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Governance and Control in the Cloud

Infrastructure as a Service

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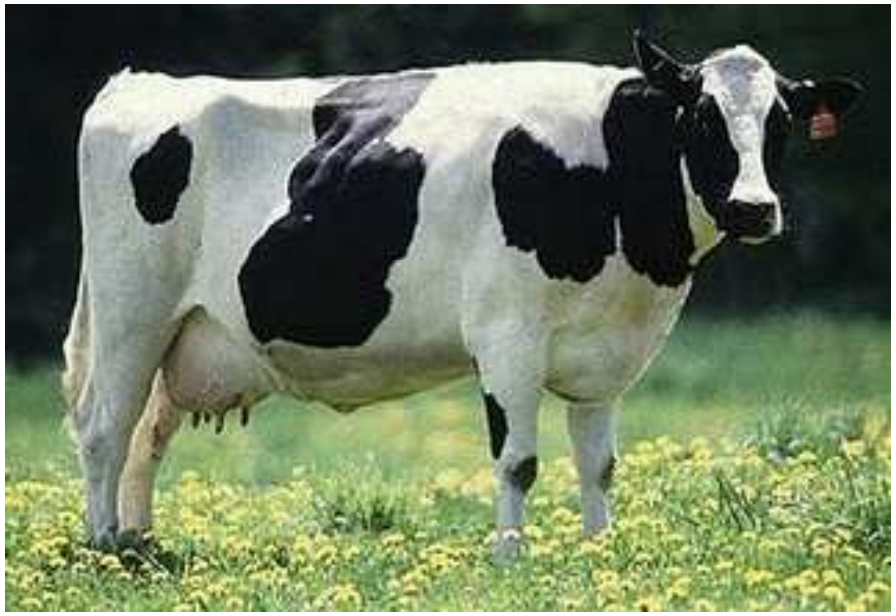
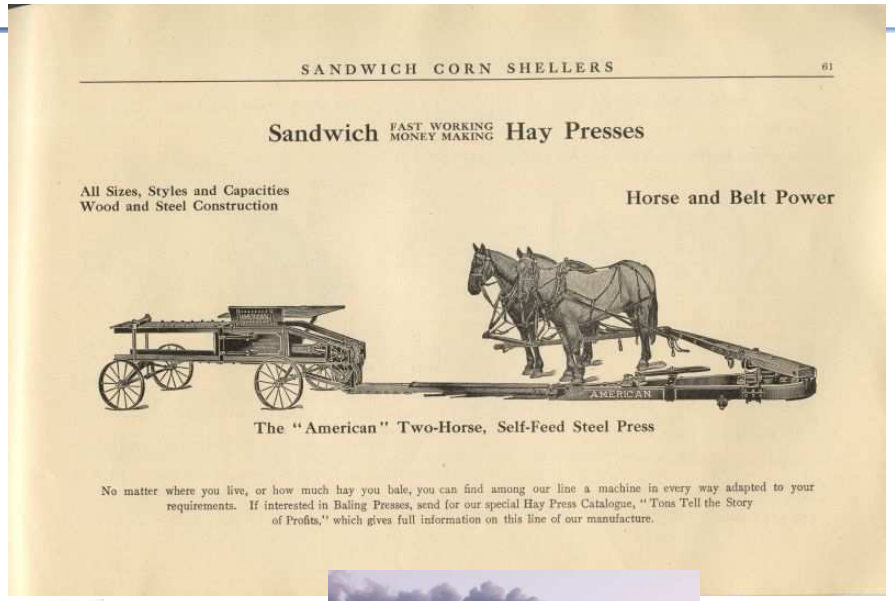
Cows



The Triumph of the Utility



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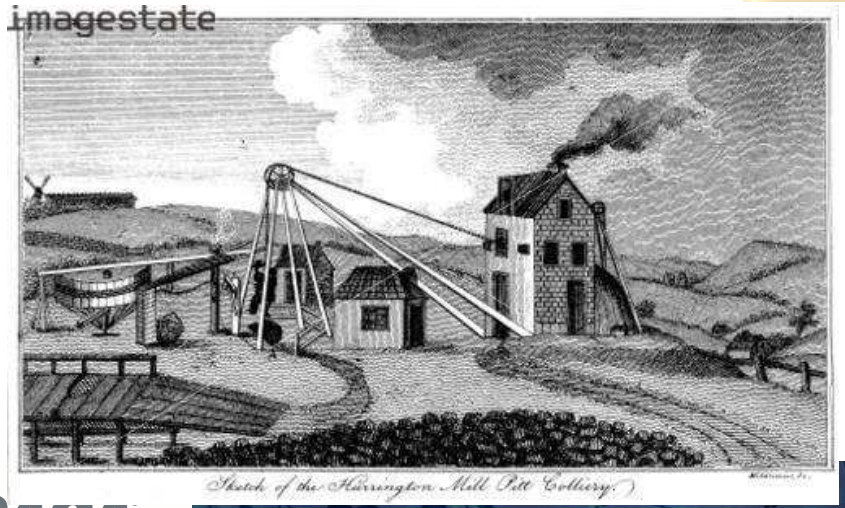

