Cloud computing: the IBM point of view

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Cloud Computing can go to mainstream adoption in 2-5 years

- **Business drivers:** business agility, cost reduction, service delivery
- **Technology drivers:** virtualisation

Source: Gartner (July 2009)
Cloud Computing is a **new user experience and delivery model** inspired by consumer Internet services.

Cloud Computing exhibits the following key characteristics:

1. On-demand self-service, service catalog
2. Ubiquitous network access
3. Location independent resource pooling
4. Rapid elasticity
5. Pay per use/ flexible pricing models, eg, pay per use

“Clouds will transform the information technology (IT) industry... profoundly change the way people work and companies operate.”

*(Source: The Economist)*
Today there are three primary delivery models that companies are implementing for cloud.

**Enterprise**

- **Traditional Enterprise IT**
- **Private Cloud**
- **Public Clouds**
- **Hybrid Cloud**

**Private Cloud**
IT activities/functions are provided “as a service,” over an intranet, within the enterprise and behind the firewall.
- Key features include:
  - Scalability
  - Automatic/rapid provisioning
  - Chargeback ability
  - Widespread virtualization

**Hybrid Cloud**
Internal and external service delivery methods are integrated, with activities/functions allocated to based on security requirements, criticality, architecture and other established policies.

**Public Cloud**
IT activities/functions are provided “as a service,” over the Internet.
- Key features:
  - Scalability
  - Automatic/rapid provisioning
  - Standardized offerings
  - Consumption-based pricing
  - Multi-tenancy

Step 1: IT Transformation Roadmap

*The key building blocks of clouds are familiar…*

**Consolidate**
- Consolidation, systems management, and monitoring
- Reduce infrastructure complexity, staffing requirements, and costs
- Improve business resilience and utilization

**Virtualise**
- Remove physical resource boundaries
- Allocate less than physical boundary
- Improve scalability, increase utilization
- Reduce hardware costs and simplify deployments

**Automate**
- Service catalog, metering, and automated deployment of virtualized resources
- Integrated virtualization management with IT processes
- Reduce overhead, improve productivity

**Self Service**
- Centralized, robust, self serve portal for 24X7 access to services
- Improve user satisfaction & productivity
- Control and manage delivery, support & administrative costs

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Simplified  Shared  Dynamic
IBM has products and services to help at each stage all the way…

**Physical Consolidation**
- PowerVM, WPARs
- z/VM, LPARs
- IBM Tivoli Productivity Center
- IBM assessments
- IBM Director multiplatform

**Virtual Resource Pools**
- VMControl System Pools
- VMControl Image Manager
- SAN Volume Controller
- BladeCenter Open Fabric Manager
- WebSphere Virtual Enterprise

**Integrated Service Management**
- Tivoli Provisioning Manager
- Tivoli Workload Automation suite
- Tivoli License Compliance Manager
- Tivoli Usage and Accounting Manager
- Tivoli Business Services Manager

**Cloud Computing**
- Tivoli Service Automation Manager
- IBM CloudBurst™
- IBM Information Archive
- IBM Smart Analytics System
- WebSphere CloudBurst™ Appliance
- IBM Smart Business Test Cloud
- IBM Smart Business Desktop Cloud
- Test and dev. services

... with consulting and implementation services
Management of physical and virtual environments together

Companies are gradually virtualising everything
- Servers, storage, networking, applications
- Different architectures and OS based on workload requirements
- Different hypervisors even for the same architecture

IBM offers
- Management of heterogeneous physical and virtual environments together and with a single view across servers, storage and network
- Integrated visibility, control & automation across heterogeneous business and technology assets
- Roadmap for integrated management of public / private cloud

“IBM VMcontrol” on YouTube
http://www.youtube.com/watch?v=oKrXEKBY2ZM
Step 2: Analyse workload and understand the right mix

- Which workload for private cloud?
- Which workload for public cloud?
- Which workload is not for the cloud?
IBM provides comprehensive cloud solutions with 3 delivery models

- Enterprise Data Center
- Private Cloud

Increase Agility

- Development & Test
- Business Processes
- Collaboration

Turn Information into Insights

- Analytics
- Infrastructure Storage

Connect & Empower People

- Desktop & Devices
- Infrastructure Compute

Drive Effectiveness and Efficiency

- Hardware
- Software
- Services
Step 3: Cloud implementation snapshot

- Easy to access, easy to use Service Request Catalog
- Hides underlying complex infrastructure from user and shifts focus to services provided
- Enables the ability to provide standardized and lower cost services
- Facilitates a granular level of services metering and billing
- **Workload standardization** eases complexity
Example: IBM Cloudburst, an Integrated Infrastructure Cloud solution

