



SOLUTION BRIEF

Boosting Hyper-V Performance 36X with Intel® Cache Acceleration Software

Improving Hyper-V Performance 36X with Intel® Cache Acceleration Software and One Intel® Data Center P3700 Series Solid-State Drive

Hyper-V is gaining popularity with the release of Windows* Server 2012 R2 because it dramatically improves scalability, performance, density, security, high availability, including unique popular features like Data Deduplication. Intel Cache Acceleration Software (Intel CAS) is in the unique position to boost Hyper-V performance because it only needs to be installed on the host machine to boost the performance of each of the VM machines. This study shows how much more performance the VM machines can gain by using Intel CAS and only one Intel DC P3700 SSD as the caching media.



CHALLENGE

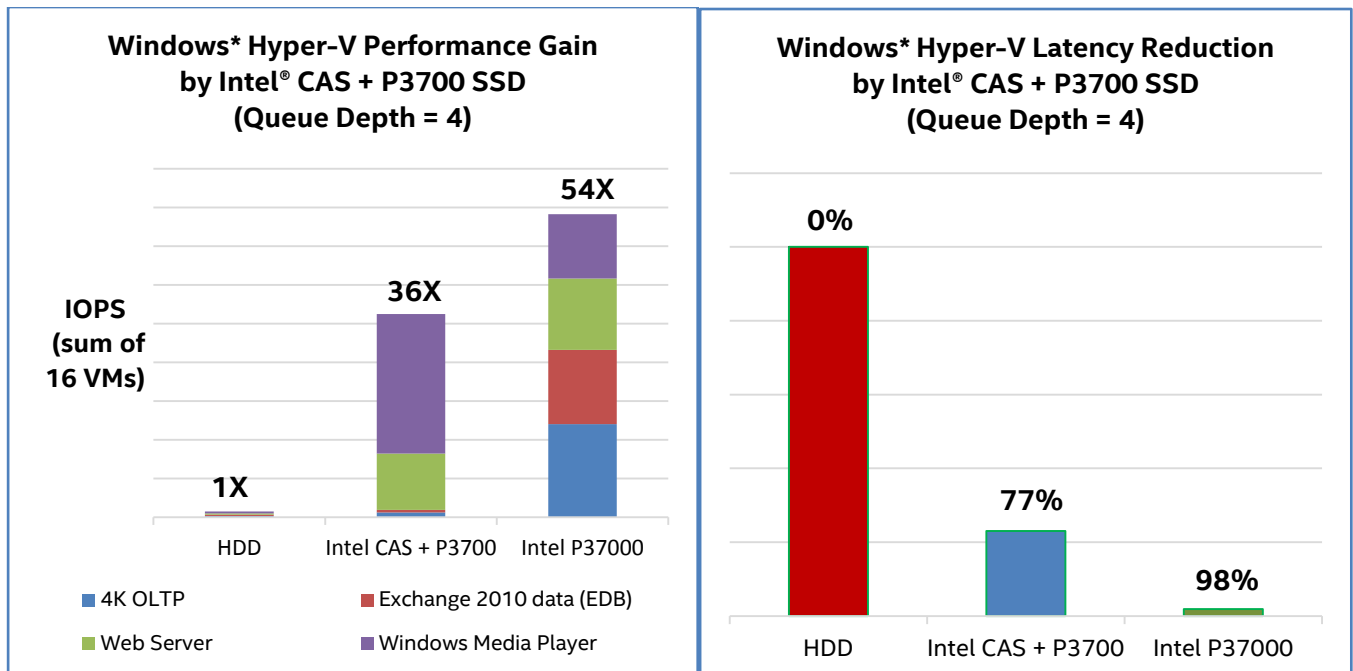
It has been recognized that performance bottleneck of virtualization technology today often is not CPU, nor memory, but storage subsystem. In order to push the performance upper limit of virtualization technology, we need to push the performance of storage subsystem.

SOLUTION

Not all data are used with the same frequency. Naturally, the majority of the data accessed is actually a small portion of the total storage footprints. Intel CAS will cache the most often used data from HDD to caching SSD. As result, the most often used data will be served out of caching SSD instead of the backend HDD. By boosting storage subsystem performance, the overall Hyper-V performance is boosted.

The solution is as easy as installing the Intel CAS software and one SSD on the Hyper-V host, without needing any change to existing applications, OS on the guests, or existing storage infrastructure.

RESULTS



RESULTS (Continued)

Simulating 4 different kinds of workloads (OLTP, Exchange Server, Web Server and Media Player) in IOMeter* and running each of the 4 workloads in 4 VMs simultaneously, the total IOPS for 16 VMs became 36X and latency reduced to 23% after installing Intel Caching Acceleration Software and only one Intel P3700 NVMe* SSD on a Hyper-V host.

Also worth mentioning is a complete Intel P3700 NVMe SSD solution, which means replacing all HDDs with SSDs as storage, to boost the performance to 54X and reduce latency to 2%. Obviously a pure SSD solution has the best performance. The hybrid caching solution is a cost-effective way to boost performance if a pure SSD solution is not an option.

CONCLUSION

Deploying an Intel® Data Center SSD with Intel Cache Acceleration Software can increase existing application and database performance immediately, without a modification or change to the existing applications or storage media back-end.

Find the Intel Solid-State Drive that is right for you. Visit www.intel.com/go/ssd for more product information.

To learn more about Intel® Cache Acceleration Software and request a trial copy, go to:

<http://www.intel.com/content/www/us/en/software/intel-cache-acceleration-software-performance.html>

SOLUTION DETAILS

Hardware Configuration and Setup

- **Hyper-V server configuration:** Intel® Xeon® CPU E5-2670 @ 2.60Hz, 128GB memory, 8x SAS 15K RAID5 as main storage, Intel P3700 NVMe SSD as caching.

VM Configuration

- 17 total. Each VM has 1 processor, 4GB RAM, 20G Storage.
- Virtual Disk format is VHDX.

Operating System

- Microsoft® Windows Server 2012 R2
- Intel CAS setup:
 - Install Intel CAS in Hyper-V hypervisor host.
 - Intel DC P3700 Series NVMe SSD used as caching SSD.
 - Pin iobw.tst to cache in the include file list.

IOMeter Setup

- Run IOMeter UI on the 17th VM to manage the test and collect results.
- Start Dynamo on the 16 VMs to simulate 16 workloads.
Each of 4 typical workloads (4K OLTP, Exchange 2010, Web Server, Windows Media Player) is distributed across 4 VMs. 16 workloads in total are running simultaneously.
 - OLTP (100% random, 67% Read/ 33% Write, 4K)
 - Web Server (100% Random, 100% Read, 4K:43%, 8K:30%, 16K:4%,32K:9%, 64K:10%, 128K:2%, 512K:2%)
 - Media Player (100% Sequential, 100% Read, 32K)
 - Exchange 2010-edb (90%: 73% read 100% random, 7%: 100% read 100% sequential, 3%: 100% write 100% sequential, 32K)

*Test scripts and IOMeter configure files are available upon request.

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The IOMeter workload executed was defined by using real world internal Intel testing results. Any change to VM workload or other factors may cause results to vary.

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