



Turbocharge Applications Without Compromise Using Enterprise Flash Storage



MetroHealth Case Study on VDI with HP 3PAR StoreServ 7450

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**2013 VMware
Innovator Award**

Metro Health Hospital is a non-profit
208-bed general acute care hospital
serving West Michigan.

Hospital services include inpatient and
outpatient services, emergency, surgery,
intensive care, cancer, rehabilitation, childbirth
and community education, among others.

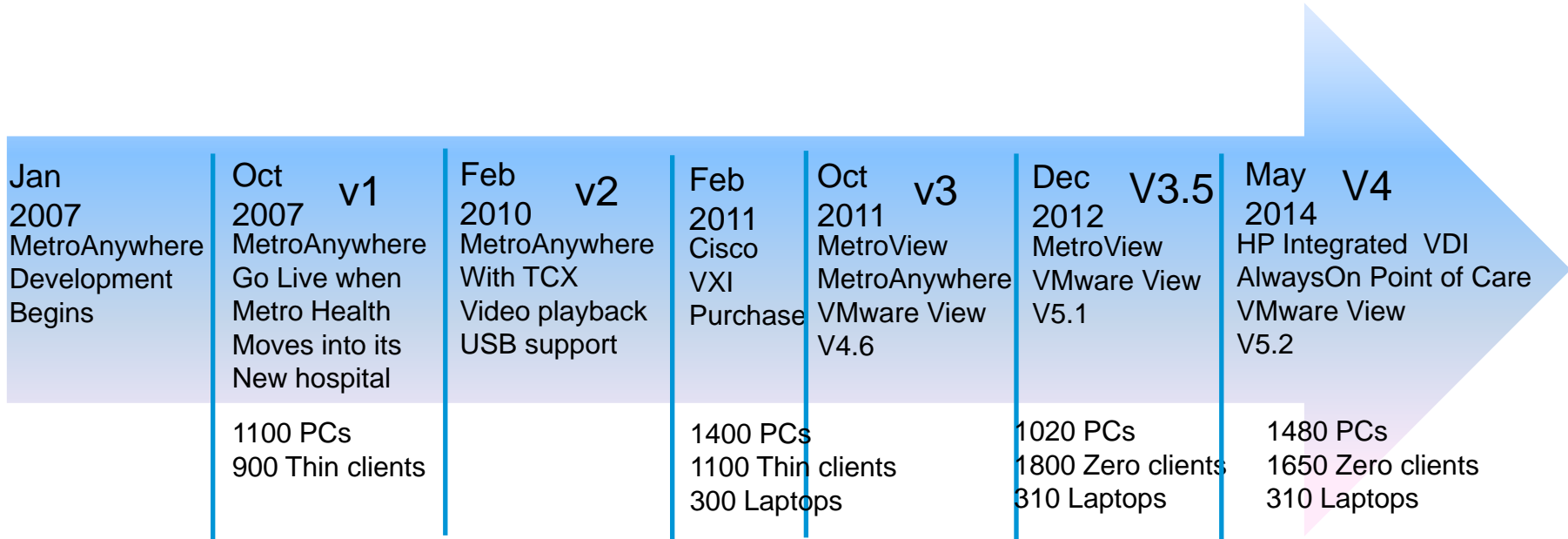
Metro Health employs more than **2,325**
full-time staff members

Metro Health has **500+** **employed** and **independent physicians**

Metro Health Hospital's innovative approach to **health care**, **technology** and **green thinking** has earned it numerous awards, including the **100 Top Hospitals National Award** (teaching hospital category) from Thomson Reuters three years in a row.



Desktop Virtualization Timeline



We needed to address some issues

Performance was sluggish.



Video playback was often poor

Our VDI infrastructure was maxed out



New VDI Boring..... Specs



BUT VITAL!

