LET THE TRANSFORMATION BEGIN
DELL EMC
Cloud Solutions

Umair Riaz
Advisory vSpecialist
Hybrid cloud accelerates digital business

IT costs reduced by an average of 24% cost savings

Of savings realized by hybrid cloud are being reallocated to new initiatives 40%

Heavy hybrid cloud adopters are 3x more likely than non-adopters to be approaching digital business goals 29% for those with significant number of workloads on hybrid cloud.

IDG global survey, sponsored by EMC, of 905 IT executives in September 2015
Cloud Models

Private Cloud
On Premise

Public Cloud
Off Premise

Hybrid Cloud
Dell EMC Solution Taxonomy
Converged Offer Continuum – Accelerating the journey from build to buy for all

Reduce Risk, Accelerate Time To Value, Deliver Lifecycle Assurance

**BUILD**
- **Basic assurance these components will work together, sizing guidance and some tips and tricks to build it myself.**
- **Build it myself but not from scratch. Make it easy to buy things together to simplify deployment.**
- **Pre-built, validated system that has flexibility in components and technology to significantly speed deployments and simplify operations.**
- **Full turnkey system that reduces IT risk and TCO while improving time to market so I can focus more on business innovation and less on ongoing IT operations.**

**BUNDLE**
- **Ref Architectures**
  - Prescriptive architecture design (e.g. recipe) built on a selective hardware and software to simplify customer deployment

**VALUES**
- **Build**
- **Want**
- **Offer**

**WANTS**
- **Build it myself but not from scratch. Make it easy to buy things together to simplify deployment.**
- **Pre-built, validated system that has flexibility in components and technology to significantly speed deployments and simplify operations.**
- **Full turnkey system that reduces IT risk and TCO while improving time to market so I can focus more on business innovation and less on ongoing IT operations.**

**BUNDLES**
- **Validated Systems**
  - An integrated system pre-validated and supported that is highly customizable and simple to order. Customers own lifecycle management themselves.

**OFFERS**
- **Validated Systems**
- **Engineered Systems**
- **Hybrid Cloud Platforms**

**Validated Systems**
- **Engineered Systems**
- **Hybrid Cloud Platforms**

**Hybrid Cloud Platforms**
- An engineered, turnkey hybrid cloud software stack built on engineered systems. Dell EMC owns the lifecycle assurance for the full stack and offers access points to public cloud.

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7/12/16 For Discussion Purposes – Offers based on Latest R&D Workstream Facts and Alternatives - "Q3 RTS" on Q4RTS
The 3\textsuperscript{rd} Platform Era

Tens of Thousands of Apps
Client / Server

Millions of Apps
Mobile  Cloud  Big Data  Social

Platform 2

Platform 3

SAP
Microsoft Office
IBM  DB2  ORACLE

NETFLIX  foursquare
Twitter  Dropbox  Facebook
OUR CLOUD STRATEGY

Cloud

On Premise

Platform 2

System of Record

Platform 3

System of Engagement
Enterprise Hybrid Cloud
Enterprise Hybrid Cloud

What Values Does EMC Bring To The Solution?
What is an engineered solution?

Products
- VMAX
- VNX
- Isilon
- VPLEX & RP
- Data Domain
- Avamar
- vRA
- vR Ops
- Log Insight
- vRA Business

Engineering

Outcome
Cloud Services

- Provision Standalone Windows
- Provision Linux
- Storage as a Service
- Backup as a Service
- DR as a Service
- Cont. Availability as a Service
- Dynamic Network Provisioning
- SQL as a Service
- Sharepoint as a Service
- Oracle as a Service
- Encryption as a Service
- Oracle RAC as a Service
- Platform as a Service
- Public Cloud Integration
EHC workflows – out of the box, DR & CA *

- Storage Provisioning Services
- Maintenance Workflows
- Virtual Machine Lifecycle
- Data Protection Backup *
- Data Protection Reporting *
- Data Protection Disaster Recovery *
Enterprise Hybrid Cloud

What Values Does EMC Bring To The Solution?

