Small VM instances
Complete data analysis up to 1.25x as fast

Medium VM instances
Complete data analysis up to 1.23x as fast

Large VM instances
Complete data analysis up to 1.20x as fast

Complete online analytics processing work faster with Google Cloud Platform N2 standard VM instances featuring 3rd Generation Intel Xeon Scalable Processors

Compared to N2 standard instances with 2nd Generation Intel Xeon Scalable processors

These days, many sound business decisions rely on a conversation between powerful analytics systems and executives who consider the data those systems report. While we can't help your staff with their deliberations, we can point the way to a cloud solution capable of speeding up data analysis so key decision-makers can gain insights sooner.

At Principled Technologies, we assessed the data warehouse analytical performance of two sets of Google Cloud Platform VM instances running Microsoft SQL Server 2019 databases: N2 standard VM instances featuring 3rd Generation Intel Xeon Scalable processors and N2 standard VM instances featuring 2nd Generation Intel Xeon Scalable processors. In our tests, the VM instances with 3rd Gen Intel Xeon Scalable processors completed the workload faster than the VM instances with 2nd Gen Intel Xeon Scalable processors (up to 1.25 times as fast when processing a single data stream).

This speed could enable your business to process more analytics work in the same analysis window you currently use, or to speed the time to insights.

How we tested

VM instances and sizing

We tested two types of N2 standard VM instances for Google Cloud Platform: those featuring 3rd Generation Intel Xeon Scalable processors (Ice Lake, or ICX), and those featuring 2nd Generation Intel Xeon Scalable processors (Cascade Lake, or CLX).

Note that Google Cloud Platform does not reveal the specific model number for the processors supporting each VM instance. However, N2 standard instances are available only with 3rd and 2nd Gen Intel Xeon Scalable processors. By matching processor speed stats to publicly available spec sheets for each generation of Intel Xeon Scalable processor, we were able to differentiate the processor supporting each instance with a reasonable level of certainty. We ensured that the processor speed for each VM instance remained consistent from test to test.

We compared the performance of the VM instances across three sizes: small, medium, and large. Figure 1 illustrates key configuration information for these VM instance sizes. For additional configuration information, see the science behind this report.

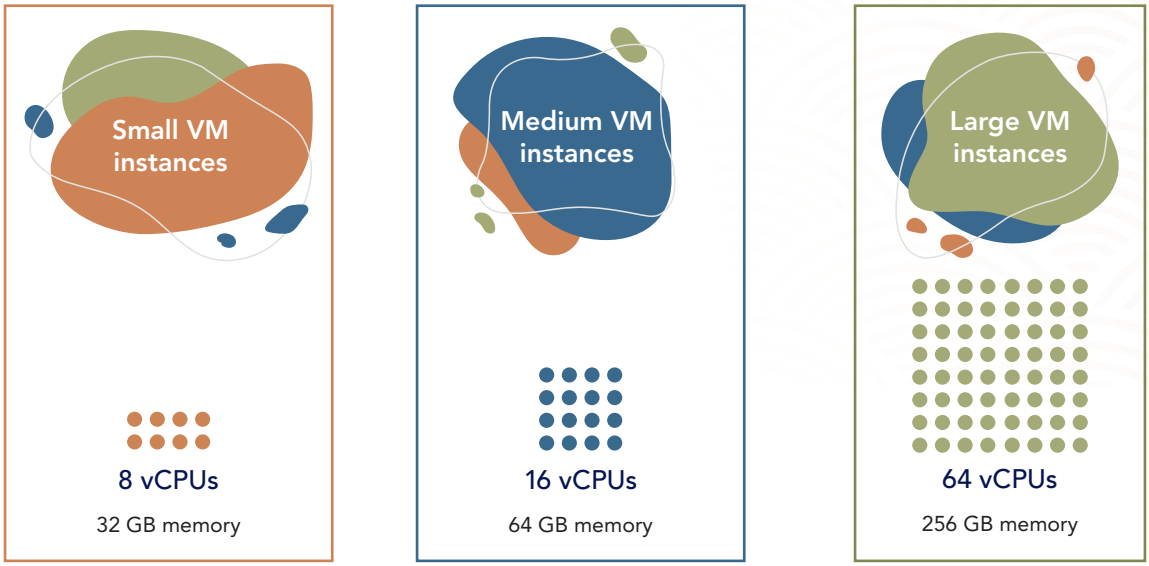


Figure 1: Information on the three VM instance sizes we tested. We ran each VM instance in the us-central1-a region. Source: Principled Technologies.

The workload

To test each VM instance, we used the TPROC-H workload from the HammerDB benchmark suite. This is an online analytics processing (OLAP) workload that measures the time required for VM instances to analyze streams of database queries (in TPROC-H, one stream comprises 22 serialized database queries).