MUST HAVE “Snappy” Performance

< 10-second reconnects

VMware Always On Point of Care

Global Load Balancing

Full motion video support

Designed for Windows7 & Epic 2014

Multi-monitor support at 1920x1080 resolution

Cost is at or below current spend

Solution must scale in increments

Solution must be granular to support new technologies

Support 3GB RAM per session

Support a 30GB image

Must support 3D graphics and CPU offload capabilities

Must provide latest Intel Ivy Bridge processors

Full solution recomposes completed in 6 – 8 hours

SAN Storage is to be based on SSD to support linked clone performance

SAN solution must provide in-line deduplication to improve storage performance

Average 50 IOPS and <6ms latency per session

Plus more specs regarding video performance

And more specs for session performance

And more.....

And more.....

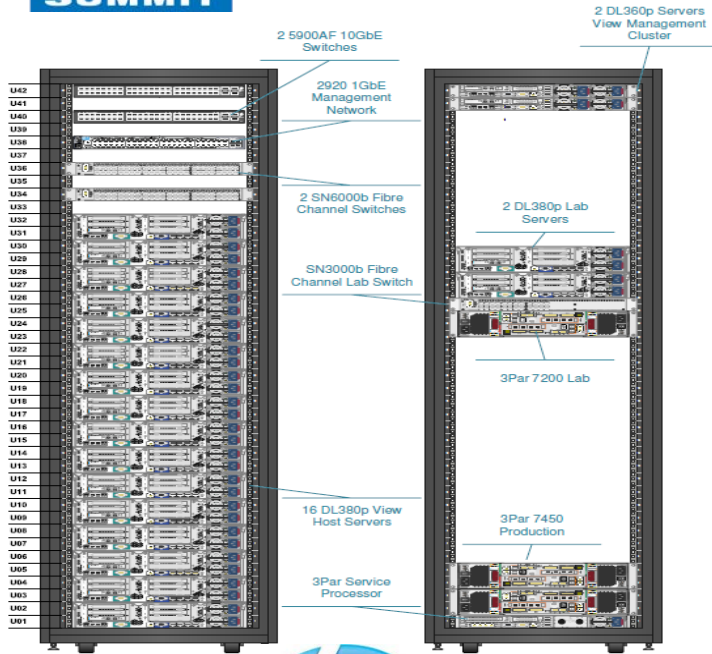
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HP Multi Site Solution – Each Site



Solution Base Includes:

HP 3PAR StoreServe 7450

4 x 7450 Controller Nodes

32 GB Cache

(8) 8GB FC ports

28TB SSD Drives

View Session hosts

(16) DL380 Rack Servers E2697v2

Dual 10 Core 2.8 GHz Ivy Bridge procs

512 GB Memory

4 GB micro SD Boot

ESX 5.5

(8) Teradici Apex 2800 CPU offload

cards

(8) NVIDIA K1 cards

Management hosts

(2) DL380 Rack Servers E2697v2

Dual 10 Core 2.8 GHz Ivy Bridge

192 GB Memory

4 GB micro SD Boot

(1) HP 2920-24G switches

(24) 1GB ports

(2) HP 5900-48 switches

(48) 10GB ports

(2) HP SN6000B switches

(?) 16GB FC ports

(24) 8GB SFPs

(2) F5 Loadbalancers

Stratusphere UX

(1250) licenses

Test System

(2) VDI Hosts - HP DL380 Gen8

(10) core Ivy Bridge 2.8GHz

Each with 512GB RAM

(4) GB Flash - ESXi local boot

Each server will have one each:

