# Dell EMC VxRail

Modernize your infrastructure and accelerate IT transformation with VxRail



# Increasing complexity of application ecosystems is driving IT transformation

As application ecosystems become more complex, IT must transform to deliver greater

EFFICIENCY

PREDICTABILITY

and BUSINESS AGILITY

# 81%

agree that if they do not embrace IT TRANSFORMATION, their firm will no longer be COMPETITIVE in their market (10% increase vs. 2017)<sup>1</sup>

Source: Based on the ESG Research paper, "Research Proves IT Transformation's Persistent Link to Agility, Innovation, and Business Value," March 2018

# IT Transformation drives agility, innovation, and business value



# Increased innovation

Transformed organizations are 16x more likely to have mature digital transformation initiatives underway



## Improved competitiveness

Transformed organizations are 2.5x more likely to believe their companies are in a strong competitive position (L) 18x

Faster time to market

Transformed organizations are 18x more likely to make better datadriven decisions \$ 8x

Enhanced IT spending efficiency

Transformed organizations are 8x more likely to be costcompetitive with the public cloud



More inclusion for IT in business strategy formulation

Transformed organizations are 6x more likely to be involved in business strategy development

Source: Based on the ESG Research paper, "Research Proves IT Transformation's Persistent Link to Agility, Innovation, and Business Value," March 2018

### HCI supports most enterprise workloads today



### MORE AND MORE CUSTOMERS ARE MODERNIZING WITH HCI

Within 2 years HCI will penetrate 93% more large enterprise organizations and 88% more SME organizations<sup>1</sup>









Agility

Simplicity Modernize

e Scalability

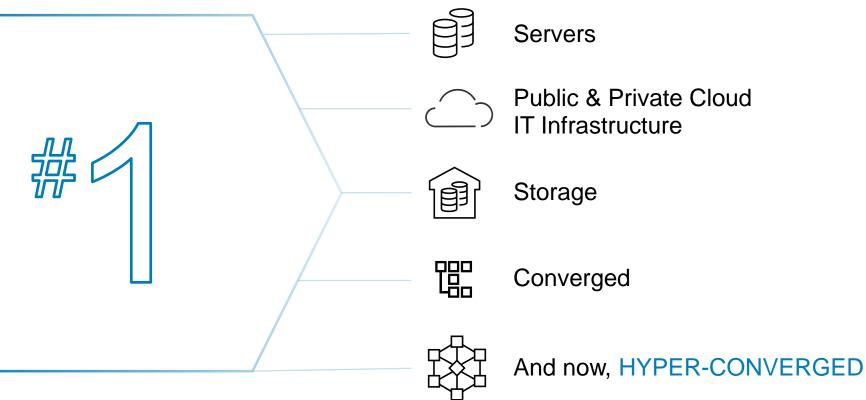
### HCI HAS CROSSED THE RELIABILITY THRESHOLD

47% of survey respondents using HCI for primary infrastructure<sup>1</sup>
45% are deploying mixed workloads on HCI<sup>1</sup>

### DELL EMC HAS #1 HCI PORTFOLIO

1. Topline Research, August 2017

## **Dell EMC industry leadership**





### Why VxRail Dramatically lower OPEX enables you to focus IT on the things that make you more competitive



CREATE CERTAINTY Management • M&O Tools • Knowledge

PREDICTABLY EVOLVE

Lifecycle • Upgrades • Support

CONTINUOUSLY INNOVATE

Building • Maintaining • Expanding

### Don't just deploy a server, transform your infrastructure with VxRail, the fastest growing HCI Appliance worldwide



Faster to deploy<sup>1</sup>

28% 619%

TCO advantage vs. BYO HCl<sup>2</sup>







# Foundation for your IT future



TRANSFORM YOUR ECONOMIC MODEL







BUILD A VALIDATED IAAS

Power next gen apps with Pivotal Cloud Foundry

VMware cloud management

Leverage the best of both

on and off premises with

Buy with no risk

with Cloud Flex

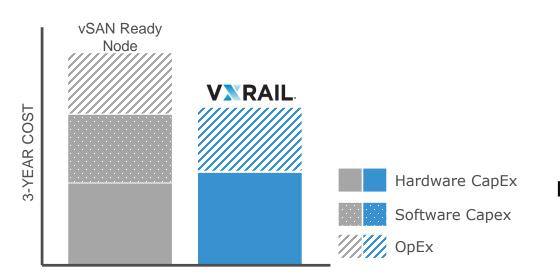


EXPAND DATA PROTECTION  $\bigcup$ 

Protect with Data protection suite for VMware

### VxRail is the foundation for your IT infrastructure transformation ONLY ON VxRAIL

## VxRail delivers measurable lifecycle value



UP TO 28% LOWER TCO

INCLUDED DATA PROTECTION NO SOFTWARE CAPEX EASIER TO SUPPORT

Source: Silverton Consulting, Dell EMC VxRail HCl vs. Build Your Own HCl, June 2017 http://dellemc.com/savings

