Dell EMC Hyper-Converged Infrastructure
New normal for the modern data center
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
IT transformation is required

A cloud operating model is needed to recognize, act and benefit from changing business circumstances.
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*
Key building blocks for HCI

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

**x86 servers**
- High-performance processors, large memory
- Flash media delivers consistent, predictable performance

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

**High-speed Ethernet**
- Connects nodes together to create cluster
- Enables HCI to deliver high IOPS and reduced latencies
Fundamental system design shift
Fundamental system design shift

- Flash server

- High core-count CPUs
- High performance and capacity flash media
- High-speed Ethernet
Fundamental system design shift

Fast network

Scale-out

Software-defined storage

Scale-out
Hyper-converged becoming new normal

Companies are already embracing HCI

>60% will adopt HCI by 2017

Source: 451 Research, December 2016
Ready for prime time!

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

**Answer:**
All of them!!

<table>
<thead>
<tr>
<th>Location</th>
<th>Percent of Sample</th>
</tr>
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<tbody>
<tr>
<td>Core / Central Data Center</td>
<td>74.4%</td>
</tr>
<tr>
<td>Departmental / Regional Data Center</td>
<td>26.0%</td>
</tr>
<tr>
<td>Third Party Colocation or Outsourced Service Provider</td>
<td>26.0%</td>
</tr>
<tr>
<td>Remote Branch Office</td>
<td>19%</td>
</tr>
<tr>
<td>Other</td>
<td>2.00%</td>
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</tbody>
</table>

Source: 451 Research, 2016
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
HCl delivers business agility

Benefits

• Shorter development cycles for applications and services
• Faster response to changing business conditions
• Elasticity enables rapid deployment and expansion of infrastructure

Public cloud speed and flexibility… delivered on-prem
HCI simplifies IT management and operations

Traditional SAN

Resource silos
- Compute
- Storage
- Network
- Virtualization
- Application

Multiple management tools, consoles

Silos eliminated
- Faster deployment
- Simpler upgrades
- Single support model

Hyper-Converged

Single pool of virtualized resources

Automated, streamlined management
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
HCI reduces footprint, improves efficiency

**Traditional SAN**

- 16:1 reduction in rack space

**Hyper-Converged**

- 50% reduction in power costs
- 25% reduction in cooling costs

Source: Gartner, HCIS TCO Paper, July 2016

Large North American Financial Services Company
Start small and scale efficiently

Traditional SAN

Hyper-Converged

Add servers and disks

Add nodes

Scale incrementally

Initial $
WikiBon 2017 study: HCI lowers TCO

Over 30% less

Tech refresh
CAPEX cycles
Forklift upgrades
Over provisioning

Traditional SAN

No silos
Pay-as-you-grow
No migrations
Scale on demand

Hyper-Converged

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
Dell EMC Hyper-Converged Infrastructure

Industry’s Fastest-Growing HCI Portfolio
One size does not fit all

Dell EMC hyper-converged portfolio

VxRail

vSphere environments

Choice of network

Appliance
Software-defined compute and storage

XC Series

Choice of hypervisor

VxRack SDDC

vSphere environments

Fully integrated network

VxRack FLEX

vSphere environments

plus bare metal and/or multi-hypervisor

Choice of network

Rack-scale
Software-defined compute, storage and network
The simplest, most powerful, most integrated HCI appliance... for customers standardized on VMware....” VxRail is where to start
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
A simple... HCI appliance for customers who want hypervisor choice... we have the XC Series
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
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!
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
If considering VxRail—but are ready for network transformation, VxRack SDDC… directed availability in 2017
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
For a **flexible** HCI system with **hypervisor of choice** or **bare metal**... can start small and **scale out** — VxRack FLEX is for you.
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
“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
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

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.
### Opportunities to get started

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