# 10GigEthr-03 (iocxgbe) B.11.31.1405 Ethernet Driver Release Notes (Edition 5)
## HP-UX 11i v3

### Abstract

This document contains specific information that is intended for users of this HP product.

## Legal Notices

## Trademark Acknowledgments

## Revision history

| Document manufacturing part number | Edition number | Publication date | Changes made to content |
|---|---|---|---|
| 5900-3847 | Edition 5 | May 2014 | Added defect fixes |
| 5900-3344 | Edition 4 | March 2014 | Added defect fixes, enhancements, and a known issue |
| 5900-3145 | Edition 3 | June 2013 | Added QXCR1001246487 problem fix; see "Problems fixed in this release" (page 9). |
| 5900-3131 | Edition 2 | June 2013 | Acknowledgment of software version discrepancy: software released with Application Release (AR) 1303 is B.11.31.1303.01. Documentation of a link problem with certain interfaces, resolved by installing the latest firmware. |
| 5900-2501 | Edition 1 | March 2013 | Performance and stability enhancements; problem fixes |

# Contents

# 10GigEthr-03 overview

## Bundle description

> **NOTE:** The software version released with Application Release (AR) 1403 is B.11.31.1405.

The 10GigEthr-03 bundle contains the `iocxgbe` driver, which supports the following products:

| PCIe 10 GbE standup adapters | PCIe 10 GbE mezzanine adapters | PCIe 10GbE / FCoE CNA standup adapters | PCIe 10GbE / FC combo standup adapter cards | PCIe 10 GbE/FCoE CNA mezzanine adapters | HP Integrity server integrated FlexFabric (CNA) adapters |
|---|---|---|---|---|---|
| AT118A | NC552m | AT111A | AT094A | NC551m<br>NC553m | BL8x0c i4 server blades integrated (LOM) FlexFabric adapter (NC553i)[1] |

[1] An Emulex BE3 CNA built-in (embedded) adapter; also referred to as a Converged Network Controller (CNC)

For more information about installing a supported adapter, see the respective adapter installation guide at the following website:

http://www.hp.com/go/10-gigabit-ethernet-docs

For more information about installing integrated FlexFabric (CNA) adapters, see the respective server installation documentation at the following locations:

www.hp.com/go/blades-docs
www.hp.com/go/integrity_servers-docs

For more information about firmware requirements and how to obtain the latest firmware for your product, see "Firmware requirements" (page 13).

## Terminology

When referring to CNA (Converged Network Adapter) technology, the following terms are used:

| | |
|---|---|
| Adapter | The whole card. |
| AVIO | Accelerated Virtual Input/Output. An I/O protocol that improves virtual I/O performance for network and storage devices used within the HP Integrity VM environment. |
| Card | The adapter, most often in reference to the hardware or to a specific form factor (such as PCIe mezzanine). |
| CNA | Converged Network Adapter. A computer input/output device that combines the functionality of a host bus adapter (HBA) with a network interface controller (NIC). In other words, it "converges" access to a storage area network and a local area network, respectively. |
| Device | The adapter as a whole, or an HP-UX device. |
| DIO | The direct I/O networking feature that allows virtual machines to directly control I/O devices, minimizing device emulation overhead incurred with AVIO. |
| FC | Fibre Channel. A network technology used for storage networking. |
| FCoE | Fibre Channel over Ethernet. An encapsulation of Fibre Channel frames over Ethernet networks that is independent |

