



**Hewlett Packard
Enterprise**

혁신에 혁신을 더하다

CI + HCI = HPE NIMBLE STORAGE dHCI 소개

HPE Category Manager 이예린 대리

CI (CONVERGED INFRASTRUCTURE) 의 출현

IT 인프라 구축의 비효율성 해결

- ☑ VM환경에서 검증된 인프라 제공
- ☑ 사전에 정의된 형태로 민첩하게 확장
- ☑ 서버/스토리지 개별 확장이 가능하여 예측 불가능한 확장에 유연하게 대응
- ☒ 관리의 복잡성 : 개별 관리 필수



Compute



Storage

가상화 환경에서의 민첩성과 유연성 확보



HCI (HYPER CONVERGED INFRASTRUCTURE)의 출현

IT 인프라 운영, 관리의 비효율성 해결

- ☑ Software-defined, Scale Out 기술 적용
- ☑ vCenter와 완벽한 통합으로 단일 통합 관리
- ☑ 인프라 3-tier 통합 (Server/Storage/Network)
- ☑ 정책 기반 자동화
- ☒ 노드 단위 확장으로 폐쇄성 존재
- ☒ 균일하지 않은 스토리지 성능, 가용성



COMPUTE + STORAGE

인프라 티어 통합을 통한 민첩성 극대화



HCI 에 대한 고객의 니즈



CI 와 HCI 의 장점을 결합하고 단점을 개선하면 어떨까?



Compute



Storage

VM환경에서 검증된 인프라 제공
서버/스토리지 개별 확장으로
예측 불가능한 확장에 유연하게 대응
~~서버 & 스토리지 site: 개별 관리~~



COMPUTE + STORAGE

완벽한 통합 관리
민첩성 극대화
~~균일하지 않은 스토리지 성능 & 가용성~~
~~노드 (서버+스토리지) 단위 확장~~



HPE Nimble Storage dHCI

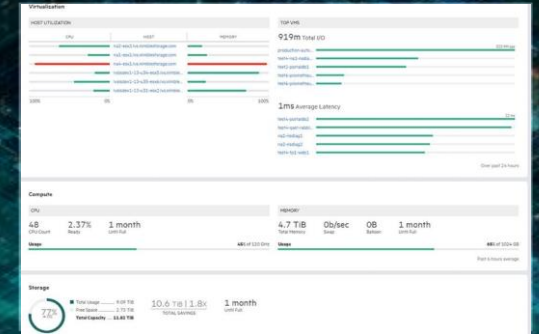
CI와 HCI의 장점을 결합하고 단점을 극복하다

Disaggregated : 분리된

유연한
확장성

고 가용성

통합 관리



CI와 HCI의 단점을 어떻게 극복하였을까?

서버 & 스토리지 Silo : 개별 관리

해결

통합관리 및 모니터링

- HPE Infosight & VMware Vcenter
- 서버, 스토리지, 스위치, VM 모두 하나의 통합 관리 툴로 모니터링
- 쉽고 간편한 관리
- 장애 예측 및 예방 가능

균일하지 않은 스토리지 성능 & 가용성

해결

고성능 고가용성

- 99.9999% 고가용성
- 1ms 미만 응답속도
- Disk 3개 동시 장애에도 서비스 영향 없음
- 무중단 이중화
- 높은 IOPS 제공

서버, 스토리지 단일 확장 불가

해결

유연한 확장성

- 스토리지, 서버 개별 확장 가능
- 불필요한 비용 최소화
- 보유하고 있는 자원 활용 가능

CI와 HCI의 장점을 결합하고 단점을 극복한 HPE NIMBLE STORAGE dHCI

HYPERCONVERGED INFRASTRUCTURE

- ☑ 관리의 간편성
- ☑ VM 중심
- ☒ 고성능 고가용성
- ☒ 확장성

2010

2020

CONVERGED INFRASTRUCTURE

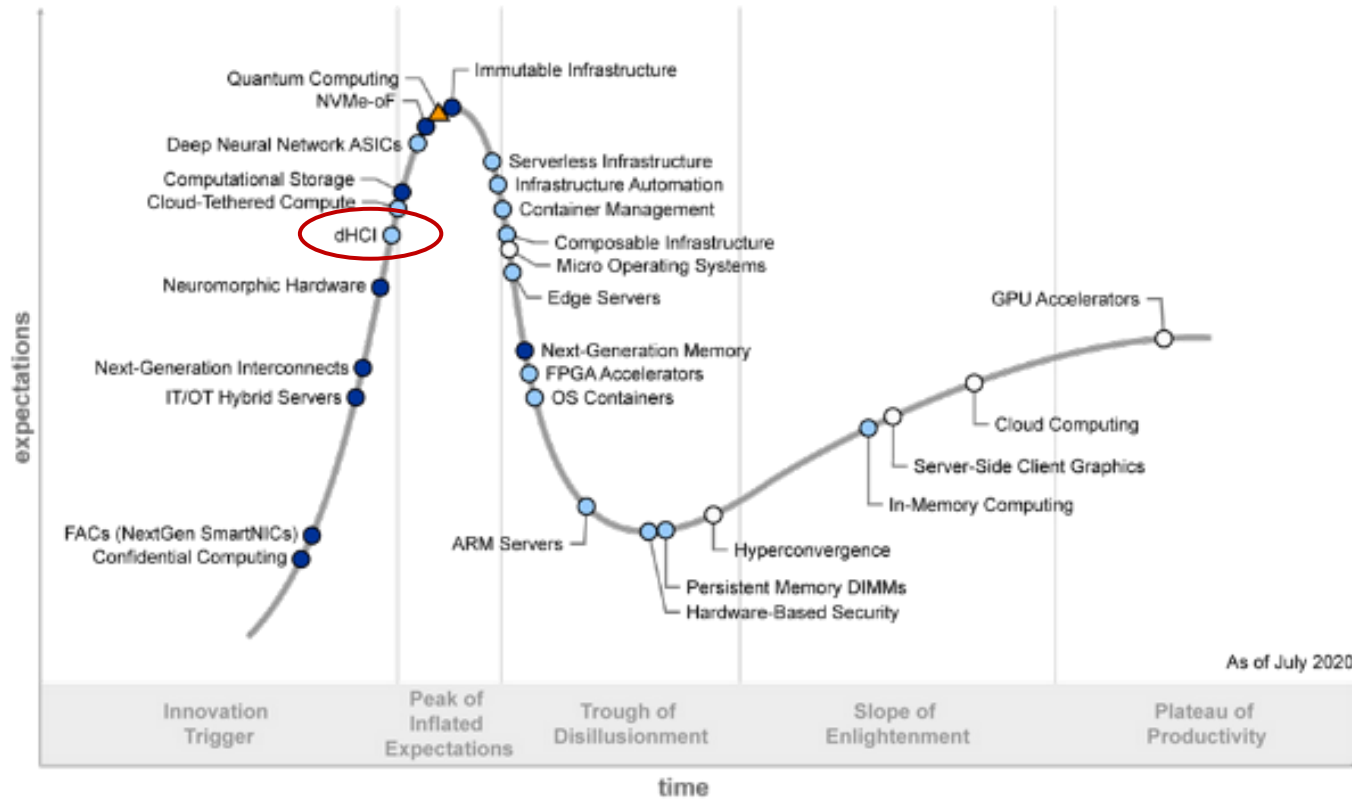
- ☑ 사전 검증된 구성
- ☑ 확장성
- ☒ 관리의 간편성

HPE Nimble Storage dHCI

- ☑ 관리의 간편성
- ☑ VM 중심
- ☑ 고성능 고가용성
- ☑ 사전 검증된 구성
- ☑ 확장성

GARTNER에서 소개한 혁신적이 미래의 HCI 아키텍처 dHCI

Hype Cycle for Compute Infrastructure, 2020



As of July 2020

Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

Source: Gartner
ID: 448100

User Advice: dHCI solutions offer many of the advantages of ECB storage solutions combined with the simplicity and VM-level storage provisioning capabilities of hyperconverged solutions. I&O leaders should evaluate dHCI solutions when they have workloads that:

- Require a mix of different server sizes and configurations.
- Consume large amounts of storage capacity.
- Have unbalanced compute and storage growth requirements.
- Demand extremely high transaction rates or throughput.
- Require predictable latency.

When considering implementing a dHCI solution, I&O leaders should:

- Identify specific workloads or initiatives where a dHCI system would be suitable.
- Implement jointly by server, storage, and virtualization teams, as skills and project alignment from all three is required.
- Deploy first as a proof of concept to ensure performance, availability, automation, and ease-of-use expectations are met.

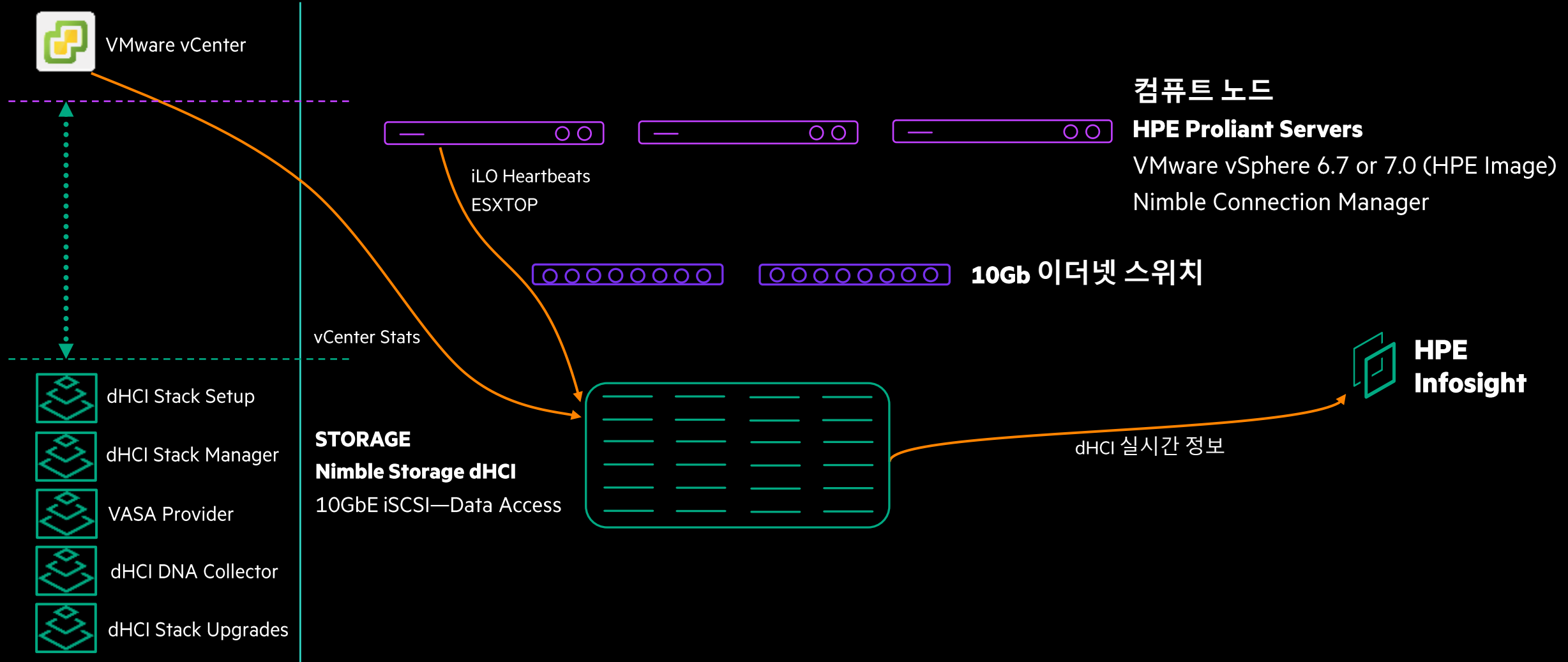
Business Impact: dHCI can provide increased agility, reduced service costs as well as increase the likelihood of meeting service levels. I&O leaders who successfully implement a dHCI solution will view dHCI as a strategic investment that enables an automated, agile architecture that delivers the flexibility and scalability required for modern business.

HPE Nimble storage dHCI 상세 소개

아키텍처 및 특징점

HPE NIMBLE STORAGE dHCI 의 아키텍처: HCI 완벽 구현

관리 플레인



HPE NIMBLE STORAGE dHCI 의 구성



HPE
INFOSIGHT

Full Stack AI-Ops



네트워크

2 x Validated 10GbE Network Switches
StoreFabric M-Series, FlexFabric 57x0/59x0, Aruba 8300



관리

VMware vCenter®
Integrated HPE Nimble Storage dHCI Stack Setup
Integrated HPE Nimble Storage dHCI Stack Manager
Integrated HPE Nimble Storage dHCI Stack Upgrades



하이퍼바이저

VMware vSphere® 7.0 or 6.7
VMware vSphere® 6.5



컴퓨트

AMD—HPE ProLiant DL325 / DL385 Gen10/Gen10+
Intel—HPE ProLiant DL560 / DL580 Gen9/Gen10
Intel—HPE ProLiant DL360 / DL380 Gen9/Gen10
10 GbE Networking



스토리지

HPE Nimble Storage Gen5 AF-SCM (iSCSI)
HPE Nimble Storage Gen5 AF (iSCSI)
HPE Nimble Storage Gen5 HF (iSCSI)



유연한 구성 방안 제공

GREENFIELD

: HPE의 신규 HCI 솔루션 제공

신규
HPE or Aruba
10GbE 스위치



신규
Proliant Gen10 서버
vSphere by HPE



신규 Nimble AF/HF
스토리지
(NO NEED FC-SAN)



BROWNFIELD

: 스위치와 HPE 서버 보유하고 있는 고객
비용 및 자원 효율적인 HCI 솔루션 제공

고객사 보유
10GbE 스위치



고객사 보유 Proliant 서버
고객사 보유 vSphere



신규 Nimble AF/HF
스토리지
(NO NEED FC-SAN)

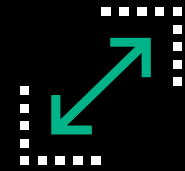


HPE NIMBLE STORAGE dHCI의 특징



Simple to deploy

15분 이내 모든 구성 완료



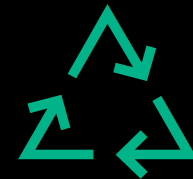
Simple to scale

서버 & 스토리지 자원을 유연하게 확장 가능



Simple to support

AI 기반 자동화 된 support 및 장애 예측 예방



Simple to manage

VM 중심의 데이터 서비스 및 자원 관리 (NOT Hardware)

HCI 경험을 그대로 제공

SIMPLE TO DEPLOY: 쉽고 빠른 설치 배포 가능

Traditional 3-Tier

HPE Nimble Storage dHCI

Component	Task	Time	Time
Network Switches	Initialize Switches	30min	30min
	Configure VLAN	15min	15min
	Configure port	15min	15min
	Configure Best Practices	15min	15min
> 60 min ESXi Host (For Each Host)	Configure ILO IP	2min	-
	Configure ILO NTP	2min	-
	Configure ILO DNS	2min	-
	Configured Raid	5min	-
	Configure Bios	5min	-
	Install VMware ESXi	15min	-
	Install Nimble NCM	5min	-
	Configure Call Home	5min	-
> 60 min Storage	Initialize storage array	15min	2min
	Create Raid	5min	-
	Configure iSCSI (Configure ports)	15min	-
	Create iSCSI Initiator (Per server)	5min	-
	Configure Best Practice	60min	-
> 60 min vCenter (For Each Host)	Configure Management network	5min	-
	Configure ESXi NTP	2min	-
	Configure ESXi DNS	2min	-
	Create iSCSI vSwitch	10min	-
	Create VMK interface	10min	-
	Create iSCSI software initiator	10min	-
	Configure Best Practice	60min	-
> 60 min vCenter (For Each Array)	Register vCenter Plugin	30min	-
	Create vSphere Cluster	5min	-
	Enabled HA/DRS	5min	-
	Configure Multipath	5min	-
	Create Datastore (1 x VMFS)	5min	-
	Configure Best Practice	60min	-

