Architected for Performance

NVM Express™ Delivering Real World Benefits

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NVMe value in client and data center

High performance Low latency

Expose the high bandwidth and low latency of PCIe SSDs with an optimized storage stack to reduce latency even further

Industry Standard

Uses industry standard software and drivers for broad compatibility and management at scale. NVMe SMART for real time monitoring and health standardized across vendors

Scalability

Improved parallelism with an efficient queuing mechanism enhances performance of multi-core CPUs and scalability

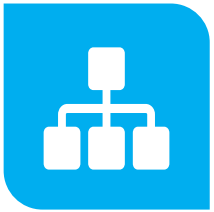
Efficiency

Lean storage stack reduces CPU overhead for IO delivering more storage performance on the same server hardware, and reducing total cost of ownership

Data center use cases for NVMe

Cloud computing

Better SLAs for CSPs, lower opx/capx, get developers to market faster, consumers services on demand



Virtualization

Lowering enterprise IT by increasing system utilization and improving virtual machine scalability

HPC

Eliminating bottlenecks in HPC workflows. NVMe keeps up with high bandwidth demands of HPC to speed up overall workflow times by an order of magnitude

Database

High performance and great QoS shine in traditional database

Big data

High bandwidth and low latency can provide business insights with real time analytics

Client use cases for NVMe

Gaming

Opens up the opportunity for unparalleled realism, with high quality textures and decreased load times

Content Creation

NVMe creates opportunity for new workflows for content creation when working with large data sets

Workstation

Opportunity to accelerate any WS workload with large data sets
Caching from backend SAN in large organizations

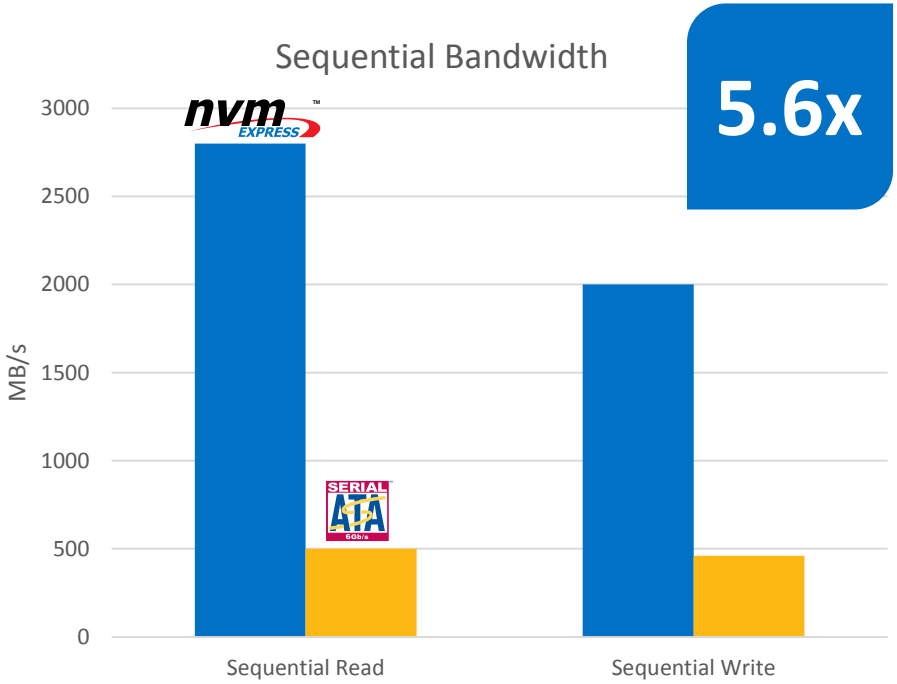
Client / Mobile

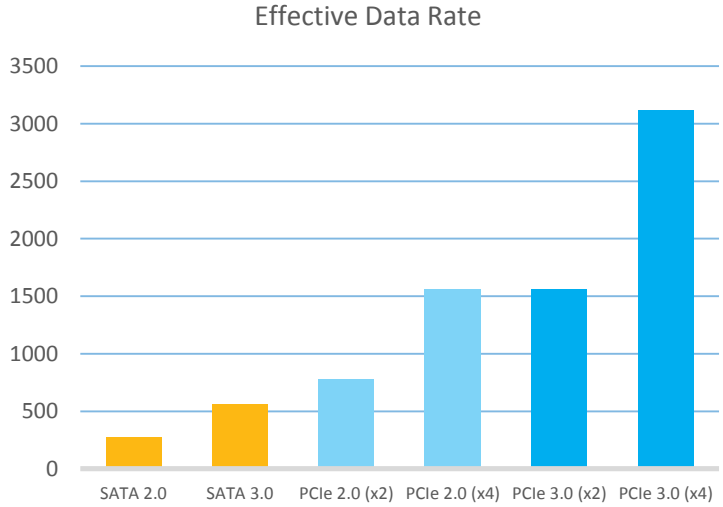
High performance is driving NVMe into client. Efficiency and features of NVNe lead to better battery life. Lower latency and better QoS delivers better application responsiveness

