



Hewlett Packard
Enterprise

HPE INTELLIGENT DATA PLATFORM

Geert Kuijken, Enterprise Architect

Realdolmen Wiki Wednesday, October 2019

HPE – THE STORAGE COMPANY



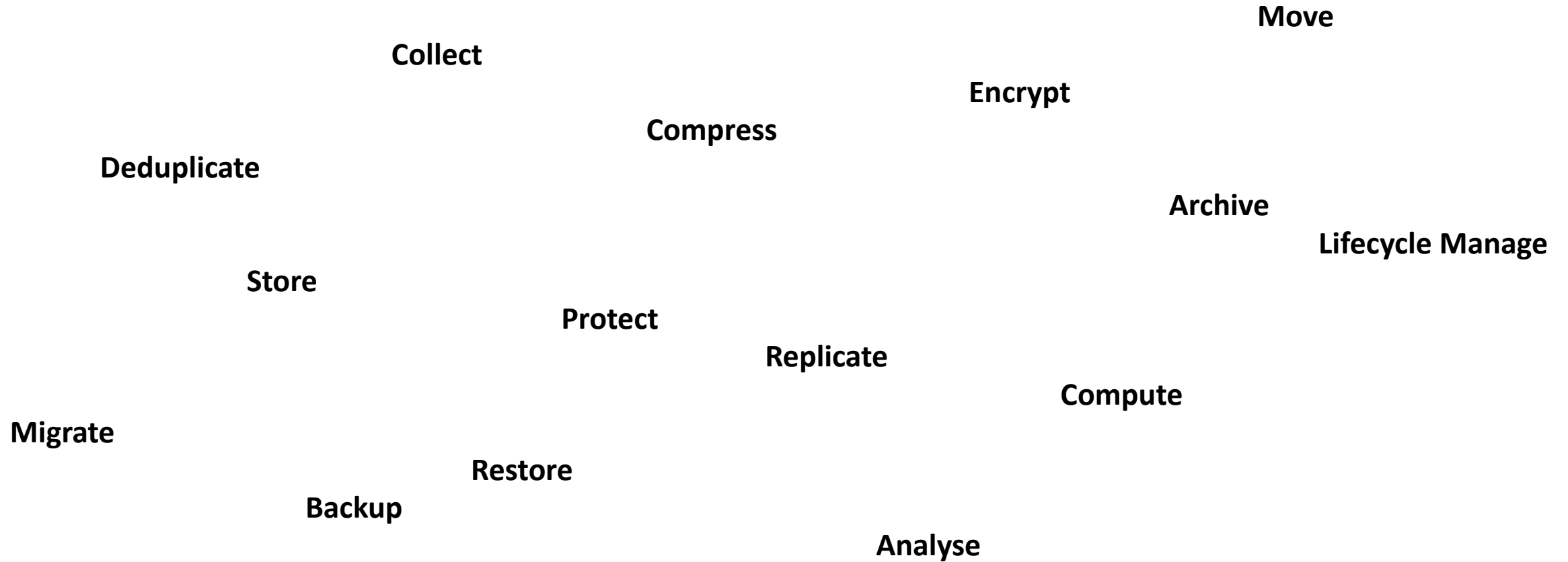
HPE – THE “DATA SERVICES” COMPANY



HPE – THE DATA SERVICES COMPANY

What data services?

Requires Storage, Compute, Fabric technologies, Hybrid IT, Intelligence

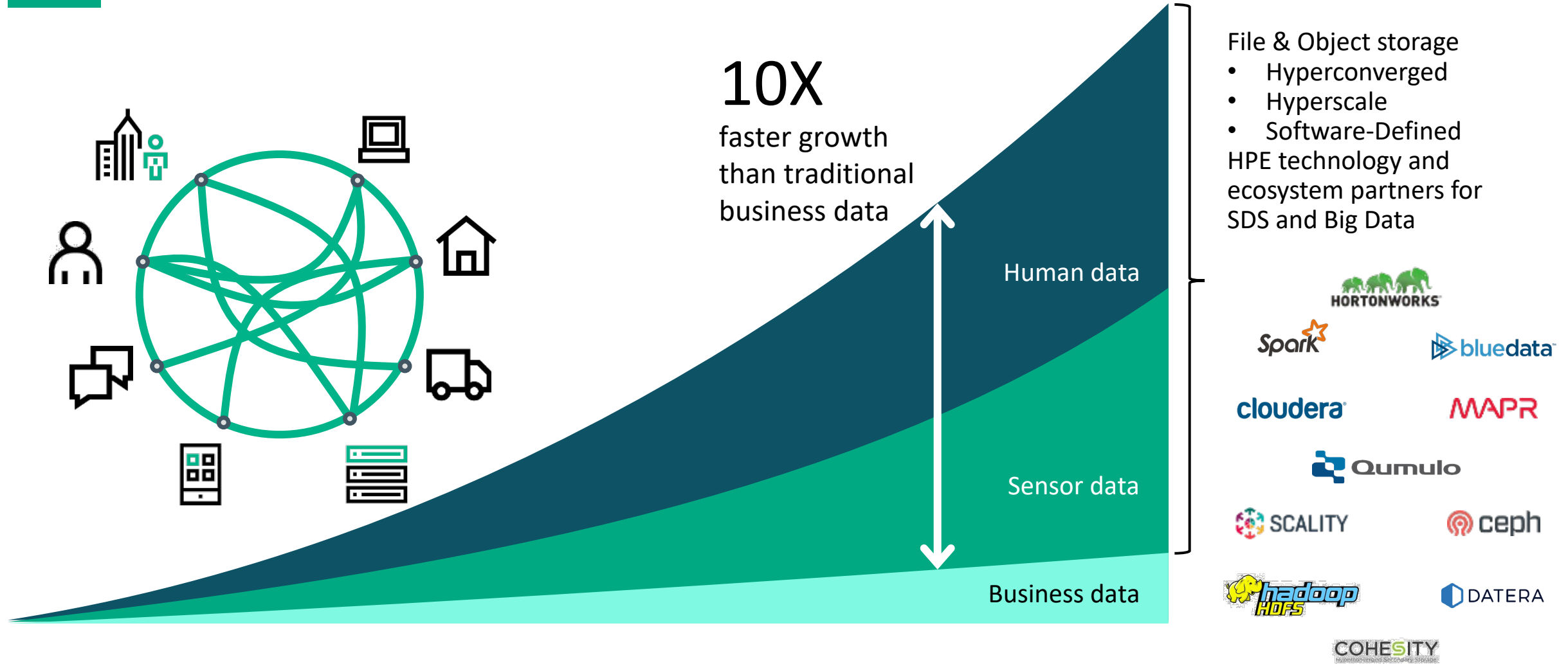


HPE INTELLIGENT DATA PLATFORM



APPS AND DATA LANDSCAPE IS CHANGING

More connected people, apps, and things generating more and more data



HPE INTELLIGENT DATA PLATFORM - TODAY

Storage component

Primera



Tier 0, All-Active
100% Uptime

Nimble



Effortless Experience
dHCI

SimpliVity



Hyper-Converged
with DR/BC

Apollo 4000



Big Data, Scale-out
Workloads

StoreOnce & Nimble Adaptive

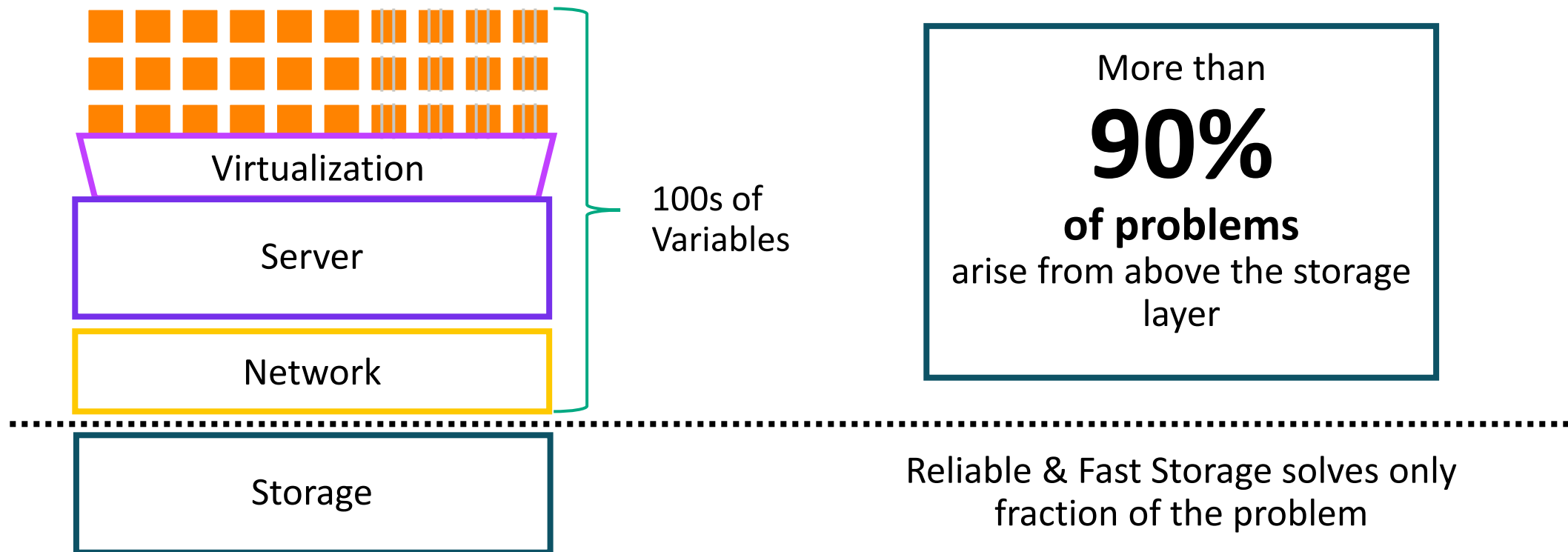


Secondary
Workloads

Powered by [HPE InfoSight](#): Autonomous and context-aware

HPE INFOSIGHT WORKS CROSS-STACK

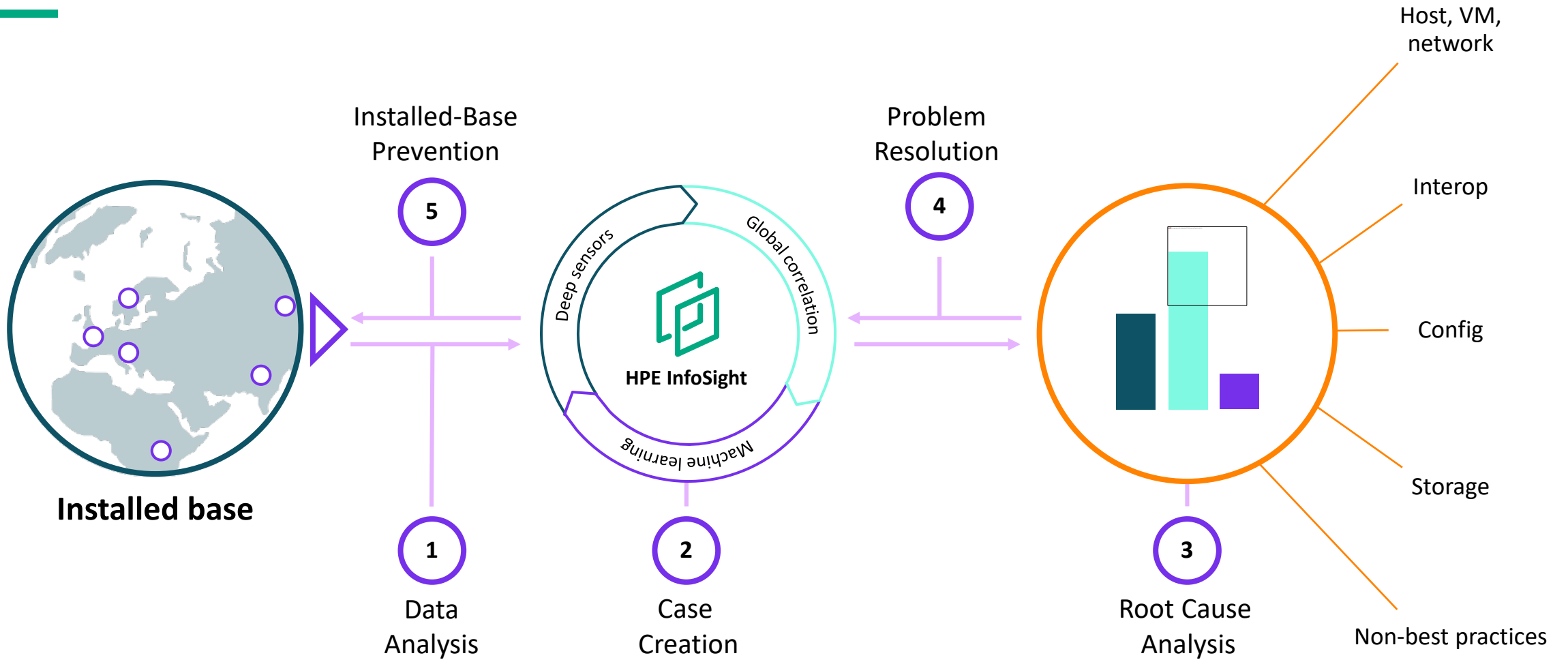
Storage resiliency alone is ineffective



*IDC, Server and Storage Availability Survey Results, April 2019

HPE INFOSIGHT

See once, prevent for all



THE INTELLIGENT DATA PLATFORM

Storage Components



WHAT IF YOU COULD HAVE BOTH AGILITY AND RESILIENCY FOR YOUR MISSION-CRITICAL APPS?