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Back to Business

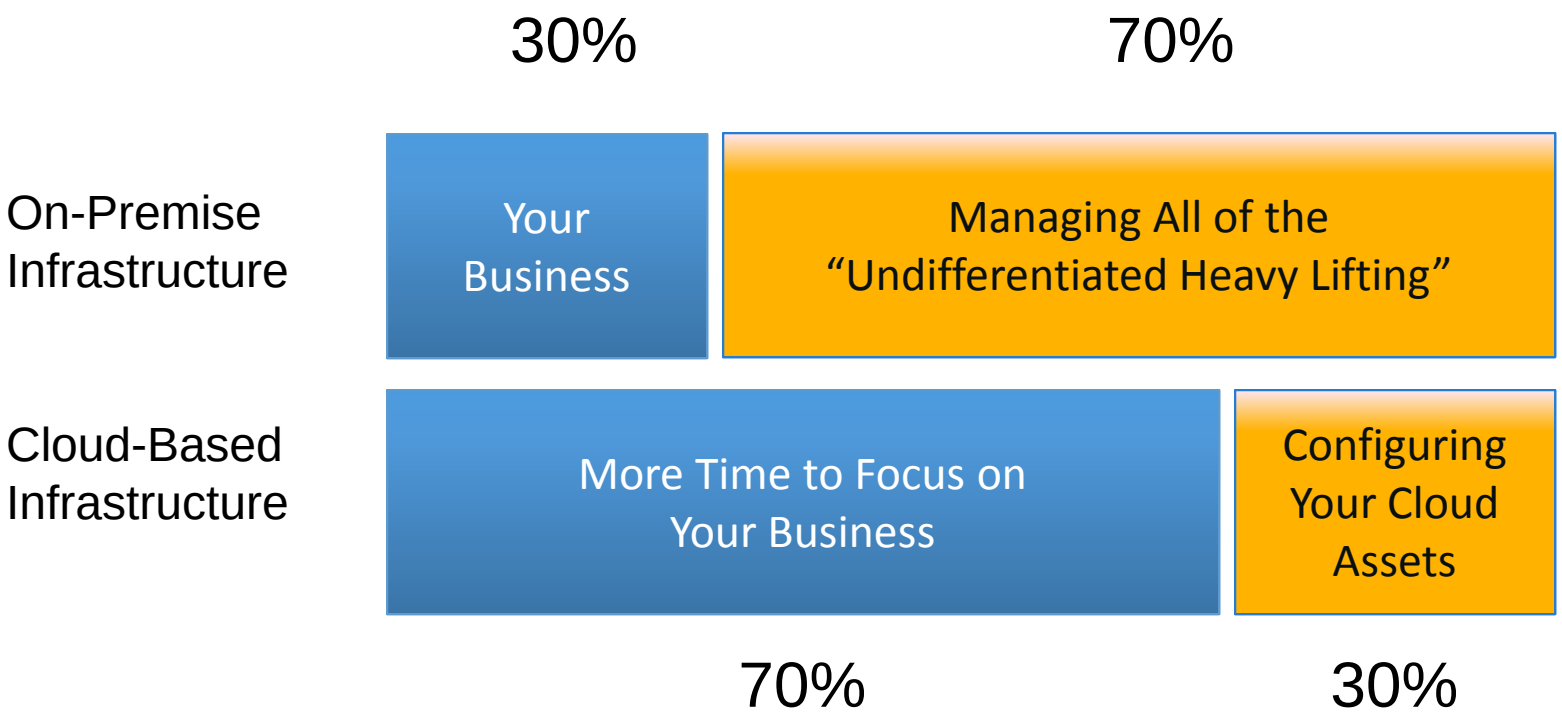
Our Discussion

- How we'll talk about Governance and Controls today
- Not an IT-assurance methodology discussion; an evaluation of controls based on IaaS-focused cloud services
- The next presentation will cover PaaS and SaaS controls

IaaS/Customer Shared Responsibilities

- Moving IT infrastructure to an IaaS creates a model of shared responsibility
- This shared model can help relieve customer's operational burden as the IaaS operates, manages and controls IT system components
- This customer/IaaS shared responsibility model also extends to IT controls

What to spend time on?