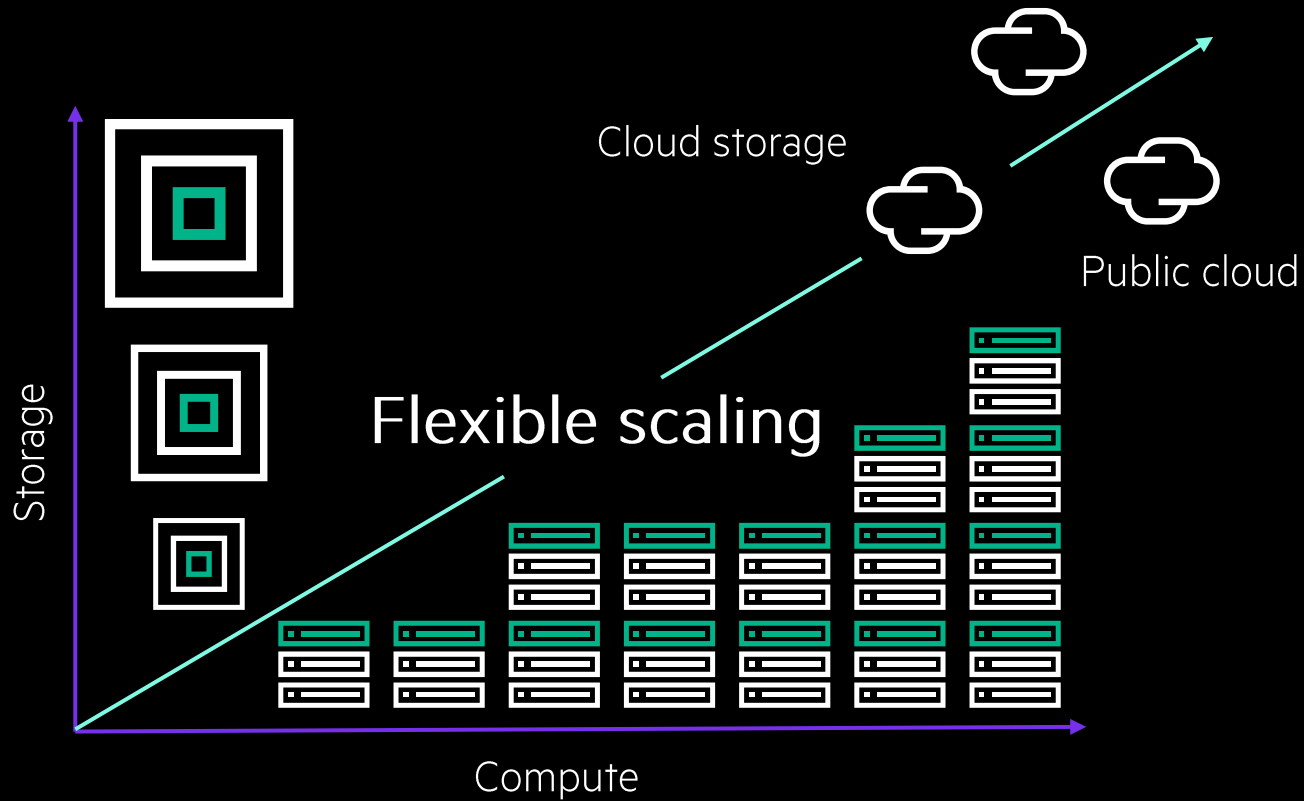
1 min
With dHCI stack setup

1 min
With dHCI stack setup

1.5 min
With dHCI stack setup

4 min
With dHCI stack setup

SIMPLE TO SCALE: 독보적인 확장성



1

컴퓨터, 스토리지 개별 확장

2

낭비 자원 ZERO

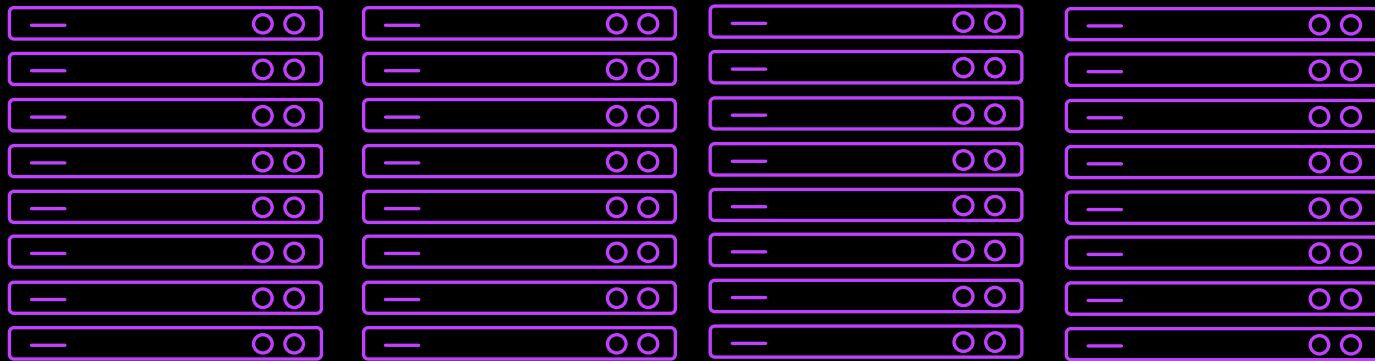
3

필요한 만큼만 확장

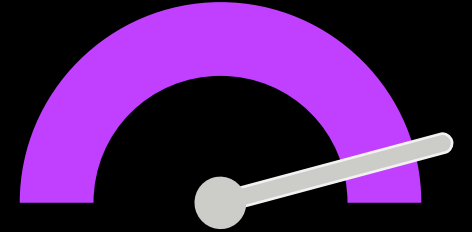
4

무종단 확장

SIMPLE TO SCALE: 독보적인 확장성

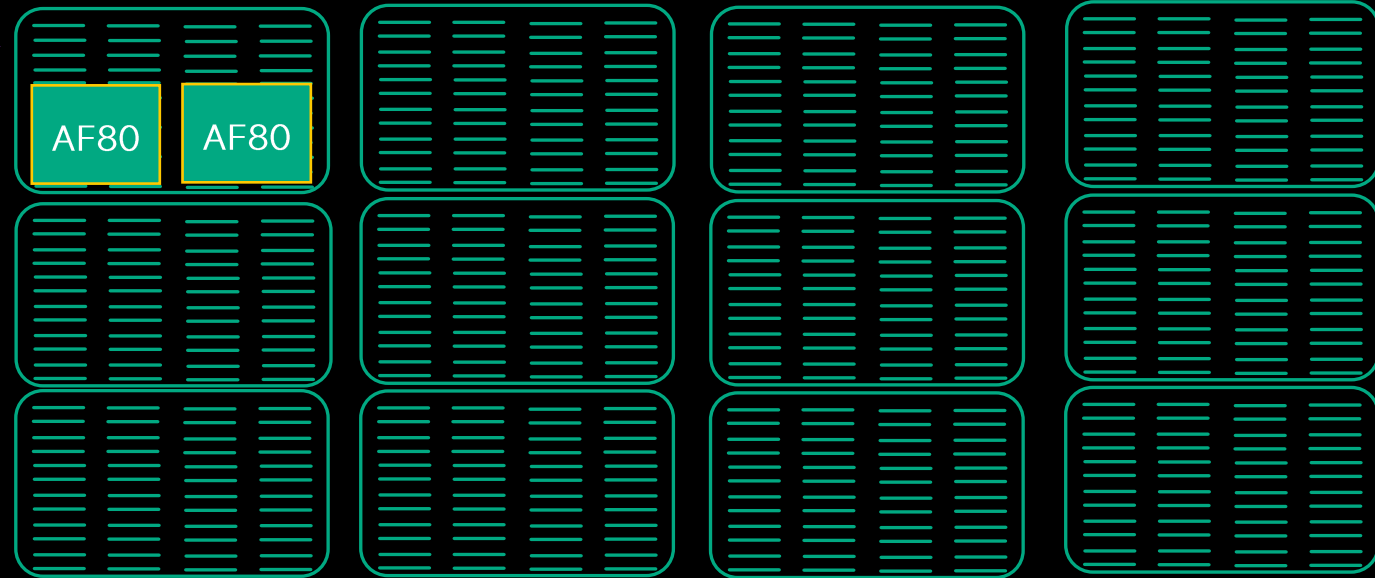


- Start Small
최소 2대 서버
- Scale Exponentially
최대 32대 서버

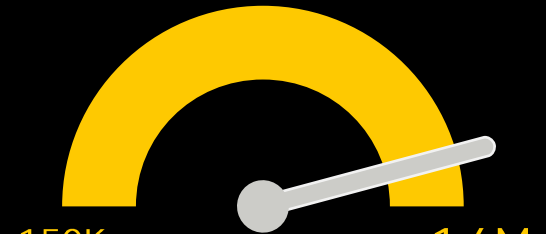


COMPUTE X32

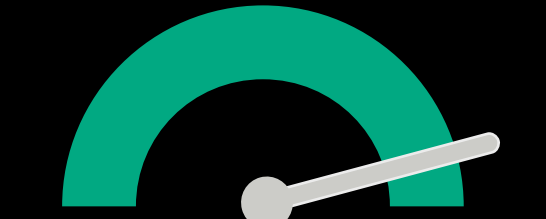
SCALE OUT



- 샤시내 디스크 확장가능
- 상위 컨트롤러로 온라인 업그레이드 가능
- 온라인 무중단 Scale Out 지원
- Scale up 및 All Flash/Hybrid 혼합 확장 지원



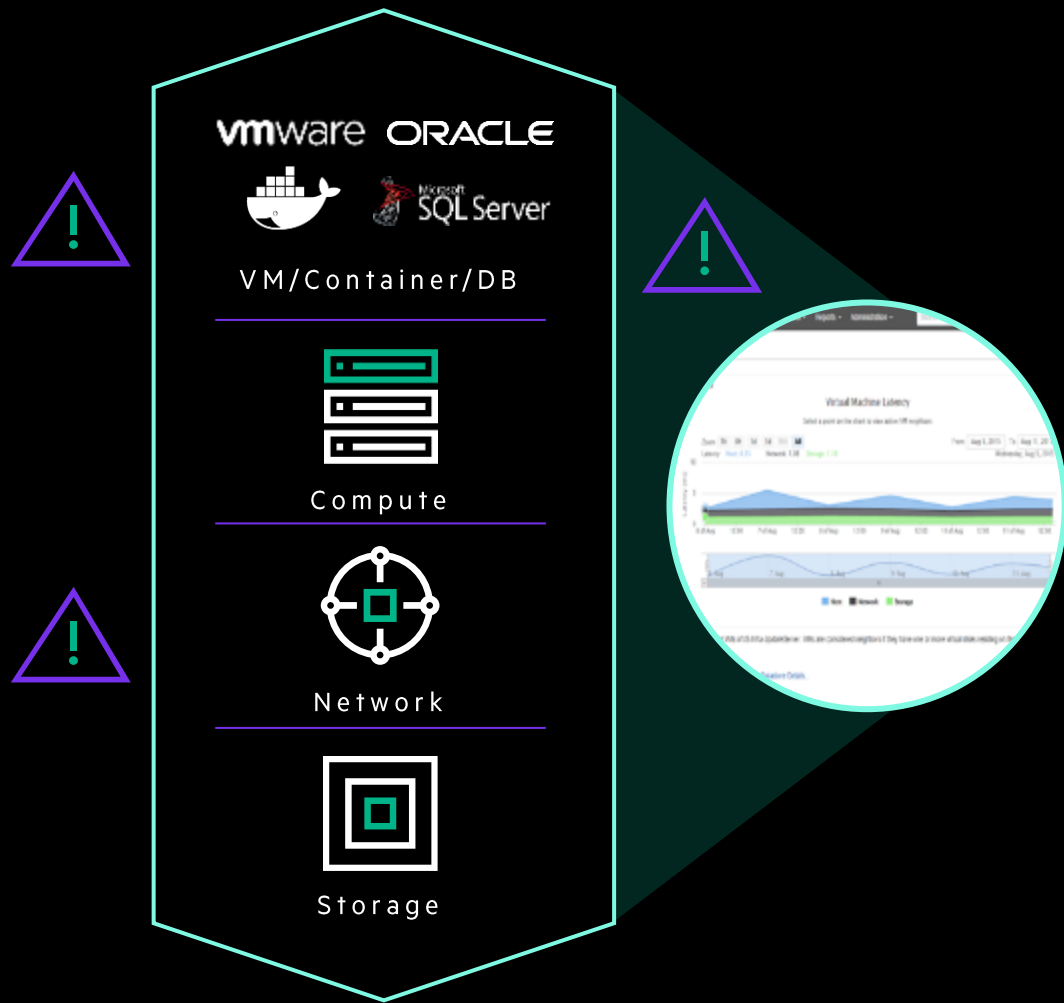
150K IOPS X4 ~1.6M



11TB Capacity X4 >9PB

SCALE OUT

SIMPLE TO SUPPORT: AI 기반 HCI 관리 기능



HPE InfoSight



서버/스토리지/네트워크 통합 분석



성능 이슈 루트 원인 분석



이슈 VM에 대한 즉집계식 파악



비활성 호스트에 대한 알림/권고



최적의 권고사항 가이드

SIMPLE TO MANAGE: vCENTER에서 통합 관리 가능

Software-defined

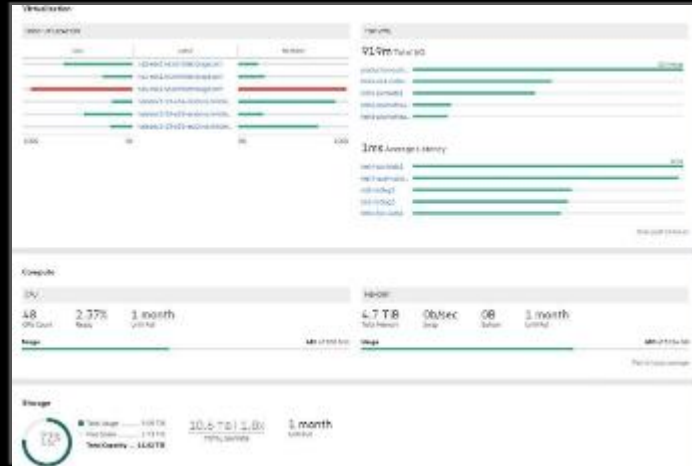
컴퓨터 및 스토리지는 추상화 되고 vCenter를 통해 통합 관리

Auto-discovery

컴퓨터, 스토리지 자원 증설을 ONE 클릭 신속 확장

Virtual Volumes

VM LUN 할당은 추상화 되어 별도로 스토리지 관리 불필요



Policy-based automation

HW 중심이 아닌 VM 중심의 스냅샷, 복제, 복구, 데이터 보호 제공

Integrated planning

장애 예측/예방 및 구성 최적화 자동 가이드

One-click upgrades

서버/스토리지/vCenter/vSphere 통합 + 무중단 +원클릭 라이프 사이클 관리

엔터프라이즈급 HCI 이상의 통합관리 기능 제공

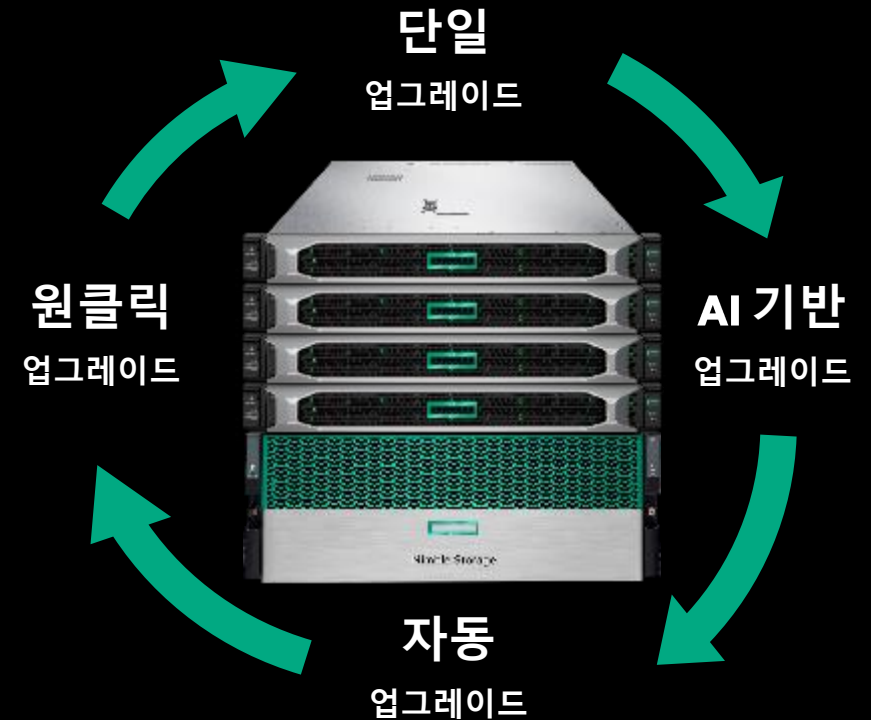
SIMPLE TO MANAGE: ONE CLICK UPGRADE

다양한 펌웨어, 소프트웨어, 버전으로 생긴 복잡성을 **ONE CLICK**으로 해결

- 스토리지 OS 소프트웨어 및 패치
- 가상화 소프트웨어 (vSphere, vCenter)
- 서버 펌웨어
- 기타 서비스팩

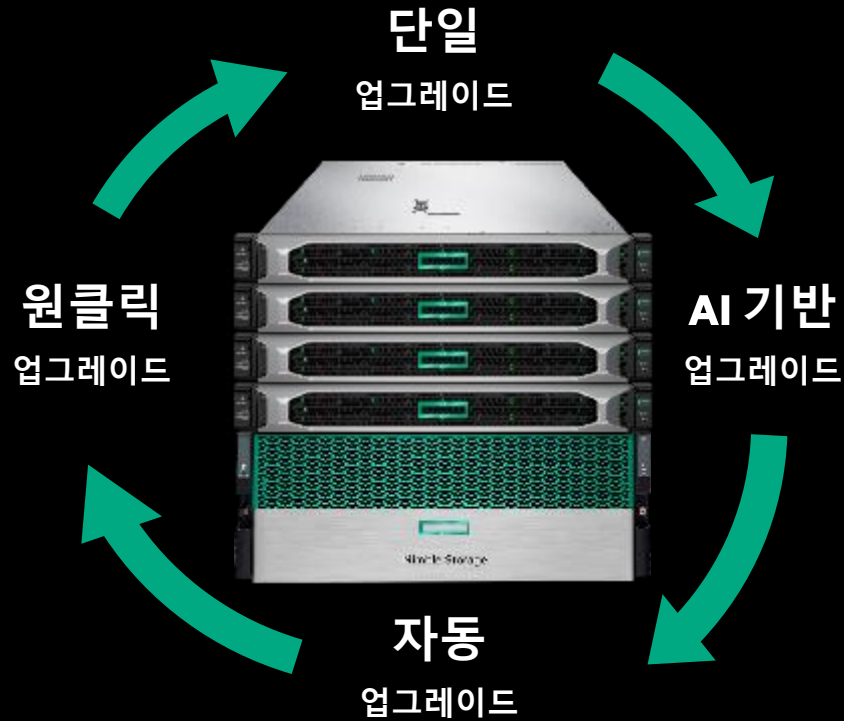
아래와 같은 기존의 **관리 복잡성을 제거**

1. 각 벤더별 사이트 방문 및 바이너리 다운로드
2. HW, SW 별 호환성 크로스-체크
3. 각 컴포넌트에 맞게 업그레이드 스케줄 수립 (수회 이상)
4. 업그레이드가 잘 되기를 마음속으로 기원
5. 각 컴포넌트 업그레이드 마다 모든 벤더 엔지니어 호출 대기



