



Capturing Workloads & Building IT Solutions



carahsoft®

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Dell Technologies

Capturing Workloads & Building IT Solutions

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DELLTechnologies

DELLTechnologies

Dell Technologies

- Dell Technologies' Advantage
- Zero Trust
- Dell Technologies' PowerEdge
 - Data Center Compute Workloads
- Dell Technologies' Storage Portfolio
 - PowerMAX, PowerStore, PowerScale & VxRail
- Dell Technologies' Data Protection
- Dell Technologies' Networking
- Dell Technologies' Services
- Technology Acquisition
- Designed for the way you work
 - Building solutions for workloads example
- Agency Use Case
- Test Drives / Next Steps
- Questions & Answers



Dell Technologies

Accelerating IT from Ideas to Innovation

Strategic Partnerships highlighting technology leaders and innovators

-  **DELL**EMC
- Tracewell
- Hugging Face
- RSA
- Thales
- Open Source
- VMware
- Microsoft



Artificial Intelligence
Cloud Native Applications



Modern Data Center
Modernization
Private Cloud



Multicloud
SaaS
FedRamp



Edge
RealTime Analysis
Edge AI

Zero Trust Authentication  Security Audit Logging

DevSecOps
Containers
Agile

AI Ready
Agile
Virtualization

Cloud Portability
Hybrid Cloud

IoT
Telemetry

Zero Trust – Dell Technologies

Dell Technologies can help you achieve Zero Trust

- A security model built on the following:
 - Anything inside or outside the organization is not trusted by default
 - Everything trying to establish a connection must gain / build trust
 - Authentication and authorization must happen before trust can be built
 - and can be repeated to re-affirm trust



- An architectural framework that is:
 - User-centric: Everything starts and centers around the user accessing the service or resource
 - Device Trust: Devices are secured, resilient and compliant
 - Service-oriented: Makes it easier to create and consume reliable services
 - Based on intrinsic security: Every action is scrutinized in the context of its risk



Device Trust

- Secure Supply Chain
- Secured Component Verification
- Silicon Based HW Root of Trust
- Case Intrusion Alerts



User Trust

- SafeID
- Role Based Administration Model



Transport & Session Trust

- Dedicated iDRAC network module
- SSH/TLS Communication Options



Application Trust

- Signed BIOS/FW updates
- Secure Software Development
- Secure UEFI Boot Capabilities