| | |
|---|---|
| | of the Ethernet forwarding schemes and integrates with existing Fibre Channel networks and management software. Computers connect to FCoE through CNAs. |
| Function | A PCIe function. Each function can be configured by HP-UX as a single device: an FCoE device or a LAN device. HP-UX can configure a dual-ported CNA with as many as 8 PCIe functions (up to four per port) in a Flex-10 environment. As many as two of these functions can be FCoE devices (one per port); the remainder are NIC or LAN devices (up to four per port). |
| HP Converged Infrastructure Architecture | A set of associated services and partner offerings that create a virtualized, on-demand data center. It integrates and virtualizes compute, storage, networking, and management resources based on several HP technologies, most notably BladeSystem Matrix, FlexFabric, and Virtual Resource Pools. |
| HP FlexFabric | Part of the HP FlexNetwork architecture portfolio, creates a common, wired-once, virtual I/O network that consolidates Ethernet and storage networks onto a single fabric. This unique, wire-once approach enables an organization to establish a simpler, high-performance, low-latency network that can dramatically lower network complexity and cost, and easily flex connections and performance to meet changes in the workload demands of highly virtualized, large-scale application environments. |
| Integrated FlexFabric adapter | On BL8x0c i4 server blade systems, an I/O adapter built into the system board that supports both LAN and FCoE functionality on the same ports. Also known as a Converged Network Controller (CNC), Converged Network Integrated Controller (CNIC), and converged LOM. It supports LAN and FCoE concurrently with high-performance protocol offloads that optimize server efficiency and maximize server virtualization ratios. Integrated FlexFabric adapters provide more functionality and intelligence than traditional LAN-only LOMs. The integrated FlexFabric adapter technology helps enable the HP Converged Infrastructure model and ubiquity of both 10GbE and network convergence. |
| LOM | LAN on motherboard. A chip or chipset capable of network connections that has been embedded directly on the motherboard of a server. For example, server blades include LOMs that are dual-port 1 or 10 Gigabit Ethernet interfaces. |
| Mezzanine adapter | Also known as a daughterboard or daughtercard. Plugs directly into the motherboard or another plug-in adapter to extend functionality. It usually fits on top of and parallel to the board or adapter it plugs into. |
| NIC | Network Interface Card. A function or device that is configured as a network or LAN I/O device. |
| PCIe | Peripheral Component Interconnect Express. A computer expansion bus standard that replaces older (such as PCI) bus standards to improvements such as a higher maximum system bus throughput, a smaller physical footprint, better performance scaling for bus devices, more detailed error detection and reporting, and native hot-plug functionality. |

|  |  | More recent revisions of the PCIe standard support hardware I/O virtualization. |
| --- | --- | --- |
|  | Port | The physical connection to the network. A CNA may have two physical connections; this configuration is often described as "dual-ported." |

## CNA overview

The CNA is a PCIe device that can be configured by HP-UX as a number of LAN and FCoE devices depending on the system configuration. Most CNAs are dual-ported. Each port represents a single wired connection to a piece of network hardware, as follows:

- In a Blade Virtual Connect environment, the CNA is configured in Flex-10 mode to connect virtualized server blades to data and storage networks. Each port is logically divided into as many as four individual devices that share the total bandwidth of the network connection. Bandwidth limits can be dynamically configured on each NIC. One of these individual devices on each port can be an FCoE device. For more information about HP Virtual Connect, see the following website:

  http://h18004.www1.hp.com/products/blades/virtualconnect/index.html

- In other environments, the CNA is configured as two individual devices per port, one FCoE and one LAN device, depending on the hardware configuration, both sharing the bandwidth of the network connection.

The CNA can be integrated into the highly-scalable HP FlexFabric data center architecture of an HP Converged Infrastructure. This open architecture uses industry standards to simplify server and storage network connections while providing seamless interoperability with existing core data center networks.

On BL8x0c i4 server blade systems, CNA devices called "integrated FlexFabric adapters" are embedded in the system board to provide more functionality and intelligence than do traditional LAN-only LOM adapters. The integrated FlexFabric adapters support LAN and FCoE connectivity concurrently with high-performance protocol offloads, optimizing server efficiency and maximizing server virtualization ratios. Connectivity can be fully virtualized to support traditional management, virtual machine migration, IP, NAS, iSCSI, and FCoE protocols, all on a single network.

For more information about HP FlexFabric, see the HP FlexFabric website:

www.hp.com/go/flexfabric

## Combo overview

A 10GbE/Fibre Channel combo adapter card is a PCIe adapter that HP-UX configures as four separate devices — a dual port FC device and a dual port LAN device. The FC devices are connected to an FC fabric through two FC fiber connections on the adapter. The LAN devices are connected to a 10Gigabit LAN through two NIC fiber connections on the adapter. The FC and LAN devices do not share bandwidth on a common connection to the fabric or network.

## Features

The `iocxgbe` driver is a PCIe 10 Gigabit Ethernet driver that can support the standup, mezzanine, and LAN on motherboard (LOM) technologies for a variety of platforms. It can be integrated into the highly-scalable HP FlexFabric data center architecture of an HP Converged Infrastructure.

