vmware

READY FOR ANY

vForum2015

Nimble Storage

9 December 2015 | Taipei, Taiwan

新世代雲端智慧快閃儲存平台
完全透析整合虛擬架構

陳 中 欣
資深技術總監

Redefining the Storage Market with Adaptive Flash

nimblestorage

Key Alliances

splunk> · CITRIX · CISCO · vmware · commvault · ORACLE DATABASE · SAP · Microsoft

Headquartered in San Jose with operations in U.S., Canada, Europe, Asia and Australia

NMBL LISTED NYSE Publicly Traded Company Since December 2013

1,000+ Employees

6,000+ Customers Since 2010

900 Channel Partners Worldwide

Gartner 2015 Leader

vmware

Observations

Storage Observations

nimblestorage

1) Todays storage is fast

2) Todays storage is cheap (sort of).....Cost of capacity is falling

3) Smaller footprints means less of everything else.....
(power / rackspace / cooling)

- We need to start asking what else storage can do for us?
- How can we get more from our storage?

vmware

INFOSIGHT

Powered by Storage Analytics

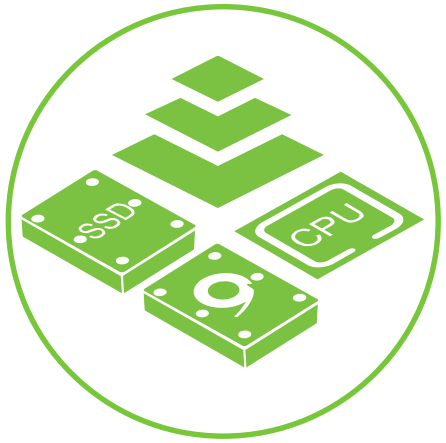
vmware

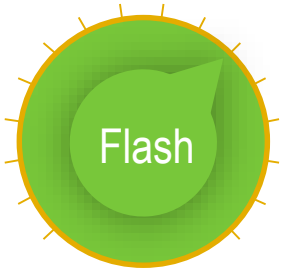
nimblestorage

Nimble's Adaptive Flash Platform

nimblestorage

CASL
Flash-optimized file system software





InfoSight
Cloud-based management/support/analytics

Performance and Capacity	Scale-to-Fit	Integrated Protection	Proactive Wellness
Significantly better performance/$ and capacity/$	Non-disruptive, flexible scaling to massive scale	Rapid backup and recovery	Peak system health and availability

Collecting sensory data

nimblestorage

Reads vs Writes

Temperature

Network Statistics

CPU Utilization

Snapshot status

Write Latency

vmware Statistics

Write IOPS

Compression

Cache Utilization

Read IOPS

PS Voltages

Replication status

Fan Speeds

Read Latency

Data block size

Block Sizes

Random vs Sequential IOPS

vmware

The Infosight Engine

nimblestorage

Nimble Approach

Comprehensive Telemetry

- Between 30 and 100M sensors per array, daily
- Data collected every 5 minutes and on-demand

Analysis and Automation

- Systems modeling
- Correlations, trending, and projections

Customer Benefits

Storage Management SaaS Offering

- Monitoring and alerting
- Visualization, capacity planning, performance management

Proactive Wellness

- Vast majority of cases opened by Nimble
- Secure, on-demand system access

Leveraging pervasive network connectivity and big data analytics to automate support and enable cloud-based management

vmware

More than just Autosupport

1) Proactive / Automated Support

Hardware Failure Alerts / Automatic case creation

MPIO misconfigurations / Network retransmits

Capacity / Performance issues

Abnormally High latency

2) Support Enablement

3) Customer Access to Infosight

Capacity Trends

Performance Information

Per-VM Monitoring

A better support experience

Per VM Monitoring

Powered by INFOSIGHT

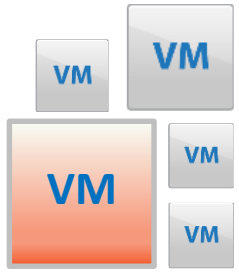
vmware

nimblestorage

Challenges of Diffusing Resource Contention in Virtual Environments

nimblestorage

- Virtualization has caused resource contention at the VM-level, even in under-utilized environments
  - » Results in performance problems for virtualized applications
- Culprits are “bully” VMs who use more than their share of resources
- Due to lack of visibility into latency throughout the stack, customers solve these issues with unnecessary storage upgrades



VM Latency = 20 ms

HOST Latency = ? ms

Network Latency = ? ms

Storage Latency = ? ms

vmware

InfoSight™

Proactive

Wellness

Username Customer Name

Password **********

Log In

Forgot password?

New user? Enroll now.

