EMC FORUM 2013

LEAD YOUR TRANSFORMATION

Fidelma Russo
Senior Vice President
Enterprise Storage Division
EMC Corporation
Thank you!
IT TRANSFORMATION

• WORLD IS CHANGING
• RAPID CHANGE ➔ APP / INFRA
• INCREASED PRESSURE ON IT
• CLOUD & BIG DATA CAN HELP
• MAKE THIS YOUR STRATEGY
• BENEFITS ➔ TOP & BOTTOM LINE
Two Fundamental Challenges

- Lower Operational Costs
- Increase Revenue

- 72% MAINTAIN
- 28% INVEST

ESG, 2009 IT Spending Intentions Survey
Our Strategic Vision & Focus

CLOUD TRANSFORMS IT

Lower Operational Costs

63% MAINTAIN

Increase Revenue

37% INVEST

BIG DATA TRANSFORMS BUSINESS

ESG, 2012 IT Spending Intentions Survey, Jan 2012
Our Strategic Vision & Focus

CLOUD
TRANSFORMS IT

TRUST
IS ESSENTIAL

BIG DATA
TRANSFORMS BUSINESS

ESG, 2012 IT Spending Intentions Survey, Jan 2012
### 1st Platform
- Mainframe, Mini Computer
- Terminals
- Millions of Users
- Thousands of Apps

### 2nd Platform
- LAN/Internet
- Client/Server
- PC
- Hundreds of Millions of Users
- Tens of Thousands of Apps

### 3rd Platform
- Mobile
- Cloud
- Big Data
- Social
- Mobile Devices
- Billions of Users
- Millions of Apps

Source: IDC, 2012
Your Challenges

Isolated teams

Limited Automation

Lack of Standard Platform

Prior decisions

Vendor Lock In

OPEX Challenges

CAPEX Challenges

Slow Delivery ➔ Apps/Infra

GRC Challenges

Stability & Predictability
Federation of Companies for Customer Choice

Pivotal

PLATFORM FOR CLOUD
BIG/FAST DATA APPS

vmware

HYBRID CLOUD
SOFTWARE-DEFINED DATA CENTER

EMC II

INFORMATION INFRASTRUCTURE

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CLOUD TRANSFORMS IT

Lower Operational Costs
Three Choices For Cloud Infrastructure

EMC Products

Best Of Breed Infrastructure Components

Partner VSPEX

Proven Infrastructure

VCE VBLOCK

Converged Infrastructure
Workloads Drive Innovation

- Home Directories
- Tech Apps
- Motion Video
- Web Content
- Online Archive
- IT
- Email
- Storage As-A-Service
- Decision Support
- App Dev
- Transaction Processing
- VM Infrastructure
- HPC

Low Service Level

High Service Level

Performance

Capacity
Best Of Breed Storage & Backup

- **LEADER HIGH-END STORAGE**: VMAX
- **LEADER MIDRANGE STORAGE**: VNX
- **LEADER SCALE-OUT NAS STORAGE**: Isilon
- **LEADER OBJECT STORAGE**: Atmos
- **LEADER BACKUP**: Data Domain, Avamar & Networker

**Capacity**
- Low Service Level
- High Service Level

**Performance**
New Performance-Intensive Workloads

- High Service Level
- Low Service Level

Performance:
- 100μS
- 500μS
- 1mS
- 2mS
More Performance-Intensive Workloads

- Financial Modeling
- Seismic Research
- Web-Scale Applications
- VDI
- Motion Video
- Tech Apps
- App Dev
- HPC
- Transaction Processing

Performance

100μS
500μS
1mS
2mS

Low Service Level
High Service Level
EMC Drives Innovation

Server Flash

Performance

Low Service Level

100μS

500μS

1mS

2mS

High Service Level

Hybrid Arrays

All Flash Array

XtremSF

XtremIO

VNX

VMAX

Isilon

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EMC Drives Innovation

Performance

100μS

500μS

1mS

2mS

Server Flash

All Flash Arrays

XtremSF

XtremIO

VMAX

Isilon

E

MC

Drives Innovation

Performance

100μS

500μS

1mS

2mS

Server Flash

All Flash Arrays

XtremSF

XtremIO

VMAX

Isilon

E

MC

Drives Innovation
Three Choices For Cloud Infrastructure

EMC Products

Best Of Breed Infrastructure Components

Partner VSPEX

Proven Infrastructure

VCE VBLOCK

Converged Infrastructure
Vblock Is Better, Faster & Lower Cost

INCREASE IT AGILITY

5X FASTER DEPLOYMENT

4X LESS STAFF RESOURCE TIME

83X BETTER AVAILABILITY

3X LOWER IT COSTS

IDC White Paper, April 2012, Case Studies Of 5 VCE Customers
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LEAD YOUR TRANSFORMATION

Chad Sakac
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http://virtualgeek.typepad.com
Hybrid Cloud Workloads - 2016

Low Service Level

High Service Level

Performance

Capacity

Virtual Private Cloud

Private Cloud

Public Cloud

10%

78%

12%

Sources: Gartner, IDC, AWS Workload Estimates, EMC Analysis
IT’s Objectives for Hybrid Cloud

Efficiency
Control
Choice

Agility
SOFTWARE DEFINED DATA CENTER
Server Virtualization Was The First Step

1. Standardize
2. Virtualize
3. Automate
The Software-Defined Data Center

Virtualization Software

- Software Defined Compute
- Software Defined Storage
- Software Defined Network
- Software Defined Security

