HP Storage Product Portfolio

Daniel Stamm,

März 2013

Positionierung StoreVirtual und StoreServ

HP StoreVirtual 4730
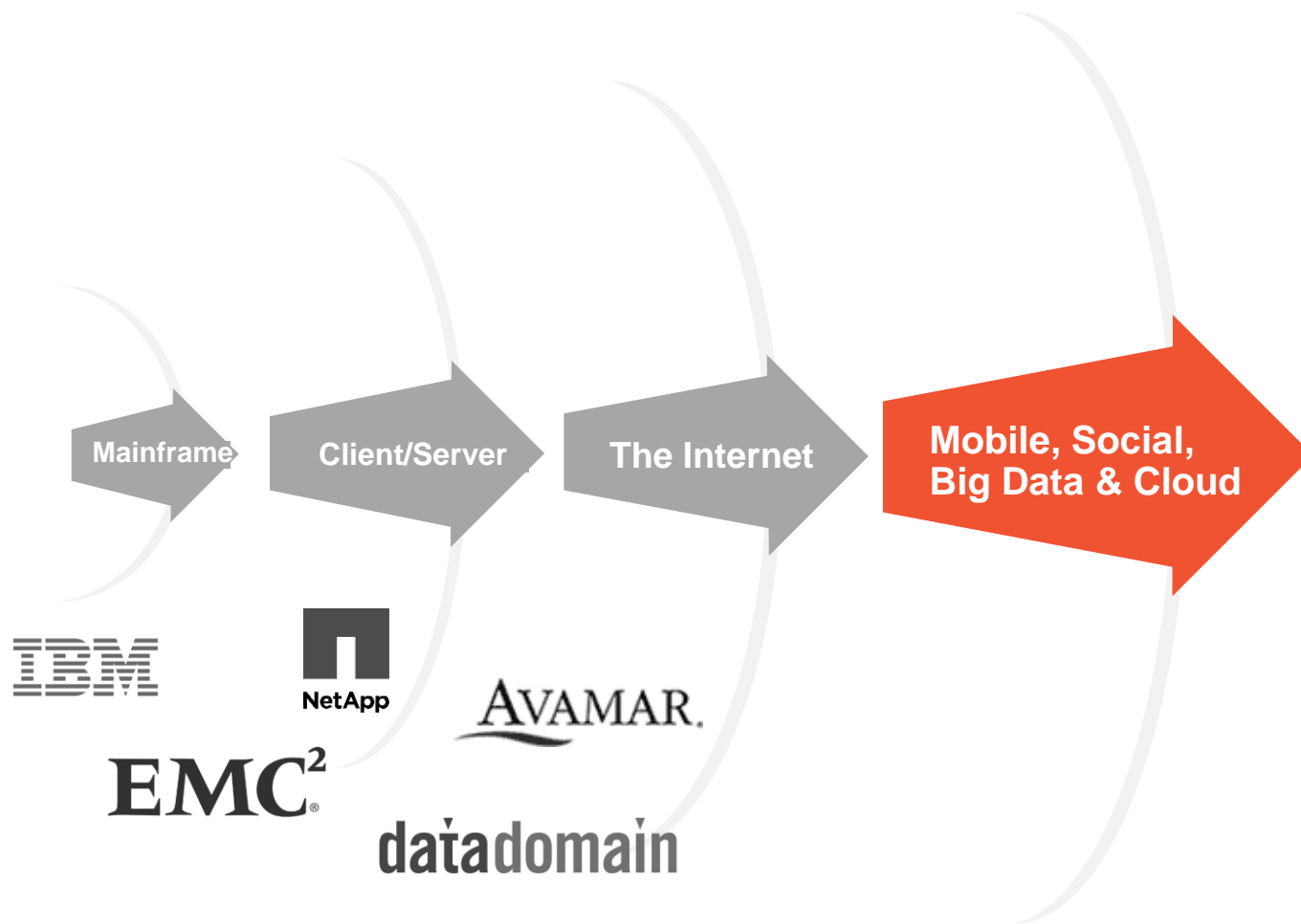

HP 3PAR StoreServ 7200

Legacy storage

Mainframe → Client/Server → The Internet → **Mobile, Social, Big Data & Cloud**

IBM
NetApp
EMC²
AVAMAR.
datadomain

Established storage designs from legacy storage vendors are 15 to 25 years old

Impossible to adjust to new trends

- Evolution to delivery of ITaaS/Cloud

- Explosion of Human Information

- Converged Infrastructure

- Software Defined Datacenters

achermann
ict-services
hp

Transforming the industry with HP Converged Storage

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

Mobile, Social, Big Data & Cloud

Converged management orchestration

Choreograph across servers, networks, and storage

Scale-out and federated software

Non-disruptive data growth and mobility

X86

Standard x86-based platforms

Increase storage performance and density

Transforming storage with the power of Convergence

achermann
ict-services

hp

HP Storage Array Positioning

	Storage Consolidation P2000 MSA	Virtual IT StoreVirtual 4000	Application Consolidation P6000 EVA	Utility Storage 3PAR StoreServ	Mission Critical Consolidation P9500
Architecture	**Dual Controller**	**Scale-out Cluster**	**Dual Controller**	**Mesh-Active Cluster**	**Fully Redundant**
Connectivity	FC, SAS, iSCSI	iSCSI, FC	FC, iSCSI, FCoE	FC, iSCSI, (FCoE planned)	FC, FCoE
Performance	30K random read IOPs ; 1.5GB/s sequential reads	35K random read IOPs 2.6 GB/s sequential reads	55K random read IOPS 1.7 GB/s sequential reads	> 390K random read IOPs; > 14 GB/s sequential reads	>1000K random read IOPS > 10GB/s sequential reads
Application Sweet spot	SMB , Enterprise ROBO, consolidation/ virtualization Server attach, Video surveillance	SMB, ROBO and Enterprise – Virtualized inc VDI , Microsoft apps, ITaaS BladeSystem SAN (P4800)	Enterprise - Microsoft, Virtualized, OLTP	Enterprise and Service Provider , ITaaS, Utilities, Cloud, Virtualized Environments, OLTP, Mixed Workloads	Large Enterprise - Mission Critical w/Extreme availability, Virtualized Environments, Multi-Site DR
Capacity	600GB – 192TB; 6TB average	7TB – 768TB; 72TB average	2TB – 480TB; 36TB average	5TB – 1600TB; 120TB average	10TB – 2000 TB; 150TB average
Key features	Price / performance Controller Choice Replication Server Attach	All-inclusive SW Multi-Site DR included Virtualization VM Integration Virtual SAN Appliance	Ease of use and Simplicity Integration/Compatibility Multi-Site Failover	Multi-tenancy Efficient Thin Technologies Performance Autonomic Tiering and Management	Constant Data Availability Heterogeneous Virtualization Multi-site Disaster Recovery Application QOS (APEX) Smart Tiers
OS support	Windows, vSphere, HP-UX, Linux, OVMS, Mac OS X, Solaris, Hyper-V	vSphere. Windows, Linux, HP-UX, MacOS X, AIX, Solaris, XenServer	Windows, VMware, HP-UX, Linux, OVMS, Mac OS X, Solaris, AIX	vSphere, Windows, Linux, HP-UX, AIX, Solaris, OVMS	All major OS's including Mainframe and Nonstop

