues per VF (total of 1536 queues). • Independent RSS indirection table for each PF and VFs. • Algorithms: — Toeplitz — Symmetric Toeplitz — XOR	Flexible queue assignment: • Up to 256 RSS queues per PF. • Up to 16 arbitrary or 256 contiguous RSS queues per VF (total of 2048 queues). • RSS support per VSI/VF • Different table sizes: — 768 tables of 64 — 16 tables of 512 — 8 tables of 2048) • Algorithms: — Toeplitz — Symmetric Toeplitz — XOR
Intel® Ethernet Flow Director Filters (per device)	8 K	8 K	16 K
Intel® Ethernet Flow Director ATR mode	Yes	Yes	No[4]
VSI	64 VSIs (“pools”) per port	384 VSIs per device	768 VSIs per device (32 with statistics block)
SR-IOV VF	64 per port	128 per device	256 per device
ACL (per device)	No	No	8 K x 40 bits (TCAM)
Forward Table (per device)	No	1 K MAC 512 VLAN	32 K x 80 bits
Edge Virtual Bridge Virtual Edge Bridge (VEB)	• Simple VEPA 802.1Qbg. • 1 VEB per PF.	• Full 802.1Qbg. • One S-Comp per physical LAN port. • Multi-channel S-Component. • Up to 384 Channels with 512 S-tags. • 16 VEBs for the device. • Floating VEB: VF to VF forwarding with no PHY link.	• Full 802.1Qbg. • 256 VEBs for the device (32 with Stats).

1. Device capability is determined by the combination of Silicon SKU and NVM image programmed on the device. See silicon/adapter product specifications for more details.
2. Functional only - Full performance benefit enabled in the Intel® Ethernet 800 Series Controllers. See readme for i40e driver.
3. See https://software.intel.com/en-us/articles/dynamic-device-personalization-for-intel-ethernet-700-series
4. ATR equivalent capability now provided by Linux kernel flow steering mechanisms (aRFS, XPS, etc).

3.0 Intel® Ethernet 800 Series System IDs

Table 2. Intel® Ethernet 800 Series System IDs

Vendor ID	Device ID	Description
8086	1590	Intel® Ethernet Controller E810-C
8086	1591	Intel® Ethernet Controller E810-C for Backplane
8086	1592	Intel® Ethernet Controller E810-C for QSFP
8086	1593	Intel® Ethernet Controller E810-C for SFP
8086	10A6	Intel® E810-C Multi-Function Network Device
8086	1598	Intel® Ethernet Controller E810-XXV
8086	1599	Intel® Ethernet Controller E810-XXV for backplane
8086	159A	Intel® Ethernet Controller E810-XXV for QSFP
8086	159B	Intel® Ethernet Controller E810-XXV for SFP

4.0 Linux Driver

This section shows Linux out-of-tree driver installation steps for 82599, 700 Series, and 800 Series products.

Note: The driver versions shown in the following examples might be out of date. Download the latest available drivers from the Intel® Download Center for installation.

4.1 82599 Driver Installation

Execute the following steps to perform driver installation for the 82599:

1. Download the *ixgbe<version_number>.tar.gz* 82599 drivers file from the Intel® Download Center. The version used here is 5.5.5.
2. Untar/unzip the archive:

   ```
   tar zxf ixgbe<version_number>.tar.gz
   ```

3. Change to the driver *src* directory, where <*x.x.x*> is the version number for the driver tar:

   ```
   cd ixgbe-<x.x.x>/src/
   ```

4. Got to *root* and compile the driver module (you will need root access):

   ```
   sudo -s
   make install
   ```

5. Ensure that any older *ixgbe* drivers are removed from the kernel before loading the new module:

   ```
   rmmod ixgbe
   modprobe ixgbe
   ```

6. For certain distributions (like, but not limited to, RedHat Enterprise Linux 7 and Ubuntu), once the driver is installed, the *initrd/initramfs* file might need to be updated to prevent the OS from loading old versions of the *ixgbe* driver.

