Dell EMC Hyper-Converged Infrastructure

New normal for the modern data center

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Traditional infrastructure and processes are unsustainable

⚠️ Expensive tech refreshes, risky data migrations

⚠️ Complex and costly to monitor, sustain and support

⚠️ Long implementation timelines

⚠️ Large capital investments typically required
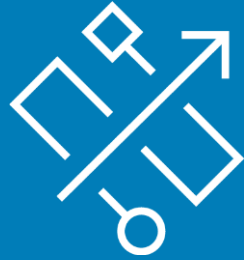
⚠️ Operational inefficiencies managing across silos

⚠️ Bottlenecks, hot spots and lack of scalability

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IT transformation is required

A **cloud operating model** is needed to **recognize, act and benefit** from changing business circumstances.

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Digital Transformation Index

Top Planned On-Premise Investments During the Next 3 Years

1. **Converged/hyper-converged infrastructure**

2. Ultra-high performance technologies (Example: flash)

3. Analytics, big data and data processing

4. Internet of Things (IoT) technologies

Source: Digital Transformation Index, 2016

Hyper-converged infrastructure enables compute, storage and networking functions to be decoupled from the underlying infrastructure and run on a common set of physical resources that are based on industry-standard x86 components.

*Source: TechTarget

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Key building blocks for HCI

Software-defined storage

- Abstracts storage functions from hardware
- Virtualizes direct-attach storage into shared pool
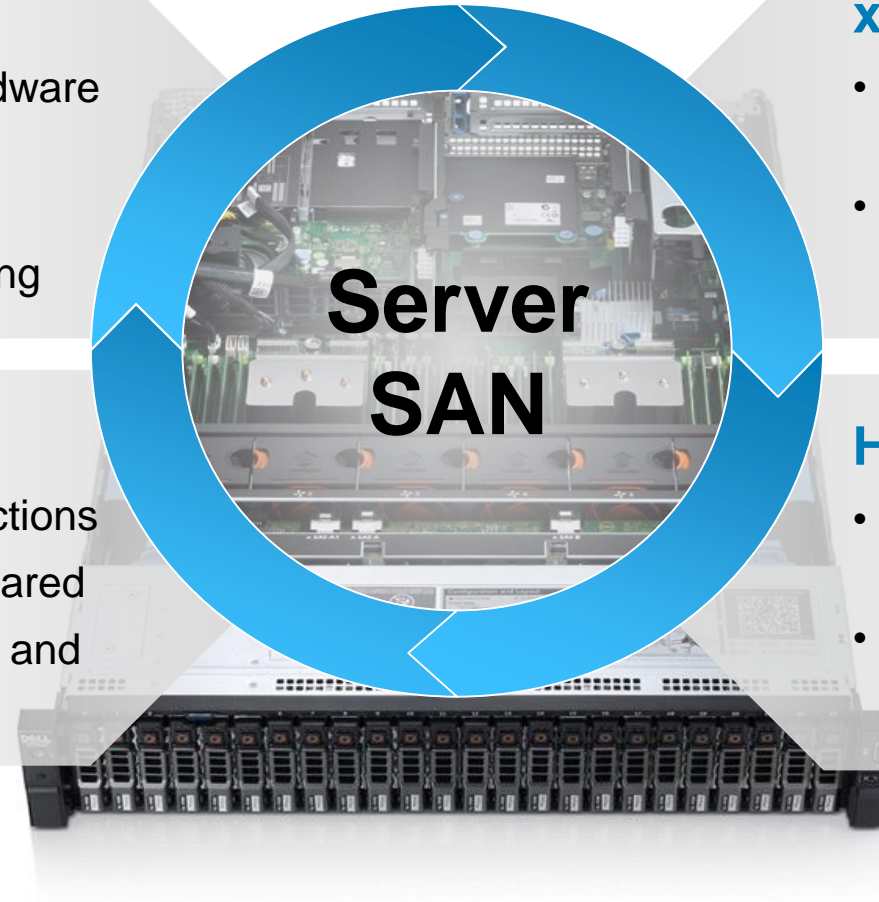- Automates provisioning, load balancing

Virtualization

- Abstracts compute and network functions
- Enables physical resources to be shared
- Greatly improves utilization, mobility and security

x86 servers

- High-performance processors, large memory
- Flash media delivers consistent, predictable performance

High-speed Ethernet

- Connects nodes together to create cluster
- Enables HCI to deliver high IOPS and reduced latencies

Server SAN

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Fundamental system design shift