Ready to help wherever you are in the journey

OPTIMIZE
Traditional IT

BUILD
What's Next

ACCELERATE
Time to Results

MSA | EVA | XP | Tape

3PAR StoreServ | StoreVirtual
StoreOnce | StoreAll

**ESTABLISHED
PLATFORMS**

**CONVERGED
STORAGE**

**CONVERGED SYSTEMS
& SERVICES**

achermann
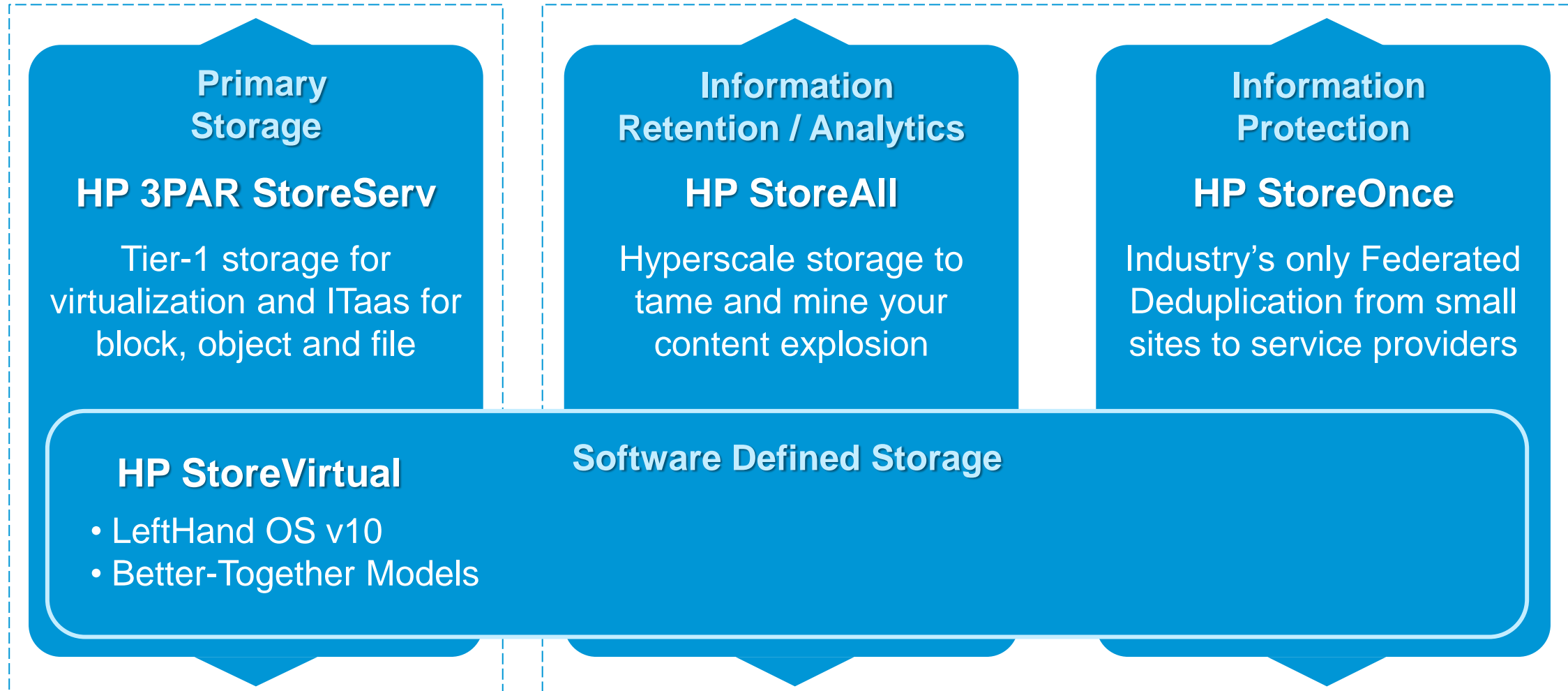ict-services

We've already started delivering on the future

Simplified portfolio and a milestone in the HP Storage transition

Primary Storage

HP 3PAR StoreServ

Tier-1 storage for virtualization and ITaas for block, object and file

Information Retention / Analytics

HP StoreAll

Hyperscale storage to tame and mine your content explosion

Information Protection

HP StoreOnce

Industry's only Federated Deduplication from small sites to service providers

HP StoreVirtual

Software Defined Storage

- LeftHand OS v10
- Better-Together Models

achermann
ict-services

HP StoreVirtual Storage
Versatile software defined storage – any way you want it.

HP StoreVirtual 4000 Storage

Scale-out storage with high availability and simplicity for SMB to Midrange environments

Simple	Scalable	Highly Available
Virtualization integration and intuitive management	Scale-out architecture with all-inclusive feature set	Built-in high availability and disaster recovery

The most versatile storage platform - Scale from VSA* to rack or blades as the business grows or use a combination of platforms – same features, same management

And all software inclusive!

*VSA stands for Virtual Storage Appliance

HA for multi-site virtualized environments

VMs remain online should the following go offline:

Rack

Room

Floor

Building

Higher availability for virtual environments

NR10 volumes accessible at both sites

VMware and Hyper-V volumes remain online during site failure

Volumes automatically re-synch after failed site comes back online

Site/Rack 1

Site/Rack2

Single Cluster

= or >
1 Gb

Single Cluster

NR 10

Data Remains Online!

Single cluster stretched between two racks, rooms or buildings
NR 10 = Network RAID 10, this is like a synchronous mirrored LUN

achermann
ict-services
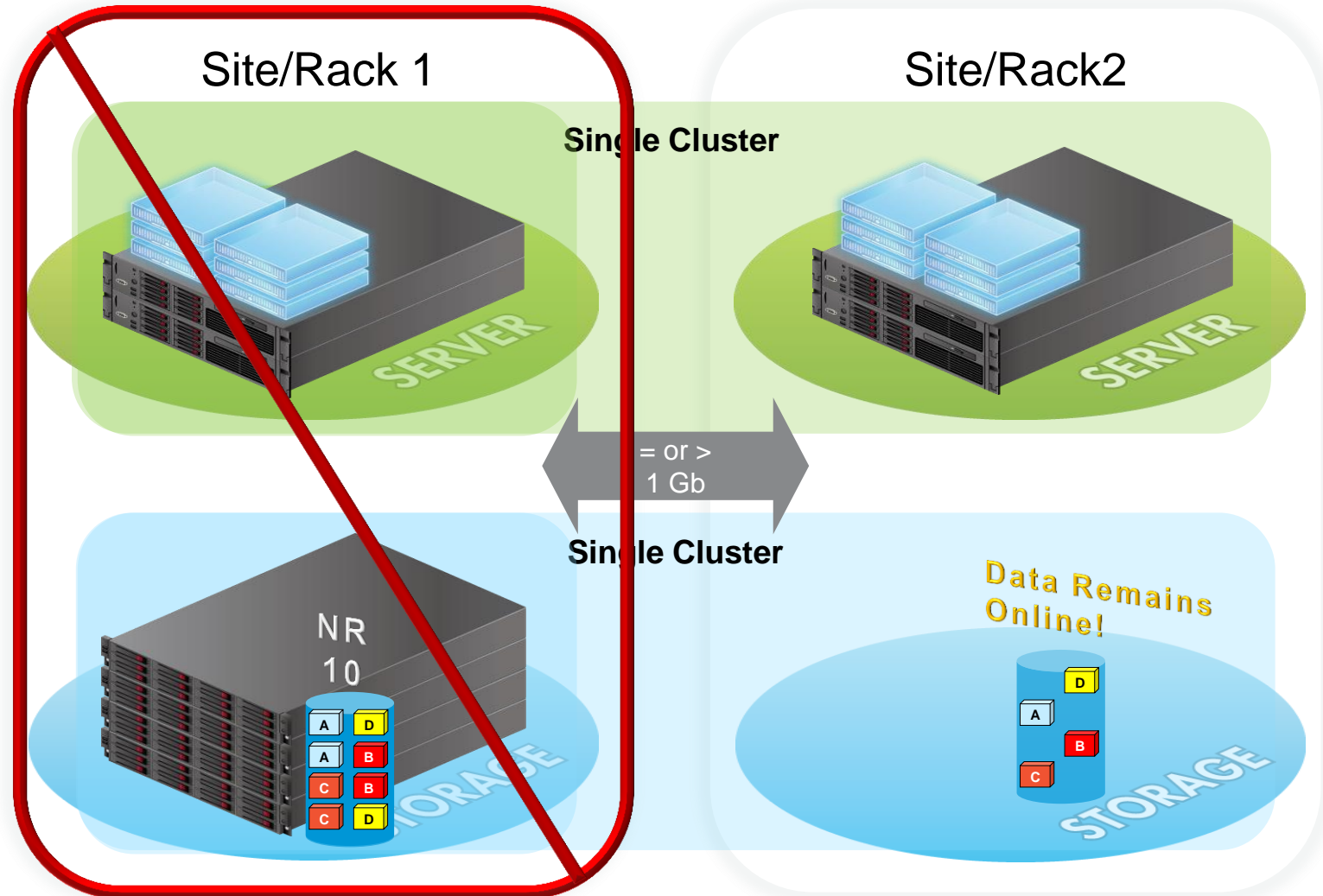
Highly available storage (smaller size or DR)

HP P4000 Virtual SAN Appliance

- P4000 Virtual Machine for ESX/ESXi and Hyper-V

- Fully featured

- Create highly available SANs on servers

  Support servers listed on hypervisor's HCL

  Convert existing SAN or DAS into P4000 storage

Affordable HA and DR for small and/or remote site
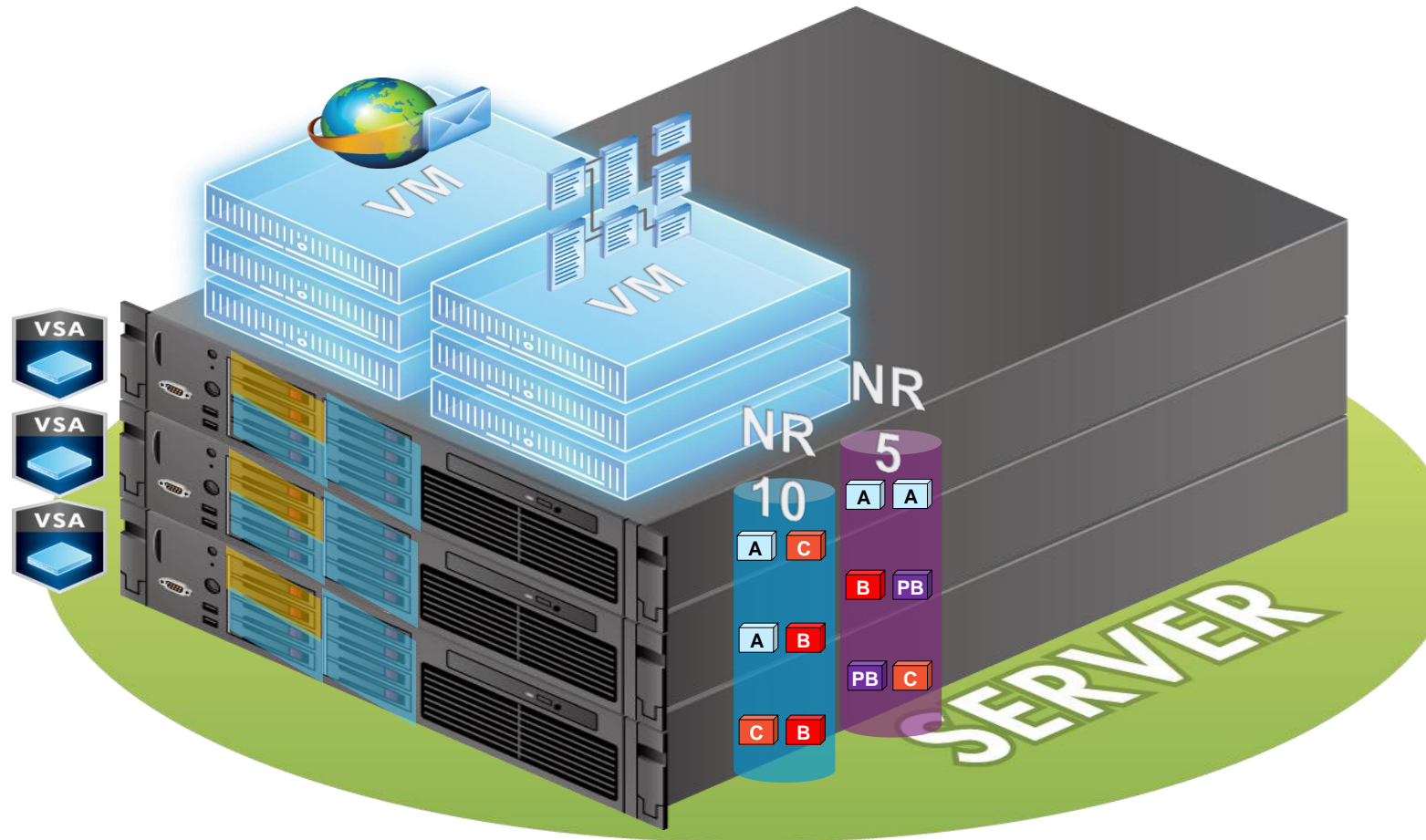
HP StoreVirtual features and integration