   On RedHat distributions, use the **dracut** utility:

   ```
   # dracut --force
   ```

   For Ubuntu:

   ```
   # update-initramfs -u
   ```

7. Verify that the new version of driver has been loaded:

   ```
   modinfo ixgbe
   ```

```
[root@localhost src]# modinfo ixgbe
filename:       /lib/modules/3.10.0-862.el7.x86_64/updates/drivers/net/ethernet/intel/ixgbe/ixgbe.ko
version:        5.5.5
license:        GPL
description:    Intel(R) 10GbE PCI Express Linux Network Driver
author:         Intel Corporation, <linux.nics@intel.com>
retpoline:      Y
rhelversion:    7.5
srcversion:     373E490B1CA4289D52EAC90
alias:          pci:v00008086d000015E5sv*sd*bc*sc*i*
alias:          pci:v00008086d000015E4sv*sd*bc*sc*i*
alias:          pci:v00008086d000015CEsv*sd*bc*sc*i*
alias:          pci:v00008086d000015CCsv*sd*bc*sc*i*
alias:          pci:v00008086d000015CAsv*sd*bc*sc*i*
alias:          pci:v00008086d000015C8sv*sd*bc*sc*i*
alias:          pci:v00008086d000015C7sv*sd*bc*sc*i*
alias:          pci:v00008086d000015C6sv*sd*bc*sc*i*
```

4.2 Intel® Ethernet 700 Series Driver Installation

Execute the following steps to perform driver installation for the 700 Series devices:

1. Download the *i40e<version_number>.tar.gz* 700 Series drivers file from Intel® Download Center. The version used here is 2.7.29.
2. Untar/unzip the archive:

   ```
   tar zxf i40e<version_number>.tar.gz
   ```

3. Change to the driver *src* directory, where <*x.x.x*> is the version number for the driver tar:

   ```
   cd i40e-<x.x.x>/src/
   ```

4. Got to *root* and compile the driver module (you will need root access):

   ```
   sudo -s
   make install
   ```

5. Ensure that any older *ixgbe* drivers are removed from the kernel before loading the new module:

   ```
   rmmod i40e
   modprobe i40e
   ```

6. For certain distributions (like, but not limited to, RedHat Enterprise Linux 7 and Ubuntu), once the driver is installed, the *initrd/initramfs* file might need to be updated to prevent the OS loading old versions of the *i40e* driver.

   On RedHat distributions, use the **dracut** utility:

