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Choose Oracle Cloud Infrastructure OCI-BM. Optimized3.36 Instances with 3rd Gen Intel[®] Xeon[®] Scalable Processors to Finish Fluid Dynamics Simulations Faster

OCI-BM.Optimized3.36 Instances Improved Performance on Two Ansys Fluent Benchmarks Compared to OCI-BM. HPC2.36 Instances with Older Processors

Organizations in engineering, healthcare, and other verticals regularly use fluid dynamics simulations to improve designs, explore new innovations, and streamline everyday operations. Because these simulations require a great deal of compute power, organizations must choose carefully when deciding on where to run their fluid dynamics workloads. Oracle Cloud Infrastructure (OCI) offers a host of possible instance types; testing with Ansys Fluent benchmarks may help distinguish which instances are best suited for this type of work.

On two Ansys Fluent simulation cases, bare-metal OCI-BM.Optimized3.36 instances enabled by 3rd Gen Intel Xeon Scalable processors boosted performance compared to OCI-BM.HPC2.36 instances with 2nd Gen Intel Xeon Scalable processors. These performance improvements ranged from 1.23x to 1.33x in testing on multiple node counts, indicating that organizations relying on fluid dynamics simulations could benefit from choosing OCI-BM.Optimized3.36 instances enabled by 3rd Gen Intel Xeon Scalable processors.

Improved Performance Modeling Flow Over a Racecar

Relative Ansys Fluent f1 racecar 140m performance

Relative performance | Higher is better

The f1_racecar_140m benchmark, which models external flow over a Formula 1 racecar, highlighted the stronger performance of the OCI-BM.Optimized3.36 instances enabled by 3rd Gen Intel Xeon Scalable processors (see Figure 1). These instances consistently outperformed the OCI-BM.HPC2.36 instances with 2nd Gen Intel Xeon Scalable processors, offering up to 1.32x the performance at a single node.



Figure 1. Relative Ansys Fluent f1_racecar_140m performance of OCI-BM. Optimized3.36 instances versus that of OCI-BM.HPC2.36 instances at two, four, eight, and sixteen nodes. Higher numbers are better.

Intel Workload Proof Series: Ansys Fluent on OCI Racecar and Exhaust System

See backup for workloads and configurations. Results may vary.





Boost Performance for Modeling Flow Over a Racecar by up to 1.32x with OCI-BM.Optimized3.36 Instances with 3rd Gen Intel Xeon Scalable Processors

vs. OCI-BEM.HPC2.36 Instances with 2nd Gen Intel Xeon Scalable Processors



Boost Performance for Modeling Vehicle Exhaust by up to 1.33x with OCI-BM.Optimized3.36 Instances with 3rd Gen Intel Xeon Scalable Processors

vs. OCI-BEM.HPC2.36 Instances with 2nd Gen Intel Xeon Scalable Processors Intel Workload Proof Series: Ansys Fluent on OCI Racecar and Exhaust System

Improved Performance Modeling Vehicle Exhaust

On the exhaust_system_33m benchmark, which models vehicle exhaust, the OCI-BM.Optimized3.36 instances enabled by 3rd Gen Intel® Xeon® Scalable processors again offered consistently better performance than OCI-BM.HPC2.36 instances with older processors. As Figure 2 shows, improvements on this benchmark ranged from 1.23x at sixteen nodes to 1.33x at one node.



Relative Ansys Fluent exhaust_system_33m performance

Figure 2. Relative Ansys Fluent exhaust_system_33m performance of OCI-BM. Optimized3.36 instances versus that of OCI-BM.HPC2.36 instances at one, two, four, eight, and sixteen nodes. Higher numbers are better.

Conclusion

If your organization relies on complex fluid dynamics simulations for business operations and product development, it's critical to choose the right platform to support those workloads. In bare-metal testing on Oracle Cloud Infrastructure, OCI-BM.Optimized3.36 instances with 3rd Gen Intel Xeon Scalable processors sped performance on two different Ansys Fluent benchmarks compared to OCI-BM.HPC2.36 instances with older processors—delivering up to 1.33x the performance.

Learn More

To begin running your fluid dynamics workloads on bare-metal OCI-BM.Optimized3.36 instances with 3rd Gen Intel Xeon Scalable processors, visit <u>https://docs.oracle.com/en-us/iaas/Content/Compute/References/computeshapes.htm</u>.

Test by Intel on 4/5/2022. Software: CentOS Linux release 7 kernel 3.10.0-1160.25.1.el7.x86_64, Intel Compiler Version 19.0.0 (Build: 20190206), Intel MPI Version 2019 Update 8 and Version 2018 Update 3, Intel MKL Intel MAth Kernel Library Version 2020.0.0 where applicable, Ansys Fluent 2021 R2. Instance details: OCI-BM.HPC2.36: Intel Xeon Gold 6154 CPU @ 3.00GHz, 72 vCPUs, 284GB RAM, NVME SSD NFS, MLX ConnectX5 RoCEv2 100Gbps; OCI-BM.Optimized3.36: Intel Xeon Gold 6354 CPU @ 3.00GHz, 512GB RAM, NVME SSD NFS, MLX ConnextX5 RoCEv2 100Gbps.

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