

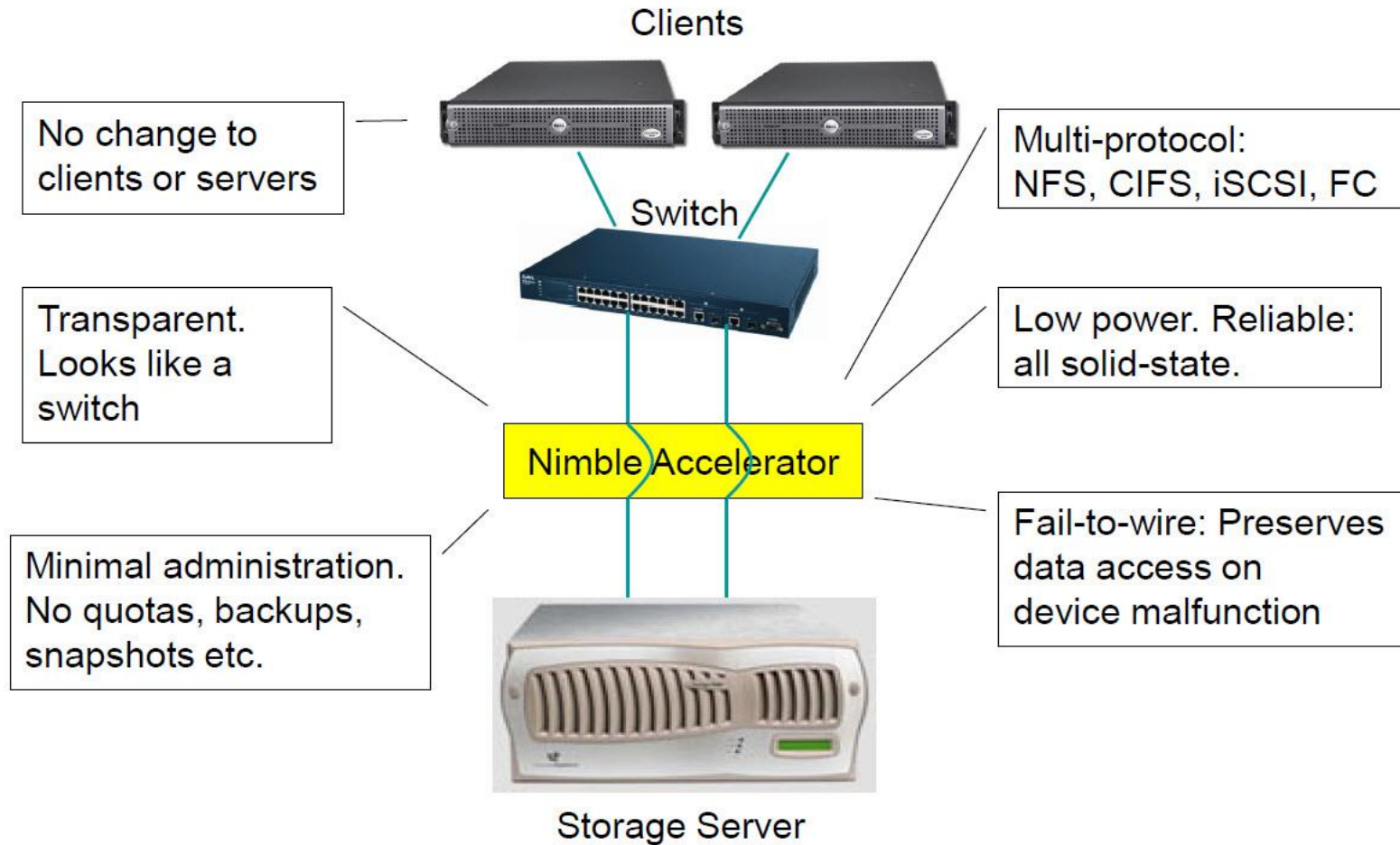
Hewlett Packard
Enterprise

Accelerating Business Outcomes