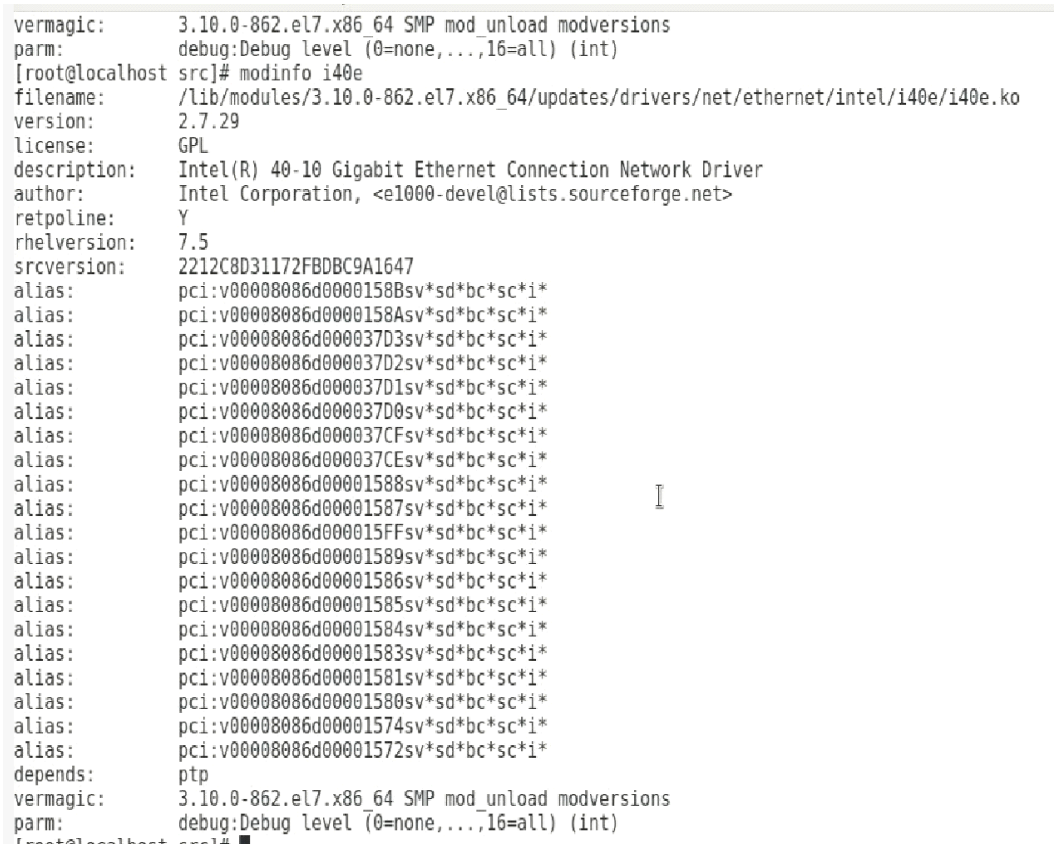
   ```
   # dracut --force
   ```

   For Ubuntu:

   ```
   # update-initramfs -u
   ```

7. Verify that the new version of driver has been loaded:

   ```
   modinfo i40e
   ```



```
vermagic:       3.10.0-862.el7.x86_64 SMP mod_unload modversions
parm:           debug:Debug level (0=none,...,16=all) (int)
[root@localhost src]# modinfo i40e
filename:       /lib/modules/3.10.0-862.el7.x86_64/updates/drivers/net/ethernet/intel/i40e/i40e.ko
version:        2.7.29
license:        GPL
description:    Intel(R) 40-10 Gigabit Ethernet Connection Network Driver
author:         Intel Corporation, <e1000-devel@lists.sourceforge.net>
retpoline:      Y
rhelversion:    7.5
srcversion:     2212C8D31172FBDBC9A1647
alias:          pci:v00008086d0000158Bsv*sd*bc*sc*i*
alias:          pci:v00008086d0000158Asv*sd*bc*sc*i*
alias:          pci:v00008086d000037D3sv*sd*bc*sc*i*
alias:          pci:v00008086d000037D2sv*sd*bc*sc*i*
alias:          pci:v00008086d000037D1sv*sd*bc*sc*i*
alias:          pci:v00008086d000037D0sv*sd*bc*sc*i*
alias:          pci:v00008086d000037CFsv*sd*bc*sc*i*
alias:          pci:v00008086d000037CEsv*sd*bc*sc*i*
alias:          pci:v00008086d00001588sv*sd*bc*sc*i*
alias:          pci:v00008086d00001587sv*sd*bc*sc*i*
alias:          pci:v00008086d000015FFsv*sd*bc*sc*i*
alias:          pci:v00008086d00001589sv*sd*bc*sc*i*
alias:          pci:v00008086d00001586sv*sd*bc*sc*i*
alias:          pci:v00008086d00001585sv*sd*bc*sc*i*
alias:          pci:v00008086d00001584sv*sd*bc*sc*i*
alias:          pci:v00008086d00001583sv*sd*bc*sc*i*
alias:          pci:v00008086d00001581sv*sd*bc*sc*i*
alias:          pci:v00008086d00001580sv*sd*bc*sc*i*
alias:          pci:v00008086d00001574sv*sd*bc*sc*i*
alias:          pci:v00008086d00001572sv*sd*bc*sc*i*
depends:        ptp
vermagic:       3.10.0-862.el7.x86_64 SMP mod_unload modversions
parm:           debug:Debug level (0=none,...,16=all) (int)
```

4.3 Dynamic Device Personalization

Dynamic Device Personalization (DDP) allows you to change the packet processing pipeline of a device by applying a profile package to the device at runtime. Profiles can be used to, for example, add support for new protocols, change existing protocols, or change default settings. DDP profiles can also be rolled back without rebooting the system.