Data Trust

- Data-at-Rest Encryption
- Automatic BIOS Recovery
- Automatic OS Recovery



Trusted Clients



Networking



Servers

Storage



DELL EMC

Virtual Clients **vmware**

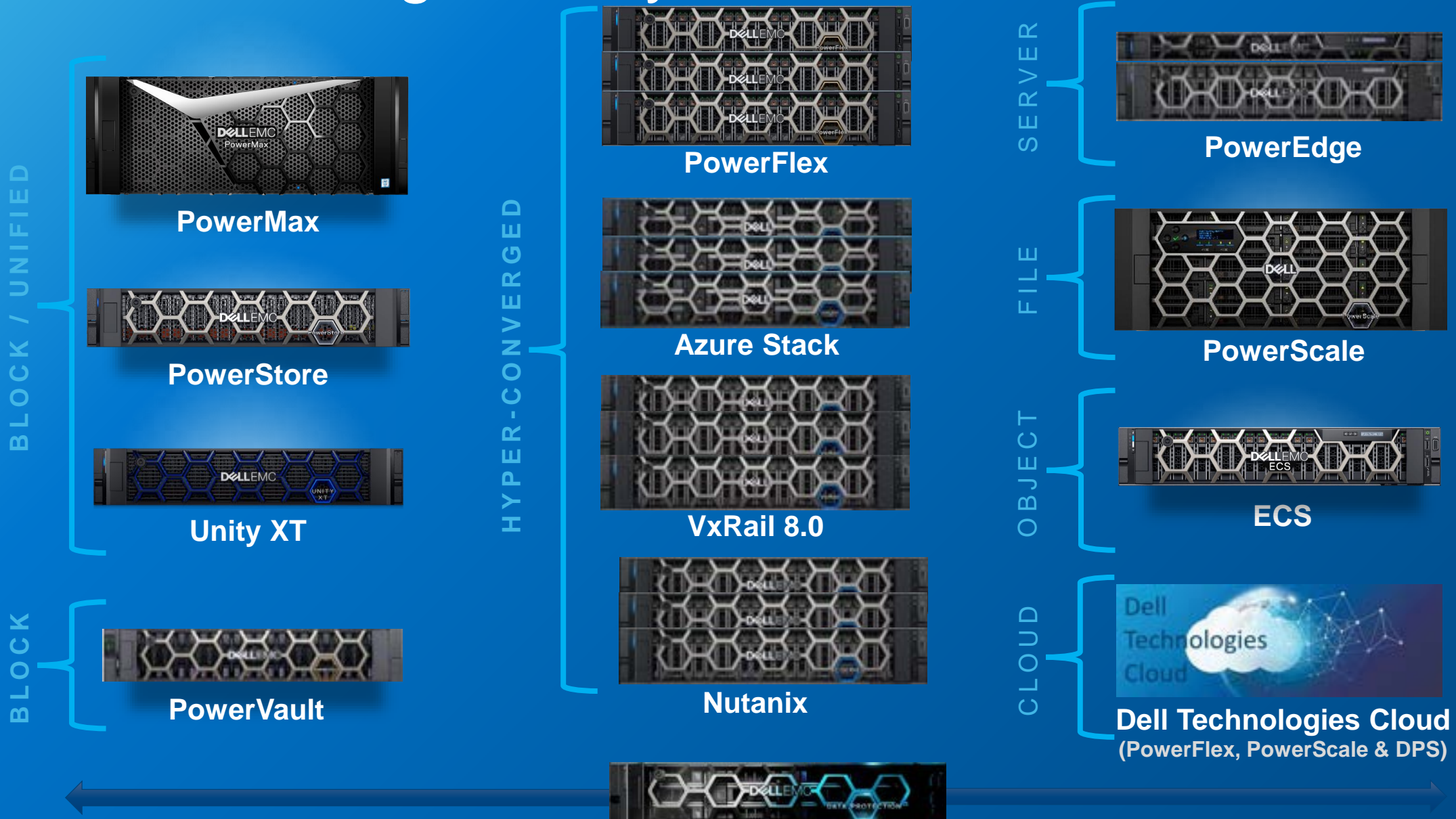
Workspace ONE

Cyber Protection



DELL Technologies

Dell Technologies – Hybrid Data Center Portfolio



PowerEdge Server Portfolio

Purpose-built | Intelligent | Cyber Resilient | Sustainable



Purpose-built

AI, for the Edge and Scale
Anywhere



Intelligent

Accomplish more with
Automation & Improve
Operational Efficiencies



Cyber Resilient

Zero Trust &
Verifiable Confidence



Sustainable

Maximize power
efficient performance

Flexible Consumption available with APEX

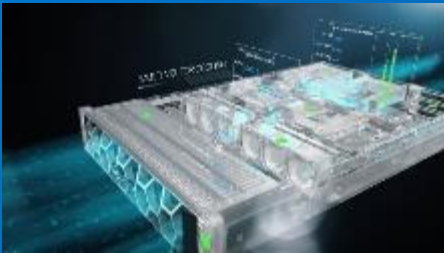
Dell Technologies Engineering and Tech...

Engineered to optimize the latest technology advances for predictable mission outcomes

Design Innovation - Performance Optimized

Dell Multi Vector Cooling

- Advanced thermal design streamlines the airflow pathways within the server, directing the appropriate volume of air to where it is needed inside the chassis



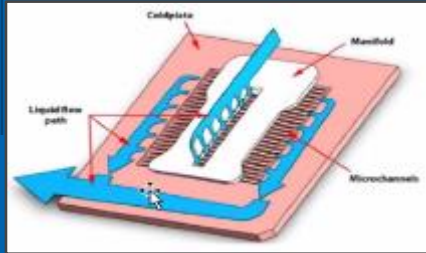
Dell Direct Liquid Cooling

- Extending liquid cooling to more PowerEdge servers, Dell DLC uses the exceptional heat removal capability of liquid to absorb and remove heat



Dell Leak Sense

- If a leak occurs, Dell Leak Sense will log an event in the iDRAC system
- This detection can be configured to take actions, such as raise an alert or power-off a server



Thoughtful Thermal Design

- The Dell Technologies thermal engineering team has tailored new thermal solutions and designs to address dense heat-producing components



Focus on Acceleration

- Support for the most complete stack of GPUs in the PowerEdge portfolio
- Maximum performance for the entire spectrum of HPC, AI-ML/DL training and inferencing, DB analytics and VDI workloads



Workloads mapping – Dell EMC PowerEdge

DELIVERING DIFFERENTIATION



MISSION APPLICATIONS

- R750, R650, MX750c, R6515
- 40% CPU, 33%+ mem Lanes than PrevGen

- High core count to meet SLAs
- Large memory capacity & Memory lanes for In-Memory Databases



DATA ANALYTICS

- R650, R7525, MX750c, R7515
- 40% CPU, 33%+ mem Lanes than PrevGen

- High core count to enable dense user base
- Large memory capacity enabling more VMs
- Massive I/O for scale-out environments



AI/ML/DL

- XE8545, R750xa, R6525
- 7x speed, 33% + mem vs PrevGen 100%+ GPU bandwidth vs PrevGen

- Highly parallelized CPU optimized for GPU acceleration
- Accelerator Support (GPU, FPGA)
- High core count for inference
- Massive I/O for scale-out environments



HPC APPLICATIONS

- R750xa, R6525, C6520, C6525
- 50%+ speed, 60% price/perf vs PrevGen

- High parallelism for complex analysis
- High parallelism for real time data streams
- Scale Out support



DATA ANALYTICS

- XE8545, R750xs, R6525
- 40%+ CPU speed, 60% price/perf vs PrevGen

- Highly parallelized CPU optimized for GPU
- High Capacity Storage
- Accelerator support



CONTAINERS & VDI

- R750xs, R650xs, R6525, R7525, C652x
- 50%+ speed, 60% price/perf vs PrevGen

- Highly parallelized CPU optimized for vGPU
- Full memory encryption helping improve data security
- All flash support

Dell EMC PowerMax

- The definition of TIER 0 data center storage

POWERFUL

Architecture



Scalability

Multi-controller
Architecture



Performance

End to End NVMe
Storage Class Memory



Resiliency

Component level
fault isolation

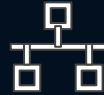


Efficiency

Inline, Global
Dedupe and
Compression –
No Compromise

SIMPLE

Operation



Connectivity

Block, File,
Mainframe, IBM i

CloudIQ

Cloud-based
monitoring and
analytics

**FUTURE
PROOF**
LOYALTY
PROGRAM



Automation

TRUSTED

Innovation



Intelligence

Machine Learning



Availability

Over 6-9s



Protection

Gold Standard
in Replication



Security

D@RE, etc.