4K

High bandwidth is required for real time 4K editing

Breaking through the SATA bottleneck





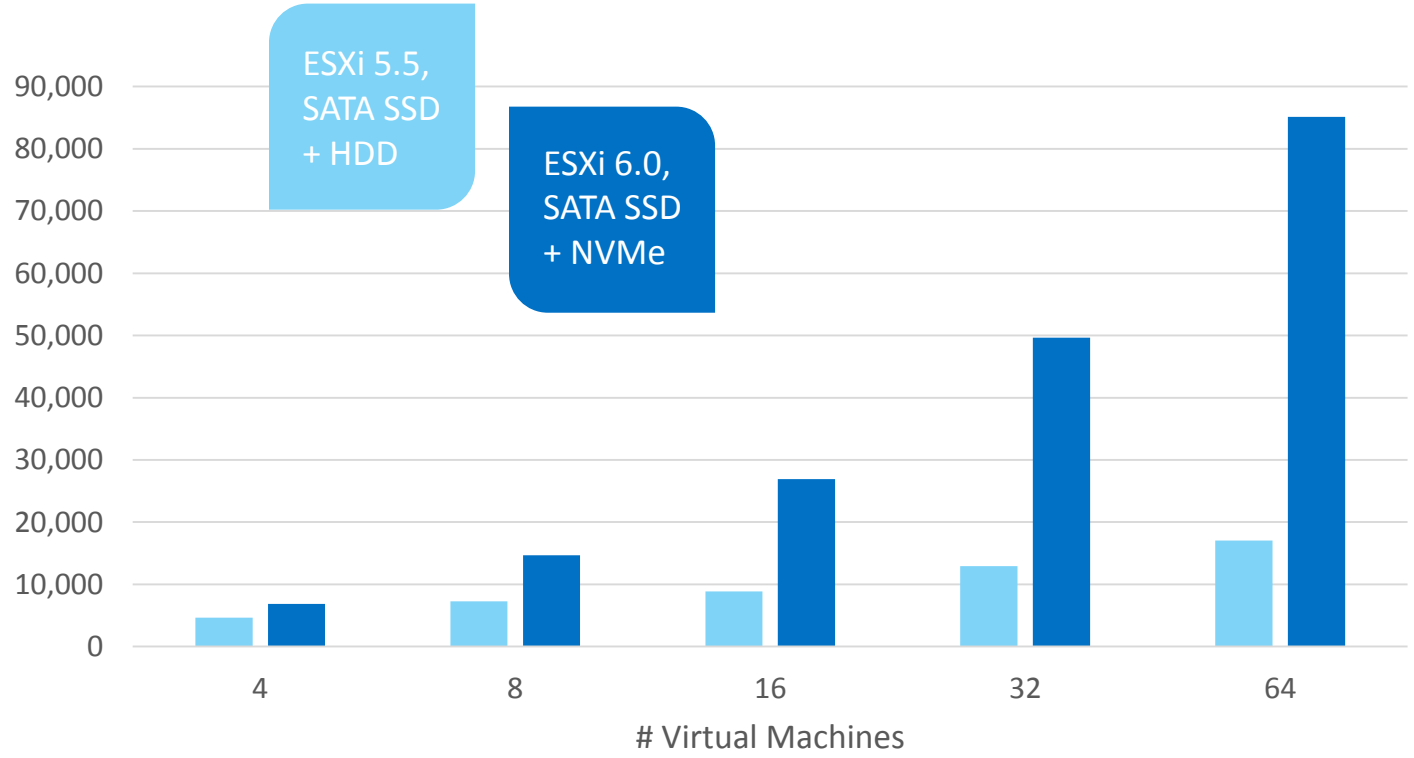
Results measured by Intel based on the following configurations. Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Configurations: Performance claims obtained from data sheet, sequential read/write at 128k block size for NVMe and SATA. Intel SSD C P3700 Series 2TB, Intel SSD DC S3700 Series SATA 6Gbps. Intel Core i7-3770K CPU @ 3.50GHz, 8GB of system memory, Windows* Server 2012, IOMeter. Random performance is collected with 4 workers each with 32 QD