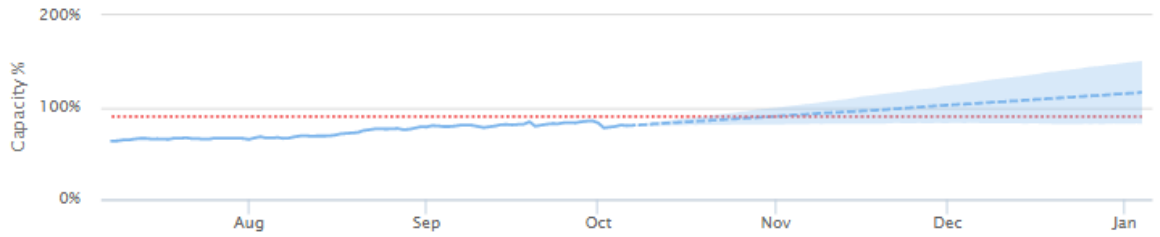
Contact Nimble Storage Customer Support

Assets /

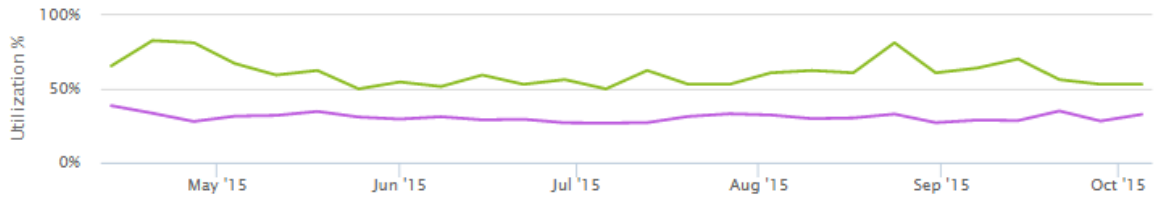
ap-nimble1 | S/N | Model: CS500 (+3 shel | 3.0-167018-opt | Group: Group1 | Pool: default

Overview | Performance | Cache

Capacity Trend



Resource Utilization



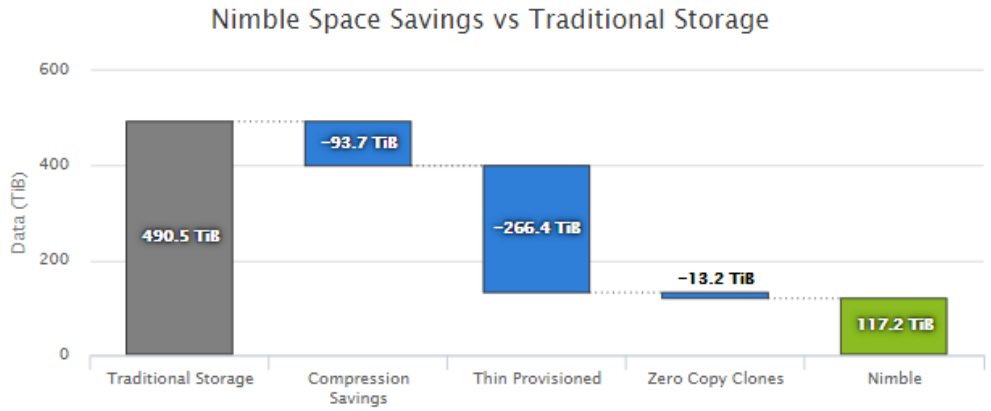
Wellness Summary

Issue Summary

	Critical	Urgent	Important	For Review
Arrays			2	1
Pools				
Volume Collections				
Volumes				
Snapshots				

Include ack'd

Space Savings



Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
    - Discovered virtual machine
    - Old VMs
    - per-vm-team
    - Tina
    - is-dev-cloud
    - is-dev-cloud-1
    - is-dev-cloud-2
    - is-dev-db-portaldb-1
    - is-dev-db-portaldb-2
    - is-dev-db-portaldb-vip
    - is-dev-nas-1
    - is-dev-nas-2
    - is-dev-nsdiag
    - is-dev-rhel6-base-template
    - is-dev-tableau81
    - is-dev-vertica1
    - is-dev-vertica2
    - is-dev-vertica3
    - is-dev-web
    - is-dev-web-1
    - is-dev-web-2
    - is-dev-web-prodtest
    - IS-Infra-UpdateServer
    - is-jenkins
    - is-nexus
    - is-puppet
    - is-qa-infosight01
    - is-qa-QA_alphas
    - is-qa-standalone
    - is-qa-standalone-2

vCenter: IS-DEV-VCENTER

Host Activity | Top VMs | Datastore Treemap | Inactive VMs | Nimble Arrays

Host Activity (past 6 hours)

Show 10 entries Search:

Host	CPU		Memory		
	Usage	Ready	Usage	Swap	Balloon
10.18.226.21	9%	0%	30%	0%	0 MB
10.18.226.22	32%	0.13%	74%	0%	0 MB
10.18.226.23	29%	0.11%	65%	0%	0 MB
10.18.226.24	33%	0.05%	74%	0%	0 MB
10.18.226.25	30%	0.20%	93%	0%	57,922 MB

Showing 1 to 5 of 5 entries Previous 1 Next

Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
  - Test-PerVmTina
- sjc-is-vcenter
  - InfoSight

vCenter: IS-DEV-VCENTER

Host Activity | Top VMs | Datastore Treemap | Inactive VMs | Nimble Arrays

Top VMs by IO (over past 24 hours)

VM	Total IO
is-dev-vertica3	6,576,220
is-dev-vertica1	6,427,340
is-dev-vertica2	5,961,120
is-qa-standalone-2	2,782,060
test pachinkodb-1	1,673,000
ln-mnigudkar	1,308,280
is-dev-db-portaldb-1	1,233,320
is-dev-db-portaldb-2	1,058,000
VMware vCenter Server Appliance	1,008,480
is-qa-QA_alphas	954,860

Top VMs by Latency (over past 24 hours)

VM	Avg Latency (msec)
%25test@SpecialCharacterVM's	960.00
test array-dispatcher	33.47
is-jenkins	13.92
ln-jvickers	11.96
is-dev-db-portaldb-vip	10.56
is-dev-tableau81	10.18
ln-gim-test	9.78
test asupdiag-2	9.47
test nsdiag-1	9.06
test pachinkoapp-2	8.70

Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
  - Test-PerVmTina
- sjc-is-vcenter
  - InfoSight

vCenter: IS-DEV-VCENTER

Host Activity | Top VMs | Datastore Treemap | Inactive VMs | Nimble Arrays

Inactive VMs

The following VMs have not generated any I/O over the past 7 days. They may be inactive or unused. Note: InfoSight only analyzes I/O to Nimble datastores.

