

Intel Data Center GPU Flex Series is flexible, robust and the industry's most open GPU solution for the intelligent visual cloud.



Media processing and delivery, AI visual inference, cloud gaming and desktop virtualization are proliferating in data centers. That rapid growth comes to an industry largely beset by dependence on proprietary, licensed coding models such as CUDA for GPU programming. The use of software based on CUDA is also limited to proprietary GPUs, without portability to other accelerator architectures or CPUs. The resulting upward pressure on total cost of ownership makes proprietary GPU programming untenable at scale.

Intel® Data Center GPU Flex Series overcomes these limitations while delivering outstanding compute density and energy efficiency for visual cloud workloads. With acceleration for visual processing and AI built into the silicon, the GPU is based on Intel® Xe HPG (high-performance graphics) microarchitecture. It provides capabilities and benefits that include:

- Support for an open, flexible, standards-based software stack together with oneAPI unified programming, which comprises open source components and libraries, tools and frameworks to build high-performance, cross-architecture media applications and solutions. This open approach helps the ecosystem break free of the technical and economic burdens of proprietary programming models.
- Industry-first hardware-based open source AV1 encoder in a GPU, improving bandwidth at the same quality by 30%, to save \$23 million per 100,000 viewers per year or improve streaming quality over the same bandwidth.¹

SUPPORTING STATS



Media transcode throughput at half the power of the competition

Intel Flex Series 140 GPU compared to NVIDIA A10

HEVC 1080p60¹

2X

Decode throughput at half the power of the competition

Intel Flex Series 140 GPU compared to NVIDIA A10

across HEVC, AV1, AVC, VP9

720p30 on select game streams

46 720p30 on select game streams

Single Intel Flex Series 170 GPU

Single Intel Flex Series 140 GPU

Hardware Specifications

Intel's Flex Series graphic processors are available in two skus: Flex Series 170 GPU for peak performance and the Flex Series 140 for maximum density. The graphics processor has up to 32 Intel X° cores and ray tracing units, up to four Intel X° Media Engines, AI acceleration with Intel X° Matrix Extensions (XMX) and support for hardware-based SR-IOV virtualization. Taking advantage of the Intel® oneVPL Deep Link Hyper Encode feature, the Flex Series 140 with its two GPUs can meet the industry's one-second delay requirement while providing 8K 60 real-time transcode. This capability is available for AV1 and HEVC HDR formats.

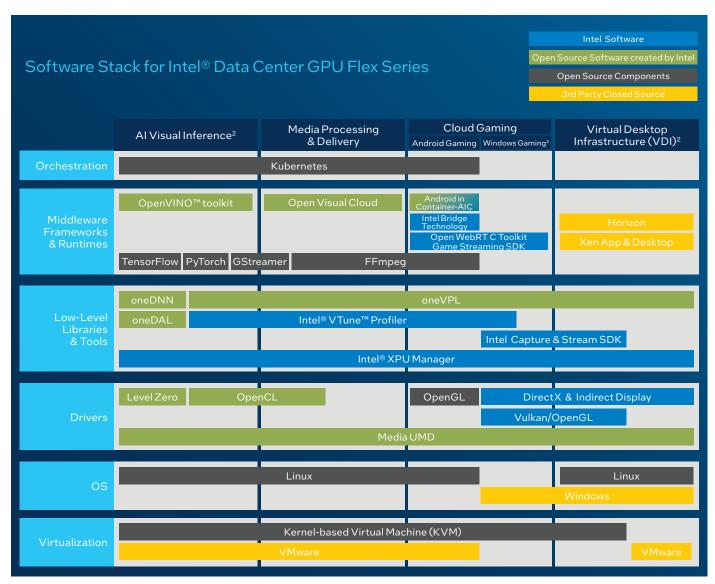
| | Intel® Data Center GPU Flex 140 | Intel Data Center GPU Flex 170 |
|---|---|---|
| Target Workloads | Media processing and delivery, Windows and Android cloud gaming, virtualized desktop infrastructure, AI visual inference ² | |
| Card Form Factor | Half height, half length, single wide, passive cooling | Full height, three-quarter length, single wide, passive cooling |
| Card TDP | 75 watts | 150 watts |
| GPUs per Card | 2 | 1 |
| GPU Microarchitecture | X° HPG | |
| X ^e Cores | 16 (8 per GPU) | 32 |
| Media Engine | 4 (2 per GPU) | 2 |
| Ray Tracing | Yes | |
| Peak Compute (Systolic) | 8 TFLOPS (FP32)/105 TOPS (INT8) | 16 TFLOPS (FP32) / 250 TOPS (INT8) |
| Memory Type | GDDR6 | |
| Memory Capacity | 12 GB (6 per GPU) | 16 GB |
| Virtualization (Instances) ³ | SR-IOV (62) | SR-IOV (31) |
| Operating Systems | Linux (Ubuntu, CentOS, Debian), Windows Server 2019/2022, Windows Client 10, Red Hat® Enterprise Linux | |
| Host Bus | PCIe Gen 4 | |
| Host CPU Support | Intel® Xeon® Processors from 3rd Gen onwards | |

Software Stack, by Use Case

The Flex Series GPU supports an open, flexible, standards-based software stack with oneAPI cross-architecture programming. The stack includes open source components and libraries, tools and frameworks so developers can create high-performance, cross-architecture media applications and solutions to meet a wide range of use cases. This open approach removes the barriers to proprietary models where code portability and the ability to adopt new architectures across multiple vendors is limited.

Intel enables the software ecosystem through industry collaborations, initiatives and standards bodies. It also provides ongoing leadership, investment and technical contributions to the open source community.

The common set of software capabilities integrates into popular middleware and frameworks, and the stack is delivered in validated productized containers or reference stacks. The containers can be orchestrated with Kubernetes on bare metal or in VMs using SR-IOV virtualization with tools to assign and manage workloads. The toolset is designed to speed time-to-market and enable flexible deployment of multiple workloads on the same GPU.



Note: oneDNN is the oneAPI Deep Neural Network Library. oneDAL is oneAPI Data Analytics Library. oneVPL is the oneAPI Video Processing Library. oneVPL, oneDNN, oneDAL, and Intel V Tune Profiler are in the Intel® oneAPI Base Toolkit (individual tools can be downloaded separately). Intel-optimized TensorFlow & PyTorch are in Intel® AI Analytics Toolkit.

Learn more about the Intel® Data Center GPU Flex Series at

www.intel.com/FlexSeriesGPU



- ¹Performance varies by use, configuration and other factors. Learn more on the Performance Index site.
- $^2 Reflects \, capabilities \, of \, Intel \, Data \, Center \, GPU \, Flex \, Series \, that \, will \, be \, available \, when \, product \, is \, fully \, mature.$

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See configuration disclosure for configuration details. No product or component can be absolutely secure.

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Your costs and results may vary.

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 $^{^{\}rm 3}\,\mbox{VMs}$ will vary by use case.