Hybrid array in VSAN vs all flash with NVMe

350% higher IOPS

More VMs

Better QoS

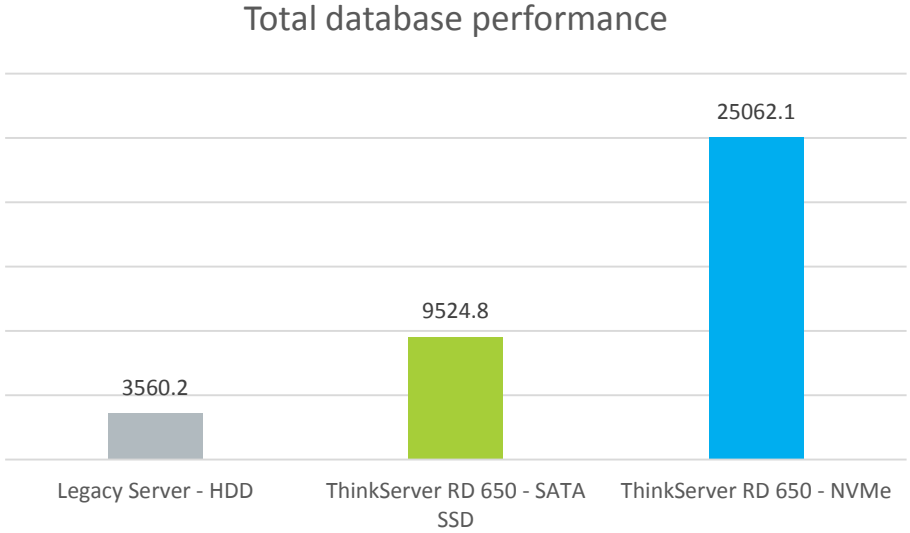


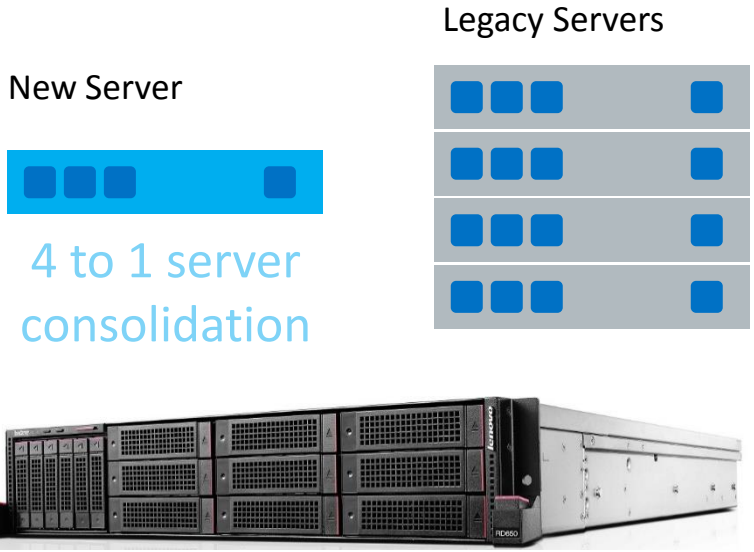
Results measured by Intel based on the following configurations. Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Configurations:

Lenovo ThinkServer RD650 with Intel® SSD DC P3700 Series Database TPC-H

7x

PERFORMANCE





For tests and configurations go to http://www.principledtechnologies.com/Lenovo/RD650_storage_performance_0415.pdf
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Microsoft SQL for Big Data Analytics with NVMe™ Acceleration

Performance /Hour	Time to Answer	Performance	Server Consolidation
x7	**1/2**	**x16.6**	**x4**
Queries/hr	Reduce query time to 28 minutes, cutting the total time to answer in half	Throughput of legacy solution	Only need 1 server to do the work of 4 previous servers

