StoreServ 7000

Storage for the Next Era of IT.

Renaud Levesque, Consultant en solutions, HP Canada
The power of convergence
Transforming the infrastructure industry

**HP Servers**
Launching new server categories

**HP Storage**
New vision for the storage industry

**HP Networking**
Simplifying the network

**HP Technology Services**
Revolutionizing support service

From servers, storage, networking and services all the way to the cloud
What organizations are looking for from their storage

**Seamless delivery of IT Services**

*Primary storage* to support all applications and data types across physical, virtual, and cloud

**More value from information**

*Information retention and analytics* for archival and search within massive “big data” content repositories

**Reduction in risk exposure**

*Information protection* via disk with deduplication for efficient and high speed backup/recovery
Tectonic shifts expose systemic gaps in legacy storage

They were not designed for today’s unpredictable workloads and unconstrained growth

Established storage designs from legacy storage vendors are 17 to 22 years old

Major trends are impacting legacy storage architectures

- Evolution to delivery of ITaaS/Cloud
- Explosion of Human Information
- Converged Infrastructure
- Software Defined Storage
HP Converged Storage is designed for the future

**HP Converged Storage System Vision:**
**Polymorphic Simplicity**
*Adj. Existence in several forms, shapes, & sizes*

1. Primary storage system architecture
2. Retention & protection architecture
3. Set of data services low-to-high
4. Approach to block, object and file
5. Architecture for both HDD and SSD/Flash
HP is transforming the industry with Converged Storage

Modern storage architectures designed for the cloud, optimized for big data and built on converged infrastructure.

**Architectural Attributes**
- **Polymorphic**
- **Autonomic**
- **Efficient**
- **Multi-tenant**
- **Federated**

**Converged management orchestration**
Choreograph across servers, networks, and storage

**Scale-out and federated software**
Non-disruptive data growth and mobility

**Standard x86-based platforms**
Increase storage performance and density
HP 3PAR StoreServ Storage
The gold standard for Tier 1 Storage in Virtual/ITaaS

**Autonomic:** Self-configuration that responds effortlessly to any demands

*Improve administration efficiency by 10x*

**Efficient:** Hardware enabled thin technologies and sub-volume tiering

*Reduce capacity requirements by 50% – Guaranteed!*

**Multi-tenant:** Bulletproof Tier 1 resilience, security and scale for consolidation

*Double VM density per server – Guaranteed!*

**Federated:** Peer-to-peer, non disruptive data mobility and transparent failover

*Refresh, load balance and protect without downtime*

*Saving up to 50 percent in total cost of ownership!*

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The industry’s first flat SAN architecture
Eliminates 50% of SAN Fabric cost, complexity and bottlenecks

- **Complex, Multi-Tier infrastructure**
- **Fabric Interconnect Layer**
- **SAN Switch Layer**

**HP Virtual Connect for 3PAR with Flat SAN technology**

- **ONE TIER** Flat SAN
- **2.5X** Faster provisioning
- **86%** Fewer components
- **55%** Lower latency

**VCE vBlock 700**

**HP VirtualSystem BladeSystem and 3PAR**
Eliminating distinctions between Midrange and Tier 1

Polymorphic Simplicity: Storage Without Boundaries

- New 3PAR StoreServ 7000
- New 3PAR File Services
- New All-SSD Array
- New EVA to 3PAR Upgrade Path
- ONE Architecture – mid to high

Only HP

Tier 1 Storage at Less than $60K!

Redefining the Midrange from $40K!
Tier 1 with midrange affordability

**NEW:** HP 3PAR StoreServ 7000 with 3PAR StoreServ File Services

**Effortless:** Reduce time spent managing storage by 90%
Self-configuring, provisioning, and optimizing via autonomic management

**Efficient:** Reduce capacity requirements 50% - Guaranteed!
Hardware enabled thin technologies, advanced tiering, and thin persistence for both file and block data

**Bulletproof:** Tier 1 features. Midrange price. 2x VM density – Guaranteed!
Quad controller resiliency, multi-tenant design, SSD models with QoS, and mixed workload optimization

**Futureproof:** Grow with freedom in any direction
Scale-out hardware and federate with HP Peer Motion to for virtually limitless scale from SMB to Enterprise
# Meet HP 3PAR StoreServ 7000 Storage