The `iocxgbe` driver supports the HP Virtual Connect Flex-10 interface on server blade platforms to connect server blades to data and storage networks. By allowing you to logically divide each network port into multiple devices, the HP Virtual Connect Flex-10 technology reduces management requirements, the number of NICs and interconnect modules needed, and power and operational costs. Before HP Virtual Connect was introduced, only two interconnect choices were available for connecting server blades to a network — passthrough devices and switches. Passthrough devices

are simple but require too many cumbersome cables and create complexity. Blade switches reduce the number of cables but add more management responsibilities for LAN and SAN administrators. In both cases, multiple people are needed to perform very simple server tasks. Only HP offers the third choice — HP Virtual Connect.

Other notable features provided by the `iocxgbe` driver include:

- Transmit Checksum Offload (CKO) and TCP Segmentation Offload (TSO) for IPv4
- Receive CKO for IPv4
- Flex-10 bandwidth allocation
- Multiple receive queues
- Receive Side Scaling (RSS) with TCP and UDP
- TCP segment reassembly in driver
- Jumbo Frames
- Multicast and Promiscuous mode
- IPv6
- IEEE 802.1Q VLAN tagging and stripping in hardware
- Interrupt migration
- Interrupt coalescing
- Link handling
- DLKM
- APA aggregate mode[1]
- APA failover mode (LAN Monitor)
- HP Serviceguard
- PCI OLRAD
- PCI Error handling and recovery
- HP Integrity Virtual Machines (HPVM)
- vPars V6
- DIO (direct I/O)
- HP-UX LAN provider
- MIB and driver statistics
- Configurable using SMH or `nwmgr`
- `nettl` tracing/logging

# New and changed features in this release

## New features

There are no new features included in this version of 10GigEthr-03 at the time of this publication.

### New features introduced with 10GigEthr-03 (iocxgbe) B.11.31.1209

This release introduces performance enhancements to the existing driver and adds support for Online Addition, Replacement, and Deletion (OL*) of PCIe standup network adapters on Superdome

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1. Only LACP mode is supported with APA aggregation with 10GbE links. APA aggregate mode is not supported with server blades over Virtual Connect interconnects. Virtual Connect does not support aggregates (trunks), LACP, or otherwise on the downlinks side.

2 servers. With this feature, the server does not need to be powered off to perform any of these operations on a network adapter.

The feature is supported with the following network adapters on Superdome 2 servers:

- AT094A
- AT111A
- AT118A

Support of this feature requires the following be installed on your Superdome 2 server:

- The latest version of the NIC (`iocxgbe`) and Fibre Channel (`fcoc`) drivers (B.11.31.1209 or later)
- HP-UX operating system B.11.31.1209 or later
- The latest version of the Superdome 2 firmware recipe (3.32 or later)

For more information about the OL* feature, see the *Interface Card OL* Support Guide* at the following location:

http://www.hp.com/go/hpux-core-docs (select **HP-UX 11i v3**)

For information about the `olrad` command used for online addition, replacement, and deletion of PCI I/O adapters, refer to the *olrad*(1m) manpage on any HP-UX 11i v3 system.

## New features introduced with 10GigEthr-03 (iocxgbe) B.11.31.1203.02

The 10GigEthr-03 (iocxgbe) B.11.31.1203.02 release introduces performance enhancements to the existing driver.

## New features introduced with 10GigEthr-03 (iocxgbe) B.11.31.1203

The following features are new with 10GigEthr-03 B.11.31.1203:

- Direct I/O (DIO) support

  Direct IO networking gives the LAN device driver direct control of the device's IO. This minimizes device emulation overhead that would be incurred with accelerated virtual I/O (AVIO). In HP-UX vPars and Integrity VM environments, AVIO I/O devices are para-virtualized and do not allow the guest operating system to directly control the hardware. With direct I/O, the LAN device driver runs on the guest and directly controls devices that have no emulation. As such, direct I/O performs better than AVIO.

