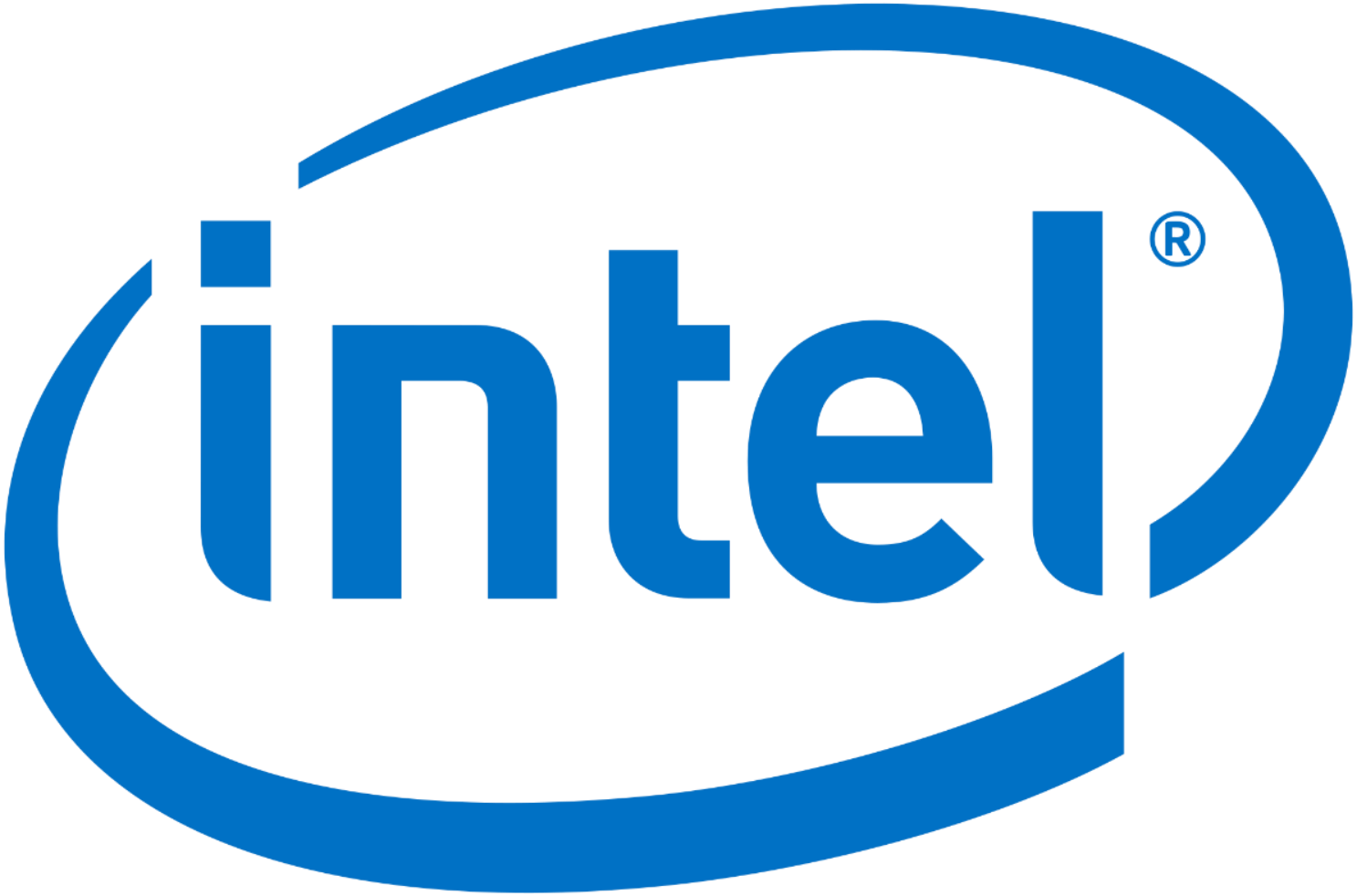
11 October 2017



Thanking our Sponsor

Hewlett Packard Enterprise

Your Independent Hewlett Packard Enterprise Technology User Community

Server revolution meets OpenVMS revolution

What you can expect in the next five years

Ken Surplice — Category Manager, Mission Critical Solutions HPE EMEA

Ray Turner — Senior Consultant, Mission Critical Solutions HPE EMEA

October 2017 (VMSfest)

Introduction

Connect OpenVMS Vienna

Companies	Digital	Compaq	HP	HPE
Software	RT-11, RSX, MUMPS, MPP	VMS, ELN, Tru64 UNIX	OpenVMS, HP-UX	
Servers	PDP, VAX, Alpha, HP9000	Integrity Itanium	Mission critical x86	

Ken Surplice, HPE Mission Critical Solutions EMEA

Category manager

- Integrity/Itanium: rack rx2800, Blades, Superdome 2, OpenVMS, HP-UX
- X86: Superdome X 2-16s, MC990 X 4-32s, Serviceguard for Linux

Companies	Digital	Compaq	HP	HPE
Software	OpenVMS	OpenVMS	OpenVMS	OpenVMS
Servers	VAX, Alpha	AlphaServer	Integrity Itanium	

Ray Turner, HPE Mission Critical Solutions EMEA

Consultant

- OpenVMS

Topics for today

OpenVMS platforms today and future

Server evolution

Memory revolution

Servers go modular

Automation revolution

Photonics

Support lifecycle

Your questions

OpenVMS in the new world

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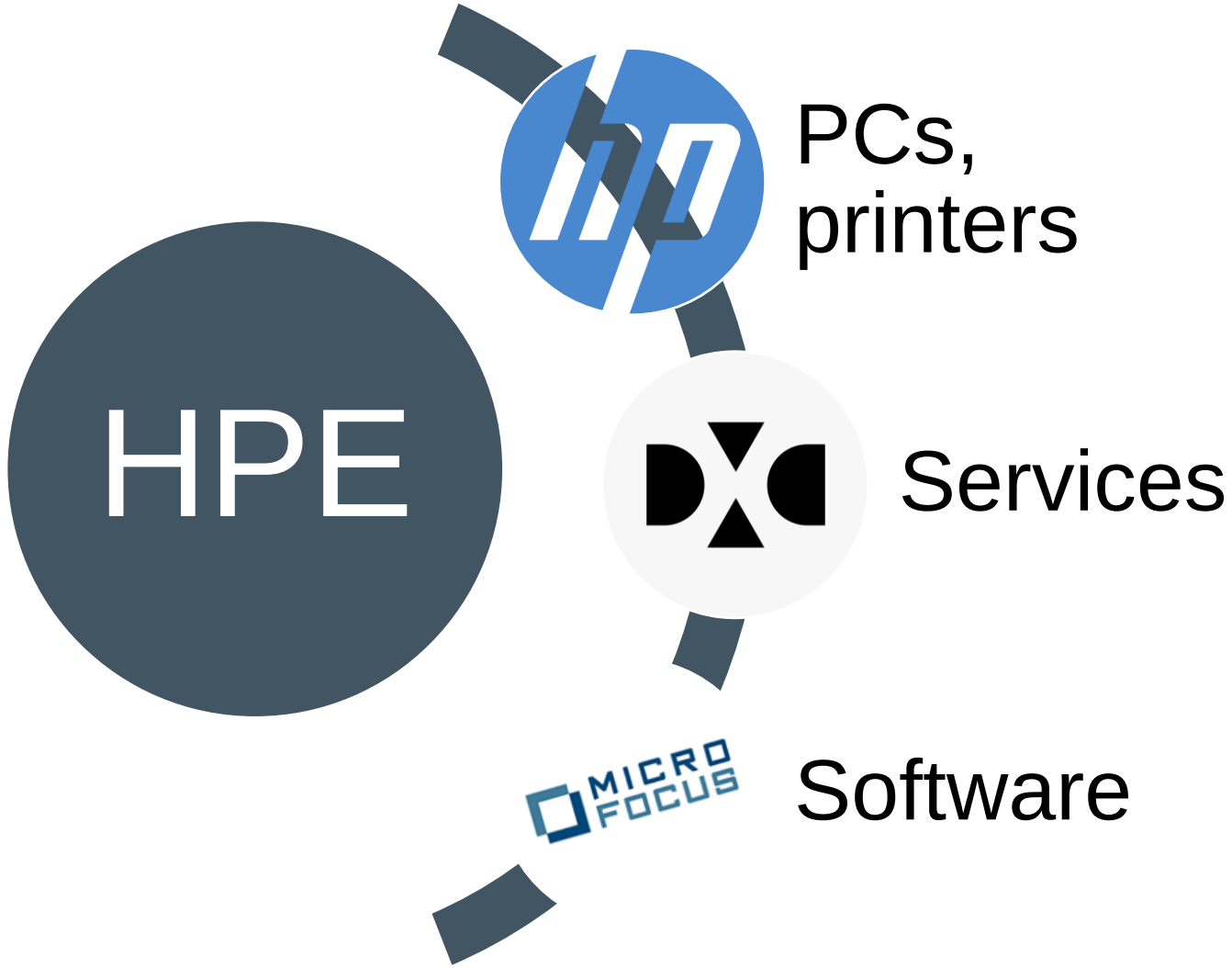
HPE update



