Cloud Transformation: Data center usage models driving Cloud computing innovation.

Jake Smith, Advanced Server Technologies

Data Center Group

Intel

- Intel may make changes to specifications and product descriptions at any time, without notice.
- Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit Intel Performance Benchmark Limitations
- Intel does not control or audit the design or implementation of third party benchmarks or Web sites referenced in this document. Intel encourages all of its customers to visit the referenced Web sites or others where similar performance benchmarks are reported and confirm whether the referenced benchmarks are accurate and reflect performance of systems available for purchase.
- Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.
- Intel, processors, chipsets, and desktop boards may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are available on request.
- Intel Virtualization Technology requires a computer system with a processor, chipset, BIOS, virtual machine monitor (VMM) and applications enabled for virtualization technology. Functionality, performance or other virtualization technology benefits will vary depending on hardware and software configurations. Virtualization technology-enabled BIOS and VMM applications are currently in development.
- Intel® Turbo Boost Technology requires a Platform with a processor with Intel Turbo Boost Technology capability. Intel Turbo Boost Technology performance varies depending on hardware, software and overall system configuration. Check with your platform manufacturer on whether your system delivers Intel Turbo Boost Technology. For more information, see http://www.intel.com/technology/turboboost
- No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) is a security technology under development by Intel and requires for operation a computer system with Intel® Virtualization Technology, a Intel® Trusted Execution Technology-enabled Intel processor, chipset, BIOS, Authenticated Code Modules, and an Intel or other Intel® Trusted Execution Technology compatible measured virtual machine monitor. In addition, Intel® Trusted Execution Technology requires the system to contain a TPMv1.2 as defined by the Trusted Computing Group and specific software for some uses.
- 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.
- Intel, Intel Xeon, Intel Core microarchitecture, and the Intel logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.
- * Other names and brands may be claimed as the property of others.
- © 2008 Standard Performance Evaluation Corporation (SPEC) logo is reprinted with permission

© 2010 Cisco and/or its affiliates. All rights reserved.

An Explosion of Internet Growth

More Users

Only 25% of the world is Internet connected today[1]

New technologies will connect over 1 billion additional users to the cloud[2]

More Devices

~80% of Internet connected devices are computers & phones[3]

Cars, TVs, households, etc. to increase connected devices 2.5x to >10 billion globally[3]

More Content

2.5B photos on Facebook[4]
30B videos viewed/mos[5]
Google indexes >1T pages[6]

8X network, 16X storage & 20x compute capacity needed[7]

Exponential growth driving need for a Billion Virtual Server Cloud[7]

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Why Enterprises want Cloud Computing?

Requirements	Line of Business	Data Center Manager
Self-Service Provisioning	✓	✓
Application Functionality	✓	✓
Application Availability	✓	✓
CapEx and Operating Expense	✓	✓
Security	N/A	✓
Image Management	N/A	✓
Virtualized	N/A	✓
Resource Utilization	N/A	✓

Value of Cloud = OpEx + Self-Service = Data Center Efficiencies

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Intel Cloud 2015 Vision

Federated
Data and services seamlessly and securely span clouds

Automated
Dynamically allocates resources to manage service level and optimize power

Client Aware
Secure access and optimal experience across the client continuum

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Next Generation Data Center Requirements

Simplified
Simplify data center operations to reduce cables, complexity and cost

Efficient
Optimizing technologies to decrease energy, human and physical asset consumption

Secure
Reduce the risk, increase the compliance and manage hybrid usage models

Identifying the Industry's Requirements for a Next Generation Data Center

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Intel® Cloud Builder Program:

Facilitating cloud development and deployment

Open Cirrus™ & Research Universities

Advanced Cloud Research

Intel Cloud Test Bed & POCs

Building Optimized Clouds

Cloud Reference Architectures, & Tools

Deployment Best Practices

Making is easier for companies to deploy & optimize clouds

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Intel® Cloud Builder Program:
Build and Optimize Cloud Solutions

Prove

Reference Solution build out and testing by key industry leaders

Trusted Test Beds

Publish

Publish & promote

Robust Online Community

Scale

Partner go to market

End user Success stories

Global promotion

Sales

CANONICAL Microsoft Novell redhat vmware CITRIX enomaly elastic computing Parallels UNIVA UD Xen

http://www.intel.com/software/cloudbuilder

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Choosing the Right Deployment Balance

External Cloud

Software as a Service (SaaS) Applications

- Staffing
- Benefits
- Travel
- Stocks
- Other SaaS Applications
- Hosted Web Application

Non-Business Critical

Remote Access & Portal Services

Service Delivery Models

Internal Cloud

- Messaging and Collaboration Infrastructure
- Enterprise applications
- User Profile Management
- Security and Virtual Machine Policy Control
- Application delivery and Management
- Workspace/Container provisioning and Management

Business Critical

Rich Client PC

- Locally Installed Applications
- Offline Application Cache
- Encrypted Data Cache

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Enterprise Cloud Maturity Framework

Attribute / Level	Next 1-2 years	2-3 years out	Future
Compute Model	• Dynamic Resource Pools • Intra DC VM migration (rack to rack)	• Automated Dynamic Resource Pools • Site 2 site (local) VM migration	• Autonomic & Predictive • Corp-Corp global VM migration
Service Level / Capability	• IaaS – on demand • PaaS – on demand • Limited SaaS and Self Service Apps • SLAs go service oriented	• DaaS (Data as a Service) • CaaS (Client as a Service) – the “stateless PC” • Wide Intra company SLAs	• *aaS • Location & Device Awareness • Biz Proc “on the fly” • SLAs span organizations
Economic model	• Pay Per VM – purchase a virtual processor, memory, storage • Service level cost eg bronze, silver, gold	• Fixed Price Service Cost for a solution ala “monthly line rental” for a given service level	• Pay per use at user/departmental/LOB level; “fine grained” by service level
Public Cloud Integration	• Social media • Simple Cloud Burst	• Cloud burst • Simple and non-critical applications	• Extended Cloud Burst • Non mission critical apps • Standard functions (eg HR)

Plan the Transformation

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

Enterprise Cloud Maturity Framework

Attribute / Level	Next 1-2 years	2-3 years out	Future
Compute Model	Compute model evolution over time		
Service Level / Capability	Transformation to service oriented, agile approach		
Economic model	Evolution of the primary charging model		
Public Cloud Integration	Increasing integration with the Public Cloud		

Plan the Transformation

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential

© 2010 Cisco and/or its affiliates. All rights reserved.
Cisco Confidential