- **ENGINEERED SOLUTION**: Designed, tested, and proven hardware and software integration
- **SIMPLIFIED SUPPORT**: One-call support model across all solution components
Single contact support

Cross-trained Dell EMC and VMware resources
Enterprise Hybrid Cloud

What Values Does EMC Bring To The Solution?

ENGINEERED SOLUTION
Designed, tested, and proven hardware and software integration

SIMPLIFIED SUPPORT
One-call support model across all solution components

SUSTAINABLE MODEL
Addresses product updates and provides guidance for ongoing maintenance

SIMPLE
SECURE
Evolution of the solution
Growing solution capabilities over time

**Extending from Private to Hybrid**
Supporting hybrid cloud deployment model with the possibility to leverage VMware vCloud Air, Dell EMC-certified public cloud providers and commodity public cloud IaaS offerings

**Disaster Recovery & Continuous Availability**
Give the Customers a broader choice of data protection and availability options by integrating Dell EMC RecoverPoint, VMware Site Recovery Manager and Dell EMC VPLEX as engineered, modular add-on options

**Enterprise Workloads**
Introducing support for a broad range of enterprise workloads (MS Apps, SAP, Oracle DB) as the modular add-ons

**Cost-efficient & more flexible management infrastructure**
Support for collapsed management

**Data Protection improvements**
Smarter & more scalable data protection, full support of active-active dual-site scenarios, incl. bi-directional data replication with site-affinity rules

**Security**
Network micro-segmentation support with VMware NSX

**Operational enhancements**
Solution extensibility with the ecosystem of external tools, such as Puppet Enterprise, ServiceNow CMDB, InfoBlox IPAM, Palo Alto Networks firewalls

**Infrastructure Choices**
More converged infrastructure choices – VxBlock, VxRack, VxRail as an edge endpoint

**Data Protection improvements**
Granular VM protection with RecoverPoint for VMs

**Multi-site support**
Improve efficiency through single portal managing resources at multiple sites Support for up to 4 EHC sites, 5 if one of them is CA enabled
EHC 4.0 ("Abrams") - What's New

At-a-glance

- Multi-vCenter support
- Remote / Multi-site support
- VM-level Disaster Recovery
- EHC Hardware Island Architecture
- EHC Object Model
- Improved Data Protection Services
- Extended Catalog Services for EHC Operations
- EHC Encryption Services update

- Converged Infrastructure updates
- VMware virtualized platform updates
- Dell EMC Software Defined Storage platform updates
- Dell EMC Data Protection platform updates
- Single EHC Sizing Tool

NEW!
Enterprise Hybrid Cloud 4.1 (“Badger”) Overview

- Minor release:
  - Main goal: accelerate adoption of vRealize Automation 7.x
  - **New deployments (greenfield) only**
  - Engineered features **equivalent to 4.0 (“Abrams”)**
  - Layered Apps not available

- New, exciting “built-in” features from:
  - vRealize Automation 7.1
  - vRealize Business for Cloud Advanced!
  - Improved multi-site support
Enterprise Hybrid Cloud

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**SIMPLIFIED PACKAGING**
VCE Foundations sizing guidance
Hardware + software for improved acquisition process

**SIMPLIFIED IMPLEMENTATION**
VCE Converged Infrastructure + VCE Foundations
Professional services for ease of deployment
Supporting hardware choice

Dell EMC VxBlock Systems
- Fastest Deployment Path
- Integrated Support Options

Dell EMC VxRack Systems
- Hyper-converged infrastructure
- Massively scalable

Dell EMC VxRail Systems
- Simple, Easy, start small, scalable
- IaaS workload endpoints
The new face of IT

Enterprise Hybrid Cloud

Expandable service catalog
Self-service portal
Multi-cloud management
Application provisioning
Self-Service data protection
Financial transparency
Placing business in the driver’s seat

Enterprise Hybrid Cloud

**SELF-SERVICE PORTAL**

Browse the catalog for services you need.

