Moving to Cloud Computing Step-by-Step
UNDERSTANDING THE RELATIONSHIPS

SOA

Enterprise Architecture

Cloud Computing
• One can consider cloud computing the extension of SOA out to cloud-delivered resources, such as storage-as-a-service, data-as-a-service, platform-as-a-service -- you get the idea.
• The trick is to determine which services, information, and processes are good candidates to reside in the clouds, as well as which cloud services should be abstracted within the existing or emerging SOA.
Software as a Service (SaaS)
*Finished applications that you rent and customize*

Platform as a Service (PaaS)
*Developer platform that abstracts the infrastructure, OS and middleware to drive developer productivity*

Infrastructure as a Service (IaaS)
*Deployment platform that abstracts the infrastructure*
• Describes Cloud Services Economy
• Building blocks: IaaS -> PaaS -> SaaS

Source: GoGrid
NIST defines cloud computing as a set of characteristics, delivery models, and deployment models.

### 5 Characteristics

- On-demand self-service
- Ubiquitous network access
- Resource pooling
- Rapid elasticity
- Pay per use

### 3 Delivery Models

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)

### 4 Deployment Models

- Private Cloud
- Community Cloud
- Public Cloud
- Hybrid Cloud
“THE CLOUD”? © Bick Group 2010

- Fixed, dedicated resources
- Hardware managed by others
- Shared applications
- Elastic Internet resources
- Provider-dedicated Web applications and Web content

Size of the cloudlets and overlap shown is not to scale

Source: Gartner Research
Organizing the Clouds
WHY CLOUD?

THE EXISTING TRAJECTORY IS NOT GOOD

$\text{Capability}$

- Cost
- MCP
UNDERSTANDING THE ROI

Graph showing the comparison between On-Premise and Cloud Computing costs over 5 years:

- On-Premise costs decrease sharply in the first year and remain constant thereafter.
- Cloud Computing costs remain constant throughout the 5 years.

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Cloud Delivered

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- Year 1
- Year 2
- Year 3
- Year 4
- Year 5

Cost of Cloud Computing Provider
Transactions / Day
“For the cloud, we're all in.”
Cloud Popularity = Hype

Source: CA
NEED A JOB?

**Job Trends** from Indeed.com

- cloud computing
CRAZY CLOUD WASHING

FREE
HOW-TO DVD

CLOUD WASH

Everything you need to create blue skies, fluffy clouds and dreamy creatures.

Life's too short for white walls.
Today’s Blog Reading:
The Fear Of Multi-tenancy
The cloud's conflict of interest over interoperability

It's time for cloud customers to vote with their dollars to get the openness and portability they've been promised

Interoperability is all the talk these days in the world of cloud computing. The PowerPoint presentations speak for themselves in their descriptions of the ability to move data, code, and even virtual machines and binary images among clouds, both private and public, with drag-and-drop ease.

Indeed, there is no real reason we can't move quickly in this direction. Many cloud providers use similar internal architectures and virtualization technology approaches, as well as similar API architectures. That provides the potential basis for interface and platform compatibility.
Connectivity becomes more challenging than ever

A “Connectivity Explosion”

• Applications, formats, APIs, protocols, standards, etc.
• Connected business partners

Connectivity neither trivial nor static:

• Incompatible structures, semantics, business rules
• No mature standards
• Changes abound
• Not easy to create robust Web services interfaces

Source: Pervasive Software
Data volumes increases at an explosive rate

Data subject to Sarbanes-Oxley, Basel II or other governmental regulation

1 Exabyte = 1 quintillion bytes

© Bick Group 2010
Rising TCO Joins Significant Integration Requirements as Top Criteria Promoting the Transition to On-Premises

Survey question: Why is your organization currently transitioning from a SaaS solution to an on-premises solution?

- Integration Requirements Became too Significant: 56%
- Data Security Requirements Increased: 44%
- Change in Business Sourcing Strategy: 37%
- Application Did Not Scale Well: 30%
- Insufficient User Adoption: 30%
- SaaS Used as Prototype Only: 30%

N = 27

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CLOUD ABSTRACTION

Task Routing

Cloud A

Cloud B

Cloud C
Dynamic Workload

Remote cloud (large, pay per use)

Local data center (small, dedicated)

5% workload, 1% time

Workload factoring

95% workload, 100% of time

Source: NEC
HERE WE GO AGAIN?
“Cloud-computing will help to optimize the Federal data facility environment and create a platform to provide services to a broader audience of customers.”

President's Budget for FY 2010
Section 9, Cross Cutting Programs
IT IS SKEPTICAL

• IT is understandably skittish about cloud computing.
• However, many of the cloud computing resources out there will actually provide better service than on-premise.
• Security and performance are still issues.
• Also, control.
“Why isn't your firm interested in pay-per-use hosting of virtual servers (also known as cloud computing)?”