Dell EMC Unity XT

NVMe
Ready

CloudIQ

FUTURE-PROOF
STORAGE LOYALTY PROGRAM



Dell EMC Unity XT 380/380F, 480/480F, 680/680F, 880/880F

Designed for **PERFORMANCE**

Optimized for **EFFICIENCY**

Built for **MULTI-CLOUD**

No Compromise Midrange Storage

Performance

- Up to 2X more performance
- NVMe-ready

Efficiency

- Up to 5:1 data reduction
- 85% system efficiency

Multi-Cloud

- Dell Technologies Cloud Platform
- Cloud Data Services
- Cloud Connected Systems
- Cloud Data Insights

Dell Technologies

PowerStore – Revolutionary Storage

Data-centric

Intelligent

Adaptable



Designed for the Data Era



Any Workload

Physical and virtual Apps and DBs, Containers and File



Performance Optimized

Scale up and scale out with end-to-end NVMe*



Efficiency Without Compromise

Always-on inline data reduction



Programmable Infrastructure

Streamlines development and automates workflows



Autonomous Appliance

Built-in automation and ML optimizes system resources



Flexible Architecture

Enables speed and application mobility



Flexible Deployment

Modernize the core, edge, and cloud without disruption

Dell EMC PowerScale – Unstructured Data

Unlock the potential within your data

STORAGE



DataIQ

CloudIQ



Intelligent Insights

CloudIQ: Infrastructure insights

DataIQ: Data insights



Any Data, Anywhere

True multiprotocol access

Edge to cloud deployment



EDGE DATA CENTER - - - - - CORE - - - - - CLOUD



Simplicity at Scale

Simple non-disruptive scaling of efficiency, bandwidth and capacity

OneFS

VxRail

VMware



Automate

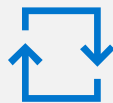
Innovate

Accelerate



Remove complexity

with automated operations via unique VxRail HCI System Software



Simplify operations

through native integration with vCenter and VMware Cloud Foundation



Optimize infrastructure

with consistent ease of use while lowering exposure with full stack lifecycle management



Harness hybrid cloud

with simple and direct path due to unique integration with VMware Cloud Foundation



Empower developers

with lock-step support for VMware Kubernetes advancements – K8s your way



Evolve workloads

with thousands of configuration options and support for mixed generation nodes



Drive productivity

with 6x9s and 92% less unplanned downtime to focus on differentiated IT activities



Surge ahead

by rapidly integrating new VMware updates with 30-day synchronous releases

Simplify IT operations with a common operational model

DELLTechnologies

Physical
RedHat/KVM
VMware
Hyper-V

PowerFlex

Unbounded Software-defined infrastructure

COMPUTE &
STORAGE



MODERNIZE WITHOUT LIMITS

AUTOMATE FOR AGILITY

OPTIMIZE YOUR WORKLOADS



Consolidation



PowerFlex Manager



Performance



Unified file and block
services



Rich toolset



Scale



Multi-cloud



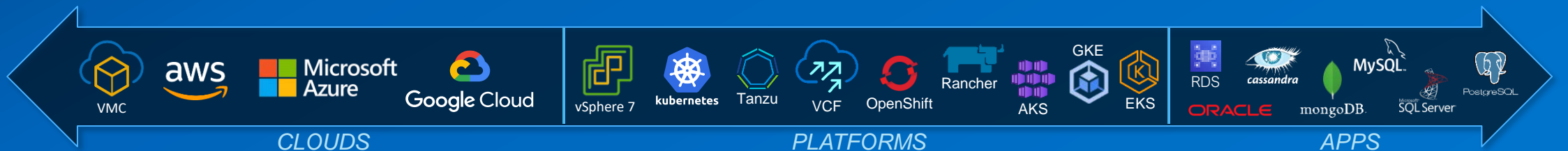
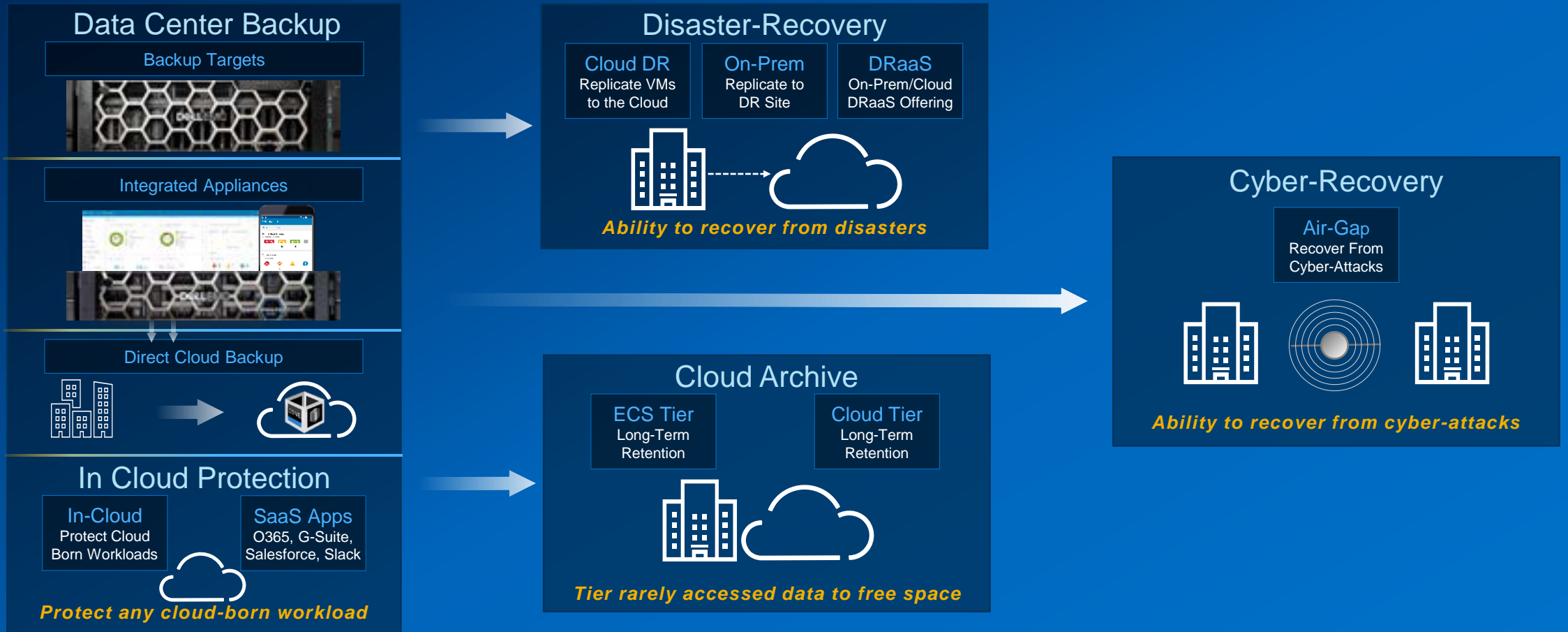
CloudIQ



