Speed Development of Smart, Connected Devices

Solutions that Run at the Network's Edge

The Intel® oneAPI Base and IoT Toolkit is a comprehensive suite of development tools tailored for developers who are building fast and efficient intelligent Internet of Things (IoT) devices and need to bring the power of big data technology to global IoT innovations—healthcare, smart homes, industrial, retail, aerospace, security, and more. These modern IoT edge workloads are incredibly diverse, and so are architectures used in solutions that run at the network's edge. Combining the core set of tools from the Intel oneAPI Base Toolkit and adding tools focused on IoT system design simplifies development and deployment across supported Intel® processors and supported XPUs with standards-driven programming languages and parallel programing models and integrated development environments (IDEs).
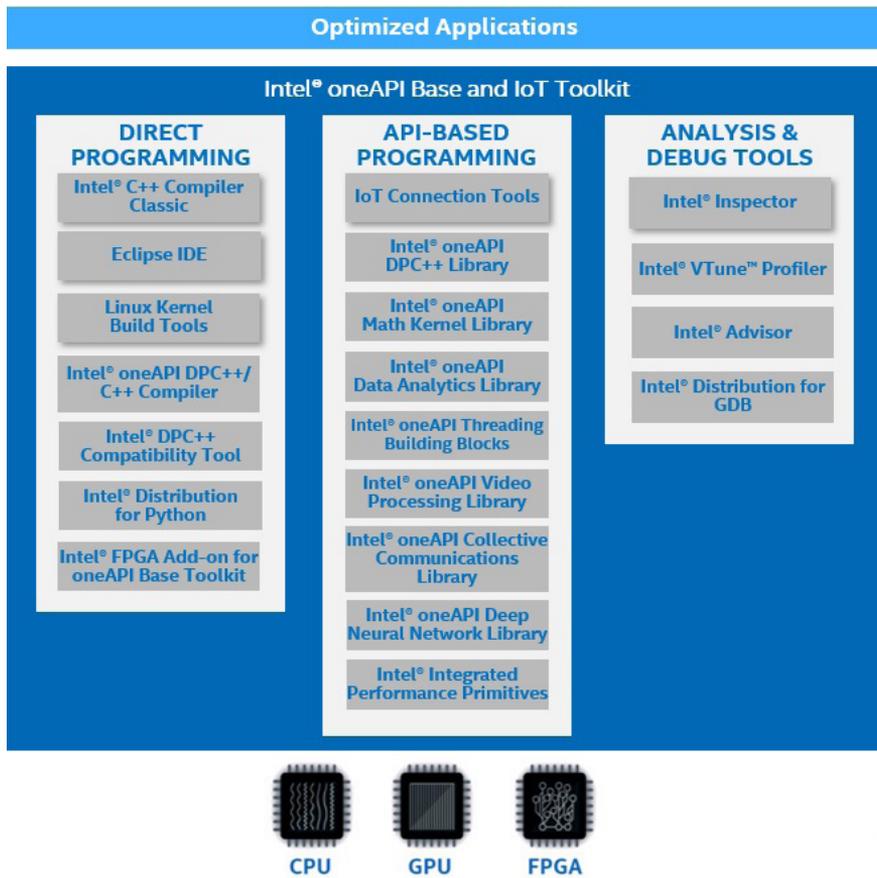
Who Needs It

- **IoT software developers** who are using C, C++, Data Parallel C++, OpenMP, and Python to efficiently deliver innovations in new devices and solutions
- **System Integrators** who need fast software stack integration and optimizations
- **Enterprises** that are moving to the edge to capture more data, analyze it faster, and act on it sooner

What it Does

Benefit from faster integration across the software stack, optimized performance and power efficiency, and improved time to market.

- **Build.** Implement efficient, high-performance code for IoT applications that exploits all the cutting-edge features of powerful Intel® architecture (CPU, GPU, FPGA). Optimize threading, memory, and persistent memory debugging early in the design cycle.
- **Analyze.** Quickly pinpoint code-tuning opportunities with deep, analysis of performance characteristics, including system behavioral analysis, power-related metrics, and hardware-specific optimizations.
- **Unite sensors to devices and devices to the cloud** with connectivity tools and sensor libraries.
- **Works seamlessly with other Intel domain-specific tools** (e.g., AI analytics, video processing, deep learning inference) to accelerate specialized IoT applications and workloads.
- **Take advantage of Priority Support.** Intel offers the ability to connect directly to Intel engineers for confidential answers to technical questions.