Show 10 entries Search:

VM	CPUs	Mem	Capacity
%25test@SpecialCharacterVM's	1	2 GB	34 GB
New Virtual Machine	1	4 GB	6 GB

Showing 1 to 2 of 2 entries Previous 1 Next

Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
  - Test-PerVmTina
- sjc-is-vcenter
  - InfoSight

vCenter: IS-DEV-VCENTER

Host Activity | Top VMs | Datastore Treemap | Inactive VMs | Nimble Arrays

Nimble Arrays

Search:

Show 10 entries

Serial Number	Hostname	Model	Pool	Group	Version
AA-100340	IS-array-01	CS220	default	IS-array-01	2.2.6.0-229590-opt

Showing 1 to 1 of 1 entries

Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
  - Test-PerVmTina
- sjc-is-vcenter
  - InfoSight

vCenter: IS-DEV-VCENTER

Host Activity | Top VMs | Datastore Treemap | Inactive VMs | Nimble Arrays

Top VMs by Datastore

VM I/O and Latency grouped by Datastore (past 24 hours)

Size indicates total I/O count. Color indicates VM Latency. Click points to drill down to VMs.

Virtual Environment

Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
    - Discovered virtual machine
    - Old VMs
    - per-vm-team
    - Tina
    - is-dev-cloud
    - is-dev-cloud-1
    - is-dev-cloud-2
    - is-dev-db-portaldb-1
    - is-dev-db-portaldb-2
    - is-dev-db-portaldb-vip
    - is-dev-nas-1
    - is-dev-nas-2
    - is-dev-nsdiag
    - is-dev-rhel6-base-template
    - is-dev-tableau81
    - is-dev-vertica1
    - is-dev-vertica2
    - is-dev-vertica3
    - is-dev-web
    - is-dev-web-1
    - is-dev-web-2
    - is-dev-web-prodtest
    - IS-Infra-UpdateServer
    - is-jenkins
    - is-nexus
    - is-puppet
    - is-qa-infosight01
    - is-qa-QA_alphas
    - is-qa-standalone
    - is-qa-standalone-2

test nsdiag-1

Virtual Machine Latency

Select a point on the chart to view active VM neighbors

Host Network Storage

Host Performance

CPU Usage CPU Ready Memory Usage

Virtual Environment

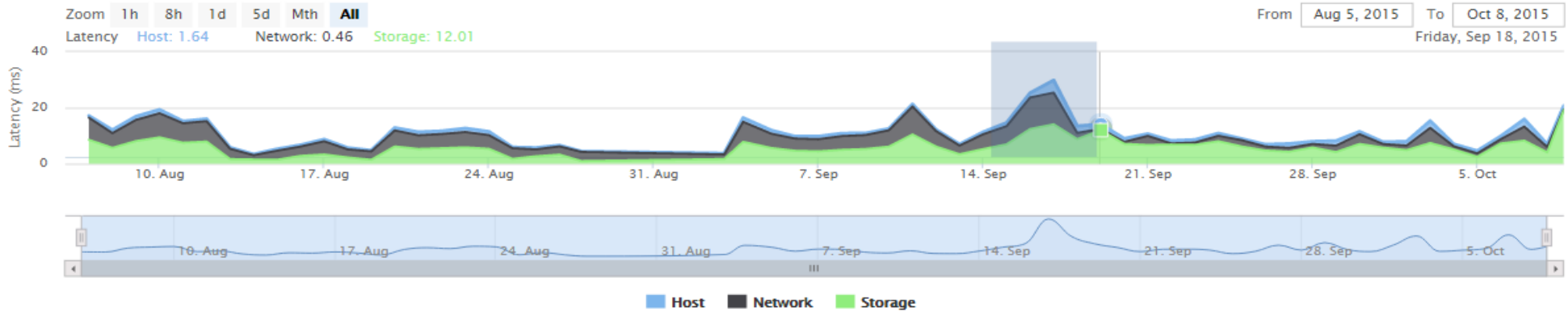
Search by Host, VM, or Datastore

- IS-DEV-VCENTER
  - HQ
    - Discovered virtual machine
    - Old VMs
    - per-vm-team
    - Tina
    - is-dev-cloud
    - is-dev-cloud-1
    - is-dev-cloud-2
    - is-dev-db-portaldb-1
    - is-dev-db-portaldb-2
    - is-dev-db-portaldb-vip
    - is-dev-nas-1
    - is-dev-nas-2
    - is-dev-nsdiag
    - is-dev-rhel6-base-template
    - is-dev-tableau81
    - is-dev-vertica1
    - is-dev-vertica2
    - is-dev-vertica3
    - is-dev-web
    - is-dev-web-1
    - is-dev-web-2
    - is-dev-web-prodtest
    - IS-Infra-UpdateServer
    - is-jenkins
    - is-nexus
    - is-puppet
    - is-qa-infosight01
    - is-qa-QA_alphas
    - is-qa-standalone
    - is-qa-standalone-2