Resilience

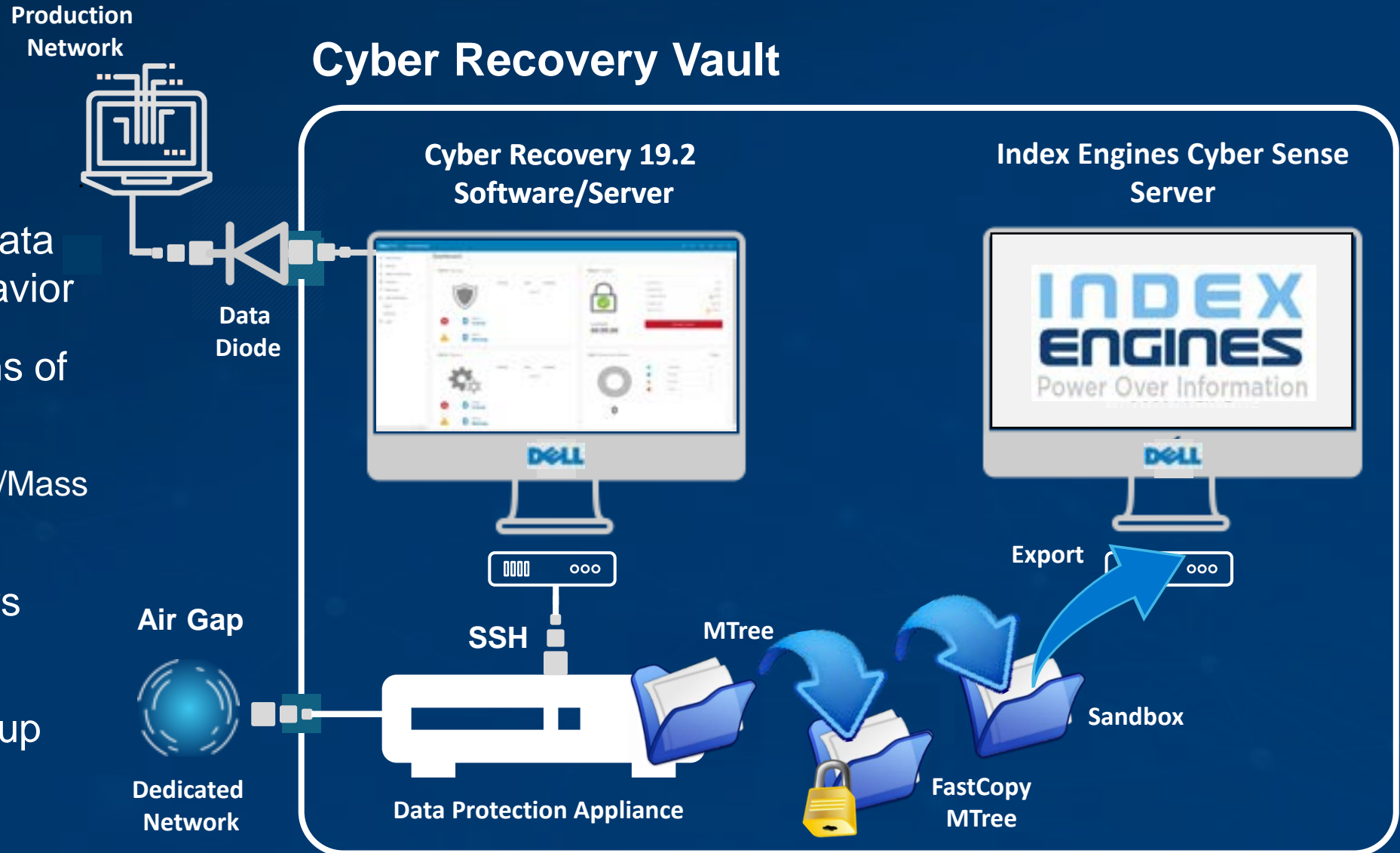
Dell Technologies Data Protection Solutions

