AWS Summit

Berlin

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Mapping traditional security technologies to AWS

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AWS' Compliance "Display Cabinet"

Certificates:

Programmes:

PCI DSS Level 1	HIPAA
SOC 1/ ISAE 3402	FedRAMP (SM)
SOC 2	DoD CSM Levels 1-2, 3-5
SOC 3	DIACAP and FISMA
ISO 9001	ISO 27001
IRAP (Australia)	MTCS Tier 3 Certification
FIPS 140-2	ITAR
CJIS	MPAA
CSA	G-Cloud
FERPA	Section 508 / VPAT

Why a Mapping of Security Controls?

- 2 primary reasons:
  - Dealing with Standards
  - Introducing the new, through the concepts of the familiar
- Also:
  - Tracking the state of the art
  - Enrico Fermi and Donald Rumsfeld

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Why a Mapping of Security Controls?

- PCI-DSS
  - standards for merchants which process credit card payments and have strict security requirements to protect cardholder data. A point-in-time certification.
- SOC 1-3
  - designed by the “big 4” auditors as an evolution of SSAE16 etc, and to address perceived shortcomings in ISO27001. A continuous-assessment certification, covering process and implementation.
- ISO 27001
  - outlines the requirements for Information Security Management Systems. A point-in-time certification, but one which requires mature processes.

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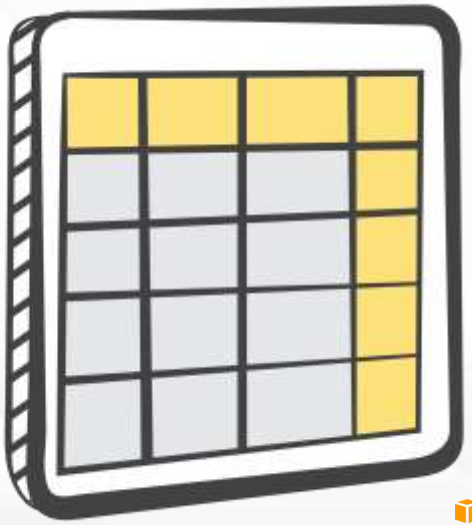
Standards, Controls and Commonality

- Controls overlap between standards
  - see eg https://www.unifiedcompliance.com
- AWS master control list and mappings
  - 1800+ internal controls
  - Mappings to external standards
  - Engage auditors, and…



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“Principles Rarely Change, but Implementations Do”

- Zeno’s Paradox: Achilles and the Tortoise
  - Technology (almost) always leads standards
  - In 2014, AWS made 516 feature updates (including new service launches)…
  - ISO27001, ISO9001, SOC1-3, PCI-DSS (and lots of others) are covered by various AWS services at the infrastructure and container layers – others aren’t
  - The AWS Marketplace is growing…

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AWS Marketplace: One-stop shop for security tools

Advanced Threat Analytics	Application Security	Identity and Access Mgmt	Server & Endpoint Protection	Network Security	Encryption & Key Mgmt	Vulnerability & Pen Testing
ALERTLOGIC	IMPERVA	CIPHERGRAPH networks	TREND MICRO	FORTINET	SafeNet	tenable network security
ALIEN VAULT	FORTINET	SECUREAUTH	intel Security	SOPHOS	Vormetric	QUALYSGUARD
	Barracuda	M-Pin SSO		Check Point We Secure the Internet.	HYTRUST	
				paloalto networks.		