Converged

Hyper-Converged

Servers

SAN

Storage

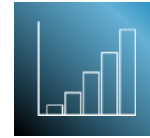**DELL**EMC
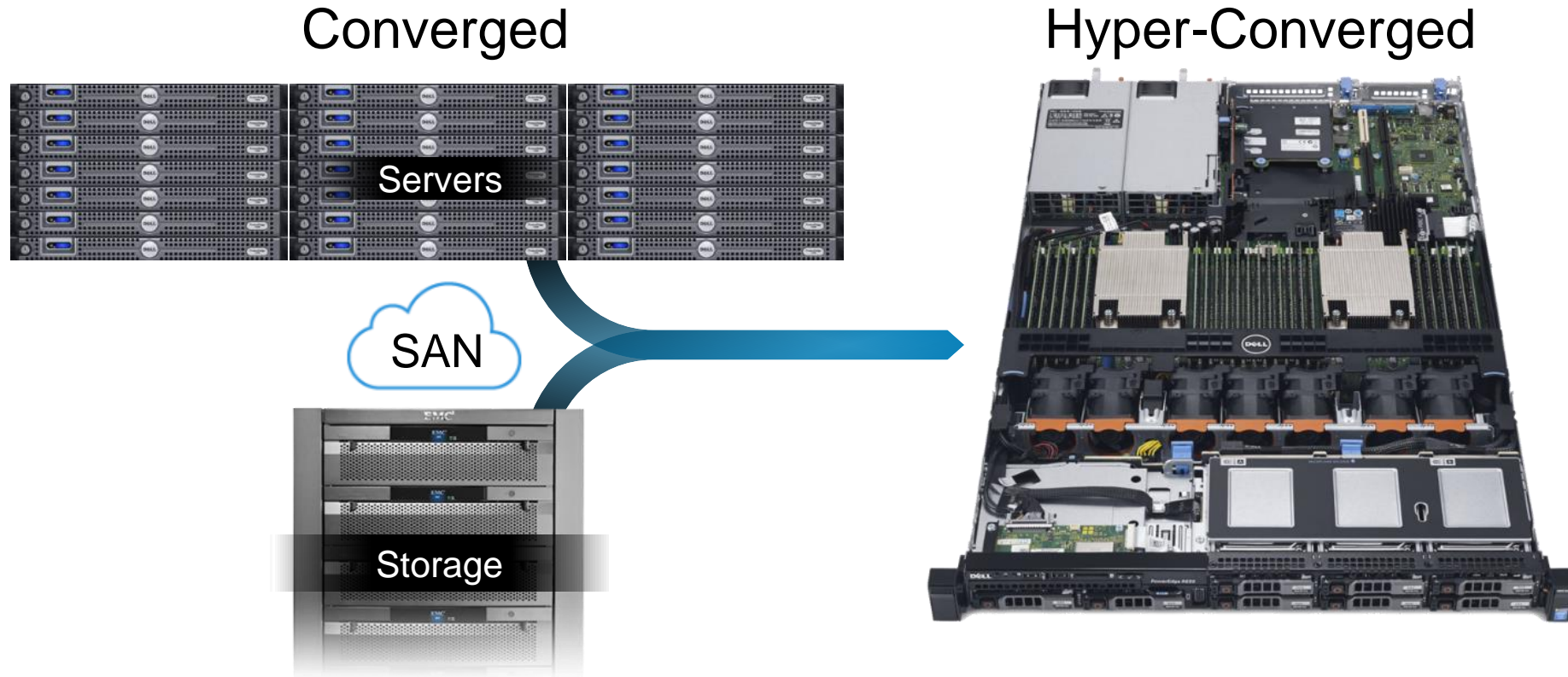
Fundamental system design shift

Flash server

High core-count CPUs

High performance
and capacity flash media

High-speed Ethernet

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Fundamental system design shift