- PCI error handling and recovery

  Peripheral Component Interconnect (PCI) failures account for a significant percentage of errors in computer systems. The PCI Error Recovery (PCI ER) feature enables:

  - Detection of PCI bus parity errors
  - Isolation of the failed I/O path
  - Automatic recovery of adapters from errors

  With this feature enabled (by default), if an error occurs on a PCI bus containing an I/O adapter that supports PCI Error Recovery:

  - The PCI bus is quarantined to isolate the system from I/O and prevent harm to the system.
  - PCI ER attempts to recover from the error and to reinitialize the bus so that I/O can resume.

  The PCI ER feature avoids system crashes, decreases system downtime, and supports single-system high availability. For more information about PCI error handling and recovery, see the *PCI/PCIe Error Recovery Product Note* at:

  http://www.hp.com/go/pci-error-handling-recovery-docs

## Changed features

The `iocxgbe` driver has been enhanced with performance and stability improvements.

# Problems fixed in this and recent versions

This section describes any problems fixed in this and recent releases of the 10GigEthr-03 product.

## Problems fixed in this release

The following problems were fixed in this release:

| SR number | Description |
|---|---|
| QXCR100318295 | **Outbound Discards are seen on Guest LAN Interface**<br><br>For a traffic from AVIO Guest, unexpected Outbound Discards are seen on the guest LAN interface and on the VSP LAN interface that is used by guest LAN interface. |
| QXCR100318145 | **System panic from wait_for_lock: Already owns lock: iocxgbe_mq_lock**<br><br>When the speed setting is changed from VCM for a port in an APA group configuration, a system panic can be seen. |
| QXCR100340515 | **LRO may truncate/Enlarge TCP frames causing TCP performance degradation**<br><br>LRO may truncate/enlarge TCP frames causing TCP performance degradation. The software LRO algorithm may try to coalesce an additional packet which does not belong to the same TCP segment. This can causes packet discards. This is a rare scenario involving a specific traffic pattern having TCP timestamps and sacks options. |
| QXCR100337165 | **Errors seen during dynamic loading of iocxgbe driver module while setting different parameters in driver startup configuration file**<br><br>While loading `iocxgbe` driver module, following messages may be displayed on terminal when various parameters are being set in driver configuration file (`/etc/rc.config.d/hpiocxgbeconf`). Though driver load is successful, parameter settings will not take effect.<br><br># kcmodule iocxgbe=best<br>WARNING: The file '/usr/conf/mod/iqxgbe.org' does<br> not contain valid<br>      kernel code. It will be ignored.<br>    ==> Update the automatic 'backup'<br>configuration first? no<br>      * Future operations will ask whether to<br>update the backup.<br> postload: Failure in driver init script to<br>configure hw.<br> ERROR lan6: The operation could not be done.<br>The option "boot_param send_cko_off recv_cko_off"<br> is not valid<br>The supported -x options are:<br>...<br>...<br>Module           State      Cause    Notes<br>iocxgbe  (before)   unused            loadable,<br>unloadable<br>         (now)      loaded    best<br>         (next boot)  loaded    explicit |
| QXCR100332496 | **LAN cable pull on iocxgbe interface does not result in DL_HP_EVENT_CABLE event**<br><br>When pulling the LAN cable from an active LAN interface, the DLPI event DL_HP_EVENT_CABLE is not logged. |
| QXCR100331986 | **Critical Resource Analysis (CRA) is not detected for tx_cko and rx_cko for a LAN Interface**<br><br>While changing the value for Transmit CKO or Receive CKO for an active LAN Interface, the CRA is not detected. |