The Linux driver installs the DDP package without user intervention or preparation. The OS driver and package are installed and set up automatically.

4.3.1 Dynamic Device Personalization Package Setup

It is essential to install ICE driver and NVM firmware image from same release SVK or LEK. The DDP package is included as part of Intel® ICE driver. The driver installs and loads the package during driver initialization.

The DDP package loads during device initialization. The driver looks for *intel/ice/ddp/ice.pkg* in the firmware root (typically */lib/firmware/* or */lib/firmware/updates/*) and checks that it contains a valid DDP package file.

If the driver is unable to load the DDP package, the device enters Safe Mode, which disables advanced and performance features, and supports only basic traffic and minimal functionality, such as updating the NVM or downloading a new driver or DDP package. Safe Mode only applies to the affected physical function and does not impact any other PFs.

Notes:

- The *ice.pkg* file is a symbolic link to the default DDP package file installed by the Linux-firmware software package or the *ice* out-of-tree driver installation.
- You cannot update the DDP package if any PF drivers are already loaded. To overwrite a package, unload all PFs and then reload the driver with the new package.
- Only the first loaded PF per device can download a package for that device.
- For more details on how to load the DDP package, refer to the readme file of the Intel® Ethernet 800 Series driver.

4.4 Intel® Ethernet 800 Series Driver Installation

Note: Intel® Ethernet 800 Series Controllers enable Dynamic Device Personalization (DDP). Refer to Section 4.3 for more details.

Execute the following steps to perform driver installation for the 800 Series devices:

1. Download the *ice<version_number>.tar.gz* 800 Series drivers file from Intel® Download Center. The version used here is 0.11.7.
2. Untar/unzip the archive:

   ```
   tar zxf ice<version_number>.tar.gz
   ```

3. Change to the driver *src* directory, where <*x.x.x*> is the version number for the driver tar:

   ```
   cd ice-<x.x.x>/src/
   ```

4. Got to *root* and compile the driver module (you will need root access):

   ```
   sudo -s
   make install
   ```

5. Make sure that any older *ice* drivers are removed from the kernel before loading the new module:

   ```
   rmmod ice
   modprobe ice
   ```

6. For certain distributions (like, but not limited to, RedHat Enterprise Linux 7 and Ubuntu), once the driver is installed, the *initrd/initramfs* file might need to be updated to prevent the OS loading old versions of the *ice* driver.

   On RedHat distributions, use the **dracut** utility:

   ```
   # dracut --force
   ```

   For Ubuntu:

   ```
   # update-initramfs -u
   ```

7. Verify that the new version of driver has been loaded.

   ```
   modinfo ice
   ```

Note: For instructions on ADQ, refer to the *Intel® Ethernet Controller E810 Application Device Queues (ADQ) Configuration Guide*.

5.0 NVM Update Tool

This section provides steps on running the NVM update tool on 700 Series and 800 Series devices.

Note: The tool versions shown in the following examples might be out of date. Download the latest available tool version from the Intel® Download Center.

5.1 Intel® Ethernet 700 Series Devices

The NVM Update Tool runs using the kernel driver of the device. Ensure that the kernel driver is downloaded as shown in Section 4.2 before proceeding further from the Command-Line Interface (CLI). The open-source version of the NVM Update Tool requires a network driver on the system prior to the NVM update. It is recommended that the most current driver be installed on the system. Open-source network drivers can be downloaded from the Intel® Download Center:

https://downloadcenter.intel.com/download/24769/Non-Volatile-Memory-NVM-Update-Utility-for-Intel-Ethernet-Network-Adapter-710-Series

The NVM Update tool (Linux) for the 700 Series can also be downloaded from Intel® Download Center:

https://downloadcenter.intel.com/download/25791/Non-Volatile-Memory-NVM-Update-Utility-for-Intel-Ethernet-Adapters-700-Series-Linux

Execute the following steps:

1. The first thing to check on the system receiving the update is the most current network driver and NVM image. This can be done with the **ethtool** interface command using the **-i** option, as follows:

   ```
   ethtool -i <interface_name>
   ```

2. Output of **ethtool -i** shows the running version of the network driver, the firmware version, and ETrackID, as follows:

   ```
   driver: i40e
   version: 2.7.29
   firmware-version: 6.01 0x80003483 1.1747.0
   expansion-rom-version:
   bus-info: 0000:06:00.0
   supports-statistics: yes
   supports-test: yes
   supports-eeprom-access: yes
   supports-register-dump: yes
   supports-priv-flags: yes
   ```

   The last four hex characters in the firmware version denote the ETrackID.