Fast network

Scale-out

Scale-out

Software-defined storage

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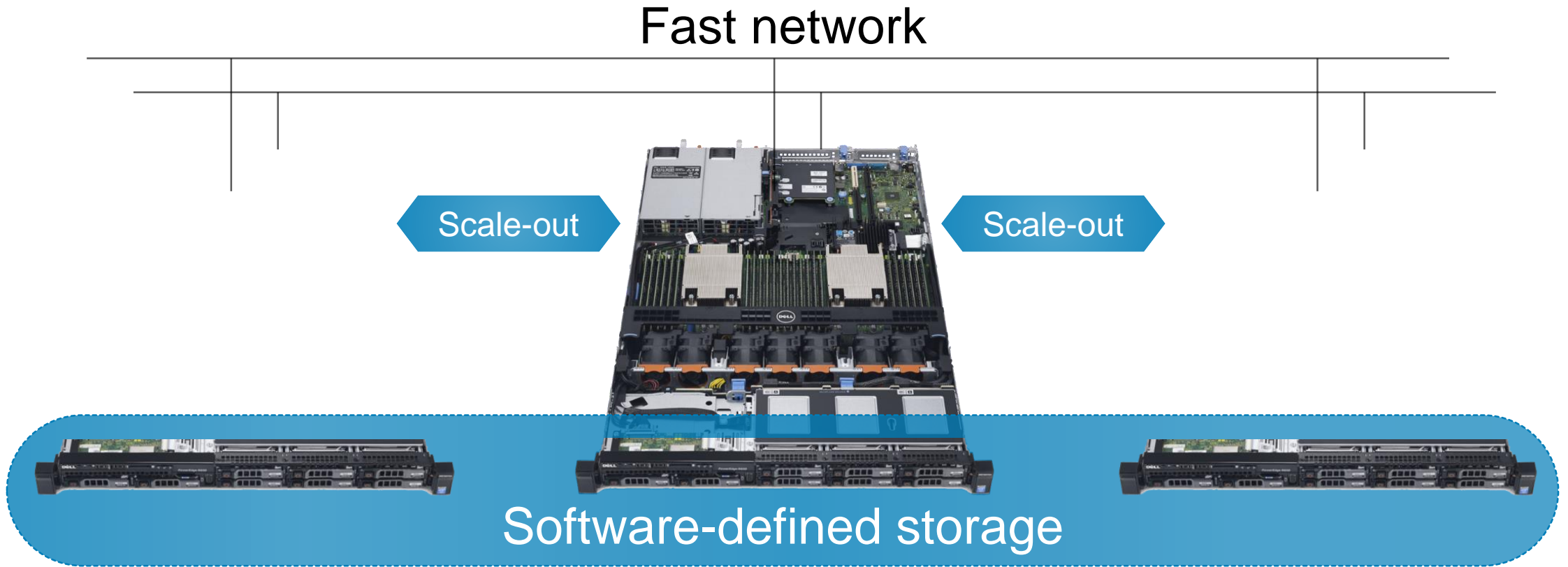
Hyper-converged becoming new normal

Companies are already embracing HCI

>60% will adopt HCI by 2017

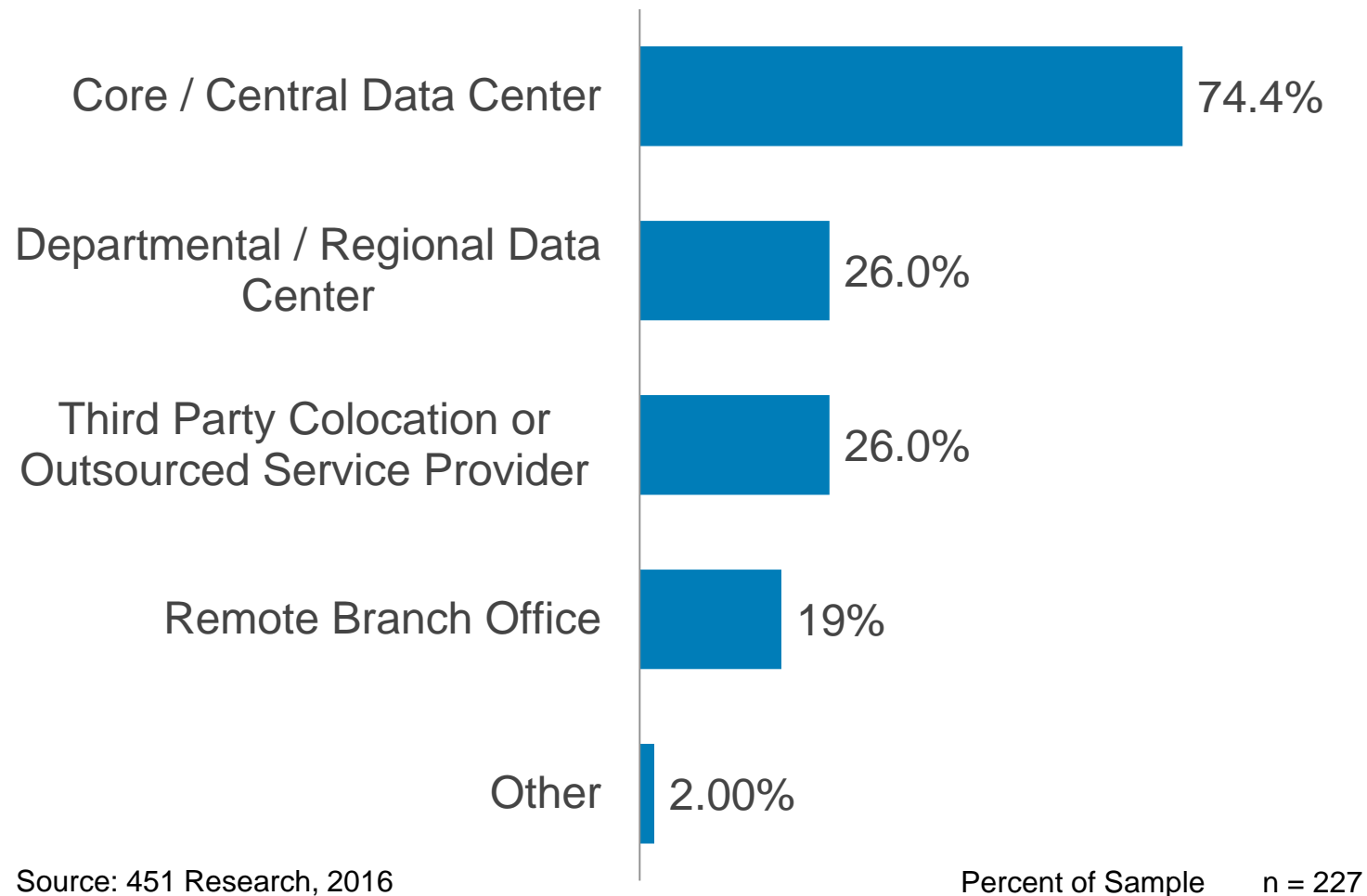Source: 451 Research, December 2016

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Ready for prime time!