Optimized Applications

Intel® oneAPI Base and IoT Toolkit

DIRECT PROGRAMMING
- Intel® C++ Compiler Classic
- Eclipse IDE
- Linux Kernel Build Tools
- Intel® oneAPI DPC++/ C++ Compiler
- Intel® DPC++ Compatibility Tool
- Intel® Distribution for Python
- Intel® FPGA Add-on for oneAPI Base Toolkit

API-BASED PROGRAMMING
- IoT Connection Tools
- Intel® oneAPI DPC++ Library
- Intel® oneAPI Math Kernel Library
- Intel® oneAPI Data Analytics Library
- Intel® oneAPI Threading Building Blocks
- Intel® oneAPI Video Processing Library
- Intel® oneAPI Collective Communications Library
- Intel® oneAPI Deep Neural Network Library
- Intel® Integrated Performance Primitives

ANALYSIS & DEBUG TOOLS
- Intel® Inspector
- Intel® VTune™ Profiler
- Intel® Advisor
- Intel® Distribution for GDB

CPU   GPU   FPGA

Highlights

Powerful Tools for Optimized Cross-Architecture Edge Solutions

The Intel oneAPI Base and IoT Toolkit gives you the tools to target cross architectures, whether you're running the applications on IoT endpoint devices or large-scale edge deployments.

DPC++ Language for Direct Programming

DPC++ is an evolution of C++ that incorporates SYCL and community enhancements. It allows code reuse across hardware targets and enables high productivity and performance across CPU, GPU, and FPGA architectures while permitting accelerator-specific tuning. The unified C++/ DPC++ Compiler also includes full modern C++.

Libraries for API-Based Programming

Powerful libraries—including deep learning, math, video, and media processing—are preoptimized for domain-specific functions and custom-coded to accelerate compute-intense workloads.

Advanced Analysis and Debug Tools

For profiling, design advice, and debug, Intel oneAPI products include leading analysis tools:

- **Intel® VTune™ Profiler** to find performance bottlenecks fast in CPU, GPU, and FPGA systems
- **Intel® Advisor** for vectorization, threading, and accelerator offload design
- **Intel® Inspector** to debug threading, memory, and persistent memory errors
- **Intel® Distribution for GDB** for efficient debug of IoT applications using a standards-based debugger

Advanced Connection and Linux Kernel Build Tools

For developing custom Linux kernels, and quickly connecting sensors to devices, the Intel oneAPI IoT Toolkit adds:

- **IoT connection tools** to unite sensors to devices and devices to the cloud
- **Linux kernel build tools** to successfully create, and support customizations of Yocto Project-based custom Linux OS

What You Get

- I**ntel® oneAPI DPC++/C++ Compiler:** A standards-based, CPU, GPU, and FPGA compiler supporting Data Parallel C++, C++, C, SYCL and OpenMP. It leverages well-proven LLVM compiler technology and Intel's history of compiler leadership for performance. Experience seamless compatibility with popular compilers, development environments, and operating systems.

- **Intel C++ Compiler Classic:** A standards-based C/ C++ compiler supporting OpenMP, focused on CPU development. Take advantage of more cores and built-in technologies in platforms based on Intel® CPU architectures. Experience seamless compatibility with popular compilers, development environments, and operating systems.

- **Intel® DPC++ Compatibility Tool:** Migrate legacy CUDA code to a multi-platform program in DPC++ code with this assistant.

- **Intel® oneAPI DPC++ Library:** Speed up data parallel workloads with these key productivity algorithms and functions.

- **Intel® oneAPI Threading Building Blocks:** Simplify parallelism with this advanced threading and memory-management template library.

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- **Intel® oneAPI Math Kernel Library:** Accelerate math processing routines including matrix algebra, fast Fourier transforms (FFT), and vector math.

- **Intel® oneAPI Data Analytics Library:** Boost machine learning and data analytics performance.

- **Intel® Distribution for Python:** Achieve fast math-intensive workload performance without code changes for data science and machine learning problems.

- **Intel® oneAPI Video Processing Library:** Deliver fast, high-quality, real-time video decoding, encoding, transcoding, and processing for broadcasting, live streaming and VOD, cloud gaming, and more.

- **Intel® oneAPI Deep Neural Network Library:** Develop fast neural network frameworks on Intel CPUs and GPUs with performance-optimized building blocks.

- **Intel® oneAPI Collective Communications Library:** Implement optimized communication patterns in deep learning frameworks. Use the components separately or together as the foundation of deep learning frameworks.

- **Intel® Integrated Performance Primitives:** Speed performance of imaging, signal processing, data compression, and more.

- **Intel® FPGA Add-On for oneAPI Base Toolkit (Optional):** Program these reconfigurable hardware accelerators to speed specialized, data-centric workloads. Requires installation of the Intel oneAPI Base Toolkit.

Priority Support

Every paid version of Intel® Software Development Products automatically includes priority support at our Online Service Center for a duration associated with your purchase, typically one year. You get:

- **Direct and private interaction with Intel's support engineers** and ability to submit confidential support requests

- **Accelerated response time** for technical questions and other product needs

- **Priority support** for escalated defects and feature requests

- **Free download access** to all new product updates and continued access to older versions of the product

- **Access to a vast library** of self-help documentation that builds off decades of experience with creating high-performance code

- **Access to Intel public community forums** supported by community technical experts and monitored by Intel engineers

- **Optional services** at additional cost including on-site/online training and consultation by Intel technical consulting engineers

Get Started

- **Get the Intel oneAPI Base and IoT Toolkit >**

- **Learn more >**

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