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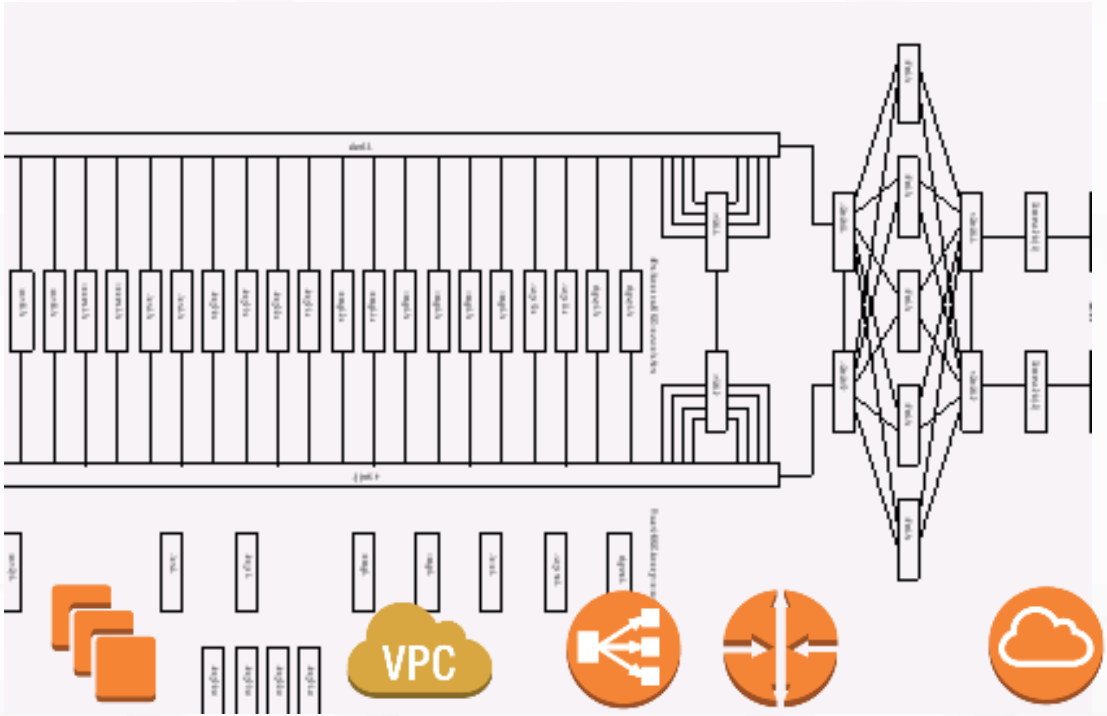
“When I were a Lad…”: Traditional Controls

Service networks looked like:



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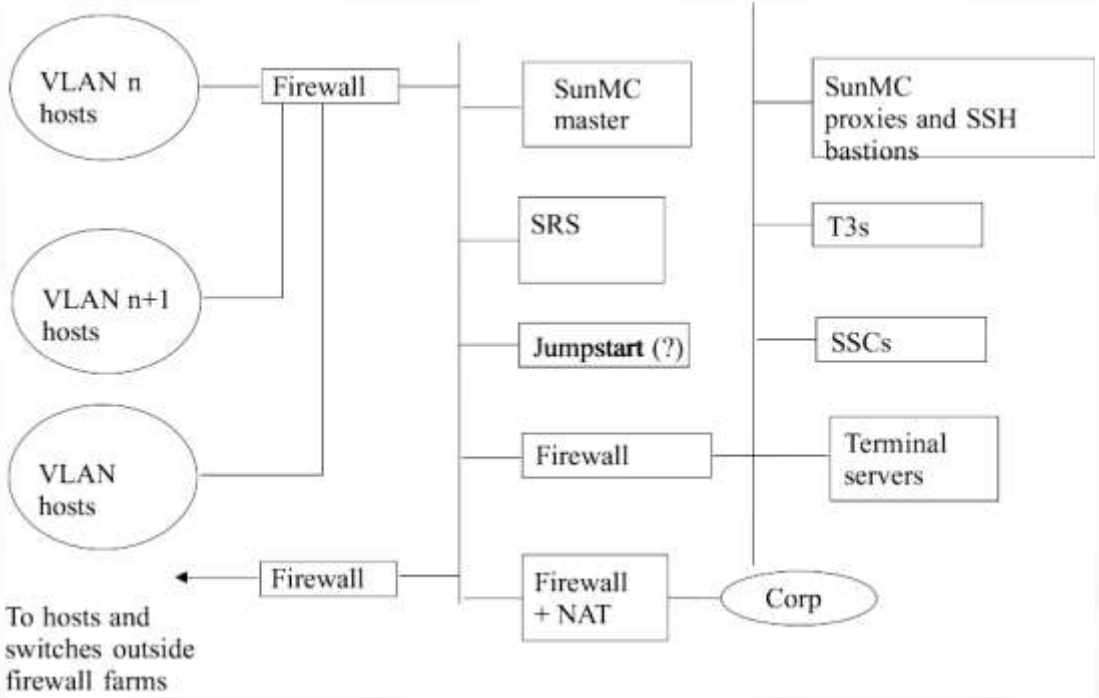
“When I were a Lad…”: Traditional Controls

Management networks looked like:



