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Cloud Opportunity and Smarter IT Delivery
Disruptive Technologies and the Internet Revolution

Centralized Computing
- Mainframe
- Supercomputers
- Personal Computer

Distributed Client-Server
- Unix-based Workstations
- Internet
- World Wide Web
- TCP-IP
- E-mail
- E-business
- Grid Computing
- Web 2.0

Cloud Computing

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“Cloud” is a new consumption and delivery model inspired by consumer Internet services.

Cloud enables:

- Self-service
- Sourcing options
- Economies-of-scale

“Cloud” represents:

- The Industrialization of Delivery for IT supported Services

Multiple Types of Clouds will co-exist:

- Private, Public and Hybrid
- Workload and / or Programming Model Specific
Cloud computing is delivering value to both the business and IT

**An Enabler of Business Transformation**
- Creating new business models
- Enabling speed and innovation
- Re-engineering business processes
- Supporting new levels of collaboration

**An Evolution of Information Technology**
- Changing the economics of IT
- Automating service delivery
- Radically exploiting standardization
- Rapidly deploying new capabilities

Increase innovation
Decrease costs
Enterprises will connect to many clouds

- Federated Identity
- Federated ESB
- Event Infrastructure
- Secure Data Pipe

Open Standards enable Cloud Ecosystem
Three cloud sub-markets expected to grow strongly
$47B market in 2008 growing at 28% CAGR will reach $126B in 2012

Cloud Spending by Sub-Market

Notes: Includes both direct providers of cloud services and components suppliers, Data represents a worldwide view across both LE and SMB
Source: IBM (MI), IDC, CIO magazine, BCG analysis
Requirement #1 – Security and Privacy

**Today’s Datacenter**

We Have Control
It's located at X.
It’s stored in server’s Y, Z.
We have backups in place.
Our admins control access.
Our uptime is sufficient.
The auditors are happy.
Our security team is engaged.

**Tomorrow’s Public Cloud**

Who Has Control?
Where is it located?
Where is it stored?
Who backs it up?
Who has access?
How resilient is it?
How do auditors observe?
How does our security team engage?

**People and identity**

**Application and process**

**Physical infrastructure**

**Data and information**

**Network, server and end point**
Requirement #2 – Service Management is needed to connect, manage and secure hybrid clouds

Enterprise Infrastructure & Private Cloud

Private shared services

Security
Governance
Integration

On-premise business applications & information

Application Integration, Monitoring Events, Identity and Security, Workload Management

Public Cloud [SaaS, IBM Cloud, other Public Cloud]

Off-premise business applications & information

Off-premise shared services

Workflow
Manage the process for approval of usage

Provisioning
Automate provisioning of resources

Monitoring
Provide visibility of performance of virtual machines

Metering and rating
Track usage of resources
Standards address inhibitors to cloud adoption including security, vendor lock-in and portability.

Recognize that cloud standards are emerging throughout the market, within IT and other industries.

Standards should be open, have long term stewardship, have code to back them, and be widely adopted.
Requirement #4 - Migration and Quality of Service

Virtualized Traditional

Standardized Images and Patterned Deployment

Shared Middleware Platform Services (increased reuse)

Shared, virtualized hardware results in Capex savings; shared middleware services results in Opex savings

Reduced Costs and Increased Flexibility
IBM cloud strategy

Technologies
To plan, build, deliver and manage cloud services

Consulting and enabling services
Experience and expertise to help clients plan, build and deliver cloud services

Cloud services
To optimize your business

Industry-specific services
Software as a Service
Process services  Collaboration services  Analytics services  ...
Shared middleware services
Infrastructure services

Integrated service management and security
Business planning / lifecycle management services
Companies have different motivations for leveraging cloud services.

**MUFG**

**Risk & Compliance**

34,000-employee bank deploying a private cloud to centralize management of desktops.

Greater remote flexibility without sacrificing control.

**Panasonic**

**Employee Productivity**

Enable collaboration across global employees as well as its network of customers, partners and suppliers.

**Large U.S. Retail Bank**

**Time to Value**

Increased efficiency, productivity and ease-of-use of its development and test environment.

**U.S. Air Force**

**Analytics & Security**

Design and demonstration of a secure cloud infrastructure for defense and intelligence networks; insights about cyber attacks, network failures & automatically preventing disruptions.
IBM is investing in cloud computing to meet internal and client needs

IBM CIO Cloud Implementations:

<table>
<thead>
<tr>
<th>Analytics</th>
<th>Collaboration</th>
<th>Development and Test</th>
<th>Desktop</th>
<th>Storage</th>
<th>Business Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Insight 109,000 users growing to 200,000</td>
<td>LotusLive 75% of all web conferencing</td>
<td>Dev/Test Time to build a dev/ test environment from 1 week to 1 hour</td>
<td>Workplace Cloud Estimated savings up to 30%</td>
<td>Network Storage Cloud Up to 40% savings in storage costs</td>
<td>Production Cloud 1,000 applications identified</td>
</tr>
</tbody>
</table>

Fit for purpose middleware platform

Common Compute Platform (Compute/ Network/ Storage)

Base Enterprise Platform
Cloud enables global industry transformations

Industry Vertical Business Services

Workload Optimized Industry Cloud Platforms

Retail and Consumer Packaged Goods Industry Cloud Platform

Healthcare Industry Cloud Platform

On a platform of robust Infrastructure Services

Compute and Storage Clouds Enterprise-class Infrastructure Services

Additional Industry Cloud Platforms
Healthcare industry platform projects – Collaborative Care Solution

Integrated solution that transforms the delivery of healthcare and provides, in a software-as-a-service model, Electronic Health Record, Health Info Exchange, Clinical Decision Support, and Healthcare Analytics.
Industry Cloud Solutions Management Approach

Output
- Prioritized Industry solution strategies
- Acquisition candidates
- Cloud solution opportunities
- Identified IBM brand solution sponsors

Output
- Understand requirements for client value creation
- Define and demonstrate IBM value capture
- Meet IBM financial model requirements
- Put cross-IBM leadership team in place

Industry Cloud Incubation Board

SVP Cloud Steering Committee

Identification

Incubation

Industry Solution Boards

Brand Offering Teams

Investment portfolio management
In summary...

- Cloud will be a core component in industry and business model transformation.

- Workloads will drive cloud adoption.

- Cloud will have major implications for enterprise security, privacy, integration, service management and migration.

- IBM is aggressively investing in and building out cloud capabilities.