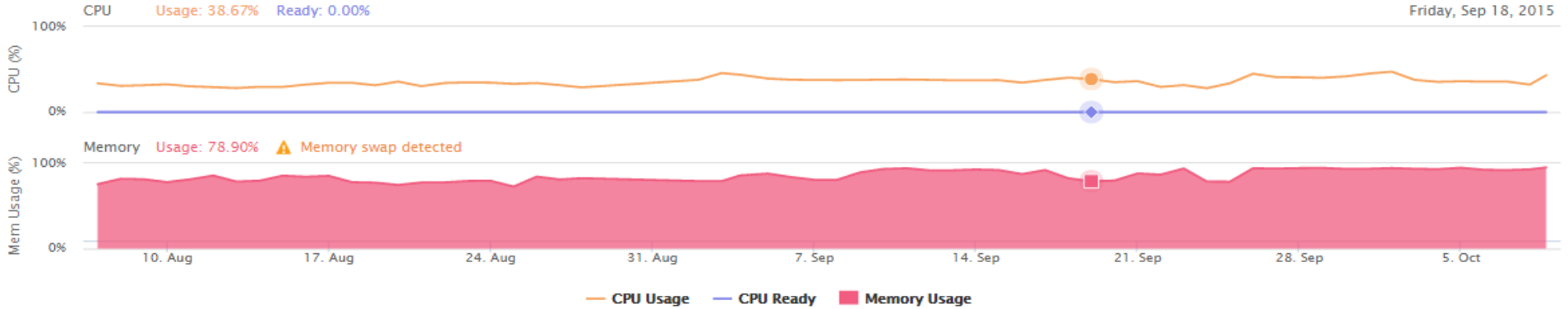
test nsdiag-1

Virtual Machine Latency

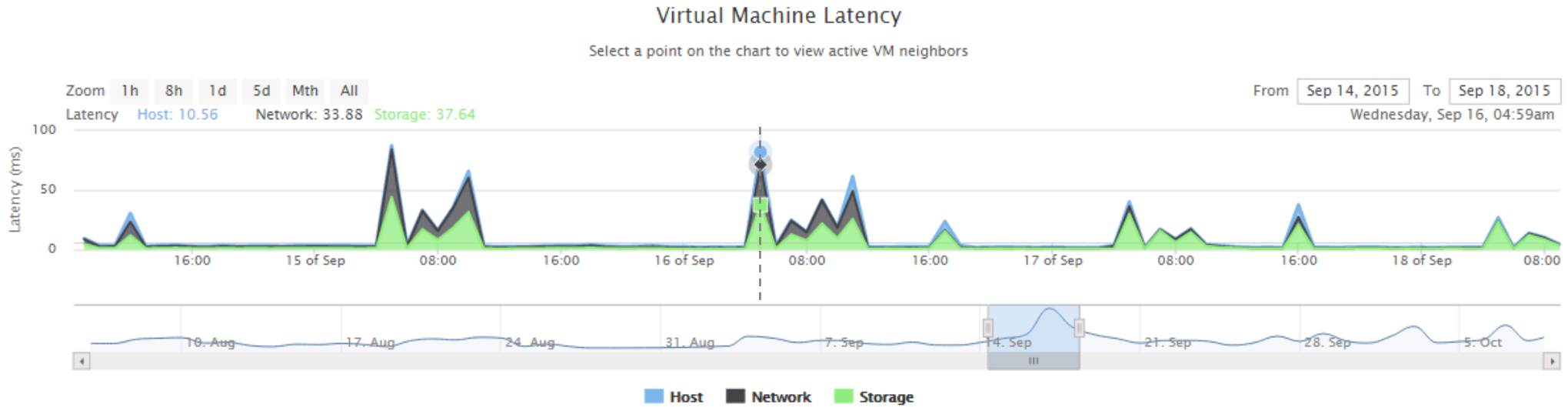
Select a point on the chart to view active VM neighbors



Host Performance



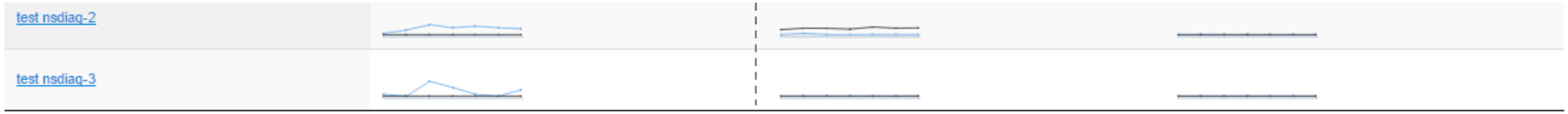
test nsdiag-1



Neighboring VM activity as of: **Wednesday, Sep 16, 04:59am**

VMs are considered neighbors if they have one or more virtual disks residing on the same datastore.

Virtual Machine Name	IOPS	MBPs
test nsdiag-2	100	0
test array-dispatcher	60	0
is-dev-nsdiag	0	0
test nsdiag-3	0	0



Showing 1 to 4 of 4 entries

Previous 1 Next

vmware

Storage Analytics

Powered by INFOSIGHT

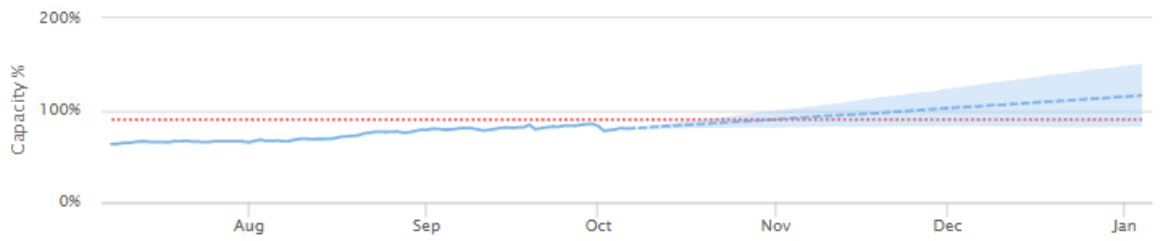
vmware

Assets /

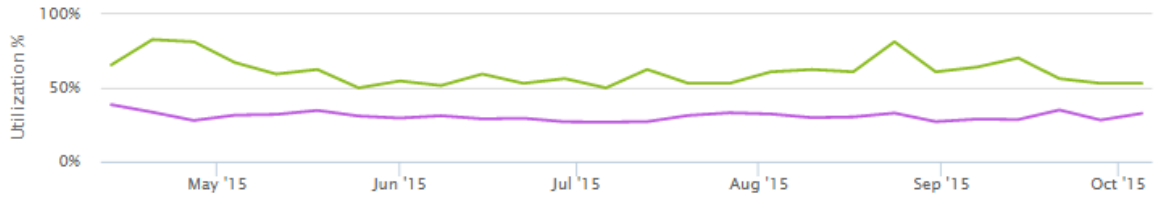
ap-nimble1 | S/N | Model: CS500 (+3 shelves) | Version: 2.2.3.0-167018-opt | Group: Group1 | Pool: default