# Problems fixed in recent releases

| SR number | Description |
|---|---|
| QXCR1001311463 | **LAN connectivity failure when using HPVM Guest based VLANs** <br><br> LAN connectivity failure when using HPVM Guest Based VLANs (GBV) over a vswitch backed by a LAN interface, if there is no VLAN configured on LAN interface on VSP. |
| QXCR1001292744 | **Install script overwrites the entry in nettlgen.conf unconditionally** <br><br> When updating the product, the corresponding nettlgen.conf entry goes back to the default setting. |
| QXCR1001293922 | **Invalid speed reported for APA: LAN Monitor port on Flex10 interfaces** <br><br> When the two LAN interfaces connected to Virtual Connect Flex 10 are configured in a LAN Monitor group, and both interfaces have a speed set to 5 Gig, the APA LM port reports speed as 10 Gigabit instead of 5 Gig. |
| QXCR1001299480 | **VPD (Serial Number) information is not updated with olrad -R/-r command** <br><br> When the command `olrad -d /olrad -A` is used, and a new network adaptor is physically added, the VPD information is updated properly, but When the command `olrad -r /olrad -R` is use, and network adaptor is physically added, the VPD information (Serial number) is NOT updated. |
| QXCR1001281632 | **ER: Port initialization failed with "4.2.401.2212" Firmware** <br><br> When "Advanced Mode" is enabled as shown from UEFI configuration tool and LAN driver is loaded, it fails to claim the card with following DISASTER error: <br><br> ```iocxgbe19: INITIALIZING HP NC553m 2p 10GbE BL-c Mezzanine Adapter at hardware path 0/0/0/5/0/0/3 DISASTER: instance number(ppa): 1``` <br><br> The Emulex CNA can operate in both Legacy and Advance modes. For Factory Fresh installs, the firmware versions 4.2.x.x onwards will program CNA in Advance mode by default. For Firmware upgrades to existing systems, the current mode setting for CNA will be preserved. The LAN driver currently supports the Emulex CNA in legacy mode only. The mode-change requires an adaptor reboot to take effect. So, the compatibility changes are made in the driver in such a way that it can work with CNA in both legacy mode as well as in Advance mode. |
| QXCR1001269384 | **ER: Speed up driver boot time** <br><br> The boot time configuration delay when multiple parameters are being set is now reduced significantly. Prior to this release, system boot time could be impacted significantly by the number of parameters being set in the configuration file, especially in system configurations supporting a large number of LAN interfaces. Each configuration parameter was set using independent calls to the driver. Additional delays would result if driver resets were required for the settings to take effect. With this release of the driver, a single call is used to set multiple parameters, reducing the delay caused by multiple resets. <br><br> A new command line option has been added to the `lanadmin` command to provide this enhancement: <br><br> ```lanadmin -X boot_param [{send_cko_on | send_cko_off}] [vmtu={0 | 32160}] [{recv_cko_on| recv_cko_off}] [{drv_pr_off | drv_pr_on}] [mtu=<size>] [tx_coal=<0-1000000>] [rx_coal=<0-1000000>] <ppa no>``` <br><br> For example: <br><br> ```lanadmin -X boot_param vmtu=0 send_cko_off recv_cko_off tx_coal=0 rx_coal=0 drv_pr_off mtu=9000 6``` |

| SR number | Description |
|---|---|
| QXCR1001246487 | **olrad -r/R command does not flag and block attempts to replace an adapter with a different type of adapter** <br><br> When replacing an interface adapter online, an identical adapter must be used as the replacement. The iocxgbe driver should detect and block mismatches but was failing to do so. All replacements were treated as if identical, causing unpredictable results. The driver now detects and blocks attempts to replace an adapter with one that is not identical. |
| QXCR1001231153 | **Host panic on fault when executing in kernel mode during reboot of vPars** <br><br> During reboot of vPars, the host crashes while freeing MSI objects. A message like the following is displayed in `msgbuf` immediately prior to the crash: |

| SR number | Description |
|---|---|
| | `iocxgbe: The device at hardware path 0/0/0/3/0/0/1 failed initialization (0).`<br>`wsio_claim init failed isc=0xe000000166f20400 name=iocxgbe` |
| QXCR100123078.2 | **SM: iocxgbe; traffic with reset+unplumb/ifcfg+olrad, vPars panic/crash**<br>During port resets, issuing `ifconfig unplumb` and `olrad` commands, the HPVM guest/vPars crashes in the initialization path of the `iocxgbe` adapter. |
| QXCR100123290.5 | **SM:iocxgbe, VPD checksum failure under HP-UX**<br>On some adapters, the following two commands may return error status (`Warning: VPD checksum failed`) when returning Vital Product Data (VPD):<br>`lanadmin -x vpd PPA`<br>`nwmgr -g -q vpd -c lanPPA` |
| QXCR100125616.4 | **rx2800 i4 host panic when running pc_cycle_loop on HPVM guests**<br>This problem was reported while running Power Cycling tests on HPVM guests and vPars. |
| QXCR100124487.9 | **HP-UX APA group with iocxgbe driver reports 10Gb ports are configured for 2Gb**<br>Aggregated ports with `iocxgbe` interfaces give the incorrect APA port speed value of 2Gb instead of 10Gb. |