## VxRail delivers more value

**73%** Faster<sup>1</sup>

Time to value with same day deployment

# 200X

Fewer steps

Automated upgrade and lifecycle process

# \$30-40K

### Included

Data protection software and maintenance

42%

Serviceability costs from integrated end-to-end support

#### DEPLOYMENT TIME

Installation, maintain dev lab version control and production, and test installation

#### EXPANSION/ UPGRADES

Ongoing planning, interoperability testing, implementation and workload movement

#### DATA PROTECTION

Disaster recovery, backup and archiving, including management and support

#### SUPPORT

Support contacts, contract maintenance, and time to resolution during downtime

### Dell EMC HCI on 14<sup>th</sup> Generation PowerEdge

#1 hyper-converged built on the bedrock of the modern data center

#### POWERFUL, PURPOSEFUL, POLISHED



Custom requirements for Dell EMC HCI built into 14<sup>th</sup> Gen PowerEdge

**3**x :

Up to three times More VDI users per node

#1

World's most configurable HCI appliances for maximum flexibility

# **VXRAIL**

### DON'T JUST DEPLOY TRANSFORM YOUR A SERVER INFRASTRUCTURE



#### COMPARISONS BASED ON VXRAIL ON 13<sup>TH</sup> GENERATION POWEREDGE PLATFORMS

POWERFUL ENOUGH FOR ANY WORKLOAD	PURPOSE-BUILT HCI SET TO GO EVERYWHERE	POLISHED APPROACH TO DELIVER HCI BENEFITS
2x Over 2x better response times	>1M Millions more configurations	<b>9x</b> Over 9x more predictable response times
Up to 2x more IOPS 12 of 45 Dell - Internal Use - Confidential	<b>3X</b> 3x more VDI users	<b>Control Substained response</b> times under 1ms <b>DOCLL</b> EMC

# New VxRail hardware

#### Future-proof your environment



#### NVMe Cache Drives

• Future proof with NVMe 800GB and 1.6TB cache drive options for faster caching technology at 2X the caching tier capacity



#### 25GbE Connectivity

- Most aggregate bandwidth of any other vendor's appliance
- 36% more network bandwidth and 25% more onboard throughput



#### High Memory Processors

 Up to 2X more memory (3TB) using new high memory Intel Xeon processor options



#### NVIDIA P40 GPUs

 2x performance in graphics acceleration and 50% more users per board for scaling high performance virtual graphics and compute



#### Flash SATA Drives

- 30% lower cost per drive
- Good option for capacity intensive workloads

### What's new VxRail on Dell EMC 14th Gen servers

E Series systems	V Series systems	P Series systems	S Series systems
•			•
Low profile	VDI optimized	Performance optimized	Storage dense
E560/F	V570/F	P570/F	S570
Higher core counts, faste		nory channels, faster memory and redundant boot devices	higher capacity memory
			mighter oupdoity memory

### VxRail configuration flexibility for your workload E, P, S, V Series based on the latest Dell EMC PowerEdge servers

#### Storage

NVMe Cache Drives: 800GB, 1600GB Cache SSDs: 400GB, 800GB, 1600GB SSDs (SAS & SATA) : 1.92TB, 3.84TB HDDs: 1.2TB, 1.8TB, 2.4TB (10K) 2.0TB 4.0TB (7.2K)

#### **Base networking**

SFP28, SFP+, RJ45

2x 25GbE 4x 10GbE 4x1GBE (auto negotiate)