<table>
<thead>
<tr>
<th></th>
<th>HP 3PAR StoreServ 7200</th>
<th>HP 3PAR StoreServ 7400</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controller Nodes</strong></td>
<td>2</td>
<td>2 / 4</td>
</tr>
<tr>
<td><strong>Max SFF drives</strong></td>
<td>144 HDD and 120 SSD</td>
<td>240/480 HDD and 240 SSD</td>
</tr>
<tr>
<td><strong>Cache</strong></td>
<td>24 GB</td>
<td>32/64 GB</td>
</tr>
<tr>
<td><strong>Max. 8GBit/s FC ports</strong></td>
<td>12 = 4 (built-in) + 8 (optional)</td>
<td>24 = 4/8 (built-in) + 8/16 (optional)</td>
</tr>
<tr>
<td><strong>Max. 10Gbit/s iSCSI/FCOE</strong></td>
<td>4 (optional)</td>
<td>4/8 (optional)</td>
</tr>
<tr>
<td><strong>Built-in IP remote copy port (can also use FC ports)</strong></td>
<td>2</td>
<td>2/4</td>
</tr>
<tr>
<td><strong>Controller Chassis</strong></td>
<td>2U with 24 SFF drive slots (2x for a 4node 7400)</td>
<td></td>
</tr>
<tr>
<td><strong>Disk Chassis (can be mixed behind one controller pair)</strong></td>
<td>SFF drive chassis: 24 slots in 2U</td>
<td>LFF drive chassis: 24 slots in 4U</td>
</tr>
</tbody>
</table>

*Post GA*
Efficient and bulletproof file services

**NEW:** HP 3PAR StoreServ File Services

**Consolidate user directories and boost capacity utilization**
- Compaction: Primary deduplication and autonomic capacity reclamation
- Policy-based Tiering: Granular block level and file-level classification

**Provide leading service levels for performance and availability**
- Performance: Native SMB 3.0 built-in plus mixed block/file workload optimization
- Security: Encryption at rest and in-flight, File-level access control, Endpoint protection onboard
- Availability: 8-way clustered services locally or over distance with Metro-Cluster transparent failover

Consolidate and save 50% on capacity

Performance for tens of thousands of users
Leading Performance and Quality of Service

**NEW:** All-SSD 3PAR StoreServ 7000

- Up to 240 SSDs
- Up to 320,000 IOPS

**Coming Soon:** Priority Optimization

- Assured performance: IOPS and bandwidth at the tenant and application level
- Available for any 3PAR StoreServ model

*Priority Optimization is available in 1H13*
HP 3PAR 7000 Software Suites

Operating System Suite
3PAR Thin Technologies

Replication Suite
Virtual Copy
Remote Copy
Peer Persistence

Data Optimization Suite
Dynamic Optimization
Adaptive Optimization
Peer Motion

Reporting Suite
System Reporter
3PARInfo

Security Suite
Virtual Domains
Virtual Lock

Application Suites
VMware vSphere
Microsoft® SQL
Exchange
Oracle

For more information: http://h18006.www1.hp.com/storage/solutions/3par/software.html

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### HP 3PAR 7000 Software Suites Contents

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<tr>
<th>3PAR 7000 Operating System Suite</th>
<th>Replication Suite</th>
<th>Data Optimization Suite</th>
<th>Security Suite</th>
<th>Reporting Suite</th>
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</thead>
<tbody>
<tr>
<td>• Virtual SP</td>
<td>• Virtual Copy (VC)</td>
<td>• Dynamic Optimization</td>
<td>• Virtual Domains</td>
<td>• System Reporter</td>
</tr>
<tr>
<td>• Online Import license (180 days)</td>
<td>• Remote Copy (RC)</td>
<td>• Adaptive Optimization</td>
<td>• Virtual Lock</td>
<td>• 3PARInfo</td>
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<tr>
<td>• SmartStart</td>
<td>• Peer Persistence</td>
<td>• Peer Motion</td>
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<td>• System Tuner</td>
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<td>• Host Explorer</td>
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<td>• Multi Path IO SW</td>
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<td>• VSS Provider</td>
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<td>• Rapid Provisioning</td>
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<tr>
<td>• Autonomic Groups</td>
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<tr>
<td>• Autonomic Replication Groups</td>
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<td>• Scheduler</td>
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<td>• LDAP Support</td>
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<td>• Access Guard</td>
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<td>• Autonomic Rebalance</td>
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<td>• Host Personas</td>
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<td>• Persistent Cache</td>
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<td>• Persistent Ports</td>
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<td>• SMI-S</td>
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<td>• 3PAR OS Administration Tools (CLI client, SNMP)</td>
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<td>• Web Services API</td>
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<td>• Management Console</td>
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<td>• Thin Provisioning</td>
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<td>• Thin Copy Reclamation</td>
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</table>

