Intel® QuickAssist for Windows*

Release Notes

*Package Version: QAT1.3.0-0009

April 2020

Revision 003US
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## Revision History

<table>
<thead>
<tr>
<th>Revision Number</th>
<th>Description</th>
<th>Revision Date</th>
</tr>
</thead>
</table>
| 003             | Intel® QuickAssist Software release 1.3.0-0009  
• Updated Windows* Software Release version v1.3.0-0009  
• Added new sections 1.3.1 What’s New and 1.3.2 Software Release History  
• Updated Features Paragraph 13, compression/decompression features  
• Updated Section 3.0 removing Neoncity security accelerators  
• Added Known Issues: QATE 38968, 40170  
• Added Resolved Issue: QATE-37219 | April 2020 |
| 002             | Intel QuickAssist Software release v1.1.0-29  
• Removed Support for Windows Server 2012  
• Added known issues QATE-37219 and QATE-36847  
• Resolved QATE-15336, Parcomp/FVL25 Driver Compatibility Issue Server 2012 R2 Update 1  
• Section 1.1 Supported Platforms updated | March 2019 |
| 001             | Initial release. | June 2018 |
1.0 **Description of Release**

This document contains information on the accompanying Intel® QuickAssist Technology (Intel® QAT) Windows* Software release v1.3.0-0009. This document also describes extensions and deviations from the release functionality described in Table 3, *Intel® QuickAssist Technology Software for Linux* Software Programmer’s Guide for the various platforms that support Intel® QAT.

*Note:* These release notes may include known issues with third-party or reference platform components that affect the operation of the software.

1.1 **Supported Hardware Platforms**

The software in this release has been validated against the following devices:

- Intel® QuickAssist Adapter 8960 and 8970
- Intel® Xeon® Scalable Platform with Intel® C62x Chipset (with Intel® QAT)
- Intel® Xeon® D Platform with Intel® C62x Chipset (with Intel® QAT)

*Note:* Intel® QAT supports Intel® Xeon® Scalable first and second generations.

1.2 **Supported Operating Systems**

The software in this release has been validated against the following Operating Systems (OS):

- Windows* Server 2019
- Windows* Server 2016

1.3 **What’s New**

New features added for this release include the following:

- Software fallback in the event of hardware failure for cryptography and compression services
- Improved error handling with the Intel® QuickAssist cryptography and compression services

1.4 **Intel® QAT Software Release Feature History**

<table>
<thead>
<tr>
<th>Release History</th>
<th>New Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Release 1.2.0-0018</td>
<td>• Intel® Intelligent Storage Acceleration Library (ISA-L) integration with Intel® QuickAssist compression and decompression services.</td>
</tr>
</tbody>
</table>
### 1.5 Data Compression Services

This software package provides the following Data Compression services:

- Static Deflate Stateless compression/decompression
- Dynamic Deflate Stateless compression/decompression
- Includes sample code application for compression services – parcomp

For ISA-L integration, the source code and information to build the DLL can be found in Table 3, Intel® Intelligent Storage Application Library GitHub. The minimum required version is 2.26.0. The DLL should be placed in the Windows® system32 directory.

The QATZip file includes the following compression/decompression functions:

- qzInit
- qzSetupSession
- qzCompress
- qzDecompress
- qzTeardownSession
- qzClose
- qzMalloc
- qzFree

### 1.6 Cryptography Services

This software package also provides the following cryptography services.

Support for PKE cryptography services include:

- Cryptography API: Next-Generation (CNG) support, sometimes referred to as the “BCrypt API.” Refer to Cryptography API: Next-Generation, Table 3.
- An Intel® QuickAssist CNG provider is registered to support the following PKE algorithms:
  - RSA
  - DSA
- ECDSA (P256, P384, P521)
- DH
- ECDH (P256, P384, P521)

- CNG API support in both user mode and kernel mode

This software release has passed the Windows Hardware Lab Kit (HLK) Certification and contains certified device drivers.