Comprehensive portfolio built to protect proven & modern workloads



Cyber Recovery Vault and Cyber Sense

- Integrated with Cyber Recovery
- Looks for changes in data not typical of user behavior
- Analytics looks for signs of cyber attack:
 - Corruption/Encryption/Mass Deletion
- Full content analytics vs metadata only
- Support common backup software:



Dell Technologies Networking vision & portfolio

- Dell Technologies' vision for the network is called Open Networking.
 - It is based on a disaggregated model offering an open ecosystem in which organizations can pick and choose from a wide range of innovative, industry-standard network applications, operating systems, and hardware platforms.
 - This approach gives customers maximum choice and control over the technologies they select and the architectures they adopt, resulting in measurable cost-savings and increases in service agility.
- We believe that our Open Networking approach and solutions stimulate rapid innovation by helping our customers achieve unprecedented levels of flexibility and efficiency. These solutions also help minimize the time and effort required to design, provision and manage networks; enable IT managers to leverage open-source tools; and provide expertise to help reduce costly engineering overhead

Fabric/Spine Interconnects



Z-series

Top-of-Rack/Leaf Interconnects



S-series

Next-Generation Access



Virtual Edge Platform

Wireless Networking



Ruckus

Dell Technologies Services

Driving the rapid adoption and optimization of your digital technologies



System Services

Achieve ROI with hardware and software services

i.e. ProDeploy+, Keep you component, Asset Tagging, Config Services, Asset Tagging, ...



Deployment Services

Accelerate technology adoption with deployment designed for you

i.e. Configuration Services, Rack Integration, Dell & EMC ProDeploy or Custom Enterprise Deployment, Managed Client Deployment, Residency Staff Aug, Asset Resale & Recycling, VMWare, Microsoft



Support Services

Maximize productivity with expert support backed by proactive, predictive technology

i.e. ProSupport Warranty Suite, Dell & EMC Warranty Renewals/Prepaid Maintenance.



Managed Services

Transform the IT experience with advanced technologies and global expertise

i.e. Infrastructure or Client Managed Services to Modernize, Automate and Transform customer environment.



Education Services

Develop and retain valuable IT talent through continuous learning

i.e. Dell, EMC, VMWare, Microsoft or 3rd Party Training via Classroom, Virtual Class, On Demand or Custom



Consulting Services

Achieve business outcomes with strategic guidance and expert execution

i.e. As-Is / To-Be Custom Consulting for IT, Digital or Workforce Transformation; Accelerator Workshop

**BOOST
TIME-TO-VALUE**

**ACCELERATE
DEPLOYMENTS**

**EXPEDITE
COST SAVINGS**

**MITIGATE
BUSINESS RISK**

APEX Flex on Demand – Operational Cloud Consumption (FOD) for VxRail vs. Cash Purchase

Actual usage & commitment level determine customer total cost

Example: Cash price = \$1.7M

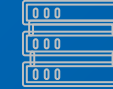
	Least Expensive	FOD Cost = Purchase
Capacity Commitment	50 – 80%	50 - 80%
Average Total Usage*	70%	100%
FoD TCO	\$1.30M	\$1.70M
	19% less than purchase	FoD \$ @ NPV = Cash

- FOD is **least expensive 100%** of the time in modeling on-premise cloud like performance
- FOD should **never** be more expensive than Cash Purchase
- The higher the capacity commitment, the lower the FOD \$ GiB/month with 85% invoice cap

**Term commitment is 48 months in all of the scenarios above

Workloads mapping – Dell EMC Storage & Solutions

DELIVERING DIFFERENTIATION



MISSION APPLICATIONS

- High Performance servers
- High Performance & Capacity block storage

▪ R750, R650, MX750c, R6515

- VxRail / VxRack / VCF (built on PowerEdge)
- PowerFlex
- PowerStore

- Networking Solutions
- Data Protection Solutions
- Solution Services
- Solution Acquisition

DATA ANALYTICS

- High Parallelism servers
- Unstructured data with “data lake” capable unstructured storage

▪ R650, R7525, MX750c, R7515, XE8545

- PowerScale

- Networking Solutions
- Data Protection Solutions
- Solution Services
- Solution Acquisition

AI/ML/DL

- Highly parallelized CPU optimized for GPU
- Ultra high performance unstructured storage

▪ Massive I/O
▪ XE8545, R750xa, R6525

- PowerScale (all-flash)
- ECS

- 10GbE/25GbE/100GbE @ Core/Top of Rack/Edge
- Data Center/Cloud/Edge/Devices & SaaS
- Rack-n-Stack/Build/Integrate/Migrate
- CapEx/OpEx – Buy/Build/Subscribe

HPC APPLICATIONS

- High parallelism for real time data streams
- Multi-node based unstructured storage

▪ R750xa, R6525, C6520, C6525

- PowerScale (many nodes)
- High Parallelism servers

- 10GbE/25GbE/100GbE @ Core/Top of Rack/Edge
- Data Center/Cloud/Edge/Devices & SaaS
- Rack-n-Stack/Build/Integrate/Migrate
- CapEx/OpEx – Buy/Build/Subscribe

CONTAINERS & VDI

- Highly parallelized CPU optimized for vGPU
- All flash storage with container and unstructured data support

