Convergence, Cloud, Big Data IT Transformation and The New Style of IT

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Today's Conversation

- The Secular Impacts on IT
- The Changing Role of IT
- Tectonic Shifts in Converged
 Infrastructure Enabling Big Data and
 Cloud
- Summary





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Information Technology The Secular Impacts











Consumer Technology and Expectations Outpace IT



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What's Driving Change

Cloud computing will profoundly influence the ClO's role





Putting Enormous Pressure on IT

- Simplify
- Speed to Innovation
- Create Agility
- Manage Risk
- Lower Costs



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The Changing Role of IT Less "T" More "I"



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Was Nick Carr Right?

Does IT Matter (in the Age of Cloud)?

"The emergence of a ubiquitous, shared IT infrastructure has many important practical implications....both for how companies manage and invest in technology itself and, more broadly, for how they think about creating and defending competitive advantage."

Nicholas Carr, Preface of

Does IT Matter?

Information Technology and the Corrosion of Competitive Advantage, 2004



Next Gen Platforms: Dense, Agile, Efficient, Autonomic HP POD Data Center, Nov. 2011. Bagram Airbase, Afghanistan



"Systems of Engagement": The New Information Engine

- Information volume growing at 59 percent annually, only 15 percent of it structured
- By 2015, less than 10 percent of all data will be human generated
- Data will grow 44x in the next decade, IT professionals only 1.4x



Massive Implications for IT Organizations and Architectures



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Our Journey in 2005-2010 Our Journey in 2012-2015

Role of New Style of IT

On premise, traditional data center	Hybrid cloud - on and off premise
Develop custom applications/COTS	Develop integrations/workflow/SaaS
Infrastructure in weeks	Infrastructure in hours and minutes
Project delivery in 9-12 months	Project delivery in 3-6 months
Focus on functionality	Focus on usability and experience
Designed for desktop	Designed for mobility
Exploit enterprise data warehouse	Exploit big data analytics
Success measured by IT metrics	Success measured by business KPIs

IT As Value Center

IT As

Cost

Center



STRATEGIC ROLE OF IT CHANGING

IT evolves from the "builder" to "trusted broker" of services





Converged Infrastructure 3 years in...

A report card:

- The industry has followed en masse: UCS, VCE, FlexPod, Exadata, etc..
- Fastest growing segment of technology
- Customer stated benefits:
 - Faster time to solution (minimize systems integration and management) and faster ROI (50-60 percent)
 - Allows faster maturation to cloud services (service catalog, self-provisioning, multi-tenant)
 - Forces a change in IT process governance and in some cases lower personnel costs
 - Reduces time in systems integration and exploration

• Work left to do:

- Continue to further simplify start-up, end to end management and automation
- Leverage deeper convergence opportunities (flat SAN, networking, software)
- Emerging workload inclusion (big data, analytics, VDI)
- Full adoption of open: Open Source, OpenStack, OpenFlow, Open Data.
- Evolution to Software Defined Everything.



What is a Software Defined Data Center?

Extending Converged Infrastructure

Software defined data center

A programmable interface that creates a unified interface across the data center to deliver dynamic and rapid deployment of traditional and cloud applications, giving the agility businesses need to respond to change and new market opportunities.





Changing Workload and Use Case Dynamics

Conditions Enabling SDDC

- Homogenization of applications and operating systems
- Application architecture and resulting network patterns
- Compute and storage density
- Rapid maturation of "open" cloud, networking mgmt, and data mgmt.
- Industry push
 Primary Outcomes:
- Agility moves from weeks to hours
- Esoterica and error removed from process
- Dis-intermediates organizational latency
- Faster innovation cycle

Other By-Products

• Potential for lower capex and opex costs (power, people, equipment)



Software Defined Data Center

Process	Old Way	<i>Current Best Practice</i>	Software Defined Data Center	HP Enabling Technologies
Provision a server	Developer meets with engineering, ops team Requirements document negotiated Multiple "towers" involved (SAN, Network, OS, Compute, Apps) 400 Tickets 4 Months	Basic user self service VM provisioned semi automatically A couple of tickets A couple of days	Request from catalog Human never touches specific request User or machine requests "service" which is delivered in real time "System Admins" configure tools and set policy Manage pool capacity, project resource needs One request, one hour	HP Virtual System HP Cloud System HP Blade System HP Converged Infrastructure
	1	1		

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The Power of a SDDC....what used to take weeks and many people...