- Public Key Encryption (PKE) services

- Support for PKE cryptography services include:

- Cryptography API: Next-Generation (CNG) support, sometimes referred to as the "BCrypt API."

Refer to Cryptography API: Next-Generation, Table 3.

- An Intel® QAT CNG provider that is registered to support the following PKE algorithms:

- Rivest-Shamir-Adleman (RSA)
- Digital Signature Algorithm (DSA)
- Elliptic Curve Digital Signature Algorithm (ECDSA) (P256, P384, P521)
- Diffie–Hellman (DH)
- Elliptic-curve Diffie–Hellman ECDH (P256, P384, P521)
- CNG API support in both user mode and kernel mode

*Note:* This software release has passed the Windows* Hardware Lab Kit (HLK*) Certification and contains certified device drivers.

### 1.7 Customer Support

Intel offers support for this software at the Application Program Interface (API) level, defined in Table 2 and Table 3 of the Programmer Guides and API reference manuals. If the field representative has created an account for you, submit support requests via the Online Service Center, [https://supporttickets.intel.com/?lang=en-US](https://supporttickets.intel.com/?lang=en-US).

### 1.8 List of Files in this Release

The Bill of Materials (BOM) is included as a text file in the released software package. This text file is labeled "filelist" and located at the top directory level for each release package.

### 1.9 Reference Documents

- [Table 2](#) lists Intel® QuickAssist Technology's generic documentation.
- [Table 3](#) lists Intel® QuickAssist Technology specific documentation.
- [Table 2](#) lists Intel® QuickAssist Technology Generic Documentation.
Table 3. Intel® QuickAssist Technology Software Specific Documentation

<table>
<thead>
<tr>
<th>Document Document No./Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® QuickAssist Technology Software for Linux* Software Programmer’s Guide 336210</td>
</tr>
</tbody>
</table>

1.10 Terminology

Table 4. Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>API</td>
<td>Application Program Interface</td>
</tr>
<tr>
<td>AES</td>
<td>Advanced Encryption Standard</td>
</tr>
<tr>
<td>BOM</td>
<td>Bill of Materials</td>
</tr>
<tr>
<td>CNG</td>
<td>Cryptography API: Next Generation</td>
</tr>
<tr>
<td>DH</td>
<td>Diffie–Hellman</td>
</tr>
<tr>
<td>DSA</td>
<td>Digital Signature Algorithm</td>
</tr>
<tr>
<td>ECDH</td>
<td>Elliptic-curve Diffie–Hellman</td>
</tr>
<tr>
<td>ECDSA</td>
<td>Elliptic Curve Digital Signature Algorithm</td>
</tr>
<tr>
<td>WHLK*</td>
<td>Windows* Hardware Lab Kit</td>
</tr>
<tr>
<td>Intel® QAT</td>
<td>Intel® QuickAssist Technology</td>
</tr>
<tr>
<td>OS</td>
<td>Operating System</td>
</tr>
<tr>
<td>PKE</td>
<td>Public Key Encryption</td>
</tr>
<tr>
<td>RSA</td>
<td>Rivest-Shamir-Adleman</td>
</tr>
</tbody>
</table>
2.0  Limitations and Known Issue

This section provides the all known limitations and known issues for windows software release v1.3.0-00009.

2.1  Limitations

This release does not support the following:

- Static Deflate Stateful compression/decompression
- Dynamic Deflate Stateful compression/decompression
- Symmetric (bulk) cryptography algorithms like Advanced Encryption Standard (AES)
- Fallback for Cryptography services
- Virtualization with Microsoft® Hyper-V using SR-IOV

2.2  Known Issues

Table 5 lists the known issues with this software Release.

Table 5.  Known Issues with this Release

<table>
<thead>
<tr>
<th>Title</th>
<th>Cannot disable driver while parcomp (compression) is running</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference #</td>
<td>QATE-36847</td>
</tr>
</tbody>
</table>

* Description

When running `parcomp` stress tests, you cannot disable all 37c8 Intel® QAT devices. Doing so may cause the driver to disable to spin until the `parcomp` process is stopped.