3. In preparation for the firmware update, update the network driver to the most current version and identify the path to the NVM Update Tool on the target system.

4. Extract the tar file:

   ```
   tar zxf 700Series_NVMUpdatePackage_<version_number>.tar.gz
   ```

5. After extracting the tar file, navigate to the location of the NVM Update Tool executable to change the *nvmupdate64e* executable file permissions, as follows:

   ```
   [root@localhost Linux_x64]# chmod 755 nvmupdate64e
   [root@localhost Linux_x64]# ls -al |grep nvmupdate
   -rwxr-xr-x. 1 500 544 4179827 Mar 18 23:15 nvmupdate64e
   -rw-r--r--. 1 500 544   22319 Mar 18 22:36 nvmupdate.cfg
   ```

6. Run the tool like any Linux executable. An example of the Linux version of the NVM Update Tool update and its output is as follows:

```
[root@localhost Linux_x64]# ./nvmupdate64e

Intel(R) Ethernet NVM Update Tool
NVMUpdate version 1.32.20.30
Copyright (C) 2013 - 2018 Intel Corporation.


WARNING: To avoid damage to your device, do not stop the update or reboot or power off the system during this up
date.
Inventory in progress. Please wait [***|......]


Num Description                          Ver.(hex)  DevId S:B    Status
=== ================================== ============ ===== ====== ==============
01) Intel(R) Ethernet Converged          6.01(6.01)  1572 00:006 Update
    Network Adapter X710-2                                       available

Options: Adapter Index List (comma-separated), [A]ll, e[X]it
Enter selection:a
Would you like to back up the NVM images? [Y]es/[N]o: y
Update in progress. This operation may take several minutes.
[**-.......]


Num Description                          Ver.(hex)  DevId S:B    Status
=== ================================== ============ ===== ====== ==============
01) Intel(R) Ethernet Converged         6.128(6.80)  1572 00:006 Update
    Network Adapter X710-2                                       successful

Reboot is required to complete the update process.

Tool execution completed with the following status: All operations completed successfully.
Press any key to exit.
```

Note: A typical update takes several minutes to complete.

7. The NVM update might require a two-step process depending on the initial image revision. Use the Software/NVM Compatibility table to verify the latest image versions.
8. When the tool execution completes, reboot the system to complete the update process and load the new firmware.
9. After the reboot, verify the new firmware with **ethtool**, as follows:

```
[root@localhost Linux_x64]# ethtool -i ens1f0
driver: i40e
version: 2.7.29
firmware-version: 6.80 0x80003cc1 1.1747.0
expansion-rom-version:
bus-info: 0000:06:00.0
supports-statistics: yes
supports-test: yes
supports-eeprom-access: yes
supports-register-dump: yes
supports-priv-flags: yes
```

5.2 Intel® Ethernet 800 Series Devices

The NVM Update Tool runs using the kernel driver of the device. Ensure that the kernel driver is downloaded as shown in Section 4.4 before proceeding further from the Command-Line Interface (CLI). The open-source version of the NVM Update Tool requires a network driver on the system prior to the NVM update. It is recommended that the most current driver be installed on the system. Open-source network drivers can be downloaded from the Intel® Download Center.

The NVM Update Tool (Linux) for the 800 Series can be also downloaded from Intel® Download Center.

Execute the following steps:

1. The first thing to check on the system receiving the update is the most current network driver and NVM image. This can be done with the **ethtool** interface command using the **-i** option, as follows:

   ```
   ethtool -i <interface_name>
   ```

   The last four hex characters in the firmware version denote the ETrackID.