SIMPLE TO MANAGE: ONE CLICK UPGRADE

프라이빗 클라우드에서는 다양하고 복잡한 펌웨어와 소프트웨어가 필요



dHCI 2.0 에는 **Software Update Catalog** 포함
검증된 소프트웨어 version 업그레이드 기능

Software Components	Catalog 1.0	Catalog 2.0	Catalog 3.0
NimbleOS	5.1.x.x	5.3.x.x	5.4.x.x
vCenter Server	6.7 U1	6.7 U2	6.7 U2
ESXi	6.7 U1	6.7 U3	6.7 U3
NCM	6.0.0-650030	6.0.0-650030	6.0.0-650030
SPP	2019.03.0	2019.03.0	2019.03.0

기존의 HCI도 구현하기 어려운
ONE CLICK 라이프 사이클 관리

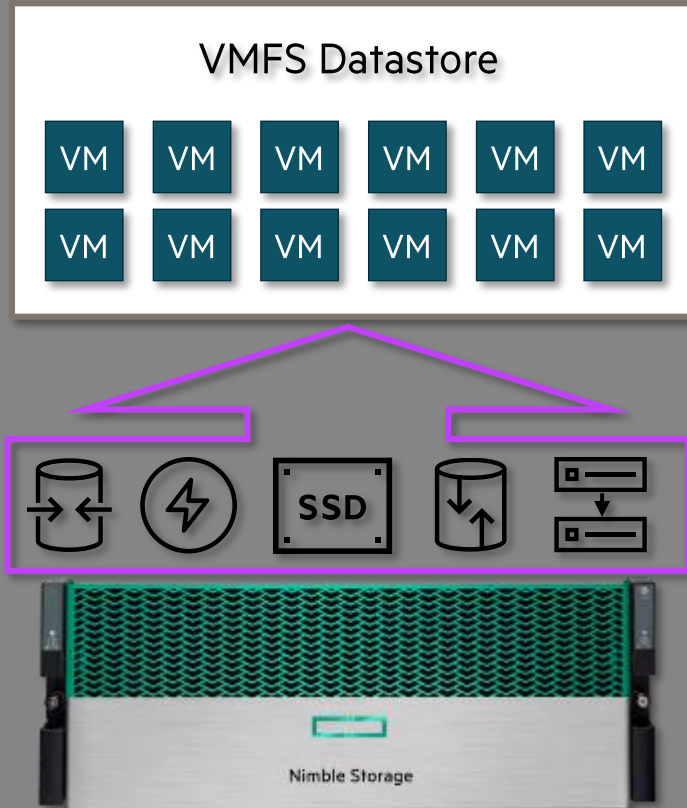
VMware 통합의 특징점

Powered by HPE dHCI

신속한 VM별 백업 및 복구 지원: VVOL

기존 HCI

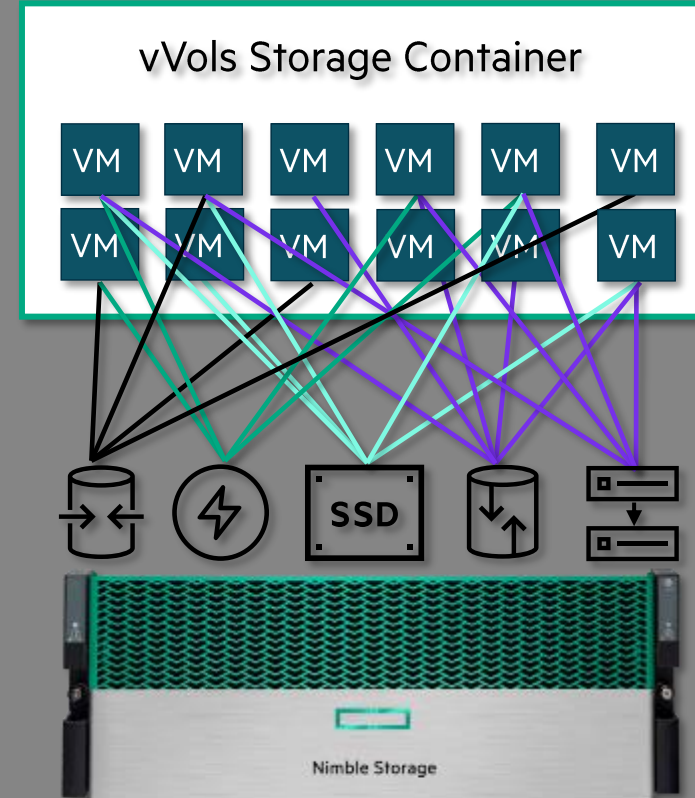
VMFS - 스토리지 전체를 추상화



No visibility

dHCI

vVols - VM과 어플리케이션에 맞게 스토리지 할당



Visibility 확보

VAAI의 XCOPY 지원으로 667%의 성능 향상

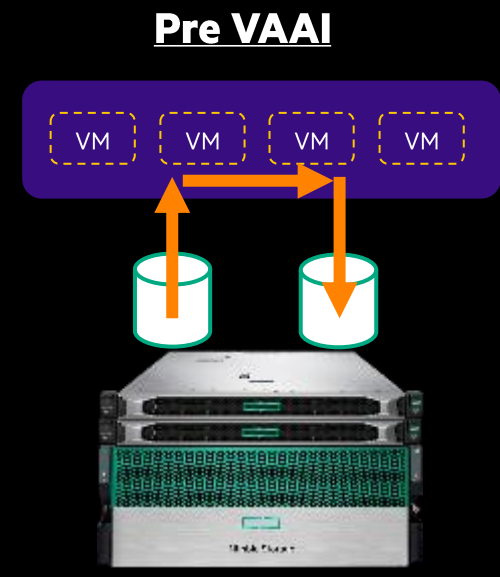


vSphere APIs for Array Integration

- 다양한 VM 볼륨 기능을 스토리지에서 구현
- Nimble 스토리지 컨트롤러 내에서 제공
- 별도의 VM 구성이나 OVA 설치 불필요
- 모든 블록 스토리지 기능 제공
 - WRITE SAME (Block Zeroing)
 - UNMAP (Re-thin & Delete)
 - Thin Provision STUN
 - BLOCK Delete
 - ATOMIC TEST & SET (Hardware Assisted Locking)
 - XCOPY (Copy offload)

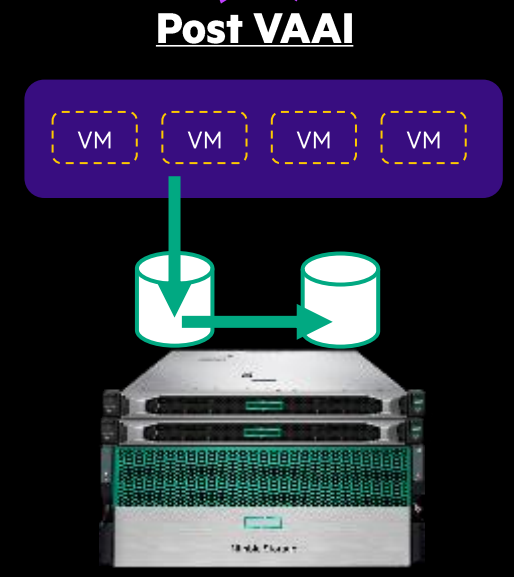
```
[root@Hulk:~] esxcli storage core device vaai status get
eui.210bec92dbb1e4bf6c9ce900d467e207
VAAI Plugin Name:
ATS Status: supported
Clone Status: supported
Zero Status: supported
Delete Status: supported
```

667%
성능 향상



1. 서버에서 볼륨 Read
2. 서버에서 다른 서버로 데이터 복사

느리고 복잡하며 호스트 IO 성능 악영향

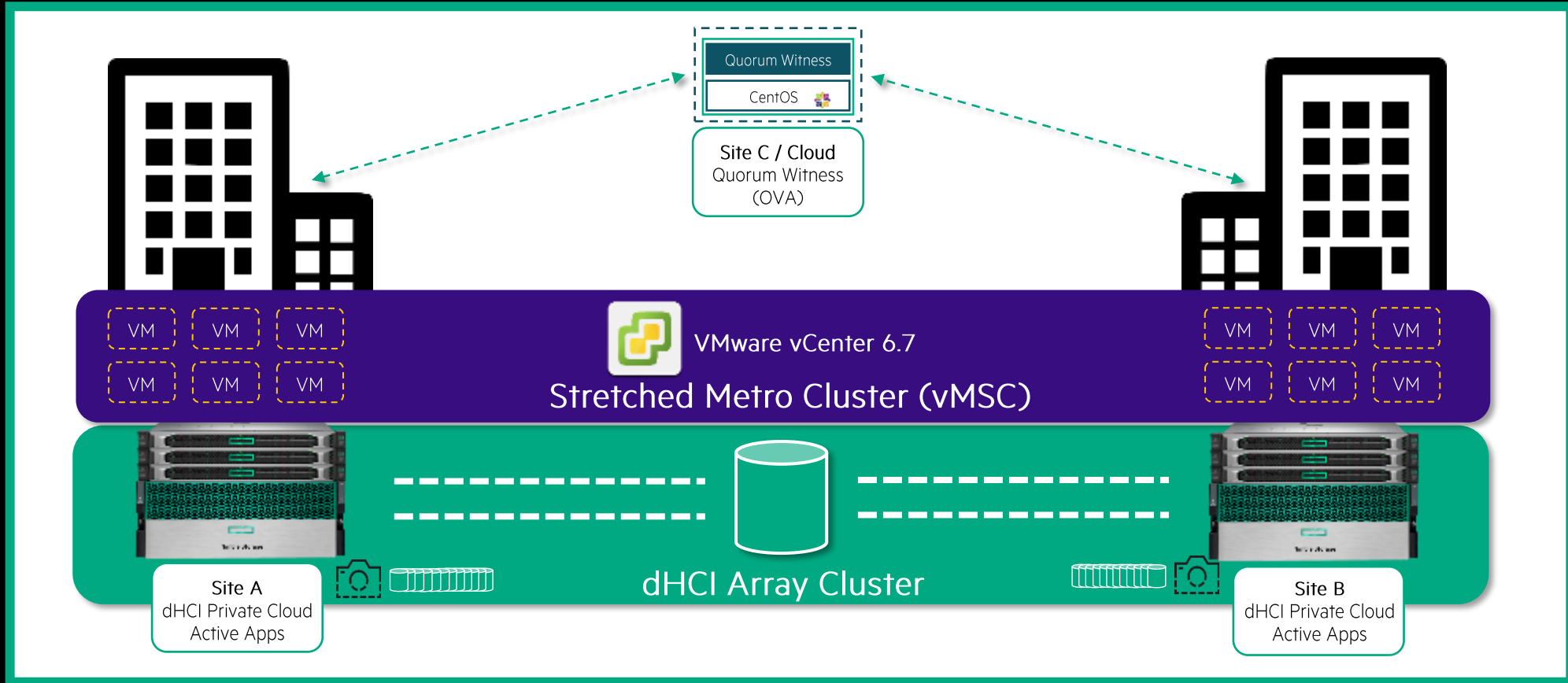


1. XCOPY 명령 자동 실행
2. 유니크 데이터만 스토리지에서 복사

빠르고 효율적이며 호스트 IO 성능 영향도 없음

VMWARE MSC & HPE PEER PERSISTENCE

스토리지 및 데이터센터 무중단 이중화 (Active-Active)



App Driven
사이트간 동기식 VM 복제

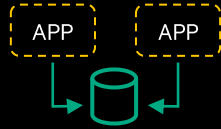
Resilient
HA 및 가용성 향상

Flexible
자동 VM 페일오버

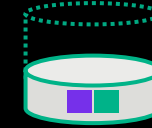
Certified
VMware vMSC 연동 검증 완료



Shared VMDK for Windows Server Failover Cluster



- MS WSFC to VMFS for Clustering
- RDM 에서 마이그레이션 가능
- VMFS 6 볼륨 지원
- FC 연결 필요



Thin Provisioning 최적화

- Thin Provisioning 볼륨 성능 극대화
- 구성 시 복잡한 요구사항 감소
- 스토리지 리소스 및 용량 활용율 향상



vVols & Container Native Storage



- 쿠버네티스 persistent 볼륨 구성 지원
- VMware SPBM 연동 관리 지원
- 개발자 직접 활용을 위한 Storage Classes 지원
- 데이터 서비스 및 정책 사용 자동 조절

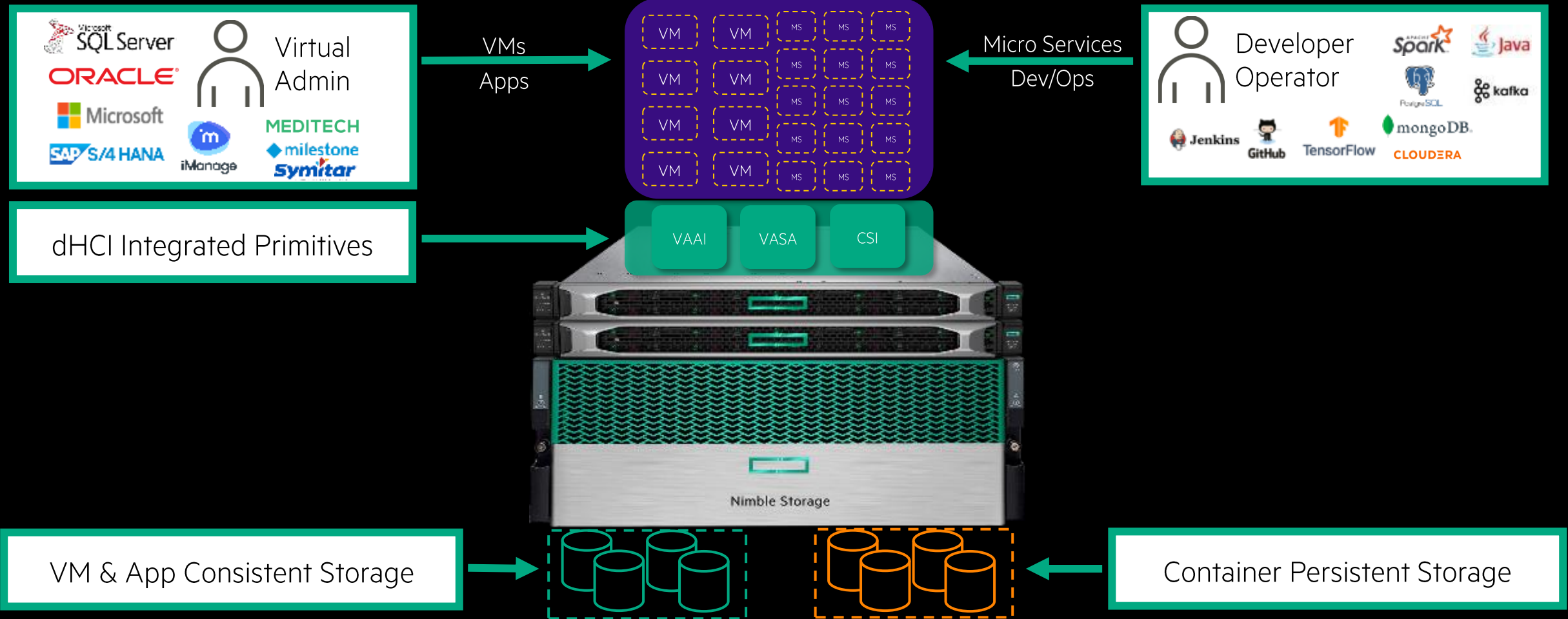


vVols & Site Recovery Manager 8.3

- DR, 개발, 테스트를 위한 vVol SRM 기능 통합
- 향상된 워크플로우에 시스템 기반 복제, 클론 및 자동화 사용
- dHCI는 VMware와 엔지니어링 파트너로 당일 즉각 지원

단일 플랫폼으로 VM 및 컨테이너 환경 지원

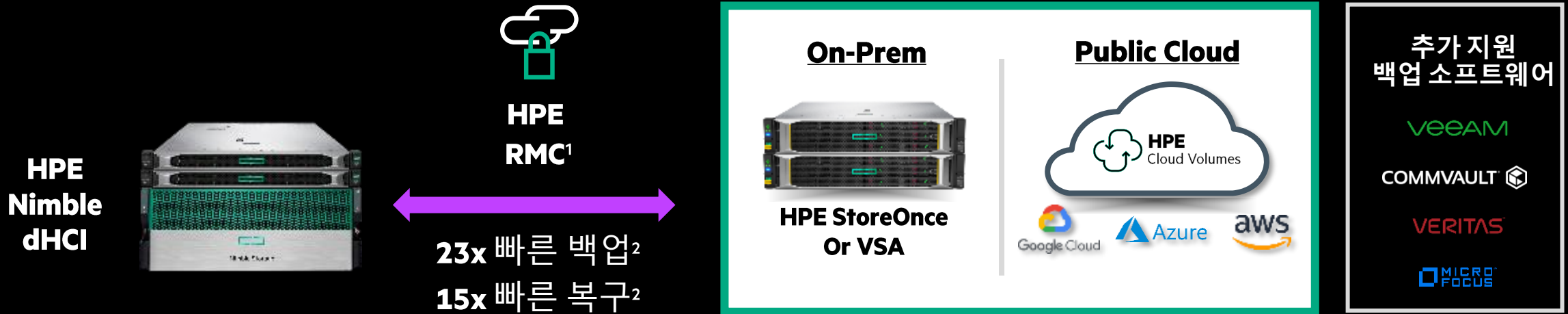
VAAI, VASA, CSI (Container Storage Interface) 통합 지원