**IBM Cloudburst**

“Built for Purpose” Cloud Solution

**Usage and Accounting**
- Provide metering and accounting for cloud services
- Enable integration to billing systems if needed

**Virtualized HW Management**
- Enhanced management of the virtual environment

**Energy Management**
- Energy management of the hardware infrastructure

**Tivoli Service Automation Manager (TSAM)**
- Orchestration of Cloud operations
- Integration point for service mgmt capabilities
- Service catalog and templates
- Automated provisioning of virtual systems

**Monitoring**
- Monitor both physical and virtual server environments

**High Availability**
- Make management system DB highly available

**Server, Storage, Network HW**
- Preinstalled and configured on IBM hardware

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“Cloudburst Technical Demo” on YouTube
http://www.youtube.com/watch?v=rcKt5gV5PN4
IBM investments led to insight, innovation, breakthrough solutions

<table>
<thead>
<tr>
<th>IBM transformation</th>
<th>“Project Blue Cloud”</th>
<th>Academic Alliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 155 data centers to five</td>
<td>▪ Hundreds of client engagements</td>
<td>▪ Global collaboration</td>
</tr>
<tr>
<td>▪ 16,000 applications to 4,500</td>
<td>▪ 20 Cloud centers</td>
<td>▪ 27 Universities</td>
</tr>
<tr>
<td>▪ $1.5 Billion savings</td>
<td>▪ Proof-of-concepts.</td>
<td>▪ 800+ students</td>
</tr>
<tr>
<td>▪ Technology Adoption Program “TAP cloud” for 110,000 employees</td>
<td>▪ IBM Research/Client collaborations</td>
<td>▪ NSF grants to 14 schools</td>
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Carnegie Mellon  
NedBank  
iTricity  
Wuxi  
HCMC

“Cloud Computing from IBM” on YouTube  
http://www.youtube.com/view_play_list?p=31A7BB2D2F8833BF
IBM has the advantage in providing a workload optimized approach

Systems leadership
we are investing in future technologies that differentiate our systems and sustain our leadership with a workload optimized approach to cloud computing

Integrated Service Management
Visibility, Control and Automation of IT and business assets required to manage the cloud

Choice of delivery models
we have a family of servers, storage, software and services from which to build private, public and hybrid cloud solutions
Start today

Define cloud strategy and roadmap

- Understand where you are on the cloud journey
- Plan cloud strategy and roadmap
- Identify the right workloads

Plan and Prepare

Condition the existing infrastructure for cloud

- Virtualise and automate existing systems
- Add service management, service catalog

Test and Deploy

Start with an isolated private cloud deployment

- Ask a demo of IBM capabilities
- Choose low-risk workload such as test and development
- Start with a pilot
- Standardize applications and systems
Thank you!

www.ibm.com/cloud
Potential benefits of migrating to a cloud environment.

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>From</th>
<th>To</th>
</tr>
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<tbody>
<tr>
<td>Serve and storage utilization</td>
<td>10-20 percent</td>
<td>Eliminate capital expenditure</td>
</tr>
<tr>
<td>Self service</td>
<td>None</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Test provisioning</td>
<td>Weeks</td>
<td>Minutes</td>
</tr>
<tr>
<td>Change management</td>
<td>Months</td>
<td>Days or hours</td>
</tr>
<tr>
<td>Release management</td>
<td>Weeks</td>
<td>Minutes</td>
</tr>
<tr>
<td>Metering or billing</td>
<td>Fixed cost model</td>
<td>Granular</td>
</tr>
<tr>
<td>Standardization</td>
<td>Complex</td>
<td>Self-service</td>
</tr>
<tr>
<td>Payback period for new services</td>
<td>Years</td>
<td>Months</td>
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Cloud accelerates business value across a wide variety of domains.
Cloud Computing can provide dramatic, measureable value…
*IBM Technology Adoption Program example*

**Business Case Results**
Annual savings: $3.3M (84%)

**Without Cloud**
- New Development
- Software Costs
- Power Costs
- Labor Costs (Operations and Maintenance)
- Hardware Costs (annualized)

**With Cloud**
- Liberated funding for new development, transformation investment or direct saving
- Deployment (1-time)
- Software Costs
- Power Costs (- 88.8%)
- Labor Costs (- 80.7%)
- Hardware Costs (- 88.7%)

**Additional business benefits**
- Rapid provisioning
- Release management
- Metering and billing

Note: 3-Year Depreciation Period with 10% Discount Rate