### Application Suite for VMware
- • Recovery Manager for vSphere
- • VASA
- • vCenter plug-in
- • vSphere Host Explorer

### Application Suite for Oracle
- • Recovery Manager for Oracle

### Application Suite for MS SQL
- • Recovery Manager for MS SQL
- • VSS provider

### Application Suite for MS Exchange
- • Recovery Manager for MS Exchange
- • VSS Provider
Raising the bar again

NEW: HP 3PAR Software for Tier 1 data services

Greater protection of application service levels
- **Persistent Ports** for online upgrades without multipathing dependency
- **Peer Persistence** for transparent server failover over metro distances

Guarantee performance levels for tenants and applications
- **Priority Optimization** for Quality of Service assurance by IOPS and Bandwidth

Reclaim even more time for storage administrators
- **Autonomic Replication Groups** for configuration-less disaster protection
Persistent Ports
Upgrade HP 3PAR OS without disturbing your business

Challenge
• Online SW Upgrade without multipath SW dependency

Solution
• HP 3PAR Host Ports have a partner port
• If Primary port goes offline, backup port takes over
  • Switch occurs in sub-seconds
  • Applicable for SAN-connect configurations
• Supports FC, FCoE and iSCSI ports

Benefits
• Online Software Upgrades while host path remains online
• Non-disruptive HBA Firmware upgrade
• Non-disruptive node maintenance
Future proof with HP 3PAR Federation

HP Peer Motion – from SMB to Enterprise

1. **Federated workload balancing** to map workloads to the right resources

2. **Federated thin provisioning** for data-center-wide efficient pooling of capacity

3. **Federated tech refresh** to keep running during upgrades

4. **Federated High-Availability** with HP 3PAR Peer Persistence for VMware

5. **Online import** to move EVA data into the HP 3PAR Federation
Peer Persistence for VMware

Data high availability across sites

Challenge
• Business continuity for virtualized data centers

Benefits
• Move applications and storage to secondary data center for maintenance and/or load balancing without any disruption to your applications

Future Enhancements
• Maintain service during server and storage failures
• Align with VMware’s Metro Storage Cluster initiative
## Tier 1 with midrange affordability

<table>
<thead>
<tr>
<th>Feature</th>
<th>EMC VMAX</th>
<th>HP 3PAR StoreServ 7400</th>
<th>EMC VNX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance during controller/cache failure</td>
<td></td>
<td></td>
<td>Integrity issues</td>
</tr>
<tr>
<td>Online HW &amp; SW upgrades w/out dependencies</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>3-site replication</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Performance for mixed workloads</td>
<td></td>
<td>Manual separation</td>
<td>✔</td>
</tr>
<tr>
<td>Multi-tenant security</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Federated from midrange to high-end</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Block and file support</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>List price &lt; $40K USD</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
HP 3PAR Online Import for EVA

Reduce cost and time to migrate your EVA data

**Agile**
Migrate your EVA data over to HP 3PAR StoreServ using the new Online Import feature
HP Services to help with datacenter transition

**Simple**
Start from what you know - All driven from your known Command View EVA interface

**Low Cost**
No need for additional hardware;
Online Import license included (6 months)
The midrange storage standard for virtualization

**Double VM density – guaranteed***
- System Wide Striping, Mixed Workload Support, and Quad Controllers
- Silicon-level Integration with VMware VAAI APIs for HW-Assisted Locking

**50% less capacity – guaranteed***
- Silicon-level Integration with VMware VAAI APIs for Thinning, Reclaim
- Adaptive Optimization and Fast RAID Technologies

**Effortless provisioning**
- Autonomic Groups and VMware Management Integration
- Remote Copy Integration with VMware Site Recovery Manager
- Peer Persistence Integration with VMware MetroCluster

Best in Class vSphere integration
HP 3PAR StoreServ Storage

**Optimize availability and VM densities**
- Wide striping
- Mixed workload support
- VMware VAAI support
- Adaptive Queue Depth
- Peer Motion
- Peer Persistence
- SRM support
- Application consistent snapshots

**Simplify provisioning and management**
- Autonomic Groups
- vCenter Management plug-in
- vCenter Recovery Manager plug-in
- VMware VASA support
- Insight Control Storage Module support
- VM fast clone

