



SQL Server 2014 Fast Track Data Warehouse for SuperMicro® SuperServer® with Seagate® Nytro™ Flash Accelerator Card

Highlights

- **Reduces the risk of a typical “do-it-yourself” deployment**
- **Turn data into meaningful information quickly**
- **Throughput performance rating of 7,191 MB/s for Rowstore and 1,433/Queries/Hr/TB for Columnstore**

Today's modern data warehouse has evolved from being thought of as a secondary archiving project to a primary one which organizations now depend on for their daily operations. Overnight processing for next day reports are becoming obsolete and now real time reporting and streaming data are the norm. The systems required to support this, however, need to be proven before implemented into a production environment, otherwise, organizations may face disastrous results. This effort includes many decisions with respect to software, hardware selection, configuration, timing and testing. Organization's

often do not have the staffing resources and time required to validate a system that would best fit their business. In response, Microsoft, Supermicro and Seagate have collaborated to provide a tested and preconfigured reference design that will meet the requirements of a wide range of environments with fast and reliable deployment. The SQL Server 2014 Fast Track Data Warehouse reference architecture including the Supermicro SuperServer 4048B-TRFT and the Seagate Nytro flash accelerator card eliminates the complex task of building out an optimized system and removes much of the upfront testing and unknowns of building out an optimized system,

Optimize Performance Nytro Flash Accelerator Card

The Seagate Nytro flash accelerator card is a solid state primary storage solution for accelerating SQL Server workloads. The small PCIe foot print gives database administrators the option of easily transforming their storage subsystem to

solid state storage. Built with advanced flash capabilities and technology that optimizes endurance and reliability, the Nytro card offers an enterprise ready solution. Using a host offload architecture design, the Nytro card reduces server CPU and DRAM dependency leaving these resources for the host and SQL Server Instance to utilize.

Achieve Efficiencies

Supermicro SuperServer 4048B-TRFT

Supermicro®, the leading innovator in high-performance, high-efficiency server technology is a premier provider of advanced server Building Block Solutions® for HPC, Data Center, Cloud Computing, Enterprise IT and Embedded Systems worldwide. Supermicro's proven high level of quality and performance has made SuperServers the platform of choice for supercomputer clusters and enterprise databases as well as business-critical, front-end server applications.

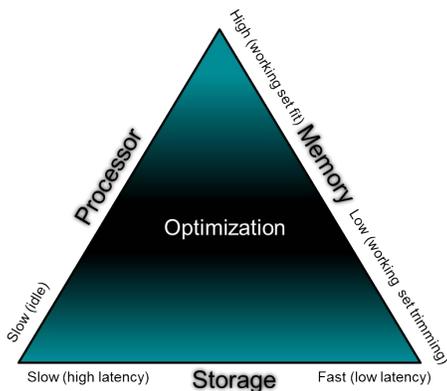
In partnership with



Workload Optimization

Customers have many hardware choices for their SQL Server 2014 Data Warehouse implementation. Systems made up of fast multi-core processors, memory, and flash storage can be combined to achieve this goal. For the best value of these hardware resources, the system should be optimized and validated.

Rather than trying to achieve the best benchmark score which can expose under or over utilization of components, the SQL Server 2014 Fast Track Data Warehouse reference architecture strives for the best balance of CPU, memory, and storage resources.



System performance optimization involves testing workload types. Changing one component affects the others, so striking the right balance among the server components is key to getting the results and value identified. Deploying the fastest processor available might seem like the most obvious way to improve system performance, but it's even more important to optimize processor, memory and storage performance to the specific workload.

Supernano
SuperServer 4048B-TRFT



Supernano Server
Memory 1.5TB



Intel Xeon E7-4890 v2
(15) Core 2.8 GHz



LSI/Avago
9280-244e MegaRAID HDD



Seagate Nytro Flash Accelerator
Card 3.2TB



Microsoft
SQL Server 2014 Enterprise



In-Memory Data Warehouse
In-Memory Analytics
Columnstore Index

Workload Optimization Metrics

Data warehouse workloads consist of loading and processing the data to be consumed. Once the data has been transformed and ready to use, the I/O consists primarily of multiple streams of read operations.

The SQL Server 2014 Fast Track Data Warehouse reference architecture made up of the Supernano SuperServer 4048B-TRFT and the Seagate Nytro card provides the ability to scale with the performance for concurrent complex read queries.

Summary

Collaboration is key when developing a successful SQL Server 2014 Data Warehouse reference architecture. Microsoft, Supernano and Seagate have based the above reference architecture on joint innovation with a goal of building a fully-optimized and reliable solution for quick and trusted deployment. Contact Supernano to see how this reference architecture can optimize your environment.

Additional Resources

SQL Server Fast Track Data Warehouse

<http://www.microsoft.com/sqlserver/en/us/solutions-technologies/data-warehousing/fast-track.aspx>

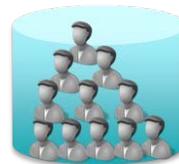
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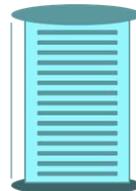
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Rated User Data Capacity
55TB



Row Store Throughput
7,191 MB/s



Columnstore Throughput
1,433/Queries/Hr/TB



Figure 2: Reference Architecture Highlights

Detailed Reference Architecture Certificate

DWFT Certification #2014-008	SuperServer 4048B-TRFT			Report Date: 9/15/2014	
DWFT Rev. 5.4	DWFT Reference Architecture				
System Provider	System Name	Processor Type		Memory	
	SuperServer 4048B-TRFT	Intel Xeon E7-4890 v2 2.8 GHz (4/60/120)		1536 GB	
Operating System			SQL Server Edition		
Windows Server 2012 R2			SQL Server 2014 Enterprise Edition		
Storage Provider	Storage Information				
	8 x 3.2TB PCIe Nytro for data and tempdb 2 x 558GB 10K RPM HDD for OS (RAID 1) 8 x 558GB 10K RPM for log (RAID 10)				
Primary Metrics					
Rated User Data Capacity ¹ (TB)	Row Store Relative Throughput ²	Column Store Relative Throughput ³	Maximum User Data Capacity ¹ (TB)		
55	244	220	66		
Row Store					
Relative Throughput ²	Measured Throughput (Queries/Hr/TB)	Measured Scan Rate Physical (MB/Sec)	Measured Scan Rate Logical (MB/Sec)	Measured I/O Throughput (MB/Sec)	Measured CPU (Avg.) (%)
244	264	6,495	7,888	7,191	84
Column Store					
Relative Throughput ²	Measured Throughput (Queries/Hr/TB)	Measured Scan Rate Physical (MB/Sec)	Measured Scan Rate Logical (MB/Sec)	Measured I/O Throughput (MB/Sec)	Measured CPU (Avg.) (%)
220	1,433	1,130	N/A	N/A	78
<p>The reference configuration is a 2 socket system rated for 25TB using the DWFT V4 methodology</p> <p>¹ Assumes a data compression ratio of 5:1</p> <p>² Percent ratio of the throughput to the row store throughput of the reference configuration.</p> <p>³ Percent ratio of the throughput to the column store throughput of the reference configuration.</p> <p>* Reported metrics are based on the qualification configuration which specifies database size and SQL Server memory.</p>					