All-inclusive feature set

- Network RAID – synchronous replication
- Peer Motion data mobility
- Linear capacity and performance scaling
- Pay-as-you-grow, scale capacity and performance as needed, non-disruptively
- Space-efficient thin provisioning
- Integrated disaster recovery
  - Snapshots
  - Remote Copy
  - Multi-site array

Application integration

- vSphere Storage API integration (VAAI, VASA)
- VMware vCenter Server storage management
- Replication adapter for VMware vCenter Site Recovery Manager
- HP Insight Control for Microsoft System Center
- HP Management pack for SCOM
- VSS provider & requestor functions
- LeftHand DSM for MPIO
- Application Aware Snapshot Manager
- Recovery Manager for Windows
- Windows Active Directory

Seamless and non-disruptive data mobility

StoreVirtual Peer Motion

In 6 Clicks – Seamlessly move volumes between:

- Systems
- Tiers
- Locations
- Disk types
- Form factors
- Different generations
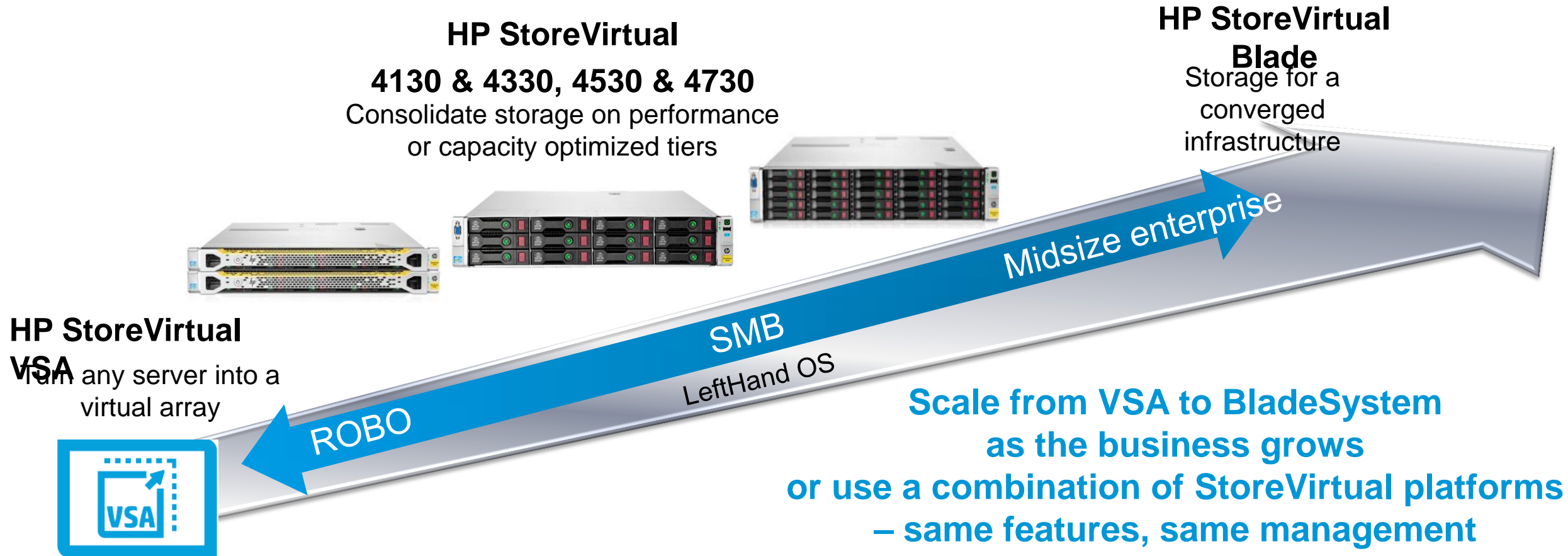- Physical and virtual platforms

In a matter of minutes - Swap out/in entire clusters – upgrade technology non-disruptively

All data remains online and available

HP StoreVirtual – the versatile platform (iSCSI and FC)

Whatever the environment – there's a StoreVirtual platform that fits

HP StoreVirtual

4130 & 4330, 4530 & 4730
Consolidate storage on performance or capacity optimized tiers

HP StoreVirtual Blade
Storage for a converged infrastructure

Midsize enterprise

SMB

LeftHand OS

HP StoreVirtual VSA
Turn any server into a virtual array

ROBO

VSA

Scale from VSA to BladeSystem as the business grows or use a combination of StoreVirtual platforms – same features, same management

achermann
ict-services

HP 3PAR StoreServ

The gold standard for tier 1 storage in Virtual/ITaaS

Autonomic: **Reduce time spent managing storage by 90%**
- System responds effortlessly and instantly to new workload demands

Efficient: **Reduce capacity requirements by up to 50% - Guaranteed ***
- Hardware enabled thin technologies and tiering for high efficiency without tradeoffs

Multi-tenant: **Double VM density per server – Guaranteed ***
- Bulletproof tier-1 resilience for massive consolidation of unpredictable mixed workloads

Federated: **Non-disruptive data mobility between systems**
- HP Peer Motion for easy refresh and data services management across multiple arrays

Everything you'd want in a next generation EVA

A pain free and risk free evolution that takes the best of EVA into the future of storage

EVA DNA

- Smart Start

- Online Import from EVA to 3PAR directly from EVA Command View
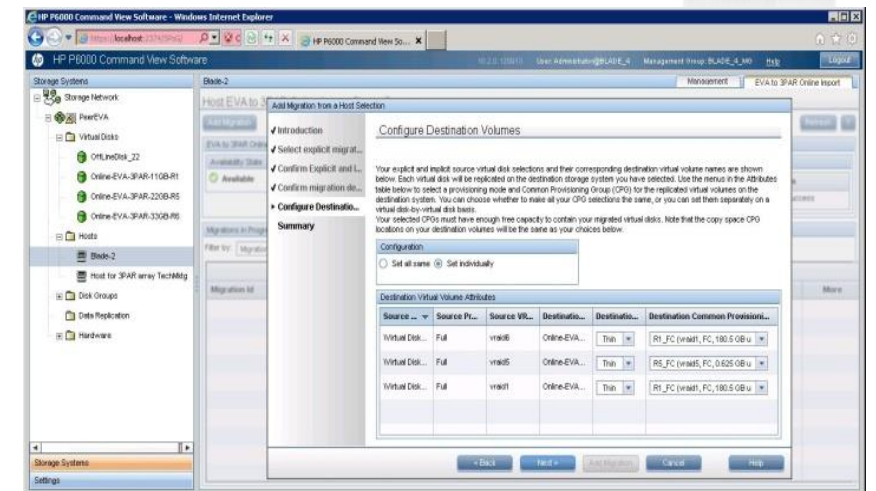
Combine the power of two leading technologies

HP 3PAR

- Leading in Cloud Service Providers
- Clustered controller architecture
- Industry leading efficiency technologies
- Multi-tenancy for mixed workloads
- Advanced application integrations

Common

- Virtualization & wide striping
- Capacity efficient snapshots
- Management simplicity
- Leading TCO

HP EVA

- Trusted - 100,000 Arrays installed WW
- Simplest midrange system on the planet
- Leading hardware efficiency

HP 3PAR V-Class
StoreServ10000

HP 3PAR F-Class

HP EVA/P6000

Storage Federation/ EVA to 3PAR Online Import

StoreServ 7000

achermann
ict-services
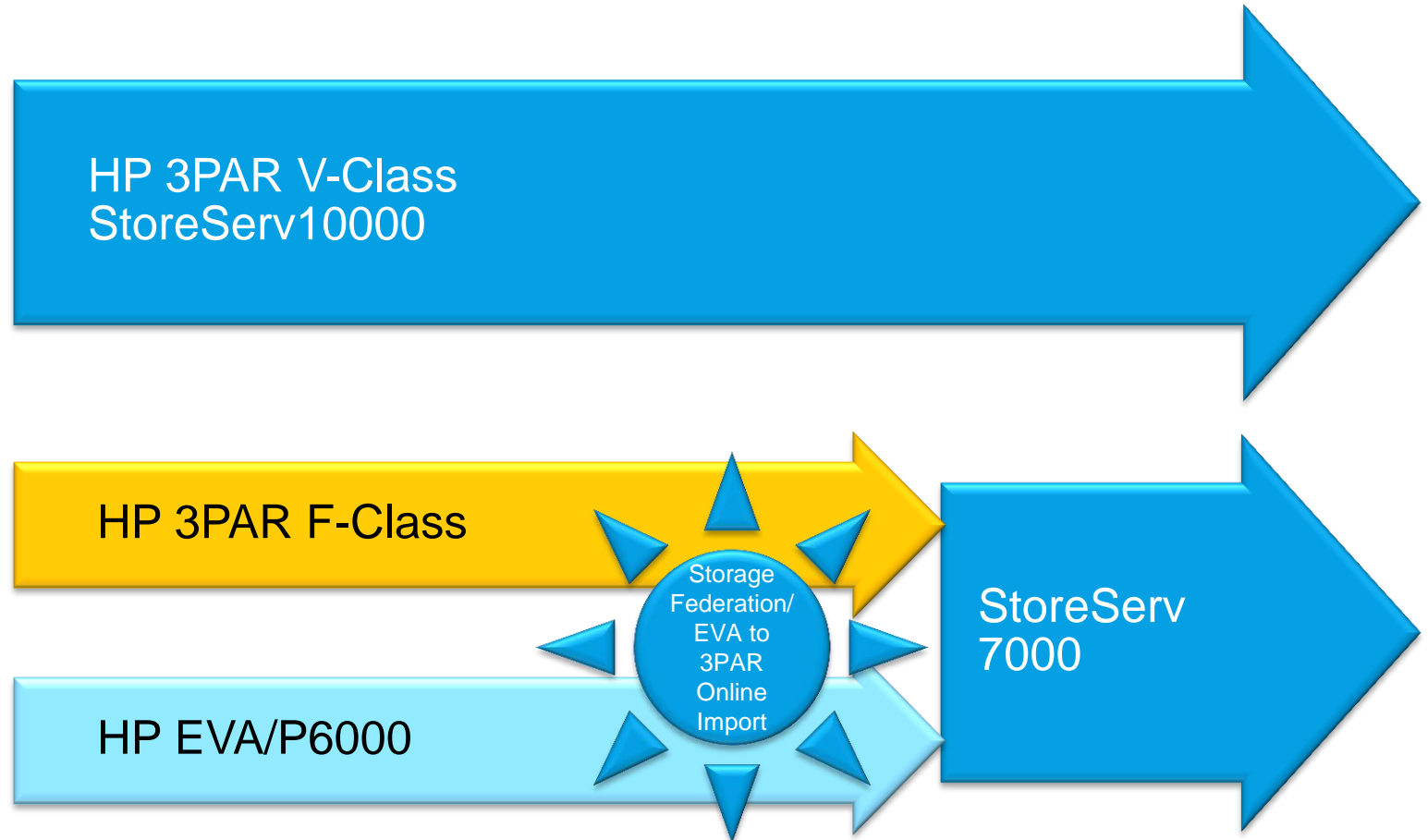
Eliminating distinctions between Midrange and Tier 1

