

# Fast track your data warehouse

## Microsoft SQL Server 2014 38 TB Fast Track for HPE ProLiant DL380 Gen9 Server

Speed time-to-value with tested and proven data warehouse reference architectures leveraging HPE NVMe solid-state drives.

### SQL Server Fast Track Reference Architectures are pre-tuned solutions that help you:

- Accelerate data warehouse implementations, helping to reduce costs and facilitate successful deployments
- Reduce the total cost of ownership by positively impacting maintenance, IT staffing, installation, configuration, and operations

### Testing results

Maximum user data capacity: 38 TB<sup>2</sup>  
Column store:

- Measured throughput: 1739 queries/hour/TB
- Relative throughput: 267<sup>3</sup>
- Physical scan rate: 2019 MB/s
- CPU (average): 81%

Row store:

- Measured throughput: 267 queries/hour/TB<sup>3</sup>
- Relative throughput: 213<sup>3</sup>
- Physical scan rate: 5,456 MB/s
- CPU (average): 84%

For more details click [here](#).

<sup>1</sup> Price comparison based on a server with two processors and eight cores each using prices published on Oracle's website:  
[click.email.microsoftemail.com/?qs=10eee80ede980722ce0f14b956147c1743de028b2d77322f71da057f7e18cd1ebba1f89a9fcc8a86](http://click.email.microsoftemail.com/?qs=10eee80ede980722ce0f14b956147c1743de028b2d77322f71da057f7e18cd1ebba1f89a9fcc8a86)

<sup>2</sup> Assumes a data compression ratio of 5:1.

<sup>3</sup> Percent ratio of the throughput to the row store throughput of the reference configuration.



### Get more value, faster

Properly sizing hardware for Microsoft® SQL Server 2014 can be complex, slowing down deployment and leading to unnecessary scale-out of storage and servers. The Microsoft SQL Server Data Warehouse Fast Track solution provides a scalable framework, focused on balancing I/O to achieve maximum server performance at a third of the cost of Oracle.<sup>1</sup>

The solution, based on the HPE ProLiant DL380 Gen9 Server and HPE Write Intensive NVMe solid-state drives (SSDs), eliminates the complexity of sizing servers for data warehouses by providing a set of data consumption rates that properly balances performance between the disk subsystem, CPU, and memory.

HPE Write Intensive NVMe SSDs deliver up to 2600 sequential read throughput while providing the best reliability in the industry. With a rated user capacity of 38 TB, the HPE ProLiant DL380 Gen9 Server and HPE Write Intensive NVMe SSDs deliver the best mix of performance and data capacity, which reduces the need to scale your data warehouse.

The solution has been tested and shown to provide more than 1700 queries per hour per TB in column store, and more than 250 queries per hour per TB in row store. Furthermore, the solution allows for massive database consolidation projects, which can provide significant savings on licensing costs.

## Solution brief

### System configuration

- HPE DL380 Gen9 Server
- 2 x Intel Xeon E5-2699 v3 processors
- 384 GB DDR4 HPE Smart Memory
- 6 x 2 TB 2.5-inch HPE Write Intensive NVMe SSDs for data and tempdb
- 2 x 120 GB 2.5-inch HPE SSDs for boot/OS
- 2 x 800 GB 2.5-inch HPE SSDs for log
- Microsoft Windows Server® 2012
- Microsoft SQL Server 2014

### Write-intensive NVMe SSDs SKUs

- 736936-B21: HPE 400 GB NVMe PCIe Write-intensive SFF 2.5-in SC2 3yr Wty SSD
- 736939-B21: HPE 800 GB NVMe PCIe Write-intensive SFF 2.5-in SC2 3yr Wty SSD
- 764892-B21: HPE 1.6 TB NVMe PCIe Write-intensive SFF 2.5-in SC2 3yr Wty SSD
- 764894-B21: HPE 2 TB NVMe PCIe Write-intensive SFF 2.5-in SC2 3yr Wty SSD

<sup>5</sup> Intel performance testing, comparing measurements on platform with two E5-2697 v2 (12C, 2.7 GHz), 8x8 GB DDR3-1866, RHEL 6.3 vs. platform with two E5-2697 v3 (14C, 2.6 GHz, 14.5 W), 8x8 GB DDR4-2133, RHEL 6.3, April 2014.

<sup>6</sup> DL380 Gen9 and Enablement Kit SKU 810393-B21.

<sup>6</sup> Price comparison based on a server with two processors and eight cores each using prices published on Oracle's website:  
[click.email.microsoftemail.com/?qs=10eee80ede980722ce0f14b956147c1743de028b2d77322f71da057f7e18cd1ebba1f89a9fcca8a6](http://click.email.microsoftemail.com/?qs=10eee80ede980722ce0f14b956147c1743de028b2d77322f71da057f7e18cd1ebba1f89a9fcca8a6)

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The complete solution provides agility for faster, lower-risk deployment on industry-standard components. Converged management platforms further decrease the time for adoption and provide the flexibility to integrate with existing management and reporting tools for rapid business results.

### Enjoy excellent performance

The HPE ProLiant DL380 Gen9 Server is the no-compromise data center standard for storage-centric applications, removing bottlenecks and improving SQL performance. Powered by two Intel® Xeon® E5-2699 v3 processors, the HPE ProLiant DL380 Gen9 Server gives you industry-leading performance with up to a 70% performance gain.<sup>4</sup> An agile infrastructure management with HPE OneView accelerates IT service delivery via a revolutionary converged management platform that delivers automation simplicity across servers, storage, and networking.

## About NVMe Express

Non-Volatile Memory Express (NVMe) is an industry standard for using NAND Flash memory in an SSD. NVMe standardizes the interface from the storage driver to the SSD, including command set and features such as power management. The standard enables native OS drivers in Windows®, Linux®, and VMware® to provide a seamless user experience. The standard was defined from the ground up for NVMe, so it is capable of much higher IOPS and lower latency than legacy storage standards, such as SATA and SAS, which were designed for hard drives. Additional information on NVMe can be found at [nvmeexpress.org](http://nvmeexpress.org)

## Boost performance with 2.5-inch HPE NVMe SSDs

Unique HPE ProLiant Gen9 Server innovations include a server design with the Express Bay Enablement Kit option that

gives you up to six 2.5-inch HPE NVMe SSDs, which are easily accessible from the front of the server. The Express Bay Enablement Kit can be added to your existing Gen9 servers. Also, a cost-effective bundled configuration with the DL380 Gen9 and the Enablement Kit is available.<sup>5</sup> You can increase system performance and efficiency by populating HPE Gen9 servers with HPE 2.5-inch NVMe SSDs or NVMe add-in cards. NVMe is a specification for accessing SSDs attached through the PCIe bus. HPE NVMe SSDs can handle larger amounts of data, improve performance, reduce overall initialization time, and protect against multi-day outages and data loss.

This solution optimizes storage throughput and maximizes the per core return on your investment by reducing the number of licenses required. With the HPE 2.5-inch NVMe SSDs you not only add serviceability, but also optimize the performance of your processor. For many workloads, you can save hundreds of thousands of dollars in operating system, database licensing, and management costs. HPE DL380 Gen9 and Write-intensive NVMe SSDs combined with SQL Server Enterprise Edition delivers built-in advanced analytics, complete mobile business intelligence, award-winning data warehousing, and in-memory online transaction processing for a third of the cost of Oracle.<sup>6</sup>

## Get better flexibility and performance, today

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[hpe.com/servers/solidstate](http://hpe.com/servers/solidstate)

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