Customers made HPE the #1 data center infrastructure vendor

More than

1,000,000

Customers over the last 25 years

100,000

trusted partners in our ecosystem

5 servers sold per minute

~40M

servers sold to date

30%

x86 **Servers** share

#1

Total Disk **Storage***

Only Major Vendor to Gain Share*

2yrs

#2

Networking

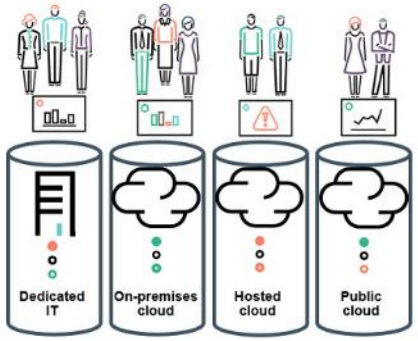
4QCY15 Market Share

Hewlett Packard Enterprise

Source: 1CQ16 IDC Disk Storage System Tracker

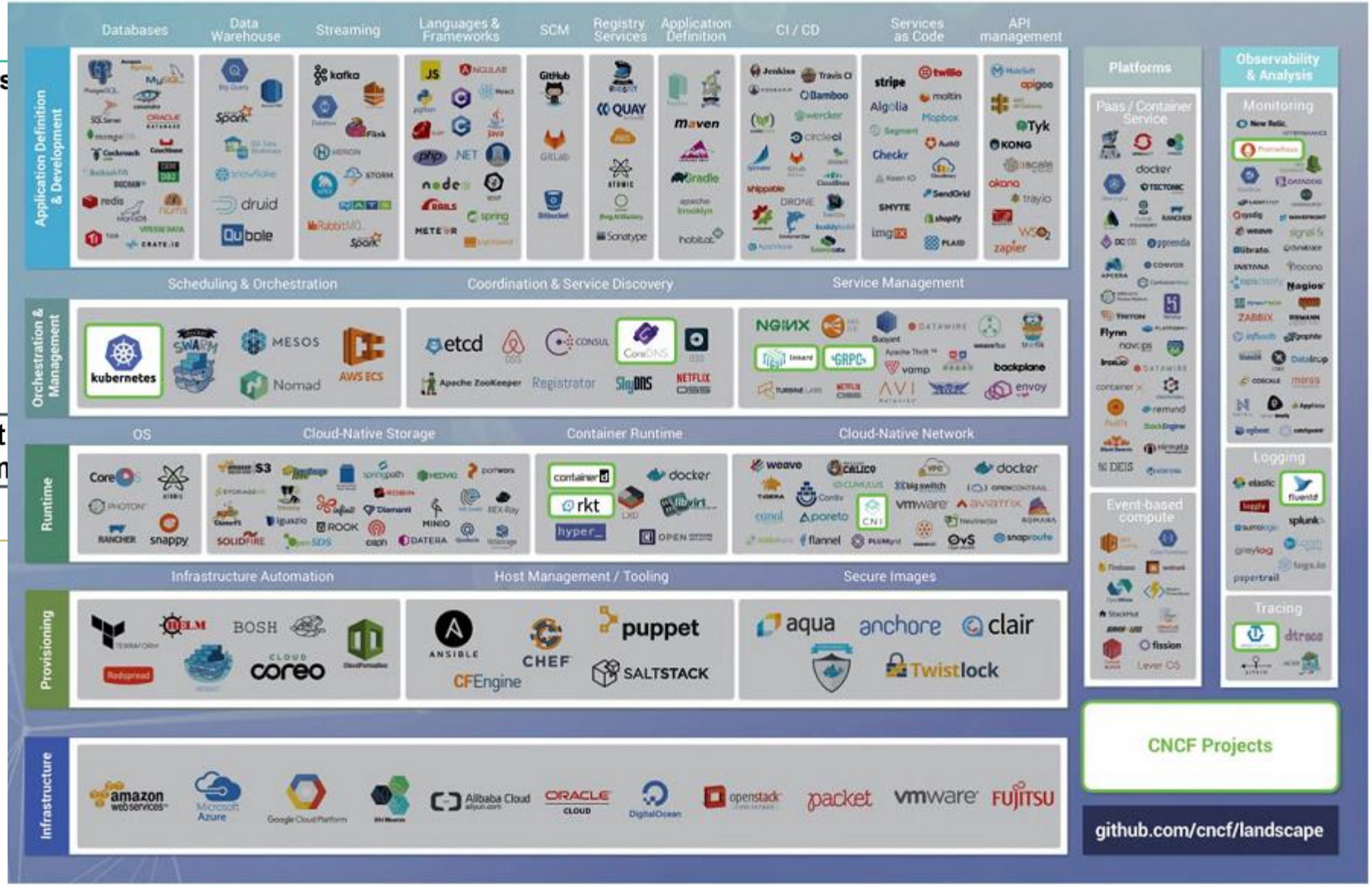
Last week

Agility is impaired by the mass

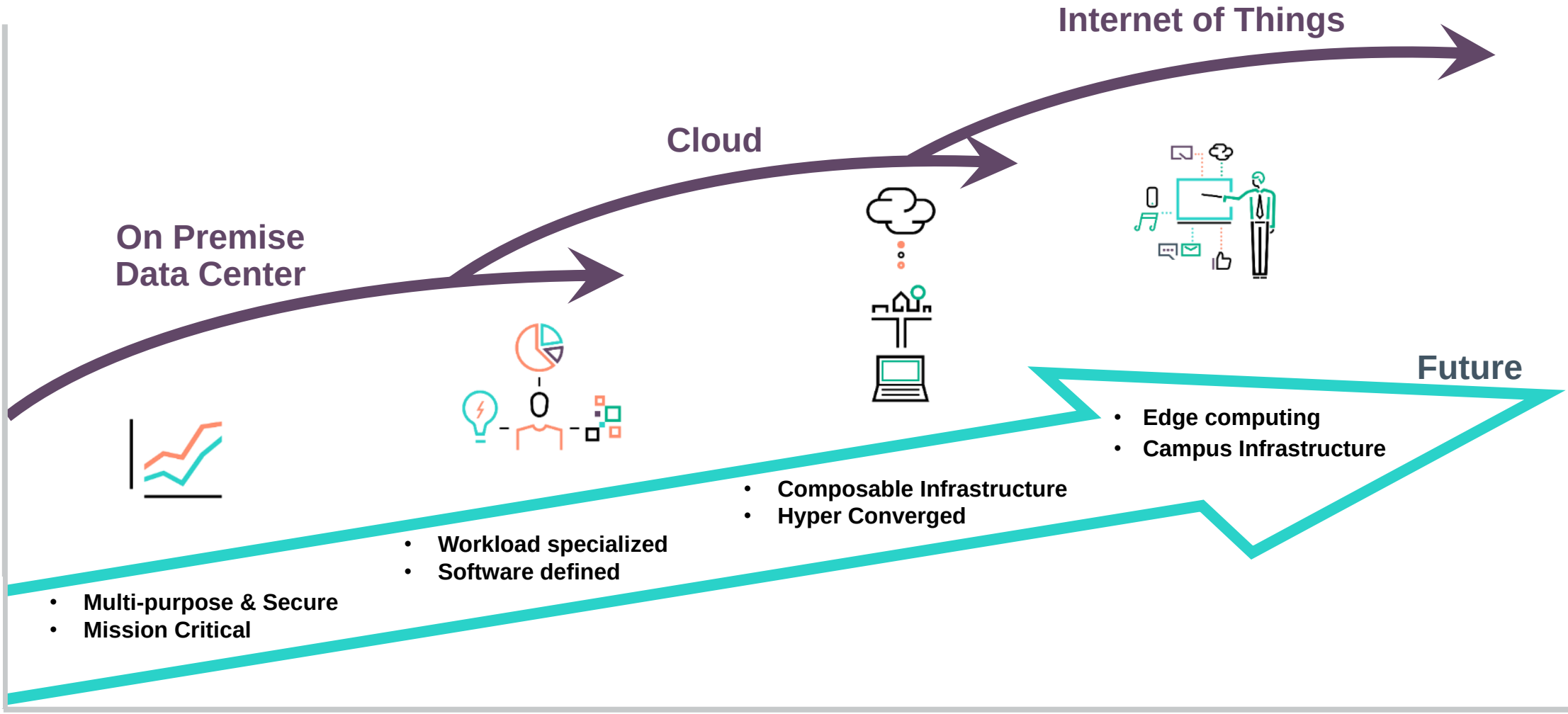


You need a solution that
ruthless focus on sim

Hewlett Packard Enterprise



Innovation to help customers progress toward the future



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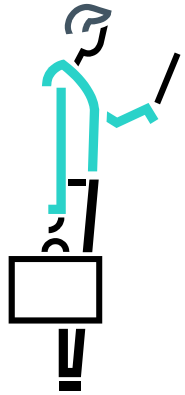
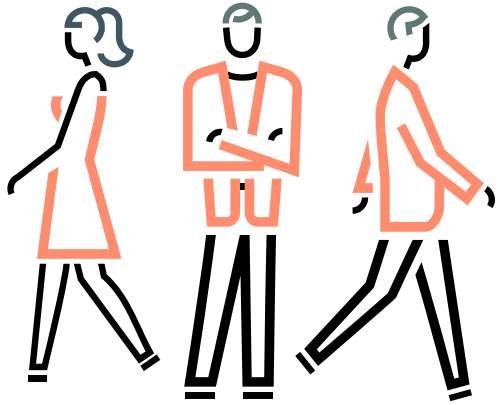
Enterprise

What does today's HPE do?

The world will be **Hybrid**



The **Intelligent Edge** is going to unleash an industrial IoT revolution



Services are going to be even more critical

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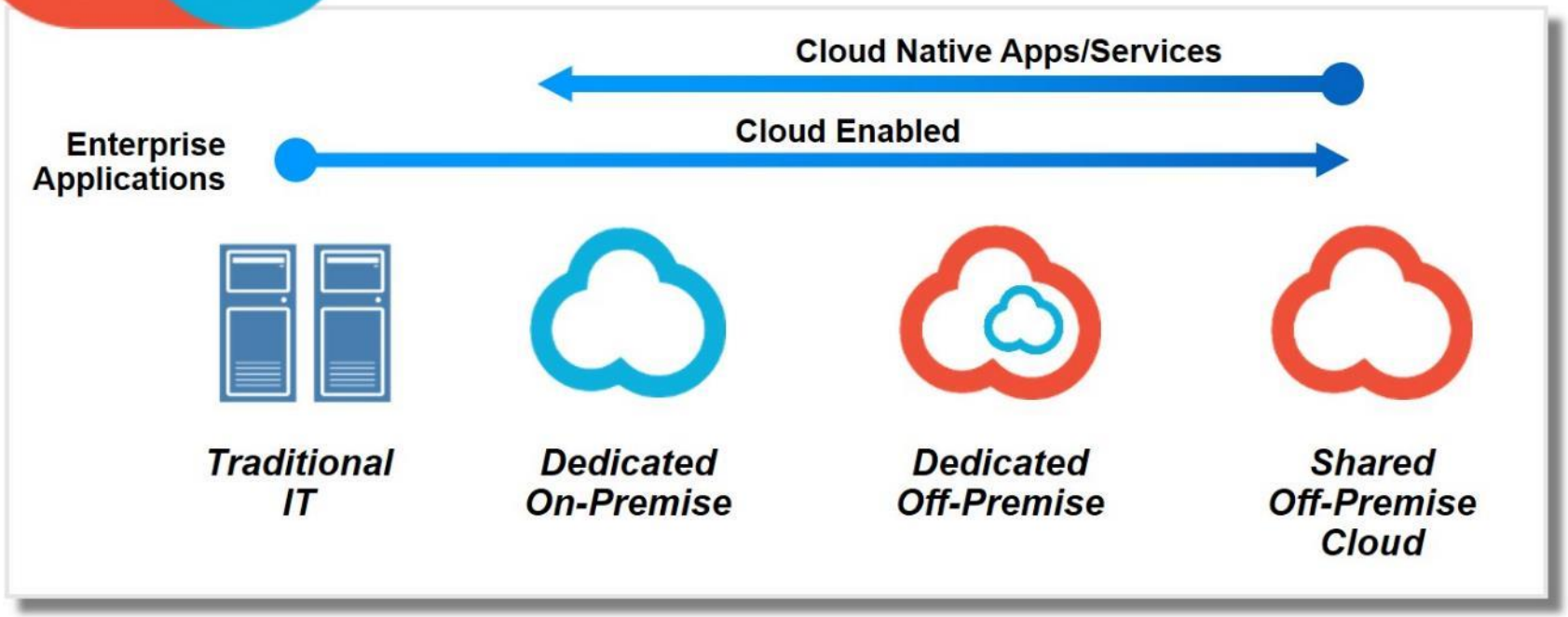
What is hybrid IT?