**Save on storage costs**
- Double VM density
- Thin provisioning
- Thin conversion
- Thin persistence
- Zero detection
- Adaptive optimization
- Get Virtual Guarantee
- Get Thin Guarantee
HP 3PAR StoreServ Get Virtual Guarantee

Increase consolidation savings by Doubling your VM Density with HP 3PAR Storage and VMware*

Qualified customers are guaranteed
- A minimum increase of 2x VM density in their existing VMware environment,
- When they migrate from their legacy storage array to HP 3PAR Storage
- If not, HP will make up the difference with additional capacity, and the related software and support.

* Program has even more value with VMware’s vRAM licensing removal from vSphere
Thin Provisioning in VMware environments

Traditional (Fat) Provisioning - dedicate on allocation

3PAR Thin Provisioning - dedicate on write

Purchased Physical Capacity
Thin Provisioning: VMware? 3PAR? Both?
If you want to reduce storage costs and maximize utilization, then do it right with array-based thin provisioning!

<table>
<thead>
<tr>
<th>PROS</th>
<th>3PAR TP Only</th>
<th>VMware TP Only</th>
<th>3PAR &amp; VMware TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• TP applies to all volumes at the array-level</td>
<td>• TP applies to VMDKs only at the VMFS level</td>
<td>• TP applies to all volumes and to the VMDKs</td>
<td></td>
</tr>
<tr>
<td>• Over-allocate volumes to maximize storage usage</td>
<td>• Over-allocate VMDKs to maximize VMFS usage</td>
<td>• Over-allocate at storage layer and at the VMFS layer</td>
<td></td>
</tr>
<tr>
<td>• One point of management by storage admin</td>
<td>• One point of management by the VMware admin</td>
<td>• High performance</td>
<td></td>
</tr>
<tr>
<td>• High Performance</td>
<td></td>
<td>• Provision large VMFS volumes with minimal upfront costs</td>
<td></td>
</tr>
<tr>
<td>• Provision large VMFS volumes with minimal upfront costs</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONS</th>
<th>3PAR TP Only</th>
<th>VMware TP Only</th>
<th>3PAR &amp; VMware TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Can’t think of anything!</td>
<td>• Requires large volume to be purchased &amp; allocated upfront</td>
<td>• Higher admin costs – must manage TP at two layers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Must estimate capacity needs</td>
<td>• No additional physical storage savings by adding VMware TP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Consumes host cycles</td>
<td>• Writing zeros makes datastore fat!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Performance hit on first writes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HP 3PAR Dynamic Optimization: Re-provisioning with no Complexity or Disruption

In a single command non-disruptively optimize and adapt
- Cost
- Performance
- Efficiency
- Resiliency

Cost per Useable TB

Performance

Fast Class (FC, SAS)

Nearline (SATA)

SSD

RAID 1

RAID 5

RAID 6

RAID 1

RAID 5

RAID 6

RAID 6
HP 3PAR Dynamic and Adaptive Optimization

Manual or Automatic Tiering

3PAR Dynamic Optimization

3PAR Adaptive Optimization

Tier 0

CPG 1

Tier 1

LUN Movement between Tiers

Sub-LUN Block Movements between Tiers based on Policies

Tier 2

CPG 3

- Region
HP 3PAR Integration With VMware Adaptive Queue Depth Algorithm

QoS feature in VMware vSphere 4 and ESX 3.5 U4
• Fixes non-responsiveness of ESX to a QUEUE FULL SCSI status
• Dynamically adjusts the number of queued I/O on a LUN
• Helps recover gracefully from I/O congestion at the port level

Allows customers to consolidate more VMs per ESX server since I/O traffic levels are regulated dynamically

By default, this algorithm is disabled. To enable it see: http://kb.vmware.com/selfservice/documentLink.do?externalId=1008113
Enhanced Multipathing: Pluggable Storage Architecture

- **SATP: Storage Array Type Plugin** detects paths, target type, reports changes to NMP
- **PSP: Path Selection Plugin** handles load balancing algorithms (MRU, Fixed, RR)
- **NMP: VMware Native Multipathing**
- **MPP: Multipathing Plugin** replaces VMware NMP with a 3rd party solution

*Change pathing from Fixed to Round Robin (we are active/active). No extra plug-in needed!*
HP 3PAR Management Plug-in For VMware vCenter

