THE NEXT GENERATION

Cloud computing – what we should be auditing

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IIA CONGRES 2017

What is cloud computing?

Model	Description	What it does	Examples
SAAS	**Software** as a service	Applications often available through a browser	Workday, Salesforce.com
PAAS	**Platform** as a service	Platform to allow customer to develop applications	Microsoft AZURE
IAAS	**Infrastructure** as a service	Servers, networks for clients to store data on – replaces your data center	Amazon Web Services, Google App engine

What is cloud computing?

Most common uses

1. Web hosting 76%
2. Email hosting 57%
3. Cloud storage and file sharing 48%

94 % of organisations have at least one Cloud service*

*Spiceworks

What does that mean for audit?

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Bad news You don’t know where the computers are, what is on them or what they do

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- **Top 4 suppliers of IAAS and PAAS have 63% of market ***
- **AWS, Microsoft, Google and IBM**
- **Are you a "big" customer for any of these?**

* Forrester 2017

What does that mean for audit?

Bad news You don't know where the computers are, what is on them or what they do

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Worst of all The top 4 commissioning departments are **IT, Marketing, Sales** and **HR**

What does that mean for audit?

Worst of all **The top 4 commissioning departments are IT, Marketing, Sales and HR**

Three **most common departments** funding cloud initiatives outside of IT.*

1. Marketing (45%),
2. Sales (43%)
3. Human Resources (40%)

**Cloud Computing Adoption Continues Accelerating In The Enterprise; Forbes*

What does that mean for audit?

Worst of all **The top 4 commissioning departments are IT, Marketing, Sales and HR**

Most popular individual cloud storage and file sharing providers employees are using…

…without IT approval* :

1. *72 %* **Dropbox**,
2. *60 %* **Google Drive**
3. *47 %* **OneDrive**

**Cloud Computing Adoption Continues Accelerating In The Enterprise; Forbes*

What does that mean for audit - consequences

If you don’t know where the computers are, what is on them or what they do…

… how do I audit what I used to be able to audit?

What does that mean for audit - consequences

If you aren’t allowed to check them…

…how do you audit the cloud technology deployed

What does that mean for audit - consequences

If the business is using the cloud for “business reasons”…

….how do I audit the business benefits?

… how do I audit what I used to be able to audit?

Depends on the service

SAAS Application functionality only

PAAS All application based controls

IAAS All system based controls including operating systems and databases

- ❑ Check contract
- ❑ Contact supplier
- ❑ Certification – last resort

… how do I audit what I used to be able to audit?

Clarify what elements you want to review

- ❑ Application
  - ❑ Functionality
  - ❑ Segregation of duties
  - ❑ Field validation
  - ❑ Logical access controls
  - ❑ Patching and version
  - ❑ Disaster recovery
- ❑ Operating system
  - ❑ Logical access controls
  - ❑ Hardening standards
  - ❑ Patching
  - ❑ Admin access

… how do I audit what I used to be able to audit?

Clarify what elements you want to review

- Database
  - Logical access controls
  - Hardening standards
  - Patching and versions
  - Admin access
- Physical security
  - Access
  - Environmental hazards
  - Utilities

… how do I audit what I used to be able to audit?

	Now	Contract	Supplier	Certification
Application				
– Functionality				
– Segregation of duties				
– Field validation				
– Logical access controls				
– Patching and version				
– Disaster recovery				
Operating system				
– Logical access controls				
– Hardening standards				
– Patching				
– Admin access				
Database				
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2017

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	Previously	ALL Now
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– Functionality		
– Segregation of duties		
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If we can:

1. Audit the application
2. Get the right to audit in the contract
3. Persuade the supplier to allow us to audit
4. Assess the certification

… how do I audit the cloud technology deployed?

The cloud has unique features:

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The cloud has unique features:

1. Virtualization

… how do I audit the cloud technology deployed?

Virtualization

We are deploying VMware or equivalent technology so how does it work?

- This is a technical audit…
- …and you may not be allowed to do it.

And what exactly are we sharing anyway?

- Check Virtualization **operating systems** are hardened to prevent cross-contamination with other customer environments**.**

… how do I audit the cloud technology deployed?

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The cloud has unique features:

1. **Virtualization**
2. **Infrastructure**

… how do I audit the cloud technology deployed?

Infrastructure

- ❑ Can your infrastructure take it?
- ❑ Bandwidth to cloud?
- ❑ Network secure?
- ❑ Browsers up to date and patched?

… how do I audit the cloud technology deployed?

The cloud has unique features:

1. Virtualization
2. Infrastructure
3. **Authentication**

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Authentication

- ❑ VPNs?
- ❑ How do they ensure only your people can connect?