Overview | Performance | Cache

Capacity Trend



Resource Utilization



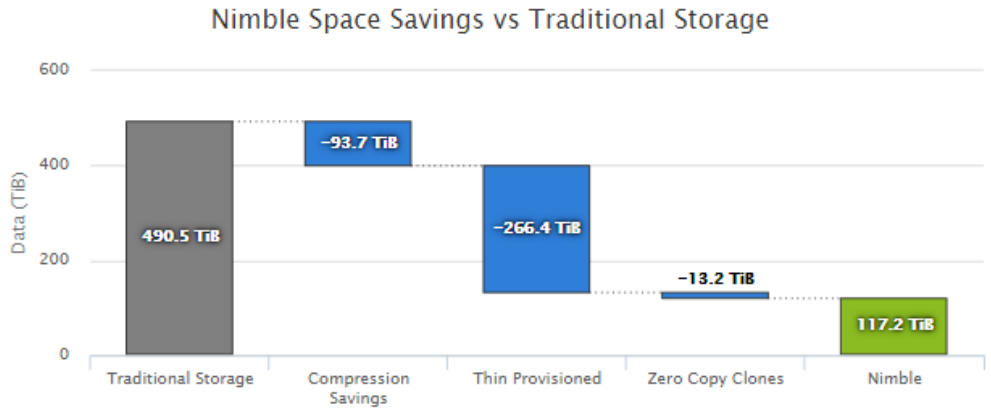
Wellness Summary

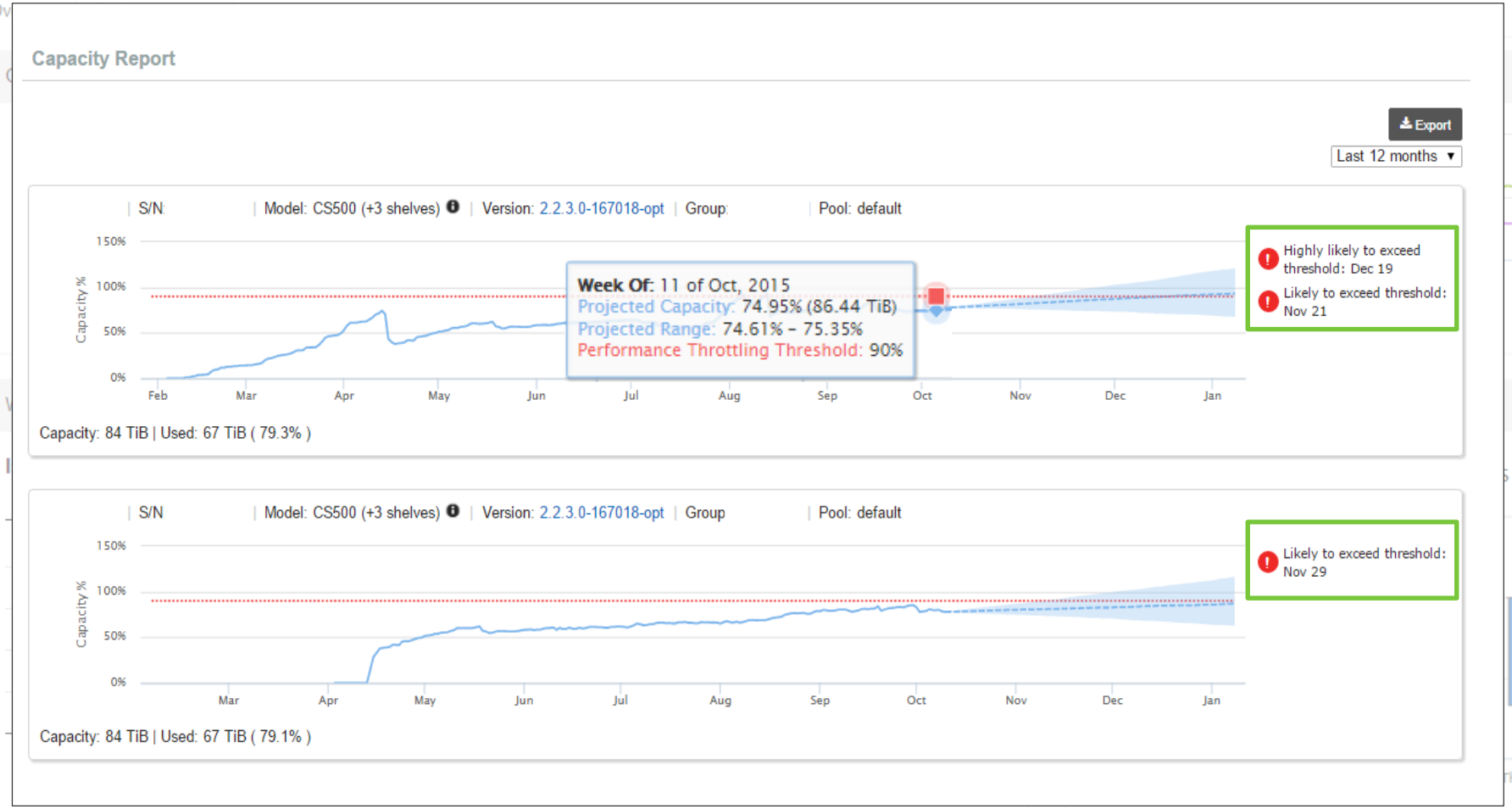
Issue Summary

	Critical	Urgent	Important	For Review
Arrays			2	1
Pools				
Volume Collections				
Volumes				
Snapshots				