Manage

Itself

Predict & prevent

App Disruptions

Consolidate

Without Risk



WHAT IF YOU COULD HAVE BOTH AGILITY AND RESILIENCY FOR YOUR MISSION-CRITICAL APPS?



HPE Nimble storage



HPE Insight



HPE 3PAR



HPE PRIMERA: THE WORLD'S MOST INTELLIGENT STORAGE

Designed for mission-critical apps

HPE Primera



Simple

Highly
available

Fast



HPE STORAGE ON-DEMAND EXPERIENCE

Radically **simple** all of the time

- Automated setup with streamlined workflows
- No separate tools needed with built-in management
- No tuning with **all-active, always-on data reduction and RAID6**
- Prescriptive OS updates transparent to applications
- API-driven for **infrastructure as code**



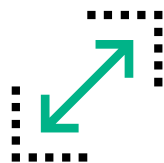
20 Min

Rack-to-Apps



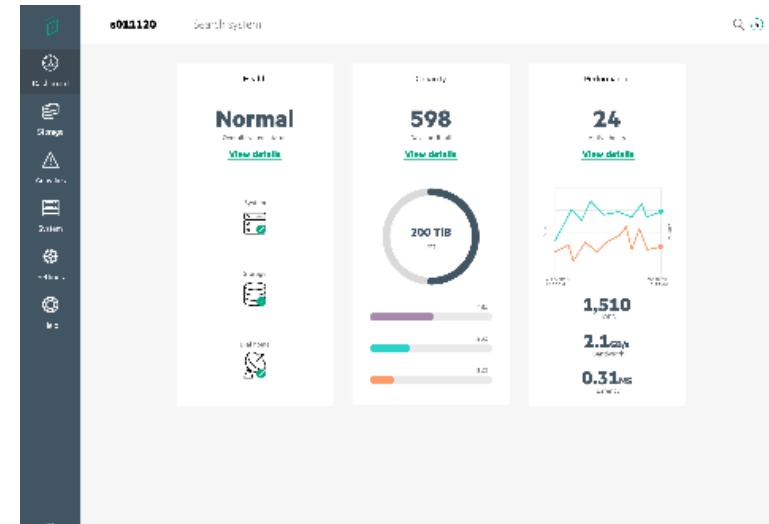
Seconds

to Provision



5 Min

No-risk upgrades



up to **93%**

reduction in time spent to
deploy, manage, and scale
storage

100% AVAILABILITY GUARANTEED STANDARD FOR EVERYONE.

No special contract. No restrictive terms. No more downtime.

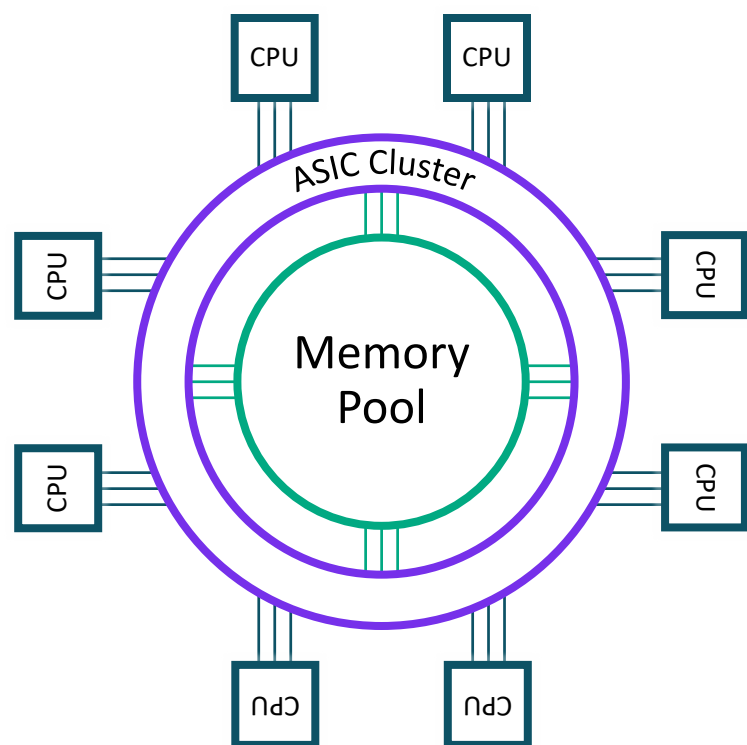
- Array must call home and be registered with Infosight
- Array must have Proactive Care or above active support contract
- Array software must be up-to-date – 10 days for patches, 30 days for OS releases
- Guarantee available for 3 years from date of purchase of array
- Credits need to be redeemed 3 years from date of receiving



HPE STORAGE PREDICTIVE ACCELERATION

All-active architecture for **fast** performance

Every volume intelligently accessing every SSD, node, and port

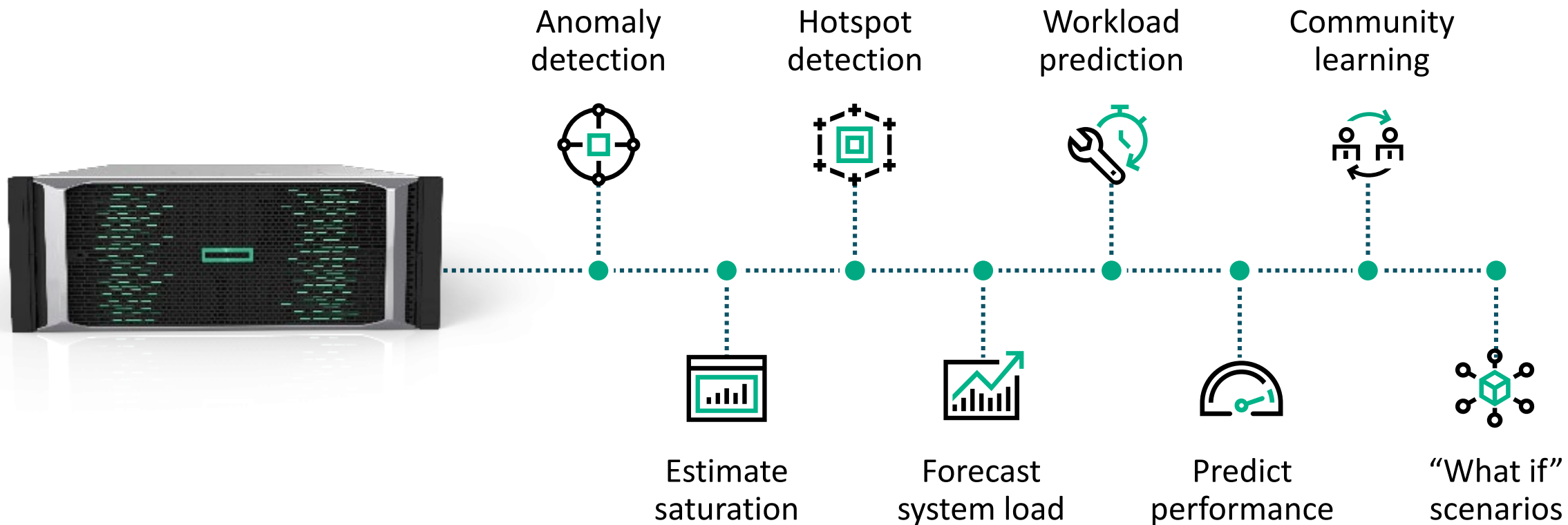


- Built for NVMe
 - Up to 1.5M IOPS always low latency
- No Tuning Required
 - Every resource is always balanced
- Multi-Tenancy at Scale
 - Quality of service for latency assurance
- Instant Failover
 - True active-active for high resiliency



HPE STORAGE PREDICTIVE ACCELERATION

Embedded AI engine self-optimizing performance



HPE PRIMERA HARDWARE BUILDING BLOCKS

Base Chassis



2U Chassis

2 nodes with 24 SFF slots



4U Chassis

2-nodes with 24 usable SFF slots
or
4-nodes with 48 usable SFF slots

Controllers



A630 / C630



A650 / C650 2N



A650 / C650 4N



A670 / C670 2N



A670 / C670 4N

Drive Enclosures



2U 24-slot SFF SAS



2U 12-slot LFF SAS

Drives



SAS SSD



NVMe SSD *



NVMe SCM
*



SAS 10K HDD



SAS NL HDD
(LFF)

Adapters



4-port 16Gb FC HBA

4-port 32Gb FC HBA

4-port 10/25Gb Eth HBA *

2-pack 10Gb Eth SFP

2-pack 10Gb Eth SFP

4-port 10GBase-T *

4-port 12Gb/s SAS HBA

Racks



HPE G2 Rack



Custom Rack



HPE PRIMERA 2U BASE CHASSIS

- 2U controller
 - 2 nodes, 24 SFF drives



16 x 12Gb SFF SAS Slots

8 x dual-use SFF Slots
(12Gb SAS or
NVMe)