Optional add-on NICs

#### GPUs

NVIDIA

Note: GPU SW & drivers sold separately

**D&LL**EMC

# E, P, S, V Series based on the latest Dell EMC P

#### Processor

Choice of 38 Intel® Scalable® processors 4 to 56 cores per system

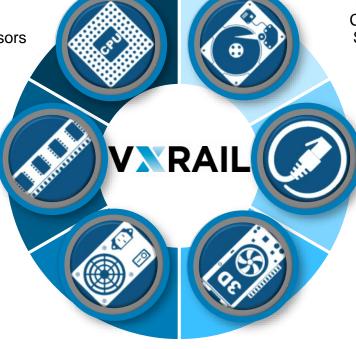
#### RAM

24 DIMM slots

16GB RDIMM 32GB RDIMM 64GB LRDIMM 128GB LRDMIM

#### **Power supply**

1100W	100-240V AC
1600W, 2000W	200-240V AC
1100W	48V DC



### VxRail scale-out rules

### Balance

All systems in a cluster must run same version of VxRail software

914

First 3 cluster systems must be identical

No mixing of hybrid and all-flash systems/appliances

All systems in the cluster must run the same base network speed (25GbE, 10GbE, or 1GbE)

1GbE must be hybrid systems with single processors

Mix and match appliance series in the cluster

Vary number of drives, CPU, memory, and model types

3-64 systems per cluster, but max of 8 if 1GbE only

RPQ required for stretched clusters





### VxRail E560/560F low profile systems





Now supports NVMe cache drives

FORM FACTOR	DRIVE CONFIGURATION
Single system	10x 12G SAS drive slots (2.5")
1U	1 or 2 disk groups with up to 4 capacity drives each
PROCESSORS	MAX CAPACITY
Single or dual socket, Up to 28 cores/CPU	30.7TB SSD or 19.2TB HDD
MEMORY	POWER SUPPLIES
Up to 3,072 GB RAM (1,536 GB per processor)	1100W 100-240V AC, 1100W 48V DC
ADDITIONAL NETWORK OPTIONS Up to 1 per processor 2x10GbE SFP+, 2x10GbE RJ45, 4x10GbE RJ45, 2x25GbE SFP28	BOOT BOSS with 2 x 240GB SATA M.2

## VxRail P570/570F performance optimized systems





Now supports NVMe cache drives

FORM FACTOR	DRIVE CONFIGURATION
Single system	24x 12G SAS drive slots (2.5")
2U	Up to 4 disk groups with up to 5 capacity drives each
PROCESSORS	MAX CAPACITY
Single or dual socket, Up to 28 cores/CPU	76.8 TB SSD or 48 TB HDD
MEMORY	POWER SUPPLIES
Up to 3,072 GB RAM (1,536 GB per processor)	1100W 100-240V AC, 1600W 200-240V AC, 1100W 48V DC
ADDITIONAL NETWORK OPTIONS Up to 3 (single CPU) or 4 (dual CPU) 2x10GbE SFP+, 2x10GbE RJ45, 4x10GbE RJ45, 4x10GbE SFP+, 2x25GbE SFP28	BOOT BOSS with 2 x 240GB SATA M.2

# VxRail V570/570F VDI optimized systems

**GPU** Minimum 1 and up to 3 PCIe GPUs NVIDIA only (M10, M60, or P40)

Note: Customers obtain and configure GPU SW and drivers vGPU requires vSphere Enterprise



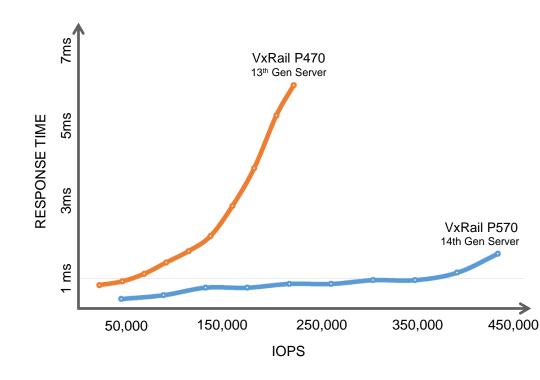
FORM FACTOR	DISK CONFIGURATION
Single system	24x 12G SAS drive slots (2.5")
2U	Up to 4 disk groups with up to 5 capacity drives each
PROCESSORS	MAX CAPACITY
Dual socket, Up to 28 cores/CPU	76.8TB SSD or 48TB HDD
MEMORY	POWER SUPPLIES
Up to 3,072 GB RAM (1,536 GB per processor)	2000W 200-240V AC
ADDITIONAL NETWORK OPTIONS Up to 4 (reduces GPU card slots) 2x10GbE SFP+, 2x10GbE RJ45, 4x10GbE RJ45, 4x10GbE SFP+, 2x25GbE SFP28	BOOT BOSS with 2 x 240GB SATA