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

HP 3PAR
StoreServ
10800

HP 3PAR
StoreServ
10400

HP 3PAR
StoreServ 7400

HP 3PAR
StoreServ 7200

NEW

NEW

Tier 1 Storage at Less than $40K USD!

Redefining the Midrange from $25K USD!

achermann
ict-services
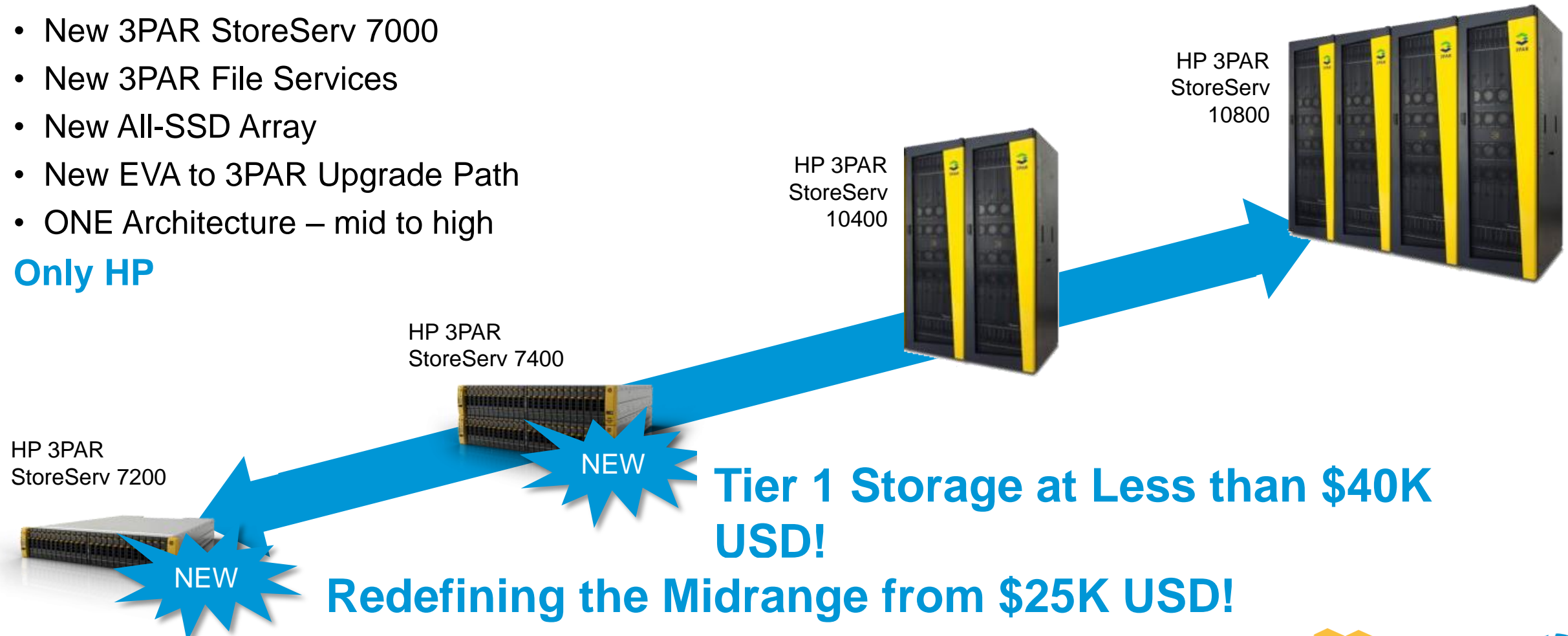
HP 3PAR StoreServ Storage

Same OS, Management Console and Software Features

	StoreServ 7200	StoreServ 7400	StoreServ 10400	StoreServ 10800
Controller Nodes	2	2 - 4	2 – 4	2 – 8
Fibre Channel Host Ports	4 – 12	4 – 24	0 – 96	0 – 192
Optional 1Gb iSCSI Ports	NA	NA	NA	NA
Optional 10Gb iSCSI Ports	0 – 4	0 – 8	0 – 16	0 – 32
Optional 10Gb FCoE Ports	0 – 4	0 – 8	0 – 16	0 – 32
Built-in IP Remote Copy Ports	2	2 – 4	2 – 4	2 – 4
GBs Cache	24	32 – 64	96 – 192	192 – 768
Disk Drives	8 – 144	8 – 480	16 - 960	16 - 1920
Available Drive Types — SLC SSD (max/array), 300GB 15krpm, 450, 900GB 10krpm, 7.2krpm	100, 200GB (120) 300GB 450, 900GB 2, 3TB	100, 200GB (240) 300GB 450, 900GB 2, 3TB	100, 200GB (256) 300, 600GB 450, 900GB 1, 2TB	100, 200GB (512) 300, 600GB 450, 900GB 1, 2TB
Read throughput MB/s	2,500	4,800	6,500	13,000
IOPS (true backend IOs)	150,000	320,000	180,000	360,000
SPC-1 Benchmark IOPS	NA	NA	NA	450'213