Evaluating and Integrating IaaS Controls

- Achieving information security compliance can be done:
  - In a detailed way (looking at individual controls)
  - In a general way (looking at an entire control environment, including subjective factors)
- When working with IaaS providers, you also have options:
  - Require service provider to publish specific controls, with pass/fail audits
  - Require service providers to adhere to a broad standard, and rely on a process or security certification

IaaS Control Governance - Summary

- Four categories of controls:
  - **General control considerations** – these are general considerations and are primarily mitigated by cloud provider selection
  - **Technology controls** – these are features of the service offered that allows the customer to implement and validate their own controls
  - **Report/certification controls** – IaaS service providers can identify specific controls, either in a SOC1/SOC2 report (specific identification) or an industry certification to a known standard (general reliance)
  - **SLA controls** – These controls can be implemented in the Service Level Agreement (SLA) and/or in the Enterprise Agreement (sales contract)

IaaS Control Governance
General Control Considerations

- Who owns which controls?
- Is compliance with industry-specific objectives (HIPAA, PCI, etc.) possible?
- Capability to Scale. Does the provider allow customers to scale beyond the original agreement?
- Provider Sustainability. Does the service provider company have long term sustainability potential?

IaaS Control Governance Technology Controls

- Network, Server, and Application Security - Does the provider follow good security practices for these areas?
- Client-side Protection - Does the cloud provider allow customers to secure and manage access from clients, such as PC and mobile devices?
- Data Location - Where does customer data reside?
- Multi-tenancy security - Is customer segregation implemented securely?
- Data isolation - Does the cloud provider adequately isolate customer data?
- Data Erase Practices - Can new customers access “deleted” data from another customer?
- Hypervisor vulnerabilities - Has the cloud provider addressed known hypervisor vulnerabilities?
- Encryption - Do the provided services support encryption?
- Identity and Access Management - Does the service include IAM capabilities?
- Data portability - Can the data stored with a service provider be exported upon customer request?
- Customer business continuity - Does the service provider allow customers to implement a business continuity plan?
- Backups - Does the service provide backups to tapes/optical media?

IaaS Control Governance Report/Certification Controls

- Vulnerability management - Are systems patched appropriately?
- Employee User Access - Does the provider effectively control internal and vendor user access?
- Logical Security - Does the provider follow good logical security practices?
- Physical Security - Does the provider follow good physical security practices?
- Environmental Safeguards - Does the provider ensure environmental safeguards are in place?
- Data Integrity, Availability and Redundancy - How does the provider ensure data integrity, availability, and redundancy?
- Right to Audit - Can customers perform audits on CSP's premise?
- Third Party Access - Are third parties allowed access to the cloud provider data centers?
- Privileged Actions - Are privileged actions monitored and controlled?
- Insider Access - Does the cloud provider address the threat of inappropriate insider access to customer data and applications?
- Physical and Environmental Controls - Are these controls operated by the cloud provider specified?
- Service Provider Business Continuity - Does the service provider operate a business continuity program?

IaaS Control Governance
SLA Controls

- Data Ownership - What are the cloud provider's rights over customer data?
- Price Increases - Will the service provider raise prices unexpectedly?
- Composite Services - Does the cloud provider layer its service with other providers' cloud services?
- Scheduled Maintenance Outages - Does the provider specify when systems will be brought down for maintenance?
- Service Availability - Does the provider commit to a high level of availability?
- Data Durability - Does the service specify data durability?
- Distributed Denial Of Service (DDoS) attacks - How does the provider protect their service against DDoS attacks?
- E-Discovery Support - Does the cloud provider meet the customer's needs to meet electronic discovery procedures and requirements?

IaaS Questionnaires - Out of Date Questions

Questions sometimes asked that will no longer be applicable using IaaS providers:

- Does the provider regularly back up all data to tape and store it offsite?
- Will the provider implement feature X or product Y in their data centers?
- How many people have access to the provider's facilities?
- Is the customer permitted to approve any maintenance, updates, or changes?

IaaS Opportunity – SOX

- SOX - key controls and obtaining “reasonable assurance” over the controls for financial reporting process
- Processing critical financial data in the cloud? If not, SOX generally does not apply directly
- If ITGC is key, a SAS70/SSAE 16 should suffice, as long as the report has coverage on needed ITGC controls
- If specific controls are key, then these controls will likely need to be called out on the SSAE16 report (more applicable to SaaS than IaaS)
- Substantive procedures also are possible as an alternative for some controls
- In the real world, most of the SOX controls will be controlled by the customer, as they manage and secure the OS, databases, transactions, etc.

IaaS Opportunity – PCI

- PCI compliance for an IaaS means that they manage Requirement 9, and you manage everything else (with some possible exceptions depending on the service)
- A “shared hosting provider” is not a service provider type defined by PCI; IaaS providers must be classified under the “other” category
- If your IaaS is a validated service provider, your QSA can rely on the CSP’s QSA work
- You need to define what is your responsibility vs. the CSP’s responsibility; the CSP will prepare a document outlining responsibilities by PCI DSS requirement for your QSA

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Questions?

Bio
Chad Woolf has spent the last 13 years working with cloud technologies, focused on the development and implementation of internet-delivered software, platforms, and infrastructure. He has specialized in managing the complexities of security, continuity, risk and compliance in a distributed IT environments and has advised large technology companies such as Microsoft, Computer Associates, Expedia, and Yahoo! Chad is a CPA and CISSP and is currently the Risk and Compliance Leader for Amazon Web Services.

You can connect with Chad in LinkedIn.