The issue has been observed mostly on Skylake-D systems.

Environment:

- Supermicro® X11 Intel® QAT Microserver with 2x 37C8 devices
- Windows® Server 2016
- W.1.1.0-0029 drivers

Steps:

1. Run a `parcomp` stress test. Automation runs with the following parameters:

   ```
   \parcomp.exe -i C:\CompressionFiles\silesia -o C:\CompressionFiles\compress -p qat -Q -t 6 -k 4096 -j 60 -x 2 -n 200
   ```

2. Disable 37c8 devices, one at a time until no more left (sometimes may occur on the first 37c8 disable).

3. Last, disable should keep spinning until `parcomp` thread is stopped.

Resolution

Disable the Intel® QAT devices only after the compression operations have been completed.

Affected OS

<table>
<thead>
<tr>
<th>Title</th>
<th>Windows Setup /passive install has crypto failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference #</td>
<td>QATE-38404</td>
</tr>
<tr>
<td>Description</td>
<td>When you use the /passive option for installation, it seems that Crypto will fail after a few iterations.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Please use normal GUI installation or when installing using /passive, use the /qn option.</td>
</tr>
<tr>
<td>Affected OS</td>
<td>Windows* Server 2019/2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>WCAT workload has ECDHE curve25519 failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference #</td>
<td>QATE-38965</td>
</tr>
<tr>
<td>Description</td>
<td>The ECDHE curve &quot;curve25519&quot; is the default curve for ECDHE in Windows*. The WCAT workload on IIS fails to authenticate when using Intel® QAT to run ECDHE and RSA, using the default curve preference order.</td>
</tr>
<tr>
<td>Resolution</td>
<td>Two possible resolutions: 1) Change the default ECDH curve in Windows to be a curve that is supported by Intel® QAT. The result is that ECDH is executed on Intel® QAT (but not using curve25519). 2) Use the CPMCNGInstaller tool to unregister ECDH provider for QAT. The result is that ECDH is executed on the CPU using the default curve25519.</td>
</tr>
<tr>
<td>Affected OS</td>
<td>Windows* Server 2019/2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>Parcomp unable to read &gt; 1GB file for compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference #</td>
<td>QATE-40170</td>
</tr>
<tr>
<td>Description</td>
<td>Parcomp is unable to read large files (test file was 2.2 GB) for compression. Thus compression would fail.</td>
</tr>
<tr>
<td>Resolution</td>
<td>When writing an application with QATZIP, chunk the file into at most 1GB increments.</td>
</tr>
<tr>
<td>Affected OS</td>
<td>Windows* Server 2019/2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>cngtest does not validate fallback operations are working correctly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference #</td>
<td>QATE-38968</td>
</tr>
</tbody>
</table>
Limitations and Known Issue

<table>
<thead>
<tr>
<th>Title</th>
<th>cngtest does not validate fallback operations are working correctly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Currently, the cngtest does not include tests to validate the fallback to the Microsoft* provider works for unsupported algorithms and curves. Environment: Supermicro* X11 Intel® QAT Microserver with 2x 37C8 devices Windows* Server 2016 The cngtest cannot validate fallback operations. If encryption is performed by SW, it needs to ensure that decryption can be performed by the Intel® QAT HW or vice-versa.</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>There is currently no workaround for this, and it may be added in a future release.</td>
</tr>
<tr>
<td><strong>Affected OS</strong></td>
<td>Windows* Server 2019/2016</td>
</tr>
<tr>
<td><strong>Driver/Module</strong></td>
<td>QAT IA – Crypto</td>
</tr>
</tbody>
</table>