Hybrid IT

The secure consumption of services from two or more sources, including private cloud, public cloud, or traditional IT, to enable any or all of the following:

- **Integration** of applications, data, and/or services
- **Composition, orchestration and management** of workloads
- **Portability** of data and applications

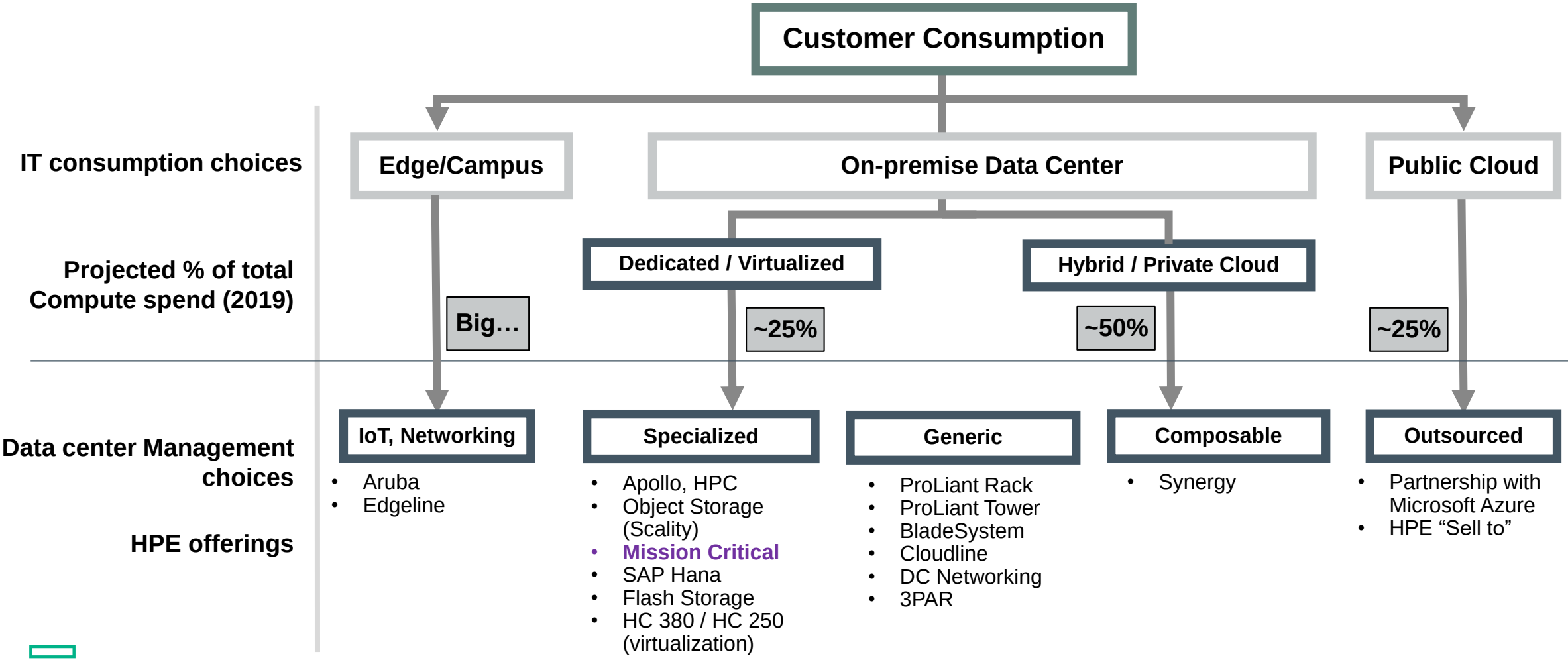


Choose the right mix for your business

Demand for data center infrastructure is growing

- Massive data explosion
- Need for analytics expanding
- Compute end points exploding
- Technology and consumption shift
- Emerging applications

Innovation to address evolving consumption patterns



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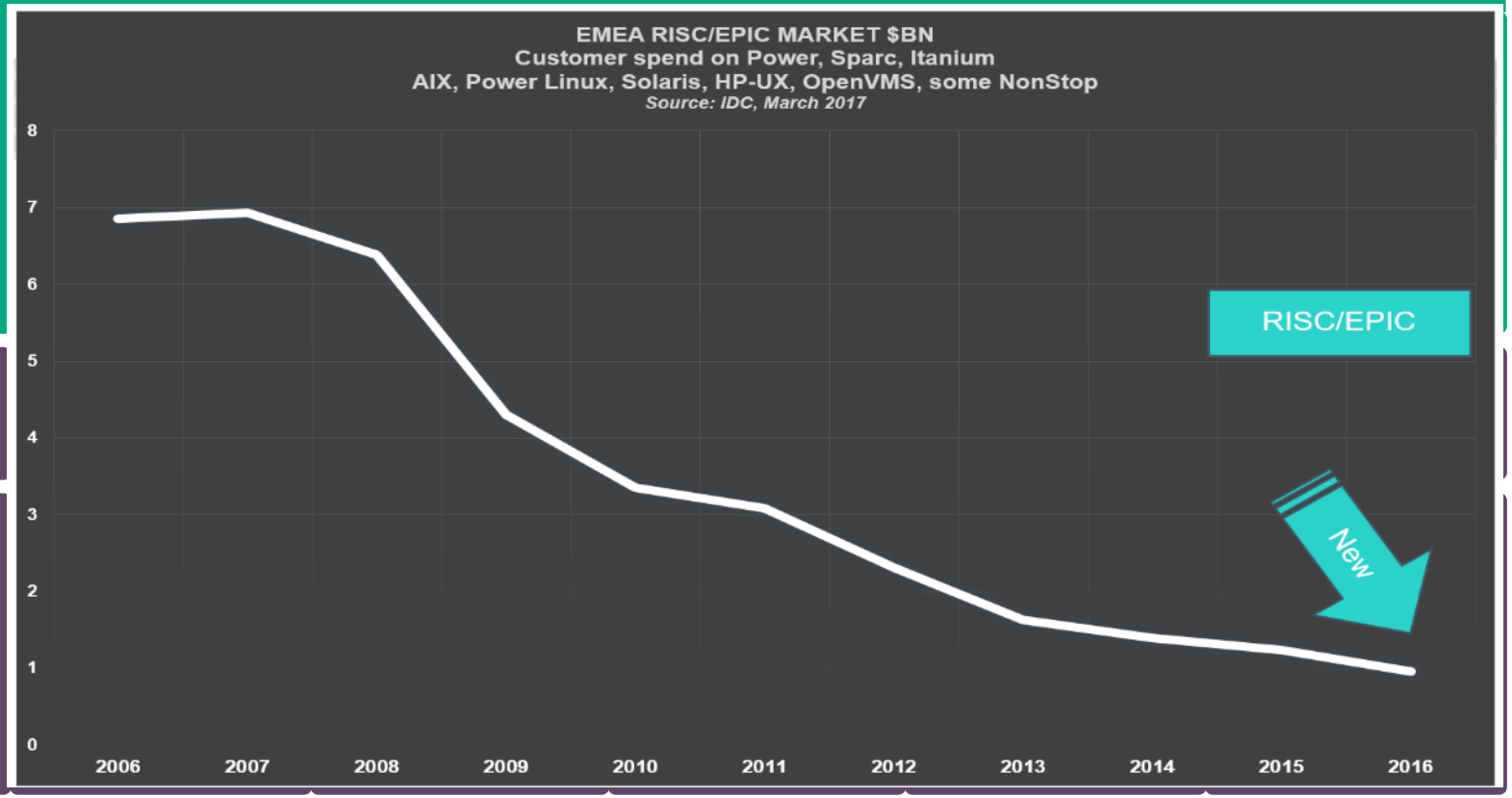
Our strategy is to build specialized solutions for target customer segments

Customer Needs

Simplicity, Subscription Pricing	Hybrid, Versatile, Secure	Always on Availability
SMB and Branch	**Core Enterprise**	**Mission Critical**
IaaS, Appliances ↑	x86 and Composable ↑	**Shift to x86 Mission Critical** ↑



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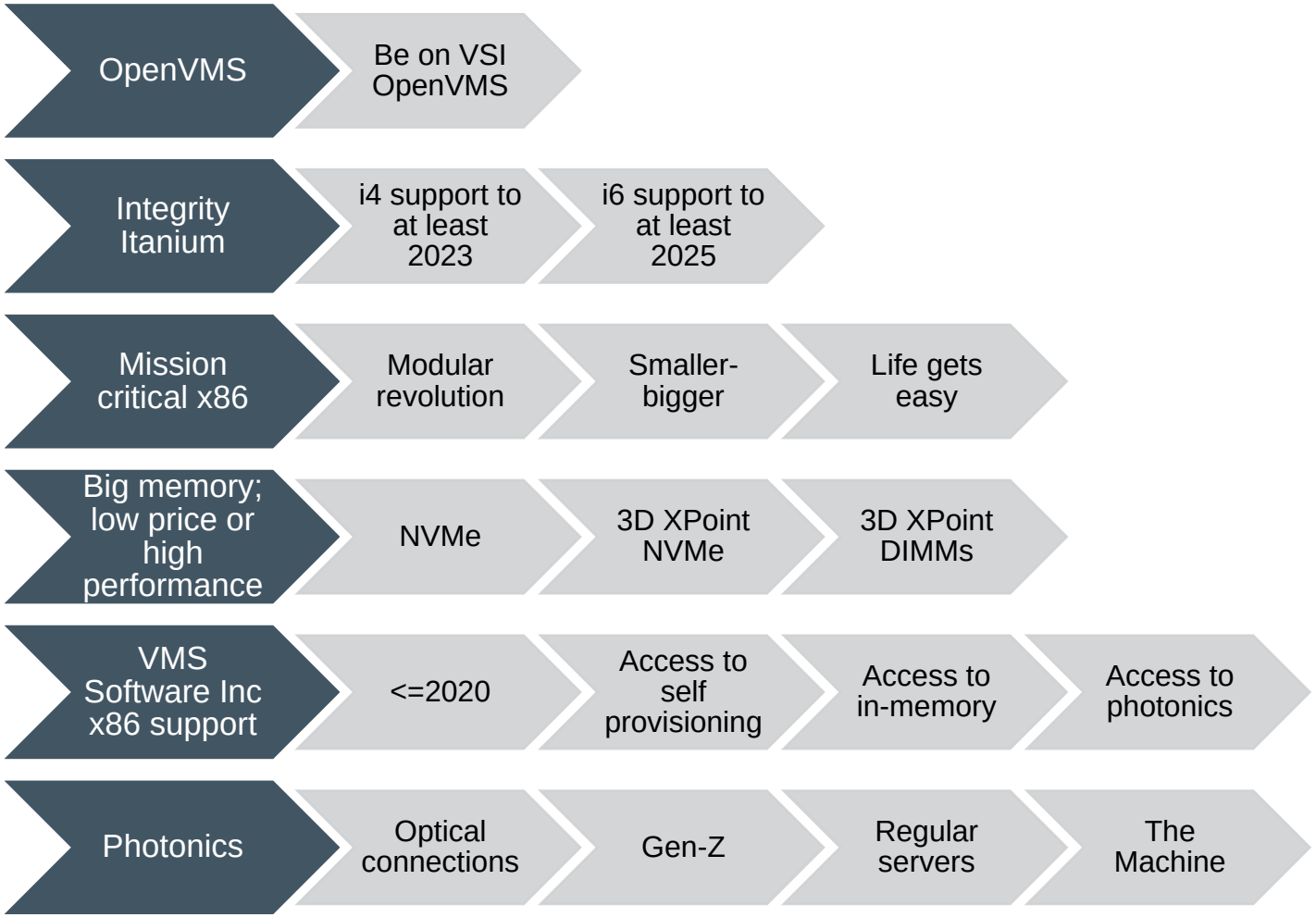
The next five years for OpenVMS users