achermann
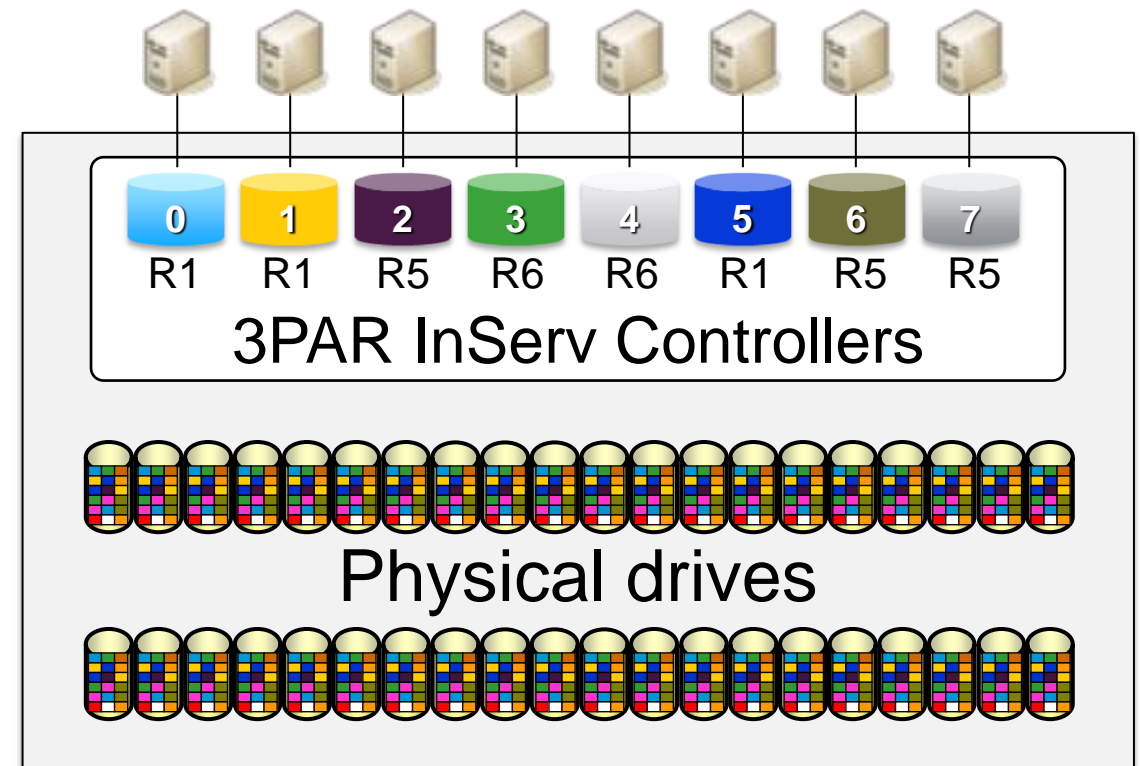ict-services

HP 3PAR virtualization advantage

Traditional Array

- Each RAID level requires dedicated drives
- Dedicated spare disk required
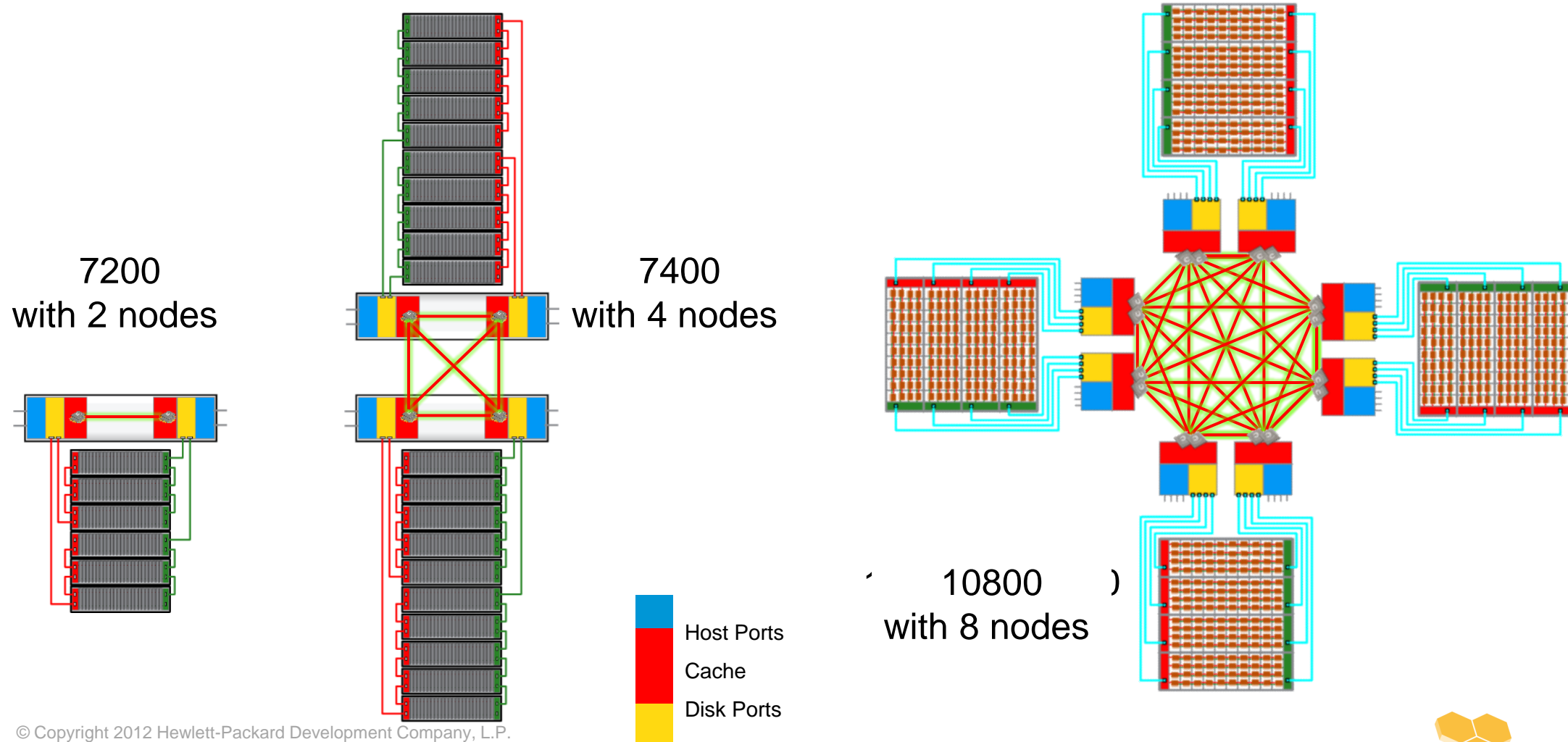- Limited single LUN performance
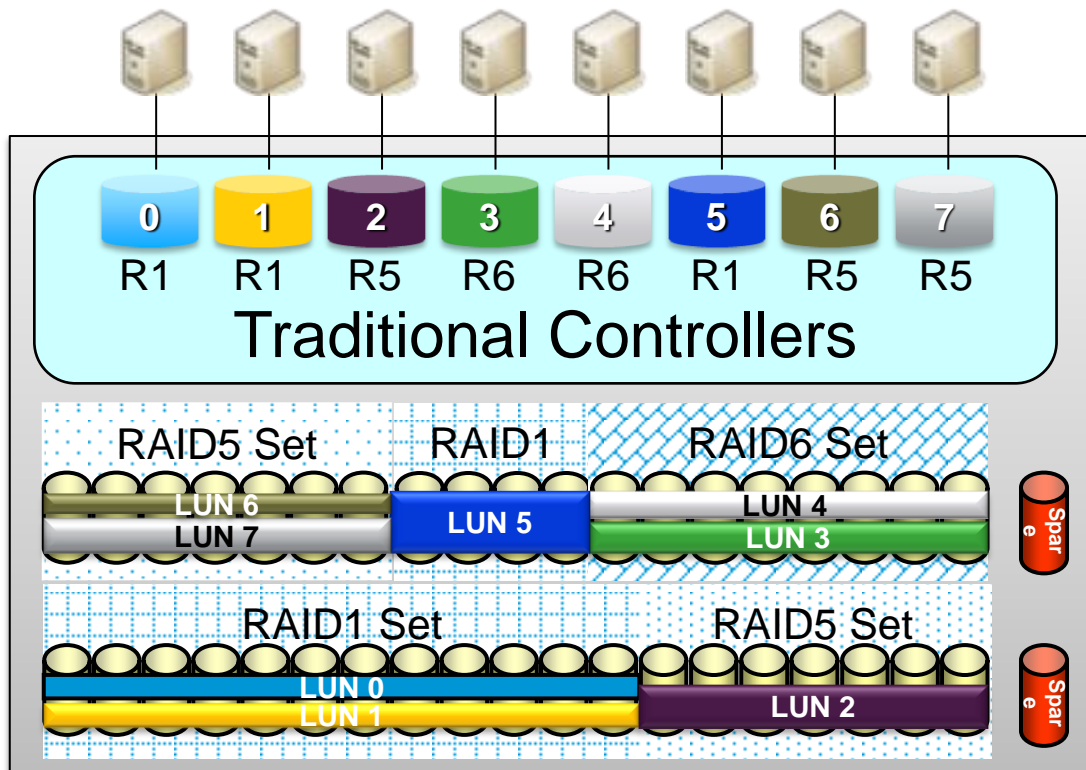
HP 3PAR – like EVA

- All RAID levels can reside on same drives
- Distributed sparing, no dedicated spare drives
- Built-in wide-striping based on Chunklets

3PAR Hardware Architecture

Cost-effective, scalable, resilient, meshed, active-active

7200
with 2 nodes

7400
with 4 nodes

10800
with 8 nodes

Host Ports
Cache
Disk Ports

HP 3PAR ASIC

Hardware Based for Performance

Thin Built in Zero Detect

Fast RAID 10, 50 & 60
Rapid RAID Rebuild
Integrated XOR Engine

Tightly-Coupled Cluster
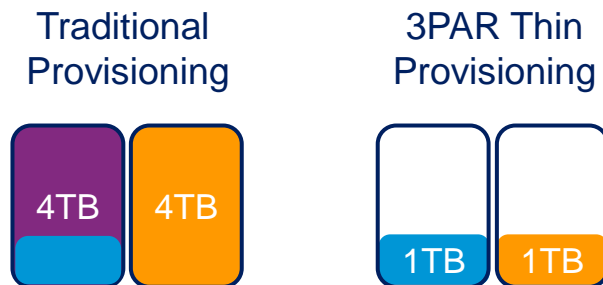High Bandwidth, Low Latency
Interconnect

Mixed Workload
Independent Metadata and Data
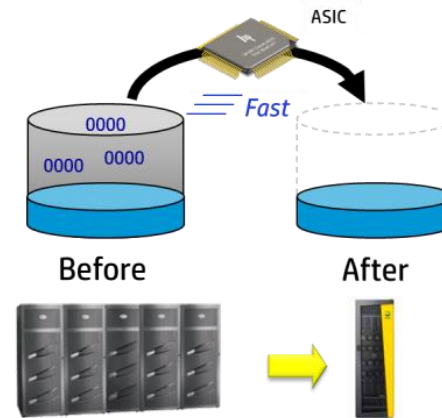Processing

HP 3PAR Thin Technologies Leadership Overview

Unprecedented space efficiency without compromise

Start Thin with Thin Provisioning

Traditional Provisioning | 3PAR Thin Provisioning

4TB 4TB | 1TB 1TB

Buy **up to 75%** less storage capacity *

Get Thin with Thin Conversion

ASIC

≡ Fast

0000 0000 0000

Before → After

Reduce Tech Refresh Costs by **up to 60%** *

Stay Thin with Thin Persistence

✓ Symantec

ORACLE

vmware

Microsoft

Thin 3PAR volumes **stay thin** over time

* See HP's Get Thin Guarantee on http://www.hp.com/storage/getthin

achermann
ict-services

hp

HP 3PAR Leadership – Efficient

HP 3PAR customers reduce TCO by 50%

"Only the HP 3PAR StoreServ platform provides a thin provisioning implementation that delivers the most efficient storage utilization." *
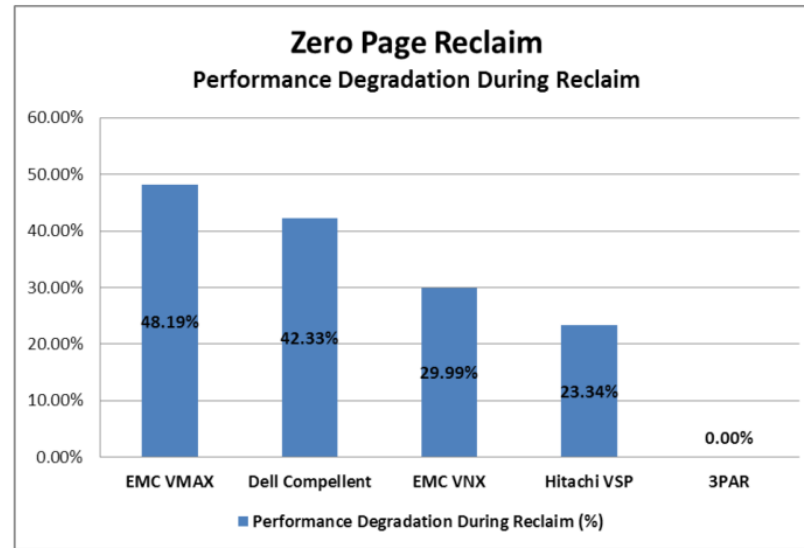