Include ack'd

Space Savings





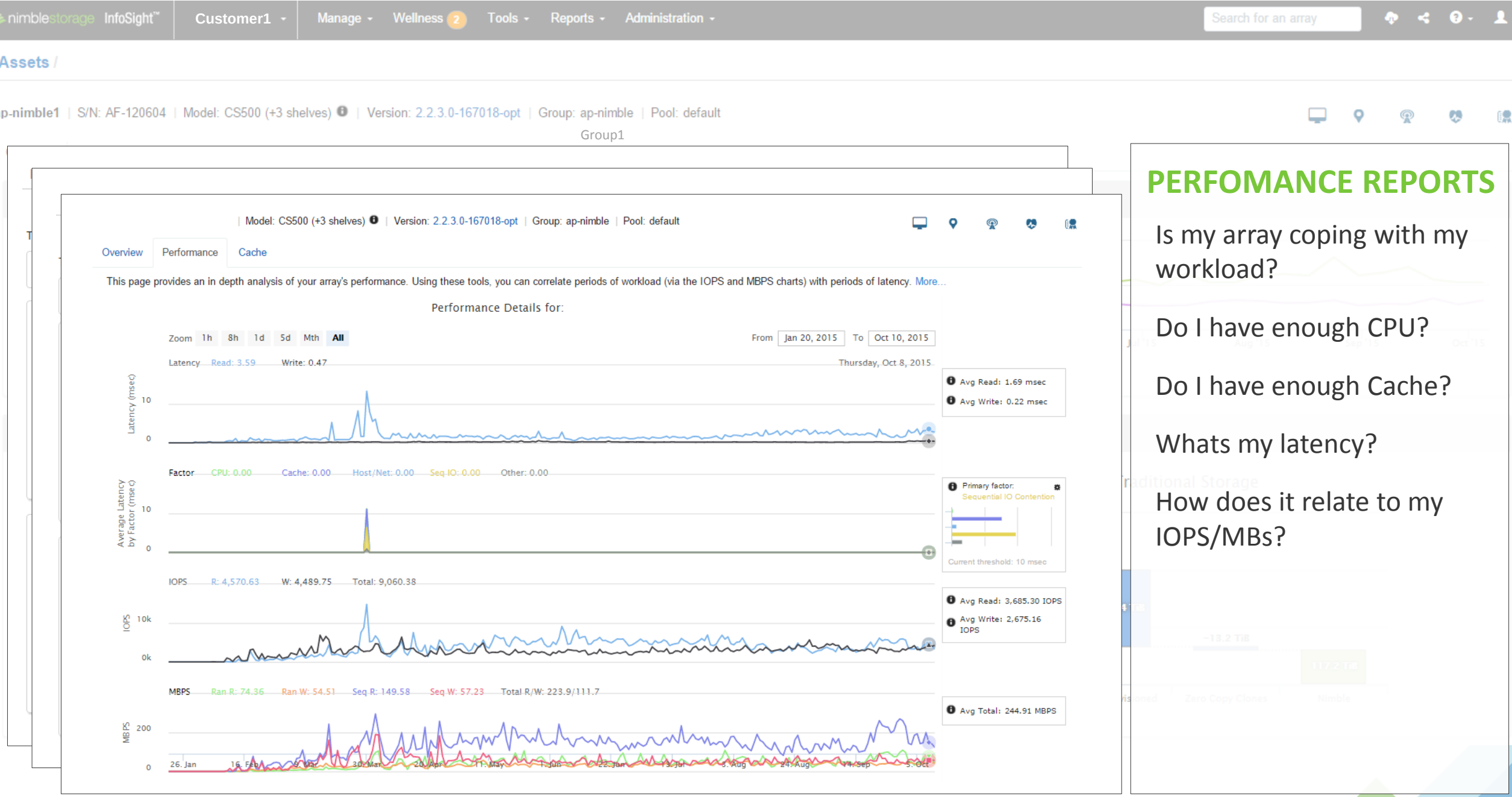
CAPACITY REPORTS

Whats my capacity trend?

How much space have I used?

How much free space do I have?

When am I likely to run out of space?



PERFOMANCE REPORTS

Is my array coping with my workload?