The HammerDB developers derived TPROC-H from the TPC-H specification; however, because the workload is not a full implementation of the TPC-H standard, the results in this paper are not directly comparable to officially published TPC-H results.

Our results

Figures 2 through 4 illustrate the results of our testing. In each test case, the N2 standard VM instance with 3rd Generation Intel Xeon Scalable processors completed the analytics workload faster than the VM instances that featured 2nd Generation Intel Xeon Scalable processors. For small VM instances, the N2 standard instance with 3rd Gen Intel Xeon Scalable processor was up to 1.25 times as fast as the N2 standard instance with 2nd Gen Intel Xeon Scalable processors. For medium instances, this advantage was up to 1.23x; for large instances, up to 1.20x.

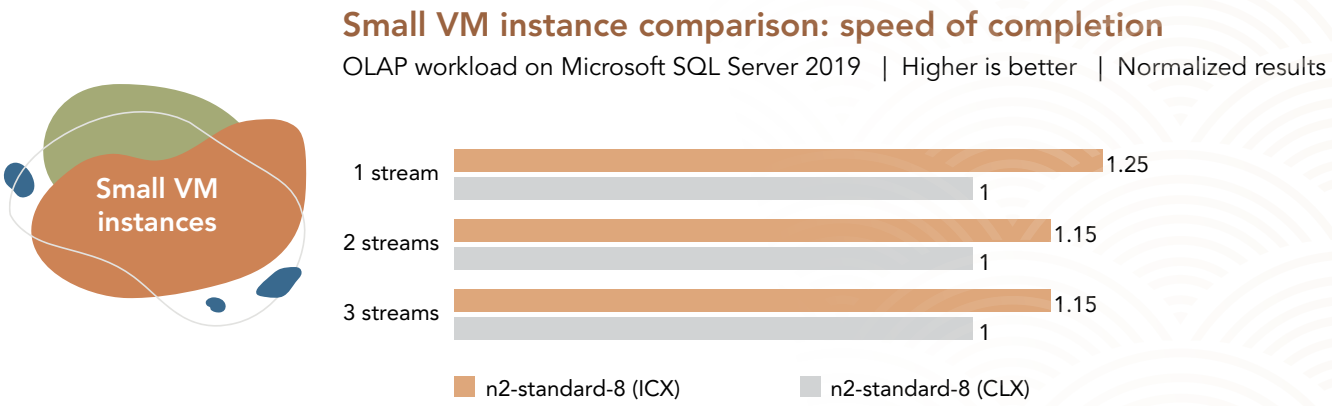


Figure 2: Comparison of the speed at which each of the n2-standard-8 VM instances completed the TPROC-H analytics workload, relative to the completion time of the VM instance with 2nd Gen Intel Xeon Scalable processors. Source: Principled Technologies.

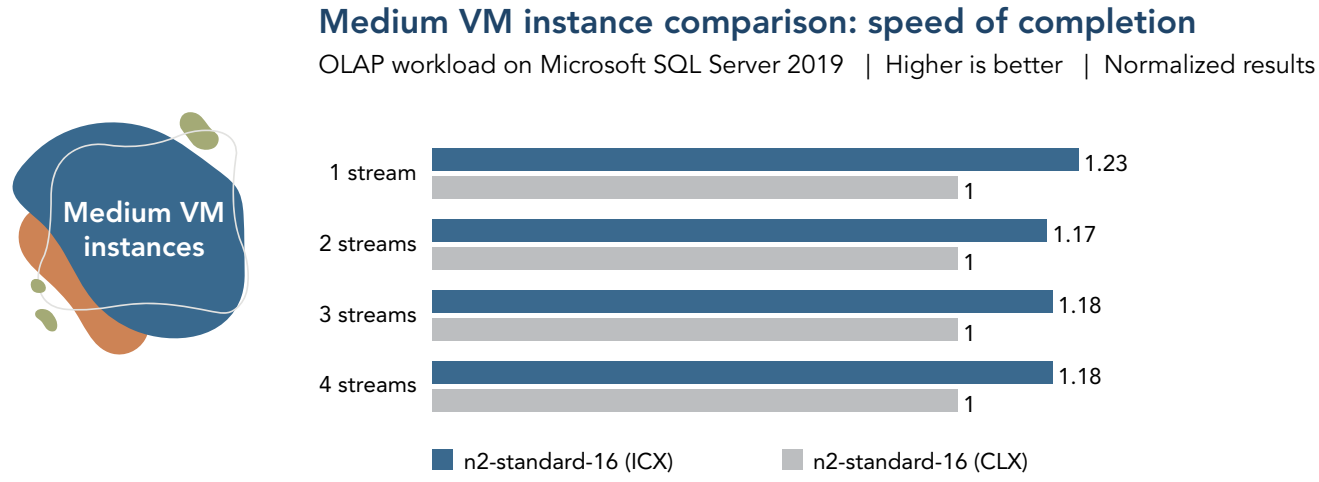


Figure 3: Comparison of the speed at which each of the n2-standard-16 VM instances completed the TPROC-H analytics workload, relative to the completion time of the VM instance with 2nd Gen Intel Xeon Scalable processors. Source: Principled Technologies.