▪ R750xs, R650xs, R6525, R7525, C652x

- VxRail / PowerFlex (built on PowerEdge)
- PowerStore
- ECS

- 10GbE/25GbE/100GbE @ Core/Top of Rack/Edge
- Data Center/Cloud/Edge/Devices & SaaS
- Rack-n-Stack/Build/Integrate/Migrate
- CapEx/OpEx – Buy/Build/Subscribe

MAINFRAME

- Mission Critical
- High Volume Data Processing

▪ IBM zSeries, iSeries

- PowerMAX
- Disk Library for Mainframe

- 10GbE/25GbE/100GbE @ Core/Top of Rack/Edge
- Data Center/Cloud/Edge/Devices & SaaS
- Rack-n-Stack/Build/Integrate/Migrate
- CapEx/OpEx – Buy/Build/Subscribe



Mission Applications – Virtualized & Physical

The experienced choice for missions with a physical and virtual environment

Solution – Traditional Server + Storage

- Mainstream PowerEdge Server Platform (for example the R750,R7525,R650,R6525)
 - Flexibly Design & Scale
 - Optimal performance across the core, cloud and edge with highly flexible, purpose-built solutions
 - Automate & Empower
 - Automation and consistency across physical and virtual environments with simplified lifecycle management
 - Secure
 - Protection from chip to firmware to VM to legacy & cloud-native apps
- Enterprise Storage (PowerScale)
 - Built for leading edge performance and capabilities
 - next-gen applications – modern analytics, containers, Data Lakes, NoSQL database tools and AI/ML,. Dell EMC PowerScale is built to address these next-gen unstructured storage heavy requirements and provide the highest level of performance needed
- Cyber Resiliency & Cyber Vault
 - Class leader in Backup and Recovery
 - Mission Protection and Continuance
 - External & Internal Threat Protection with the ONLY Cyber Vault
- Dell Networking
 - 25GbE/100GbE (to core) performance
- Support Services and Acquisition options



Mission Applications - Virtualized

A perfect choice for missions, taking full advantage of virtualization and cloud native design

Solution – Hyper Converged – PowerFlex based

- PowerFlex Platform / Dell Technologies & OpenSource on PowerEdge
 - Exceptional productivity
 - Unlock performance with built-in automation that integrates the latest hardware and software while maintaining infrastructure integrity.
 - 44% faster deployment of new VMs
 - 92% less unplanned downtime for IT teams / Continuously Validated States
 - Single point of support for all hardware and software
 - Exceptional results
 - Pave the way for a budgeted IT transformation with efficiency improvements, incredible TCO and payback measured in months.
 - Exceptional 5-year ROI
 - lower TCO over a 5-year period
 - lower operating costs
 - increase in team efficiency
 - Cyber Resiliency & Cyber Vault
 - Class leader in Backup and Recovery
 - Mission Protection and Continuance
 - External & Internal Threat Protection with the ONLY Cyber Vault
- Dell Networking
 - 25GbE/100GbE (to core) performance
- Support Services and Acquisition options



Dell Technologies Recent Solution

DOE – Digital Library



AI/ML/DL

- Highly parallelized compute
high performance unstructured storage
- XE8545, R750xa, R6525
- PowerScale (all-flash)
- ECS



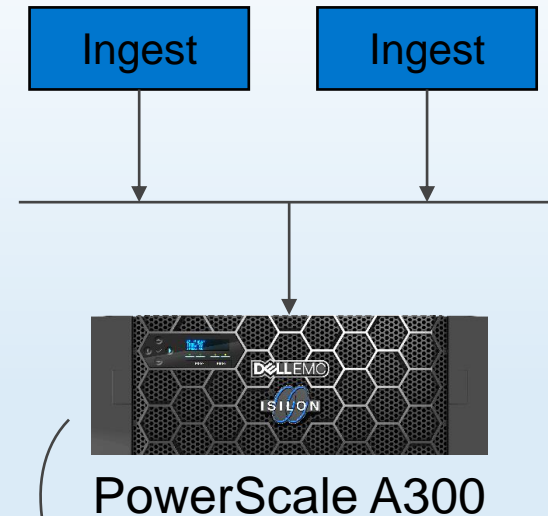
**PowerScale
& ECS**


About the Digital Library

Over nine digitization labs

- Motion Picture
- Video Tape
- Audio Tape
- Microfilm
- Microfiche
- Rocky Flats
- Paper