135

Minutes

- 1,650 discrete data records evaluated as input requirements
- Three blade enclosures configured & firmware updated
- 8 CI Flex Fabric interfaces configured & firmware updated
- 3 Onboard Administrator modules configured & firmware updated
- 42 blade servers configured & firmware updated
- 28 network set connections created & applied
- 64 VLAN connections created & applied
- 84 SAN fabric connections created & applied
- 42 3PAR storage hosts created
- 126 Virtual Volumes (LUNs) created & assigned to hosts
- 84 SAN fabric zones created



56 SAN hosts created & added to two fabrics



Emerging Taxonomy of SDDC



Four tectonic shifts enabling Convergence, Cloud and Big Data



To software defined networks and integrated photonics



Io unstructured, distributed data management





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Tectonic shift #1: OpenSource Cloud and Data Management

Next-generation runtime environment for scale-out, hyperscale, and cloud deployments



Hadoop/NoSQL/OpenStack are going mainstream

 Nearly every enterprise customer either has an Hadoop initiative planned, in POC, or in production

ISVs are leading the movement from Oracle

• Examples: Cerner, Amdocs, ATT approached HP for HBase /Hive plan for next-gen app platform

Hybrids (SQL/Hadoop/NoSQL combos) will be common.

• Performance optimization (batch, real time, OLAP)



Tectonic shift #1: OpenSource Data Management Changing the way software is architected





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Tectonic shift #2: shift in compute momentum

From general purpose CPU to energy and algorithm optimized SoC ecosystem





New style of IT required for IoT solutions

Extreme scale and optimal efficiency needed for unique, differentiated IoT solutions



Source: HP internal analysis

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Why Power Efficiency Matters:

The current style of IT is unsustainable

Electricity Consumption





HP Pathfinder Innovation Ecosystem

Select technology partnerships focused on quicker, customer-driven innovation





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Tectonic shift #3: Integrated Fabrics, Photonics and Software Defined Networks



Big Data Solutions

Network Connections

Network and Fibre Channel SAN. HP core and edge 1GbE/10GbE network switches. Brocade 8Gb/16Gb fibre channel switches.

HP Networking combined portfolio includes ProCurve, 3Com, H3C, and TippingPoint. Best in class expanding networking capabilities accelerating the Converged Infrastructure strategy.

Network backbone, HP 3Com 10500, High-density switch, full Layer 3,



Amount of time (minutes) to move 1,000GB of data.

15.9 min.

Ethernet

SAN

HP FlexNetwork architecture is the industry's only unified architecture for the data center, campus, and branch. FlexFabric uses a common wire-once virtual I/O network consolidating Ethernet and storage networks into a single fabric. Ease migration of application connections across different resources.



Why SDN? Legacy networks can't meet today's expectations

Today's network limitations

Application indifferent	Impossible to identify applications and meet diverse service levels		
Rigid, physical networks	Architected for one tenant, user type and location - lacking programmability		
Manual management	Slow to respond to new application requirements and hampered by manual errors		
STANFORD	CoropenFlow Excess (LABS ^{hp}) Open Networking BBN Technologies		

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Tectonic shift #4: persistent memory



Persistent memory is not just faster flash. It is used fundamentally differently...

- Collapsing of the storage hierarchy
- · All data delivered cost effectively in memory and at low latency
- · Writes become durable, allowing cycle by cycle checkpoint and recovery



Changing how systems and software are designed

Traditional design:

HW Complexity: multiple traversals of interfaces and sub-systems SW Complexity: billions of lines of software



Persistent memory design:



Key Considerations for SDDC: We are on a journey



"The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday's logic."

-Peter Drucker

"If you do not change direction, you may end up where you are heading."

-Mark Twain, Author/Philosopher



Thank you!



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