Hyperscale Use Cases for Scaling Out with Flash

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Business challenges

[Diagram showing a comparison between storage budget and performance requirements.]
Balance the IT requirements

How can you get the best of both worlds?

Boost **Service Levels** with flash-optimized tier-1 storage and lower **Cost** by leveraging shared and commodity hardware.
A change to performance density

Higher performance, lower latency, with less hardware*

36 storage arrays

OR

3 hybrid servers

Stop throwing spindles at the problem:

• Increase performance for demanding random workloads
• Reduce cost, rack space, and power consumption vs HDD
  • 93% less power consumption
  • 90% less rack space

*Comparison based on 8K OLTP workload on 4335 SSD tier
So why is Software-Defined Storage taking off?

Abundance of CPU power x86 Servers

80% of server workloads now Virtualized

Flash Disks
Server development boosts software-defined capabilities

Latest storage testing of newest Intel Xeon E5 v3 processors

4X

• Increase of VDI users and storage performance!

1.8X

• Increase with OLTP workloads and 50% reduction in latency!

Moving the same workload from previous generation Intel® Xeon® E5 v2 processor based servers to the next generation Intel® Xeon® E5 v3 processor based server platforms, as seen when utilizing the Load DynamiX workload modeling utility.

Cluster setup: 3 servers, VMware, HP StoreVirtual VSA, 2 SSDs, 4 SAS HDDs, 3.0ms latency
What is the value of Software-Defined Storage?

**Economics:** SDS is Hardware & Hypervisor agnostic. Any x86 server or storage platform - old or new - from any vendor for an open pool of shared capacity.

**Innovation:** Choose the latest components to best fit for your workload - from hypervisor to server to storage as they come to market. Scale-out seamlessly and move data easily as your needs change.

**Empowerment:** Co-locating applications and storage on the same machine empowers the system admin to control the complete infrastructure stack on which business applications run.
Converging the Infrastructure reduces cost, complexity and management
Turn servers into fully featured, highly available arrays

Create shared storage on any x86 server with VMware vSphere, Microsoft Hyper-V or KVM
Homogenous pool with iSCSI connectivity

Move data across the infrastructure – tiers, locations, virtual or physical storage

Protect data with availability zones – across racks, floors, sites
Change replication levels on-the-fly
Building the solution
Tiers vs Hybrid solutions

**Multiple tiers** – design the server with media to match the workload

- Manually move data up/down tiers as needed
- Federated data mobility moves volumes seamlessly between tiers, clusters, locations

**Hybrid solution** – 2 or more types of media with automation

- Choose PCIe, SSD, SAS, MDL SAS as tiers
- Automated movement from Tier 1 to Tier 0

Faster tier

Slower tier
Seamless and non-disruptive data mobility

Peer Motion – federated data mobility

Move volumes seamlessly between

- Storage systems
- Clusters
- Locations
- Disk types
- Form factors
- Different generations
- Physical and virtual platforms

In a matter of minutes swap out/in entire clusters for non-disruptive technology upgrade

All data remains online and available
Automated tiering for changing and unpredictable workloads

- Dynamic movement between two storage tiers
- Granular and efficient movement of data at sub-age level
- Maintain “heat map” for blocks on all tiered vols
  - Frequently accessed blocks are promoted to Tier 0
  - Less frequently accessed blocks moved to Tier 1
  - Intelligently avoids contention between application IO and internal data movement
Software Defined Storage – StoreVirtual VSA

Creating a shared storage pool

StoreVirtual VSA Cluster

Tier 0

Tier 1

DL 380

Tier

SSD
SAS
OS
Software Defined Storage – StoreVirtual VSA

Building a server cluster

Hyper-V or vSphere Cluster

StoreVirtual VSA Cluster

DL 380

Tier 0

Vol 1

Vol 2

Vol 3

Tier 1

SSD

SAS

OS

VM

VM

VM

VM

VM

VM
Software Defined Storage – StoreVirtual VSA

High Availability

Hyper-V or vSphere Cluster

StoreVirtual VSA Cluster

Vol 1
Vol 2
Vol 3

Tier 0
Tier 1

VM VM DL 380
VM VM DL 380
VM VM DL 380

SSD SAS OS
Software-Defined Storage

Adding Backup to the environment

Hyper-V or vSphere Cluster

StoreVirtual VSA Cluster

Tier 0

Tier 1

Vol 1

Vol 2

Vol 3

VM

VM

VM

VM

VM

VM

DL 380

DL 380

DL 380

SSD

SAS

OS
Hyper-converged scale-out

Hyper-converged platform with 4 server nodes

• Compact form-factor
• Powerful compute and storage
• Redundant 10GbE networking

Virtual machines and applications reside on all hyper-converged systems.

Scale-out Compute/Storage

Networking
10 GbE ToR Switches

Central Management

Adaptive Optimization Tier 0
Hyper-converged scale-out

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Adaptive Optimization Tier 0
Applying this to a hyper-converged platform

Mgmt VM:
- 4 vCPUSs, 12 GB RAM
- Install utility
- ProLiant server provisioning
- OV4VC
- CMC

Customer network

HP or customer supplied switches

10GbE SW

Factory set sub-net

vCenter console

Mgmt VM

App VM

App VM

App VM

App VM

VSA

Micro server

VSA

Micro server

VSA

Micro server

VSA

Micro server

SL2500 chassis

SSD

HDD

SW

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- 4 vCPUSs, 12 GB RAM
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- CMC
HP StoreVirtual VSA: Unlock your server’s capacity

Gain resilient shared storage with Intel-based servers and StoreVirtual VSA

Virtualized Servers

Shared storage inside your server

- Up to 80% Lower capital investment
- Up to 50% Less physical footprint
- Up to 60% Reduce energy costs
Thank you!

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