



# Handle more PostgreSQL transactions on Google Cloud N2 VM instances powered by 2nd Generation Intel Xeon Scalable processors – Cascade Lake

## Compared to Google Cloud N1 VM instances with older processors

Even in the cloud, underlying hardware drives workload performance, which is why selecting the right configurations to run e-commerce workloads is vital to business success. Selecting Google Cloud N2 VM instances with updated 2nd Generation Intel Xeon Scalable Cascade Lake processors can allow your business to support more customers.

At Principled Technologies, we used the HammerDB tool to compare PostgreSQL database performance of two types of Google Cloud Platform instances at small (8), medium (16), and large (64) vCPU counts: Google Cloud N1 VM instances with older processors and Google Cloud N2 VM instances with 2nd Generation Intel Xeon Scalable Cascade Lake processors.

Across all three sizes, Google Cloud N2 VM instances delivered more TPC-C-like transactions per minute on PostgreSQL databases at only a slightly higher cost per VM instance. Choosing Google Cloud N2 VM instances that support more customers can prepare your business for future growth while also reducing the number of VM instances you must operate, manage, and secure.



**Support more customers at a time**

**Handle more transactions per minute**

1.21x the transactions per minute (TPM) for small VM instances



1.20x the TPM for medium VM instances



1.16x the TPM for large VM instances

## N2 series VM instances for Google Cloud Platform

The N2 series offers a few advantages that can contribute to boost performance compared to the N1 series.<sup>5</sup> These advantages include:<sup>1</sup>

- Increased CPU speeds at 2.8GHz vs. 2.2GHz
- Increased memory at each size
- Increased egress network bandwidth limits

### How we tested

We used an OLTP workload from the HammerDB suite based on the TPC-C benchmark to test the PostgreSQL databases on Google Cloud N1 VM instances powered by older processors and Google Cloud N2 VM instances featuring 2nd Generation Intel Xeon Scalable processors. Note that Google Cloud Platform does not make available the specific model number for the processor powering each VM instance. We made sure that the processor speed information they provided was consistent from test to test, but we cannot say for certain which specific processors we used for each test.

The HammerDB developers derived their OLTP workload from TPC-C benchmark specifications. However, because the HammerDB test is not a full implementation of the official TPC-C benchmark, our results are not directly comparable to published TPC-C results. The HammerDB TPC-C workload reports the number of workload transactions that represent “the principal activities of an order-entry environment” per minute.<sup>2</sup> We compared the performance of Google Cloud N1 and N2 VM instances across three VM sizes: small (8 vCPUs), medium (16 vCPUs), and large (64 vCPUs)

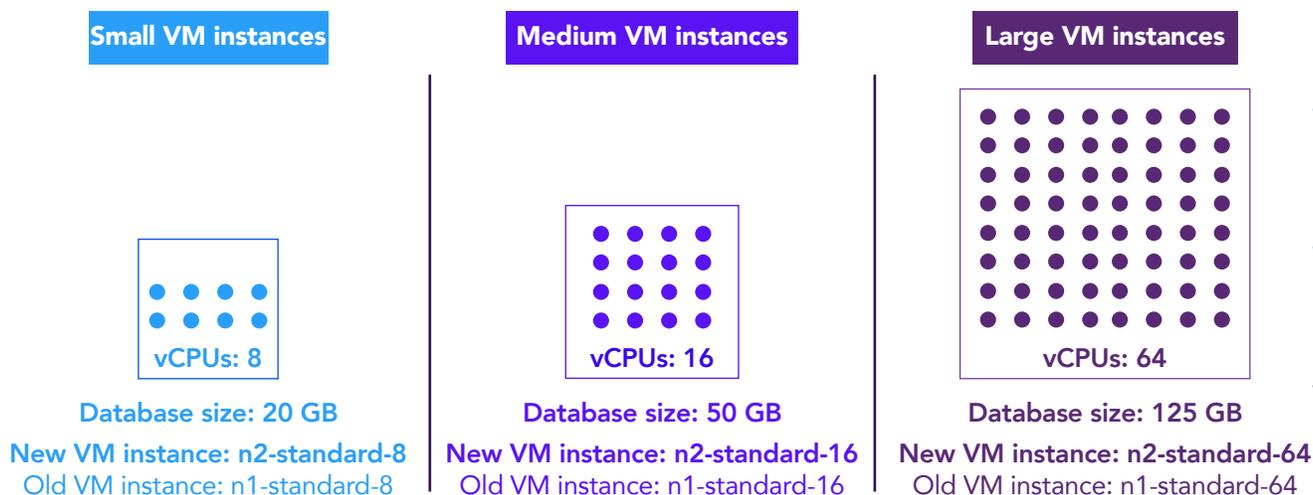


Figure 1: Specifications for the Google Cloud VM instances we used in testing. We tested each instance in the us-east1-b region. Source: Principled Technologies.