Provision storage via vCenter

Replicate storage

View Datastore to LUN mapping

Host Explorer functionality
Reports vSphere I/O stack

VASA support
HP 3PAR Recovery Manager for VMware (RMV)

– Solution composed of:
  • 3PAR Virtual Copy
  • 3PAR Virtual Lock (optional)

– Benefits:
  • Protects VMs / Datastores
  • Rapid recovery of full VMs
  • Rapid recovery of individual files and directories within a VM
  • 100s of recovery points
HP 3PAR Virtual Copy – Snapshot at its best

Manageability
- Safely prioritize and promote snaps
- Safely delete-able snapshots
- Scheduled creation/deletion
- Consistency groups

Efficiency
- Reservation-less snapshots
- Non-duplicative snapshots
- Thin Provisioning aware
- Variable QoS

Scalability
- 100s of snapshots
- Instant readable or writeable snapshots
- Virtual Lock for retention of read-only snaps
- Snapshots of snapshots

Integrations with Oracle, SQL, Exchange, VMware, Data Protector, Symantec, Commvault
**vSphere Storage API - Array Integration (VAAI)**

Enables integration with array-specific capabilities & intelligence

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Assisted Locking</td>
<td>• Lock LUN at the block level instead of whole LUN&lt;br&gt;• <strong>Improves performance</strong> and VM density</td>
</tr>
<tr>
<td>Full Copy</td>
<td>• Offload large data movements to the storage array&lt;br&gt;• <strong>Reduces time</strong> for cloning and Storage vMotions&lt;br&gt;• <strong>Reduces resource overhead</strong> on server host</td>
</tr>
<tr>
<td>Block Zero</td>
<td>• Offload large, repetitive block-level write operations of zeros&lt;br&gt;• Significant <strong>performance improvements</strong> for VM disk creation</td>
</tr>
<tr>
<td>Thin Provisioning</td>
<td>• <strong>Reclaim space</strong> when deleting/moving VMs&lt;br&gt;• <strong>Improves efficiency</strong> of thin provisioning, avoid out-of-space conditions</td>
</tr>
</tbody>
</table>
Hardware Assisted Locking: Atomic Test & Set (ATS)

- SCSI Reservations used for VMFS metadata updates
- Entire LUN Locked during VMFS metadata update impacting all IO for every VM on that LUN
- Lock/release mechanism delay time (and bugs) can leave host in a hung state

Operations that require locks: change VM power state, vMotion/Storage vMotion, growing thin disk or snapshot, creating/deploying VM, creating/deleting any file

- Locking occurs at a block level allowing concurrent LUN access from other VMs
- Enables bigger LUNs and more VMs per LUN (higher VM density)
- 3PAR enables 10x faster data comparisons for ATS using the 3PAR Gen4 ASIC vs. array CPU
**Full Copy Offload: XCOPY**

- Host involved in data movement when cloning VMs or using Storage vMotion
- Host consumes precious memory and CPU cycles performing “non-host” related tasks
- Significant network overhead incurred during data movement via the host

- Offloads data movement from the host to the array
- Improved performance when cloning VMs or using Storage vMotion
- Further increases VM density as host memory and CPU are not taxed with data movement
Block Zero Offload: WRITESAME

- Host sends large blocks of zeros to disk when initializing VMs

- Thin & Thick VMDKs: Blocks initialized at run time

- EZT VMDKs: Entire VMDK initialized at create time

- Host offloads writing large blocks of zeros to the array when initializing VMs

- Faster provisioning of VMs with no host CPU cycles consumed writing zeros

- Side benefit of zero detect in 3PAR ASIC means no space consumed
UNMAP in VAAI is back vSphere 5 Update 1 & 5.1

- VM deletion or Storage vMotion does not release space on datastore

UNMAP now done manually using CLI in vSphere 5: vmkfstools –y <percent of free space>

- Process creates a balloon file of size specified by the percentage and then deletes it
- UNMAP commands are then sent which un-allocate the deleted space
- Resource intensive process, can be very time-consuming, do this off-hours
- More efficient w/3PAR by creating dummy VM w/EZT disk & letting zero-detect handle it
**HP 3PAR Thin Persistence and VMware EZT**

- VMware recommends EagerZeroedThick (EZT) VMDK for highest performance
- VMware requires EZT for Fault Tolerance & MSCS Clusters
- 3PAR Thin Technologies optimize EZT formats