VM 보호를 위한 백업 방안 제공



백업 SW, 서버, 미디어서버가 필요 없는 다이렉트 백업 지원 : RMC 기능



Simple

스토리지 자체 제공
기능으로 쉬운 구성



Efficient

별도 백업 서버/SW
미디어서버 불필요



Fast

Snapshot 기반으로
초고속 백업 보장



Cloud-ready

퍼블릭 클라우드 연계 백업
방안 제공

1. RMC is complimentary with every HPE Primera, HPE Nimble Storage and HPE Nimble Storage dHCI
2. For VMware environments compared to traditional backup environments

dHCI만의 차별화된 특징점

용량 효율성, 비용 효율성

HCI VS dHCI 용량 효율성 비교

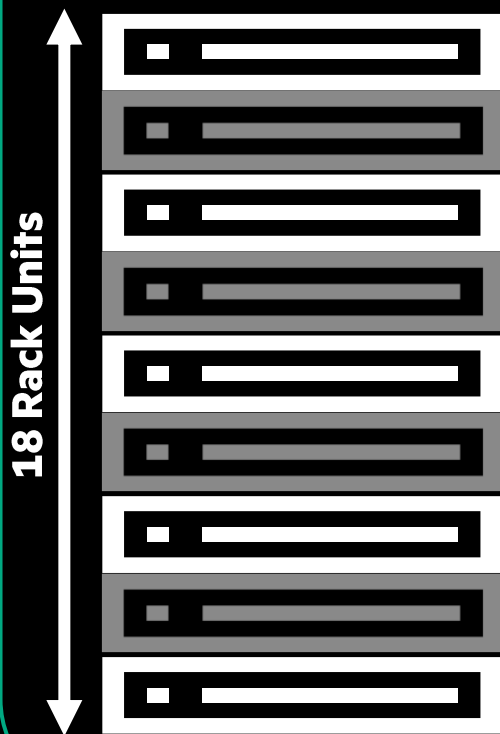


HCI 효율성

- 9 개 노드 (서버+스토리지)
- **18개** VMware 라이선스
- 36개 10/25Gb Ethernet 포트
- 물리용량 : 290TB SSD
- 가용용량 : 54TB
- **물리 vs 가용용량 : 18%**
- 평균 중복제거율 1.5:1
- **총 81TB Effective 용량**

4.5TB per Rack Unit

HCI - 3벌복제



dHCI - Triple parity



dHCI 효율성

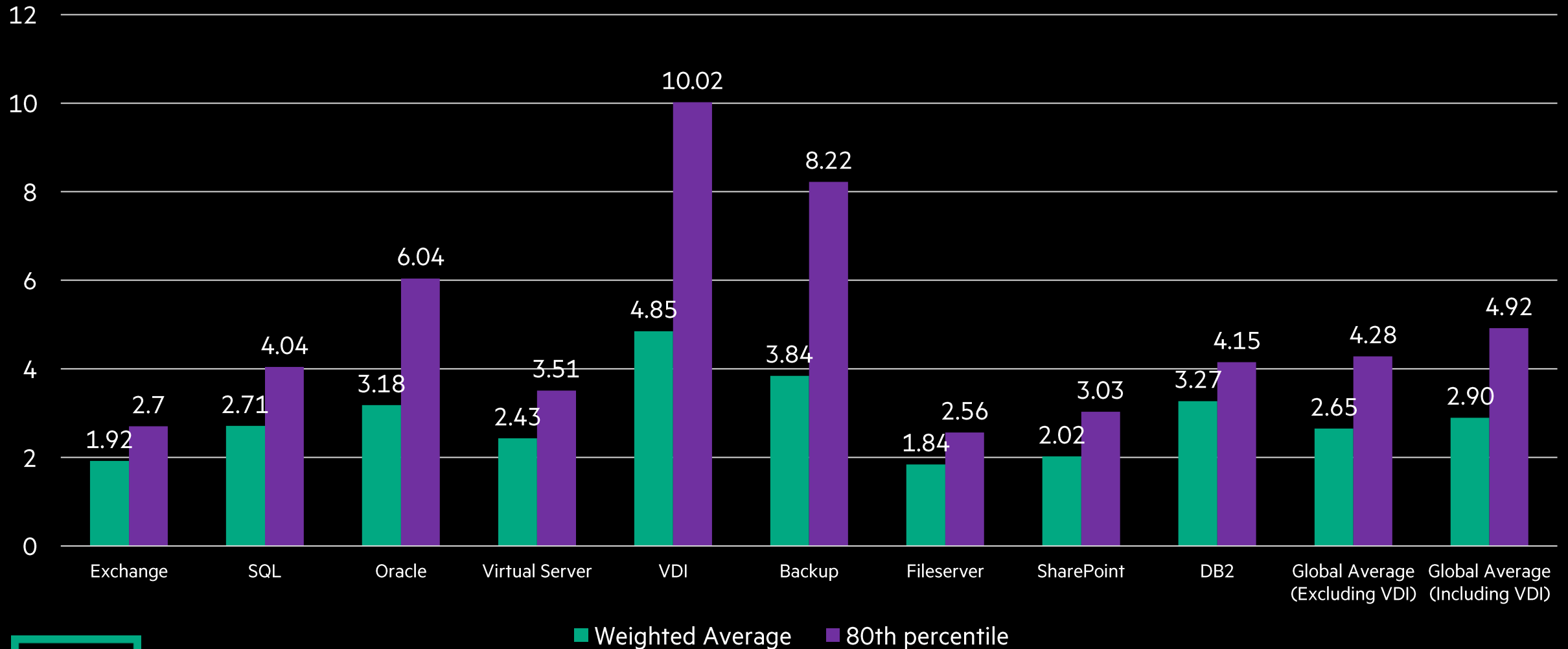
- 3 대 서버 & 1 대 스토리지
- **6개** VMware 라이선스
- 20개 x 10/25Gb Ethernet 포트
- 물리용량 : 46TB SSD
- 가용용량 : 33TB
- **물리 vs 가용용량 : 75%**
- 평균 중복제거율 3:1
- **총 104TB Effective 용량**

14TB per Rack Unit

가상화 환경에서 **TOP CLASS 효율성, TCO 보장**

dHCI의 워크로드별 실제 데이터 효율성

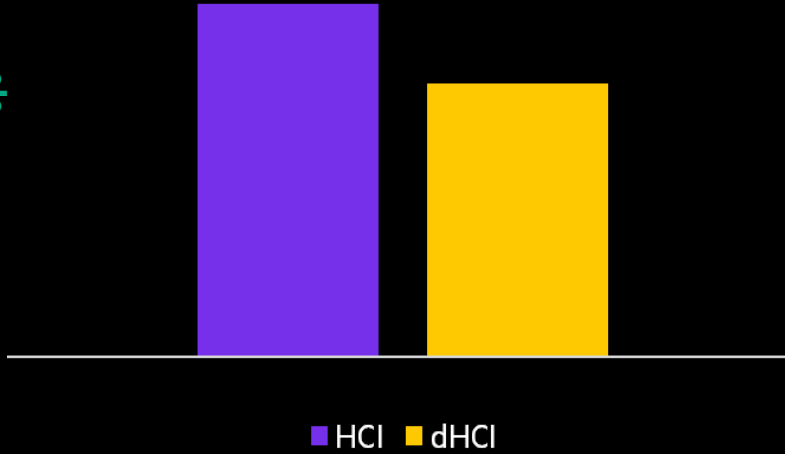
Application Reduction Numbers—Taken From InfoSight



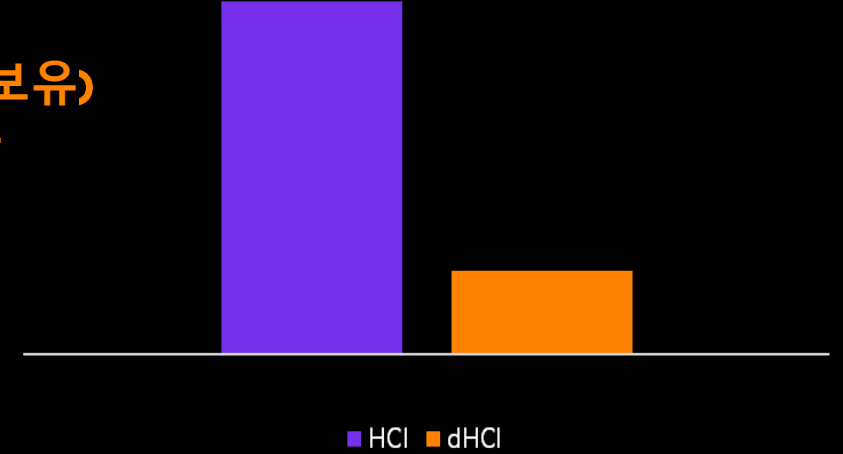
■ Weighted Average ■ 80th percentile

HCI VS dHCI COST 효율성 비교

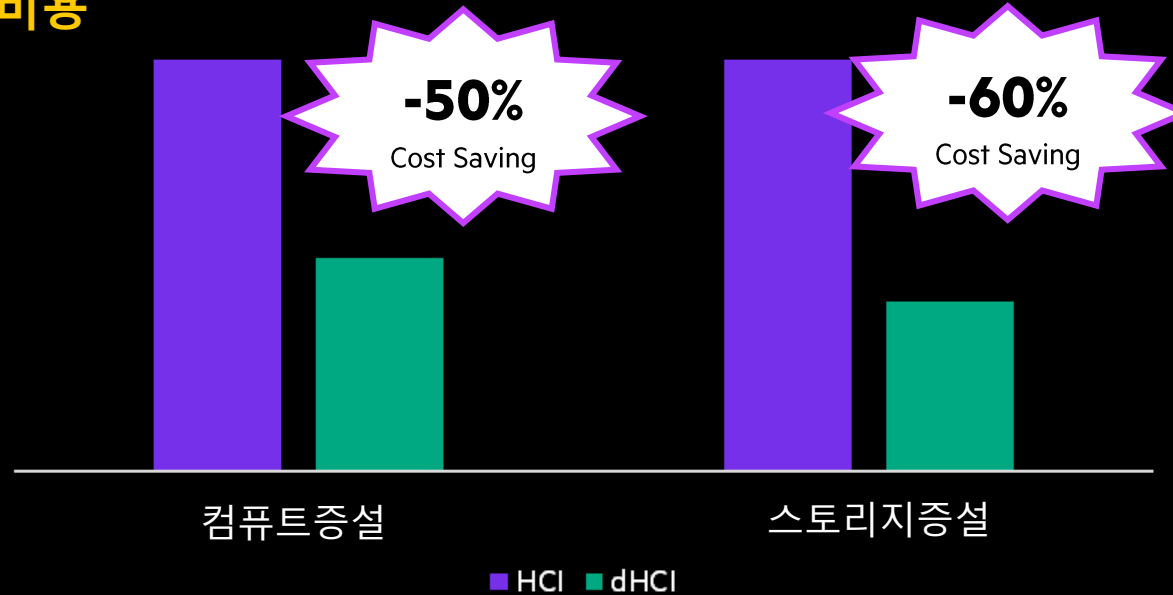
GreenField
초기 도입 비용



BrownField
(스위치, 서버 보유)
초기 도입 비용



컴퓨터노드, 스토리지 증설 비용



Depends on configuration

Usecase 및 레퍼런스

```
1. 사용자 요구사항 분석
2. 시스템 요구사항 정의
3. 아키텍처 설계
4. 상세 설계
5. 개발
6. 테스트
7. 배포
8. 유지보수
```



HPE NIMBLE STORAGE dHCI USECASE

A 병원

현재는 200개 VM을 쓰지만 나중에는 1,000 개 이상이 될 수 있어요.

B 텔레콤

Usable 10TB가 필요하지만 나중에 스토리지 용량만 폭발적으로 늘 수 있어요.

C 은행

금융 업무 중요도로 인해 HCI이지만 고성능, 고가용성 스토리지가 필요해요.

D 공공기관

관리할 인력이 부족해요. 통합관리는 필수이고 운영이 쉽고 편해야 해요.

E 제조

공장 라인이 멈추면 바로 손실로 이어집니다. 이중화를 통한 다운 타임 최소화가 필수입니다.

2019년 말 출시 후 1년 동안

APAC 전체 Reference Account 50+

109대의 시스템 도입

“HPE Nimble Storage dHCI를 통해 운영 비용을 50% 절감하고, VDI 성능을 2배 향상시켰으며, 애플리케이션 프로비저닝 시간을 50% 단축할 수 있었습니다.”

- Rob Collins, Heads of Infrastructure and Service Management, PetSure



“Nimble Storage dHCI 가 굉장히 빠른 설치 및 배포를 지원하여 시간을 절약할 수 있었는데, 이는 우리가 집에서 가족과 아이들과 더 많은 시간을 보낼 수 있다는 것을 의미한다. 이는 굉장히 중요한 부분이다.”

- Tony Pannone, Chief Information Officer
at Highmark Federal Credit Union



“스토리지를 컴퓨트와 분리하는 것은 우리에게 매우 중요하다. 스토리지를 확장할 때마다 컴퓨트를 확장하도록 강요받는 것은 service provide 들의 세계에서는 적합하지 않다.”

- Bryce Farmilo, Chief Technology Officer, Layer X Cloud



“우리는 고가용성으로 많은 데이터를 저장해야 한다. HPE Nimble dHCI는 간단하고 확장성이 좋다. 컴퓨트를 추가하지 않고도 스토리지 용량을 쉽게 추가할 수 있다. 이러한 점이 IT가 기업의 성장을 더 쉽게 지원하게 한다.”

- Eddy Lareine, IT Manager, La Sentinelle





Hewlett Packard
Enterprise

dHCI 통합관리 툴 HPE INFOSIGHT 데모

HPE Storage Presales 김정수 부장

HPE INFOSIGHT 서포트 일원화 및 장애 예측/예방

- ① **서포트 일원화**
서버/네트워크/스토리지/VM 모두 하나의 contact point로 장애 접수
- ② **빠른 원인 분석**
한번의 전화로 서버/네트워크/스토리지/VM/가상화 원인 파악
- ③ **AI 기반으로 자동 케이스 오픈**
모든 레벨 1, 2 이슈
- ④ **HPE가 먼저 연락**
미리 예방하고 미리 파악해서 미리 전화 드립니다.

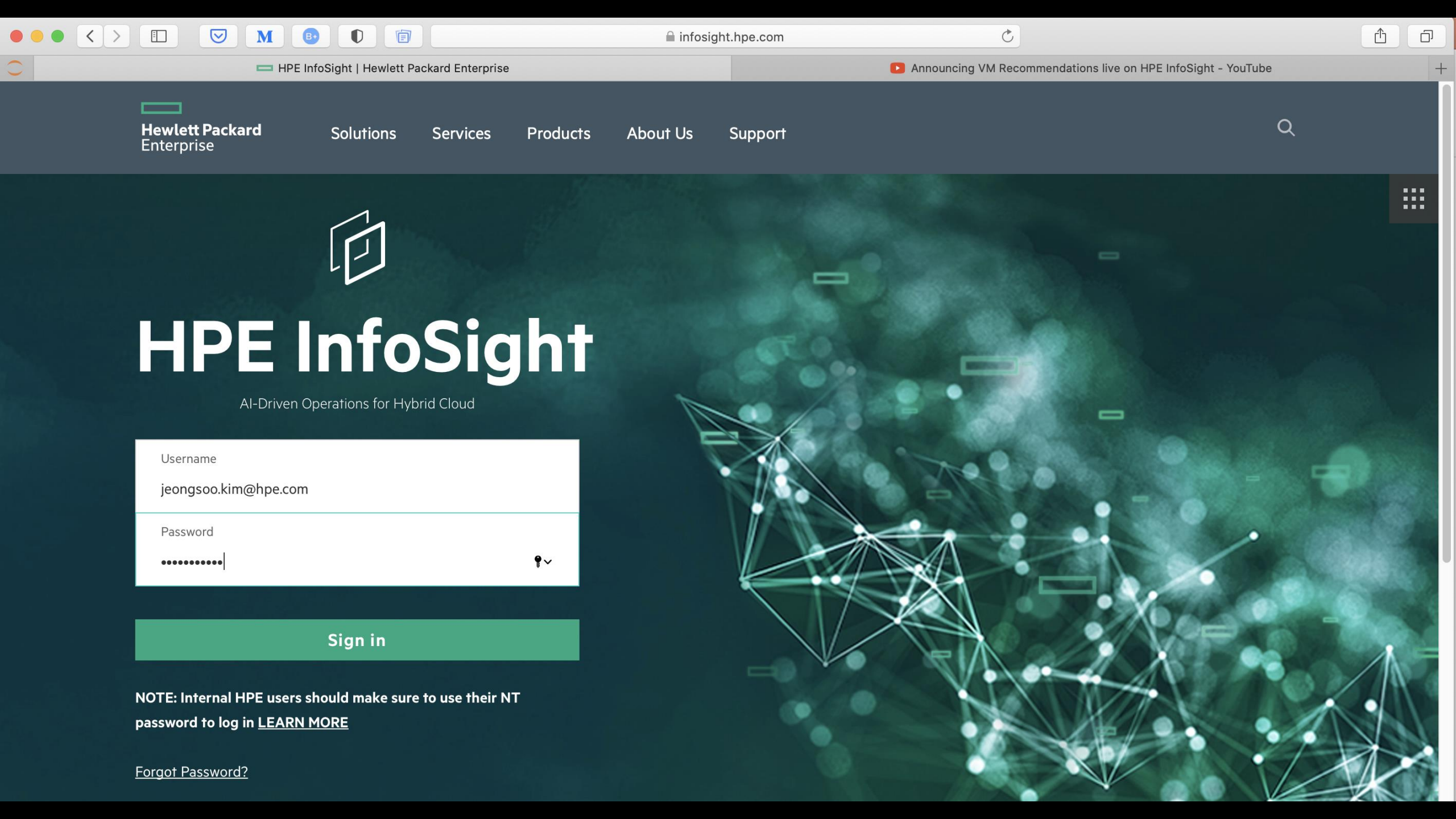


>4.91 / 5점
지원 만족도



케이스 평균 응답 시간
1분 이내





HPE InfoSight

AI-Driven Operations for Hybrid Cloud

Username

jeongsoo.kim@hpe.com

Password

.....|



Sign in

NOTE: Internal HPE users should make sure to use their NT password to log in [LEARN MORE](#)

[Forgot Password?](#)

Welcome to HPE InfoSight!