Question:
In which locations are you deploying hyper-converged infrastructure at your organization?

Answer:
All of them!!

Core / Central Data Center — 74.4%

Departmental / Regional Data Center — 26.0%

Third Party Colocation or Outsourced Service Provider — 26.0%

Remote Branch Office — 19%

Other — 2.00%

Source: 451 Research, 2016

Percent of Sample   n = 227

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What's driving interest?

Main drivers

Agility

Ability to respond quickly to business threats or opportunities

Simplicity

Simplify operations with software-driven automation and lifecycle management

Modernization

Public cloud efficiency and economics, but with peace of mind of on premises

Scalability

Start small and easily scale up or scale out while maintaining performance levels

Improve efficiency and lower operational costs

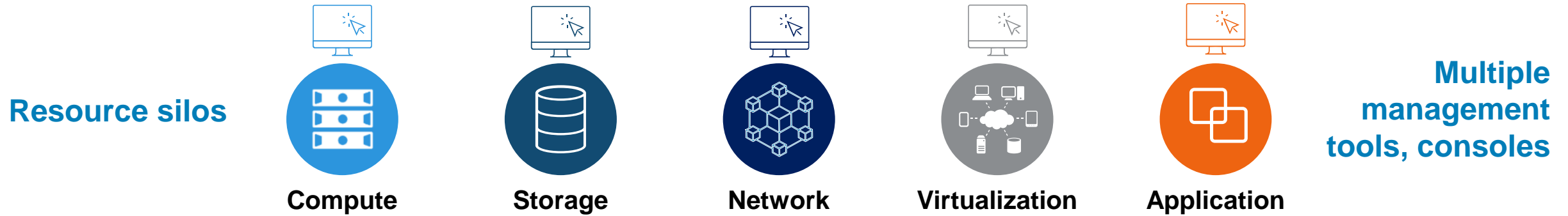DELLEMC

HCI delivers business agility

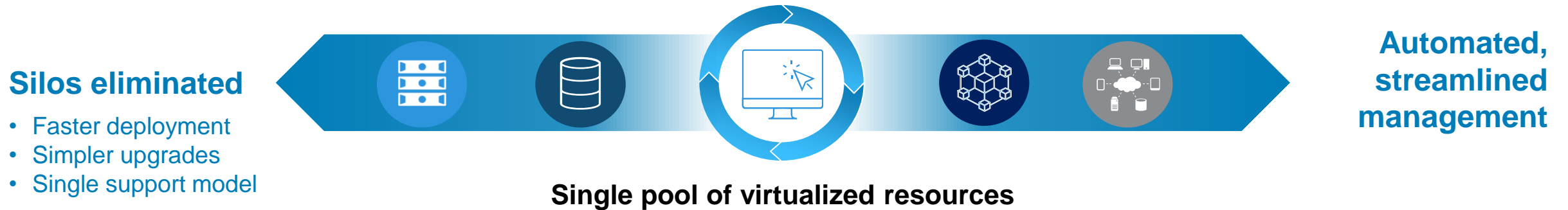**Public cloud speed and flexibility… delivered on-prem**

Benefits

- Shorter development cycles for applications and services

- Faster response to changing business conditions

- Elasticity enables rapid deployment and expansion of infrastructure

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HCI simplifies IT management and operations

Traditional SAN

Resource silos

| Compute | Storage | Network | Virtualization | Application |

Multiple management tools, consoles

Hyper-Converged

Silos eliminated

- Faster deployment
- Simpler upgrades
- Single support model

Automated, streamlined management

Single pool of virtualized resources

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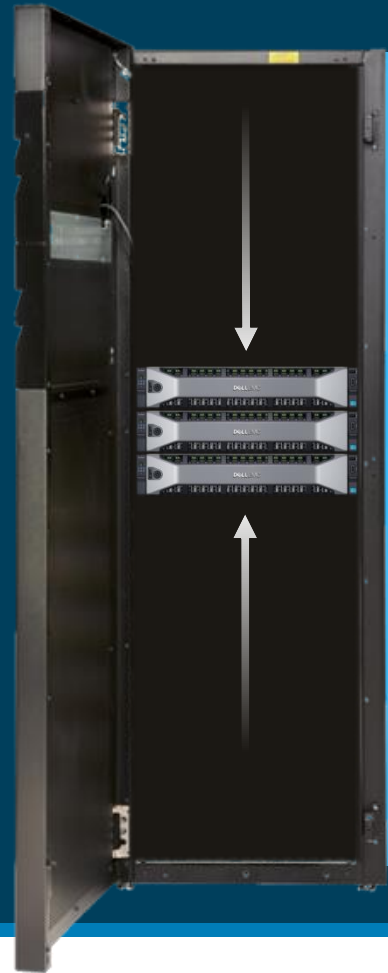
HCI incorporates modern architectural attributes