- Teradici Apex 2800 CPU offload

card

- NVIDIA K1 card

(1) 3PAR 7200 array

(1) HP SN3000B 24/12 FC switch

Performance Differentiators

Maintain dual active/active data centers

Redundant dark fiber loop between data centers

Single name space across both data centers

No Blade Servers

Maximize video processing

Teradici APEX 2800 CPU offload cards

Maximize graphics processing

NVIDIA GRID K1

Maximize granular scalability

can add more RAM

Maximize flexibility

can add 2nd NVIDIA K1

OR..... The next gen card

The speed of SSD

1ms access vs 10ms access

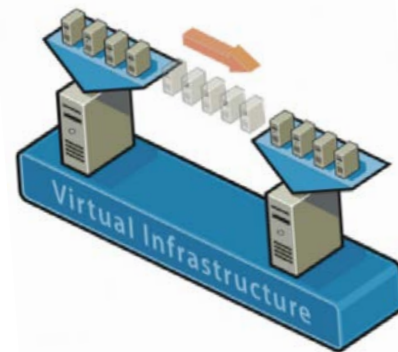
Now (4) controllers/array vs two

Round-robin multipathing

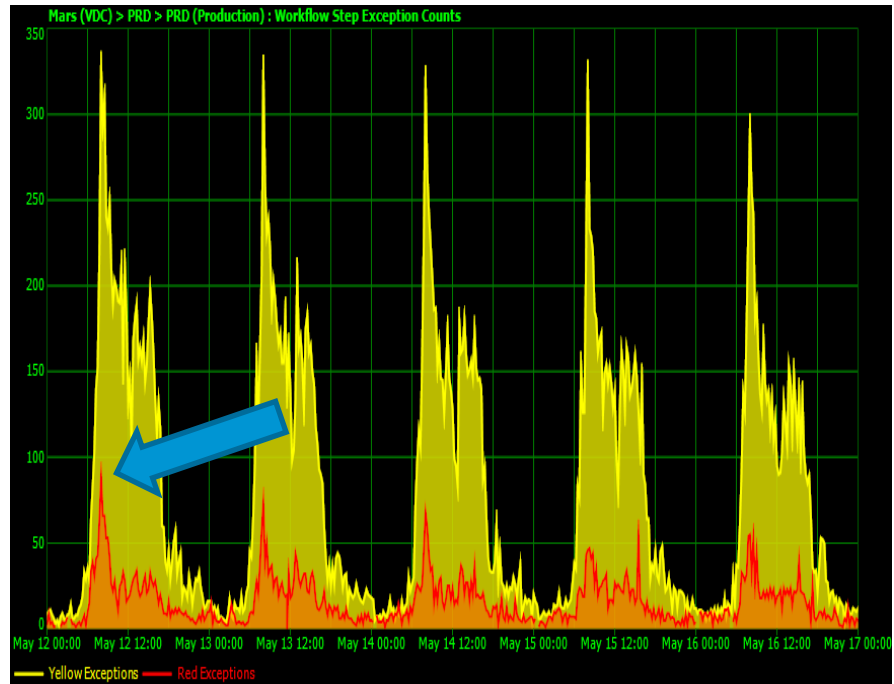
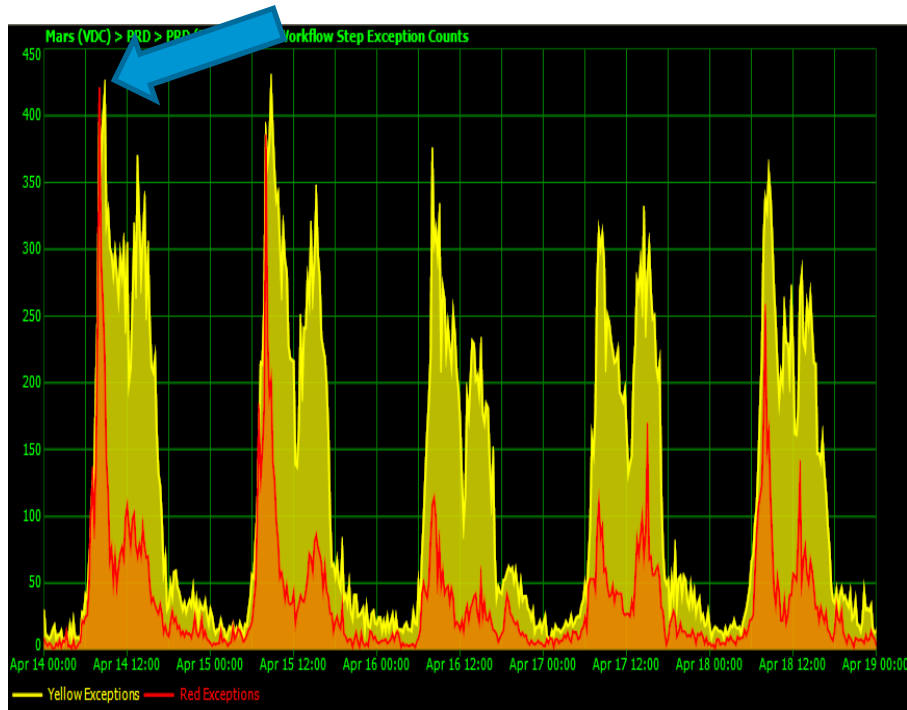
vSphere Storage I/O Control (SIOC)