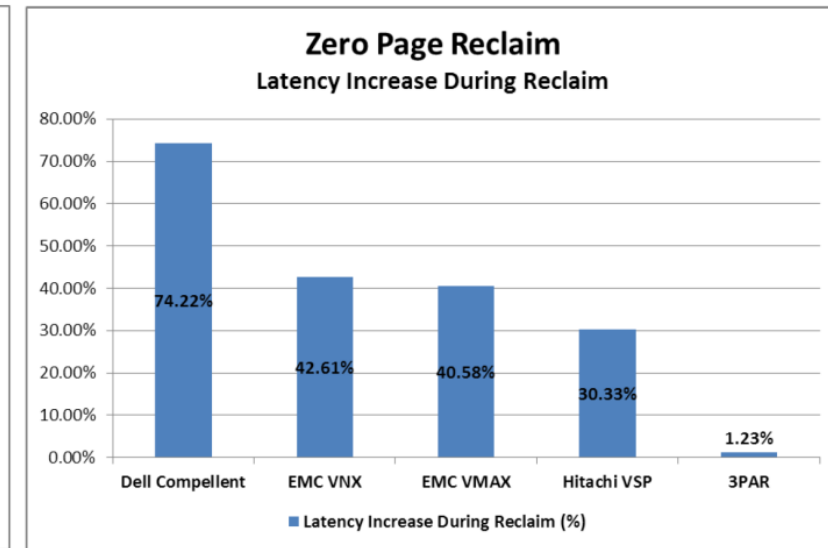Figure 1 - Test 1 - IOPS Performance during ZPR

Figure 2 - Test 1 - I/O Latency during ZPR

* Quote out of the "Thin Technologies Competitive Comparison" Whitepaper by the Edison Group in September 2012
http://www.theedison.com/pdf/2012_Samples_HP_Thin_Provisioning.pdf

Zusammenspiel mit VMware
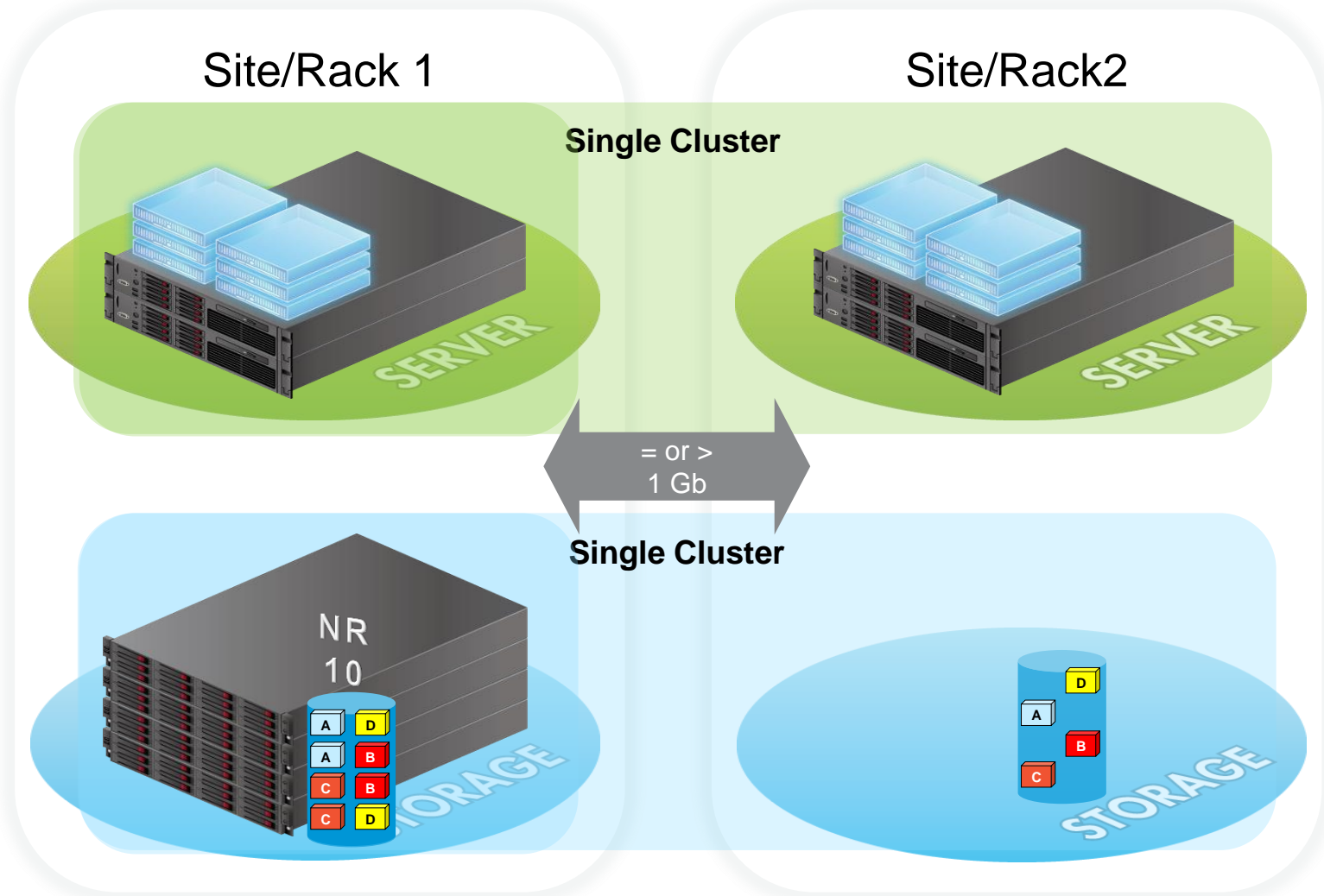

HP StoreVirtual 4730

HP 3PAR StoreServ 7200

HA for multi-site virtualized environments

VMs remain online should the following go offline:

Rack

Room

Floor

Building

Higher availability for virtual environments

NR10 volumes accessible at both sites

VMware and Hyper-V volumes remain online during site failure

Volumes automatically re-synch after failed site comes back online

Site/Rack 1

Site/Rack2

Single Cluster

SERVER

SERVER

= or >
1 Gb

Single Cluster

NR 10

A D
A B
C B
C D

D
A
B
C

STORAGE

STORAGE

Single cluster stretched between two racks, rooms or buildings
NR 10 = Network RAID 10, this is like a synchronous mirrored LUN

achermann
ict-services

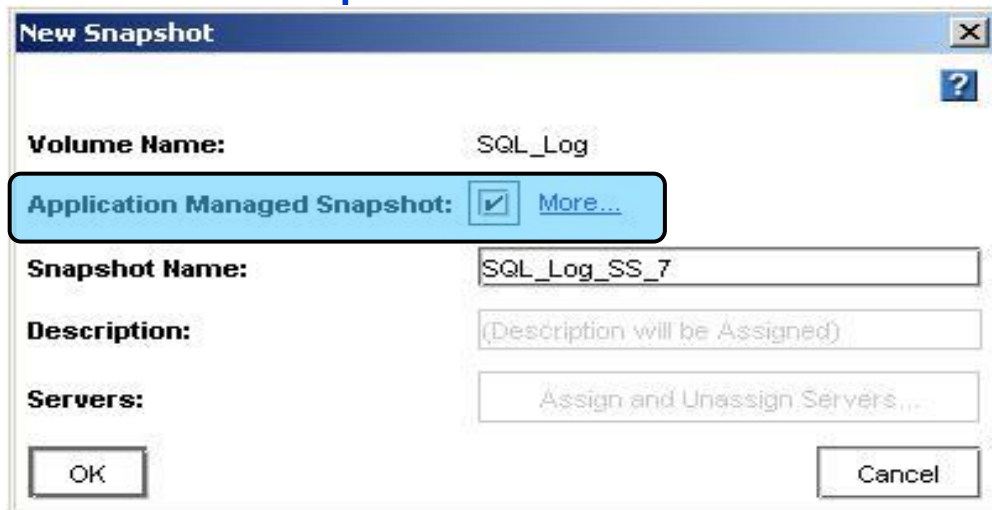# How HP LeftHand P4000 SANs protect application data

Customer challenges

Tightened recovery SLAs

Application aware data protection is called for

No added cost or complexity

P4000 Snapshots:

Typical situation

Back-up and recovery via snapshots augment traditional data protection

Application recoverability in doubt

- P4000 application integrated snapshots:
  - Quiesced snapshots for ESX or VSS applications
  - No custom scripts
  - No added GUI & no training
  - No added SW cost
  - No added management server

- And, P4000 application integrated snapshots support:
  - Remote copy for disaster recovery
  - SmartClone volumes for quiesced applications or VMs

3PAR VMware Integration

## HP 3PAR Utility Storage is the perfect fit for virtualized environments

– Allows greater virtual machine (VM) density thanks to

- Inherent wide-striping

- Mixed workload support

- Full VAAI integration

– Simplified storage administration with the VMware vCenter Server integration

– Seemless storage over two sited: Peer Persistance

– Simplified disaster recovery due to full VMware vCenter Site Recover Manager (SRM) integration

– Efficient integration of HP 3PAR Thin Technologies

– Easy recovery and replication using HP 3PAR Recovery Manager Software for VMware vSphere

See also: http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-4023ENW.pdf

HP Leadership – Federation

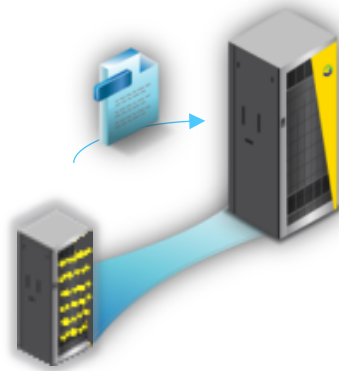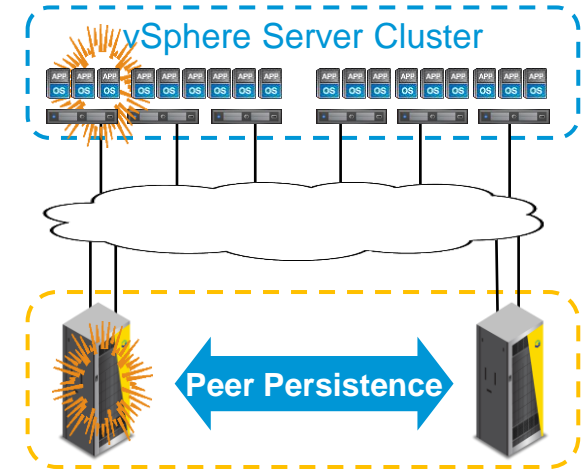## HP 3PAR Peer Motion – Online Import – Peer Persistence