Flash
Reduce costs
Consistent and predictable performance

Cloud-enabled
Policy-driven service delivery
Data and application mobility

Scale-out
Scale as you grow
Manage with fewer resources

Software-defined
Automate provisioning and business agility
Programmable data services

Trust
Encrypt at rest and in flight
Integrated data protection

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HCI reduces footprint, improves efficiency

Traditional SAN

Hyper-Converged
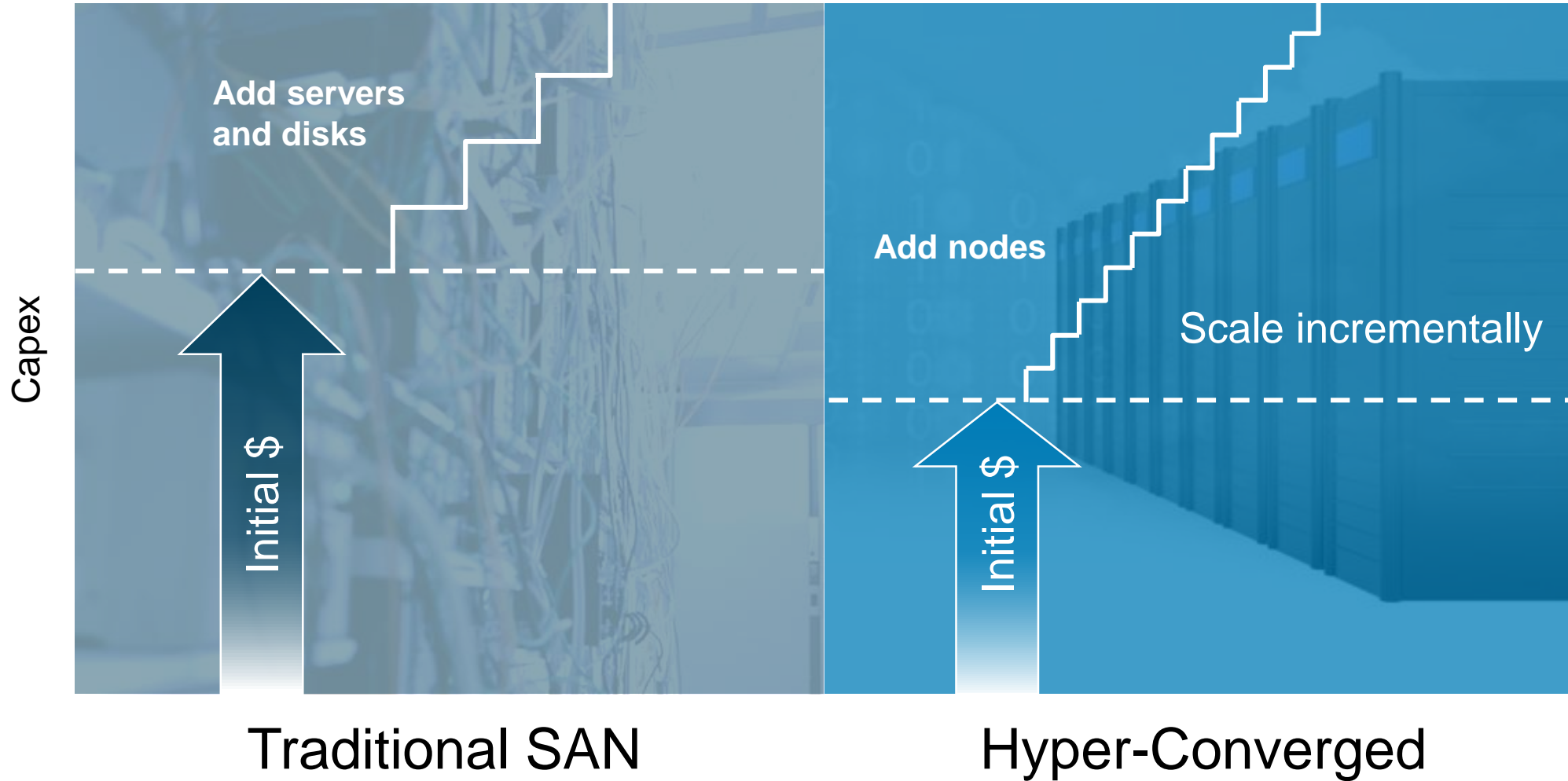
16:1
reduction rack space