### VxRail S570 capacity optimized systems



FORM FACTOR	DISK CONFIGURATION
Single system	12x 3.5" + 2x 2.5" 12G SAS drive slots
2U	1 or 2 disk groups with up to 6 capacity drives each
PROCESSORS	MAX CAPACITY
Single or dual socket, Up to 28 cores/CPU	48TB HDD (hybrid only)
MEMORY	POWER SUPPLIES
Up to 1,536GB RAM (768GB per processor)	1100W 100-240V AC, 1100W 48V DC
ADDITIONAL NETWORK OPTIONS Up to 3 (single CPU and dual CPU) 2x10GbE SFP+, 2x10GbE RJ45, 4x10GbE RJ45, 4x10GbE SFP+, 2x25GbE SFP28	BOOT BOSS with 2 x 240GB SATA M.2

### Transforming performance on VxRail



#### FOR VIRTUALIZED WORKLOADS

Comprehensive data services Hundreds of thousands of IOPS Application acceptable response times

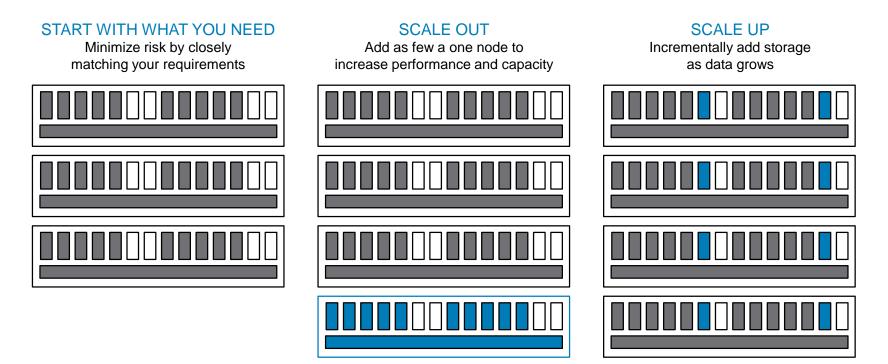
#### FOR MISSION CRITICAL WORKLOADS

Sustained sub-ms predictable response time Millions of IOPS Supporting demanding applications

> OLTP 4K 70/30 R/W workload RAID-5 with Checksum 12 Node cluster

# Single node scaling and upgrades

#### Minimizes risk and enables pay as you grow



### What is inside VxRail?

A full suite of capabilities included at no additional charge



POWERED BY
VMWARE
vSAN

vSAN Enterprise vCenter Server vRealize Log Insight

vSphere Ready\*

### LIFECYCLE MANAGEMENT AND SUPPORT TOOLS

VxRail Manager Secure Remote Support INCLUDED DATA PROTECTION OPTIONS

RecoverPoint for VMs vSphere Replication vSphere Data Protection

\*Compatible with a broad range of customer-supplied vSphere licenses

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### VxRail is powered by VMware vSAN 6.6

The best technology for the leading virtualization ecosystem



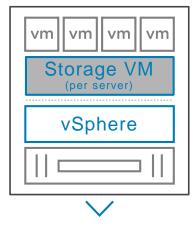


DATA AT REST ENCRYPTION NATIVE HCI ENCRYPTION

ENHANCED STRETCHED CLUSTERS LOCAL AND SITE PROTECTION

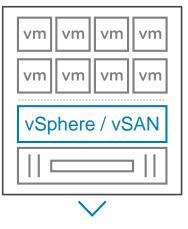
## In-kernel vSAN makes VxRail more efficient

#### TYPICAL HCI



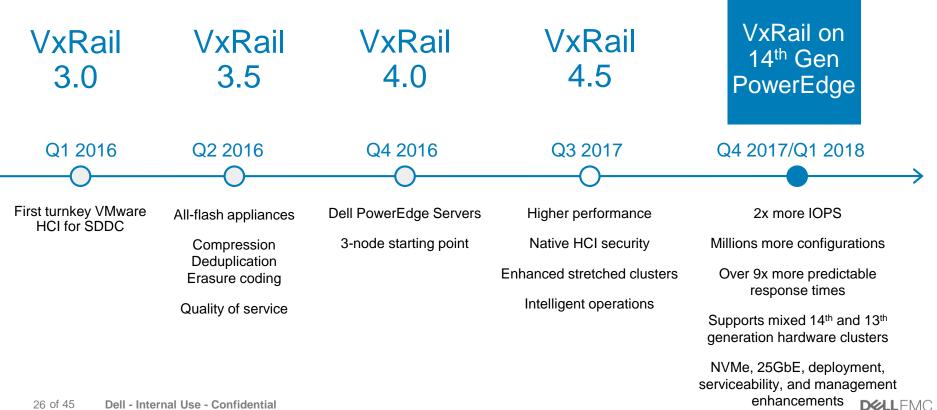
- Storage VM consumes resources
  - ightarrow Data paths are inefficient
- $\otimes$  Management must be bolted on
- S Coarse storage management