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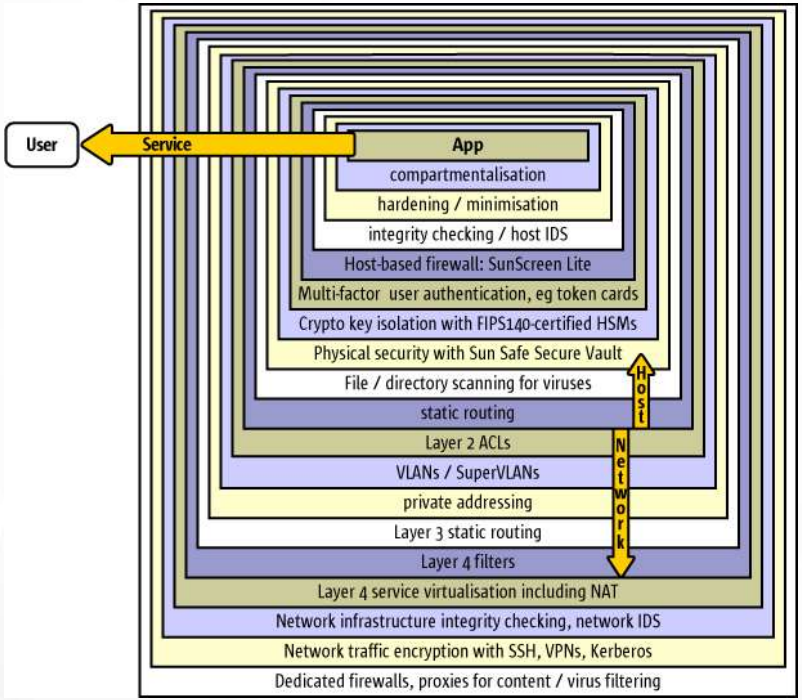
“When I were a Lad…”

Security technologies looked like:



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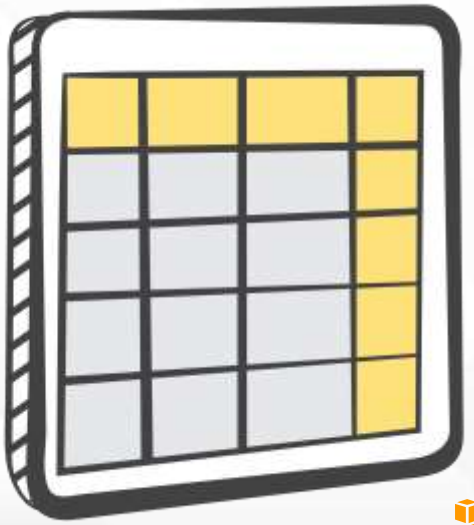
But:

- AWS security controls are rather more extensive
  - Can't readily be reduced to a 2D "onion"
    - (5 dimensions might about do it…)
- So, we have a table
  - And it's not small (circa 110 rows…)



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Start Here:

- Infrastructure meta-security
- Host security
- Network security
- Logging and Auditing
- Resilience
- User Access Control and Management
- Cryptography and Key Management
- Incident Response and Forensics
- “Anti-Malware”
- Separation of Duty
- Data Lifecycle Management
- Geolocation

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“Can our current Security Functions be mapped onto AWS?”

AWS Environment Management

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“Can our current Security Functions be mapped onto AWS?”

Network

AWS to Customer Networks →	Internet and/or Direct Connect
Layer 2Network Segregation →	Amazon VPC
Stateless Traffic Management →	Network Access Control Lists
IPsec VPN →	VPC VGW, Marketplace
Firewall/ Layer 3 Packet Filter →	Security Groups
IDS/IPS →	AWS CloudTrail, CloudWatch Logs,SNS, VPC Flow Logging
Managed DDoS Prevention →	Included in Amazon CloudFront

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Brand New DDoS Whitepaper:

- http://d0.awsstatic.com/whitepapers/DDoS_White_Paper_June2015.pdf

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“Can our current Security Functions be mapped onto AWS?”

Encryption, Key Management

Data-In-Flight	→	IPsec or TLS or your own
Volume Encryption	→	Amazon EBS Encryption
Object Encryption	→	AmazonS3 Encryption (Server and Client Side)
Key Management	→	AWS Key Management Service
Dedicated HSMs	→	AWS CloudHSM
Database Encryption	→	TDE (RDS / Oracle EE)
	→	Encrypted Amazon EBS (with KMS)
	→	Encrypted Amazon Redshift

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“Can our Current Security Functions be mapped onto AWS?”

Data Management

Hierarchical Storage	→	Amazon S3 Lifecycle
Deletion Protection	→	Amazon S3 MFA Delete
Versioning	→	Amazon S3 Versioning
Archiving	→	Amazon Glacier

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“Can our Current Security Functions be mapped onto AWS?”

