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<th>Description</th>
<th>Page</th>
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<td>5</td>
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<td>8</td>
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<td>9</td>
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<tr>
<td>5</td>
<td>Open Issues</td>
<td>12</td>
</tr>
</tbody>
</table>
1.0 Overview of the Release

These Release Notes are intended for Intel® Omni-Path Fabric software provided inbox with the OS release. This document provides a brief overview of the changes introduced into the Intel® Omni-Path Software by this release. 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, open issues, and issues that were resolved during release development.

1.1 Audience

The information provided in this document is intended for installers, software support engineers, service personnel, and system administrators.

1.2 Document Versions

Intel® Omni-Path publications are available at the following URLs. For documents compatible with this release, refer to the V10.7 documents listed in the table below.

- Intel® Omni-Path Switches Installation, User, Reference Guides, and Release Notes
  http://www.intel.com/omnipath/SwitchPublications
- Intel® Omni-Path Software Installation, User, Reference Guides, and Release Notes (includes HFI documents)
  http://www.intel.com/omnipath/FabricSoftwarePublications

The following table lists the end user document versions supported by this release.

<table>
<thead>
<tr>
<th>Title</th>
<th>Doc. Number</th>
<th>Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Omni-Path Fabric Quick Start Guide</td>
<td>J57479</td>
<td>4.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Fabric Setup Guide</td>
<td>J27600</td>
<td>8.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Fabric Switches Hardware Installation Guide</td>
<td>H76456</td>
<td>7.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Host Fabric Interface Installation Guide</td>
<td>H76466</td>
<td>5.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Fabric Software Installation Guide</td>
<td>H76467</td>
<td>9.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Fabric Switches GUI User Guide</td>
<td>H76457</td>
<td>9.0</td>
</tr>
<tr>
<td>Intel® Omni-Path Fabric Switches Command Line Interface Reference Guide</td>
<td>H76458</td>
<td>9.0</td>
</tr>
</tbody>
</table>

continued...
1.3 **Software License Agreement**

This software is provided under license agreements and may contain third-party software under separate third-party licensing. Please refer to the license files provided with the software for specific details.

1.4 **If You Need Help**

Technical support for Intel® Omni-Path products is available 24 hours a day, 365 days a year. Please contact Intel Customer Support or visit [http://www.intel.com/omnipath/support](http://www.intel.com/omnipath/support) for additional detail.

1.5 **Packages in This Release**

<table>
<thead>
<tr>
<th>Intel® Omni-Path Software Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packages created by Intel</td>
</tr>
<tr>
<td>opa-address-resolution-10.7.0.0.133-2.el8.x86_6</td>
</tr>
<tr>
<td>opa-basic-tools-10.7.0.0.133-2.el8.x86_64</td>
</tr>
<tr>
<td>opa-fastfabric-10.7.0.0.133-2.el8.x86_64</td>
</tr>
<tr>
<td>opa-fm-10.7.0.0.145-2.el8.x86_64</td>
</tr>
<tr>
<td>opa-libopamgt-10.7.0.0.133-2.el8.x86_64</td>
</tr>
</tbody>
</table>

*continued...*
**Intel® Omni-Path Software Packages**

<table>
<thead>
<tr>
<th>Package Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>libfabric-1.6.2.1.el8.x86_64</td>
<td></td>
</tr>
<tr>
<td>libpsm2-10.3.58-2.el8.x86_64</td>
<td></td>
</tr>
</tbody>
</table>

**Firmware binaries delivered by Intel**

- 8051 firmware version 1.27.0
- SBus Master firmware version 0x10130001
- PCIe SerDes firmware version 0x4755
- Fabric SerDes firmware version 0x1055

**Packages used by Intel**

- rdma-core-22-2.el8.x86_64 (libhfi1)
- openmpi-3.1.2-5.el8.x86_64
- mpitests-openmpi-5.4.2-4.el8.x86_64
- mpitests-mvapich2-5.4.2-4.el8.x86_64
- mvapich2-psm2-2.3-5.el8.x86_64
- mpitests-mvapich2-psm2-5.4.2-4.el8.x86_64

**HFI Programmable Firmware**

To download Intel programmable firmware for HFIs, refer to the following:

- Unified Extensible Firmware Interface (UEFI)
- Thermal Management Module (TMM)
- Firmware Tools

*Note:* Refer to the [Intel® OPA Compatibility Matrix](#) on page 9 for the firmware versions compatible with this release.