- 4U controller
 - 4 nodes, 48 SFF drives

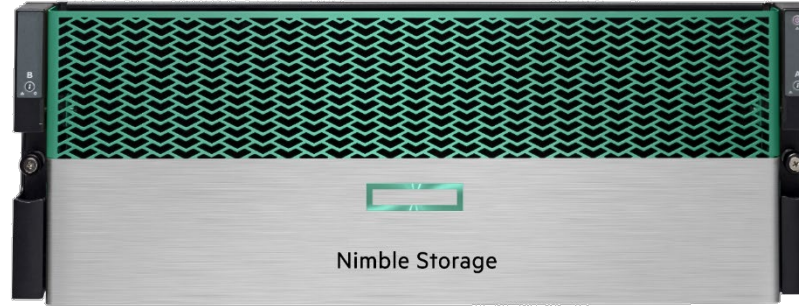
32 x 12Gb SFF SAS Slots

16 x dual-use SFF Slots



HPE NIMBLE: NOT PRIMERA'S LITTLE BROTHER

Designed for Simplicity



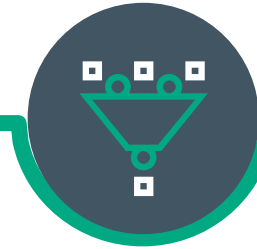
**Store More
Guarantee**



Timeless Storage



**InfoSight predictive
analytics**



Inline always-on dedupe

All-Flash and Hybrid Flash models

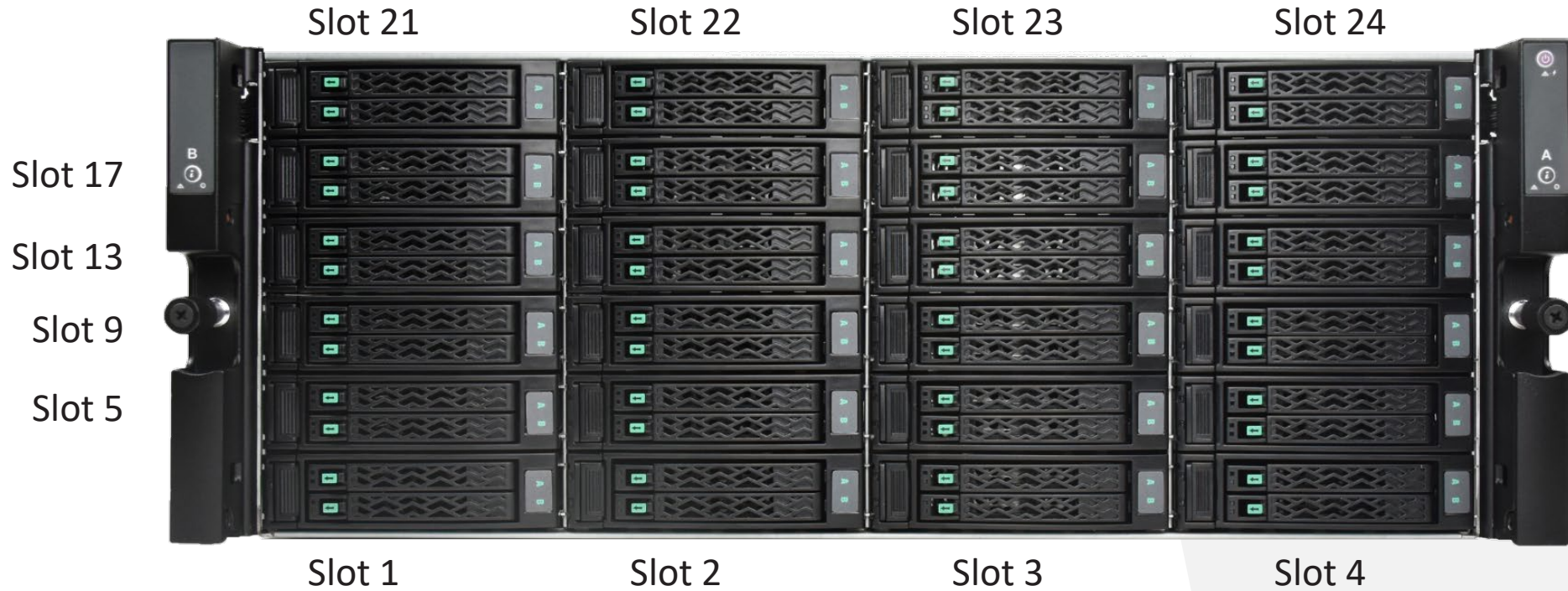
99.9999% availability guarantee – no special contracts required

Fully no SPoF Active/Passive architecture

Triple+ Parity RAID configuration

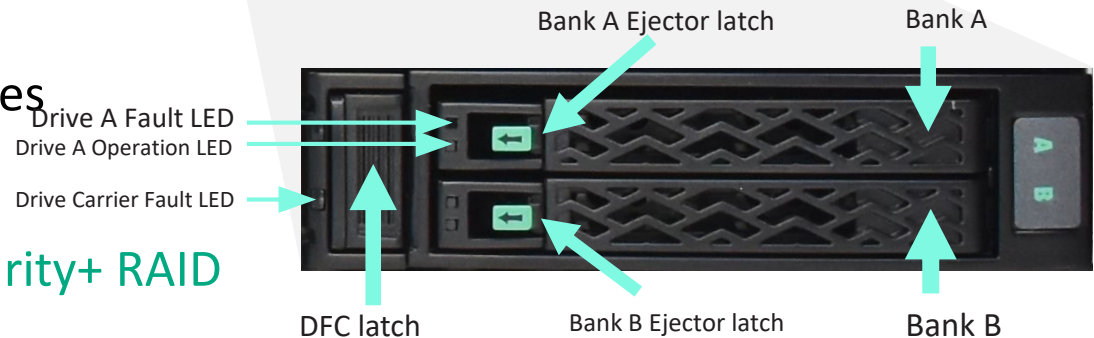
All-inclusive Licensing

ALL FLASH SERIES DRIVE LAYOUT



- 4U Chassis
- 48 SSD Drive capacity
 - Same layout for expansion shelf

- 2 Banks of 24 x 3.5" SSD drives
 - Bank A – SSD Drives 1 -24
 - Bank B – SSD Drives 25 - 48
 - Per Bank: 21 + 3 for Triple Parity+ RAID



HYBRID FLASH SERIES DRIVE LAYOUT

Slots 21-24

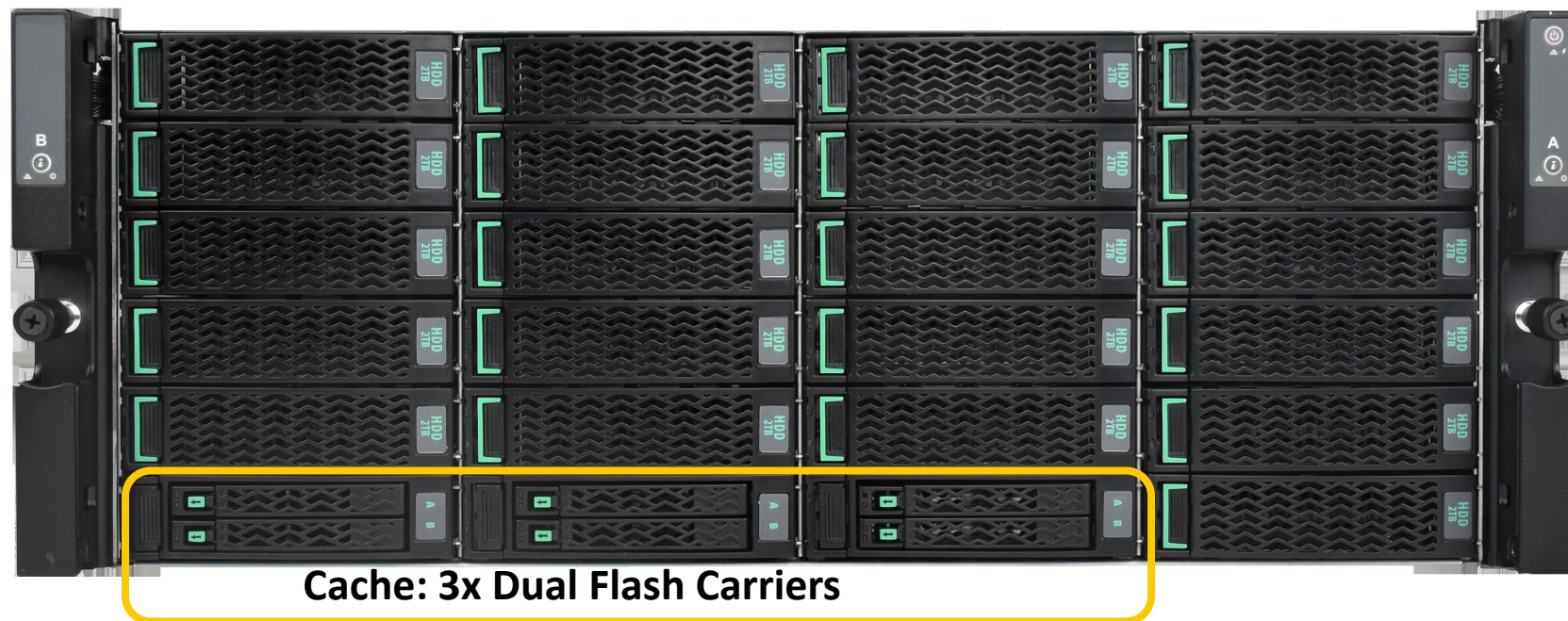
Slots 17-20

Slots 13-16

Slots 9-12

Slots 5-8

Slots 1-4



- 4U24 Chassis
- 24 x 3.5" Slots carry 21x HDDs + 3x DFCs. HDDs: 18 + 3 Triple Parity+ RAID
- DFCs: HF20/40/60: minimum of 6 SSDs (both banks populated) to support dedupe
 - HF20C: minimum of 3 SSDs in Bank A
 - Same layout for expansion shelf. Bank A prepopulated with 3 SSDs

DRIVE LAYOUT – HF20H ENTRY MODEL



- 4U24 Chassis
- 24 x 3.5" Slots carry 11x 1TB HDDs + 2x DFCs; additional HDD 11 slots are empty
- HDDs: **8 + 3 Triple Parity+ RAID**
 - 11TB capacity upgrade to 22TB raw (additional cache may be required to maintain 8% flash-to-disk ratio)
- DFC: minimum of 2 SSDs in Bank A. Minimum of 4 SSDs recommended to support dedupe