2. In preparation for the firmware update, update the network driver to the most current version and identify the path to the NVM Update Tool on the target system.

3. Extract the tar file:

   ```
   tar zxf ice_NVMUpdatePackage_<version_number>.tar.gz
   ```

4. After extracting the tar file, navigate to the location of the NVM Update Tool executable to change the **nvmupdate64e** executable file permissions, as follows:

   ```
   File  Edit  View  Search  Terminal  Help
   [root@localhost CVL_Upgrade_SEC]# chmod 755 nvmupdate64e
   [root@localhost CVL_Upgrade_SEC]# ls -al |grep nvmupdate
   -rwxr-xr-x. 1 paeuser paeuser  4033672 Aug  1 06:32 nvmupdate64e
   -rw-r--r--. 1 paeuser paeuser     3507 Jul 31 21:41 nvmupdate.cfg
   ```

5. Run the tool like any Linux executable.

   An example of the Linux version of the NVM Update Tool update and its output is as follows:

```
[root@localhost Config]# ./nvmupdate64e

Intel(R) Ethernet NVM Update Tool
NVMUpdate version 1.34.14.2
Copyright (C) 2013 - 2019 Intel Corporation.


WARNING: To avoid damage to your device, do not stop the update or reboot or power off the system during this up
date.
Inventory in progress. Please wait [***+......]


Num Description                         Ver.(hex)  DevId S:B    Status
=== ================================= ============ ===== ====== ==============
01) Intel(R) Ethernet Converged         7.00(7.00)  1572 00:006 Update not
    Network Adapter X710-2                                      available
02) Intel(R) Ethernet Network Adapter   0.80(0.50)  1592 00:009 Update
    E810-C-Q2                                                   available

Options: Adapter Index List (comma-separated), [A]ll, e[X]it
Enter selection:a
Would you like to back up the NVM images? [Y]es/[N]o: n
Update in progress. This operation may take several minutes.
[**-.......]


Num Description                         Ver.(hex)  DevId S:B    Status
=== ================================= ============ ===== ====== ==============
01) Intel(R) Ethernet Converged         7.00(7.00)  1572 00:006 Update not
    Network Adapter X710-2                                      available
02) Intel(R) Ethernet Network Adapter   0.80(0.50)  1592 00:009 Update
    E810-C-Q2                                                   successful

Please Reboot your system now and run the NVM update utility again to complete the update. Failure to do so will
 result in an incomplete NVM update.
```

Note: A typical update takes several minutes to complete.

6. The NVM update might require a two-step process depending on the initial image revision.
7. When the tool execution completes, reboot the system to complete the update process and load the new firmware.
8. After the reboot, verify the new firmware with **ethtool**, as follows:

```
[root@localhost Config]# ethtool -i ens2f0
driver: ice
version: 0.11.2_rc30
firmware-version: 0.50 0x8000174b 1.2210.0
expansion-rom-version:
bus-info: 0000:09:00.0
supports-statistics: yes
supports-test: yes
supports-eeprom-access: yes
supports-register-dump: yes
supports-priv-flags: yes
[root@localhost Config]#
```

6.0 Configuration Utilities for 700 Series and 800 Series Devices

6.1 Intel® Ethernet Port Configuration Tool

The Intel® Ethernet Port Configuration Tool (EPCT) is a command-line utility that allows users to change the link type of XL710-QDA1, XL710-QDA2, E810-CAM1, and E810-CAM2 devices. The supported types are defined within the adapter's NVM. This utility displays only the devices that potentially support reconfiguration. The Linux tool version can be obtained from Intel® Download Center.

Note: The tool version shown in the following example might be out of date. Download the latest available tool version from the Intel® Download Center. Moving forward. EPCT will be the generic tool for configuring the ports for XL710-QDA1, XL710-QDA2, E810-CAM1, and E810-CAM2 devices.

