

## PRODUCT BRIEF

Rendering and Ray Tracing  
Intel® oneAPI Base and Rendering Toolkit

# Photorealistic Rendering That Scales

intel software



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## Powerful Libraries for High-Fidelity Visualization Applications



Intel® oneAPI Base and Rendering Toolkit is a comprehensive suite of development tools that enable developers and content creators to build high-performance, high-fidelity, extensible, and cost-effective visualization applications and solutions through open-source rendering libraries optimized on Intel® Xeon® scalable processors, other Intel® CPUs, and, in the future, Intel® X® architecture GPUs. It combines the core set of tools from the Intel oneAPI Base Toolkit and adds tools focused on advanced ray tracing and rendering developers to deliver high performance and high image quality for data-intensive use cases.

### Who Needs It

The toolkit is for developers working on applications (**Figure 1**) including:

- Digital content creation
- Professional rendering
- Animation
- Scientific visualization
- Computer-aided design, architectural engineering
- Gaming VR and AR

### What it Does

Meet the demands of the highest-quality, ray tracing use cases without the limitations and compromises of rasterization. Users can interactively visualize huge datasets (terabytes) embracing full system memory beyond today's memory limits of GPU add-in cards. Plus, your existing investments in graphics and rendering solutions based on Intel® oneAPI Rendering Toolkit libraries will seamlessly scale to gain the exponential performance benefits of future, flexible CPU-plus-accelerator platforms.

### Highlights

Intel oneAPI Rendering Toolkit is a set of advanced, open-source libraries that deliver high performance and high image quality for data-intensive use cases on CPU platforms of all sizes, including workstation, data center/cloud, and high-performance computing (HPC) clusters. It provides both scalable and interactive ray tracing and OpenGL visualization.

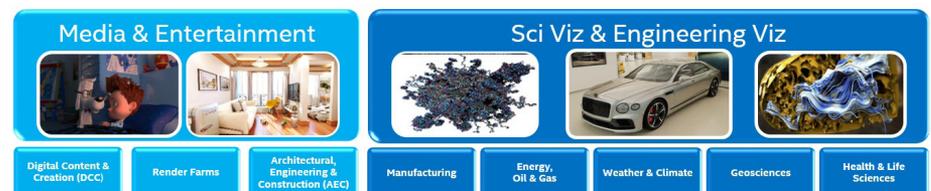


Figure 1. Applications for Intel oneAPI Rendering Toolkit

## What You Get

Intel oneAPI Rendering Toolkit is a set of advanced, open-source libraries that deliver high performance and high both scalable and interactive ray tracing and OpenGL image quality for data-intensive use cases on CPU platforms visualization.

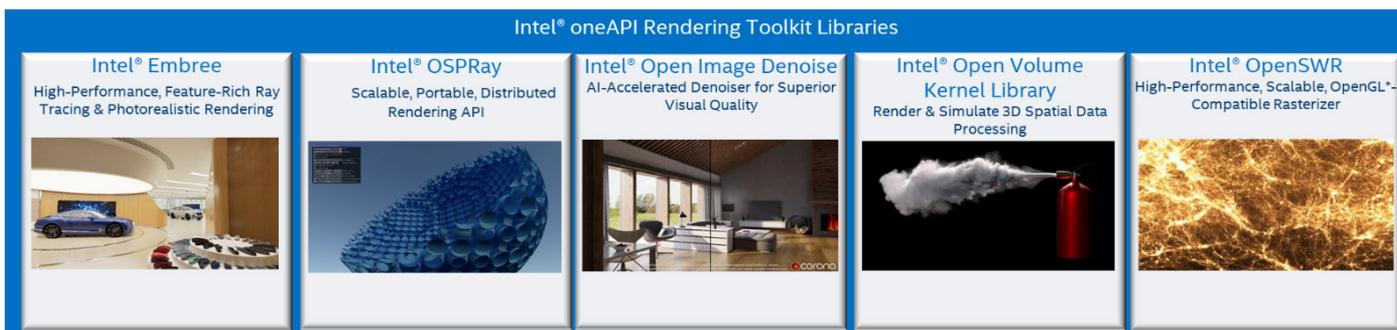


Figure 2. Intel oneAPI Rendering Toolkit libraries

## Intel Leadership in Ray Tracing for High Performance Graphics and Compute

Ray Tracing and Rendering Software Toolkit Capabilities	Intel oneAPI Rendering Toolkit	Competitive Tools
<b>Runs at scale</b> from laptop or workstation across enterprise HPC, cloud, and everywhere you have compute infrastructure.	✓	No
<b>Visualize huge datasets</b> (terabytes) interactively, embracing full system memory creating freely beyond limits to 32GB card VRAM.	✓	No
<b>Persistent memory support</b> for data loss protection, reduced restart times, and I/O performance for ever-growing geometric and volumetric data.	✓	No
<b>Combined volume and geometry rendering.</b>	✓	No
<b>Render in high-fidelity visualization:</b> shadows, ambient occlusion, global illumination, denoising.	✓	✓
<b>Supports model complexity beyond triangles:</b> triangle meshes; quad meshes; flat or round oriented curves; discs, spheres, and subdivision surfaces.	✓	Limited
<b>Supports path tracing, ambient occlusion</b>	✓	Limited
<b>Motion blur support</b> for linear, time-segmented objects, and quaternion.	✓	✓
<b>Open-sourced libraries</b> , permissive Apache 2 license with 100+ ISVs delivering content creation tools utilizing common scalable compute infrastructure.	✓	No
<b>Future-proofs code</b> with built-in support for hybrid rendering on Intel CPUs and future X <sup>e</sup> architecture/ GPU).	✓	No

The Intel<sup>®</sup> oneAPI Base Toolkit is a core set of advanced compilers, libraries and analysis and debug tools, such as Intel<sup>®</sup> VTune™ Profiler and Intel<sup>®</sup> Advisor), for building and deploying high-performance, data-centric applications across a variety of Intel architectures. Data Parallel C++ (DPC++) language for direct programming, which is also included, is an evolution of C++ that incorporates SYCL\* that allows code reuse across hardware targets and enables high productivity and performance across CPU, GPU, and FPGA architectures, while permitting accelerator-specific tuning.

- **Intel<sup>®</sup> oneAPI DPC++/C++ Compiler:** A standards-based, cross architecture 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<sup>®</sup> DPC++ Compatibility Tool:** Migrate CUDA source code to DPC++ code with this assistant.
- **Intel<sup>®</sup> oneAPI DPC++ Library:** Speed up data parallel workloads with these key productivity algorithms.
- **Intel<sup>®</sup> oneAPI Threading Building Blocks:** Simplify parallelism with this advanced threading and memory management template library.
- **Intel<sup>®</sup> Advisor:** Design code for efficient vectorization, threading, and offloading to accelerators.
- **Intel<sup>®</sup> VTune™ Profiler:** Find and optimize performance bottlenecks across CPU, GPU and FPGA systems.
- And more

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- **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

## Try Your Code in the Intel® DevCloud

Develop, run, and optimize your Intel oneAPI code in the Intel® DevCloud—a free development sandbox with access to the latest Intel CPU, GPU, and FPGA hardware and Intel oneAPI software.

## Get Started

- [Get the Intel oneAPI Base and Rendering Toolkit >](#)
- [Learn more >](#)



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