## Our results

### Small VM instances

Organizations that require smaller-sized virtual machine instances don't necessarily require small performance. Supporting more transactions per minute can ensure that e-commerce sites are ready to handle peak customer needs or enable headroom for future growth.

As Figure 2 shows, choosing a small (8 vCPU) Google Cloud N2 VM instance with 2nd Generation Intel Xeon Scalable Cascade Lake processors instead of a small Google Cloud N1 VM instance could mean supporting up to 1.21 the transactions per minute, which can also mean requiring fewer overall VM instances.

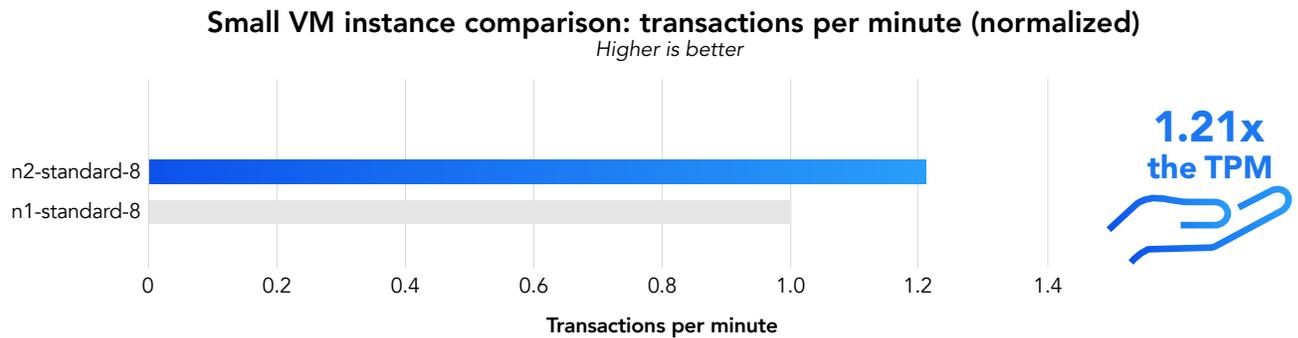


Figure 2: Normalized comparison of average HammerDB transactions per minute for PostgreSQL database workloads running on Google Cloud VM instances with 8 vCPUs. Higher is better. Source: Principled Technologies.

### Medium VM instances

As Figure 3 shows, choosing a medium (16 vCPU) Google Cloud N2 VM instance with 2nd Generation Intel Xeon Scalable Cascade Lake processors instead of a medium Google Cloud N1 VM instance could mean supporting up to 1.20 the transactions per minute, which can mean operating fewer VM instances to meet customer needs.

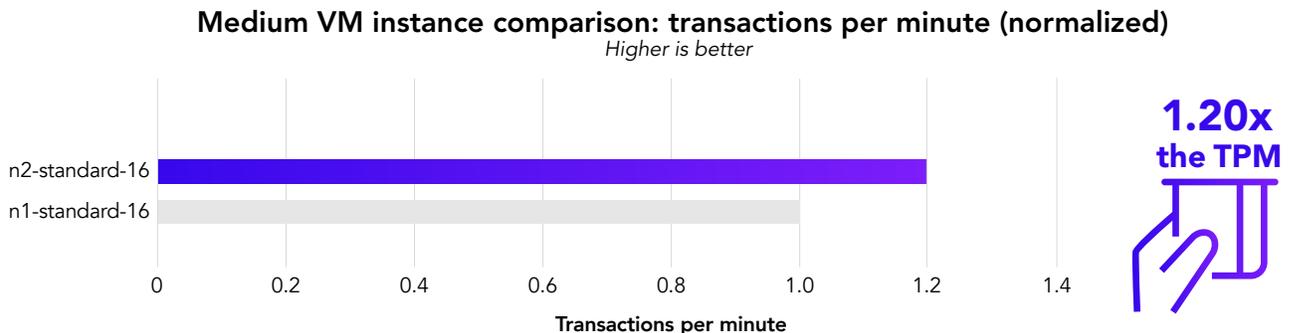


Figure 3: Normalized comparison of average HammerDB transactions per minute for PostgreSQL database workloads running on Google Cloud VM instances with 16 vCPUs. Higher is better. Source: Principled Technologies.