Host / Instance Security

Traditional Controls	Traditional Controls (mostly)
Instance Management	Delete-and-promote
Incident Management	More alternatives!
Asset Management	“What the API returns, is true”
Instance Separation	PCI Level 1 Hypervisor
	Dedicated Instances

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“Can our Current Security Functions be mapped onto AWS?”

- For some functions, AWS architecture will take you in a particular direction – for other functions, AWS architecture allows you to do more interesting things than on-premise.
- Some examples:

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“Familiar functions, made Cloud scale”:

- IAM: “RBAC writ large”
  - Fine-grained privilege
  - Further access controls
    - Source IP
    - Time of day
    - Use of MFA
    - Region affected (a work in progress; works for EC2, RDS)
- Data Pipeline: “Cron writ large”

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Asset Management, Logging and Analysis:

- “What the API returns, is true”
- CloudTrail, Config, CloudWatch Logs
  - “Checks and balances”
  - S3 append-only, MFA delete
  - SNS for alerting
  - Easy building blocks for Continuous Protective Monitoring

AWS CloudTrail

AWS Config

CloudWatch

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IDS / IPS / WAF:

- Host vs network
  - Everything preventative needs to be inline
    - IPS / WAF in particular
    - Unless you wanted to have fun with RST packets
  - Dealing with autoscaling
  - Separation of Duty / managed service?
- VPC Flow Logging

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Immutability and Mandatory Access Control:

- S3 cross-account sharing
- SELinux on EC2
  - SELinux enforcing policy can be complicated to write – see eg http://www.tresys.com

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Incident Management:

- Traditional infrastructure:
  - Manage and Mitigate?
  - Pursue and Prosecute?
- Cloud gives you a third option:
  - Replicate, repair, ringfence and redirect
  - You’re back up and running, with previous environment isolated for forensic examination

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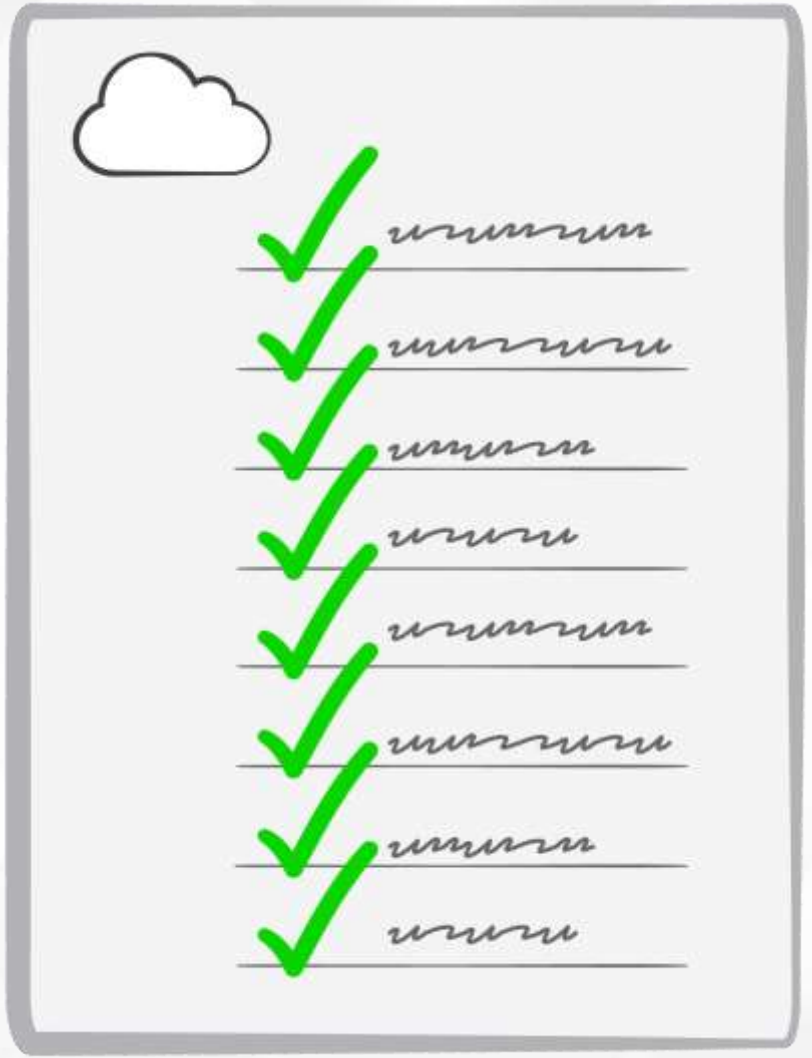
Regulatory Compliance:

- Deutsche BaFin, UK FCA
- French ASIP Santé
- …



Thank You

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PLACE

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