http://genzconsortium.org/

Gen-Z: An open systems Interconnect designed to provide memory semantic access to data and devices via direct-attached, switched or fabric topologies.

1977- 2020

- OpenVMS defines the machine environment you run on

2020 -

- OpenVMS runs alongside everything else, wherever you like

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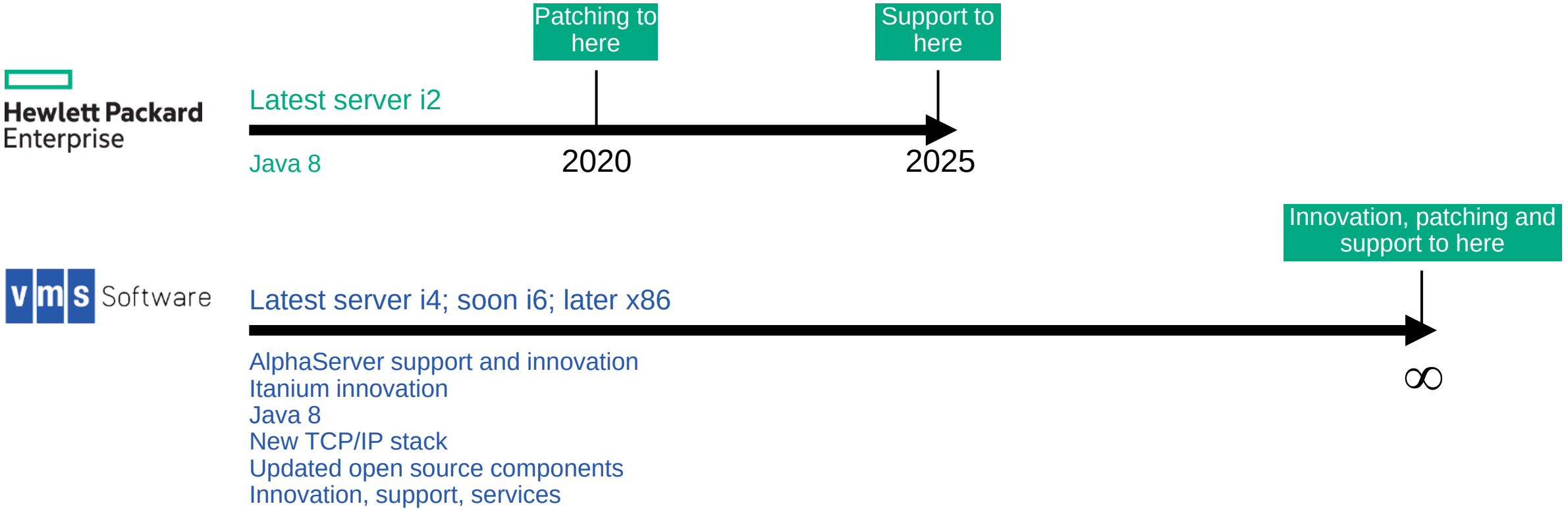
OpenVMS

Be on VSI OpenVMS



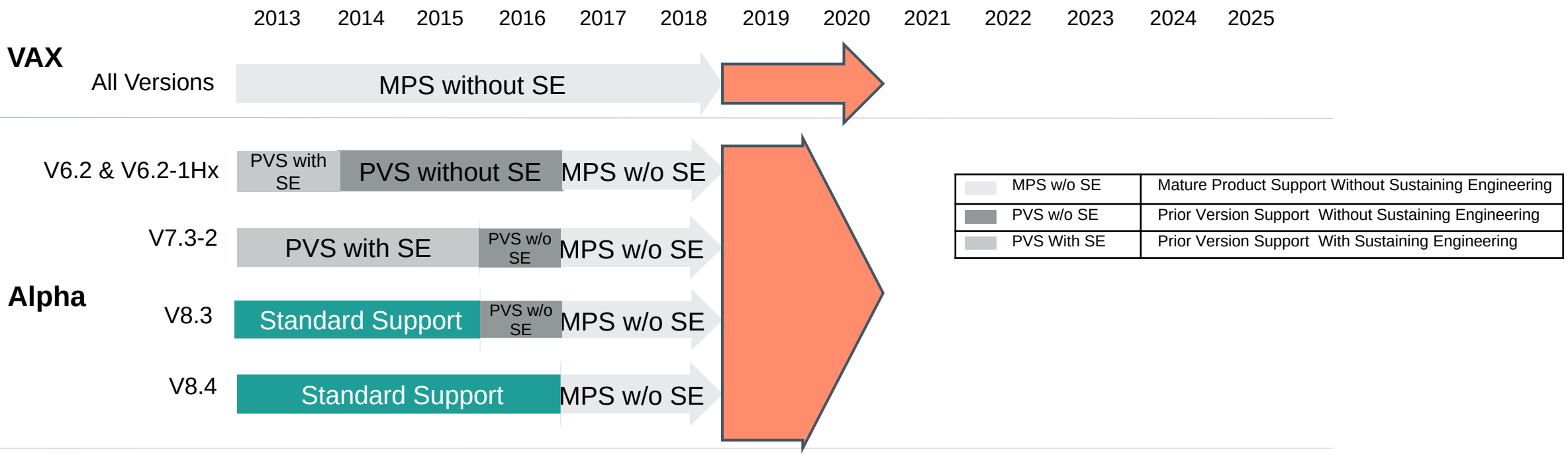
AlphaServer support and innovation
Itanium innovation
Java 8
New TCP/IP stack
Updated open source components
Innovation, support, services

Integrity Itanium

i4 support to at least 2023

i6 support to at least 2025

plus more transition time, from HPE and from VSI



Integrity Itanium | i4 support to at least 2023 | i6 support to at least 2025

HPE Integrity i6 for OpenVMS
(2018 support)

Lower-platform TCO

Long-term support

Achieve continuous operations	Realize better economics	Reduce your business risk

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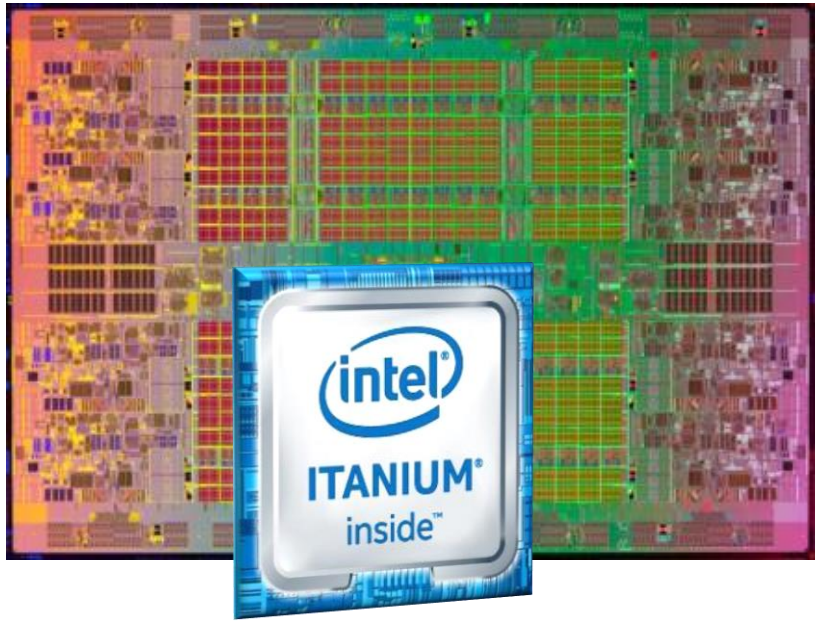
Intel Itanium® 9700: Trusted Foundation for the Mission Critical Enterprise



World-Class resiliency

Intel Instruction Replay Technology, End-To-End Error Detection, Intel Cache Safe Technology

Scalable performance

High Performing 8 Cores, Advanced EPIC parallelism with Massive On-Die Cache, Large Memory addressing, 32 socket scalability with Node Controller

Business continuity

Three generations of Itanium can co-exist within same enclosure

Itanium® 9700 delivers proven IT stability with enterprise performance and mainframe class resiliency

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What’s new with HPE Integrity i6 servers

Mission-critical computing continuity through 2025

Intel Itanium 9700 series processor
- Up to 2.66GHz frequency

Support for i2, i4 and i6 processors in same enclosure

Integrity options update
- Memory refresh for 8GB and 16GB
- New HPE Storage, IO support*
- Platform for future enhancements*

HPE Integrity Rack rx2800 i6 Server

HPE Integrity BL8x0c i6 Blade Server

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HPE Integrity i6 value at i4 prices