50%
reduction power costs

25%
reduction cooling costs

Large North American Financial Services Company

Source: Gartner, HCIS TCO Paper, July 2016

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Start small and scale efficiently

Add servers and disks

Add nodes

Scale incrementally

Capex

Initial $

Initial $

Traditional SAN

Hyper-Converged

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Wikibon 2017 study: HCI lowers TCO

Over 30% less

Traditional SAN

Servers

SAN

Storage
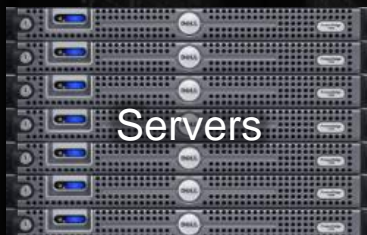
Tech refresh

CAPEX cycles

Forklift upgrades

Over provisioning

Hyper-Converged

No silos

Pay-as-you-grow
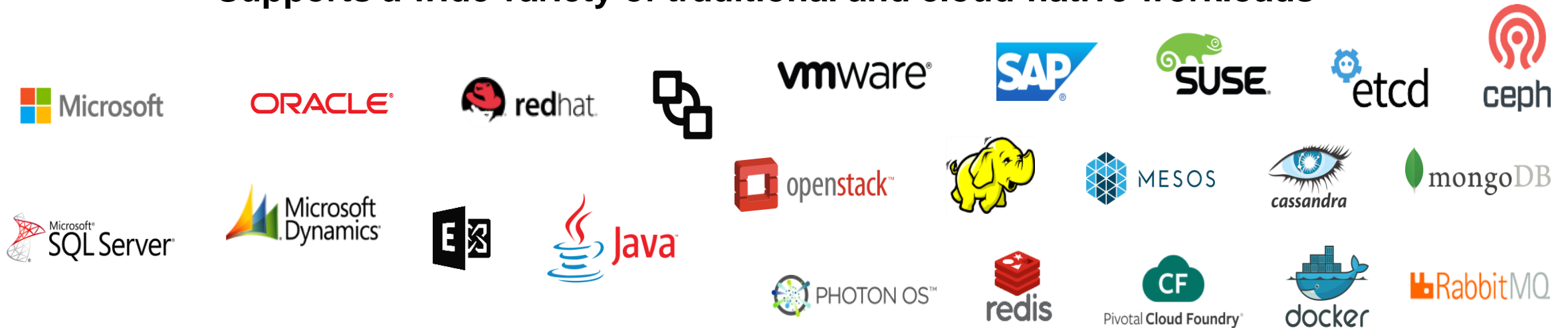
No migrations

Scale on demand

Source: Wikibon

What workloads are appropriate for HCI?

True or False: HCI is only for VDI   **FALSE!!**

Supports a wide variety of traditional and cloud-native workloads

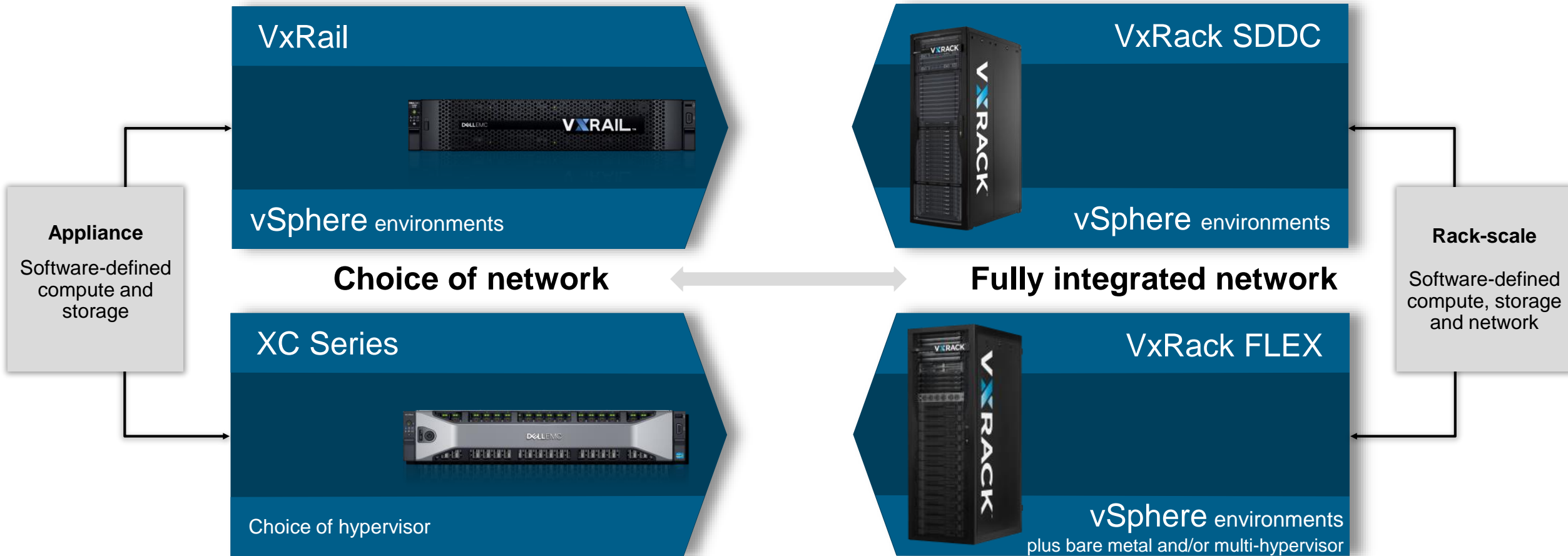| Traditional business apps | Test/Dev | IaaS, PaaS | Big Data analytics |