**IT-AS-A-SERVICE**

- **Backup policy and retention choice**
  - Daily backup with 1 year retention
  - On-demand restore

- **Automation and service level selection**
  - High availability for workloads
  - Automated disaster recovery

- **Storage choice**
  - Platinum
  - Silver
  - Gold
  - Public cloud
IaaS with data protection
Avamar, data domain, and RecoverPoint for VM across vCenters

- Deploy EHC management pod at 2 vCenters
- One self-service portal manages all vCenters
- Local backups for VM workloads
- Bi-directional VM and backup replication
- VMs and self-service portal failover
- Backup and security policies travel with VMS
- Automate failback

Avamar, data domain, and RecoverPoint for VM across vCenters
Intelligent monitoring
Enterprise Hybrid Cloud

Increased uptime, availability and performance
Ease of cloud management
Real-time intelligence for better infrastructure decisions
Communicate the value of IT services

Enterprise Hybrid Cloud

**Total Cloud Cost**
- $19,541 per Month

**Operational Analysis**
- $90 Average Monthly Cost per VM

**Consumption Analysis**
- 21 VM(s)

- Drives better consumption behavior
- Ties consumption to resources
- Communicates metering and usage

<table>
<thead>
<tr>
<th>Cost Drivers</th>
<th>CAPEX / OPEX</th>
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<tbody>
<tr>
<td>- Server Hardware</td>
<td>$13,305</td>
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<tr>
<td>- Storage</td>
<td>$4,215</td>
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<tr>
<td>- Licensing</td>
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<td>- Network</td>
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<tr>
<td>- Facilities</td>
<td>$270</td>
</tr>
<tr>
<td>- Additional Costs</td>
<td>$270</td>
</tr>
</tbody>
</table>

**Cloud Resources**
- CPU: 45%
- RAM: 17%
- Storage: 30%
- DB: 8%

**Consumption Allocation**
- DevOps: -$1
- EHC Operation: -$8
- Others: -$591

**Allocation**
- Allocated cost
- Unallocated cost

**Consumption Largest Changes**
- DevOps: -$1
- EHC Operation: -$8
- Others: -$591
Extend services: overview
Accelerate transformation to ITaaS

Application transformation
Workload and application migration
- Assess and plan
- Migrate
- Replatform OSs and applications
- Retire/archive applications

Operating model transformation
Operational transformation services
- Planning and readiness
- Organization transformation
- Process transformation

Blueprints and enhanced integrations
- Additional blueprints
- Extended capabilities
- Third-party integration

INFRASTRUCTURE TRANSFORMATION
Enhanced monitoring and management
- Operational readiness
- Monitoring and management configuration

Extended resiliency
- Continuous availability
- Disaster recovery
- Data protection

Network virtualization and security
- Security (micro-segmentation)
- Software-defined networks

PRE-DEFINED SERVICES AND WORKFOWNS
Operational management
vRealize operations
Self-service and automation
vRealize automation
Financial transparency
vRealize business

VIRTUALIZED infrastructure
vSphere
NSX
Converged and hyper-converged infrastructure
Dell Hybrid Cloud for Microsoft
Dell Hybrid Cloud for Microsoft – Solution Stack

- Pre-deployed infrastructure
  - Compute, storage, switches, network TOR
  - N+1 fault tolerant optional
- Pre-configured as per best practices
- Integrated Management
  - Configure, deploy, patching
  - Monitoring
  - Automation
- Service providers for IaaS & DBaaS, extendable for PaaS
- Integrated multi-cloud management
- Integrated Azure services
- Up to 400 VM’s*, 108 TB of usable storage
- Optimized deployment and operations for Microsoft and other standard and mixed workloads

* VM Topology - 2vCPU, 1.75 GB Ram, 50 GB Disk
Dell Cloud System for Microsoft

Azure
- BackUp * Site Recovery * Ops Insights

Dell Hybrid Cloud Platforms
- Dell Private Cloud Fast Track
  - 57-160 VMs
- Dell Hybrid Cloud System for Microsoft
  - 100-400 VMs
- Dell Hybrid Cloud System for Microsoft

Dell Hybrid Cloud Management
- Dell Cloud Management System

Dell BackUp/DR Appliance
- Dell AppAssure
- Microsoft DPM

Microsoft Cloud Platform System
- Powered by Dell
  - 2000-8000 VMs

Dell Software (SonicWorks, Boomi, AppAssure, etc.)