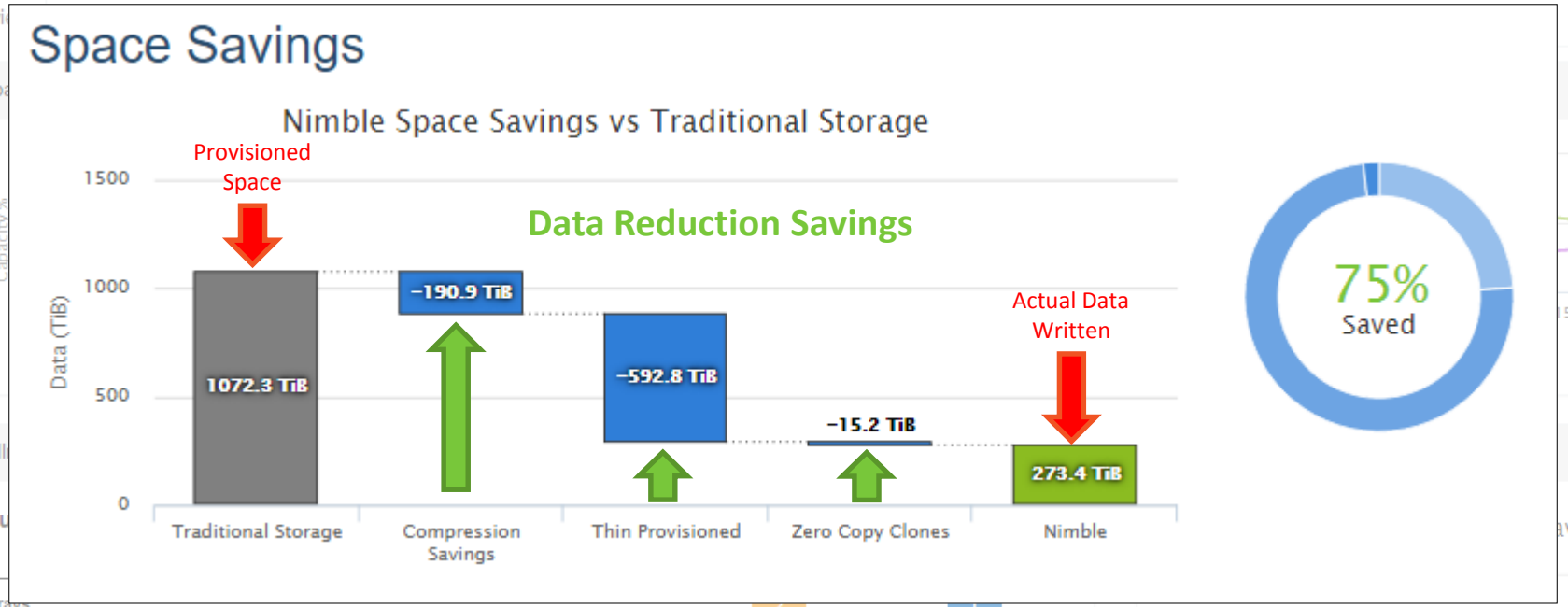
Do I have enough CPU?

Do I have enough Cache?

Whats my latency?

How does it relate to my IOPS/MBs?

vmware



DATA REDUCTION

How much space have I provisioned?

How much data have I actually written?

Where are those space savings coming from?

- Compression
- Thin Provisioning
- Zero Copy Clones

DATA PROTECTION REPORTS

What data am I protecting?

What's my RPO based off my snapshot schedule?

How long am I retaining snapshot backups?

What data is being replicated?

Summary

InfoSight
Cloud-based
management/support/analytics

- Infosight changes the way you manage storage and virtual environments
- Eliminates manual performance analysis and troubleshooting
- Per VM monitoring enabled through the Nimble Storage Vmware plugin
- No additional cost or licensing
- No additional hardware or software

成功案例 – 淡江大學

nimblestorage

淡江大學採用Nimble智慧快閃儲存平台 滿足雲端環境儲存需求

淡江大學自1950年創設迄今，歷經65年歲月，已發展成為擁有淡水、台北、蘭陽、網路等4個校園的綜合型大學；其長期秉持「國際化、資訊化與未來化」教育理念，IT佈局向來精準縝密，一直是國內大專院校參考範本。

淡江大學資訊處網路管理組　蕭明清組長

Nimble Storage CS300

早在2006年，淡江大學即採用VMware ESX2.1，從一台伺服器虛擬化開始做起，迄至今日，原本散見不同單或系所的IT硬體基礎設施，多已化零為整，由單一虛擬化雲端平臺台集中納管計算資源；肩負此維運任務的資訊處網路管理組統計，在該組看管的34項資訊系統中，多達29項已導入虛擬化，比重可謂不低。然而在運算資源池佈建有成之餘，淡江大學資訊處網路管理組長蕭明清仍有掛念，意即既有系統採用的儲存設備，自2011年啟用至今，保固期已屆終止，也經常因容量不敷使用，及附加軟體功能(譬如狀態監控、備援、備份等等)的昂貴授權費用而滋生困擾，長此以往，唯恐導致雲端應用大局橫生阻礙，必須儘速解決。

為此蕭明清決定更新儲存系統，考慮換置一套更符合需求的高效能儲存設備；緊接著，網路管理組同仁緊鑼密鼓展開測試作業，幾經嚴謹的評估與驗證，最終擇定導入**Nimble Storage的CS300智慧快閃儲存陣列，且規劃引進兩座，分別建置於不同建築物，透過該儲存內建之區塊級快照保護資料，再藉由光纖網路互相抄寫備援，採雙資料中心架構以滿足高可用性需求。**

- **Nimble內建所有完整功能授權　全然不需擔心後續成本負擔**

針對新儲存設備的遴選原則，蕭明清不諱言指出，為確保IT預算花在刀口上，因此務先觀察建置成本的合理性，且需要評量的成本結構，除了設備本身硬體價格多寡，亦需一併考量附加軟體功能或空間授權方式，只因很多的功能擴充成本，實在讓校方不敢領教；除成本外，舉凡效能、穩定性、容量等基本要件，自然也不容馬虎，總而言之，網路管理組的任務，便是選擇性價比優異的儲存系統。

- **Nimble Storage 快取加速循序配置(Cache Accelerated Sequential Layout)架構**

讓整體系統效能高出數倍，且提供高速的快照技術(redirect on write)，不管進行多少份資料快照，儲存效能全然不受任何影響。再者，Nimble Storage提供良好的擴展性與升級路徑，用戶若遇效能或容量，可在不停機下升級控制器、擴充磁碟櫃，也能在不停機下升級儲存系統版本(Nimble OS)，無論如何都不會影響應用服務運作，使蕭明清大為激賞。