… how do I audit the cloud technology deployed?

The cloud has unique features:

1. Virtualization
2. Infrastructure
3. Authentication
4. **Performance**

… how do I audit the cloud technology deployed?

Performance

- **Issue management**
  - We are sharing, so our issues could be lost
  - How does help desk change?
- **System**
  - Performance in line with contract?

… how do I audit the cloud technology deployed?

The cloud has unique features:

1. Virtualization
2. Infrastructure
3. Authentication
4. Performance
5. Legal

… how do I audit the cloud technology deployed?

Legal

- **Data protection**
- **Jurisdiction**
  - ❑ Where is the data exactly?
- **Encryption**
  - ❑ Where is it encrypted – at rest, in transit?
  - ❑ Backups?
- **Data transferability** – can I move my data
- **Legal and Electronic Discovery**
  - ❑ **C**an we fulfil legal requirements?
- **Contract**
  - ❑ Confidentiality of data
  - ❑ Data retention

… how do I audit the cloud technology deployed?

The cloud has unique features:

1. Virtualization
2. Infrastructure
3. Authentication
4. Performance
5. Legal
6. **Business Continuity Plans**

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Why audit the benefits?

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Because its not delivering

Benefits claimed	%
Faster access to infrastructure	62
Higher availability	56
Faster to market / innovation	51
Higher performance/ legacy systems	38
Cost savings	35
IT staff efficiency/ customer service	34

Source: State of the cloud: Rightscale 2017

… how do I audit the business benefits?

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Because its not delivering

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… how do I audit the business benefits?

What does the business say the benefits are?

1. **Value for money from reduced costs / Capex**
2. **Faster to market/ innovation**
   - Agility leads to being able to do things like enter new markets, improved productivity and improved responsiveness to customers
3. **Higher performance/ replacing legacy systems so improved capability**
4. **Enabling business continuity / availability**
5. **Improved IT staff efficiency/ customer service support**
   - Focussed on core business
6. **Faster access to infrastructure/ scalability**
   - Easily deploy your application around the world

… how do I audit the business benefits?

What does the business REALLY think the benefits are?

Value for money **Cheap**

… how do I audit the business benefits?

What does the business <u>REALLY</u> think the benefits are?

Value for money
Faster to market

Cheap
Don't need IT interfering

… how do I audit the business benefits?

What does the business <u>REALLY</u> think the benefits are?

Value for money	Cheap
Faster to market	Don't need IT interfering
Replacing legacy systems	**Gets rid of old stuff**

… how do I audit the business benefits?

What does the business <u>REALLY</u> think the benefits are?

Value for money	Cheap
Faster to market	Don't need IT interfering
Replacing legacy systems	Gets rid of old stuff
Enabling business continuity	**No need for this now!**

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Improved customer support	**Gets rid of systems we don't like dealing with**.

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Value for money	Cheap
Faster to market	Don't need IT interfering
Replacing legacy systems	Gets rid of old stuff
Enabling business continuity	No need for this now!
Improved customer support	Gets rid of systems we don't like dealing with.
Fast access / scalability	**We can increase the size of storage without thinking about the cost or even why we are doing it.**

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Value for money What are the true costs

- Licences
- Operating costs
- CAPEX
- Training
- Cost savings

Remember – **IF** its cheap because **its controlled to the hosts concerns** not yours!

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Faster to market How long did it take them to implement?

- ❑ Initial project
- ❑ Subsequent implementations
- ❑ Change requests
- ❑ Issue clearance

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Replacing legacy

Did they get rid of the old stuff and…

… is control at a comparable level?

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Enabling BC

Did they set up new business continuity plans?

Did availability actually improve?

Can they cope with:

- ❑ DDoS
- ❑ Data centre failure
- ❑ Network failure
- ❑ Security breaches
- ❑ Technical issues

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Customer support How have they changed support arrangements?

- ❑ SLAs
- ❑ Contracts
- ❑ Helpdesk statistics
- ❑ System usage
- ❑ Customer feedback

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Scalability What have they changed?

- ❑ Integration and interfaces
- ❑ Up-scaling costs
- ❑ Flexibility usage
- ❑ Ability to change provider

… how do I audit the business benefits?

How to audit the benefits and stay relevant

Innovation What innovation?

- ❑ Fundamental changes to processes
- ❑ Functionality
- ❑ Technical innovation

In Summary

1. Focus on why you adopted the cloud
2. Understand key management concerns
3. Emphasis is on security, ROI and delivery against contract
4. Don’t rely on certification
5. Alarm bells

- ❑ 4th party cloud solutions
- ❑ Rogue departments
- ❑ No right to audit / limited access
- ❑ Vague benefits

Contact

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