<table>
<thead>
<tr>
<th>EZT VM on other arrays</th>
<th>EZT VM on 3PAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data</strong></td>
<td><strong>Data</strong></td>
</tr>
<tr>
<td>000000000000</td>
<td>000000000000</td>
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</tbody>
</table>

**50GB** VMDK (10GB data; 40GB zeroed) consumes **50GB**

**50GB** VMDK (10GB data; 40GB zeroed) consumes **10GB**

3PAR Zero Detect + Thin Persistence Eliminates writing EZT 0's to disk
vSphere Storage API - Array Integration (VAAI)

Enables integration with array-specific capabilities & intelligence

**VAAI Benefits:**
- Bigger LUNs without worrying about SCSI reservations
- Consolidate more VMs on host
- Increased performance, efficiency and scalability

**3PAR VAAI Differentiators:**
- 3PAR ASIC used for data comparison – 10x faster than array CPUs
- VMware’s Adaptive Queue Depth support
HP 3PAR and VMware Site Recovery Manager (DR)

- SRM Simplifies and automates disaster recovery
- Turns manual recovery runbooks into automated recovery plans
- SRM relies on array replication
- SRM Replication Adapter (SRA) developed by 3PAR and distributed by VMware at no charge
- 3PAR SRA allows SRM to manage 3PAR Remote Copy groups and enables failover and failback
- SRM managed via vCenter
HP 3PAR Remote Copy – Replication at its best

**Manageability**
- Initial setup in minutes
- Simple, intuitive commands

**Efficiency**
- Native IP-based, or FC
- No extra copies or infrastructure needed
- Built-in zero detection
- Thin-provisioning and reclaim aware

**Scalability**
- Mirror between any InServ size or model
- Many to one, one to many
- Asynchronous Periodic, Synchronous, or Synchronous Long Distance
- Mirror selected snapshots

Integration with VMware, Oracle, Exchange, SQL, CLX
HP 3PAR Peer Persistence: “Transparent” Failover (HA)

NEW in 3.1.2!

ESX running in ALUA mode

- Active Path
- Standby Path

LUN A

Fabric

Array A

Vol A (Primary)

Site 1

2.6ms RTT Sync

latency RC

Site 2

Array B

Vol A (Secondary)

LUN A

Fabric

ESX cluster
vSphere vs. 3PAR Comparable Storage Features

### Storage features that are supported on both platforms

<table>
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<th>3PAR feature</th>
<th>vSphere feature</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive Optimization</td>
<td>Storage DRS</td>
<td>If using AO, Storage DRS should only be used for initial placement and not for load balancing</td>
</tr>
<tr>
<td>Thin Provisioning</td>
<td>Thin Provisioning</td>
<td>OK to use together but not much benefit and more difficult to manage, array thin provisioning is recommended</td>
</tr>
<tr>
<td>Adaptive Queue Depth</td>
<td>Storage I/O Control</td>
<td>If using SIOC, do not enable Adaptive Queue Depth, also Adaptive Queue depth is not compatible with Storage DRS</td>
</tr>
<tr>
<td>Peer Motion</td>
<td>Storage vMotion</td>
<td>Use Storage vMotion to move individual VMs, use Peer Motion to move entire VMFS volumes</td>
</tr>
<tr>
<td>Remote Copy</td>
<td>vSphere Replication</td>
<td>Both work with SRM, Remote Copy w/SRA is more scalable and more efficient</td>
</tr>
<tr>
<td>Virtual Copy</td>
<td>VM Snapshot</td>
<td>Virtual copy snapshots are smaller, more efficient and require no host resources</td>
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Abstract

This implementation guide provides information for enhancing compatibility between an HP 3PAR StoreServ Storage and
VMware ESX environment. The guide describes why you should consider using HP 3PAR Thin Provisioning and
HP 3PAR Adaptive Optimization in an HP 3PAR StoreServ Storage environment, as well as how to deploy
HP 3PAR thin provisioning to VMware ESX. It also highlights the advantages of using HP 3PAR Thin
Provisioning: The Complete Experience.
HP 3PAR StoreServe Storage
The only storage architecture you’ll ever need

• Simple, efficient, and agile storage designed for unpredictable mixed workloads and virtualization

• Optimized to make full use of new flash/SSD capabilities

• Only storage with a single architecture, software and management from midrange to high-end

• StoreServ 7000 = Tier 1 Capabilities at a Mid-Range Price

www.hp.com/go/3PARStoreServ
Thank you