<table>
<thead>
<tr>
<th>Concern</th>
<th>SMB</th>
<th>Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security concerns about security/privacy issues in virtualization or</td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td>cloud environments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too immature</td>
<td>40%</td>
<td>46%</td>
</tr>
<tr>
<td>We believe our total costs are cheaper</td>
<td>37%</td>
<td>39%</td>
</tr>
<tr>
<td>The offering capabilities don't match our needs</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>Specific compliance requirements that the service providers can't</td>
<td>19%</td>
<td>24%</td>
</tr>
<tr>
<td>meet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our application vendor or custom apps aren't compatible or won't</td>
<td>23%</td>
<td>28%</td>
</tr>
<tr>
<td>support it</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The performance isn't good enough</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Other reason</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Too difficult to understand</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Don't know</td>
<td>3%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Base: 267 SMB and 275 enterprise hardware decision-makers

Source: Enterprise and SMB North America and European Hardware Survey, Q4 2009
"Private Cloud Computing is Real – Get Over It"

- Tom Bittman – Gartner

<table>
<thead>
<tr>
<th>Category</th>
<th>Not aware (includes &quot;Don't know&quot;)</th>
<th>Not interested</th>
<th>Interested, but no budget for it</th>
<th>Interested, and planning budget for it</th>
<th>Implementing in the next 12 months</th>
<th>Already implemented</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global 2,000 enterprises</td>
<td>23%</td>
<td>29%</td>
<td>23%</td>
<td>12%</td>
<td>6%</td>
<td>6%</td>
<td>257</td>
</tr>
<tr>
<td>Very large enterprises</td>
<td>26%</td>
<td>30%</td>
<td>24%</td>
<td>13%</td>
<td>4%</td>
<td>3%</td>
<td>321</td>
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<tr>
<td>Large enterprises</td>
<td>20%</td>
<td>38%</td>
<td>21%</td>
<td>13%</td>
<td>5%</td>
<td>3%</td>
<td>384</td>
</tr>
<tr>
<td>Medium-large businesses</td>
<td>22%</td>
<td>35%</td>
<td>23%</td>
<td>13%</td>
<td>5%</td>
<td>2%</td>
<td>354</td>
</tr>
<tr>
<td>Medium-small businesses</td>
<td>27%</td>
<td>40%</td>
<td>18%</td>
<td>11%</td>
<td>1%</td>
<td>1%</td>
<td>387</td>
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<tr>
<td>Small businesses</td>
<td>36%</td>
<td>42%</td>
<td>12%</td>
<td>7%</td>
<td>1%</td>
<td></td>
<td>577</td>
</tr>
</tbody>
</table>

Base: hardware decision-makers at North American and European enterprises, midmarket companies, and small businesses

Source: Enterprise And SMB Hardware Survey, North America And Europe, Q3 2008

Source: Forrester Research, Inc.
However, not so fast.

• Not all computing resources should exist in the clouds, private or public.

• Cloud computing is not always cost effective.

• Do your homework before making the move.
<table>
<thead>
<tr>
<th>A Fit When:</th>
<th>Not A Fit When:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processes, applications, and data are largely independent</td>
<td>Processes, applications, and data are largely coupled</td>
</tr>
<tr>
<td>Points of integration are well defined</td>
<td>Points of integration are not well defined</td>
</tr>
<tr>
<td>Lower level of security is fine</td>
<td>Higher level of security is required</td>
</tr>
<tr>
<td>Core internal enterprise architecture is healthy</td>
<td>Core internal enterprise architecture needs work</td>
</tr>
<tr>
<td>Web is the desired platform</td>
<td>The application requires a native interface</td>
</tr>
<tr>
<td>Cost is an issue</td>
<td>Cost is an issue</td>
</tr>
<tr>
<td>Applications are new</td>
<td>Application is legacy</td>
</tr>
</tbody>
</table>
Path to clouds: start with the architecture

Understand:
• Mission drivers
• Information under management
• Existing services under management
• Core business processes
Business Case

For the Cloud

AS-IS

TO BE

DEPLOY

SECURITY

Data

Services

Process

GOVERNANCE
For the Cloud

AS-IS  TO BE  DEPLOY

SECURITY

Data  Services  Process  Platform
Private, Public, Hybrid

GOVERNANCE
For the Cloud

AS-IS

TO BE

DEPLOY

SECURITY

Provider Technology Selection & Validation

Development & Testing

Migration & Testing

Final Deployed Target Architecture

GOVERNANCE
INFORMATION MODEL

Create the Information Model

Understand Ontologies

Understand the Data

Catalog the Data

Build Information Model

LEGACY METADATA

EXTERNAL METADATA (B2B)

ONTOLOGIES

DATA DICTIONARY & METADATA

DATA CATALOG

INFORMATION MODEL

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Create a Service Model

DATA CATALOG

INFORMATION MODEL

Understand Services

Information to Services

Build Service Model

CANDIDATE SERVICES

SERVICES & INFORMATION

SERVICE MODEL
1. Access the mission.
2. Access the culture.
3. Access the value.
4. Understand your data.
5. Understand your services.
6. Understand your processes.
7. Understand the cloud resources.
8. Identify candidate data.
9. Identify candidate services.
10. Identify candidate processes.
11. Create a governance strategy.
12. Create a security strategy.
13. Bind candidate services to data and processes.
15. Implement security.
16. Implement governance.
17. Implement operations.
DON’T FORGET

Cloud Computing PODCAST

Episode 100 Last Week!
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