#### VxRAIL WITH vSAN



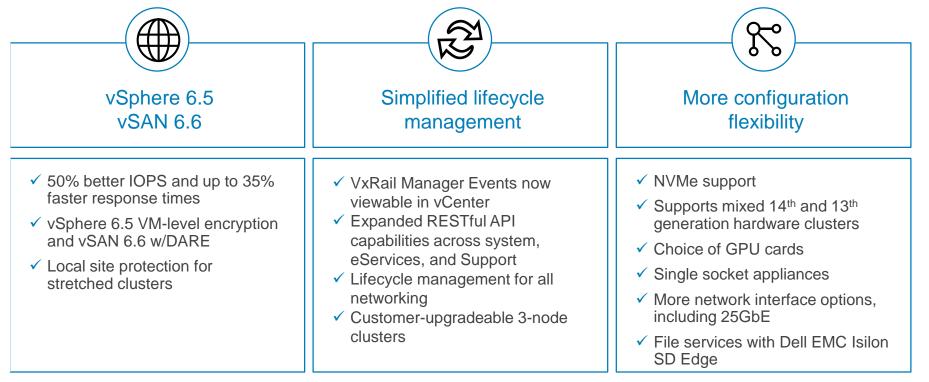
2x CPU and 3x memory efficiency
 Native vMotion and DRS
 Simple, single management pane
 Per-VM management and polices

### VxRail evolution



## VxRail 4.5 the foundation of IT transformation

The best technology for VMware virtualization ecosystems



### Software-defined NAS for the enterprise edge

### **PRODUCT FEATURES**

Full vCenter integration All OneFS Data Services & Protocols Scales to 36 TB

Start Free & Frictionless (non-production, community support)

Provides SMB, NFS, HDFS and OpenStack Swift protocols

### **KEY BENEFITS**

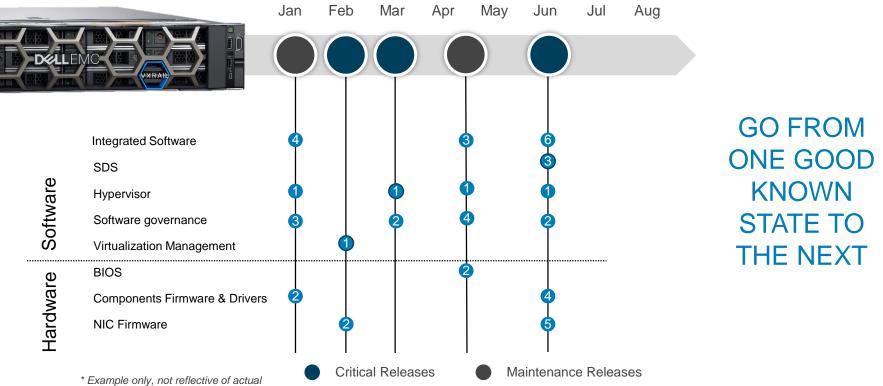
Simple, agile and cost efficient platform Easy to manage with standard VMware tools Consolidate/distribute data from/to remote locations Deploys in minutes



Optional software

# VxRail simplifies lifecycle management

Sustained and delivered as a single software update- no more testing, sequencing, and validating

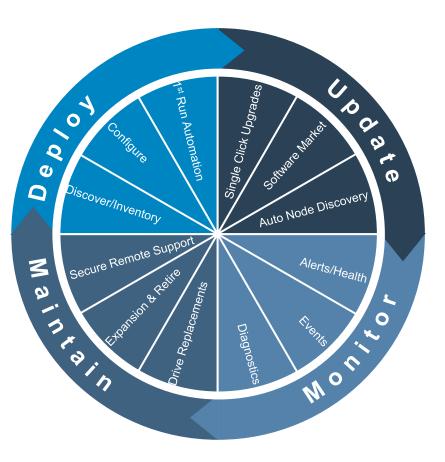


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# **VxRail Manager**

# Delivers automation, lifecycle management, and serviceability

- Deploy appliances with ease over 200 automated tasks
- Update all software in single click
- Monitor using dashboards for health, events, and physical views
- **Maintain** with direct access to support, articles, and community