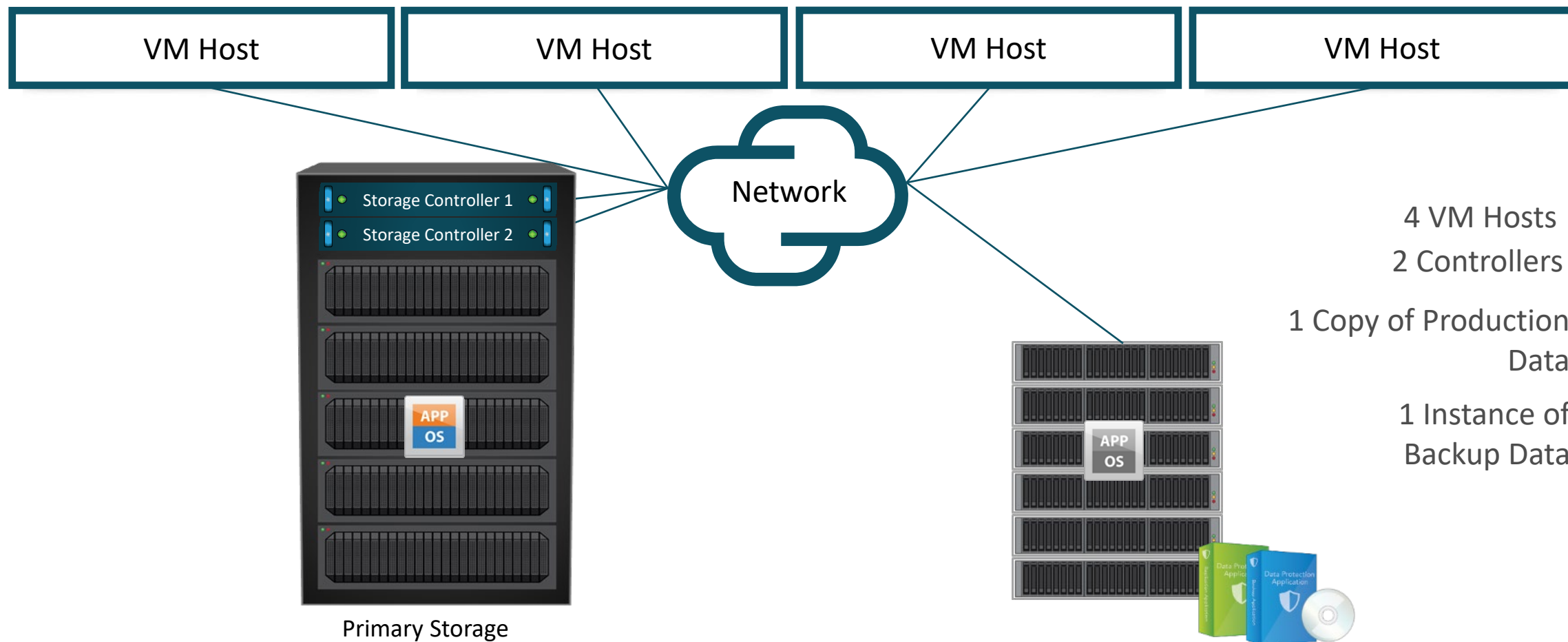
THE INTELLIGENT DATA PLATFORM

Hyperconverged Compute/Storage Components



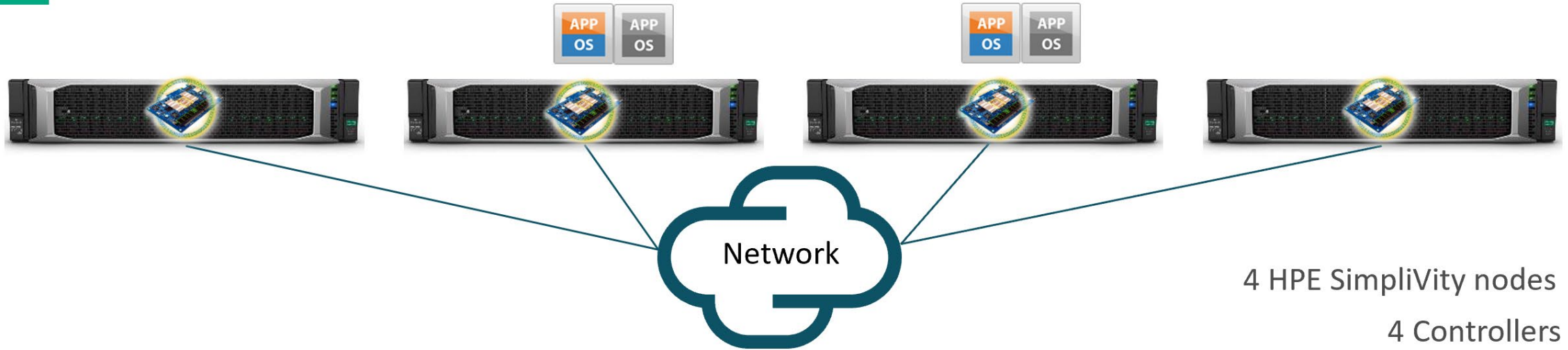
FOCUS ON HYPERCONVERGENCE

Part 1: HPE SimpliVity - doing more with less



FOCUS ON HYPERCONVERGENCE

Part 1: HPE SimpliVity - doing more with less

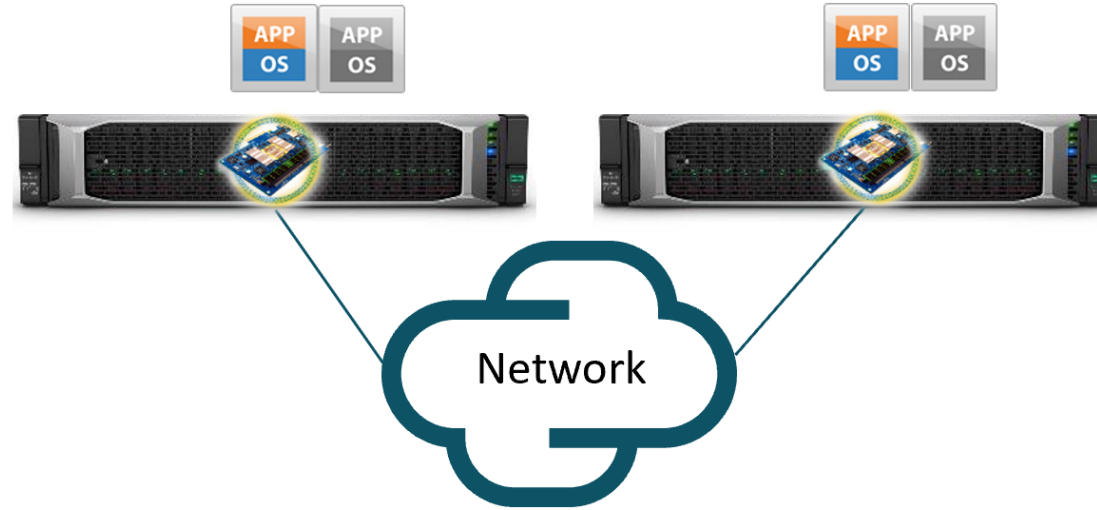


- 4 HPE SimpliVity nodes
- 4 Controllers
- 2 Copy of Production Data
- 2 Instances of Backup Data



FOCUS ON HYPERCONVERGENCE

Part 1: HPE SimpliVity - doing more with less



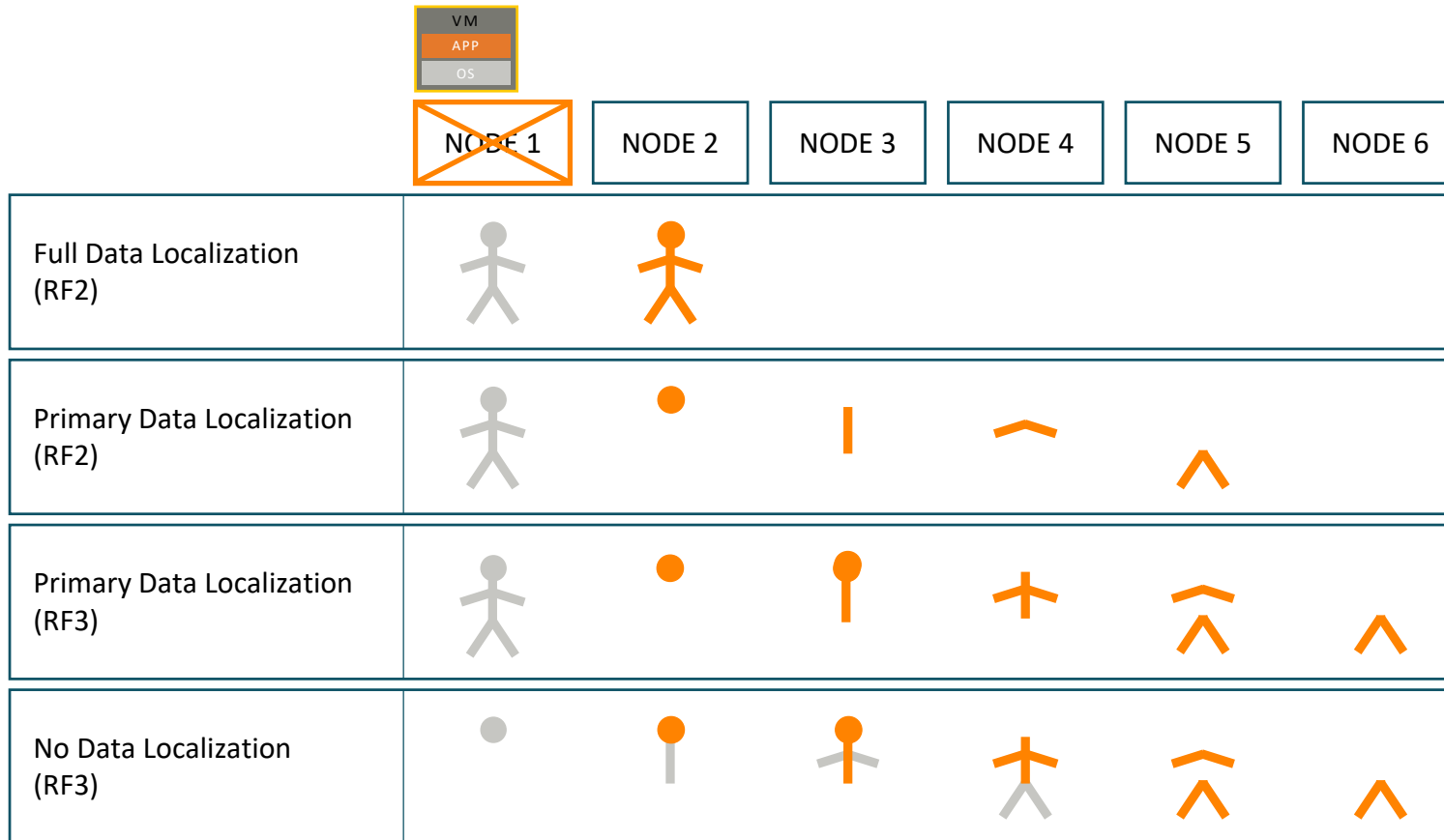
2 HPE SimpliVity nodes

2 Controllers

2 Copy of Production
Data

2 Instances of
Backup Data

DATA DISTRIBUTION PERFORMANCE CONSIDERATIONS



Predictable performance	Peak performance
Best	Best
Poor	Good
Poor	Good
Fair	Fair

- Full Data Localization provides most Predictable Performance
 - Data ALWAYS stored local to the VM, even when VM is moved
 - Data never need to be “re-localized”
 - Fully exploits speed of all-flash storage.
- Full Data Localization provides best Peak Performance.
 - Data ALWAYS stored local to the VM
 - Lowest overhead in write operations



HPE SIMPLIVITY PRODUCT FAMILY



	2600	325	380H	380G	380
Form Factor	2U2N, 2U4N, 1-2P Apollo r2600 Gen10	1U1N, 1P ProLiant DL325 Gen10	2U1N, 1-2P ProLiant DL380 Gen10 LFF	2U1N, 1-2P ProLiant DL380 Gen10 SFF	2U1N, 1-2P ProLiant DL380 Gen10 SFF
Data Path	Software-optimized	Software-optimized	Software-optimized	Software-optimized	Hardware-accelerated
Memory	Up to 1.5TB	Up to 2TB	Up to 3TB	Up to 3TB	Up to 1.5TB
Usable Capacity	7.5TB	XS, S, 4.6TB, 7.5TB	Large 25TB	Small 7.5TB	XS, S, M, L, XL 3, 6, 11, 16, 32TB
Storage Configuration	6 x 1.9TB SSD All flash	4 or 6 x 1.9TB SSD All flash	4 x 1.92TB SSD & 8 x 4TB HDD	6 x 1.9TB SSD All flash	5 x 960GB to 12 x 3.8TB All flash
Features	Density optimized	AMD-based	Hybrid storage \$/GB optimized	100% Software-optimized Extra available PCIe slots	4000 Series (RI) 6000 Series (MU)
Use cases	Edge deployments Limited space	ROBO, Edge SMD deployments	Backup/archive Longer term SimpliVity backups	Multi-GPU image processing, VDI Additional NIC connectivity for 1P systems	Data Center consolidation Maximum general-purpose performance



FOCUS ON HYPERCONVERGENCE

Part 2: HPE Disaggregated Hyperconverged (dHCI)

Hyperconverged Infrastructure: HPE SimpliVity

Disaggregated Hyperconverged Infrastructure: dHCI



DHCI: HYPER-CONVERGED DEPLOYMENT WITH STANDARD COMPONENTS

Start with Configuration Checklist and Deployment Guide

Global Networking	
Description	Variable
Management Network VLAN	mgmt_vlan
Management Network Netmask	mgmt_net_netmask
Management Network Gateway	mgmt_net_gw
Management Network DNS Server	mgmt_net_dns1
Management Network Domain Name	mgmt_net_domain_name
Management Network NTP Server	mgmt_net_ntp1
VM Production Network VLAN	vm_production_net_1_vlan
iSCSI1 VLAN	iscsi1_vlan