- Specialized Indexing



Artificial Intelligence 

Public Hyper-Scalars

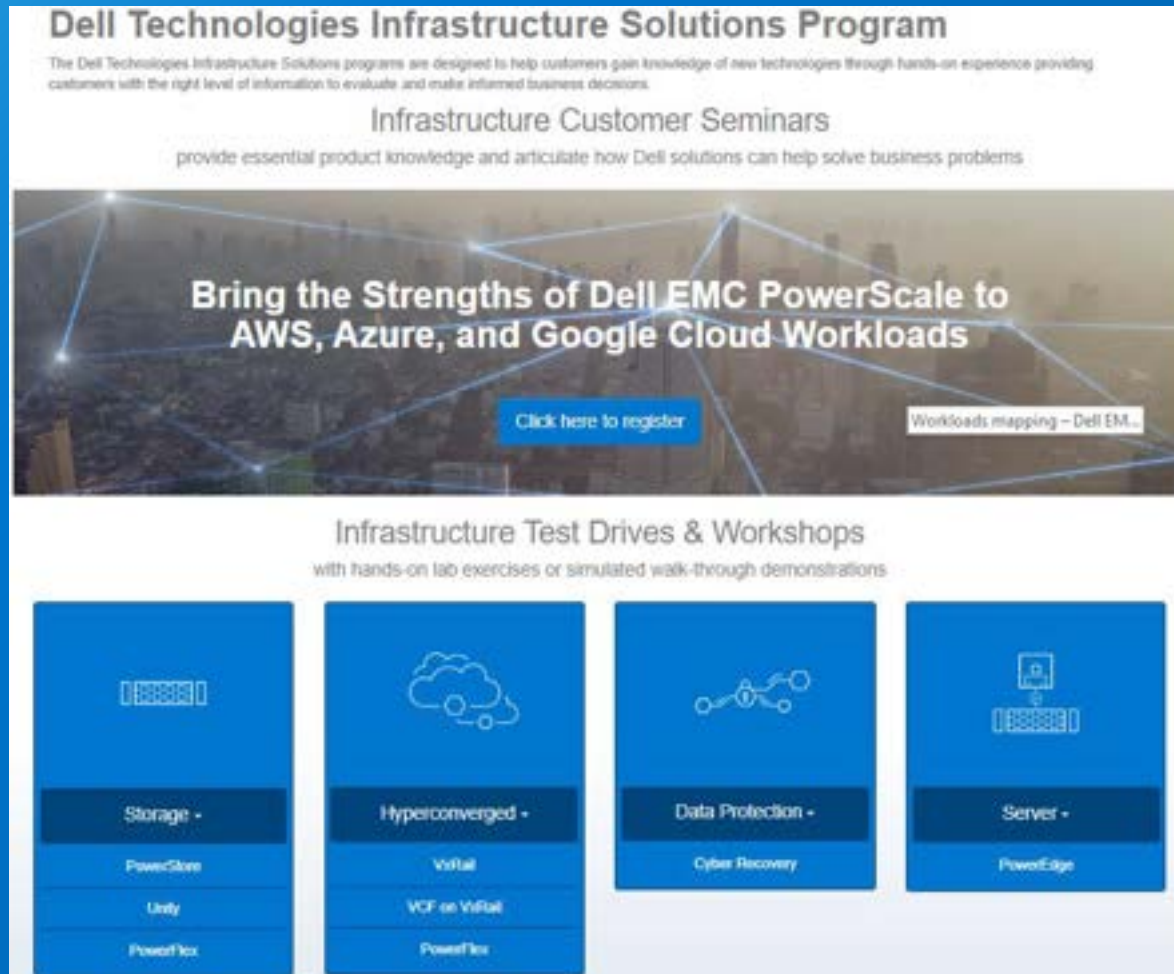
DELL Technologies

* This drawing does not necessarily represent all of the connections or equipment required for a complete solution. It is provided as a high-level overview

Next Steps – Dell Technologies – Test Drives

The Dell Technologies Infrastructure Solutions Program is designed to help customers gain knowledge of new technologies through hands-on experience. Our Unique program provides customers with the right level of information to evaluate and make informed mission decisions.

https://app.firefly.cloud/Dell-EMC_test_drive/



Dell Technologies Infrastructure Solutions Program

The Dell Technologies Infrastructure Solutions programs are designed to help customers gain knowledge of new technologies through hands-on experience providing customers with the right level of information to evaluate and make informed business decisions.

Infrastructure Customer Seminars

provide essential product knowledge and articulate how Dell solutions can help solve business problems

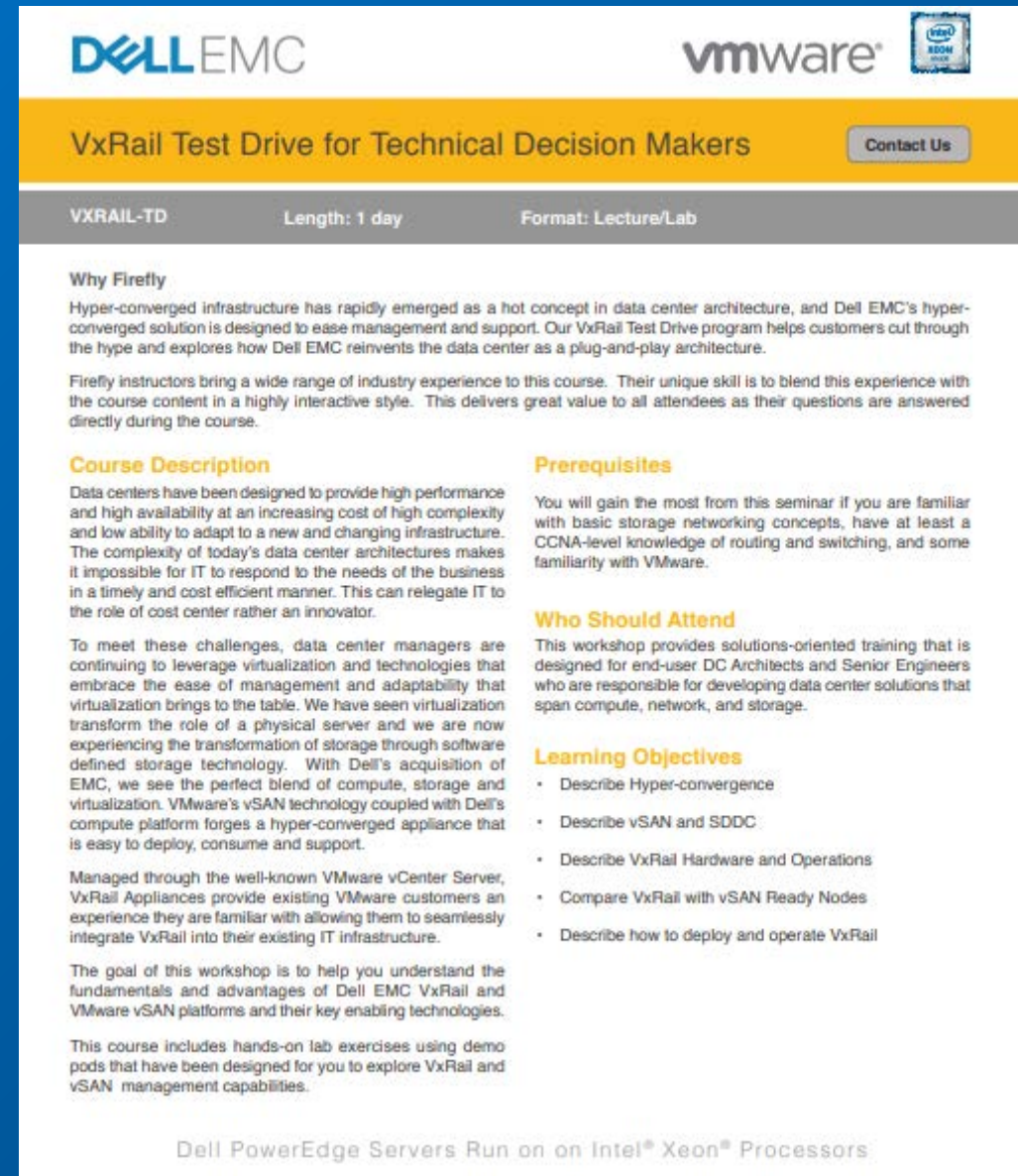
Bring the Strengths of Dell EMC PowerScale to AWS, Azure, and Google Cloud Workloads