Take advantage of VAAI primitives

Lab platform (7200) used for production testing



EPIC System Pulse - Before and After

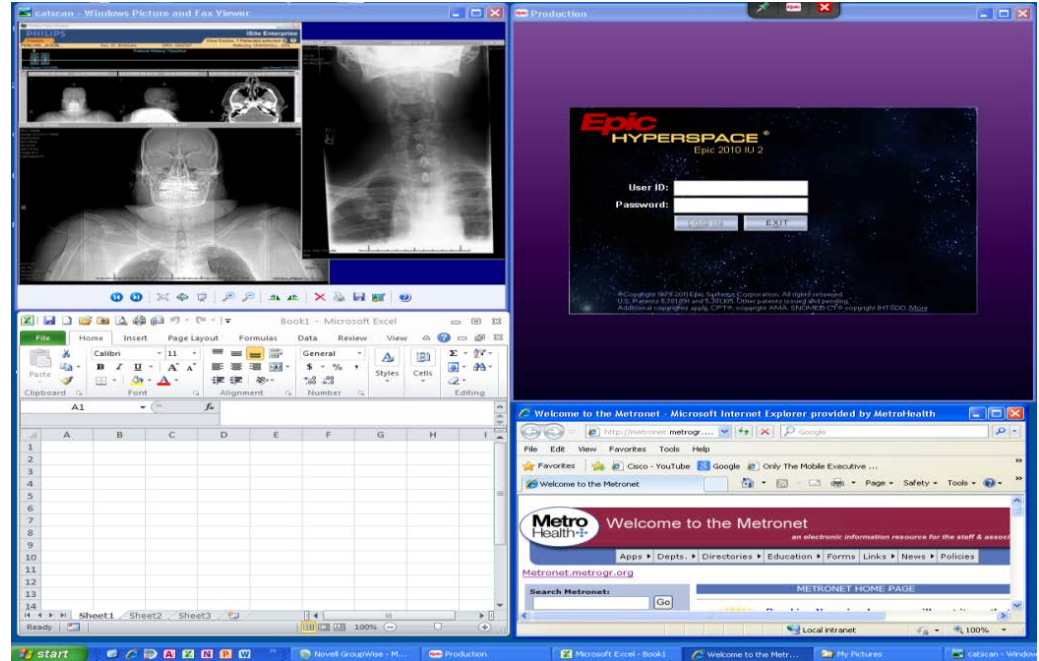


Roaming with fast reconnects

- Reconnect to active desktop in 10 seconds or less
- To a FULL Windows desktop
- Access to ALL opened applications simultaneously

The most dangerous kind of waste is the waste we do not recognize.

~Shigeo Shingo





Time Savings with roaming

Roaming with fast reconnects to a **full Windows OS desktop** – 10 seconds or less

		Time is in seconds			Hours					Annual	
		Full PC login	Reconnect time	Time savings	Time saved/day	Working Days/year	Hours Time saved/yr	Per Person Cost Savings	Staff Counts	Annual TOTAL Projected SAVINGS	TOTAL recognized SAVINGS
		60	10	50	3600						20%
# reconnects per day		35%									
	User type	Avg Salary	Salary + benefits	Hourly rate							
	40 Physician	\$150,000	\$202,500	\$97	0.56	209	116.11	\$11,304.09	200	\$2,260,817.31	\$452,163.46
	60 clinician	\$42,000	\$56,700	\$27	0.83	227	189.17	\$5,156.61	1200	\$6,187,932.69	\$1,237,586.54
	20 Professional	\$65,000	\$87,750	\$42	0.28	200	55.56	\$2,343.75	400	\$937,500.00	\$187,500.00
	20 Support	\$33,000	\$44,550	\$21	0.28	235	65.28	\$1,398.14	400	\$559,254.81	\$111,850.96
											\$1,989,100.96

Being rich is having money; being wealthy is having time.