HPE Integrity i6 new SKUs – only processor SKUs change

SKU	Long Description
AM382B	HPE BL8x0c i6 Itanium 9760 (2.67GHz/8-core/32MB/170W) Processor Kit
AM383B	HPE BL8x0c i6 Itanium 9740 (2.13GHz/8-core/24MB/170W) Processor Kit
AM384B	HPE BL8x0c i6 Itanium 9750 (2.53GHz/4-core/32MB/170W) Processor Kit
AM385B	HPE BL8x0c i6 Itanium 9720 (1.73GHz/4-core/20MB/130W) Processor Kit
AT104B	HPE rx2800 i6 Itanium 9720 (1.73GHz/4-core/20MB/130W) Processor Kit
AT105B	HPE rx2800 i6 Itanium 9740 (2.13GHz/8-core/24MB/170W) Processor Kit
AT138B	HPE rx2800 i6 Itanium 9750 (2.53GHz/4-core/32MB/170W) Processor Kit
AT106B	HPE rx2800 i6 Itanium 9760 (2.67GHz/8-core/32MB/170W) Processor Kit
AT121B	HPE Superdome 2 CB900s i6 Itanium 9760 (2.67GHz/16-core/32MB/170W) Cell Blade
AT122B	HPE Superdome 2 CB900s i6 Itanium 9740 (2.13GHz/16-core/24MB/170W) Cell Blade
AT123B	HPE Superdome 2 CB900s i6 Itanium 9760 (2.67GHz/16-core/32MB/170W) iCAP RTA Server Blade
AT124B	HPE Superdome 2 CB900s i6 Itanium 9740 (2.13GHz/16-core/24MB/170W) iCAP RTA Server Blade
AT126B	HPE Superdome 2 CB900s i6 Itanium 9760 2.67GHz 32MB iCAP RTU Server Blade
AT125B	HPE Superdome 2 CB900s i6 Itanium 9740 2.13GHz 24MB iCAP RTU Server Blade

Same price as i4

Announced: May-2017
Shipped: Jun-2017

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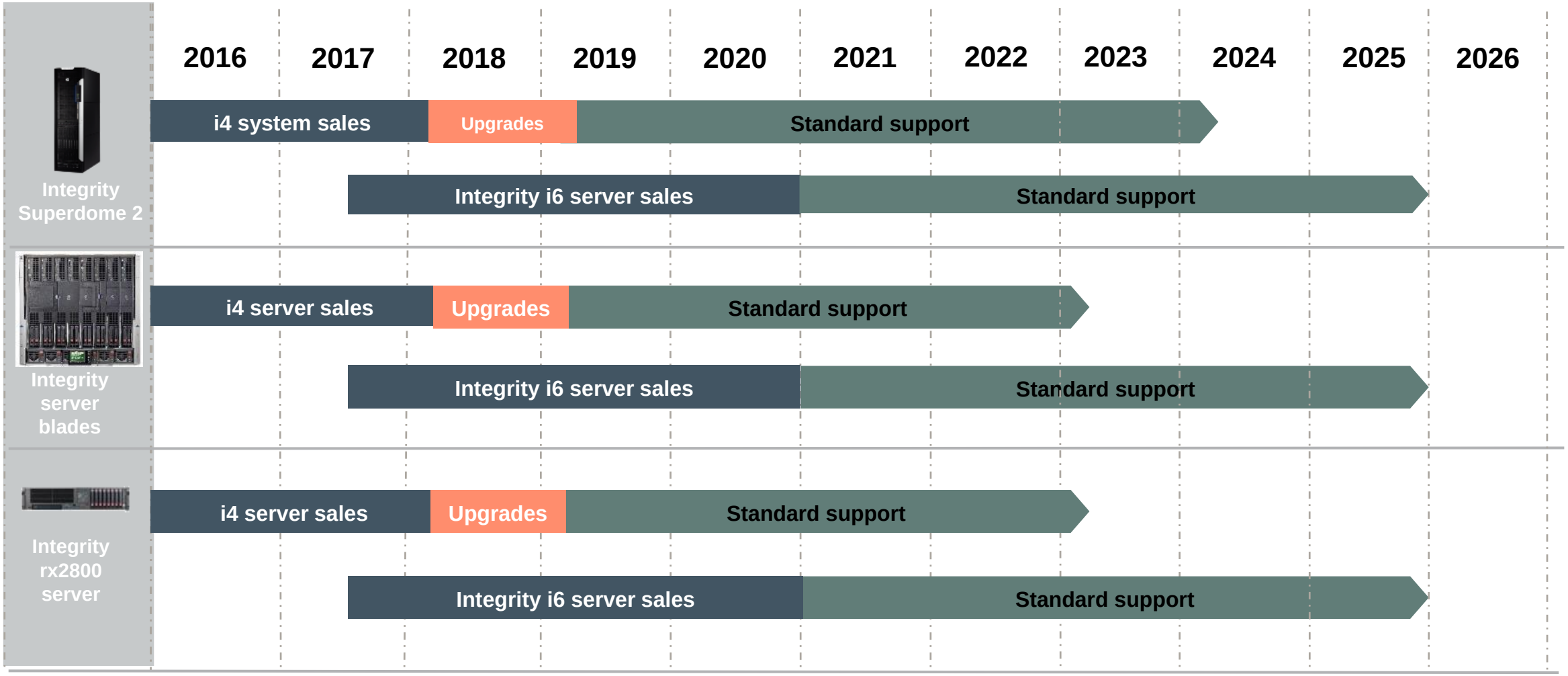
Integrity Servers roadmap



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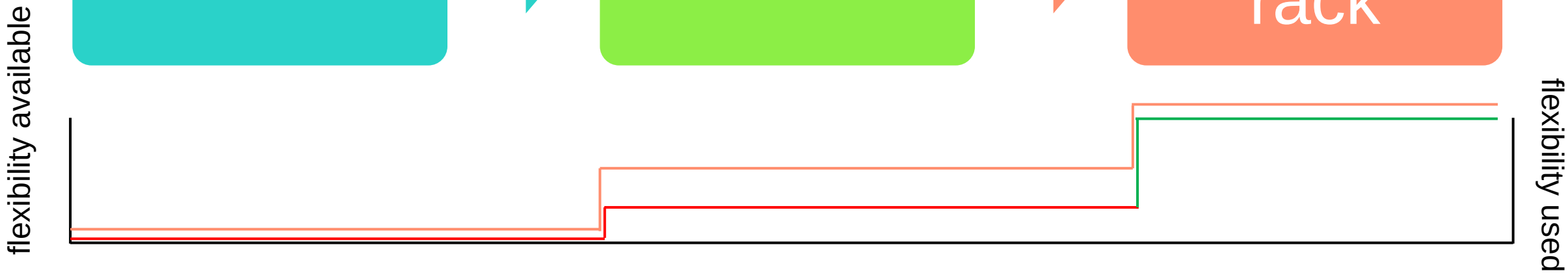
Mission critical x86 | Modular revolution | Smaller-bigger | Life gets easy

rack → blades → modular rack



Mission critical x86 | Modular revolution | Smaller-bigger | Life gets easy

2-16 sockets in a modular chassis

I ♥ Superdome X.
High up-front cost

Scales up to 8 chassis
32 socket

5U, 4-socket chassis

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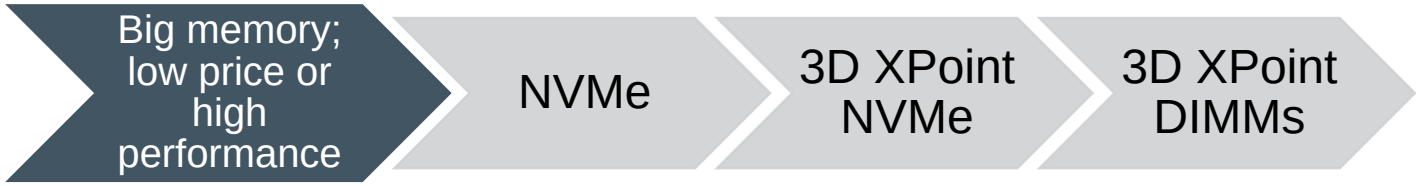


Memory today Itanium

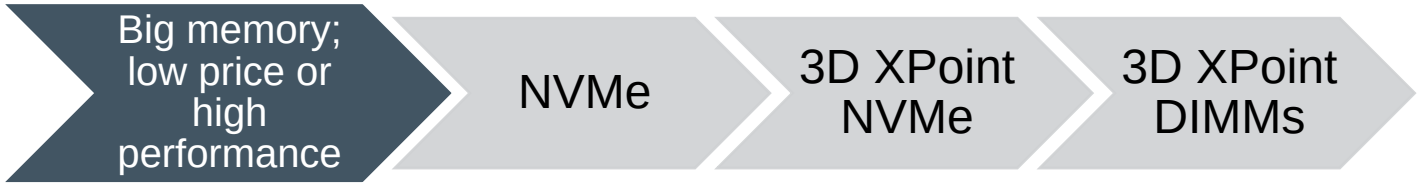
- rx2800 384GB max, 16GB DIMMs
- bl890 1.5TB max, 16GB DIMMs

Memory today x86

- Superdome X 48TB max, 128GB DIMMs
- MC990 X 48TB max, 64GB DIMMs

What next Outlook

- 128GB DIMMs stay expensive
- Xeon Skylake half DIMM slots of Broadwell
- Why?