# Known problems and limitations

The following problems are known to exist in this release:

- While loading IOCXGBE module through kcmodule command following message may be displayed on terminal when various parameters are being set in configuration file (/etc/rc.config.d/hpiocxgbeconf). Though driver loading is successful but parameter settings will not take effect.

```
hptem499# kcmodule iocxgbe=best
WARNING: The file '/usr/conf/mod/iqxgbe.org' does not contain valid
        kernel code. It will be ignored.
    ==> Update the automatic 'backup' configuration first? no
      * Future operations will ask whether to update the backup.
postload: Failure in driver init script to configure hw.
ERROR lan6: The operation could not be done.
The option "boot_param send_cko_off recv_cko_off" is not valid
The supported -x options are:
send_cko_on    Enable hardware TCP/UDP (IPv4) Checksum Offload (CKO)
 on transmit
send_cko_off   Disable hardware TCP/UDP (IPv4) Checksum Offload
(CKO) on transmit
recv_cko_on    Enable hardware TCP/UDP (IPv4) Checksum Offload (CKO)
 on receive
recv_cko_off   Disable hardware TCP/UDP (IPv4) Checksum Offload
(CKO) on receive
tx_coal        Set transmit interrupt coalescing value (0-1000000,
 default 32 usecs)
rx_coal        Set receive interrupt coalescing value (0-1000000,
default 20 usecs)
tx_fctrl       Set transmit flow control (respond to pause frames,
 default On)
rx_fctrl       Set receive flow control (generate pause frames,
default On
drv_mq         Set the number of receive queues (1-5, default 5,
limited by
```

```
                          number of CPUs + 1 and hardware capability)
drv_pr_on        Enable TCP Packet Reassembly in driver
drv_pr_off       Disable TCP Packet Reassembly in driver
vmtu             Set the Virtual MTU on the interface (0 or 32160,
default 32160)
clear_stats      Reset statistics
WARNING: The installed kernel modules include multiple versions of
 the
        module 'iocxgbe'. Version 1.0.[52DF621E] will be ignored.
      * The requested changes have been applied to the currently
        running configuration.
WARNING: The module 'iocxgbe' could not be set to the 'loaded' state,
        because another module depends on it.
Module                State  Cause    Notes
iocxgbe (before)      unused          loadable, unloadable
        (now)         loaded best
        (next boot)   loaded explicit
```

**Workaround:** If the above failure message is seen,  explicitly run "/sbin/init.d/hpiocxgbe start" to apply the intended settings in startup configuration file.

- After system boot, link problems are seen. For example, the link is DOWN and the speed is 1Gb/s; the link status should be UP with 10Gb/s (when connected to a 10Gb link). This problem happens with the following adapters:

  ○ NC553i Integrated (LOM) FlexFabric adapter

  ○ NC552m (product number: 610609–B21)

  ○ NC553m (product number: 613431–B21)

  The problem is not caused by the iocxgbe driver. The problem is caused by a defect in the firmware.

  **Severity: High**

  **Workaround:** Update to the latest firmware for the adapter. For more information, see "Firmware requirements" (page 13).

- **Firmware update fails for Emulex ATxxx adapters on HP-UX 1209.ic383**  (QXCR1001255872)

  **Severity: Medium**

  When using the nwmgr to update firmware for Emulex ATxxx adapters, if the STRMSGSZ tunable has a non-zero value, the update might fail. The error message will indicate an invalid argument was detected.

  **Workaround:** Use kctune to change the STRMSGSZ value to 0.

- **Problems occur when using SNAP (Sub-Network Access Protocol) encapsulation with VLANs.** (QXCR1001061473)

  **Severity: Medium**

  SNAP encapsulation enables protocols such as TCP/IP to use an IEEE802.3 SNAP header. This protocol works correctly for non-VLAN devices. For VLAN devices, when a minimum size SNAP packet is received and the VLAN tag is removed, the device incorrectly flags the packet as undersized and discards it.

