The Information Assurance Practices of Cloud Computing Vendors

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- Introduction
- Types of Cloud Services
- Information Assurance
- Attributes of Cloud Vendors
- Data Collection
- Results and Analysis
Introduction

- Cloud computing offers dynamically scalable and virtualized resources as services over the Internet.

- Cloud computing privacy and security concerns remain a major impediment.

- Looked at security, privacy, and business integrity.

- Compared type of cloud service, online traffic, company size.
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Types of Cloud Services(1)

- Infrastructure-as-a-Service (IaaS)
- Platform-as-a-Service (PaaS)
- Software-as-a-Service (SaaS)
Types of Cloud Services (2)

**Infrastructure-as-a-Service (IaaS)**


- Further categorize:
  - Hardware-aaS (Amazon Web Services).
  - Database-aaS (Oracle).
  - Storage-aaS (Amazon Simple Storage Service).
Types of Cloud Services (3)

- Platform-as-a-Service (PaaS)

  - Computing Platform and Solution Stack.
  
  - Consumers have control over the deployed applications and hosting environment configurations.
  
  - EX: Google App Engine.
Types of Cloud Services (4)

- **Software-as-a-Service (SaaS)**

  - The customer through a thin client interface such as a Web browser.

  - That customers are unaware of where the computation occurs.

  - EX: Google, Microsoft, etc.
### Types of Cloud Services (5)

<table>
<thead>
<tr>
<th>Service</th>
<th>Benefits</th>
<th>Vendors</th>
</tr>
</thead>
</table>
| Infrastructure-as-a-service (IaaS) | Lower IT infrastructure, administrative, maintenance costs. | • Microsoft SQL Azure  
• The Rackspace Cloud  
• Oracle  
• EnterpriseDB |
| Platform-as-a-service (PaaS) | Cost reduction, especially in ensuring security, scalability, failover services. | • Google App Engine  
• Sun Microsystems  
• GoGrid |
| Software-as-a-service (SaaS) | Low initiating costs, painless upgrades, seamless integration, easy customization, managed service-level agreements. | • Salesforce.com CRM  
• 3Tera  
• IBM M Lotus Live |
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Information Assurance(1)

- Complexity in a cloud computing world.
- Loss of direct control of resources and increased liability.
- Reliability loss is another distinct risk.
- It also offers some distinct benefits.
Information Assurance(2)

- Security
- Privacy
- Business Integrity
Information Assurance(3)

- Security:
  - There is a high possibility of security threats in the cloud.
  - Cloud providers can invest in better security controls through scale economies.
  - 64 percent of respondents in the US federal.
Privacy:

- Cloud computing clients have major concerns regarding privacy.

- Clients want to view access logs and audit trails.
Information Assurance (5)

Business Integrity:

- Business continuity and uptime are important issues.

- Performing integrity checks on the migrated data.
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Attributes of Cloud Vendors(1)

- We began with three hypotheses:
  - Cloud Service Type
  - Online Traffic
  - Company Size
Attributes of Cloud Vendors(2)

Cloud Service Type:

- Clients accessing different kinds of cloud services might have different information assurance priorities.

- Different cloud service types bring out significant differences in information assurance practices.
Attributes of Cloud Vendors (3)

Online Traffic:

- Reputation is a critical factor in trusting e-commerce companies.
- We therefore use online site traffic as a proxy for a cloud vendor’s reputation.
Attributes of Cloud Vendors(4)

- Company Size:

  - E-commerce consumers’ trust is also positively influenced by the size of the company offering online services and products.

  - We believe that the size of the employee pool is a reasonable proxy for capturing cloud vendor size.
Attributes of Cloud Vendors(5)

From:
- Forrester Research
- Focus Magazin
- CIO magazine
- HostReview
- Vendorrate. Com

<table>
<thead>
<tr>
<th>Cloud computing vendor</th>
<th>Online traffic</th>
<th>Company size</th>
<th>Cloud type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CloudWorks</td>
<td>Low</td>
<td>Small</td>
<td>IaaS</td>
</tr>
<tr>
<td>Enki Consulting</td>
<td>Low</td>
<td>Small</td>
<td>IaaS</td>
</tr>
<tr>
<td>JungleDisk</td>
<td>Low</td>
<td>Small</td>
<td>SaaS</td>
</tr>
<tr>
<td>3Tera</td>
<td>Low</td>
<td>Small</td>
<td>SaaS</td>
</tr>
<tr>
<td>Cloud9 Analytics</td>
<td>Low</td>
<td>Small</td>
<td>SaaS</td>
</tr>
<tr>
<td>Absolute Performance</td>
<td>Low</td>
<td>Small</td>
<td>SaaS</td>
</tr>
<tr>
<td>Vertica</td>
<td>Low</td>
<td>Medium</td>
<td>IaaS</td>
</tr>
<tr>
<td>EnterpriseDB</td>
<td>Low</td>
<td>Medium</td>
<td>IaaS</td>
</tr>
<tr>
<td>GoGrid</td>
<td>Low</td>
<td>Medium</td>
<td>PaaS</td>
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<tr>
<td>Layered Technologies</td>
<td>Low</td>
<td>Medium</td>
<td>IaaS</td>
</tr>
<tr>
<td>IBM Lotus Live</td>
<td>Low</td>
<td>Large</td>
<td>SaaS</td>
</tr>
<tr>
<td>CloudAppy</td>
<td>Low</td>
<td>Large</td>
<td>SaaS</td>
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<tr>
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<td>IaaS</td>
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<tr>
<td>EngineYard</td>
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<td>Small</td>
<td>PaaS</td>
</tr>
<tr>
<td>NetSuite CRM+</td>
<td>Medium</td>
<td>Large</td>
<td>SaaS</td>
</tr>
<tr>
<td>Yahoo Zimbra</td>
<td>Medium</td>
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<td>SaaS</td>
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<tr>
<td>Accenture</td>
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<td>Large</td>
<td>PaaS</td>
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<tr>
<td>Sun Microsystems</td>
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<td>Large</td>
<td>PaaS</td>
</tr>
<tr>
<td>Oracle</td>
<td>High</td>
<td>Large</td>
<td>IaaS</td>
</tr>
<tr>
<td>Microsoft Office Live†</td>
<td>High</td>
<td>Large</td>
<td>SaaS</td>
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<tr>
<td>Salesforce.com</td>
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<tr>
<td>Amazon</td>
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</tr>
<tr>
<td>Google Apps Engine†</td>
<td>Very high</td>
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<td>PaaS</td>
</tr>
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Data Collection

- We used a questionnaire based on the three dimensions—Security, Privacy and Business Integrity.

  - Security - Different information assurance regulations.

  - Privacy - Vendors grant flexibility to users on data control.

  - Business Integrity - pertained to business continuity issues.
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Results and Analysis (1)

- By Cloud Service Type:
  - PaaS vendors place less emphasis on privacy.
  - SaaS to provide better assurances on privacy.
Results and Analysis(2)

- By Online Traffic:
  - Unavailability indices versus site traffic.
  - The site traffic doesn’t appear to influence security practices.
Results and Analysis (3)

- By Company Size:
  - Negative indices versus company size.
  - Security different only between different-sized companies.
Results and Analysis(4)

Results:

- That privacy and security aren’t interpreted in a synonymous sense by vendors.

- That security practices aren’t influenced by the traffic attracted by the vendor.

- A considerable difference in privacy concerns between developed and developing countries.
End