Data mobility
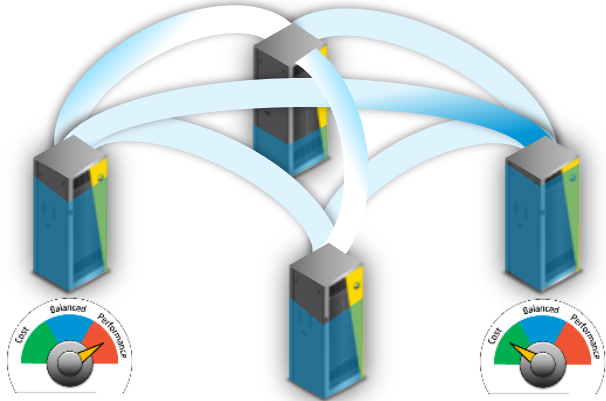
Respond to growth and changing
demands – map and move
workloads to the right resources

Built-in tech refresh

Do-it-yourself lifecycle data
migration without service
disruption
– now including EVA to 3PAR

Federated High-Availability

vSphere Server Cluster

Peer Persistence

Never lose data access
across metropolitan distances

Peer Persistence v1 – 3PAR Storage & VMware

High Availability Enhancements

What does it provide?
- Load Balancing across data centers with Storage vMotion
- High Availability of VMware environments across data centers
- Transparent LUN presentation across two sites within synchronous Remote Copy distances

How does it work?
- Based on 3PAR Remote Copy and vSphere ALUA host mode persona 11
- Presents primary Vol as active and secondary as standby
- Remote Copy Group migration initiated by "setrcopygroup switchover <group>" command

Supported environments:
- ESX vSphere 5.x
- Sync Remote Copy
- Up to RC supported max of 2.6ms (~260km)

Requirements:
- 3PAR Disk Arrays
- 3PAR Remote Copy License
- 3PAR Peer Persistence License

VMware Metro Storage Cluster (single subnet)

Fabric A

Fabric B

Up to 2.6ms RTT latency

Swap Vol A

Vol B sec

Vol B prim

Vol A prim

Vol A sec

3PAR Array A

3PAR Array B

achermann
ict-services
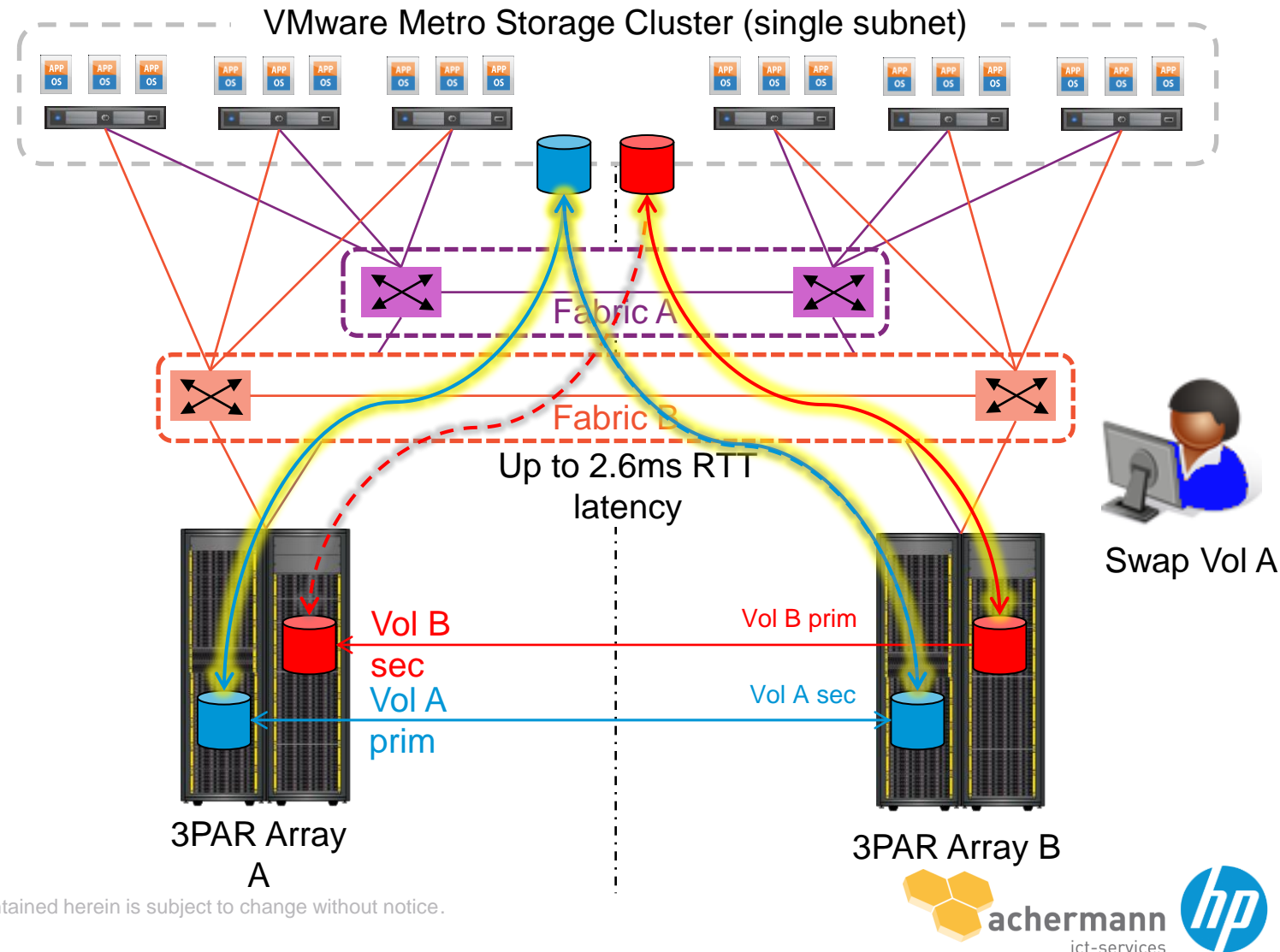
VMware ESX DR with SRM

Automated ESX Disaster Recovery
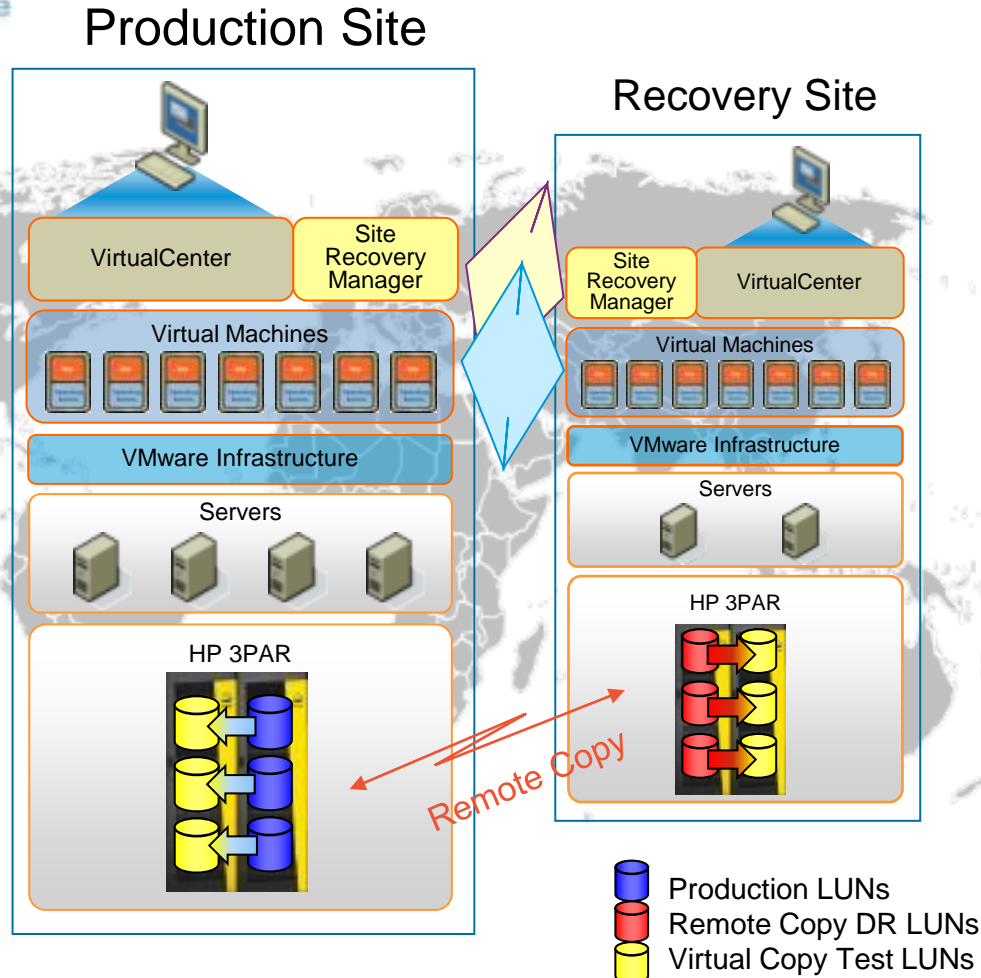
What does it do?