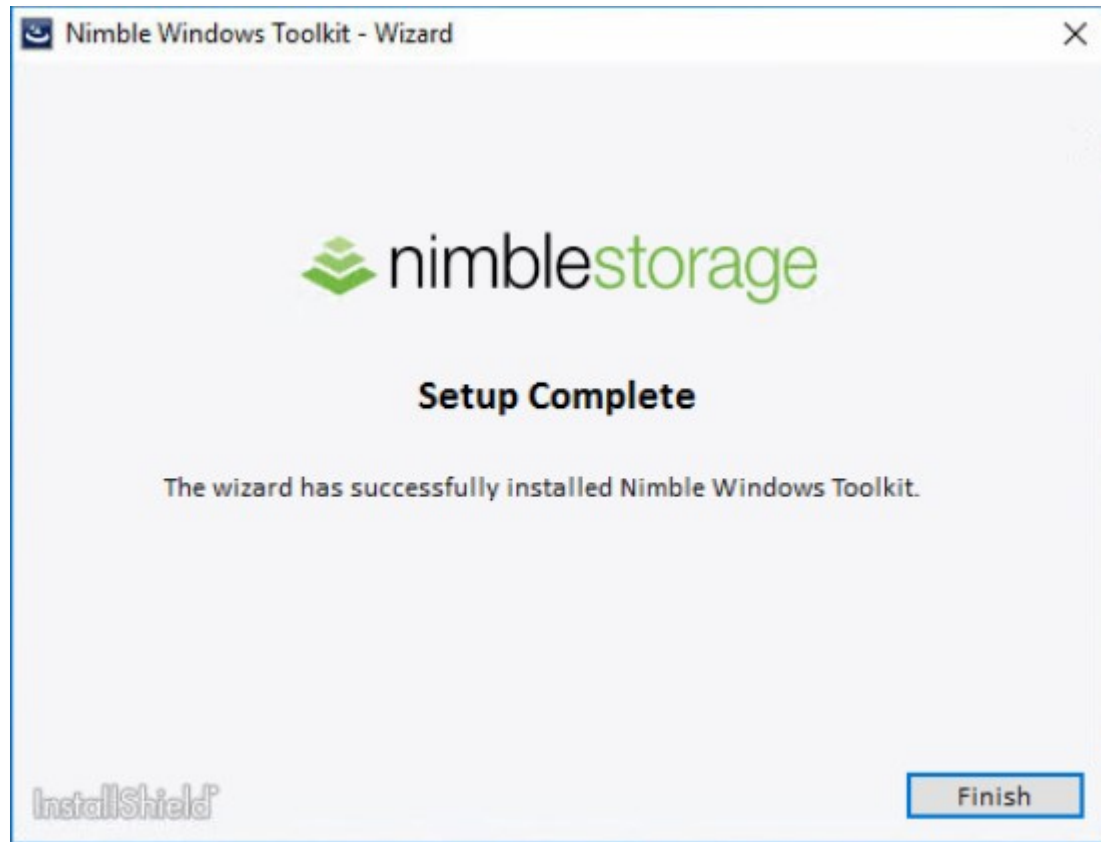
DHCI: HYPER-CONVERGED DEPLOYMENT WITH STANDARD COMPONENTS

Deploy Switches using Deployment
Guide



DHCI: HYPER-CONVERGED DEPLOYMENT WITH STANDARD COMPONENTS

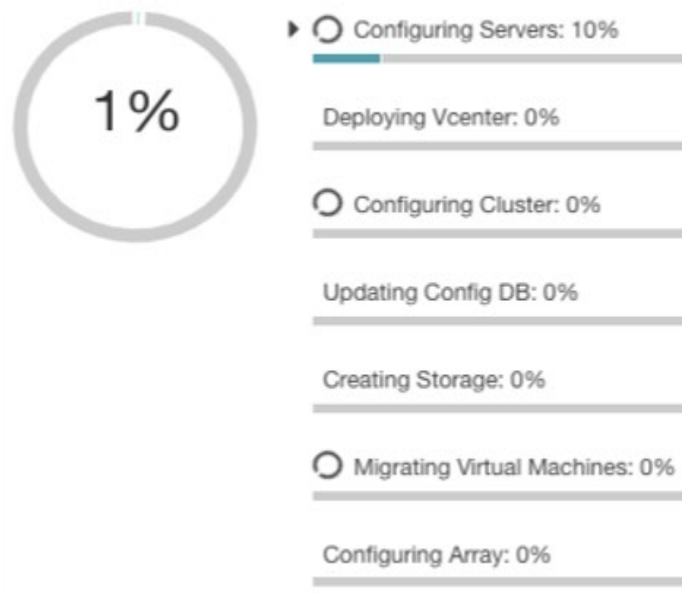
Deploy Nimble via std wizard



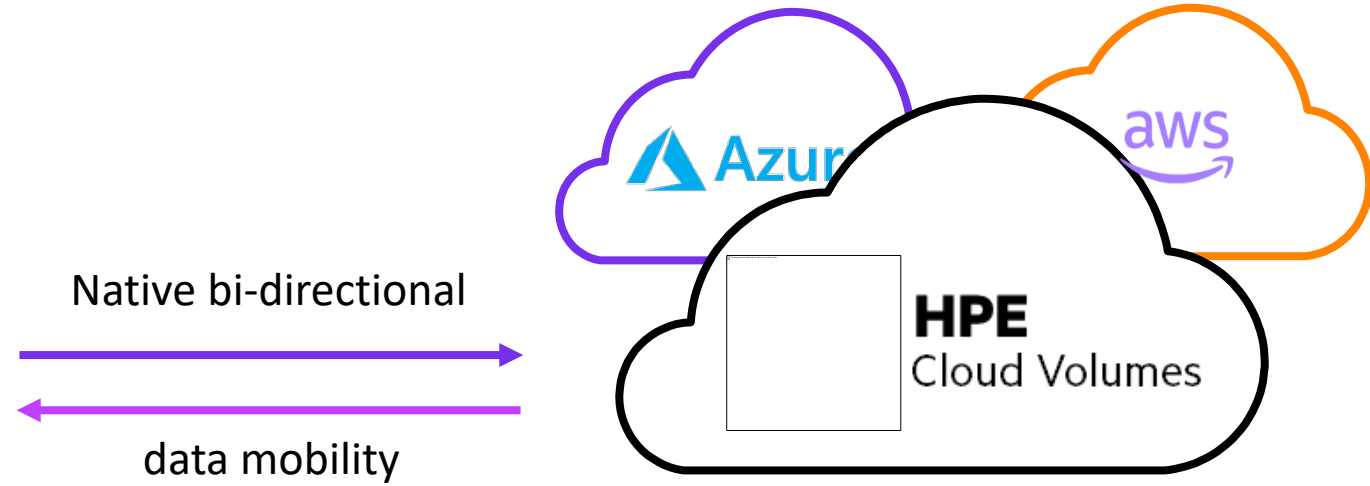
DHCI: HYPER-CONVERGED DEPLOYMENT WITH STANDARD COMPONENTS

In 15 min the Nimble Wizard will:

- Run Configuration Checker
- Deploy vCenter and ESX Servers
- Connect vCenter *and* Servers to InfoSight via Nimble array
- Provision volumes
- Migrate VMs



EASY WORKLOAD MOBILITY



**Hybrid Cloud
Backup and DR**

**Agility for
DevOps**

**Hybrid Cloud
Container Apps**

THE INTELLIGENT DATA PLATFORM

Data Mobility



HPE RECOVERY MANAGER CENTRAL

Policy Engine for Data Management

Application-consistent snapshots

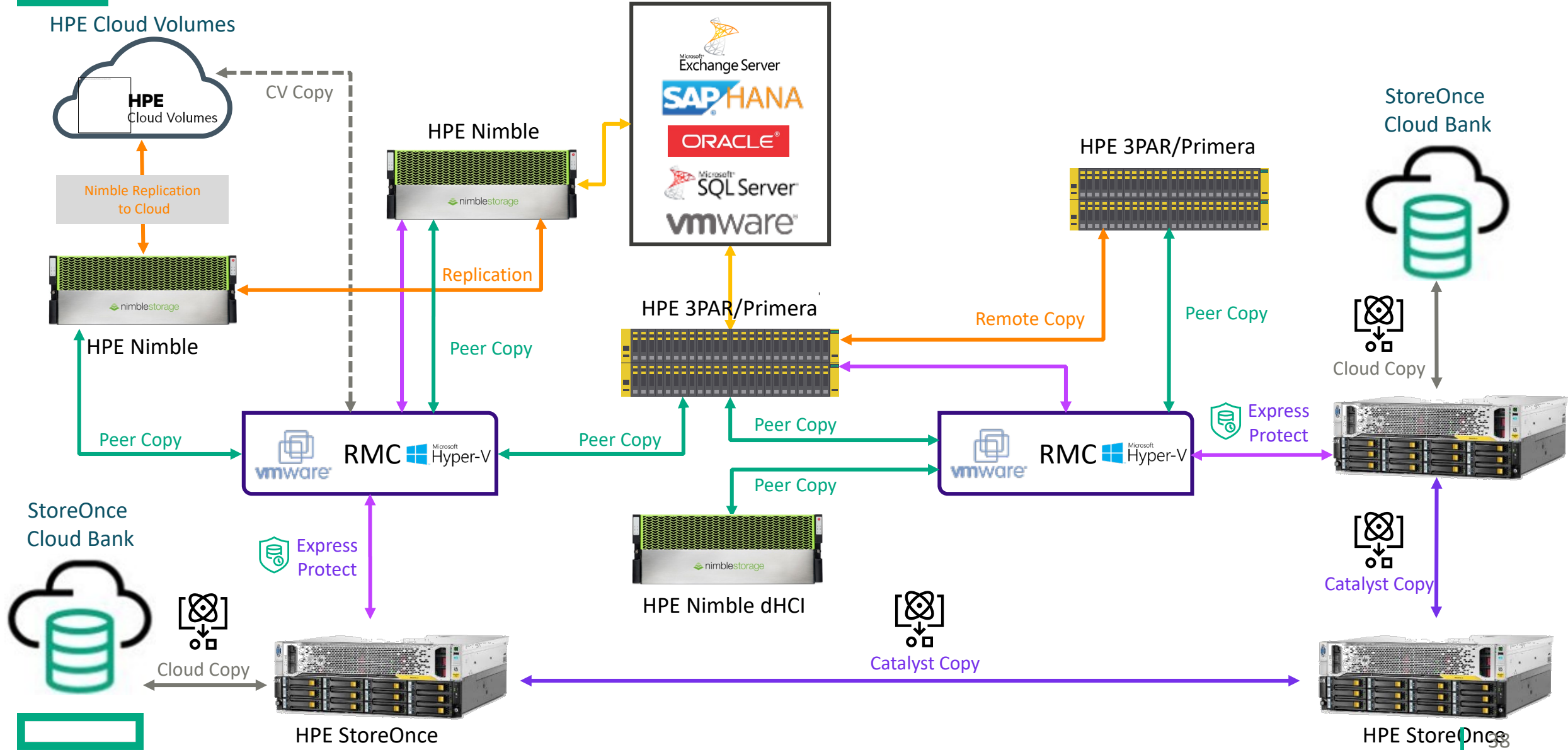
- RMC-S: Microsoft SQL app-consistent protection
- RMC-V: VMware app-consistent protection
- RMC-O: Oracle app-consistent protection
- RMC-E: Microsoft Exchange app-consistent protection
- RMC-Core: Crash-consistent protection for 'any' application data
- RMC REST APIs: Can be used with app-quiescing scripts to automate app-consistent protection for 'any' application on Nimble volumes

Functionality

- Snapshot-based backups from primary storage to StoreOnce
- StoreOnce Catalyst Rapid Express Protect Backups
- StoreOnce Catalyst Rapid Express Restore
- Rapid Recovery from any point-in-time copy
- Zero Copy Clones
- StoreOnce Catalyst Copies on off-site StoreOnce
- Copies on StoreOnce Cloud Bank Storage
- Peer Copy between StoreOnce – Nimble – 3PAR – Primera

RMC is included in HPE Nimble – 3PAR – Primera storage

HPE RECOVERY MANAGER CENTRAL



THE INTELLIGENT DATA PLATFORM

Composable Infrastructure

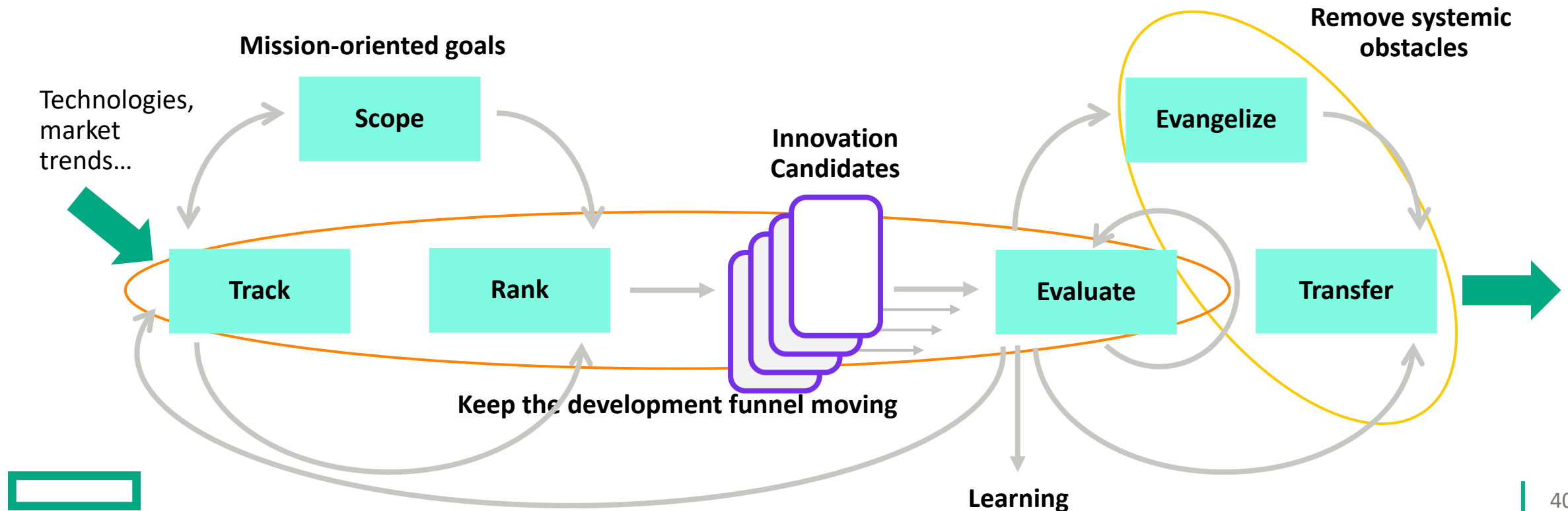


WHERE DOES COMPOSABILITY MAKE SENSE?

