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Depend on Oracle® Cloud Infrastructure Partnered with Intel® Xeon® Processors to Deliver High-Performance Computing Environments without On-Premises Overhead Costs
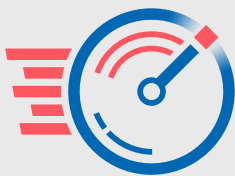
HPC-CFD

BM.HPC2.36 provides better or comparative relative performance for LS-DYNA workloads

vs. a similarly configured on-premises HPC environment

Reduce On-Site Overhead Without Sacrificing HPC workload Performance with Oracle and Intel

Switch to Oracle Cloud Infrastructure to Get the Power for HPC without the Hardware Cost

When organizations need to run heavy-hitting workloads like Computational Fluid Dynamics (CFD) or crash simulation applications, the popular belief is that only an on-premises High-Performance Computing (HPC) environment can provide the requisite resources. Now, with the partnership of Oracle Cloud Infrastructure (OCI) and Intel, this is no longer the case. Bare-metal OCI instances with Intel® Xeon® Scalable processors now offer comparative or better performance when running LS-DYNA workloads compared to a similarly configured on-premises HPC environment.

Demonstrating LS-DYNA Performance

Oracle ran a series of tests using some common CFD and crash simulation analysis applications. These tests compared a similarly configured bare-metal platform to one of their "Shapes" (or instances) of cloud offerings called BM.HPC2.36. Both the 16-node bare metal and the 16-node OCI testbeds used Intel® Xeon® Gold 6154 processors with similar configurations. Oracle ran these tests with LS-DYNA, which is used for modeling and analyzing common computer-aided engineering (CAE) workloads. This LS-DYNA workload used the "Car2Car" model, a car crash simulation with 2.4 million elements. As Figure 1 below demonstrates, the OCI instance shows comparable results to the bare metal cluster.

LS-DYNA Performance Car2Car Oracle BM.HPC.36 vs On-Premises
Relative Performance | Higher is better

Total Cores	Intel on-premise	Oracle BM.HPC2.36
36	1.00	1.04
72	1.00	1.04
144	1.00	1.07
288	1.00	0.92
576	1.00	0.93

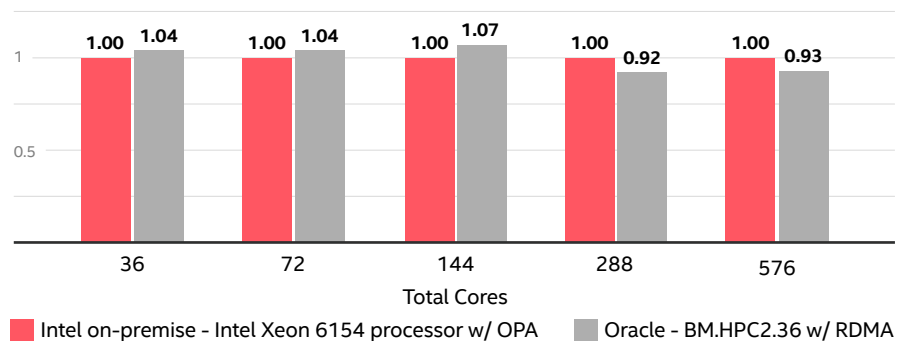■ Intel on-premise - Intel Xeon 6154 processor w/ OPA   ■ Oracle - BM.HPC2.36 w/ RDMA

Figure 1. Relative performance results comparing LS-DYNA Car2Car model workload performance with scaling core counts of the Oracle BM.HPC2.36 and on-premises clusters.

Reduce On-Site Overhead Without Sacrificing Performance

When you move your HPC workloads over to an Oracle Cloud Infrastructure instance using Intel® Xeon® Scalable processors, you save more than the time required to deploy and maintaining an on-premises infrastructure. Moving these workloads to the cloud also allows you to save on operating expenses such as maintenance costs, licensing fees, and utility payments. By moving to an OCI instance for HPC workloads, you get the performance you expect while saving precious time and money that your administrators can spend advancing other business initiatives.

Intel delivers optimized hardware and software capabilities at the cloud service provider (CSP) level that help ensure you get exceptional performance per cost. Innovations in Intel Xeon Scalable processors include:

- Higher per-core performance for increased performance and scalability for HPC workloads

- Greater memory bandwidth/capacity to meet memory-intensive workload demands

- Expanded I/O abilities

- Intel Ultra Path Interconnect (Intel UPI) that increases scalability and improves inter-CPU bandwidth

- Intel Advance Vector Extensions 512 (Intel AVX-512) that boosts performance for computational tasks such as modeling and simulation

- Near-zero encryption overhead to keep transactions secure

Together, Oracle Cloud instances with Intel® Xeon® Scalable processors combine the performance of on-premises infrastructure with the elasticity and on-demand availability of the cloud.

Learn More

To begin running your HPC workloads on Oracle Cloud Instances with Intel Xeon Scalable processors, visit https://www.oracle.com/cloud/hpc/.

To read more about this testing, visit the Oracle blog post.

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