by leveraging Intelligent Storage

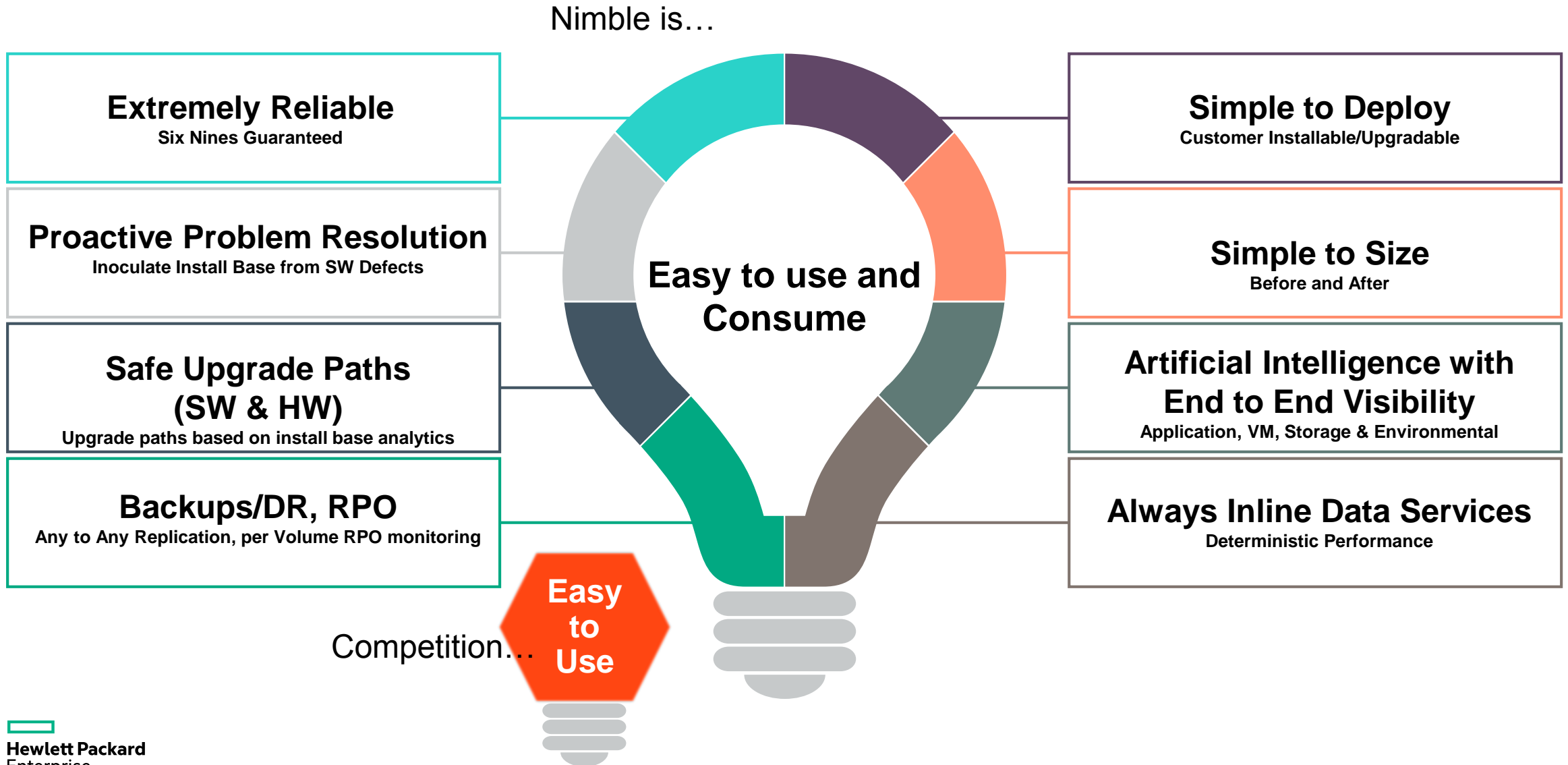


Nimble Storage 101: The Early Days