[Click here to register](#) [Workloads mapping - Dell EMC](#)

Infrastructure Test Drives & Workshops

with hands-on lab exercises or simulated walk-through demonstrations

- Storage -**
 - PowerStore
 - Unity
 - PowerFlex
- Hyperconverged -**
 - VxRail
 - VCF on VxRail
 - PowerFlex
- Data Protection -**
 - Cyber Recovery
- Server -**
 - PowerEdge



VxRail Test Drive for Technical Decision Makers

[Contact Us](#)

VXRAIL-TD Length: 1 day Format: Lecture/Lab

Why Firefly

Hyper-converged infrastructure has rapidly emerged as a hot concept in data center architecture, and Dell EMC's hyper-converged solution is designed to ease management and support. Our VxRail Test Drive program helps customers cut through the hype and explores how Dell EMC reinvents the data center as a plug-and-play architecture.

Firefly instructors bring a wide range of industry experience to this course. Their unique skill is to blend this experience with the course content in a highly interactive style. This delivers great value to all attendees as their questions are answered directly during the course.

Course Description

Data centers have been designed to provide high performance and high availability at an increasing cost of high complexity and low ability to adapt to a new and changing infrastructure. The complexity of today's data center architectures makes it impossible for IT to respond to the needs of the business in a timely and cost efficient manner. This can relegate IT to the role of cost center rather than an innovator.

To meet these challenges, data center managers are continuing to leverage virtualization and technologies that embrace the ease of management and adaptability that virtualization brings to the table. We have seen virtualization transform the role of a physical server and we are now experiencing the transformation of storage through software defined storage technology. With Dell's acquisition of EMC, we see the perfect blend of compute, storage and virtualization. VMware's vSAN technology coupled with Dell's compute platform forges a hyper-converged appliance that is easy to deploy, consume and support.

Managed through the well-known VMware vCenter Server, VxRail Appliances provide existing VMware customers an experience they are familiar with allowing them to seamlessly integrate VxRail into their existing IT infrastructure.

The goal of this workshop is to help you understand the fundamentals and advantages of Dell EMC VxRail and VMware vSAN platforms and their key enabling technologies.

This course includes hands-on lab exercises using demo pods that have been designed for you to explore VxRail and vSAN management capabilities.

Prerequisites

You will gain the most from this seminar if you are familiar with basic storage networking concepts, have at least a CCNA-level knowledge of routing and switching, and some familiarity with VMware.

Who Should Attend

This workshop provides solutions-oriented training that is designed for end-user DC Architects and Senior Engineers who are responsible for developing data center solutions that span compute, network, and storage.

Learning Objectives

- Describe Hyper-convergence
- Describe vSAN and SDDC
- Describe VxRail Hardware and Operations
- Compare VxRail with vSAN Ready Nodes
- Describe how to deploy and operate VxRail

Dell PowerEdge Servers Run on on Intel® Xeon® Processors

Next Steps and Q & A

Architect your solution for your workload needs

- Storage Type
- Performance
- Capacity
- Efficiency
- Acquisition

Next Steps

- Schedule a Follow-up
- Schedule a Test Drive
- Contact Carahsoft
- Contact your Dell team



Thank you for viewing this Dell Technologies presentation! Carahsoft is the distributor for Dell Technologies public sector solutions available via GSA, ITES-SW, MHEC, and other contract vehicles.

To learn how to take the next step toward acquiring Dell Technologies' solutions, please check out the following resources and information:



For additional resources:
carah.io/DellResources



For additional Dell Technologies solutions:
carah.io/DellSolutions



To purchase, check out the contract vehicles available for procurement:
carah.io/DellContracts



For upcoming events:
carah.io/DellEvents



For additional public sector solutions:
carah.io/DellSolutions



To set up a meeting:
Dellgroup@carahsoft.com or 866-Dell-2-Go