### Automation speeds deployment

VxRail automates more than 200 configurations tasks and workflows, including those below

INITIALIZING	CONFIGURING
<ul> <li>Configuring password on vCenter Server</li> <li>Configuring private DNS server on vCenter Server</li> <li>Setting up management network on ESXi hosts</li> <li>Configuring time on ESXi hosts</li> <li>Configuring Syslog on ESXi hosts</li> <li>Configuring host name on vCenter Server</li> </ul>	<ul> <li>Registering ESXi hosts with vCenter</li> <li>Creating storage policies on vCenter</li> <li>Setting up host names on ESXi hosts</li> <li>Renaming vCenter Server network on ESXi hosts</li> <li>Setting up NIC bonding on ESXi hosts</li> <li>Setting up vSAN, vMotion, VM networks on ESXi hosts</li> <li>Setting up NIC teaming on ESXi hosts</li> <li>Setting up DNS on ESXi hosts</li> <li>Restarting loudmouth on ESXi hosts</li> </ul>

FINISHING

- Restarting loudmouth
- Accepting vCenter Server EULA
- Creating vCenter Sever database
- Creating appliance architecture in vCenter Server

BUILDING

- Configuring password on ESXi hosts
- Initializing SSO subsystem
- Starting vCenter Server

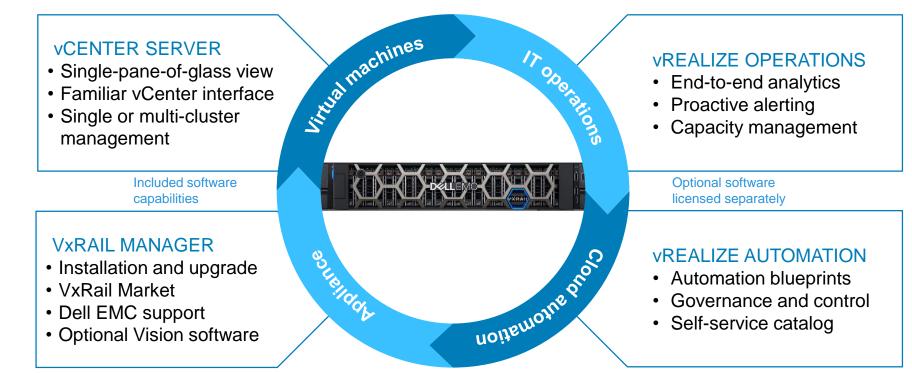
- · Renaming datastore
- Configuring password on ESXi hosts

Setting up clustering for ESXi hosts

Copying file to vSAN datastore

# Easily apply your VMware expertise to VxRail

Leverage your investment in VMware management and orchestration



### **Comprehensive data protection**

Included and extended data protection capabilities

### INCLUDED DATA PROTECTION

#### Active/Active Stretched Clusters

Continuous Availability for DR

#### RecoverPoint for VM

- Any point-in-time recovery
- Starter quantity of licenses included

#### vSphere Replication

• Specific point-in-time recovery (5min)

#### vSphere Data Protection

- 8 TB of deduplicated backup and recovery
- Single-step image recovery

### ENHANCED PROTECTION OPTIONS



#### **DPS for VMware**

- Granular backup and recovery
- Monitoring and real-time analytics
- Metadata or full-content index search

#### Data Domain Virtual Edition

 Simple, flexible, cloud-enabled, software-defined protection storage



- Flexible capacity up to 96 TB
- Includes DD Boost, DD Replicator, DD Encryption

## Flexible consumption options



BYO / VMWARE ELA APPLY EXISTING VMWARE LICENSING TO VxRAIL

CLOUDFLEX PROVIDED BY DELL FINANCIAL SERVICES



#### VCAN VMWARE PROGRAM FOR SERVICE PROVIDERS

- Existing licenses or ELA to be applied to VxRail
- Acquire new licenses from preferred channel

- Cloud like economic model
- No obligation after 12 months
- Price drops over time

- Utility based consumption model
- REQUIRED if using VxRail to deliver hosted/outsourcing services on or off premises