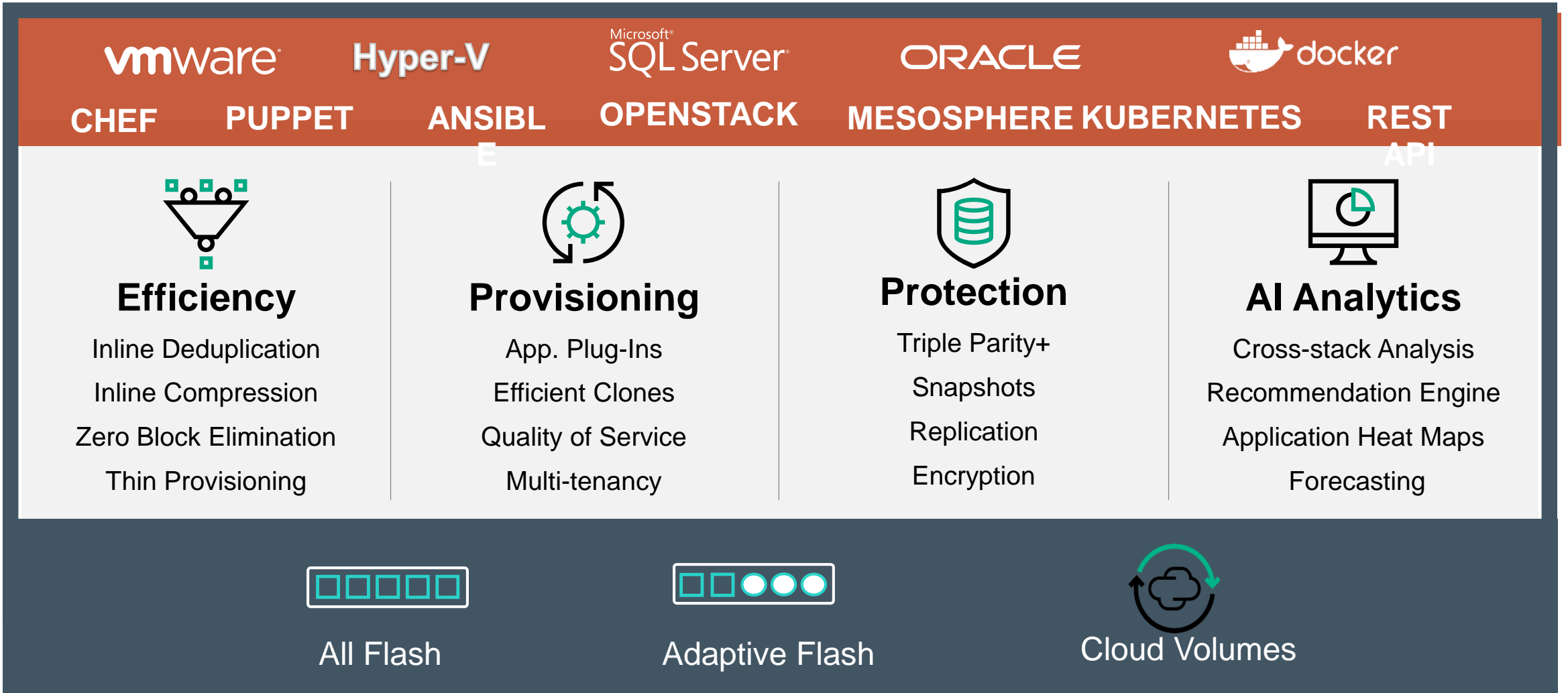
The Accelerator Appliance



Why does Nimble win?