- Simplifies DR and increases reliability
- Integrates VMware Infrastructure with HP 3PAR Remote Copy and Virtual Copy
- Makes DR protection a property of the VM
- Allowing you to pre-program your disaster response
- Enables non-disruptive DR testing

Requirements:

- VMware vSphere™
- VMware vCenter™
- VMware vCenter Site Recovery Manager™
- HP 3PAR Replication Adapter for VMware vCenter Site Recovery Manager
- HP 3PAR Remote Copy Software
- HP 3PAR Virtual Copy Software (for DR failover testing)

Also see the 3PAR vSphere Whitepaper

3PAR Recovery Manager for VMware

Array-based Snapshots for Rapid Online Recovery

Solution composed of

- 3PAR Recovery Manager for VMware
- 3PAR Virtual Copy
- VMware vCenter

Use Cases

- Expedite provisioning of new virtual machines from VM copies
- Snapshot copies for testing and development

Benefits

- Hundreds of VM snapshots granular, rapid online recovery
- Reservation-less, non-duplicative without agents
- vCenter integration – superior ease of use

See also http://h18006.www1.hp.com/storage/software/3par/rms-vsphere/index.html
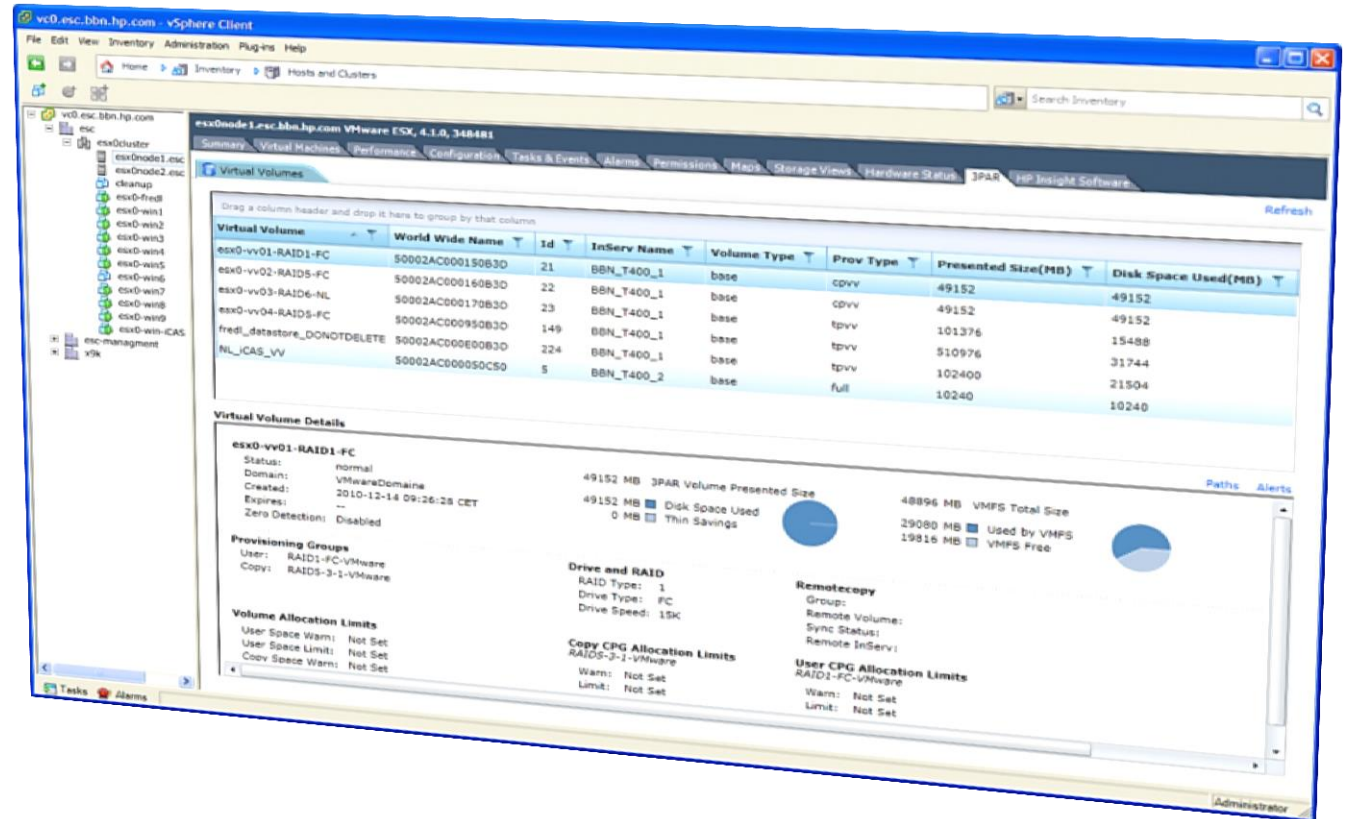
Datensicherung

HP StoreVirtual 4730

HP 3PAR StoreServ 7200

Datenschutz, Redundanz und Desaster Recovery

- No Single Point of Failure Design
- Snapshot Technik für schnellen und schlanken online Schutz, vor allem schnelles Recovery
- Redundante Lösung in Bezug auf Desaster Recovery
  - Stretched HP StoreVirtual Cluster mit Network RAID 10
  - Remote Copy mit HP 3PAR StoreServ, eventuell Peer Persistance oder SRM
- Backup Lösung auf Band und / oder StoreOnce

HP StoreOnce Backup

Backup to disk: Leading performance and efficiency from SMBs to Service Providers

HP StoreOnce: Disk-Based Data Protection

Data Protection

Backup & Restore

Disaster Recovery

MORE DATA amount of data to protect doubles every 18 months

MORE LOCATIONS estimate of 50% company data resides in remote offices

MORE OVERHEADS operational costs, management time and resource throttles innovation to 30% of spend

MORE RISK 60% of companies that lose their data will shut down within 6 months of the disaster

achermann
ict-services

HP StoreOnce Key Features

Helps to meet backup windows

- Consolidates multiple parallel backup streams to a single appliance
- Offers disk–based performance

Protects remote offices

- Automates backup and DR
- Centralizes data protection of multiple sites and allows management from a single pane of glass
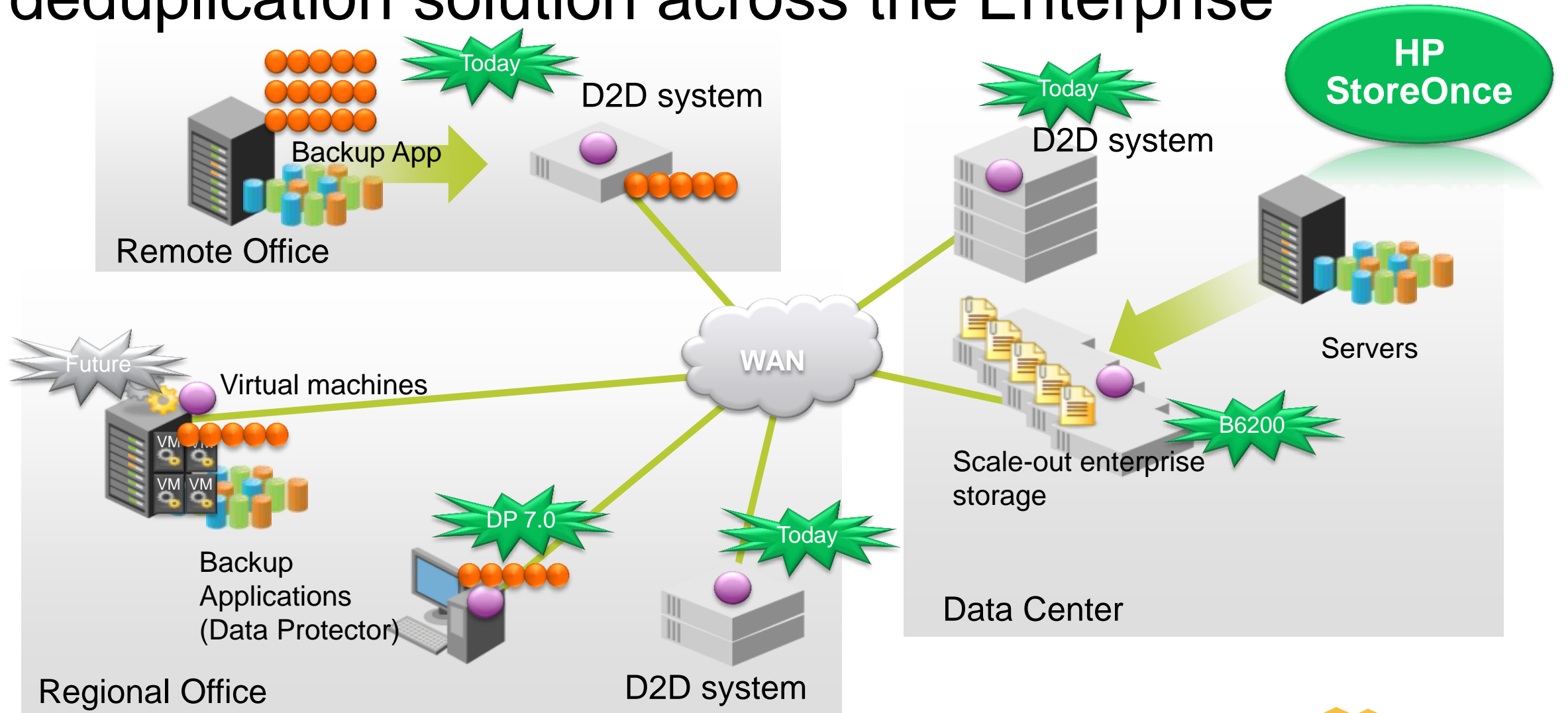
Offers reliable disaster recovery

- Deduplicates backup data
- Automates offsite replication of changed, deduplicated blocks
- Uses lower cost, lower bandwidth links
- Simplifies remote management

Provides rapid file restore

- Keeps 20x more backup data on hand for longer
- Integrates data and restore across multiple platforms

achermann
ict-services

HP StoreOnce Vision: A single disk-based deduplication solution across the Enterprise

HP StoreOnce

Today — D2D system

Backup App

Remote Office

Today — D2D system

Servers

Future — Virtual machines

WAN

Scale-out enterprise storage

B6200

Data Center

DP 7.0

Backup Applications (Data Protector)

VM VM
VM VM

Today — D2D system

Regional Office

achermann
ict-services

HP StoreOnce portfolio

Greater scalability, more flexibility

B6200

4430
Series

4420
Series

Data
Protector 7

4220
Series

4210
Series

2620 Series

StoreOnce Catalyst

2.5TB's usable | 4 to 9TB's usable with upgrade | 8 to 18TB's usable with upgrade | Scalable to 38TB's usable | Scalable to 76TB's usable | Scalable to 512TB's usable

Entry-level | **Mid-range** | **Enterprise**

achermann
ict-services

Thank you