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### **Get Better HPC Performance When You Choose AWS EC2 C6i Instances Featuring** 3rd Gen Intel<sup>®</sup> Xeon<sup>®</sup> Scalable Processors

#### Compared to C5 Instances with Older Processors, C6i Instances Handled up to 1.71x the STREAM Throughput

Businesses today face challenges more complex than ever before. From supply chain concerns to evolving global markets to digital marketing, decision-makers must weigh countless concerns as they work to propel their organization forward. With properly analyzed data, business leaders don't have to wade through terabytes of information to find relevant facts. Instead, they can use analyzed data to make well-informed choices for their business and spend time growing other areas of their organization.

Analyzing large datasets requires considerable computing power. When running these high-performance computing (HPC) workloads in the cloud, choosing the right instance allows you to get the most from your cloud investment.

The STREAM benchmark, which is widely used for HPC benchmarking, reports a throughput metric of MB/sec. In our tests with STREAM on two types of AWS Elastic Cloud Compute (EC2) instances, we found that C6i instances with 3rd Gen Intel Xeon Scalable processors delivered up to 1.71 times the performance of C5 instances with older processors.

#### Up to 1.28x the Performance on Smaller Instances

To reflect businesses that require smaller instances to run their HPC workloads, we tested C6i and C5 instances with lower vCPU counts of 4, 8, and 16. At each of these sizes, C6i instances featuring 3rd Gen Intel Xeon Scalable processors handled more MB per second, improving performance by up to 1.28 times (Figure 1).





MB per second | Higher is better

Figure 1. Relative performance, in MB per second, that C6i instances handled compared to C5 instances. Higher numbers are better.



Large Instances:

Up to 1.71x the STREAM MB/Sec with C6i Instances Featuring 3<sup>rd</sup> Gen Intel **Xeon Scalable Processors** vs. C5 Instances with Older Processors

#### Up to 1.71x the Performance on Larger Instances

Businesses might choose to run HPC workloads on larger instances, so our testing also included two larger sizes of C6i and C5 instances. At these sizes, the vCPU counts differ between the two: C6i instances feature 32 and 64 vCPUs, while C5 instances come with 36 and 72 vCPUs. We configured them as comparably as possible for our testing. As Figure 2 shows, despite lower vCPU counts, C6i instances with 3<sup>rd</sup> Gen Intel<sup>®</sup> Xeon<sup>®</sup> Scalable processors achieved up to 1.71 times the STREAM performance of C5 instances.



Figure 2. Relative performance, in MB per second, that C6i instances handled compared to C5 instances. Higher numbers are better.

#### Conclusion

To effectively run HPC workloads, your organization needs instances with a great deal of computing power. As test results show, AWS EC2 C6i instances with 3<sup>rd</sup> Gen Intel Xeon Scalable processors delivered up to 1.71 times the STREAM throughput compared to C5 instances. Whether your organization needs larger or smaller instances, choose C6i instances for superior performance.

#### Learn More

To begin running your HPC workloads on AWS EC2 C6i instances, visit https://aws.amazon.com/ec2/instance-types/c6i/.

All tests by Intel in April 2022 on us-east-1a with Ubuntu 22.04.4 LTS 5.15.0-1013-aws. All c5 instances Intel® Xeon® Platinum 8275CL CPU @ 3.00GHz / Intel® Xeon® Platinum 8223CL CPU @ 3.00GHz. All c6i instances Intel® Xeon® Platinum 8375C CPU @ 2.90GHz.Instance details:c5.xlarge: 4 vCPUs, 7GB RAM; c5.2xlarge: 8 vCPUs, 15.91GB RAM; c5.4xlarge: 16 vCPUs, 32.06GB RAM; c5.9xlarge: 36 vCPUs, 71.91GB RAM; c5.18xlarge: 72vCPUs, 144.12GB RAM; c6i.xlarge: 4 vCPUs, 8GB RAM; c6i.2xlarge: 8 vCPUs, 16.11GB RAM; c6i.4xlarge: 16 vCPUs, 32.34GB RAM; c6i.8xlarge: 32 vCPUs, 64.80GB RAM; c6i.4xlarge: 64 vCPUs, 129.82GB RAM.

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