- **在線壓縮及精簡配置功能　使空間配置需求驟減**

針對效能、容量與擴展性，Nimble Storage表現同樣不含糊。其支援全時運作的內嵌式壓縮，經實測在虛擬化環境中，平均可讓1TB實際容量發揮1.7TB(1.7倍壓縮比)運用價值，某些應用甚至可達2~3TB(2~3倍壓縮比)，另外搭配精簡配置(Thin Provisioning)，更可謂如虎添翼；蕭明清藉由InfoSight數據檢測，該校既有62TB儲存空間，拜在線壓縮(In-line Compression)、精簡配置兩項功能加乘所賜，竟大幅節省97%，再也無懼使用單位申請時高估用量而佔據大量空間。

vmware

Globe Reference Customers

nimblestorage

Installed base of over 6,000 midsize and large enterprise customers and 2600 deployments with over 280 new customers being added every quarter

vmware

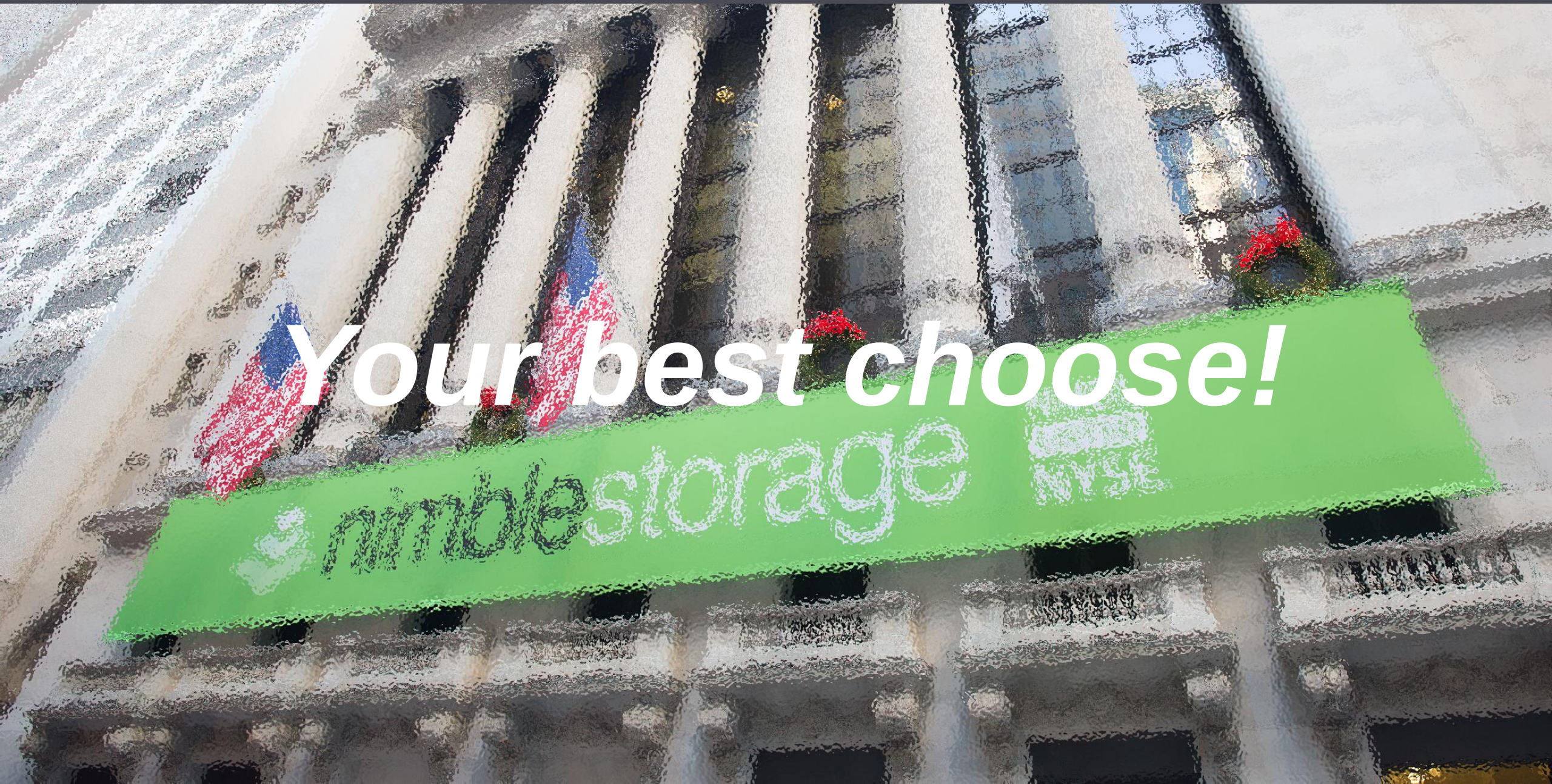
APJ Reference Customers

nimblestorage

Telcos	Service Providers	Government	Health	Finance	Education
Telstra	FUJITSU	Parliament of Victoria	Epworth HealthCare	SUNCORP	DEAKIN UNIVERSITY AUSTRALIA
NTT Communications	uecomm Powering Network Convergence	Cabinet Office	Royal Flying Doctor Service of Australia	IOOF	The University of Queensland Australia
SK telecom	dreamscape	Tasmania Police	국립암센터 National Cancer Center	Grant Thornton	大阪大学 Osaka University

Services	Retail	E-Commerce	Manufacturing	Utilities	Media & Ent
Deloitte.	STAPLES	YAHOO! JAPAN	Fonterra	State Grid Corporation of China	NRL
Sequoia Capital	Jeanswest	Rakuten	HONDA	North East Water	Melbourne Olympic Parks
pwc	cash converters	coupang Color Your Days	Mitsubishi Electric	Gippsland Water	Singapore Press Holdings

vmware


Your best choose!
nimblestorage


nimblestorage

READY
FOR ANY
vForum2015