Margaret Bonnano





IDC ExpertROI® SPOTLIGHT

Metro Health Giving Time Back to Its Care Providers with VMware Horizon View

Sponsored by: VMware

Matthew Marden
January 2014

Randy Perry

“IDC estimates that Metro Health will realize almost \$2.75 million per year in benefits from higher revenue and employee time savings that are being transformed into business benefits for the hospital.”

Business Value Highlights

Organization: Metro Health

Location: Grand Rapids, Michigan

Challenge: To deploy a desktop virtualization solution in a cost-effective manner while providing diverse end users, including physicians, with instant and secure access to their active sessions and use of their desktop applications

Solution: VMware View

Cumulative Benefits:

- \$14.3 million over five years
- ROI of 338%
- Payback in 9.8 months

Other Benefits:

- Lowered device subscription costs by 45%
- Reduced support calls per device by 37%

Storage for the datacenter of the future

HP 3PAR StoreServ delivers TODAY

Affordable and Autonomic all flash platform 

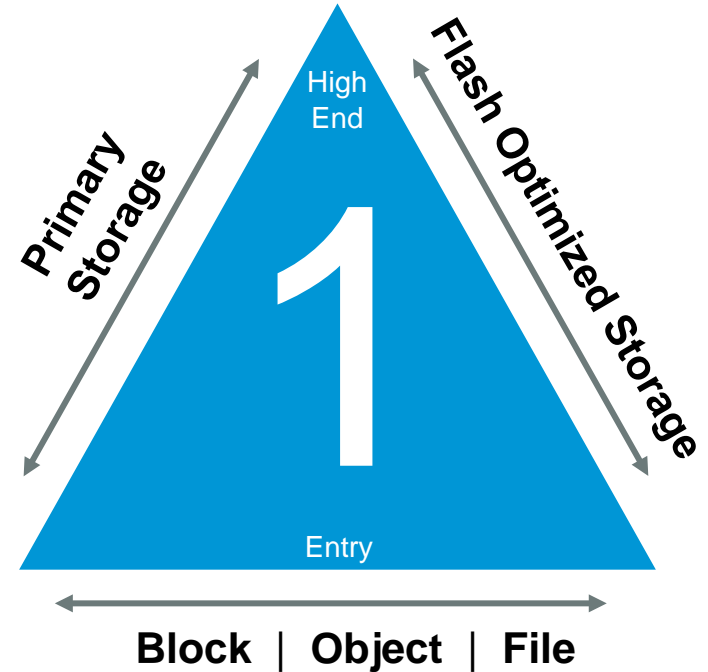
- Easy to put FLASH FIRST

Modern Tier 1 Storage Architecture

- Move to Flash without compromises

Availability guaranteed

- Get 6-Nines Guarantee for peace of mind