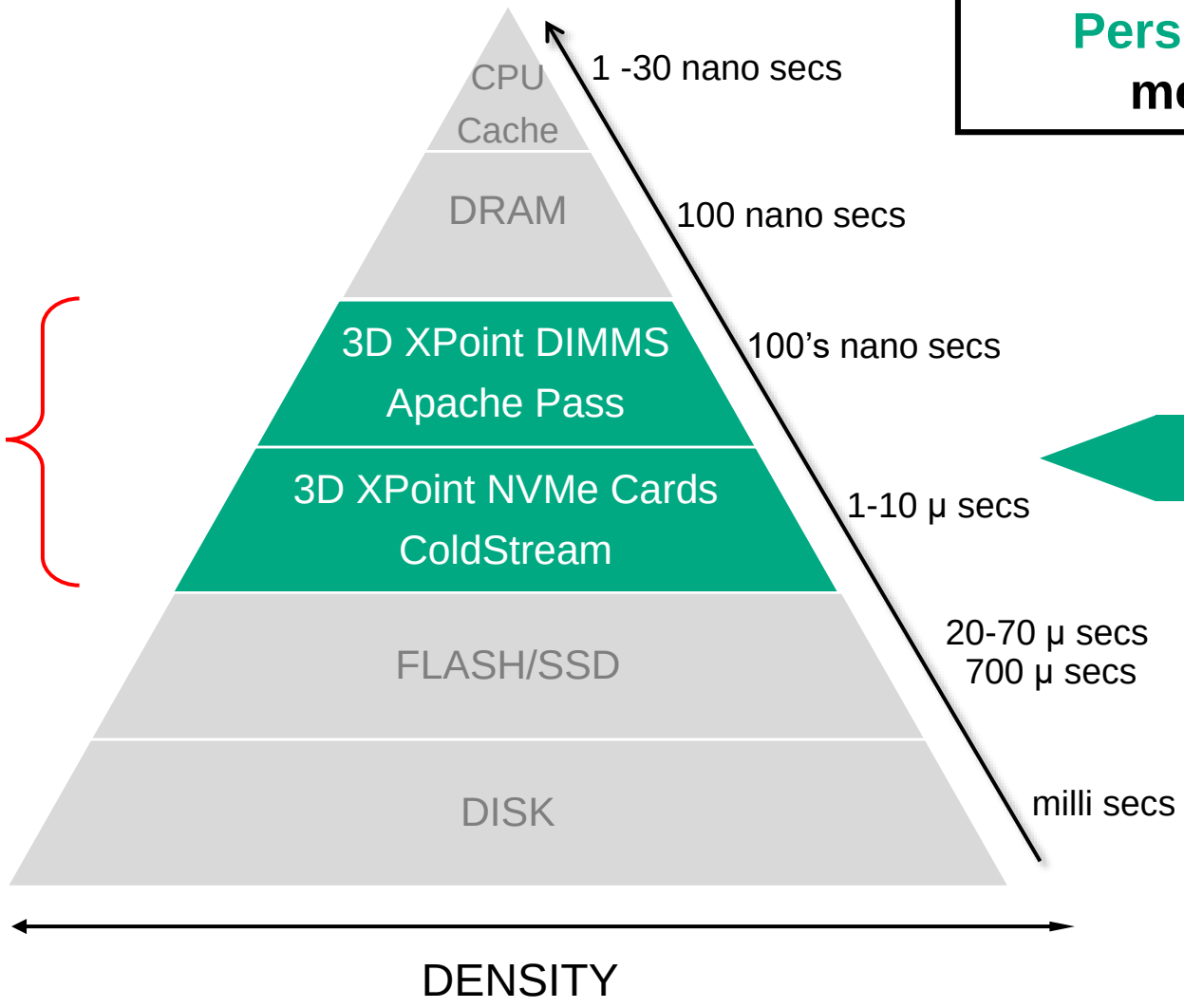
NVMe exceeds expectations today

Non-volatile
PCI Express slot
Simplified software stack

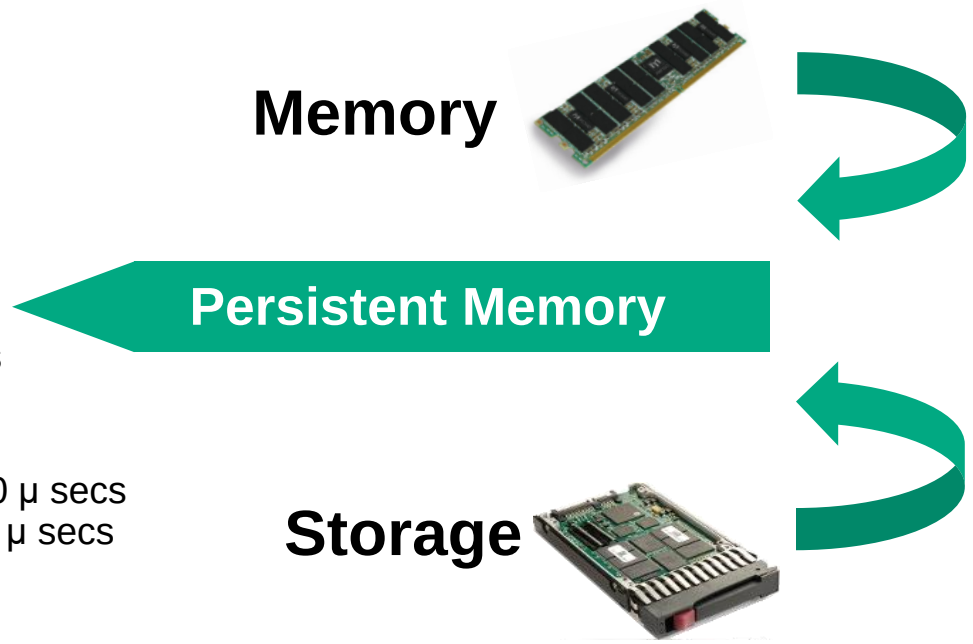
3D XPoint next year

Non-volatile, faster, bigger
PCI Express slot
DIMMs

Convergence of Memory and Storage Technologies



Persistent Memory = Performance of memory, persistence of Storage



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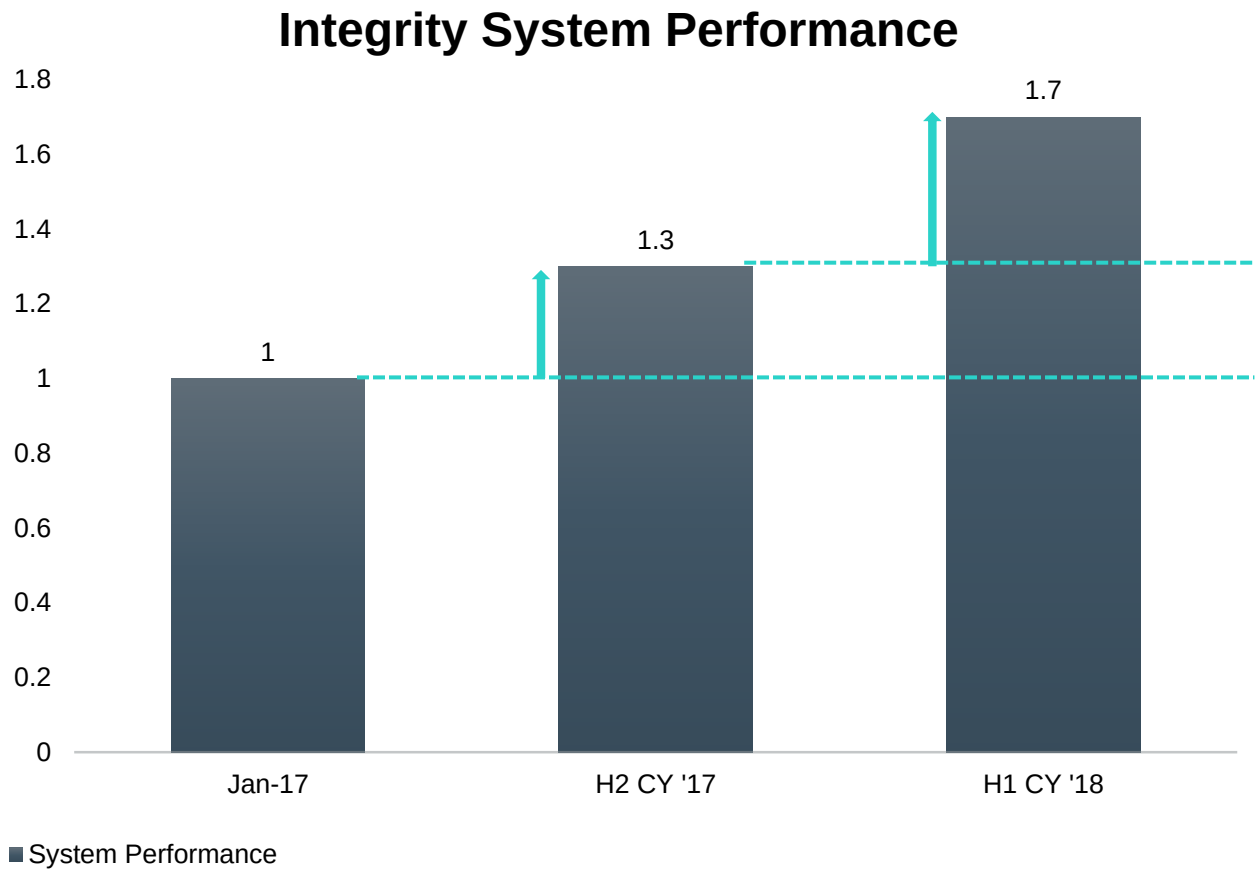
Workload acceleration with Non-Volatile Memory technology

Ongoing system-level innovations for HPE Integrity i6 systems

Enhancing System and Application Performance

- Increases system performance with improvements in I/O latency & IOPS
- HP-UX software enhancements enable applications to take advantage of the improved system performance seamlessly*

Usage	Workload
High Speed Block Storage	Generic applications
High Speed Temporary Storage	Analytics and Telco Applications
Transaction Acceleration	Databases
Read or Write Cache	IO intensive applications

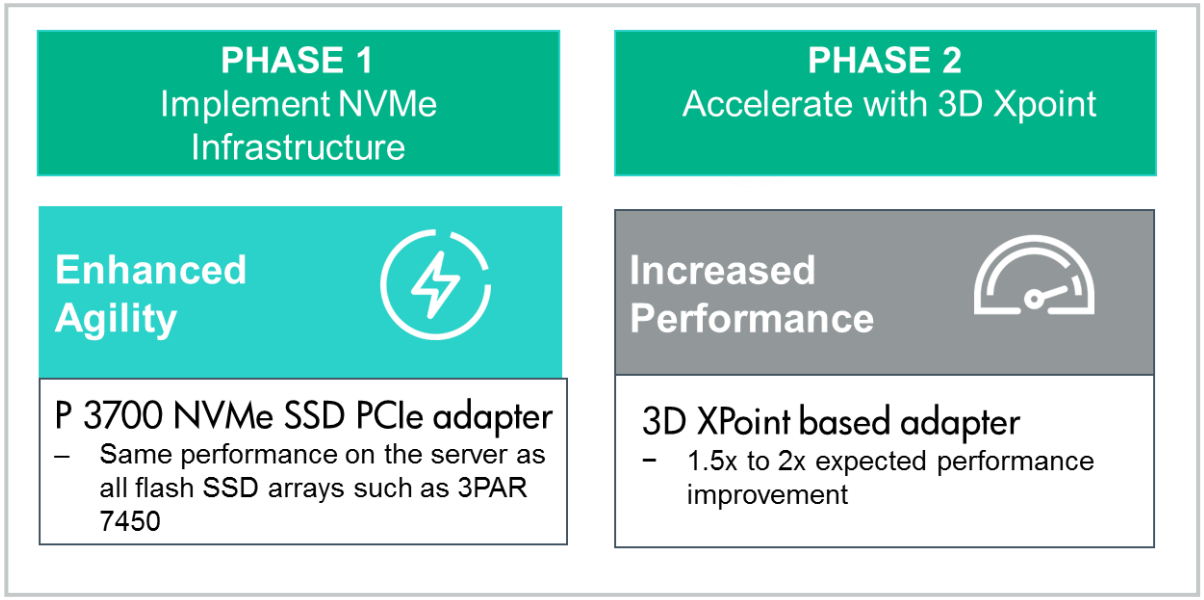


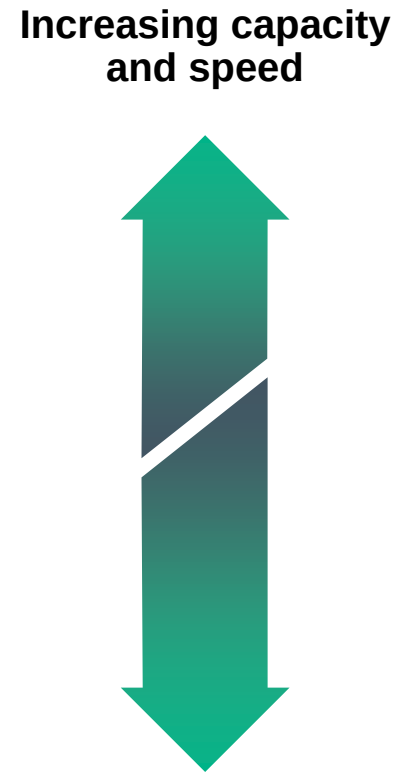
Integrity I/O on HPE Integrity i6 servers