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Dell EMC Hyper-Converged Infrastructure

Industry's Fastest-Growing HCI Portfolio

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One size does not fit all

Dell EMC hyper-converged portfolio

VxRail

vSphere environments

VxRack SDDC

vSphere environments

Choice of network ⟷ **Fully integrated network**

Appliance

Software-defined compute and storage

Rack-scale

Software-defined compute, storage and network

XC Series

Choice of hypervisor

VxRack FLEX

vSphere environments
plus bare metal and/or multi-hypervisor

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*The **simplest,** most powerful, **most integrated HCI appliance… for customers standardized on VMware….”** VxRail is where to start*

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Challenges

– Aging infrastructure was hampering Rent-A-Center's ability to grow

– IT was consumed with tweaking infrastructure to ensure adequate performance and scalability

Solution

– All-flash Dell EMC VxRail Appliance, VMware Horizon VDI, VMware NSX, VMware vRealize

Benefits

– Reduced administrative management overhead
– Cut deployment time from weeks to hours
– Reclaimed storage space, easing pressure on power and cooling costs

"Getting VxRail up and running in a couple hours was tremendous. It was a huge win for us."

– Mike Conroy
Senior Director of Technical Operations
Rent-A-Center

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A simple… HCI appliance for customers who want hypervisor choice… we have the XC Series

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Challenges

– Performance of enterprise applications, management complexity, constrained space and slow VM deployment due to legacy 3-tier infrastructure

– Led to infinitely delayed value projects

Solution

– Installed XC Series powered by Nutanix software
– Microsoft Exchange/SQL/Lync, VDI, Body Cam solution

Benefits

– **80% floor space reduction** (84U to 16U)
– Simplified infrastructure management via single UI
– Increased performance beyond previous 3-tier environment

"The simplicity of the [Dell XC Series powered by Nutanix] hyper-converged platform, the lower cost, and having just one vendor to call for support was the most attractive solution."

– Ryan McCarroll
Sr. Systems Administrator
Harris County

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At scale, the network is even more critical

Network design/hardware selection

Plan for future growth

Multiple IT teams involved

Complex (physical + logical planning)

Maintain performance levels at scale

Expertise and planning required!

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Momentum building for rack-scale HCI

"As HCI clusters grow in size, the **networking infrastructure** that connects nodes and the networking monitoring tools needed to manage traffic and locate problems will require tighter integration to keep up with rapidly evolving workloads and customer requirements."

451 Research, Hyperconvergence – A Market Update
December 2016

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*If considering VxRail—but are **ready for network transformation,** VxRack SDDC… **directed availability in 2017***

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Government agency in APJ

Challenges

- Seed infrastructure for 2,000 VDI users
- Scale to 20,000 + users in future
- Capability to support 130,000 end point devices

Solution

- Dell EMC VxRack SDDC
- VMware Cloud Foundation
- Services—plus Support and Residency

Benefits

- Modern infrastructure platform capable of supporting large-scale virtual desktop environment
- Predictable performance and scalability
- Budget and cost predictability for future scaling

Modern infrastructure platform capable of supporting large scale virtual desktop environment

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For a *flexible* HCI system with **hypervisor of choice or bare metal…** can start small and **scale out** — VxRack FLEX is for you.

WOOLWORTHS LIMITED

Challenges

– Cut $10B in logistics costs over the next 10 years

– Required a high-availability platform to operate a third-party robotics warehousing application

– Ability to integrate into existing management tools and to remotely manage and define the entire solution

Solution

– VxRack System with FLEX

– Vision Intelligent Operations Software

Benefits

– 50% cost reduction with remote management of integrated systems, simplifying operations

– Accelerated time-to-market, ensuring rapid integration and deployment of IT piece of the logistics and supply-chain automation

"We selected VxRack based on three key drivers — data center in a box, remote management, and the ability to run our mission critical inventory management application"

– Ben Carter
– Senior Infrastructure

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"*The simplest, most powerful, most integrated HCI appliance … for customers standardized on VMware ….*" VxRail is where to start

"*If considering VxRail—but are ready for network transformation,* VxRack SDDC… *directed availability in 2017*"

"*For a flexible HCI system with hypervisor of choice or bare metal… can start small and scale out*—VxRack FLEX is for you."