FLASH Redefined

F FAST

900,000 IOPS **at** 0.7ms

L Low

\$2/GB Usable with Thin Deduplication

A Cost
Autonomic

System-wide Striping, Rapid Provisioning

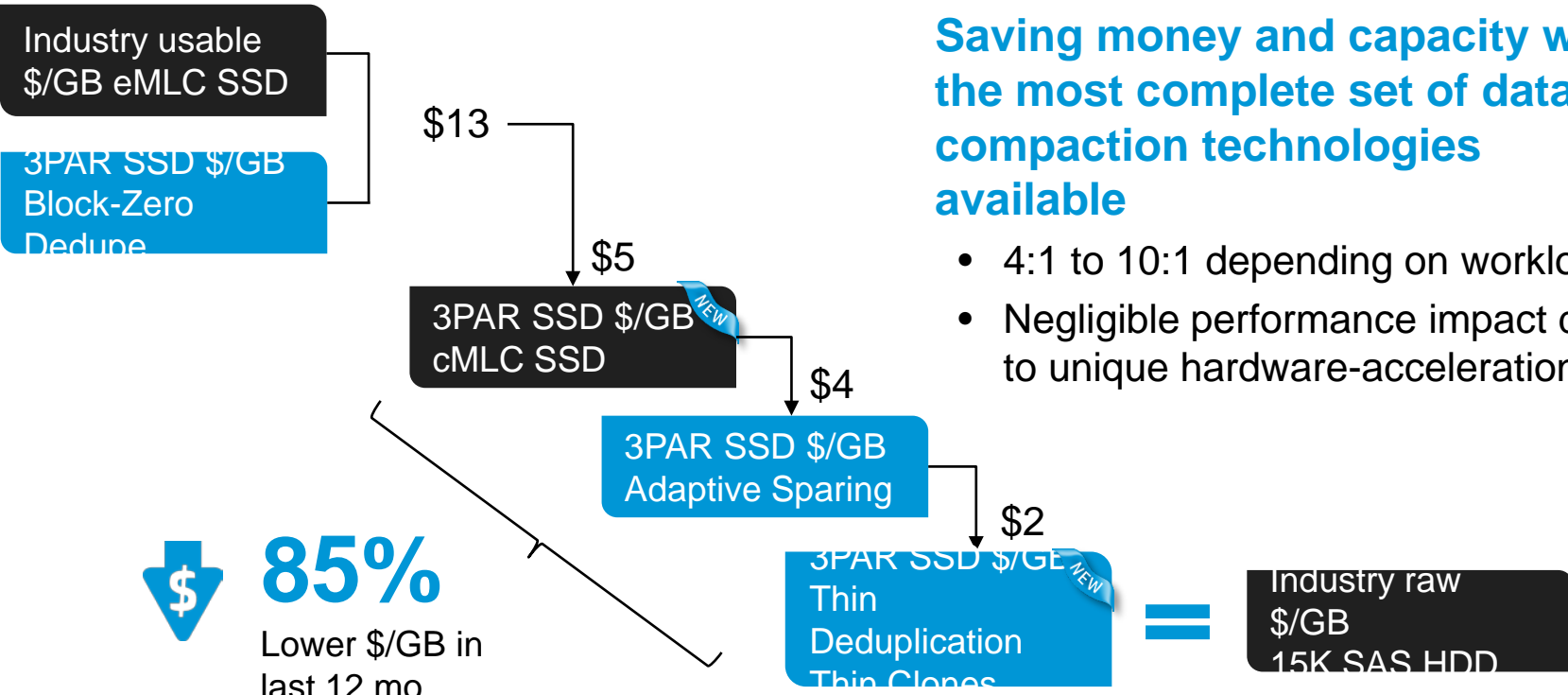
S Scalable

>450TB all-flash raw, >1PB Usable

H Highly
Available

Quad-controller resilience with most
complete data services (RC, QoS,
Federation)

Affordable: All-flash at less than \$2 per GB us



Saving money and capacity with the most complete set of data compaction technologies available

- 4:1 to 10:1 depending on workload
- Negligible performance impact due to unique hardware-acceleration

 **85%**
Lower \$/GB in last 12 mo.



The Future is NOW!



Legacy
Storage

3PAR
Online
Import

Flash at the
price of
Disk

Uptime
guaranteed

Next
Generatio
n Data
Centre





Thank You



What we like about our VMware View VDI solution



Being adopted as mainstream by Metro Health.



Our VDI solution offers significant benefit to cost and time savings.



Device agnostic- including mobile devices



Our VDI environment has never completely gone down.



We use our DR to perform our upgrades



Significant security improvement – data in data center



Has improved quality of life with quick access to one's virtual environment



Make it matter.