Accelerate workload performance with NVMe

Workload Accelerator for Itanium servers:

- Workload Accelerator for HP-UX/i6 servers is an IO Accelerator Solution based on NVMe technology that will offer enhanced Application Performance and Responsiveness
- Planned to be supported with rackmount and SD2 Itanium servers.



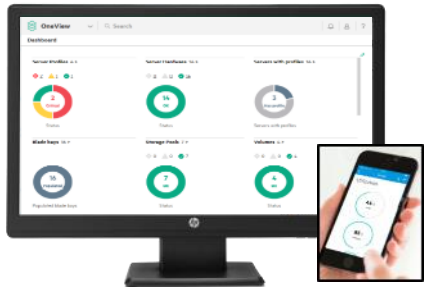


VMS Software Inc x86 support | <=2020 | Access to self provisioning | Access to in-memory | Access to photonics

Deploy Infrastructure Faster

Simplify Lifecycle Operations

Increase Productivity



HPE OneView

The infrastructure automation engine built with software-defined intelligence

Online VC Migration – Migrate from VC to HPE OneView with no downtime; support 8 Flex NICs on c-Class

c-Class ToR Network Mgmt – Monitoring and basic downlink provisioning for Cisco 5k/6kswitches

Virtual Connect 16Gb FC Support – provision 16Gb modules with the same ease as the rest of the portfolio.

Remote Support for Servers – Phone home HW failure events to HP for expedited part replacement

Global Dashboard – Unify views across multiple HPE OneView appliances.

FW Data Collection and Reporting – full FW inventory collection and reporting

HPE OneView supported on BladeSystem, ProLiant DL , Apollo, Superdome X servers

What’s new for Enterprise Servers?

Accelerating Data Center Modernization

The first Composable Infrastructure

Industry leading technology

A single infrastructure for both traditional and cloud native apps

HPE Synergy

Your infrastructure as code

HPE OneView Composer
Integrated software-defined intelligence

Image Streamer:
Instantly provision operating environments on stateless infrastructure

Composable Fabric
Rack scale multi-fabric connectivity eliminates standalone TOR switches

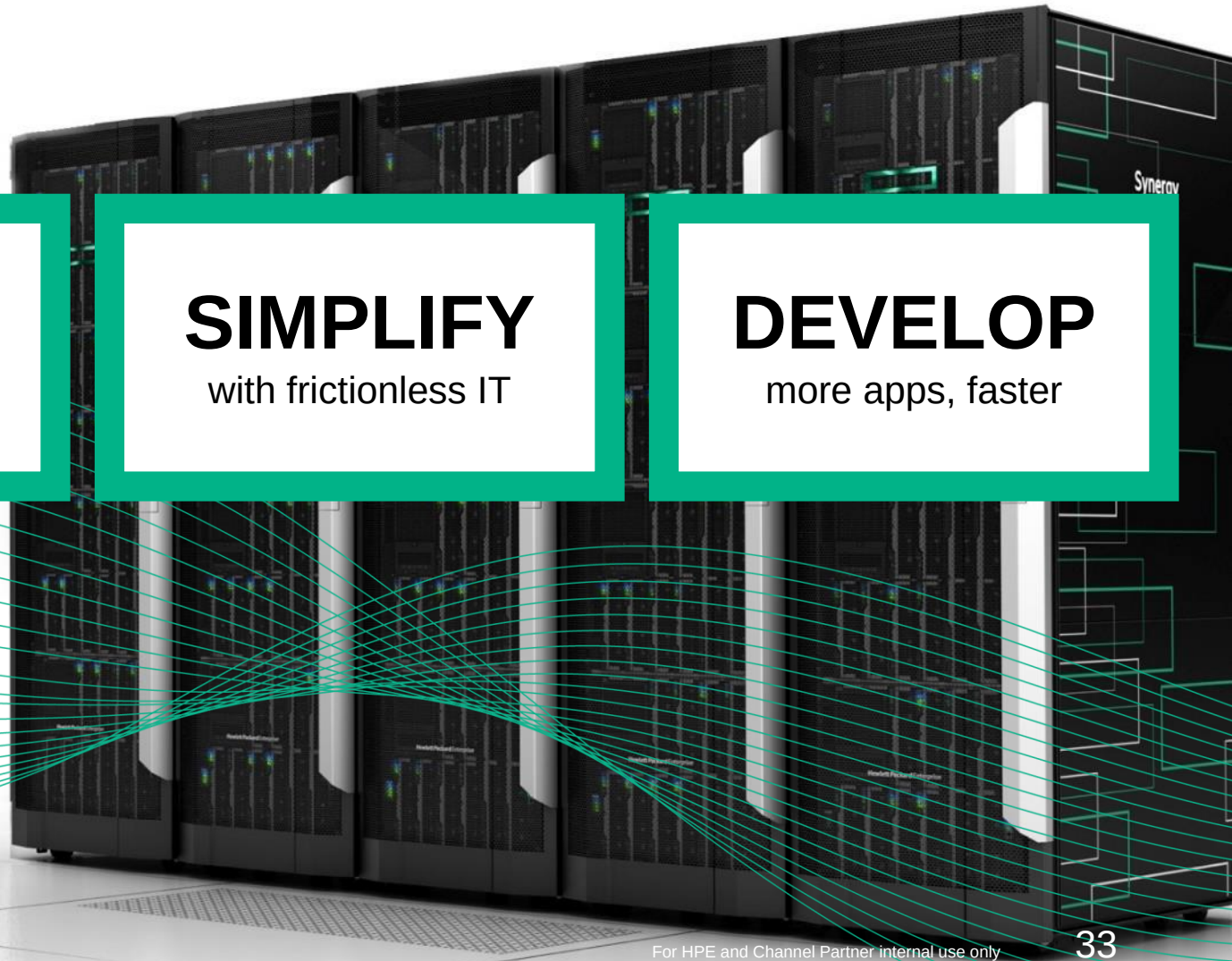
Composable Storage
High-density integrated storage Compose any compute with any storage (SDS, DAS, SAN)

Composable Frame
Scaling simple and automated at rack/row scale Photonics and memristor ready for investment protection

Composable Compute
Provides the performance, scalability, density and configuration flexibility

HPE Synergy: The first platform architected for composability

Your infrastructure as code (programmable infrastructure)



REDUCE
over-provisioning and CapEx

DEPLOY
at cloud-like speed

SIMPLIFY
with frictionless IT

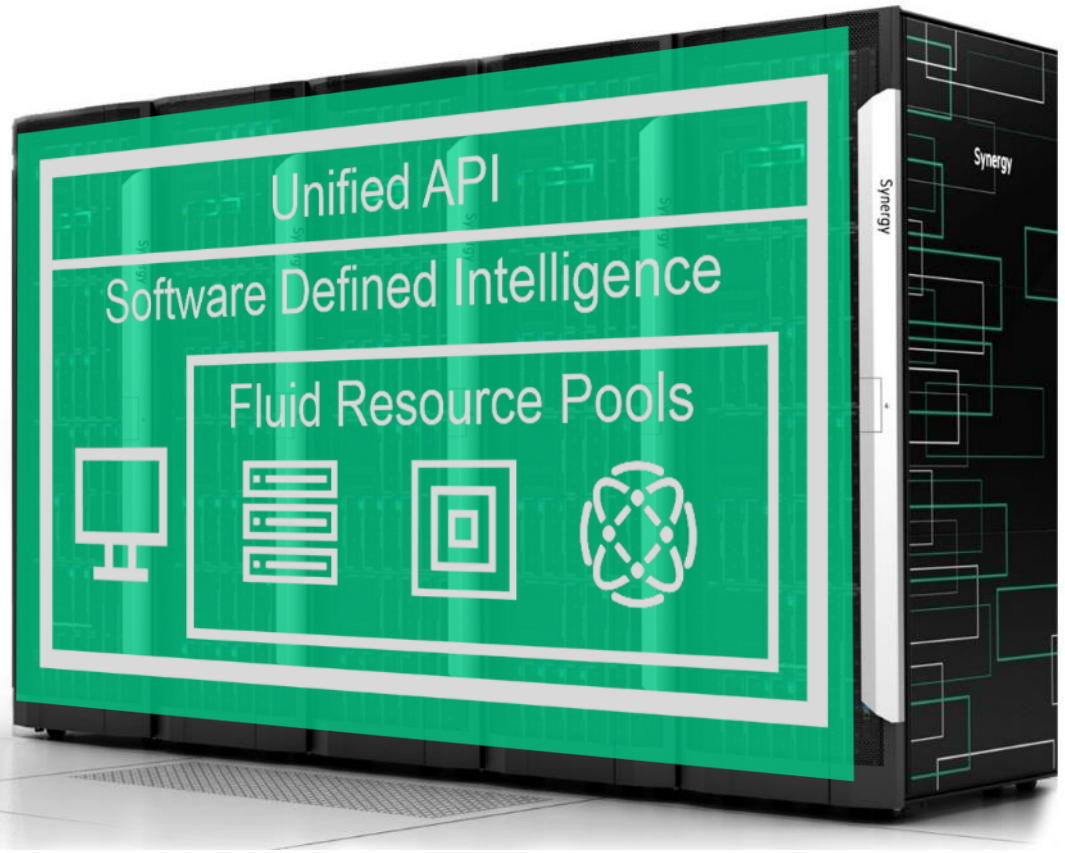
DEVELOP
more apps, faster

Hewlett Packard Enterprise

HPE Synergy: driving digital transformation in a Hybrid IT world

Composer powered by HPE OneView and Image Streamer

Composable Compute



Composable Fabric

Rack scale multi-fabric connectivity eliminates standalone TOR switches

Composable Storage

High-density integrated storage to compose any compute with any storage (SDS, DAS, SAN)