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SAS Analytics for business

Time to Answer reduced by

92%

complete 12x jobs in 14% less time

Jobs per hour

x14

number of jobs per hour

Server consolidation

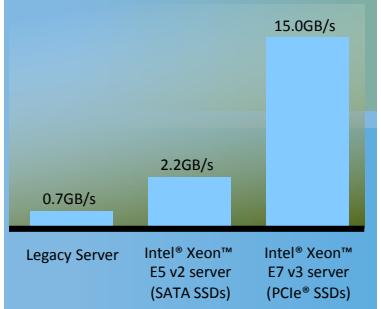
x6

24U of servers can be replaced with a single 4U E7v3 server

Performance

x21.4

The throughput



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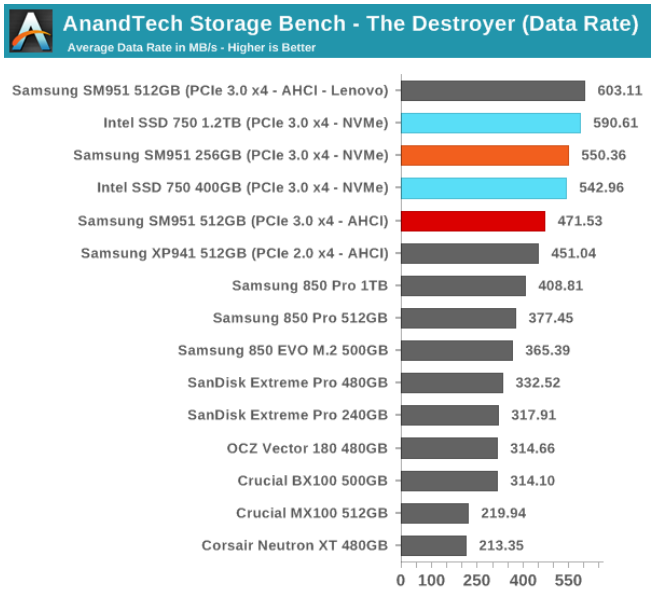
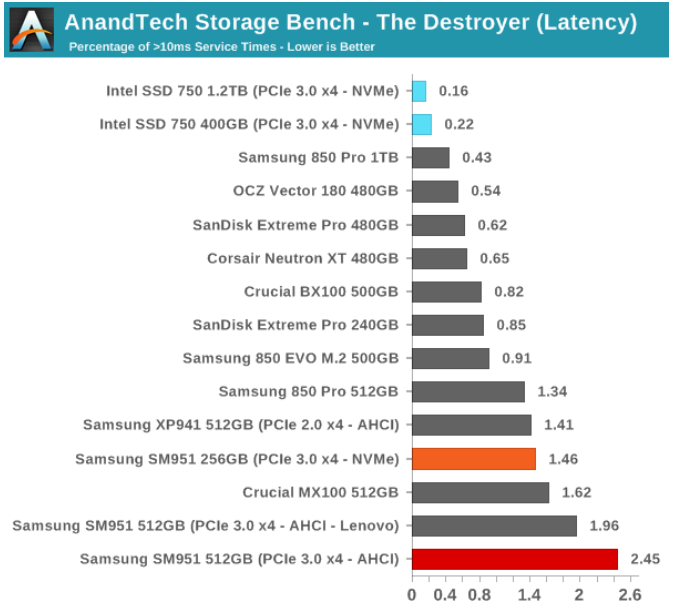
AnandTech NVMe Benchmarks

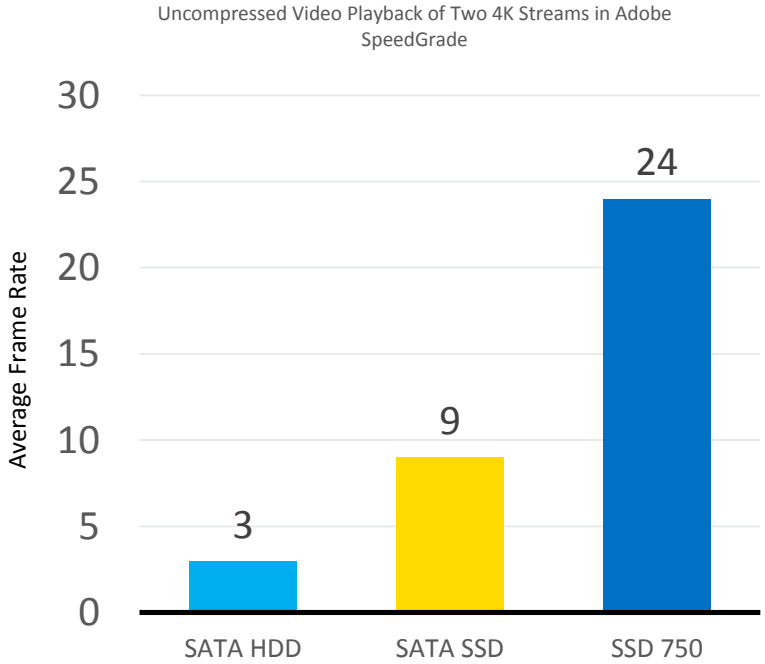
Trace of Photo Sync/Editing, Gaming, Virtualization, Productivity, Video Playback, App development





Source: http://www.anandtech.com/show/9396/samsung-sm951-nvme-256gb-pcie-ssd-review/4

Dual 4K video editing in real time made possible with NVMe™



Real time 4k editing made possible

Design & build richer content with larger data sets, textures and assets

NVMe SSD = ***~2.5x*** (frames/sec) SATA SSD

NVMe SSD = ***~8x*** (frames/sec) SATA HHD

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