### 2.3 Resolved Issues

<table>
<thead>
<tr>
<th>Title</th>
<th>Parcomp/FVL25 Driver Compatibility Issue Server 2012 R2 Update 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reference #</strong></td>
<td>QATE-15336</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>During parcomp parameter testing (running through hundreds of possible parcomp combinations), the parcomp executable may stop responding at random times. The issue has only been observed on Windows* Server 2012 R2 Update 1. Environment: Platform: S2600WFQ (Wolf-Pass with Intel® C628 Chipset OS: Windows Server 2016 RS1 Intel® QAT: Driver: QAT1.7.W.1.0.0-1 Steps: Run through hundreds of different parcomp combinations. Observe executable crashes. The system is okay if force was killing parcomp PID.</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>Windows* Server 2012 is not supported for this release.</td>
</tr>
<tr>
<td><strong>Affected OS</strong></td>
<td>Windows* Server 2012</td>
</tr>
<tr>
<td><strong>Driver/Module</strong></td>
<td>CPM IA – Compression</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>Default curve order for elliptic curves not supported by QAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reference #</strong></td>
<td>QATE-37219</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The default curve order on Windows when using cipher suites with ECDHE is as follows: curve25519 NistP256 NistP384</td>
</tr>
</tbody>
</table>

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Intel® QuickAssist Windows*  
Release Notes  
April 2020  
Document Number: 337758-003US
Limitations and Known Issue

<table>
<thead>
<tr>
<th>Title</th>
<th>Default curve order for elliptic curves not supported by QAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Since \texttt{curve25519} is not supported by Intel\textsuperscript{\textregistered} QAT, cryptography operations will fail when using cipher suites with \texttt{ECDHE}. However, the \texttt{NistP256} and \texttt{Nist384} curves are supported by Intel\textsuperscript{\textregistered} QAT, so if the curve priority order is changed as shown below, cryptography operations when using cipher suites with \texttt{ECDHE} will succeed: \texttt{NistP256} \texttt{NistP384} \texttt{curve25519}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Modify the default ECC Curve Order as below:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Launch the Group Policy Editor: \texttt{gpedit.msc}</td>
</tr>
<tr>
<td>2.</td>
<td>Open Computer Configuration/Administrative Template/Network/ SSL Configuration Settings</td>
</tr>
<tr>
<td>3.</td>
<td>Double-click ECC Curve Order (in the right pane)</td>
</tr>
<tr>
<td>4.</td>
<td>Click \texttt{Enabled}</td>
</tr>
<tr>
<td>5.</td>
<td>Edit the ECC Curve Order in the priority order described above.</td>
</tr>
<tr>
<td>6.</td>
<td>Click ‘\texttt{Apply}’ and exit the application</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affected OS</th>
<th>Windows\textsuperscript{*} Server 2019/2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver/Module</td>
<td>QAT IA – Crypto</td>
</tr>
</tbody>
</table>
3.0  **Software Installation**

The release package includes the Setup.exe installation application. Use this application to install the package on the targeted OS. For more information on how to install the package, refer to the Readme file included in the package:

```
\quickassist\README.txt
```

Upon completion of the installation, the `README` text file can also be found in the following folder:

```
<Program Files>\Intel\Intel(R) QuickAssist Technology
```

**Note:** For those customers that had already have installed the previous version of the Intel® QAT software package, uninstall it and reboot before installing this new production package.

To ensure software installation completed successfully and that Intel® QAT devices are functional, refer to Figure 1. The screenshot lists three “Intel C62x Accelerator” devices under the “Security accelerators” PNP Classification.

Figure 1, Device Manager with Intel® QuickAssist driver installed in Microsoft® Windows

![Figure 1. Device Manager with Intel® QuickAssist driver installed in Microsoft® Windows](image)
4.0 **Test Applications**

4.1 **Compression Test Application**

A compression test application, parcomp, is included in this package. For more information on how to use the parcomp application, refer to the Readme file included in the package. You can find the README file in the following folder upon completion of the installation:

```
<Program Files>\Intel\Intel(R) QuickAssist Technology
```

4.2 **Cryptography (PKE) Test Application**

A cryptography test application for PKE operations, cngtest, is included in this package. For more information on how to use the cngtest application, please refer to the Readme file included in the package. You can find the README file in the following folder upon completion of the installation:

```
<Program Files>\Intel\Intel(R) QuickAssist Technology
```