Hewlett Packard Enterprise

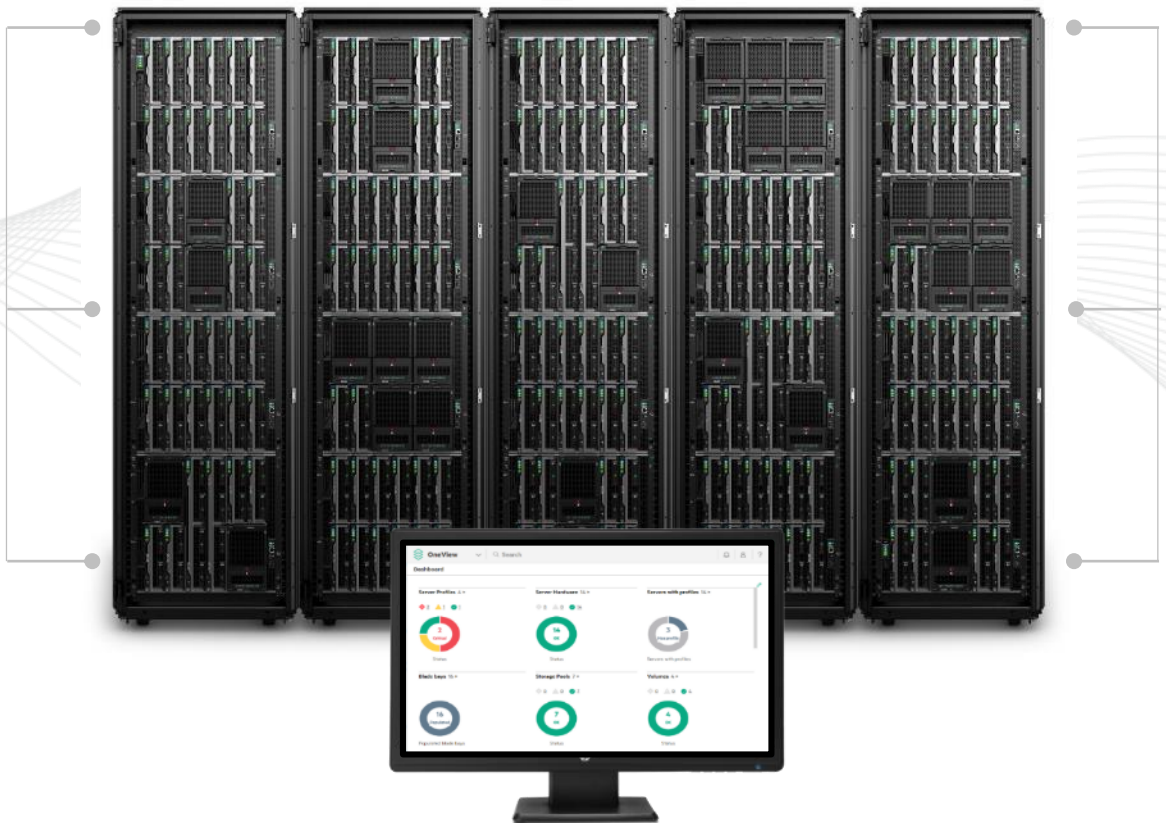
HPE Synergy unique innovations enable the composable experience

Private bare metal cloud ready to run any application and delivered as infrastructure as code

Single Management Interface:
One interface to discover, compose, update, and troubleshoot

Image Streamer:
Instantly provision operating environments on stateless infrastructure

Template Based Composition:
Templates composes the infrastructure to match the workload's needs



Frictionless Operations:
Firmware and driver updates delivered seamlessly as one

Unified API:
Operations changes can be easily automated and **Developers can program the infrastructure as code**

Developer Portal:
Presents a private bare metal cloud through unified API & SDK

Transformational power of HPE Synergy

Single infrastructure for your traditional and cloud-native workloads

VDI / CAD applications
run during the day

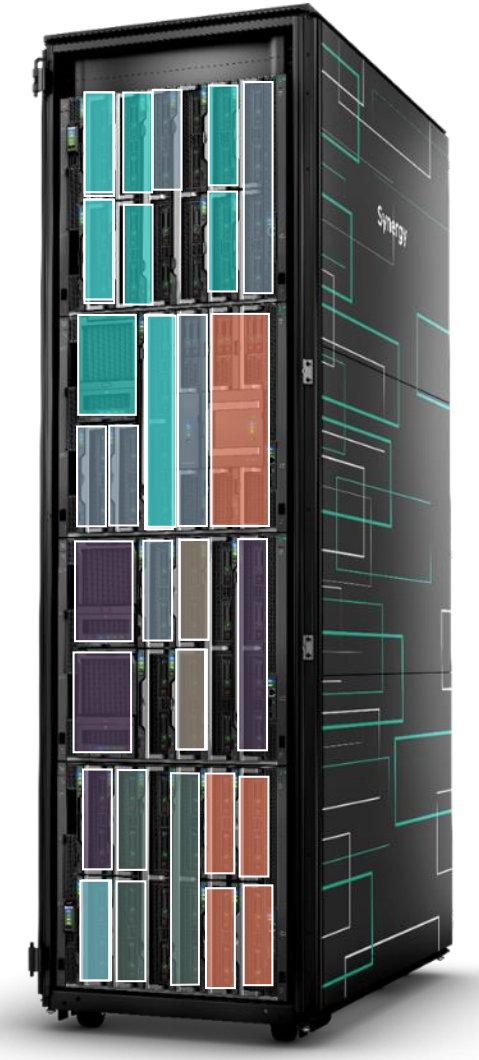
Modeling & Analytics
Run at night

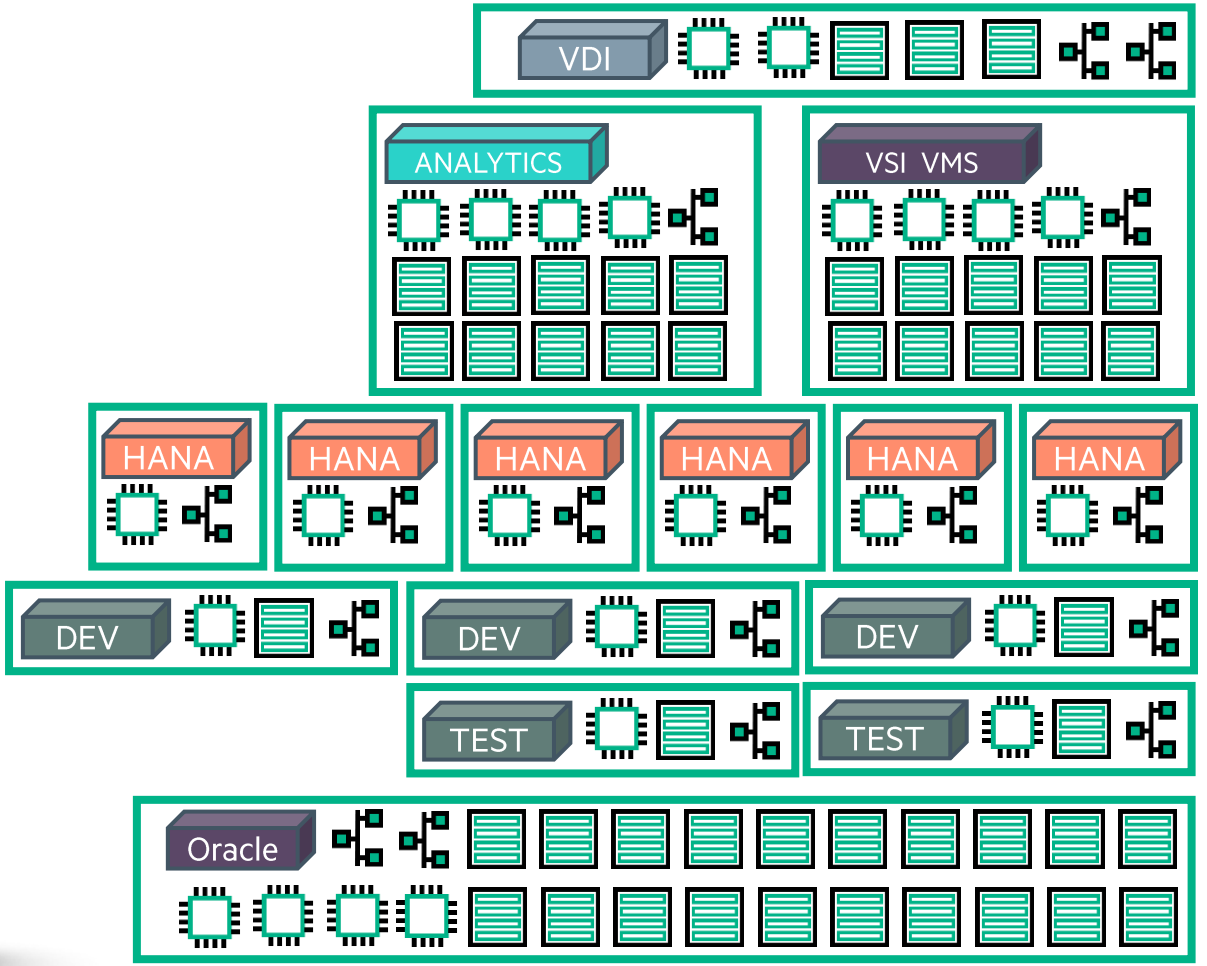
VSI VMS
Runs all the time [Ken ☺]

SAP HANA
for running production mission-critical workloads

App Dev/Test environment is needed now that peak season is over

and **Oracle database, on OpenVMS, naturally**





The next five years for OpenVMS users

2017	2018	2019	2020	2021
Get up to date	Stay up to date	Evaluate OpenVMS on x86	Move to OpenVMS on x86	Evaluate OpenVMS on x86 photonic infrastructure
Move to VSI OpenVMS	Research in-memory	Monitor composable infrastructure		
Budget for refresh	Monitor mission critical x86	Integrate into x 86 infrastructure		

http://genzconsortium.org/

Gen-Z: An open systems Interconnect designed to provide memory semantic access to data and devices via direct-attached, switched or fabric topologies.

Data Center of the Future, with OpenVMS

Hybrid IT Wins

Software-defined Everything

New Memory, Security, Photonics

Energy efficient IT

Hewlett Packard Enterprise

Questions ?