"*A simple… HCI appliance for customers who want hypervisor choice*"… we have the XC Series

Powerful hyper-converged portfolio with a cloud-like consumption model

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New: Cloud Flex for HCI provided by Dell Financial Services**

Cloud-like economic model

Eliminate acquisition costs and move to a straightforward OPEX cost structure
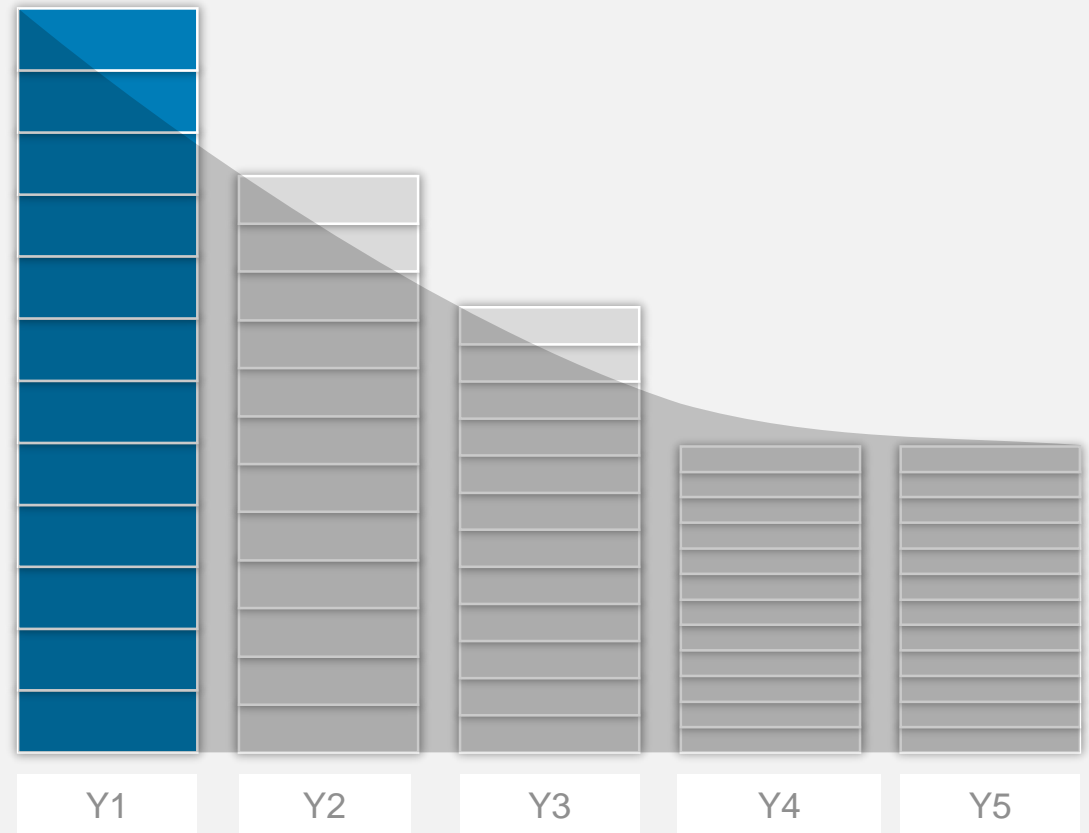
No obligation

Customers experience the benefits of HCI without a long term commitment

Price drops over time

Ensures monthly rate is competitive with decreasing price of technology

| Y1 | Y2 | Y3 | Y4 | Y5 |

Declining monthly payments

**Payment solutions provided and serviced by Dell Financial Services L.L.C. or its affiliate or designee ("DFS") for qualified customers. Offers may not be available or may vary in certain countries. Where available, offers may be changed without notice and are subject to product availability, credit approval, execution of documentation provided by and acceptable to DFS, and may be subject to minimum transaction size. Offers not available for personal, family or household use. Dell EMC and the Dell EMC logo are trademarks of Dell Inc. Restrictions and additional requirements may apply to transactions with governmental or public entities.

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Opportunities to get started

Net-new workloads or green-field applications	Virtual desktops, general-purpose workloads, databases, etc.
Server or storage refresh	Opportunity to modernize infrastructure in current environment
Larger remote or regional offices	Often require centralized management and smaller footprint
Test/Dev environments with isolated infrastructure	Ideal for developers who want agility to spin up/tear down

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Key takeaways

- Hyper-converged infrastructure (HCI) is ready for prime time!

- HCI delivers the business agility and efficiency needed to compete in today's economy

- Dell EMC has the fastest growing adoption rate of HCI solutions in the industry

- Don't be left behind! Start evaluating HCI solutions today

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