Always-On App-Centric Data Services



Leading AI for Hybrid Cloud

Collecting and Analyzing Millions of Sensors per Second

Customer Impact



Predictive Support Automation



Preemptive Recommendations



Proactive Management



Continuous Improvement

Cloud-Based AI Platform



Predictive Analytics Engine



Global Learning



Recommendation Engine

Cross-Stack Telemetry

vmware

ORACLE

Microsoft
SQL Server

Exchange

Compute

Network

Storage



Identifying Root Cause & Solution

VM Details

VM: test5-arraydispatche x

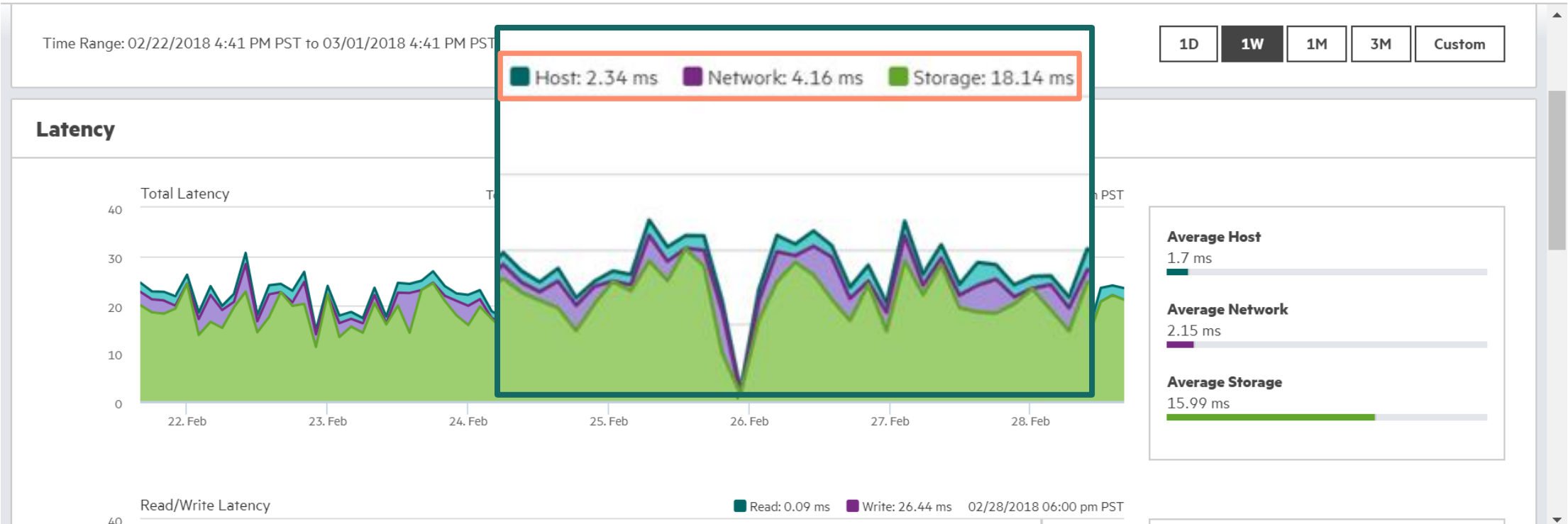
Secure | <https://infosight.hpe.com/tenant/Nimble.Tenant.0018000000ovsdmAAA/infrastructure/virtualization/vmware/vms/1001387900064>

HPE InfoSight™ Dashboards Infrastructure Resources Nimble Storage Customer Nimble Storage - Infosight

VMware Datacenters Clusters ESXi Hosts Datastores VMs

VM test5-arraydispatcher1

vCenter: is-vcenter.lvs.nimblestorage.com Datacenter: [LVS-ISDEV](#) Cluster: [Cluster5](#) Host: [lvsisdev1-13-u43-esx14.lvs.nimblestorage.com](#)
Datastore: [test5-misc1](#) Volume: [test5-misc1](#)



