

Get Intelligence Fast with Microsoft SQL Server 2019 and Linux® on Bare Metal

In collaboration with:



Tech Note by

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Summary

This joint paper outlines a brief discussion on the key hardware considerations when configuring SQL Server 2019 with Red Hat Linux based on the most recent 15th Generation PowerEdge Server portfolio offerings.

Microsoft SQL Server 2019 has evolved from a traditional database to an industry leading data platform built to take on any data project. For IT professionals who need to deliver fast online transaction processing (OLTP) for financial transactions or accelerated online analytical processing (OLAP) for inventory forecasting, SQL Server 2019 running on Linux®—Red Hat®, SUSE®, Ubuntu® or Docker®—is a go-to solution.

Many organizations deploy SQL Server 2019 on an on-premises, bare-metal server because it is often the most cost-effective and least complex option. Bare-metal servers enable organizations to avoid performance penalties associated with virtualization. To get intelligence fast with SQL Server, IT professionals turn to Dell EMC™ PowerEdge™ servers.

Dell EMC PowerEdge R750 servers with 3rd Generation Intel® Xeon® Scalable processors, fast NVM Express® (NVMe®) solid-state drives (SSDs), PCIe® Gen4 interfaces and the Dell™ PowerEdge RAID Controller (PERC) 11 H755N show a **7x gain** in new orders per minute (NOPM) and **5.25x faster** RAID array builds, as compared to the previous-generation of hardware.ⁱ

Key Considerations

Below are key considerations to get you started:

Optimize performance per core. High-performance 3rd Generation Intel Xeon Scalable processors optimize performance per core. This reduces the number of cores required and results in lower SQL Server 2019 licensing costs.

Plan for high availability. For high availability as you scale, use SQL Server 2019 replication, log shipping, mirroring, clustering or AlwaysOn Availability Groups (AG).

Process transactions faster. For use cases that require faster processing, consider adding [Intel® Optane™ persistent memory \(PMem\)](#). Intel Optane PMem enables you to cost-effectively increase performance using [SQL Server 2019 features](#) like tail-log and the hybrid buffer pool (HBP). Additionally, as the number of clusters increases, considering upgrading the network interface controller (NIC) to support faster communication.

Recommended Configurations

Select from the configurations below based on your SQL Server 2019 licenses. Both a Base and Plus configuration are listed for SQL Server 2019 Enterprise edition.

	Microsoft SQL Server 2019 Standard Edition—Base Configuration	Microsoft SQL Server 2019 Enterprise Edition—Base Configuration	Microsoft SQL Server 2019 Enterprise Edition—Plus Configuration
Platform ⁱⁱ	Dell EMC™ PowerEdge™ R650 server supporting 10 NVMe® drives (direct connection with no Dell™ PowerEdge RAID Controller [PERC]), 1 RU		Dell EMC PowerEdge R750 supporting 16 NVMe drives (direct connection with no Dell PERC), 2 RU
CPU ⁱⁱⁱ	2 x Intel® Xeon® Gold 5317 processor (12 cores at 3.0 GHz)	2 x Intel® Xeon® Gold 6342 processor (24 cores at 2.8 GHz) or 2 x Intel® Xeon® Gold 6346 processor (16 cores at 3.1 GHz)	2 x Intel® Xeon® Platinum 8362 processor (32 cores at 2.8 GHz) or 2 Intel® Xeon® Platinum 8358 processor (32 cores at 2.6 GHz)
DRAM ^{iv}	256 GB (16 x 16 GB DDR4-3200)	512 GB (16 x 32 GB DDR4-3200)	512 GB (16 x 32 GB DDR4-3200) or more
Persistent memory ^{iv}	None	Optional	
Boot device	Dell EMC™ Boot Optimized Server Storage (BOSS)-S2 with 2 x 480 GB M.2 Serial ATA (SATA) solid-state drives (SSDs) (RAID1)		
Storage adapter ⁱⁱ	Optional Dell PERC H755N NVMe RAID		Optional dual Dell PERC H755N NVMe RAID
Transaction log drives ^v	1 x 1.6 TB Intel® SSD P5600 (PCIe®) Gen4, mixed-use)	2 x 1.6 TB Intel SSD P5600 (PCIe Gen4, mixed-use)	2 x 400 GB Intel Optane SSD P5800X (PCIe Gen4) or 2 x 375 GB Intel Optane SSD DC P4800X (PCIe Gen3)
Data drives	2 x (up to 8 x) 3.84 TB Intel SSD P5500 (PCIe Gen4, mixed-use)	4 x (up to 8 x) 3.84 TB Intel SSD P5500 (PCIe Gen4, mixed-use)	6 x (up to 14 x) 3.84 TB Intel SSD P5500 (PCIe Gen4, mixed-use)
NIC ^{vi}	Intel® Ethernet Network Adapter E810-XXV for OCP3 (dual-port 25 Gb)		Intel Ethernet Network Adapter E810-XXV for OCP3 (dual-port 25 Gb) or Intel Ethernet Network Adapter E810-CQDA2 PCIe add-on card (dual-port 100 Gb)

Learn More

Contact your Dell or Intel account team for a customized quote 1-877-289-3355

Get started with SQL Server 2019 and Linux on bare metal:

- [SQL Server solution spotlight](#)
- [“Release notes for SQL Server 2019 on Linux”](#)
- [Using Intel Optane PMem with SQL Server 2019](#)
- [Configuring Intel Optane PMem for use with SQL Server 2019](#)

ⁱ Prowess Consulting. “Can Newer Dell EMC Servers Offer Significantly Better Performance for Microsoft SQL Server?” August 2021. www.prowesscorp.com/research.

ⁱⁱ Base configurations for Microsoft SQL Server Standard and Enterprise editions: Optional Dell™ PERC H755N NVMe® supported only with an eight-drive chassis.

ⁱⁱⁱ Microsoft SQL Server Enterprise edition Base configuration: When more than one CPU is recommended, choose the CPU based on expected workload and licensing cost.

^{iv} Microsoft SQL Server Enterprise edition Plus configuration: On systems with Intel® Optane™ PMem, only 16 DIMM slots can be populated with DRAM.

^v Microsoft SQL Server Enterprise edition Plus configuration: The Intel® Optane™ SSD P5800X is recommended, but the previous-generation Intel Optane SSD DC P4800X can be used instead if the Intel Optane P5800X is not yet available.

^{vi} For special cases like data warehousing, where very high throughput is required, a 100 Gb NIC might be required.