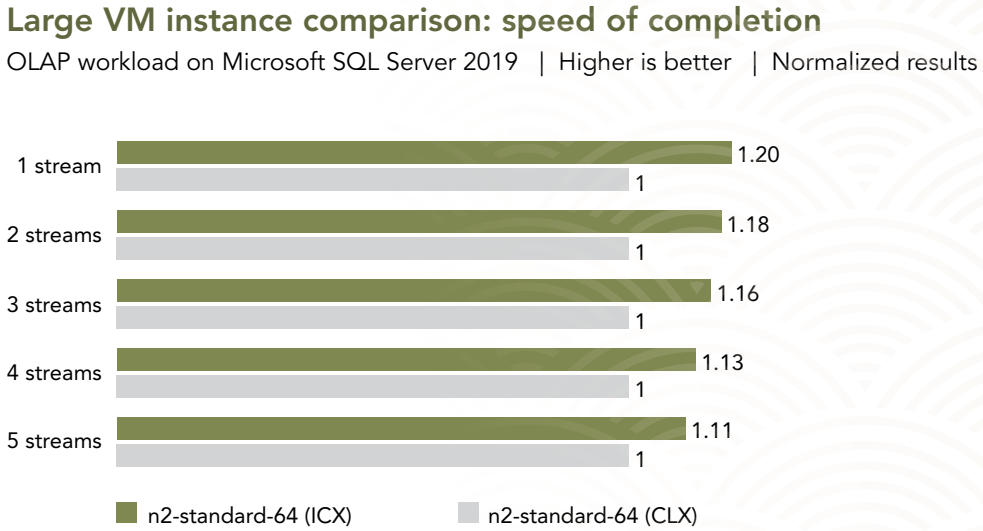


Figure 4: Comparison of the speed at which each of the n2-standard-64 VM instances completed the TPROC-H analytics workload, relative to the completion time of the VM instance with 2nd Gen Intel Xeon Scalable processors. Source: Principled Technologies.

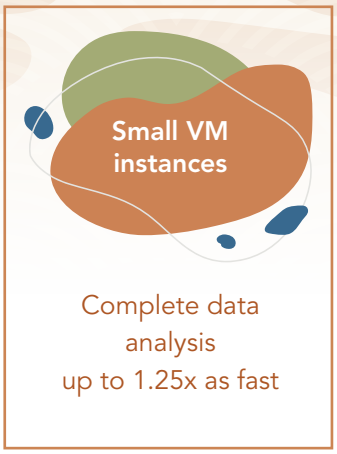
How our results translate to real-world use cases

It can be difficult to understand how isolated results can relate to your real-world business, so here's a hypothetical scenario to help.

Each night, a company has a four-hour window in which to analyze data on a 100GB database. The analysis must complete before sunrise, as executives and other leaders rely on the data from this analysis to help focus their business growth and improvement efforts.

Based on the results of our single-stream TPROC-H tests, the large N2 standard VM instance that used 3rd Gen Intel Xeon Scalable processors would enable this company to complete 576 query streams within their nightly analysis window. However, the large N2 standard VM instance with 2nd Gen Intel Xeon Scalable processors would allow time for only 480 query streams—a difference of 20 percent.

Now, let's say that each night, this company needs only complete 480 query streams total. The large N2 standard VM instance with 2nd Gen Intel Xeon Scalable processors would require four hours. But with the N2 standard VM instance with 3rd Gen Intel Xeon Scalable processors, this company would be able to complete this task in just 3.3 hours, shrinking their analysis window by forty minutes each night.



Conclusion

In our Google Cloud Platform tests, N2 standard series VM instances featuring 3rd Generation Intel Xeon Scalable processors completed an online analytics workload on a Microsoft SQL Server 2019 database up to 1.25 times as fast as N2 standard series VM instances with 2nd Gen Intel Xeon Scalable processors. If your organization relies on regular database analytics work, choosing cloud VM instances capable of quickly completing that work can help shorten the time from analysis to insight, and thereby quicken the pace of innovation.

Read the science behind this report at https://facts.pt/9LqyCyO ▶

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