Identifying Source of Latency

Pool: vertica-array2-test3 x

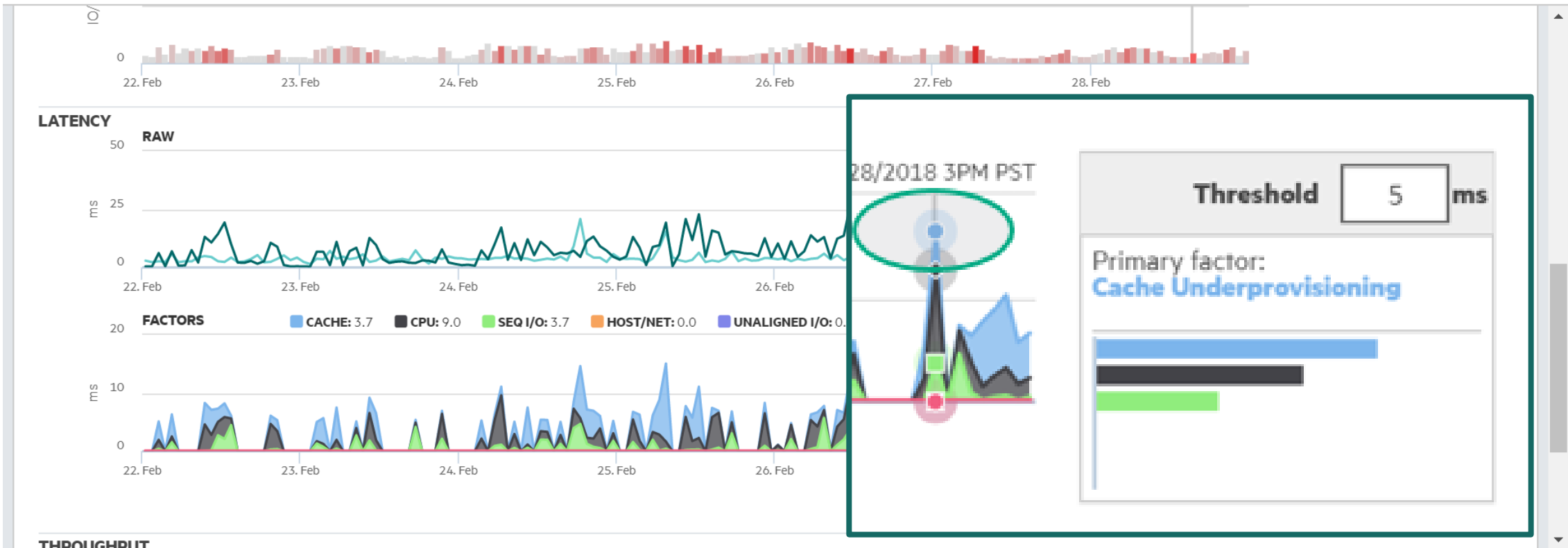
Secure | https://infosight.hpe.com/tenant/Nimble.Tenant.0018000000ovsdmAAA/infrastructure/storage/nimble/pools/0a330cb19a9a5de76000000000000000000000001?...

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Nimble Storage Pools Arrays Volumes

Pool vertica-array2-test3 (default)

Group: vertica-array2-test3 Volumes: 32 Array: lvs-is-u7-dev33-array-02 (AF-108038)



AI Engine: Recommendation

Executive Dashboard | HPE x

Secure | https://infosight.hpe.com/tenant/Nimble.Tenant.0018000001AC5ppAAD/dashboards/nimble/executive

⚠ NimbleOS 2.1.9.1 is no longer supported. These arrays should be upgraded: scooby-snack (AC-103022)

HPE INFOsight | Dashboards | Infrastructure | Resources | Nimble Storage - IT

Nimble Storage | Operational | **Executive** | Wellness | Capacity | Labs

Upgrade Needs

Note: Upgrade recommendations are based on the last 4 weeks of activity.

rtp-nmbi-01 | S/N: AF-106897 | Model: CS460G-X2 (+3 shelves) | Version: [2.3.18.0-394708-opt](#) | Group: rtpnm

ⓘ Upgrade Recommended

	Current	Recommended
Controller	CS400 Series	
Cache		
Head Shelf:	2,400 GB	2,400 GB
All-Flash Shelf:	0 GB	3,200 GB
HDD Shelf:	1,800 GB	1,800 GB
Total:	4,200 GB	7,400 GB
Capacity		
	171 TB	

sjc-nmbi-exch-01 | S/N: AC-103821 | Model: CS460G-X2 (+1 shelf) | Version: [2.3.16.0-364135-opt](#) | Group: sjc-nmbi-exch-01 | Pool: default

InfoSight: Host & VM Recommendation Engine

Environment Status

VM performance is degraded due to the overprovisioning of virtual CPU cores, which is creating scheduling contention. VM latency is elevated.

- Virtual CPU Overprovisioning
- Elevated Latency

Diagnosis

VM performance is degraded due to the overprovisioning of virtual CPU cores, which is creating scheduling contention.

Recommendations

- Move **impacted** VMs to a Host with a significantly lower ratio of virtual CPU to physical CPU cores.
- Reduce the number of virtual CPUs allocated to **overprovisioned** VMs.
- Reduce the overall number of virtual CPUs provisioned on the Host(s) used by **impacted** VMs.