Dell Consulting Services & ProSupport

Dell Financial Services
WHY ARE WE HERE?
**HOW DO THE TERMS FIT IN YOUR LIFE-CYCLE?**

**DevOps**
**NOT MY PROBLEM**
Separate tools, varied incentives, opaque process

**SHARED RESPONSIBILITY**
Common incentives, tools, process, and culture

**CI/CD**
**RELEASE ONCE EVERY 6 MONTHS**
More bugs in production

**RELEASE EARLY AND OFTEN**
Higher quality of code

**Microservices**
**TIGHTLY COUPLED COMPONENTS**
Slow deployment cycles waiting on integrated test teams

**LOOSELY COUPLED COMPONENTS**
Automated deploy without waiting on individual components

**MANAGE**
**DEPLOY**
**DESIGN**
CLOUD FOUNDRY HAIKU

Here is my source code
Run it on the cloud for me
I do not care how

--Onsi Fakhouri (and every developer ever)
PIVOTAL CLOUD FOUNDRY
structured cloud native platform

• Pivotal Cloud Foundry provides a foundation for Cloud Native applications
• Capabilities for rich developer and operator experience
• Based on Open Source Cloud Foundry with large supporting ecosystem
Deploy to dev

Install runtime and container

Self service interface

Deploy to dev
cf push

App Deployed

Install services (db, messaging, hadoop, ...)

Setup load balancing, SSL termination and dynamic routing

Setup / config High Availability

Setup APM

Setup log streaming

NATIVE HYBRID CLOUD
NATIVE HYBRID CLOUD

What value does EMC bring to the solution?

• **Engineered Solution**
  Designed, tested, and proven hardware and software integration

• **Built-in Data Protection**
  Automated Backup and Recovery of Applications, Application Code, and Core Components

• **Monitoring and Reporting**
  Provide performance, physical infrastructure, and financial insight

• **Simplified Support**
  One call support model across all solution components

• **Sustainable Model**
  Addresses product updates and provides guidance for on-going maintenance and life-cycling

• **Simplified Packaging**
  …of Hardware + Software on a single order to improve the acquisition process

• **Ease of Deployment**
  …guidelines for customer delivery and operations; services + automated installation
EMC Native Hybrid Cloud Platform

**Developer Platform in a Day**
- Build, Deploy, Scale

**Infrastructural Services in a Day**
- Deploy, Configure, Connect

**Continuous Integration & Delivery**

**Application Performance Management**

**Reporting & Showback**

**Data & Business Analytics**

**Self Service Marketplace**

**Pivotal Cloud Foundry**

**Developer & IT Ops Services**

**Cloud-Native Platform**

**Consistent Experience – On- and Off-Premises**

**Accelerate Cloud-Native Applications**

**On-Prem / Self-Run**

**Off-Prem / Managed**

This slide contains forward looking statements, products and features that are subject to change at anytime without written or verbal warning.
Virtustream Enterprise Cloud

- Designed for mission-critical, I/O-intensive apps
- Run apps like SAP faster & more cost-effectively
- Complete planning & application migration services
- Comprehensive, defense-in-depth security
- Federate with global footprint of xStream-Powered Clouds
- Full suite of managed services for on- and off prem
Virtustream Storage Cloud

- Cloud-native object storage
- Global, hyper-scale footprint
- Seamlessly extend on-prem storage & backup
- Connectors to EMC storage and backup devices
- Cloud tiering
- Cold & frozen storage
- LTR of backups