Links

Recent Pages

- VMs: VM List / Host: tme-esx1.lab.nimblestorage.com
- VMs: VM CPU Contention Trend / Host: tme-esx1.lab.nimblestorage.com
- ESXi Hosts: Host List
- Datastore: Nimble-DS1
- Datastores: Datastore List
- VMs: VM Capacity Trend / Datastore: Nimble-DS1
- VMs: VM Memory Contention Trend / Host: 10.64.35.204
- Host: 10.64.35.204
- Clusters: Cluster List
- Datacenters: Datacenter List

Product Pages

- Nimble Storage
- HPE Primera & 3PAR StoreServ
- StoreOnce
- RMC
- Servers
- HPE Primera & 3PAR StoreServ (Classic)

Landing Page

Set a default organization and page to go to after logging in.

You can return to this home page by clicking the HPE InfoSight logo at the top-left of every page.

Organization

Hewlett-Packard Stockfile

Landing Page

Select page

Set as Default

Bulletins

Dismiss all

- HPE 3PAR StoreServ - Current Issues 9 days ago Dismiss >
- HPE Employee Access Request Process 14 days ago Dismiss >
- Announcing HPE Nimble Storage Streaming Data 2 months ago Dismiss >
- HPE StoreOnce - Current Issues 2 months ago Dismiss >

Compute Solution Storage Virtualization

- Servers
- Nimble Storage dHCI
- HPE Primera & 3PAR StoreServ**
 - Systems (Classic)
 - Systems
- Nimble Storage**
 - Pools
 - Arrays
 - Volumes
- StoreOnce**
 - Systems
- RMC**
 - Systems
- VMware**
 - Datacenters
 - Clusters
 - ESXi Hosts
 - Datastores
 - VMs

page to go to after logging in.
page by clicking the HPE InfoSight logo

- VMs: VM CPU Contention
- Trend / Host: tme-
- esx1.lab.nimblestorage.com
- ESXi Hosts: Host List
- Datastore: Nimble-DS1
- Datastores: Datastore List
- VMs: VM Capacity Trend /
- Datastore: Nimble-DS1
- VMs: VM Memory Contention
- Trend / Host: 10.64.35.204
- Host: 10.64.35.204
- Clusters: Cluster List
- Datacenters: Datacenter List
- StoreOnce
- RMC
- Servers
- HPE Primera & 3PAR StoreServ (Classic)

Organization
Hewlett-Packard Stockfile

Landing Page
Select page

Set as Default

Bulletins

Dismiss all

- HPE 3PAR StoreServ - Current Issues 9 days ago Dismiss >
- HPE Employee Access Request Process 14 days ago Dismiss >
- Announcing HPE Nimble Storage Streaming Data 2 months ago Dismiss >
- HPE StoreOnce - Current Issues 2 months ago Dismiss >

View ☰ Nimble Storage dHCI Overview ▾

PRS-CL 0
AF40 | 2 Hosts | 34 VMs Overutilized Hosts

CPU 0% of 4.4 GHz

Memory 49% of 511.3 GiB

Storage Capacity 5% of 7.3 TiB

View ☰ Nimble Storage dHCI Overview ▾

PRIS-CL

AF40 | 2 Hosts | 34 VMs

0

Overutilized Hosts

CPU 0 % of 4.4 GHz

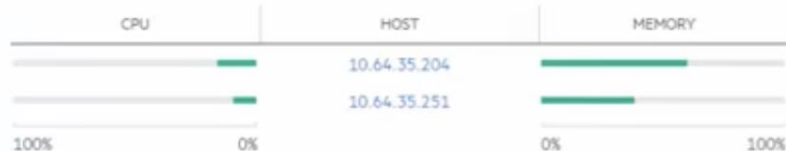
Memory 49 % of 511.3 GiB

Storage Capacity 5 % of 7.3 TiB

Nimble Storage dHCI PRS-CL

Virtualization

HOST UTILIZATION



TOP VMS



0ms Average Latency



Over past 24 hours

Compute

CPU

4 CPU Count 0.50% Ready

Usage 13% of 4 GHz

MEMORY

511 GiB Total Memory 0b/sec Swap 0B Balloon

Usage 49% of 511 GiB

Past 6 hours average

Storage



18.6 TiB | 459331.0x

TOTAL SAVINGS

Wellness

SERVERS

2 18 minutes ago 09/25/2019 3:30:18 PM

Critical 2

STORAGE

2 2 minutes ago 09/25/2019 3:46:43 PM

There are no health issues

Server 2M28200160 | [Manage](#)

SUMMARY

Server Hostname: [REDACTED]
 Product Name: **ProLiant DL380 Gen10**
 Product ID: **868704-B21**
 Location:

WARRANTY/SUPPORT STATUS

Status: **Active**
 End Date: **6/19/2021**

HARDWARE STATUS

CPUs Fans PSUs Memory Storage NICs Other










MONITORING SERVICES

 9 hours ago
 09/25/2019 6:55:46 AM

 6 hours ago
 09/25/2019 9:37:51 AM

- Overview
- Wellness Alerts
- Event Logs
- Server Hardware
- Firmware & Software**

Operating System

VMware ESXi

Firmware

NAME	VERSION
Embedded Video Controller	2.5
HPE Smart Storage Battery 1 Firmware	0.60
iLO	iLO 5 v1.40p68 built on Feb 05 2019
Innovation Engine (IE) Firmware	0.2.0.11
Intel(R) Ethernet Converged Network Adapter X710-4	1.1747.0
Intelligent Platform Abstraction Data	8.9.0 build 38
Intelligent Provisioning	3.10.222
ME SPI Descriptor	1.2.0
P816i-a SR Gen10 Array Controller in slot 0	1.98
Power Management Controller Firmware	1.0.4

Drivers

NAME	VERSION
balloonVMCI	
cbt	Built on: Nov 4 2018
cdp	Built on: Nov 4 2018
cmmds	
cmmds_net	
deltadisk	Version 1.1. Built on: Nov 4 2018
dvfilter	Version 1.1.0-2. Built on: Nov 4 2018
dvfilter-generic-fastpath	Version 0.1.0-0 (Built on: Dec 18 2017)
dvsdev	Built on: Nov 4 2018
esxfw	

Server 2M28200160 | Manage

SUMMARY

Server Hostname: [Redacted]
Product Name: ProLiant DL380 Gen10
Product ID: 868704-B21
Location:

WARRANTY/SUPPORT STATUS

Status: Active
End Date: 6/19/2021

HARDWARE STATUS

CPUs Fans PSUs Memory Storage NICs Other
[Icons for each hardware component]

MONITORING SERVICES

9 hours ago 09/25/2019 6:55:46 AM
6 hours ago 09/25/2019 9:37:51 AM

- Overview Wellness Alerts Event Logs Server Hardware Firmware & Software

- System Board Processor Memory Power Supply Network Smart Array Controller & Drives Embedded SDCard

PROC 1

Version: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Family: Intel Xeon processor
Stepping: Skylake SP H0
Max Speed: 4000 MHz
Cores Count: 10
Cores Enabled: 10

PROC 2

Version: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
Family: Intel Xeon processor
Stepping: Skylake SP H0
Max Speed: 4000 MHz
Cores Count: 10
Cores Enabled: 10

Server 2M28200160 | Manage

SUMMARY

WARRANTY/SUPPORT STATUS

HARDWARE STATUS

MONITORING SERVICES

Server Hostname: [REDACTED]
 Product Name: **ProLiant DL380 Gen10**
 Product ID: **868704-B21**
 Location:

Status: **Active**
 End Date: **6/19/2021**

CPUs Fans PSUs Memory Storage NICs Other

9 hours ago 6 hours ago
 09/25/2019 6:55:46 AM 09/25/2019 9:37:51 AM

- Overview
- Wellness Alerts
- Event Logs**
- Server Hardware
- Firmware & Software

- Integrated Management Log
- iLO Event Log**

SEVERITY	DESCRIPTION	TIMESTAMP	CLASSIFICATION
i	135235: iLO clock has been synchronized with IPNoRg6rBl.	09/24/2019 05:16:59:00	ILO
i	135014: iLO clock has been synchronized with IPNoRg6rBl.	09/23/2019 18:16:57:00	ILO
i	134605: iLO clock has been synchronized with IPNoRg6rBl.	09/23/2019 07:46:54:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 23:12:45:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 22:42:45:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 21:42:45:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 21:12:45:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 20:12:44:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 19:42:44:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 18:42:44:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 18:12:44:00	ILO
i	134009: iLO clock has been synchronized with IPNoRg6rBl.	09/21/2019 18:07:44:00	ILO
!	134045: iLO time update failed. Unable to contact NTP server.	09/21/2019 18:07:39:00	ILO
i	134044: The Overall Security State of the system is at Risk. ACTION:Refer to #ilo user manual or Security Dashboard help page.	09/21/2019 18:07:21:00	ILO
i	134043: iLO network link up at 1000 Mbps.	09/21/2019 18:07:20:00	ILO
!	134042: iLO reset by watchdog.	09/21/2019 18:07:13:00	ILO

Server 2M28200160 | Manage

SUMMARY

Server Hostname: [REDACTED]
Product Name: **ProLiant DL380 Gen10**
Product ID: **868704-B21**
Location:

WARRANTY/SUPPORT STATUS

Status: **Active**
End Date: **6/19/2021**

HARDWARE STATUS

CPU's Fans PSUs Memory Storage NICs Other



MONITORING SERVICES

 9 hours ago
09/25/2019 6:55:46 AM

 6 hours ago
09/25/2019 9:37:51 AM

CREATION TIME

SEVERITY

CONDITION

09/04/2019 06:31:09

Critical

Overall Server Security Status RISK

Device: Not Available

Description: **Symptom:**

Overall server security status is Risk.

Cause:

One of more server's security configuration settings is vulnerable.

Action:

Review the device's Security dashboard page to identify the vulnerable security configuration setting(s) and change the settings(s) to make the server secure.

Support Documentation:

For additional product information located in our user manuals, go to the Hewlett Packard Enterprise Library at <http://www.hpe.com/info/enterprise/docs>:

- User Guide
- Maintenance and Service Guide
- Troubleshooting
- Release Notes

To view Hewlett Packard Enterprise self - repair videos, go to :

- Customer Self Repair (<http://www.hpe.com/support/selfrepair>)
- Customer Self Repair Services Media Library (<https://thesml.tcs.hpccorp.net/default.aspx>)

For live assistance, go to the Hewlett Packard Enterprise Worldwide website at <http://www.hpe.com/assistance>

Server 2M28200160 | Manage

SUMMARY

Server Hostname: [Redacted]
Product Name: ProLiant DL380 Gen10
Product ID: 868704-B21
Location:

WARRANTY/SUPPORT STATUS

Status: Active
End Date: 6/19/2021

HARDWARE STATUS

Hardware status icons: CPUs, Fans, PSUs, Memory, Storage, NICs, Other

MONITORING SERVICES

Monitoring service cards: Heart icon (9 hours ago), Gear icon (6 hours ago)

- Overview Wellness Alerts Event Logs Server Hardware Firmware & Software

Table with columns: CREATE TIME, SEVERITY, CONDITION. Row: 09/04/2019 06:31:09, Critical, Overall Server Security Status RISK

SUMMARY

WARRANTY/SUPPORT STATUS

HARDWARE STATUS

MONITORING SERVICES

Server Hostname: [REDACTED]
 Product Name: **ProLiant DL380 Gen10**
 Product ID: **868704-B21**
 Location:

Status: **Active**
 End Date: **6/19/2021**

CPU Fans PSUs Memory Storage NICs Other

9 hours ago
 09/25/2019 6:55:46 AM

6 hours ago
 09/25/2019 9:37:51 AM

- Overview
- Wellness Alerts
- Event Logs
- Server Hardware
- Firmware & Software

System Board

Serial Physical: **2M28200160**
 Product ID: **868704-B21**
 PCA Part Number: **809455-001**
 Build Date: **5/17/2018 2:24:32 AM**

iLO

Firmware: **iLO 5 v1.40p68 built on Feb 05 2019**
 License: **iLO Advanced**
 Hostname: [REDACTED]
 IP Address: [REDACTED]

Processors

Processor 1: **Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz**
 Stepping: **Skylake SP H0**
 Processor 2: **Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz**
 Stepping: **Skylake SP H0**

Memory

Installed: **16 x 16 GB 2400 MHz**

Power Supply

Power Supply 1: **@ 1600 Watts**
 Firmware: **03/01/16**

Storage

Slot 0: **P816i-a SR Gen10**
 Firmware: **1.98**
 Drives: **1 drives, 1 x 1 TB total**

Networking

No information available

BIOS

BIOS Vendor: **HPE**
 BIOS Version: **U30 v2.04**
 BIOS Date: **04/18/2019**

FILTERS: opald contains "4bb280b3b81e70df" Clear all

SERIAL NUMBER	HOSTNAME	ILO	HEALTH			PRODUCT		
			STATUS	POWER STATUS	HARDWARE STATUS	PRODUCT NAME	PRODUCT ID	OPERATING SYSTEM
2M28200160			✓	✓		ProLiant DL380 Gen10	868704-B21	VMware ESXi
2M28200162			✓	✓		ProLiant DL380 Gen10	868704-B21	VMware ESXi

View Server List

Summary Monitoring Services/Support

Download CSV

FILTERS: opald contains "4bb280b3b81e70d" Clear all

SERIAL NUMBER	HOSTNAME	ILO	HEALTH			PRODUCT		
			STATUS	POWER STATUS	HARDWARE STATUS	PRODUCT NAME	PRODUCT ID	OPERATING SYSTEM
2M28200160			✓	✓	📺 🗑️ 📡 📧 ⚙️ ⋮	ProLiant DL380 Gen10	868704-821	VMware ESXi
2M28200162			✓	✓	📺 🗑️ 📡 📧 ⚙️ ⋮	ProLiant DL380 Gen10	868704-821	VMware ESXi



Wellness

SERVERS



2



14 minutes ago
09/25/2019 3:30:18 PM

 Critical

2

STORAGE



2



3 minutes ago
09/25/2019 3:41:36 PM

There are no health issues

18.2M ops

1 ms

NAME	HOST	DATASTORES	ARRAY	TOTAL USAGE	VCPU (PAST 24 HOURS)		VMEM (PAST 24 HOURS)		LAST ACTIVITY
					AVERAGE	PEAK	AVERAGE	PEAK	
fg-tme-witness1	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	102.1 GiB	13 MHz	45 MHz	33.7 MiB	143.4 MiB	6 hours ago
fred-tme-python01	10.64.35.251	Test	rtp-afa124 (AF-201392)	2.1 GiB	N/A	N/A	N/A	N/A	Inactive
gke-admin-master-59xr7	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	72.7 GiB	719 MHz	996 MHz	1.5 GiB	2.4 GiB	6 hours ago
gke-admin-node-8468d566d7-56nbb	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	62.0 GiB	344 MHz	440 MHz	797.1 MiB	1.4 GiB	6 hours ago
gke-admin-node-8468d566d7-pnk5d	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	61.9 GiB	433 MHz	700 MHz	924.5 MiB	1.9 GiB	6 hours ago
gke-on-prem-admin-appliance-vsph...	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	20.0 GiB	N/A	N/A	N/A	N/A	Inactive
gke-on-prem-osimage-1.12.7-gke1...	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	10.0 GiB	N/A	N/A	N/A	N/A	Inactive
gke-tme-f5	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	102.1 GiB	850 MHz	1,416 MHz	440.7 MiB	764.6 MiB	6 hours ago
gke-tme-ljmp01	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	158.1 GiB	61 MHz	533 MHz	179.1 MiB	491.5 MiB	7 hours ago
gke-tme-router01	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	154.1 GiB	94 MHz	117 MHz	162.3 MiB	327.7 MiB	6 hours ago
gke-tme-wjmp01	10.64.35.251	Nimble-DS1	rtp-afa124 (AF-201392)	158.1 GiB	93 MHz	751 MHz	349.9 MiB	1.1 GiB	6 hours ago
gke-tme-wks01	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	58.1 GiB	22 MHz	182 MHz	88.3 MiB	191.1 MiB	6 hours ago
juju-kube-wrk01	10.64.35.251	Test	rtp-afa124 (AF-201392)	11.1 GiB	19 MHz	89 MHz	85.0 MiB	245.8 MiB	9 hours ago
New Virtual Machine	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	40.0 GiB	N/A	N/A	N/A	N/A	Inactive
prs-tme-vcenter2	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	423.0 GiB	233 MHz	629 MHz	1.5 GiB	2.7 GiB	6 hours ago
tme-dc-0-fvtn9-6b95659d65-b5tw7	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	48.1 GiB	680 MHz	1,255 MHz	1.5 GiB	2.2 GiB	6 hours ago
tme-dc-8565cc5575-cwn5d	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	48.1 GiB	285 MHz	436 MHz	658.1 MiB	1.1 GiB	6 hours ago
tme-dc-8565cc5575-ig5px	10.64.35.204	Nimble-DS1	rtp-afa124 (AF-201392)	48.1 GiB	389 MHz	466 MHz	782.3 MiB	1.4 GiB	6 hours ago

VM SUMMARY

CAPACITY

PERFORMANCE (PAST 24 HRS AVG)

4 CPU COUNT

16.0 GiB MEMORY

61.9 GiB USAGE

292.0 GiB ALLOCATED

5.58 AVG IOPS

0.11 ms AVG LATENCY

2.00 ms MAX LATENCY

Performance Capacity VMDKs (3)