Fits with agile, cloud-native, DevOps approach

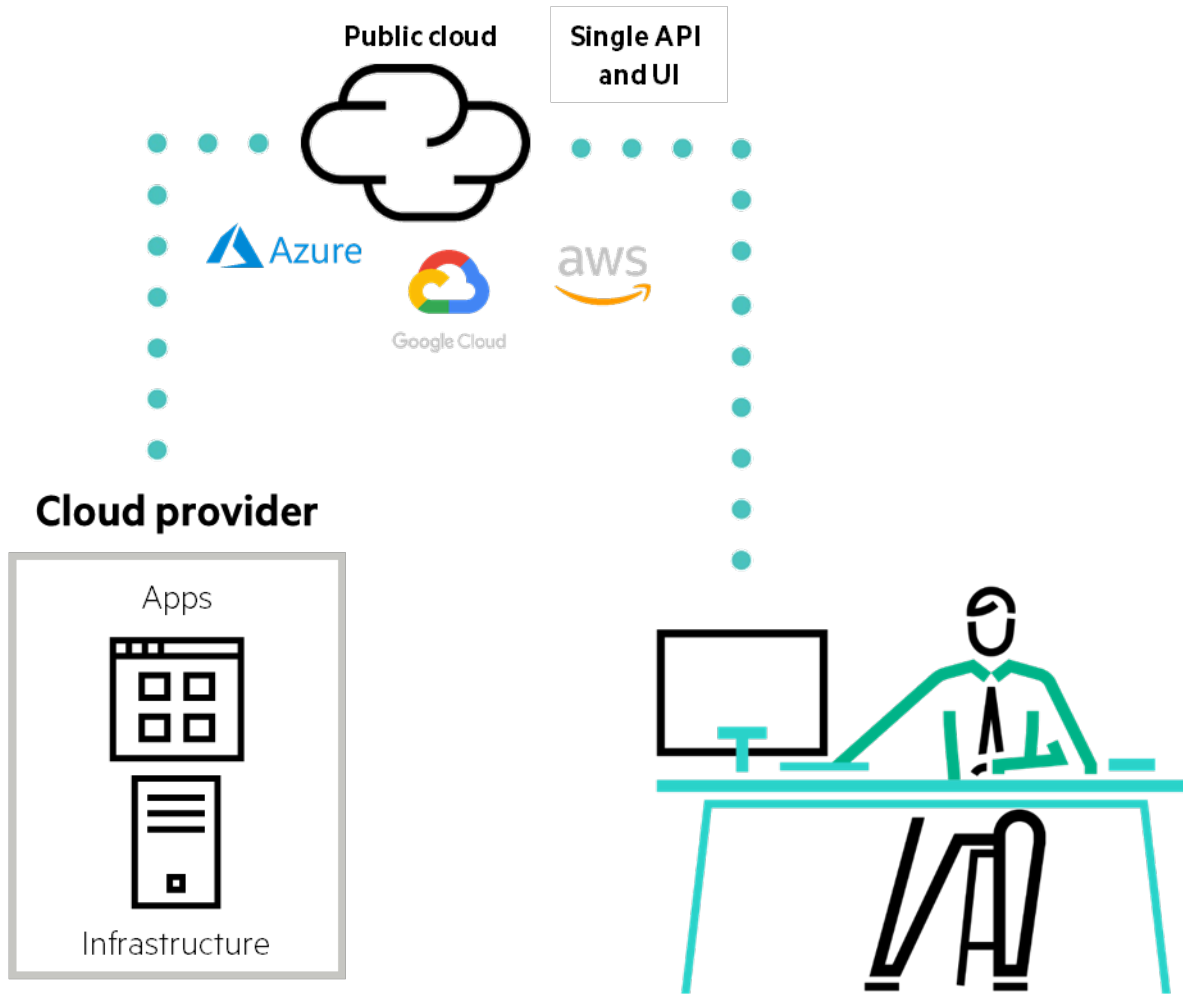
Infrastructure Automation

- Automate frequent, rapid, unattended infrastructure (re-)deployment tasks
- Automate service desk ticket creation, workflows, case closure...
- Automate DevOps: integrate any app development and IT operations (Gartner **STREET** process):



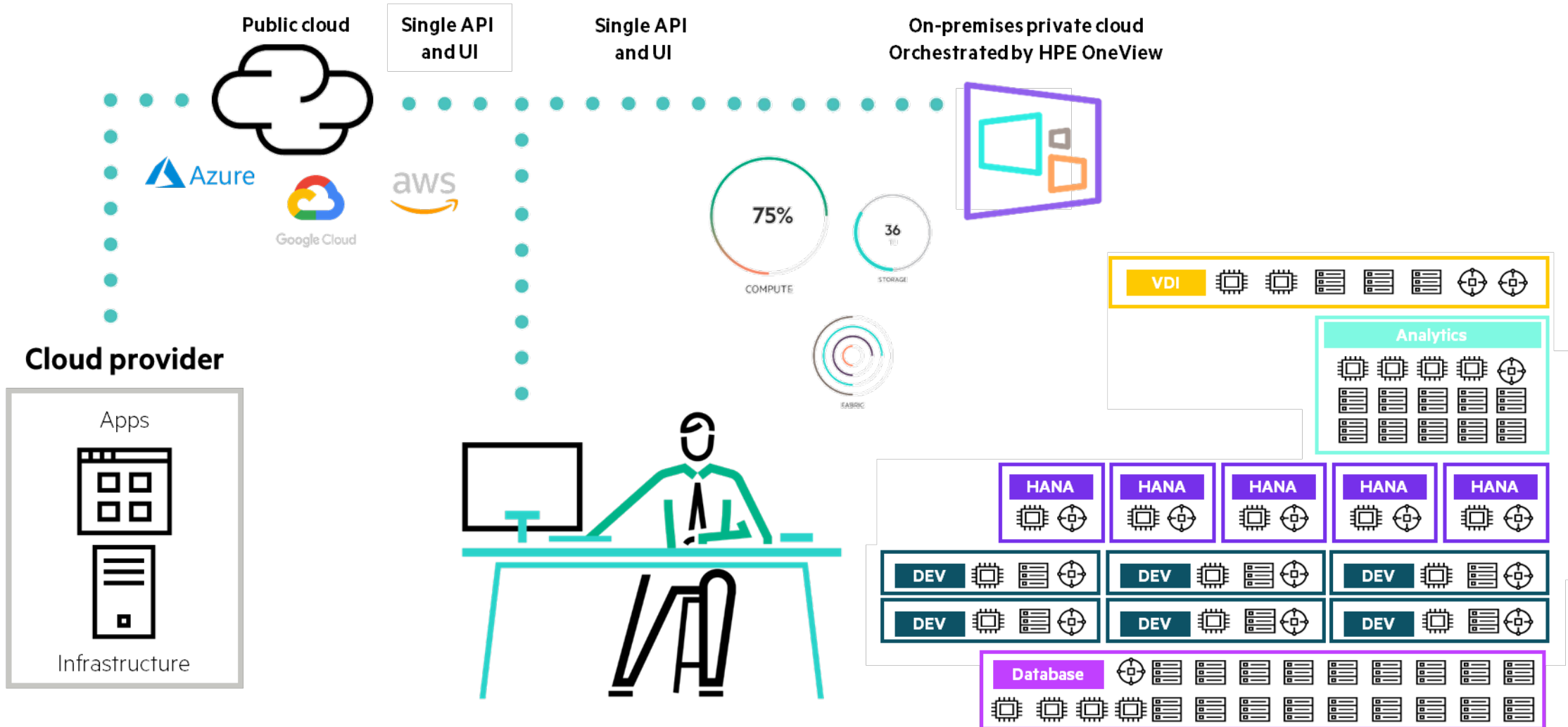
FOCUS ON COMPOSABILITY

Orchestrate physical infrastructure like the cloud



FOCUS ON COMPOSABILITY

Orchestrate physical infrastructure like the cloud



HPE ONEVIEW UNIFIED API

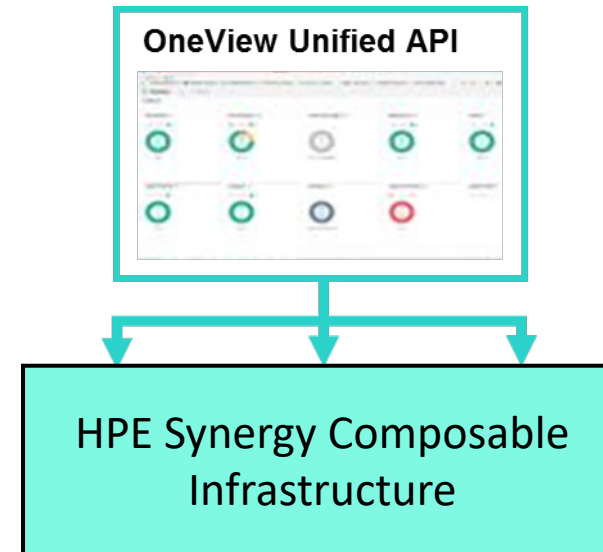
Use **HPE Synergy** infrastructure like code for agility and flexibility

HPE OneView Unified API

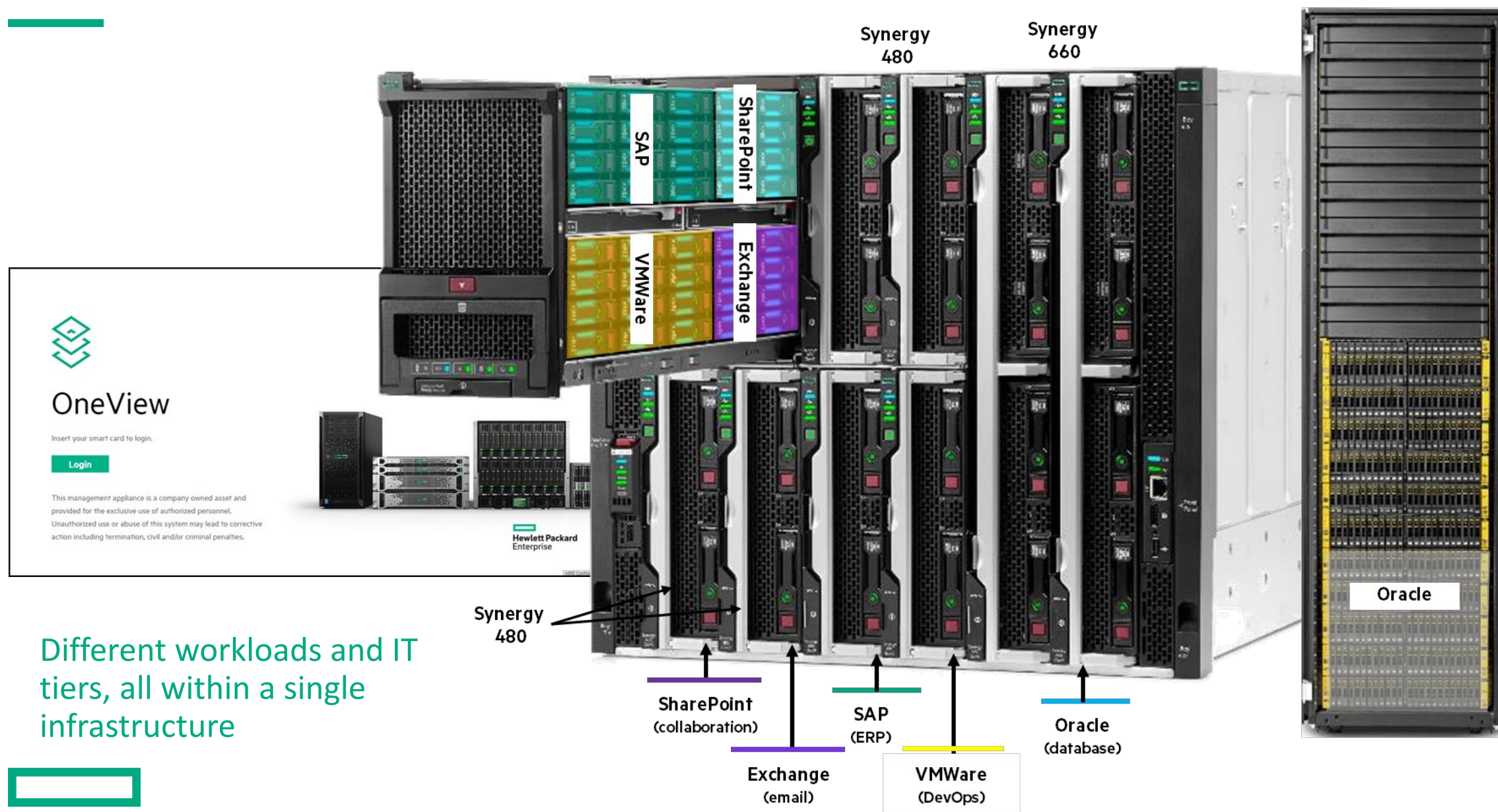
Automate infrastructure for DevOps



```
New-HPOVProfile -name myESXhost -template ESX6.5host
```