The following shows how to display help and the network adapter of the system by using tool's **-devices** option in the Linux OS. The network card used as an example here is the E810-CAM2.

```
[root@localhost linux64e_1.34.11.0]# ./epct64e
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

Options:
    -h / -help / -?
      Displays command line help.
    -h (parameter) / -help (parameter) / -? (parameter)
      Usage help for specific command line parameter.
    -devices [parameter]
      Displays supported devices present in the system. If 'branding' parameter is specified branding view is pr
esented.
    -nic=(device_index)
      Selects device with specified index.
    -get
      Displays port configuration for specified device.
    -set (option)
      Configures device with specified option.

All actions succeeded.
[root@localhost linux64e_1.34.11.0]# ./epct64e -devices
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

NIC Seg:Bus:Fun   Ven-Dev   Connector Ports Speed    Quads  Lanes per PF
=== ============= ========= ========= ===== ======== ====== ============
 1) 000:009:00-01 8086-1592 QSFP      2     100 Gbps Dual   4

Warning: Any changes to the port option configuration will require a reboot before the device will function corr
ectly.

All actions succeeded.
```

The following screen shot shows how to select the branding title for the specific network adapter on the system using the **-get** option:

```
[root@localhost linux64e_1.34.11.0]# ./epct64e -nic=1 -get
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

Available Port Options:
================================================================================
 Active  Port                             Quad 0           Quad 1
 Option  Option (Gbps)                    L0  L1  L2  L3   L4  L5  L6  L7
======== ============================    ==============  ================
    X    100-100                      -> 100   -   -   -  100   -   -   -
         50+50                        ->  50   -  50   -    -   -   -   -
         4x25                         ->  25  25  25  25    -   -   -   -
         2x25-2x25                    ->  25  25   -   -   25  25   -   -
         8x10                         ->  10  10  10  10   10  10  10  10
         100                          -> 100   -   -   -    -   -   -   -

Warning: Any changes to the port option configuration will require a reboot before the device will function corr
ectly.

All actions succeeded.
```

The following screen shot shows how to select the port option for the specific network adapter using **-set** option. After using this option the user must reboot the system for the changes to take affect and for the device to function in the correct port configuration.

```
[root@localhost linux64e_1.34.11.0]# ./epct64e -nic=1 -set 50+50
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

New configuration was set: 50+50
Restart the system to apply the changes.

The port options have changed for this device. You must reboot for the device to function correctly.

All actions succeeded.
```

The following screen shots confirm that the new port option selected (50+50) has been applied to the network adapter.

```
[root@localhost linux64e_1.34.11.0]# ./epct64e -devices branding
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

NIC Seg:Bus Ven-Dev   Mode        Adapter Name
=== ======= ========= =========== ============================================
 1) 000:009 8086-1592 50+50       Intel(R) Ethernet Network Adapter E810-C-Q2

Warning: Any changes to the port option configuration will require a reboot before the device will function corr
ectly.

All actions succeeded.
[root@localhost linux64e_1.34.11.0]# ./epct64e -devices
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

NIC Seg:Bus:Fun   Ven-Dev   Connector Ports Speed    Quads  Lanes per PF
=== ============= ========= ========= ===== ======== ====== ============
 1) 000:009:00-01 8086-1592 QSFP      2     50  Gbps Single 2

Warning: Any changes to the port option configuration will require a reboot before the device will function corr
ectly.
```

```
[root@localhost linux64e_1.34.11.0]# ./epct64e -nic=1 -get
Intel(R) Ethernet Port Configuration Tool
EPCT version: v1.34.11.00
Copyright(C) 2019 Intel Corporation.

Available Port Options:
================================================================================
 Active  Port                            Quad 0          Quad 1
 Option  Option (Gbps)                   L0  L1  L2  L3   L4  L5  L6  L7
======== ============================    ==============  ================
         100-100                     -> 100   -   -   - 100   -   -   -
    X    50+50                       ->  50   -  50   -   -   -   -   -
         4x25                        ->  25  25  25  25   -   -   -   -
         2x25-2x25                   ->  25  25   -   -  25  25   -   -
         8x10                        ->  10  10  10  10  10  10  10  10
         100                         -> 100   -   -   -   -   -   -   -

Warning: Any changes to the port option configuration will require a reboot before the device will function corr
ectly.

All actions succeeded.
```

For more details on the usage of EPCT, refer to its user guide.

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