Easing Software Development through Open Source Integration of Intel® QuickAssist Technology Acceleration

Common software framework built on standard open source software bridges physical and virtual deployment models, simplifying integration of hardware acceleration.

Accelerating Open Source Applications

With network traffic soaring and security risks rising, high performing compression and cryptography functions have become fundamental capabilities for many network devices spanning both physical and virtual deployment models. The industry’s move to virtual models, including network functions virtualization (NFV) and software-defined networking (SDN), creates a unique challenge for equipment manufacturers who must provide a consistent user experience across these diverse use models without sacrificing performance or time-to-market. Developing applications that integrate open source compression and cryptography software is an efficient way to provide both consistency and performance. Making this even more compelling is the open source community’s concerted effort to develop high-quality software designed for integration into network appliances.

Open source solutions typically decouple software from hardware, giving equipment manufacturers increased flexibility when selecting a computing platform. This provides a framework that is capable of spanning multiple deployment models with very little investment in software modifications. In this scenario, a little investment can add significant benefit if this software is given access to any accelerator present on the platform. This access can be enabled via the software framework built around Intel QuickAssist Technology, which provides transparent (i.e., no API changes) invocation of hardware or software acceleration to the application. This ensures that any appliance, whether physical or virtual, will be optimized for Intel architecture platforms.

Open Software Framework: Key Benefits

- **Scalable** – leverage acceleration without API changes across physical or virtual deployments
- **Flexible** – develop in user or kernel space, use software or hardware acceleration
- **Time to Market** – accelerate software development through the use of open source software
- **Simple** – integrate patch

This solution brief discusses ways to accelerate performance on Intel® architecture processors using software and/or hardware acceleration, while maintaining software compatibility across physical and virtual deployments. This is one in a series of five briefs describing how to maximize the benefits from Intel® QuickAssist Technology. Please see the Resources section for links to the series.
Implementation Scenarios

Equipment manufacturers can implement Intel QuickAssist Technology in a number of ways, as illustrated in Figure 1. The software framework supports both open source and proprietary applications in either user space or kernel space. Patches are provided as part of the framework to enable access to hardware acceleration via open source APIs. If acceleration isn’t present on the system, Intel architecture-specific optimizations have been released into several open source libraries.

Figure 1 shows the integration options:
- Applications can use the Intel QuickAssist Technology API to communicate directly with acceleration hardware, providing the highest performance.
- Alternatively, applications can call the associated open source APIs, which will use either Intel-developed patches (for platforms containing hardware acceleration with Intel QuickAssist Technology) or software optimizations based on the latest Intel instruction set architectures. This approach maximizes cross-platform scalability given the ability to access either software or hardware optimized implementations via a single API.

Common Software Framework

Intel QuickAssist Technology includes a software framework for deploying platform-level workload acceleration. It provides the flexibility to allow equipment manufacturers to strike the right balance between scalability, deployment model, and performance. Coupled with this software framework, Intel QuickAssist Technology can reduce cost, power consumption, and form factor space while also increasing performance, scalability, and portability.
Resources

Solution Brief Series: Intel® QuickAssist Technology
Part 1: Integrated Cryptographic and Compression Accelerators on Intel® Architecture Platforms
Part 2: Bridging Open Source Applications and Intel® QuickAssist Technology Acceleration
Part 3: Accelerating OpenSSL® Using Intel® QuickAssist Technology
Part 4: Accelerating Hadoop® Applications Using Intel® QuickAssist Technology
Part 5: Scaling Acceleration Capacity from 5 to 50 Gbps Intel® QuickAssist Technology


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