**1.6 Supported Features**

- The list of supported hardware is in Table 3 on page 8.
- Product constraints are described in [Product Constraints](#) on page 11.
- UEFI, TMM, and Firmware Tools are standalone rpms.
  - Support for active optical cables (AOC) on server platforms using integrated HFI for OPA (commonly known as “-F”).
  - Support for Power Class 2 active optical cables (AOC). See [Product Constraints](#) on page 11 for more information.
- Legacy BIOS Boot Mode Enhancements to support boot over fabric, custom board descriptions, and pre-boot platform configuration data for AOC support.
- Multi-endpoint functionality. See the [Intel® Performance Scaled Messaging 2 (PSM2) Programmer’s Guide](#) for details.
• Support for OpenFabrics Interfaces (OFI), a framework that includes libraries (including libfabric) and applications used to export fabric communication services to applications.

• Support for NVMe over Fabric Protocol

• Virtual Fabric creation has been enhanced to better support advanced topologies, including the ability to place multicast traffic on a separate SL from unicast traffic. For details, see the Intel® Omni-Path Fabric Suite Fabric Manager User Guide, section 2.

• Support for the Enhanced Hypercube Routing Engine is outside the scope of Intel® OPA support. However, Intel partners may offer such support as part of their solutions. In addition there is an open source community who may be able to answer specific questions and provide guidance with respect to the Enhanced Hypercube Routing Engine.

### 1.7 Supported MPI Libraries

The table below lists the different MPI libraries supported by Intel® Omni-Path Fabric Software. Note that the second column indicates whether the MPI library is included in the distribution.

**Table 2. Supported MPI Libraries**

<table>
<thead>
<tr>
<th>MPI Implementation</th>
<th>Runs Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open MPI 2.1.2</td>
<td>PSM2</td>
</tr>
<tr>
<td>MVAPICH2-2.3B</td>
<td>PSM2</td>
</tr>
</tbody>
</table>

### 1.8 Intel Hardware

The following table lists the Intel hardware supported in this release.

*Note:* The Intel® PSM2 implementation has a limit of four (4) HFIs.

**Table 3. Supported Hardware**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Xeon® Processor E5-2600 v3 product family</td>
<td>Haswell CPU-based servers</td>
</tr>
<tr>
<td>Intel® Xeon® Processor E5-2600 v4 product family</td>
<td>Broadwell CPU-based servers</td>
</tr>
<tr>
<td>Intel® Xeon® Scalable Processors</td>
<td>Skylake CPU-based servers</td>
</tr>
<tr>
<td>Intel® Xeon Phi™ x200 Product Family</td>
<td>Knights Landing CPU-based servers</td>
</tr>
<tr>
<td>Intel® Xeon Phi™ 72x5 Processor Family</td>
<td>Knights Mill CPU-based servers</td>
</tr>
<tr>
<td>Intel® Omni-Path Host Fabric Interface 100HFA016 (x16)</td>
<td>Single Port Host Fabric Interface (HFI)</td>
</tr>
<tr>
<td>Intel® Omni-Path Host Fabric Interface 100HFA018 (x8)</td>
<td>Single Port Host Fabric Interface (HFI)</td>
</tr>
<tr>
<td>Intel® Omni-Path Switch 100SWE48Q</td>
<td>Managed 48-port Edge Switch</td>
</tr>
<tr>
<td>Intel® Omni-Path Switch 100SWE48U</td>
<td>Externally-managed 48-port Edge Switch</td>
</tr>
<tr>
<td>Intel® Omni-Path Switch 100SWE48UFH</td>
<td>Externally-managed 48-port Edge Switch, hot-swap power and fans</td>
</tr>
</tbody>
</table>
Table 4.  Intel® OPA Compatibility Matrix

<table>
<thead>
<tr>
<th>UEFI</th>
<th>TMM</th>
<th>Managed Switch</th>
<th>Externally-Managed Switch</th>
<th>FM GUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8.1.0.0</td>
<td>10.8.0.0.214</td>
<td>10.8.0.0.186</td>
<td>10.8.0.0.186</td>
<td>10.8.0.0.206</td>
</tr>
<tr>
<td>1.7.2.0.0</td>
<td>10.7.0.0.3</td>
<td>10.7.0.0.146</td>
<td>10.7.0.0.144</td>
<td>10.7.0.0.145</td>
</tr>
<tr>
<td>1.6.0.0.0</td>
<td>10.4.0.0.146</td>
<td>10.6.1.0.3</td>
<td>10.6.1.0.1</td>
<td>10.6.0.0.136</td>
</tr>
</tbody>
</table>

1.10  Installation Requirements

This section provides instructions and information on installing the software.