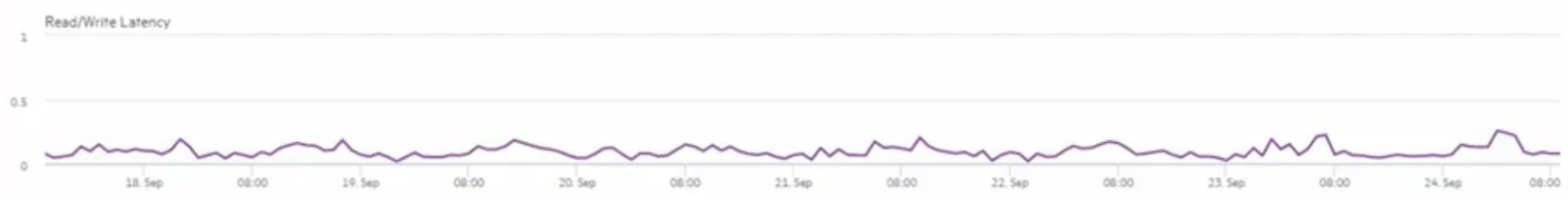
Time Range: 09/18/2019 3:44 PM EDT to 09/25/2019 3:44 PM EDT

1D 1W 1M 3M Custom

Latency



Average Host 0.1 ms, Average Network 0 ms, Average Storage 0 ms

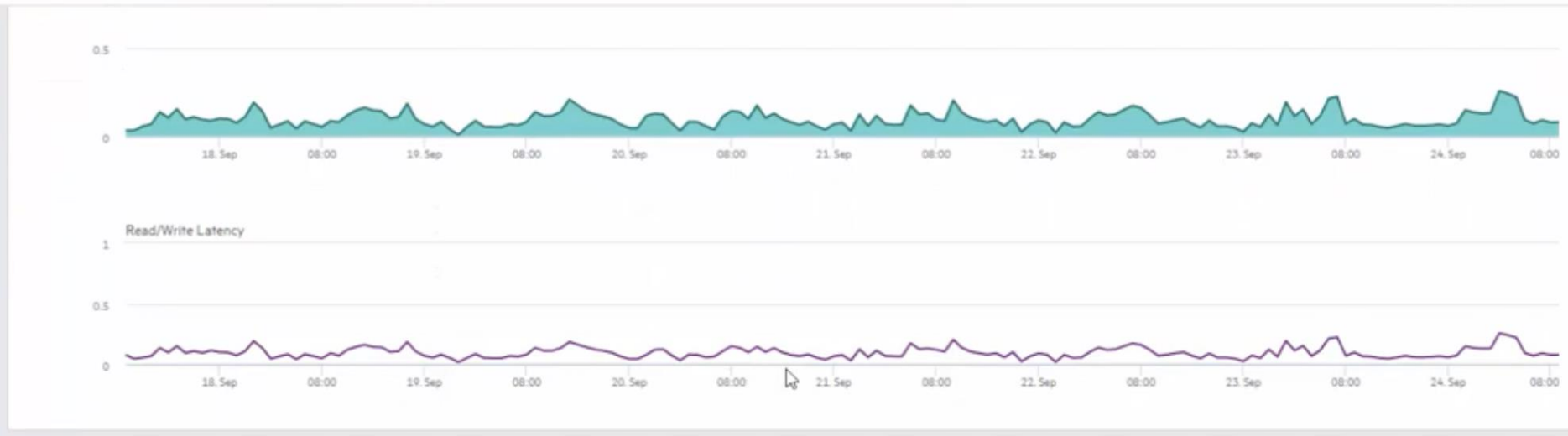


Average Read 0 ms, Average Write 0.1 ms

IOPS



Average Read 0 IOPS



Average Network
0 ms

Average Storage
0 ms

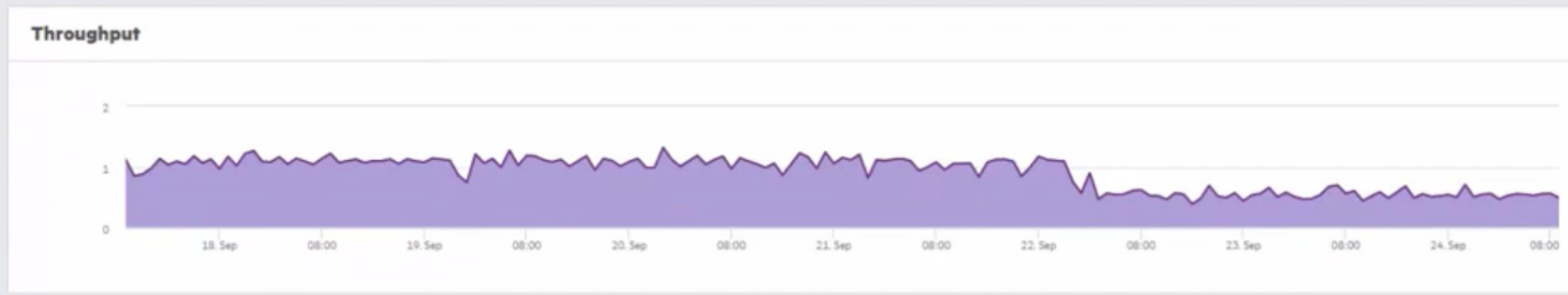
Average Read
0 ms

Average Write
0.1 ms



Average Read
0 IOPS

Average Write
9.58 IOPS



Average Read
0 B/sec

Average Write
923.21 KiB/sec

VM SUMMARY		CAPACITY		PERFORMANCE (PAST 24 HRS AVG)	
4 CPU COUNT	16.0 GiB MEMORY	61.9 GiB USAGE	292.0 GiB ALLOCATED	5.58 AVG IOPS	0.11 ms AVG LATENCY
					2.00 ms MAX LATENCY

Time Range: 09/18/2019 3:44 PM EDT to 09/25/2019 3:44 PM EDT

Latency



Average Host
0.1 ms

Average Network
0 ms

Average Storage
0 ms



Average Read
0 ms

Average Write
0.1 ms

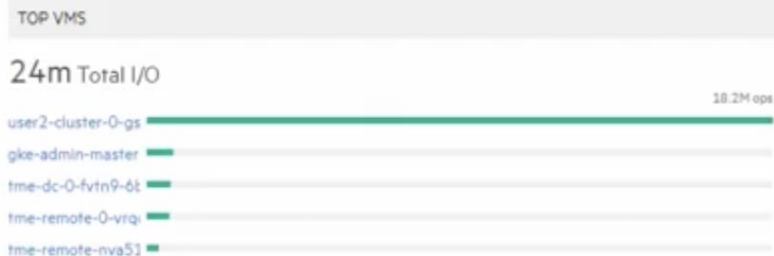
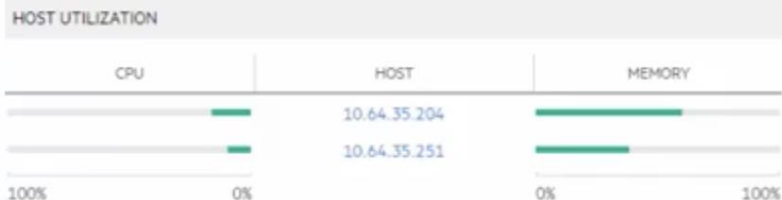
IOPS



Average Read
0 IOPS

Nimble Storage dHCI PRS-CL

Virtualization

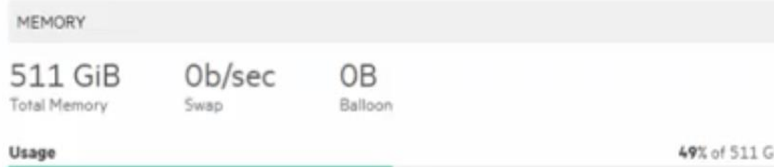
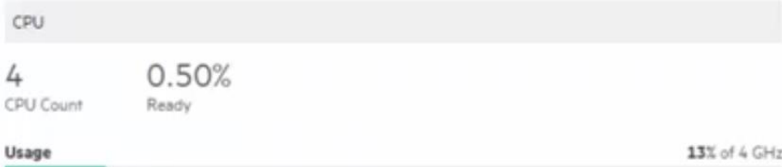


Wellness



There are no health issues

Compute



Past 6 hours average

Storage



View Array List For Group grp-rtp-afa124

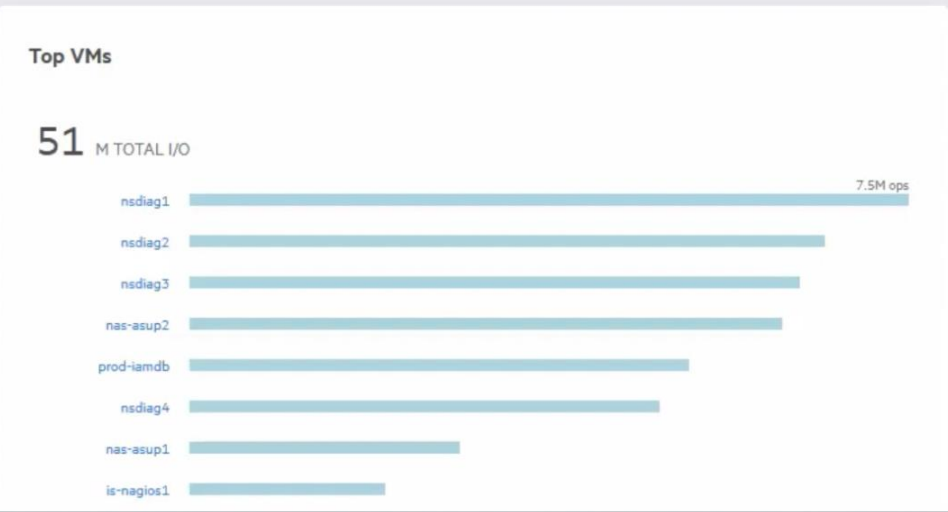
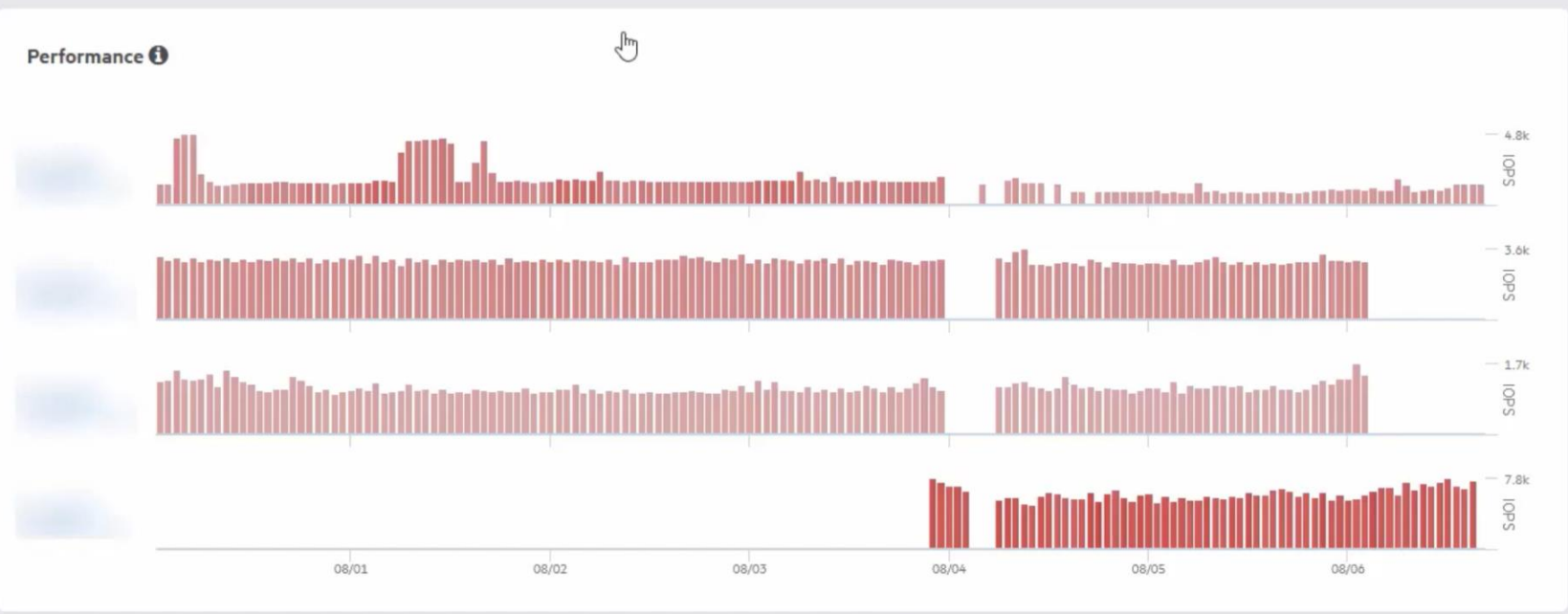
Summary Monitoring Services/Support

Download CSV

ARRAY	CALL HOME		HEARTBEAT		SUPPORT			TIMEZONE
	STATUS	LAST DATA SENT	STATUS	LAST HEARTBEAT	STATUS	AGREEMENT	END DATE	
AF-201222	✖		⚠	an hour ago (09/25/2019 2:22:...		Premium	12/31/2020	America/Los_Angeles
rtp-afa124 (AF-201392)	✔	12 hours ago (09/25/2019 12:...	✔	2 minutes ago (09/25/2019 3:4...		Premium	12/31/2020	America/Los_Angeles

ARRAY	GROUP	POOL	MODEL	S/W VERSION	SHELVES	HARDWARE STATUS	RAW SIZE		USABLE SPACE		HOST INTERFACE
							HDD	SSD	TOTAL	AVAILABLE	
AF-201222					0		0.0 B	23.0 TB	15.1 TiB	15.1 TiB	1 Dual 10Gbe SFP+
rtp-afa124 (AF-201392)	grp-rtp-afa124	grp-rtp-afa124 (default)	AF40	5.1.3.0	1		0.0 B	34.6 TB	7.3 TiB	6.9 TiB	1 Dual 10Gbe SFP+; 1 Dua...

Operational Dashboard



System

HARDWARE

108
ARRAYS

MONITORING SERVICES

HEARTBEAT

CALL HOME

Protection ?

Recommended Actions

Pool: [Pool Name] (default) 🕒

Analysis Dates: 7/30/2020 - 8/6/2020.

Elevated Random Read and Sequential Read Latency

Random Read Cache Miss

- Consider QoS limits on random read workloads.
- Consider staggering random read workloads.

[Show More](#)

Pool: [Pool Name] 01 (default) 🕒

Analysis Dates: 7/30/2020 - 8/6/2020.

Elevated Random Read Latency

Unaligned IO

- We recommend using larger block size (8K or higher) on the volumes suffering from unalignment and are operating on lower block sizes.

Pool: [Pool Name] 01 (default) 🕒

Analysis Dates: 7/31/2020 - 8/4/2020.

Elevated Random Read Latency

Unaligned IO

- We recommend using larger block size (8K or higher) on the volumes suffering



Recommended Actions

Pool: group-array-temp16 (default) ⓘ

Analysis Dates: 7/30/2020 - 8/3/2020.

Elevated Random Read Latency

Unaligned IO

- We recommend using larger block size (8K or higher) on the volumes suffering from unalignment and are operating on lower block sizes.

VM: win-vm-ex-03 ⓘ

Analysis Dates: 7/27/2020 - 8/4/2020.

Performance issues have been identified affecting this vm.

Elevated Latency

- A single dominant contributor for latency has not been isolated. For VMs labeled **multi-source**, further investigation is required to determine the primary sources

[Show More](#)

Datastore: Datastore3-VM-sync-snaps ⓘ

Analysis Dates: 7/29/2020 - 8/6/2020.

Performance issues have been identified affecting this datastore.

Elevated Latency

- Investigate potential **host** issues contributing to latency on this datastore.
- View timeline report of when VMs are most affected by latency on this datastore.
- View treemap report of which VMs are most affected by latency on this datastore.

[Show Less](#)

Recommended Actions

Pool: [redacted] (default) ⓘ

Analysis Dates: 7/30/2020 - 8/3/2020.

Elevated Random Read Latency

Unaligned IO

- We recommend using larger block size (8K or higher) on the volumes suffering from unalignment and are operating on lower block sizes.

VM: ia ⓘ

Analysis Dates: 7/27/2020 - 8/4/2020.

Performance issues have been identified affecting this vm.

Elevated Latency

- For VMs labeled **storage**: look to the storage performance recommendation system for additional guidance.

[Show More](#)

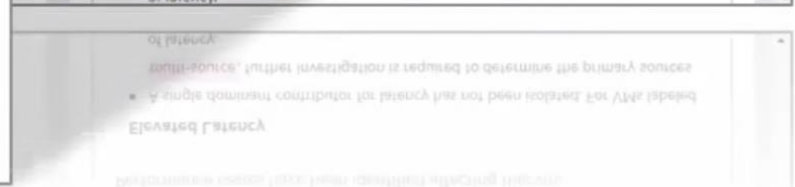
VM: nas-[redacted] ⓘ

Analysis Dates: 7/27/2020 - 8/4/2020.

Performance issues have been identified affecting this vm.

Elevated Latency

- A single dominant contributor for latency has not been isolated. For VMs labeled **multi-source**, further investigation is required to determine the primary sources of latency.



HPE InfoSight Dashboards

VMware Datacenters Clusters

VM win-vm-49

Performance Capacity VMDKs (1)

Time Range: 07/24/2020 3:43 PM EDT to 07/31/2020 3:43 PM EDT

1D 1W 1M 3M Custom

Latency

Total Latency

Read/Write Latency

IOPS

Throughput

Recommended Actions ⓘ

Analysis Period
2020-07-15 04:19:00 to 2020-07-23 04:08:00.

Condition
Performance issues have been identified affecting this vm.

Diagnosis

Elevated Latency

VM latency is elevated.