Resource Flexibility
Policy-Driven Management

ABSTRACT, POOL & AUTOMATE

Hardware Isolation
Automated Services

Physical Hardware

Server
Storage
Network
Security
Open Architecture ➔ Server Choice
Open Architecture ➔ Network Choice

The Software-Defined Data Center

vmware

Cisco  Brocade  HP  Juniper Networks  Dell

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Open Architecture ➔ Storage Choice
Open Architecture ➔ Application Choice

The Software-Defined Data Center

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EMC Software-Defined Storage

Information Infrastructure

Database
Collaboration
ERP
Middleware
Next Gen

vmware

Oracle
Microsoft
SAP
IBM

VMAX
VNX
Isilon
Atmos
Data Domain

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Information Infrastructure

EMC Corporation

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Open Architecture ➔ Orchestration Choice
"SOFTWARE DEFINED" JUST MARKETING?
“Software Defined”: TECHNICAL WHAT.

• 3 things:
  1. Decoupling and abstracting control and policy (control plane) from physical stuff that does work.
  2. Where the physical stuff that does work (data plane) can be software on commodity hardware, do it that way
  3. Programmable infrastructure APIs: automate everything
“Software Defined”: TECHNICAL WHY.

• 3 things:
  1. Reduce infrastructure “fragility” by abstraction and reducing operational complexity
  2. Increase agility
  3. Open up new architectural options (converged, software data planes)
Understanding “Control” & “Data” Plane
### Understand: “Control” / “Data”

<table>
<thead>
<tr>
<th>Control Plane</th>
<th>Data Plane</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Give me a 2 vCPU + 4GB VM, HA, 4000/4000 CPU/MEM DRS shares”</td>
<td>VMPTRLD M64 VMX</td>
</tr>
<tr>
<td>“load pointer to VM structure” – in 5 ns”</td>
<td>“read this bit string with this offset, lookup against MAC table, and choose logical port – in 300 ns”</td>
</tr>
<tr>
<td>“Create a L2 tunnel between these two L3 endpoints, and apply this QoS throttle”</td>
<td>“open a file handle, read with this byte offset + write this byte string, and check CRC for consistency – in 5,000,000 ns”</td>
</tr>
<tr>
<td>“Create a filesystem using the ‘Bronze’ service level, enable access to these VMs, VM-level snapshots”</td>
<td>“Create a filesystem using the ‘Bronze’ service level, enable access to these VMs, VM-level snapshots”</td>
</tr>
</tbody>
</table>

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“Data Planes” come in different forms.
Where do you put the control plane?
... In “Networking Land”...
... In “Storage Land” – ONE way...
... In “Storage Land” – ONE way...

Database: ORACLE
Collaboration: Microsoft
ERP: SAP
Middleware: IBM
Next Gen: EMC

Workloads
OS
IaaS
Hypervisor

Vendor-specific VASA Implementations
... In “Storage Land” – ANOTHER way...

- **Database**: Oracle
- **Collaboration**: Microsoft
- **Workloads**: OS
- **ERP**: SAP
- **Middleware**: IBM
- **Next Gen**

**IaaS**

**Hypervisor**

**SPBM/vVol ViPR**

**Single VASA Implementation**

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How Do You Do Data Planes/Services?
ANOTHER Way…

Database
- ORACLE
- Microsoft

Collaboration
- Microsoft

Workloads
- SAP
- IBM

ERP

Middleware

Next Gen

OS

IaaS

Hypervisor

EMC² ScaleIO, vIsilon, vVNX

vRecoverpoint, vVPLEX

EMC²

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EMC ViPR ➡ Software-Defined Storage
Software Control Plane and Data Plane
EMC ViPR ➔ Software-Defined Storage
Software Control Plane and Data Plane
BIG DATA TRANSFORMS BUSINESS

Increase Revenue
Federation of Companies for Customer Choice

Pivotal

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Introducing Pivotal

Next Generation Cloud & Big / Fast Data Apps
Location & Types Of Big Data

**Enterprise**
- Structured Data
- Unstructured Data

**Partner**
- Credit Data
- Shipping Data
- Forecast Data
- Location Data

**Public**
- Social, Video Data
New Apps Are Built In New Ways

Social & Primarily Accessed By Mobile Devices

Developed With Modern Programming Tools & Data Fabrics

Deployed On A Software-Defined Cloud Infrastructure
Federation of Companies for Customer Choice

Pivotal

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INFORMATION INFRASTRUCTURE
The Old World Of Security

TRADITIONAL THREATS FOCUSED ON INTRUSION

TRADITIONAL SECURITY FOCUSED ON PREVENTION
Advanced Threats Are Different

1. Targeted
   - Specific Objective
   - Attack Begins
   - Cover-Up Window
   - Cover-Up Complete

2. Interactive
   - Human Involvement

3. Hidden
   - Low and Slow

TIME

System Intrusion

1. Decrease
   - Dwell Time
2. Accelerate
   - Response Time

Response

Attack Identified

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Advanced Security ➔ New Shift in Focus

Historical Security Investment
- Prevention: 80%
- Monitoring: 15%
- Response: 5%

Future Security Investment
- Prevention: 33%
- Monitoring: 33%
- Response: 33%
Federation of Companies for Customer Choice

Pivotal

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vmware

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INFORMATION INFRASTRUCTURE

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What Does This All Mean To Your Business?
CLOUD TRANSFORMS IT

BIG DATA TRANSFORMS BUSINESS

TRUST IS ESSENTIAL

Save Money

Smarter Investments

Protect Your Business
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TRANSFORMATION