1.10.1  Installation Instructions

Perform the steps in this section to install the default Intel® Omni-Path Software configuration.

Assumptions

- You are logged in as root or with root privileges.
- You have a list of IPv4 addresses and netmasks for each IPoIB interface you are going to set up.
- RHEL* packages are available in a yum repository.

References

- Refer to the Intel® Omni-Path Fabric Software Installation Guide for related software requirements and next steps.
- Refer to the Intel® Omni-Path Fabric Switches Hardware Installation Guide for related firmware requirements.

Procedures

Perform the following steps to install the default Intel® Omni-Path Software configuration using RHEL* OS:
### Step | Task/Prompt | Action |
--- | --- | --- |
**Install OPA-Basic Software** | 1. At the command prompt, enter the installation command for opa-basic-tools. | Type `yum install -y opa-basic-tools` and press Enter. |
| 2. At the command prompt, reboot the server. | Type `reboot` and press Enter. |
| 3. Check your link using opainfo. | Type `opainfo` and press Enter. Example output: |
| | hfi1:0: 1 | PortGID: 0xf800000000000000:001175010163f931 |
| | PortState: Active |
| | LinkSpeed Act: 25Gb En: 25Gb |
| | LinkWidth Act: 4 Rx: 4 En: 3,4 |
| | LinkWidthDnGrd ActTx: 4 Rx: 4 En: 3,4 |
| | LQRC Act: 14-bit En: 14-bit,16-bit, 48-bit Mgmt: True |
| | 48-bit Mgmt: True 48-bit |
| | LID: 0x00000001-0x00000010 SM LID: 0x0000000c |
| | SL: 9 |
| | QPP: AOC 5m FINISAR CORP P/N FCBN425QHIC03 Rev A |
| | Xmit Data: 0 MB |
| | Pkts: 251 |
| | Recv Data: 0 MB |
| | Pkts: 251 |
| | Link Quality: 5 (Excellent) |

| 4. Install the rdma-core rpm. | Type `yum install -y rdma-core` and press Enter. |
| 5. On all compute nodes: install the PSM2 library. | Type `yum install -y libpsm2` and press Enter. |

**Install Intel® Omni-Path Fabric Suite Components on the Management Node**

| 7. Install the opa-address-resolution rpm on all nodes. | Type `yum install -y opa-address-resolution` and press Enter. |
| 8. Install Fabric Manager. | Type `yum install -y opa-fm` and press Enter. |
| 9. Start the Fabric Manager. | Type `systemctl start opafm` and press Enter. |

**Set up IPoIB IPV4 Configuration**

| 10. Manually edit or create the ifcfg-ibX file. | Note: Use the OS distribution-supplied instructions for setting up network interfaces. |
| | Type `cat /etc/network-scripts/ifcfg-ib0` and press Enter. Example output: |
| | DEVICE=ib0 |
| | BOOTPROTO=static |
| | IPADDR=10.228.200.173 |
| | BROADCAST=10.228.203.255 |
| | NETWORK=10.228.200.0 |
| | NETMASK=255.255.252.0 |
| | ONBOOT=yes |
| | CONNECTED_MODE=yes |
| | MTU=65520 |

**NOTE:** To configure datagram mode for AIP, change `CONNECTED_MODE=no` and remove (comment out) `MTU=` of the ifcfg-ib0 file. Further details can be found in the *Intel® Omni-Path Fabric Performance Tuning User Guide*. 

continued...
<table>
<thead>
<tr>
<th>Step</th>
<th>Task/Prompt</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Bring up the ib0 interface.</td>
<td>Type <code>ifup ib0</code> and press Enter.</td>
</tr>
<tr>
<td>12.</td>
<td>Perform a test ping.</td>
<td>Type <code>ping &lt;remote IPoIB address&gt;</code> and press Enter. For example: <code>ping 10.228.200.161</code></td>
</tr>
</tbody>
</table>

End Task

### 1.11 Product Constraints

- The minimum firmware version for Intel® Omni-Path Host Fabric Interface Silicon 100 Series Switch ASIC is 10.6.
- Power class 2 AOC are supported. You must use UEFI version 1.5 or newer for proper operation. Servers using integrated HFI (-F) requires a specific BIOS level to support power class 2 AOC; contact your BIOS vendor for more information.