Recommendations

- For VMs labeled **storage**: look to the storage performance recommendation system for addit... ▼
- Consult Volume Performance Contention to see top consumers on the storage pool supporti... ▼
- A single dominant contributor for latency has not been isolated. For VMs labeled @@multi-so... ▼

Peer VMs

Virtual machines are sorted from highest to lowest latency. Only Virtual Machines with Recommended Actions are displayed

NAME	SHARED R...	STATUS	RE...	READ...	WRITE...	WRITE...
win-vm-cpu2	Host Pool Data...	Host	22.19	1291.24	8.00	1570.42
win-vm-cpu1	Host Pool Data...	Multi-source	174.14	263.19	63.98	214.77

Organization
ble InfoSight - Demo

Search 🔍 Settings ⚙️ Help 🗨️ Profile 👤

Datacenter: Nimble Datacenter

00.

ing this vm.

performance recommendation system for addit... ▼

ee top consumers on the storage pool supporti... ▼

not been isolated. For VMs labeled @@multi-so... ▼

vest latency. Only Virtual Machines with Recommended

RE...	READ...	WRITE...	WRITE...
22.19	1291.24	8.00	1570.42
174.14	263.19	63.98	214.77
1.90	5.62	1.51	77.04
57.71	14.52	57.93	17.67



Recommended Actions ⓘ

Analysis Period

2020-07-15 07:13:00.0 to 2020-07-23 04:08:00.0.

Condition

Performance issues have been identified affecting this datastore.

Diagnosis

Elevated Latency

VM latency is elevated.

Recommendations

Dependent VMs are experiencing latency; address host and networking issues. ▼

Dependent VMs

Virtual machines are sorted from highest to lowest latency. Only Virtual Machines with Recommended Actions are displayed

NAME	SHARED R...	STATUS	RE...	READ ...	WRITE...	WRITE...
pachi		Storage	0.00	11.00	1.49	0.49
beta-web2		Host	0.00	10.00	2.00	0.29



Analysis Period 07-16-2020-hard-coded - 07-23-2020-hc

Recommended Actions

Object Type Any Issue Type Any Snooze False Search

- Any POOL VM DATASTORE HOST

VM: 2k16-guest-iSCSI-02. Analysis Dates: 7/15/2020 - 7/23/2020. Performance issues have been identified affecting this vm. Elevated Latency. A single dominant contributor for latency has not been isolated. For VMs labeled multi-source, further investigation is required to determine the primary sources of latency.

VM: 2k16-guest-iSCSI-02. Analysis Dates: 7/15/2020 - 7/23/2020. Performance issues have been identified affecting this vm. Elevated Latency. A single dominant contributor for latency has not been isolated. For VMs labeled multi-source, further investigation is required to determine the primary sources of latency.

Datastore: VMware-DS-9-Space-NoDeDup. Analysis Dates: 7/15/2020 - 7/23/2020. Performance issues have been identified affecting this datastore. Elevated Latency. Dependent VMs are experiencing latency; address host and networking issues.

Recommended Actions Analysis Period 04-Aug-2020 - 12-Aug-2020

Object Type All Issue Type All Snoozed No Search

- All
- Pool: lv POOL
- Analysis Dat VM
- Elevated Ra DATASTORE
- HOST

Unaligned We recommend using larger block size (8K or higher) on the volumes suffering from unalignment and are operating on lower block sizes.

Pool: lvs-vertica14-array01 (default)

Analysis Dates: 8/4/2020 - 8/12/2020.

Elevated Random Read Latency

Unaligned IO We recommend using larger block size (8K or higher) on the volumes suffering from unalignment and are operating on lower block sizes.

Pool: Asup-array02-lvs (default)

Analysis Dates: 8/4/2020 - 8/12/2020.

Elevated Random Read Latency

Random Read Cache Miss Consider QoS limits on random read workloads. Consider staggering random read workloads. Show More

Analysis Period 04-Aug-2020 - 12-Aug-2020

Recommended Actions

Object Type **VM** Issue Type **All** Snoozed **No** Search

VM: nsdiag1 [Refresh] [Alert]

Analysis Dates: 8/5/2020 - 8/12/2020.

Performance issues have been identified affecting this vm.

Virtual CPU Underprovisioning

- Assign additional virtual CPUs to this **underprovisioned** VM.

VM: nsdiag2 [Refresh] [Alert]

Analysis Dates: 8/5/2020 - 8/12/2020.

Performance issues have been identified affecting this vm.

Virtual CPU Underprovisioning

- Assign additional virtual CPUs to this **underprovisioned** VM.

VM: nsdiag3 [Refresh] [Alert]

Analysis Dates: 8/5/2020 - 8/12/2020.

Performance issues have been identified affecting this vm.

Virtual CPU Underprovisioning

- Assign additional virtual CPUs to this **underprovisioned** VM.

VM nsdiag1

Datastore: esx-app1 Host: 3 Cluster: InfosightHA_LV Datacenter: LasVegas_Datacenter vCenter: lvscenter Volume: esx-app1

TIME RANGE: 08/05/2020 11:18:00 AM TO 08/12/2020 11:22:00 AM

1D 1W 1M 3M Custom

Latency



IOPS



Throughput



Recommended ACTIONS

Analysis Period
2020-08-05 11:18:00 to 2020-08-12 13:22:00.

Condition
Performance issues have been identified affecting this vm.

Diagnosis

Virtual CPU Underprovisioning

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

Recommendations

Assign additional virtual CPUs to this underprovisioned VM.

When virtual machines have high CPU utilization, it can mean that the processes running on those VMs is starved for CPU resource. Generally targeting vCPU utilization well under 90% is advisable.

Peer VMs

Virtual machines are sorted from highest to lowest CPU contention. Only Virtual Machines with Recommended Actions are displayed

NAME	CPU CO-STOP	VIRTUAL PRO...	CPU USAGE (%)	SHARED RESO...	STATUS
nsdiag1	1.07	4.00	111.47	Blue	Underprovisioned
nsdiag2	1.06	4.00	111.00	Blue	Underprovisioned
nsdiag3	1.06	4.00	100.47	Blue	Underprovisioned



Virtual CPU Underprovisioning

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

Recommendations

Assign additional virtual CPUs to this **underprovisioned** VM.

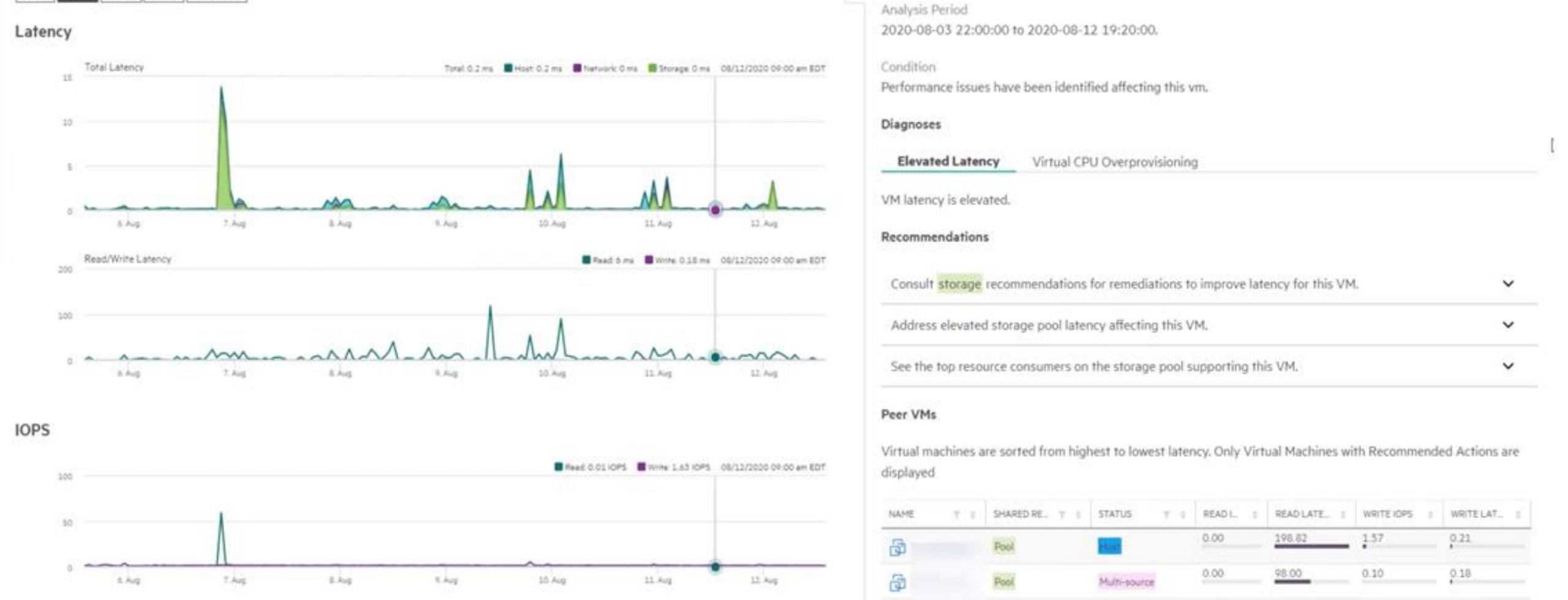
When virtual machines have high CPU utilization, it can mean that the processes running on those VMs is starved for CPU resource. Generally targeting vCPU utilization well under 90% is advisable.

Peer VMs

Virtual machines are sorted from highest to lowest CPU contention. Only Virtual Machines with Recommended Actions are displayed

NAME	CPU CO-STOP	VIRTUAL PRO...	CPU USAGE (%)	SHARED RESO...	STATUS
nsdiag1	1.07	4.00	111.47	Host	Underprovisioned
nsdiag2	1.06	4.00	111.00	Host	Underprovisioned
nsdiag3	1.06	4.00	100.47	Host	Underprovisioned

Time Range: 08/06/2020 11:13 AM EDT to 08/13/2020 11:13 AM EDT
 1D 1W 1M 3M Custom



Recommended Actions

Analysis Period: 2020-08-03 22:00:00 to 2020-08-12 19:20:00.

Condition: Performance issues have been identified affecting this vm.

Diagnoses

- Elevated Latency** - Virtual CPU Overprovisioning

VM latency is elevated.

Recommendations

- Consult **storage** recommendations for remediations to improve latency for this VM.
- Address elevated storage pool latency affecting this VM.
- See the top resource consumers on the storage pool supporting this VM.

Peer VMs

Virtual machines are sorted from highest to lowest latency. Only Virtual Machines with Recommended Actions are displayed.

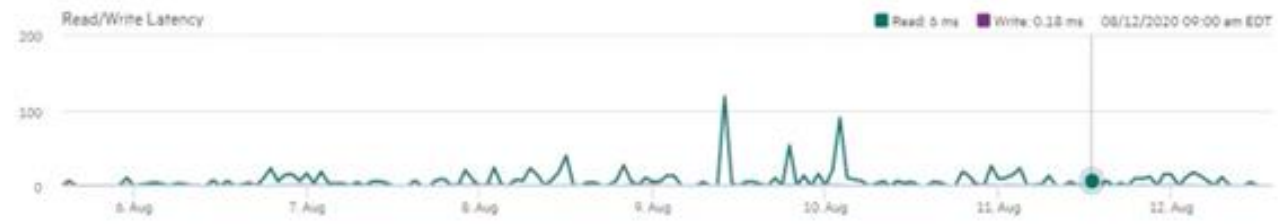
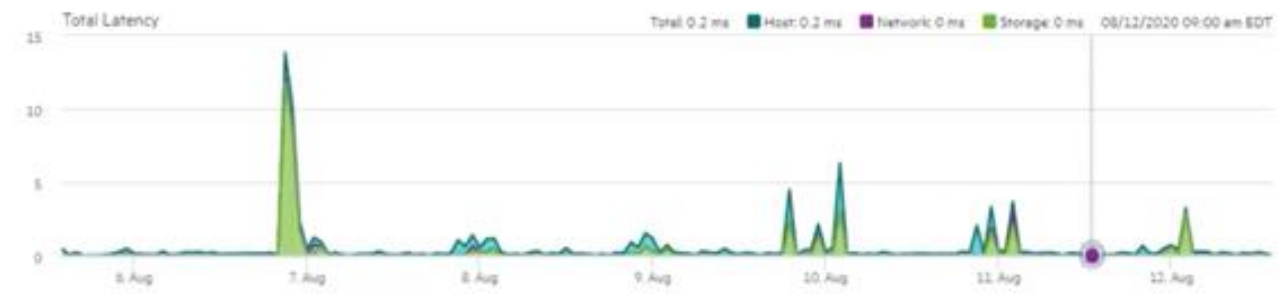
NAME	T	SHARED RE.	T	STATUS	T	READ I.	READ LATE.	WRITE IOPS	WRITE LAT.
		Pool		OK		0.00	198.82	1.57	0.21
		Pool		Multi-source		0.00	98.00	0.10	0.18
		Pool		OK		0.00	88.00	0.83	0.48

Performance Capacity VMDKs (1)

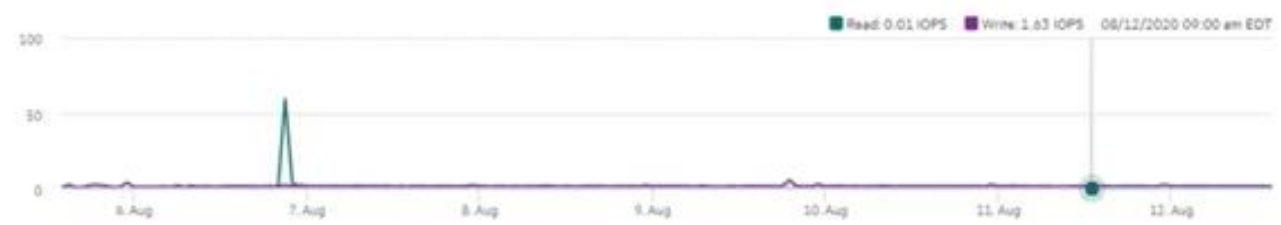
Time Range: 08/06/2020 11:13 AM EDT to 08/13/2020 11:13 AM EDT

1D 1W 1M 3M Custom

Latency



IOPS



Throughput

Recommended Actions ⓘ

Analysis Period: 2020-08-03 22:00:00 to 2020-08-12 19:20:00.

Condition: Performance issues have been identified affecting this vm.

Diagnoses

Elevated Latency Virtual CPU Overprovisioning

VM latency is elevated.

Recommendations

- Consult **storage** recommendations for remediations to improve latency for this VM. [dropdown]
- Address elevated storage pool latency affecting this VM. [dropdown]
- See the top resource consumers on the storage pool supporting this VM. [dropdown]

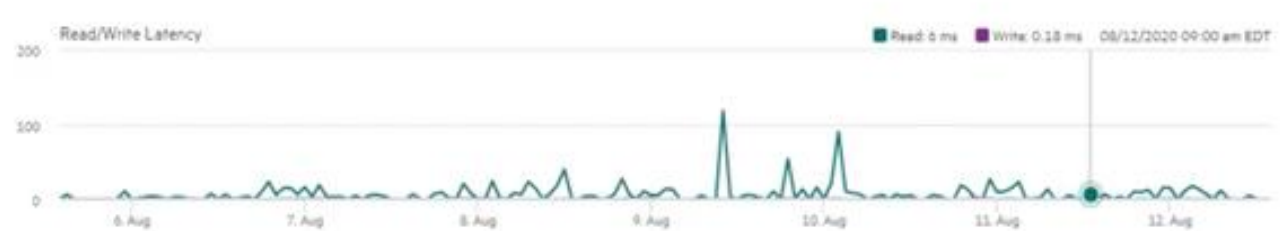
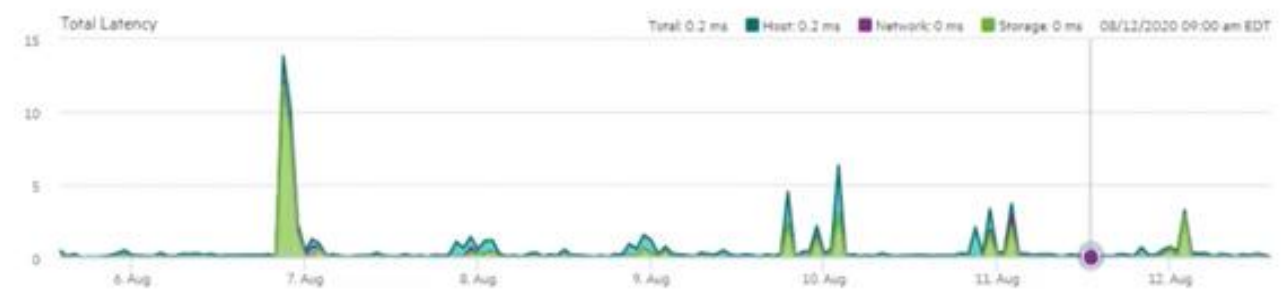
Peer VMs

Virtual machines are sorted from highest to lowest latency. Only Virtual Machines with Recommended Actions are displayed

NAME	Y	SHARED RE.	Y	STATUS	Y	READ I.	Y	READ LATE.	Y	WRITE IOPS	Y	WRITE LAT.	Y
[icon] Pool		Pool		Full		0.00		198.62		1.57		0.21	
[icon] Pool		Pool		Multi-source		0.00		98.00		0.10		0.18	
[icon] Pool		Pool		Full		0.00		88.00		0.83			

Time Range: 08/06/2020 11:13 AM EDT to 08/13/2020 11:13 AM EDT
 1D 1W 1M 3M Custom

Latency



IOPS



Throughput

Recommended Actions ⓘ

Analysis Period
 2020-08-03 22:00:00 to 2020-08-12 19:20:00.

Condition
 Performance issues have been identified affecting this vm.

Diagnoses

Elevated Latency **Virtual CPU Overprovisioning**

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

Recommendations

Reduce the number of virtual CPUs allocated to this **overprovisioned** VM.

Peer VMs

Virtual machines are sorted from highest to lowest CPU contention. Only Virtual Machines with Recommended Actions are displayed.