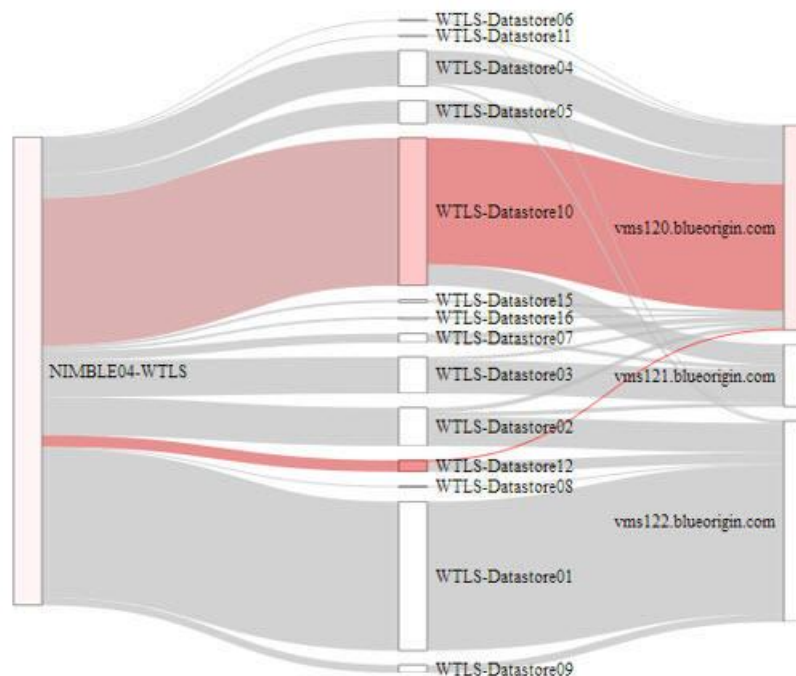
VM Details

The virtual machines below are first sorted by recommendation **label** and then in order of descending cpu contention. Only virtual machines with recommended actions are displayed.

Name	Status	CPU CoStop+Ready %	vCPU Count	CPU Usage %
TXITR-SKYDB-V01	impacted overprovisioned	4.92	8	1.73
TXITR-SWFNSQL-V01	impacted overprovisioned	4.11	8	4.41
TXITR-SKYMOM-V01	overprovisioned	2.04	4	1.85
wtls-bdms07	overprovisioned	0.87	8	0.83

Treemap Sankey

This sankey chart shows the relationships between storage arrays (left), datastores (center), and hosts (right); the width of the lines connecting them represents the amount of IO traffic. The color of each array, datastore, and host denotes how much CPU contention (i.e. CPU ready and costop) is occurring on the associated virtual machines.



InfoSight: Host & VM Recommendation Engine

Nimble Storage | Operational | Executive | Wellness | Capacity | **Labs**

InfoSight Labs / Cross Stack Recommendations Give Feedback

Select a Date Range: 2019-02-20 to 2019-02-27 Analyze

is-vcenter.lvs.nimblestorage.com

Environment Status
VMs are utilizing nearly all of the vCPU resources allocated to them. VM latency is elevated.

● Virtual CPU Underprovisioning ● Elevated Latency

Diagnosis
VMs are utilizing nearly all of the vCPU resources allocated to them.

Recommendations
Assign additional virtual CPUs to **underprovisioned** VMs targeting vCPU utilization under 90%.

VM Details
The virtual machines below are first sorted by recommendation label and then in order of descending cpu contention. Only virtual machines with recommended actions are displayed.

Name	Status	CPU CoStop+Ready %	vCPU Count	CPU Usage
test-pachinko2	underprovisioned	0.08	4	116.56
test-pachinko1	underprovisioned	0.07	4	118.66
test-search-content1	underprovisioned	0.07	4	93.51
test2-streamdb2	underprovisioned	0.01	1	122.67
test2-streamdb3	underprovisioned	0	1	124.99

Treemap **Sankey**

The more of this treemap that is colored, the more widespread the issue. Square size indicates the CPU utilization of each virtual machine as expressed in number of virtual CPU cores. The color of each virtual machine denotes the CPU utilization as expressed as a percentage of virtual cycles allocated to it.

0 50 100 150

HPE InfoSight: AI for the Data Center

Extending HPE InfoSight Across HPE



Storage



Servers



Networking



Converged



Thank You

Tony Huk, Senior Storage Technical Architect