  **Workaround:** None. This problem might be corrected in a future release of the 10GigEthr-03 bundle.

- **Multi-queue operation is not available on all functions.**

  **Severity: Medium**

Multi-queue enables traffic to be partitioned across CPUs. The CNA supports only receive multi-queue operation. Multiple queues are supported only on the first PCIe function for each port: function 0 (port 0) and function 1 (port 1). The `iocxgbe` driver sets the number of receive queues for each of these PCIe functions to 5. For each remaining PCIe function, the number of queues is 1 and remains 1.

- **Improper system shutdown results in a PCI error when `iocxgbe` devices are allocated to guests in a DIO environment.**

  **Severity: Low**

  In a DIO environment, shutting down the system improperly might result in a PCI error if `iocxgbe` devices are allocated to a guest.

  **Workaround:** To avoid this problem, shut down guests before shutting down or rebooting the system. Follow the recommended HP-UX system shutdown and reboot procedures described in the appropriate HP-UX administrator guide.

# Compatibility and installation requirements

This section describes the compatibility information and installation requirements for this release.

- For specific installation instructions, see the installation procedure or overview document for your adapter.
- For detailed information on supported server platforms, operating systems, and firmware level requirements, see the *HP-UX Ethernet Card Support Matrix*.

These documents are available at:

http://www.hp.com/go/10-gigabit-ethernet-docs

## Operating system and version compatibility

This release is specific for HP-UX 11i v3, Application Release B.11.31.1209 or later.

## Hardware requirements

This version of 10GigEthr-03 (`iocxgbe`) runs with the HP-UX 11i v3 (B.11.31) operating system on HP Integrity BL8x0c i2 server blades, HP Integrity BL8x0c i4 server blades, the HP Integrity rx2800 i2 and HP Integrity rx2800 i4 servers, and the HP Superdome 2 systems.

## Firmware requirements

ⓘ **IMPORTANT:** To ensure full functionality, you must install the latest adapter firmware and Extensible Firmware Interface (EFI) driver for your adapter.

The 10GigEthr-03 (`iocxgbe`) requires the latest firmware for supported devices. For more information, see the latest *HP-UX Ethernet Card Support Matrix* at:

http://www.hp.com/go/10-gigabit-ethernet-docs

ⓘ **IMPORTANT:** Link problems might be seen with the following `iocxgbe` adapters:

- NC553i Integrated (LOM) FlexFabric adapter
- NC552m (product number: 610609–B21)
- NC553m (product number: 613431–B21)

The problem is caused by a defect in the firmware. Update your firmware to 4.2.401.2212.

> **NOTE:** NC552m is only supported on HP Integrity servers with the adapter firmware version indicated in the *HP-UX Ethernet Card Support Matrix*. If you purchase an NC552m as a standalone product, it might ship with a lower or higher adapter firmware version preinstalled. Before booting HP-UX, you must install the indicated firmware version.

Firmware requirements for the newly-supported OL* feature are listed in "New features introduced with 10GigEthr-03 (iocxgbe) B.11.31.1209" (page 7).

To determine and download the latest adapter firmware and EFI driver for your product, follow these steps:

1. Go to http://www.hp.com.
2. Click the **Support & Drivers** link on the main page.
3. Click the **Drivers & Software** tab.
4. Enter your product name (for example, NC552m or, for LOMs, a server name such as Superdome 2) or enter the product number and click **Search**.
5. Click the **Cross operating system (BIOS, Firmware, Diagnostics, etc.)** link.
6. Click **EFI and FWs for use on Integrity** under the **Description** heading for the EFI download.
7. To review firmware versions and release notes, click the **Readme** tab. To download the firmware, click the **Download** button.
8. Download the firmware.
9. To install the firmware update, follow the procedure supplied with the downloaded update package.

# Related information

## HP references

The latest documentation for Ethernet and CNA adapters is available in English at:

http://www.hp.com/go/10-gigabit-ethernet-docs

## Other references

For additional information about configuring and updating UEFI functionality on these product, see the *Emulex Boot Manual* on Emulex website, at:

http://www.emulex.com/files/downloads/hardware/boot_manual.pdf

# Software availability in native languages

The 10GigEthr-03 product is available only in the English language.

# Documentation feedback

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