

COST-EFFECTIVE VIRTUALIZED OLTP SQL SERVER PERFORMANCE WITH INTEL® OPTANE™ PERSISTENT MEMORY 100 SERIES FOR HPE

Comparing Intel Optane PMem 100 series for HPE to all-DRAM in a virtualized environment with Microsoft SQL Server 2017 and VMware using second generation Intel® Xeon® Scalable processors



Key takeaways

With Intel Optane PMem 100 series for HPE on multiple virtualized OLTP databases, the following results were achieved:

- Scaled to 66% more VMs and databases (10 VMs/20 databases)
- Provided 63% more total performance from the host server
- Maintained nearly identical batch requests per second per individual VM/database as compared to results with 6 VMs
- 29% lesser memory cost than an equivalent 1.5 TB all-DRAM configuration^{1,3}

HPE ProLiant DL380 Gen10 configurations

All-DRAM with 6 VMs:

2 Intel® Xeon® Platinum 8280 (2.70 GHz, 28-core) with hyper-threading enabled; VMware ESXi 6.7.0, Microsoft Windows Server 1607 (OS Build 14393.2841), Microsoft SQL Server 2017 version 14.0.3076.1; 12 x 64 GB HPE DDR4 LRDIMMs; 16 x 400 GB WU SFF SSDs. Baseline test: 6 VMs, each VM configured with 8vCPU, 120 GB, and 2 x 200 GB databases

Intel Optane PMem 100 series for HPE with 6 VMs and 10 VMs:

2 Intel Xeon Platinum 8280 (2.70 GHz, 28-core) with hyper-threading enabled; VMware ESXi 6.7.0, Microsoft Windows Server 1607 (OS Build 14393.2841), Microsoft SQL Server 2017 version 14.0.3076.1; 12 x 32 GB HPE DDR4 LRDIMMs; 12 x Intel Optane 128 GB persistent memory 100 series for HPE; 16 x 400 GB WU SFF SSDs; 6 VMs, each VM configured with 8vCPU, 120 GB, and 2 x 200 GB databases; separate run with 10 VMs, each VM configured with 8vCPU, 120 GB, and 2 x 200 GB databases.

EXECUTIVE SUMMARY

Hewlett Packard Enterprise provides a performance comparison between [Intel® Optane™ persistent memory 100 series for HPE](#), available in 128, 256, and 512 GB capacities, in Memory Mode versus all-DRAM on the [HPE ProLiant DL380 Gen10 Server](#) running Microsoft SQL Server 2017 with multiple virtualized OLTP databases on a workload representing a stock trading application emulator from Microsoft.²

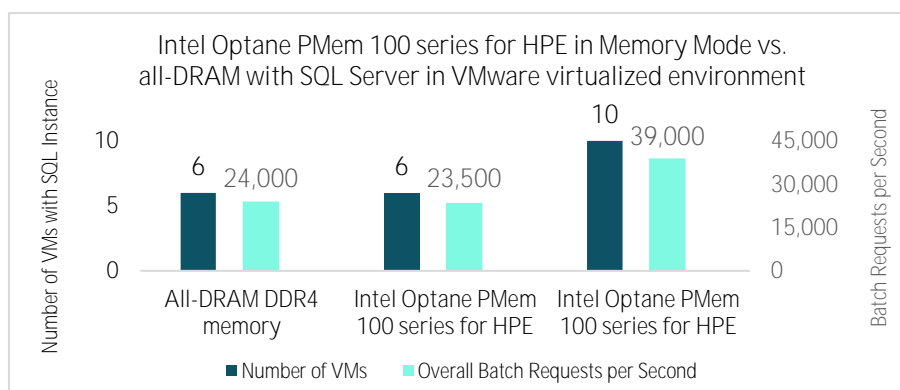


FIGURE 1. Performance results of all-DRAM vs. Intel Optane PMem 100 series for HPE in Memory Mode in a virtualized environment with SQL 2017 and VMware vSphere on the HPE ProLiant DL380 Gen10 Server.

RESULTS

Scaling advantage. Intel Optane PMem 100 series for HPE in Memory Mode provides additional memory capacity that enables hosting additional Virtual Machines (VMs) and databases. This configuration resulted in scaling the host workload to 10 VMs and 20 databases.

Performance. At 6 VMs and 12 databases, Intel Optane PMem 100 series for HPE in Memory Mode achieved nearly the same SQL Server performance as the all-DRAM configuration (only a 2% delta). With the same hardware configuration, Intel Optane PMem 100 series for HPE in Memory Mode was also able to scale to 66% more VMs and databases. This scale was achieved with 63% more total performance of 39,000 batch requests per second without impacting the performance of individual VMs as compared to configurations with 6 VMs.

Price comparison. The same VM scaling and total performance increase can be achieved using all DRAM DDR4 with 128 GB DIMMs. However, cost analysis showed that the 1.5 TB configuration with Intel Optane PMem 100 series for HPE had a 29% lesser memory cost than a configuration with 1.5 TB all-DRAM (not shown in the graph).^{1,3}

¹ All-DRAM configuration with 1.5 TB of DDR4 vs. configuration with 1.5 TB Intel Optane PMem 100 series for HPE including 384 GB of DDR4 DRAM: see configuration details.

² HPE internal lab testing.

³ Based on pricing as of June 2020.

CUSTOMER VALUE WITH HEWLETT PACKARD ENTERPRISE

Powerful enterprise technology. Intel Optane PMem 100 series for HPE ensures high capacity, high performance, and ongoing data safety. The HPE ProLiant DL380 Gen10, the industry's most trusted compute platform, delivers world-class performance with the right balance of expandability and scalability in a 2U/2P form factor.

BOTTOM LINE

Intel Optane PMem 100 series for HPE in Memory Mode along with VMware vSphere improve total cost of ownership for customers looking to run OLTP SQL Server workloads by increasing the memory footprint to support more VMs and workloads while also maintaining excellent overall performance. HPE performance engineering solutions are poised to accelerate customer success.

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