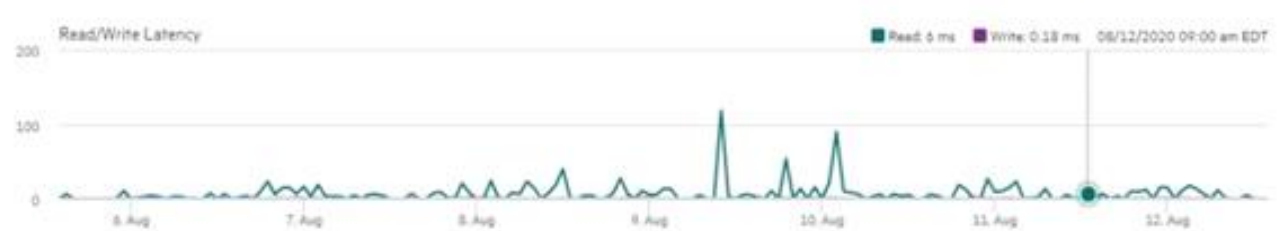
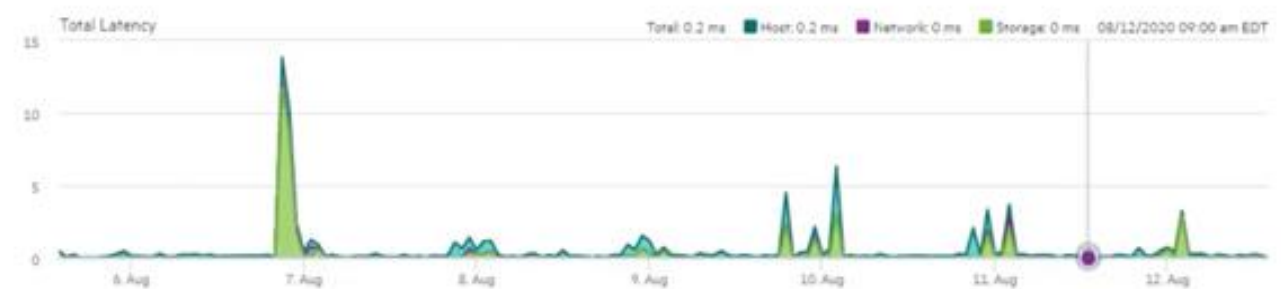
NAME	CPU CO-STOP	VIRTUAL PRO.	CPU USAGE (%)	SHARED RESO.	STATUS
[Icon]	3.48	8.00	23.84		Impacted, Overprovis...
[Icon]	3.05	8.00	11.11		Impacted, Overprovis...
[Icon]	2.66	8.00	19.89		Overprovisioned
[Icon]	2.55	8.00	18.46		Overprovisioned
[Icon]	2.43	8.00	14.18		Overprovisioned

Performance Capacity VMDKs (1)

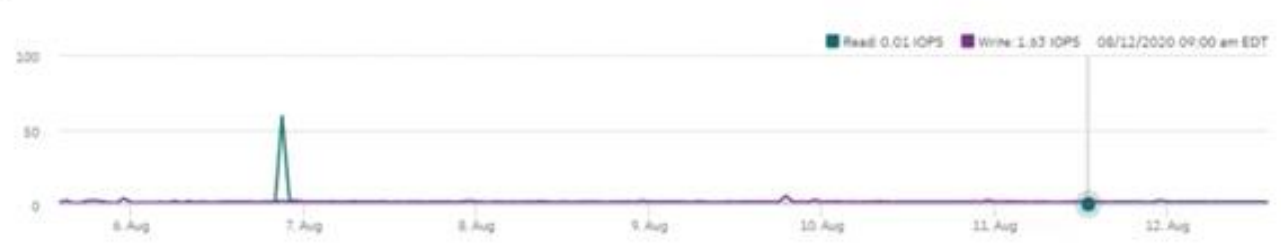
Time Range: 08/06/2020 11:13 AM EDT to 08/13/2020 11:13 AM EDT

1D 1W 1M 3M Custom

Latency



IOPS



Throughput

Recommended Actions

Analysis Period: 2020-08-03 22:00:00 to 2020-08-12 19:20:00.

Condition: Performance issues have been identified affecting this vm.

Diagnoses

- Elevated Latency** - Virtual CPU Overprovisioning

VM latency is elevated.

Recommendations

- Consult **storage** recommendations for remediations to improve latency for this VM.
- Address recommendations provided for the attached storage pool as described on the [Pool Performance Details](#) page.
- Address elevated storage pool latency affecting this VM.
- The latency on the storage pool supporting this vm is elevated. Address the performance recommendations for the attached pool as described on the [Pool Performance Details](#) page.
- See the top resource consumers on the storage pool supporting this VM.

CAPACITY		PERFORMANCE (PAST WEEK AVG)		SNAPSHOTS		
 <p>36% Usage</p> <ul style="list-style-type: none"> Total Usage: 55.91 TiB Free Space: 97.62 TiB Total Capacity: 153.53 TiB 	<p>634.5 TiB 12.3X TOTAL SAVINGS</p>	<p>29.2K IO/sec IOPS</p>	<p>1.3GiB/sec THROUGHPUT</p>	<p>6.5 ms R LATENCY</p>	<p>0.2 ms W LATENCY</p>	<p>3</p>

Time Range: 08/06/2020 11:00 AM EDT to 08/13/2020 11:00 AM EDT

1D 1W 1M 3M Custom

The charts below provide an in depth analysis of your pool/array's performance. Using these tools, you can correlate periods of workload (via the IOPS and MBPS charts) with periods of latency. [More...](#)



Recommended Actions

Past Day Past Week

Analysis Period
08/05/2020 3:00:00 AM EDT to 08/12/2020 6:36:00 PM EDT.

Condition
The storage system is experiencing elevated random read and sequential read latency.

Diagnosis

SSD Bandwidth Saturation

SSD bandwidth saturation is affecting random read and sequential read performance.

Recommendations

- Consider QoS limits on high SSD bandwidth volumes.
- Consider staggering workloads on high SSD bandwidth volumes.
- Increase system SSD bandwidth by adding SSDs.

Volume Details

The volumes below are ranked by the SSD bandwidth they consume during periods

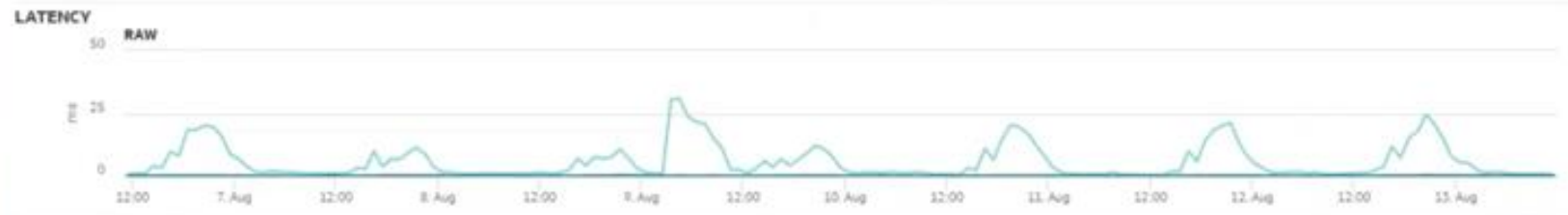
Pool

Array 1

Time Range: 08/06/2020 11:00 AM EDT to 08/13/2020 11:00 AM EDT

1D **1W** 1M 3M Custom

The charts below provide an in depth analysis of your pool/array's performance. Using these tools, you can correlate periods of workload (via the IOPS and MBPS charts) with periods of latency. [More...](#)



Recommended Actions

Past Day **Past Week**

Analysis Period
08/05/2020 3:00:00 AM EDT to 08/12/2020 6:36:00 PM EDT.

Condition
The storage system is experiencing elevated random read and sequential read latency.

Diagnosis

SSD Bandwidth Saturation

SSD bandwidth saturation is affecting random read and sequential read performance.

Recommendations

- Consider QoS limits on high SSD bandwidth volumes. >
- Consider staggering workloads on high SSD bandwidth volumes. >
- Increase system SSD bandwidth by adding SSDs. >

Volume Details

The volumes below are ranked by the SSD bandwidth they consume during periods when latency is elevated.

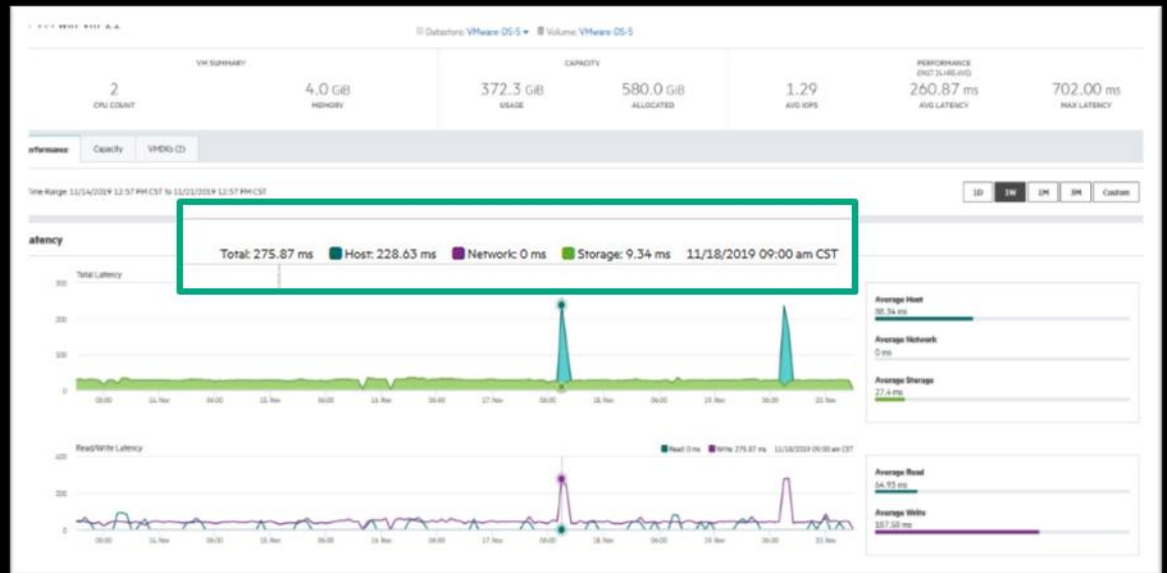
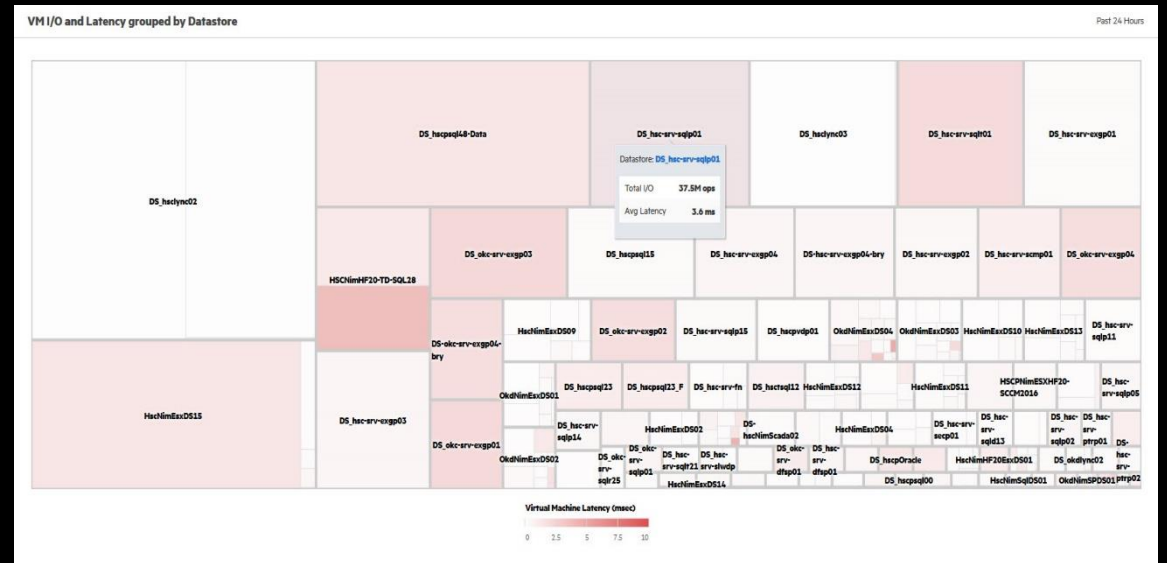
VOLUME NAME	T	IOPS	MBPS	SSD BANDWL.
.1		5,416.4	106.9	11.0
		1,038.5	76.4	4.0
.10		1,199.5	80.0	3.5

문제가 있는 VM 빠르게 식별 및 처리



HPE Infosight

- VM 지연 요인 진단 : 스토리지, 호스트 또는 네트워크
- 노이즈가 많은 이웃 VM에 대한 수정 조치 수행
- 활용도가 낮은 VM 파악 및 회수
- 모든 리소스의 성능과 현재 상태 진단 및 성능 최적화
- 성능이 낮은 VM의 근본 원인 파악
- VM에 영향을 주는 네트워크, 서버, 스토리지 상세 성능 파악 제공



Environment Status

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

Virtual CPU Underprovisioning (Selected) Elevated Latency

Diagnosis

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

Recommendations

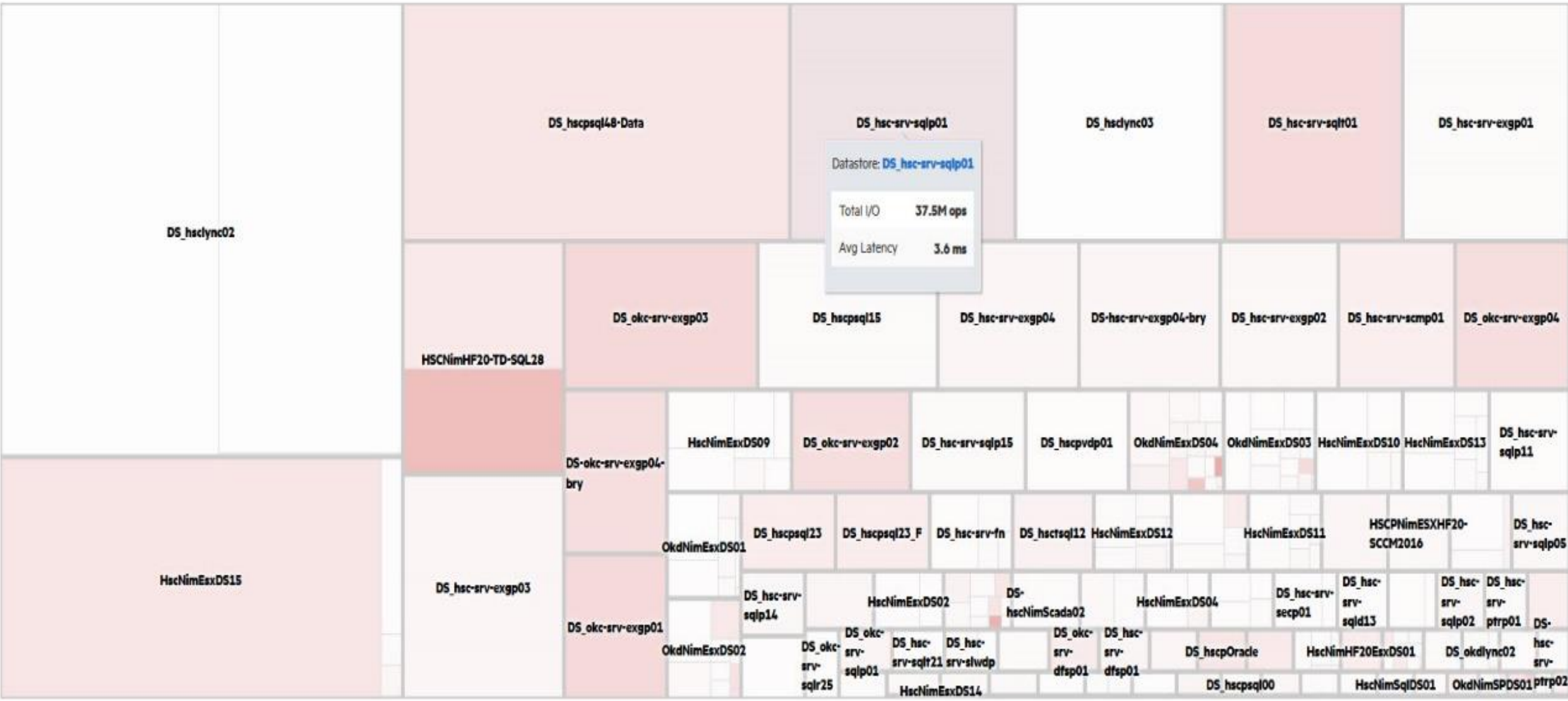
Assign additional virtual CPUs to underprovisioned VMs targeting vCPU utilization under 90%.

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-streamb2	underprovisioned	0.01	1	122.67
test2-streamb3	underprovisioned	0	1	124.99

Treemap visualization showing 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 cores allocated to it.



HPE INFOSIGHT & DHCI

- Announcing VM Recommendations live on HPE InfoSight
<https://www.youtube.com/watch?v=XXIPOnjbeFg>
- HPE InfoSight Cross Stack Recommendations
<https://www.youtube.com/watch?v=gEKdWwLfd6A>
- HPE InfoSight AI Performance recommendations demo
<https://www.youtube.com/watch?v=686nfXoQo-U>





SUMMARY



HPE NIMBLE STORAGE dHCI 한장으로 정리

고성능, 고가용성 그리고 유연한 확장성을 제공할 수 있는 HCI 제품이 없을까?

좀더 경제적이고 비용 효율적인 아키텍처를 지원하는 HCI 제품이 없을까?

Business critical 한 업무에 사용할 수 있는 HCI 제품이 없을까?

HPE Nimble Storage dHCI is the SOLUTION



- 컴퓨터 노드와 스토리지 **독립적 확장**
- **고성능, 빠른 응답속도**
- 99.9999%+의 **고가용성**
- 완벽한 **HCI 경험** 제공
- **통합관리툴**로 장비 및 VM 관리
- **보유하고 있는 리소스** 활용 가능



**Hewlett Packard
Enterprise**

THANK YOU

Please contact nimblestorage-kr@hpe.com