COMPOSABLE INFRASTRUCTURE FOR ANY WORKLOAD



HPE ONEVIEW UNIFIED API

Use **HPE Synergy** infrastructure like code for agility and flexibility

HPE OneView Unified API

```
New-HPOVProfile -name myESXhost -template ESX6.5host
```

OneView Unified API

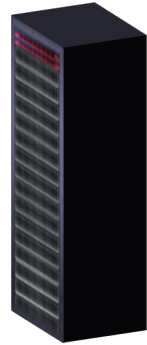


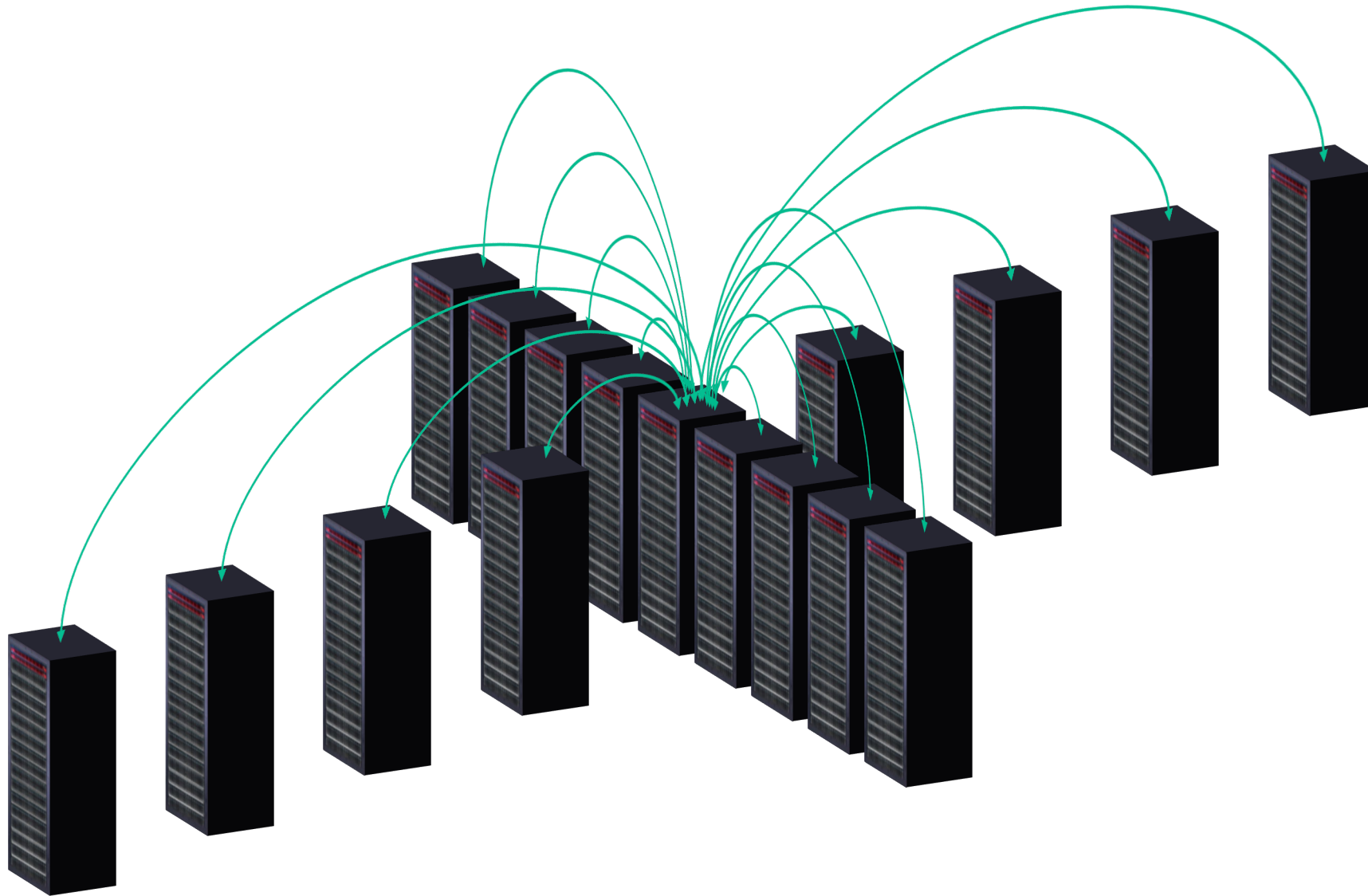
Compute

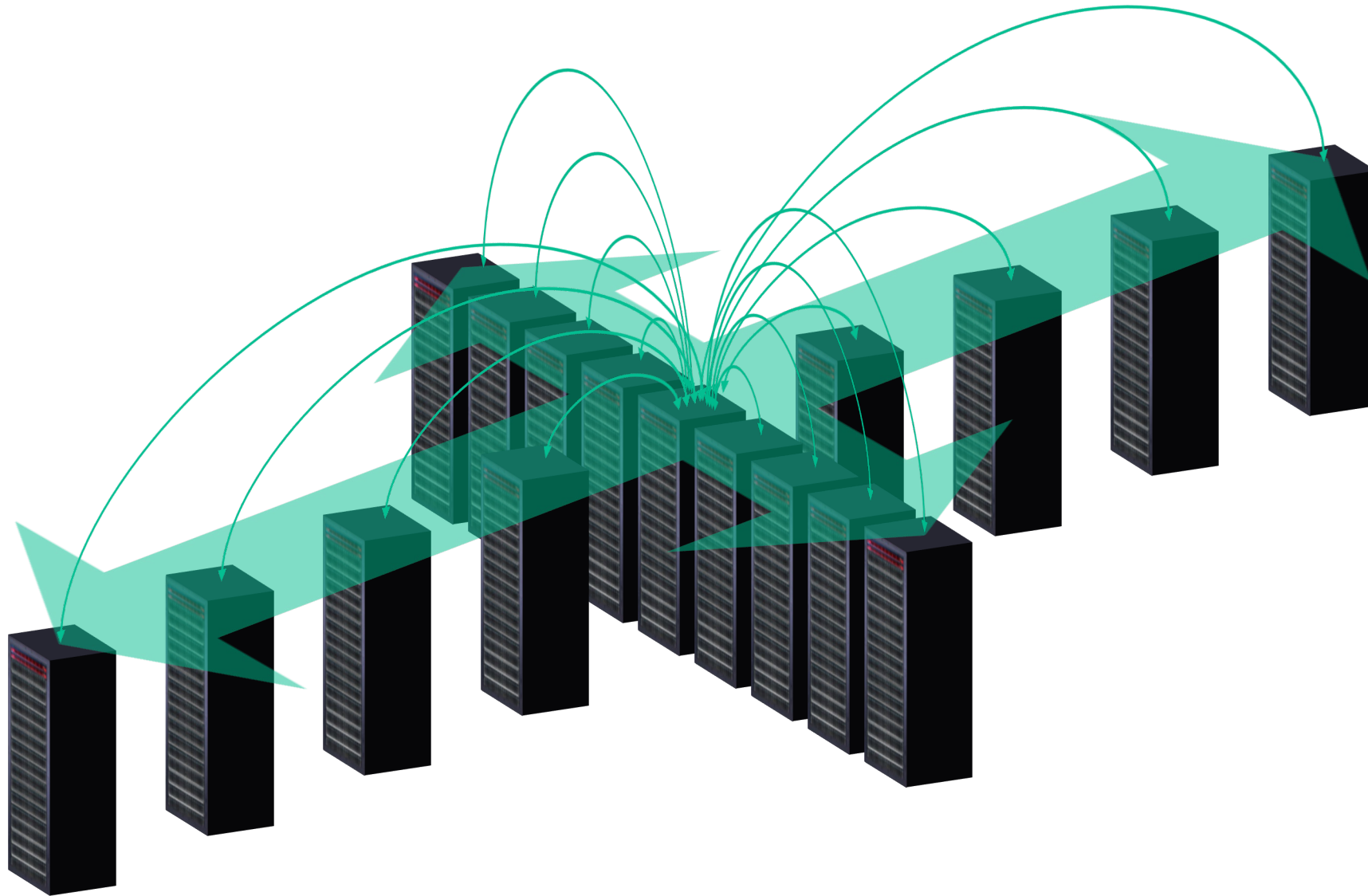


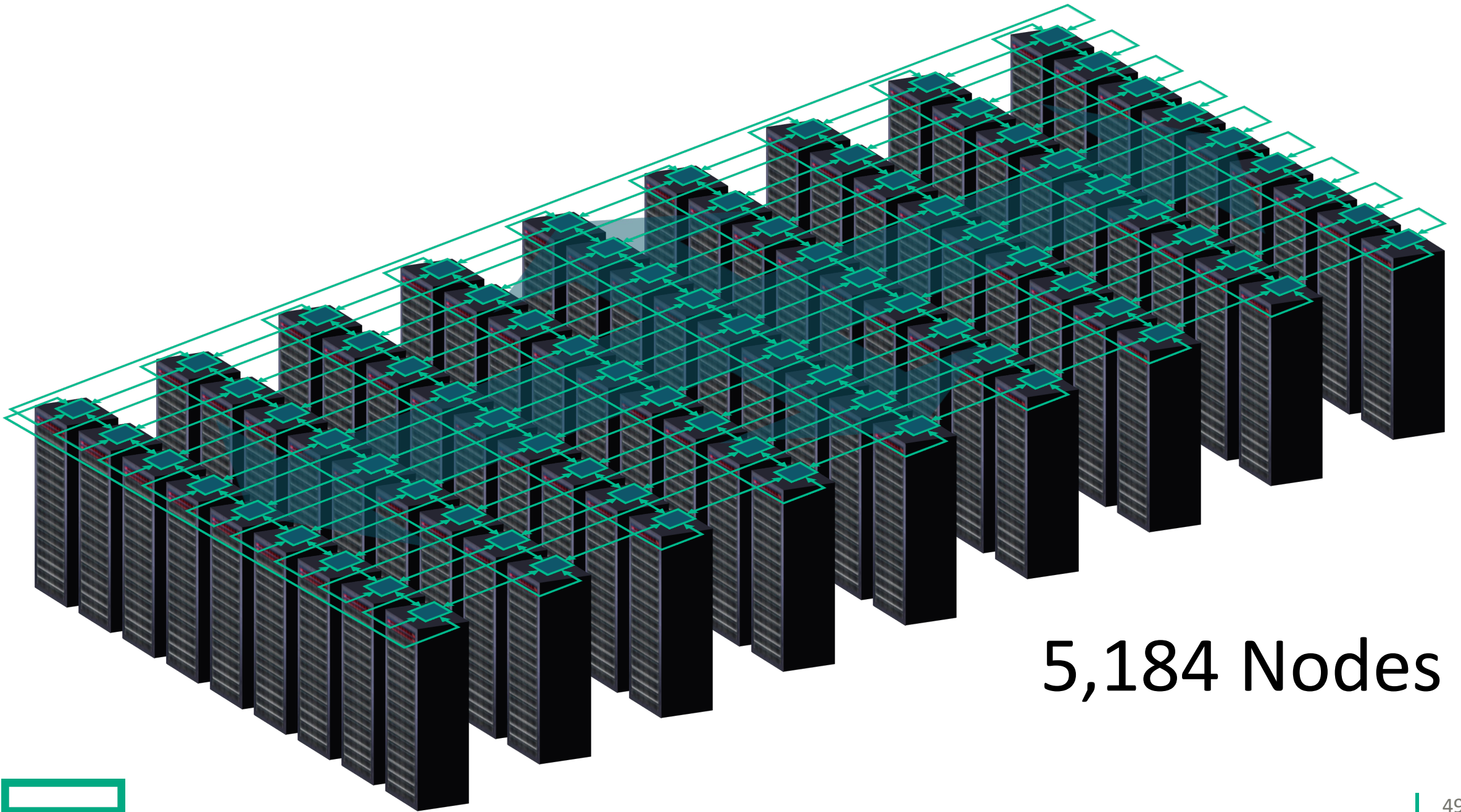
Storage

HPE Composable Fabric



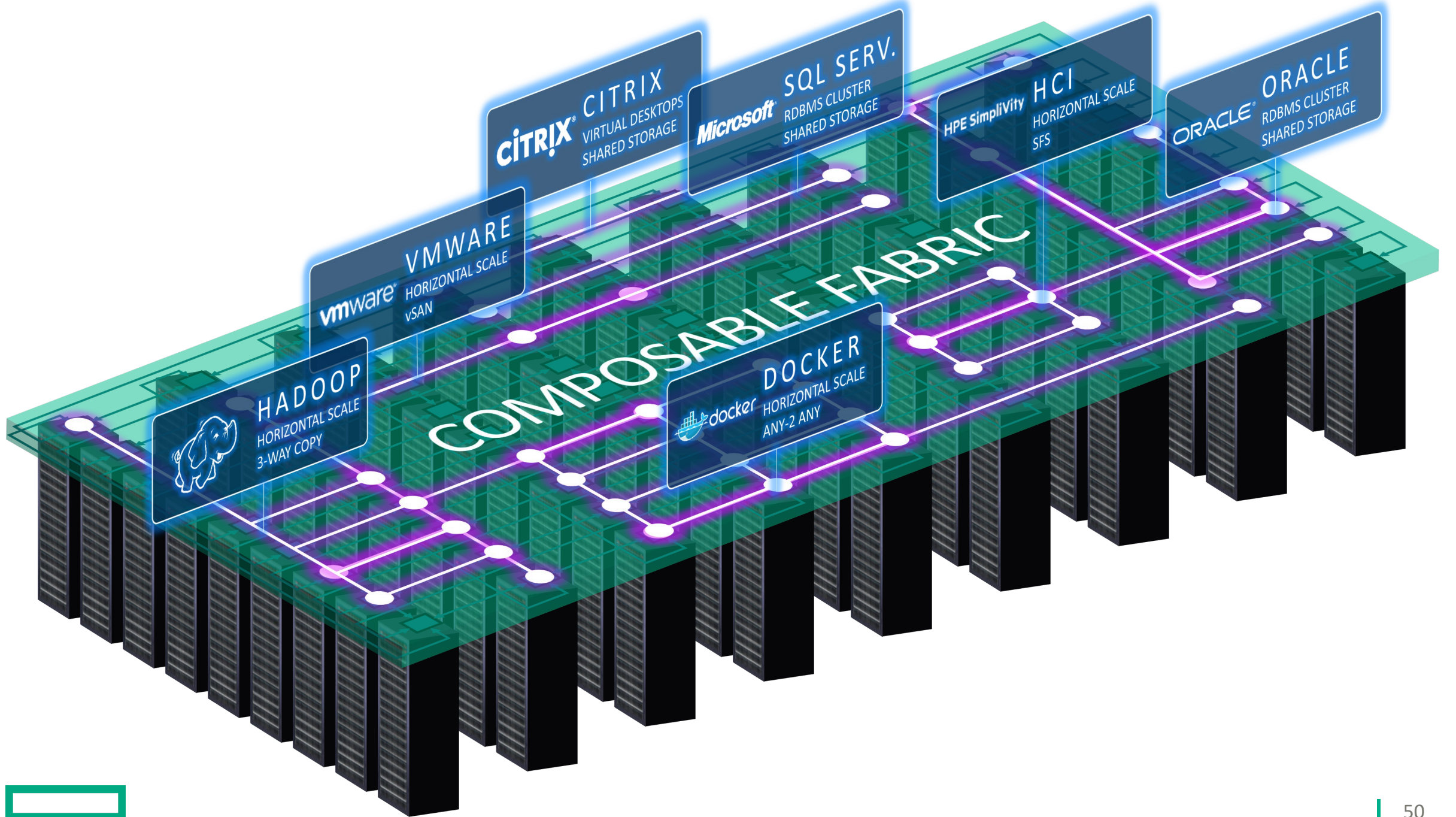




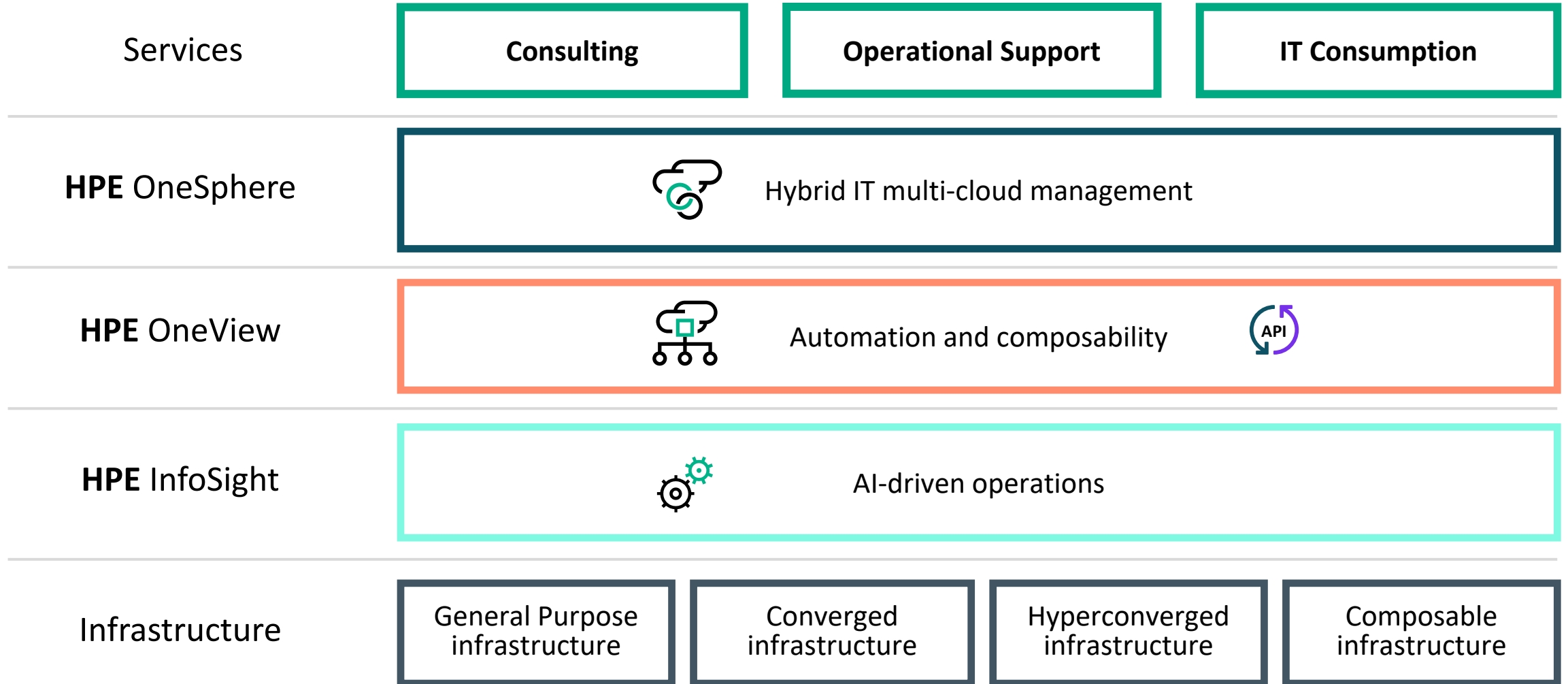


5,184 Nodes

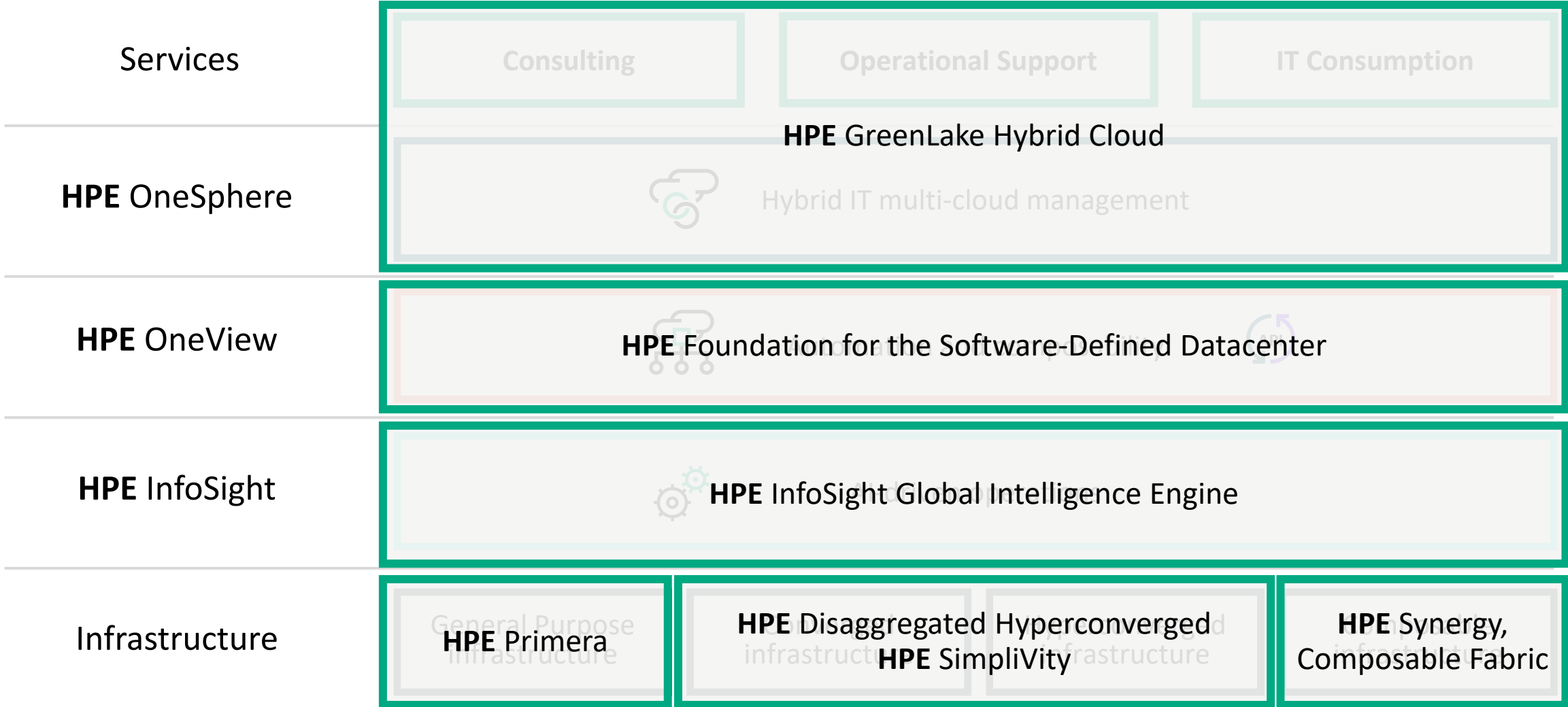




COMPANY-WIDE FOCUS ON MAKING HYBRID CLOUD SIMPLE



COMPANY-WIDE FOCUS ON MAKING HYBRID CLOUD SIMPLE



HPE COMPLETE

Ecosystem



WHAT IS HPE COMPLETE?

The HPE Complete program resells best-in-class third party branded products

Build with confidence



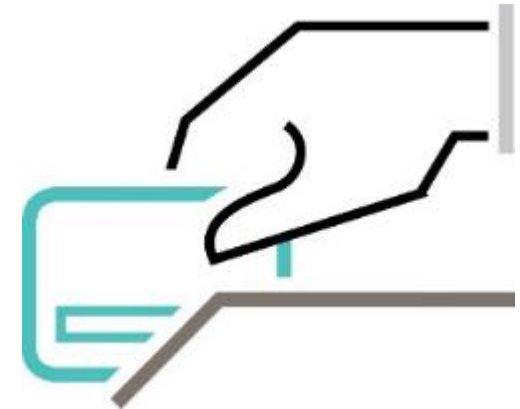
Provides customers broader choice of products which complement and complete HPE solutions, often with custom integration guides and tools.

End-to-end solutions



Minimizes risk of deploying partner products into HPE's ecosystem through HPE Complete Assured interoperability testing and validation.

Multivendor, single order



Simplifies purchase of complete solutions via one HPE purchase order.



THIRD PARTY PRODUCT

HPE Complete Process

HPE VALIDATED

Product Assured	HPE Complete Assured interoperability validation of partner products with HPE infrastructure
Product Launch	Standard HPE NPI launch process governance to ensure Third Party Products have all HPE SKU benefits
Fulfillment	With few exceptions, worldwide fulfillment supports end customers, VARs, and distributors
Support	Third party direct expertise provides installation, support, and warranty. HPE Complete engineering facilitates customer issue resolution with third party as needed
Integration	Integration with HPE automation and orchestration roadmap, optimized partner specific HPE HW bundle SKUs, and customized integration tools and guides



**Hewlett Packard
Enterprise**

THANK YOU



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