## Large VM instances

As Figure 4 shows, choosing a large (64 vCPU) Google Cloud N2 VM instance with 2nd Generation Intel Xeon Scalable Cascade Lake processors instead of a large Google Cloud N1 VM instance could mean supporting up to 1.16 the transactions per minute, which can leave processing power to meet peak performance demands or reduce the number of VMs organizations must pay for and manage.

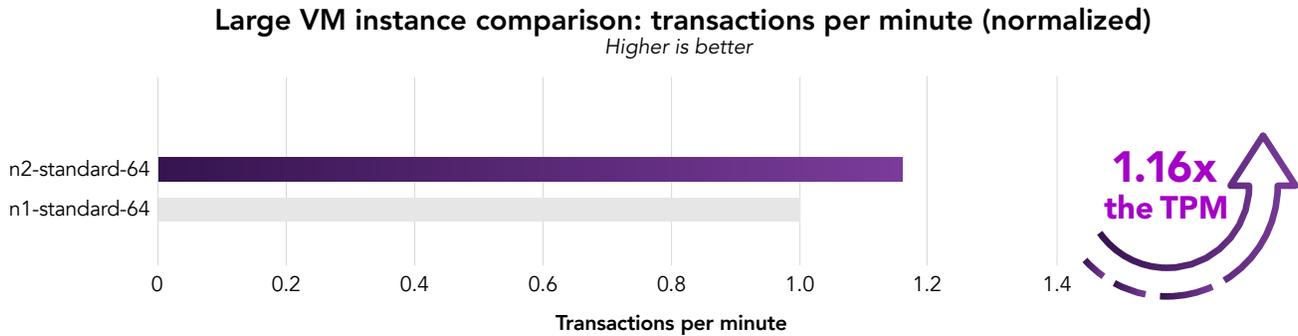


Figure 4: Normalized comparison of average HammerDB transactions per minute for PostgreSQL database workloads running on Google Cloud VM instances with 64 vCPUs. Higher is better. Source: Principled Technologies.



## Better performance and better value

Our test results show that Google Cloud N2 VM instances with 2nd Generation Intel Xeon Scalable Cascade Lake processors delivered up to 1.21x the transactions per minute of N1 VM instances. But they don't cost that much more. At the time of this writing, choosing a Google Cloud N2 VM instance costs only 1.02 times as much as an N1 VM instance, which means that it offers a better overall value.<sup>3</sup>





## Conclusion

Selecting the right underlying hardware for your Google Cloud VM instances is vitally important to the overall success of your e-commerce operation, and choosing upgraded Google Cloud N2 VM instances with 2nd Generation Intel Xeon Scalable Cascade Lake processors can offer significantly greater performance and better overall value.

Compared to their Google Cloud N1 counterparts, Google Cloud N2 small VM instances processed 1.21 times as many transactions per minute, medium VM instances performed 1.20 times as many TPM, and large VM instances handled 1.16 times as many TPM. Plus, current prices show the N2 hardware can offer overall greater value as it costs only 1.02 times as much as the N1 VM instances. When you're selecting new VM instances for your Google Cloud deployment, consider the performance and value benefits you can gain by choosing Google Cloud N2 VM instances with 2nd Generation Intel Xeon Scalable Cascade Lake processors.

- 1 "N1 machine types," accessed November 6, 2020, [https://cloud.google.com/compute/docs/machine-types#n1\\_machine\\_types](https://cloud.google.com/compute/docs/machine-types#n1_machine_types).
- 2 "Overview of the TPC-C Benchmark," accessed November 6, 2020, <http://www.tpc.org/tpcc/detail5.asp#:~:text=The%20benchmark%20is%20centered%20around,of%20stock%20at%20the%20warehouses>.
- 3 "Amazon EC2 On-Demand Pricing," accessed October 28, 2020, [https://cloud.google.com/compute/vm-instance-pricing#n2\\_predefined](https://cloud.google.com/compute/vm-instance-pricing#n2_predefined).

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