# Cloud Flex for HCI provided by Dell Financial Services\*



### CLOUD-LIKE ECONOMIC MODEL

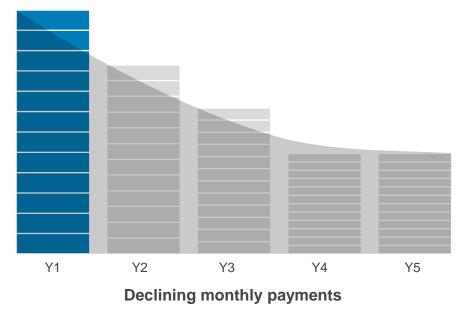
Eliminate acquisition costs and move to a straightforward OPEX<sup>1</sup> cost structure



#### NO OBLIGATION AFTER 12 MONTHS

Customers experience the benefits of HCI without a long term commitment



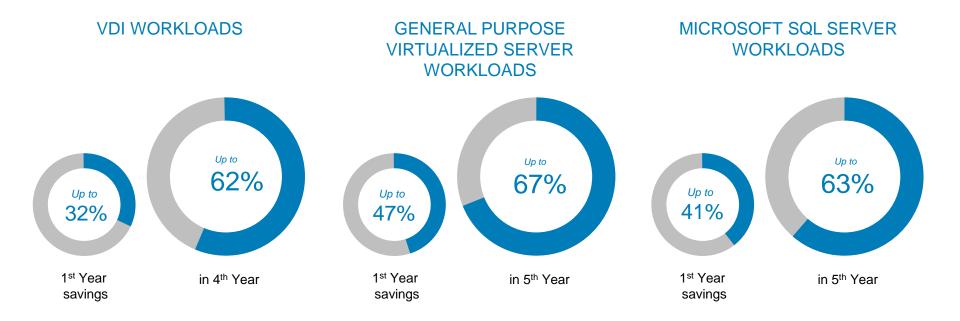


"Payment solutions provided and serviced by Dell Financial Services LL.C. or its affiliate or designee ("DFS") for qualified customers. Offers may not be available or may vary in certain countries. Where available, offers may be changed without notice and are subject to product availability, credit approval, 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. Consult your tax or accounting advisor.

<sup>1</sup> OpEx accounting treatment is at customer's discretion, based on business protocol.

### Cost advantages over Public Cloud\*

**Dell EMC HCI with Cloud Flex** 



\*Internal Dell EMC comparisons to AWS pricing on 4/28/2017. Savings compared to AWS on-demand pricing are even greater.

VDI workloads savings based on comparisons with Amazon Workspaces pricing for 150 VDI instances, assuming AWS pricing drop by 10% per year. General purpose workload savings based on comparisons with AWS pricing for a server virtualization workload (50 VMs). Microsoft SQL server workload savings based on comparisons with AWS pricing for 20 DB VMs. Assumes 10% yearly price drop for AWS costs per year. VxRail sized using VxRail sizing tool.

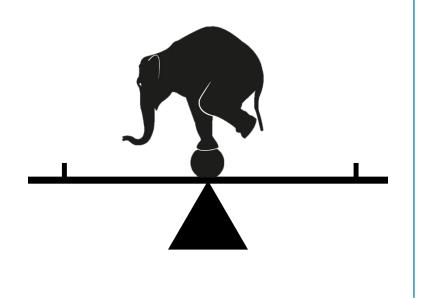


### What workloads are appropriate for HCI?

### TRUE OR FALSE: HCI IS ONLY FOR VDI? FALSE!!



## What doesn't belong in a VxRail?





### EXTREMELY LARGE DATABASES

Creates a compute to storage imbalance that isn't a fit for VxRail



#### LARGE SCALE FILE DEPLOYMENTS

Isilon SD Edge ideal for small scale or edge to core file deployments



#### HPC WITH MASSIVE CALCULATIONS

High compute to storage ratio doesn't match a VxRail profile

# è€

#### TRUE ARCHIVING

Long-term cold storage (i.e. Tape) is not a cost-effective use case for VxRail

# VxRail Appliance services



PRODEPLOY FOR ENTERPRISE

# Expert Installation and Implementation

- ProDeploy: Including predeployment planning, project management and 24x7 onsite installation
- ProDeploy Plus: Additional value including post-deployment assistance and training credits

CROSS PRODUCT

#### Extended VxRail Capabilities

- Implementation for:
  - RecoverPoint for Virtual Machines
  - DPS for VMware
  - Data Domain Virtual Edition
- Residency
- Expansion
- Software upgrade
- Workload/data migration
- Data erasure



#### Comprehensive 24x7 Support

- Single point of support for all VxRail hardware and software
- · Global, trusted
- ProSupport, ProSupport with mission critical option and ProSupport Plus are available