### 1.12 Product Limitations

This release has the following product limitations:

- Performance Administration (PA) Failover should not be enabled with FMs running on differing software versions.
  To disable PA failover, edit the `/etc/opa-fm/opafm.xml` file and in the `<Pm>` section, change `<ImageUpdateInterval>` to 0.
- Enabling UEFI Optimized Boot on some platforms can prevent the HFI UEFI driver from loading during boot. To prevent this, do not enable UEFI Optimized Boot.
2.0 Issues

This section lists the open issues in the Intel® Omni-Path Software.

2.1 Open Issues

The following table lists the open issues for this release.

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>STL-47095</td>
<td>Memory allocation errors with MVAPICH2-2.1/Verbs.</td>
<td>Note: To avoid this issue, use MPIs over PSM. If you are using MPIs over verbs, the following workaround is required:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• When running MVAPICH2 jobs with a large number of ranks (for example, &gt; 36 ranks but ≤ 72 ranks), you must set the following parameters in /etc/security/limits.conf:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>— hard memlock unlimited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>— soft memlock unlimited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Also, you must increase the lkey_table_size:LKEY table size in bits ($2^n$, where $1 \leq n \leq 23$) from its default of 16 to 17. For instructions on setting module parameters, refer to the Intel® Omni-Path Fabric Performance Tuning User Guide, HFI1 Driver Module Parameters chapter.</td>
</tr>
<tr>
<td>STL-46193</td>
<td>On Intel® Xeon Phi™ systems, failure observed during software upgrade when rebuilding the boot image. Error message contains: Rebuilding boot image with &quot;/usr/bin/dracut -f&quot;</td>
<td>Due to the extended processing time of the dracut command on the Intel® Xeon Phi™ platform, Intel recommends the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Install and configure Intel® Xeon Phi™ systems separately.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Change the FF_TIMEOUT_MULT value in opafastfabric.conf from 2 to 6 for Intel® Xeon Phi™ systems.</td>
</tr>
<tr>
<td>STL-49732</td>
<td>The Subsystem Vendor and Subsystem Device ID in the PCI configuration space of Intel® Omni-Path discrete HFI cards may not indicate the correct OEM vendor and device. As a result, the lspci command may show incorrect Subsystem Vendor and Device ID information. This issue affects Intel server boards for Intel® Xeon® Processor v3 and v4 Product Family configured in Legacy OS boot mode.</td>
<td>Reconfigure the system from Legacy OS boot mode to UEFI boot mode.</td>
</tr>
<tr>
<td>142330</td>
<td>MPI applications that leverage the PSM2 library’s access to the HFI ASICs Memory Mapped IO and that access the MMIO directly (not via PSM2) can potentially cause an &quot;unsupported opcode&quot; error which some servers handle as a critical error.</td>
<td>Disable upstream error reporting using the AER mask register.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For discrete HFI ASICs, use</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>setpci -d 8086:24f0 ECAP_AER +8,1=00100000100100000</code></td>
</tr>
</tbody>
</table>

continued...
<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>143449</td>
<td>PM will scroll LQI=0 and Integrity Exceeded Threshold logs when an additional VF with QoS enabled and a device group that is not &quot;All&quot;. Note: This issue does not occur when running against the default opafm.xml configuration file.</td>
<td>Set the <code>&lt;ProcessVLCounters&gt;</code> field in the opafm.xml configuration to 0 to stop scrolling of logs related to LQI.</td>
</tr>
<tr>
<td>STL-46077</td>
<td>For systems running on RHEL* 8, there is a known issue with irqbalance.</td>
<td>Contact Intel Customer Support for more information.</td>
</tr>
</tbody>
</table>
| STL-57327 | Due to a bug in the kernel debug file system, the HFI driver is not able to access many of its files in `/sys/kernel/debug/hfi1*`, resulting in limited HFI debugging capabilities such as:  
• opacapture will fail to gather data for analysis on customer systems.  
• No port statistics will be available for analysis on a live host.                                                                                                                                   | None. Note: This will be fixed in the next kernel release. Refer to Red Hat* issue PR 1686755.                                                                                                             |