# **ProDeploy for Enterprise**

The most complete deployment offer prepares you for today and tomorrow



### BENEFITS:

- Deployment of mission-critical systems worry-free
- Build the right skills for your staff
- Maintain long-term value of your technology
- Accelerate technology adoption

### EXPERTS

Onsite Dell EMC certified engineers Technology Service Manager engagement

### M INSIGHTS

30-days of post-deployment configuration assistance

Project documentation with knowledge transfer

Training credits for Dell EMC Education Services

### 🧭 EASE

End-to-end guidance Flexible delivery models Minimal disruption to ongoing projects

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### EXPERTS

Onsite Dell EMC certified engineers

Technology Service Manager engagement (via custom support agreement)

### M INSIGHTS

30-days of post-deployment configuration assistance

Project documentation with knowledge transfer

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### 🕑 EASE

End-to-end guidance Flexible delivery models Minimal disruption to ongoing projects

## **ProSupport for Enterprise**

Comprehensive 24x7 support for VxRail Appliances



### BENEFITS:

- Maximize productivity by leveraging Dell EMC scale and skill
- Minimize disruptions with around the clock access to highly trained experts
- Gain efficiency through a single source for all your support needs

### EXPERTS

24x7 support through phone, chat and online

55,000+ Dell EMC & partner professionals

### 🚮 INSIGHTS

SRS proactive monitoring, automated issue detection, notification and case creation

Proactive account management

### 🕑 EASE

165 countries, 55+ languages Automated case creation with notification

Support for up to 5 years

# **ProSupport Plus for Enterprise**

Proactive and predictive support for VxRail Appliances



### BENEFITS:

- Adopt complex technologies with confidence by relying on our experts
- Improve performance and stability with automated proactive and predictive recommendations
- Maximize workload availability with automated support enabled by Secure Remote Services

### EXPERTS

Designated Technology Service Manager

Priority access to senior ProSupport Plus engineers

Collaborative 3rd party support

### M INSIGHTS

Proactive and predictive issue detection Assessments and performance recommendations

Systems maintenance guidance

### 🕑 EASE

Hypervisor, operating environment and OS support

Automated case creation with notification

Support for up to 5 years

### **Dell EMC Consulting Services for VxRail**

Be ready when your VxRail is delivered



Develop a service-focused approach to IT to realize the real business value from the new HCI





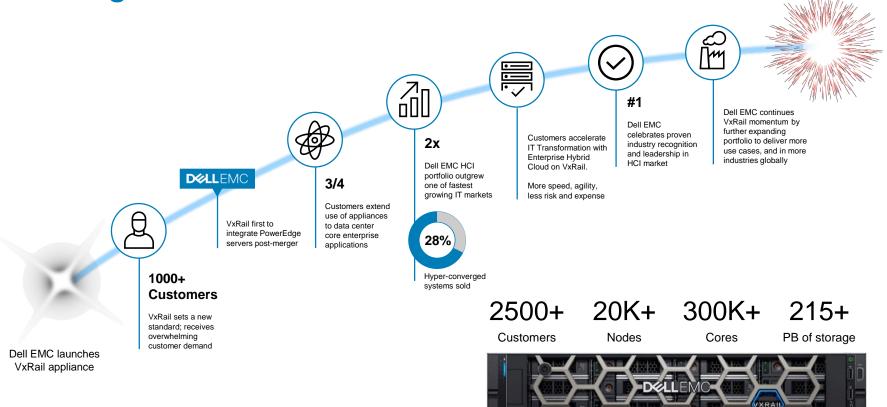
Asses business, application and financial drivers to determine workload candidates



Rapidly migrate the most important workloads to the new HCI

### Accelerate adoption and increase consumption

### Amazing VxRail momentum



**D&LL**EMC

# VxRail, the standard in hyper-converged

Don't just deploy a server, transform your infrastructure

#### POWERFUL AND EFFICIENT

- Up to 2x more IOPS
- Low CPU and memory overhead
- More direct IO path
- Per-VM policies and QoS

#### PURPOSEFUL AND FLEXIBLE

- Millions of configurations for any use case
- Start small & pay as you grow
- Comprehensive data protection
- 3x more VDI users

#### POLISHED AND PROVEN

- Full VMware too and ecosystem integration
- 9x more predictable response times with sustained response times under 1ms
- Dell EMC HCI market leadership



### DESIGNED AS ONE BY DELL EMC | VMWARE

DELEMC