



Security Models for Cloud

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Introduction

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Companies:



Roles:

- Security Design Engineer
- Systems Engineer
- Sales Engineer
- Salesperson
- Business Development
- Global Account Manager

Actual work:

- Installation / Configuration
- Design
- Support
- Product development / POC
- Audit
- Penetration testing
- Sales / BD



CISSP Certification

- ♦ Access Control
- ♦ Application Security
- ♦ Business Continuity and Disaster Recovery Planning
- ♦ Cryptography
- ♦ Information Security and Risk Management
- ♦ Legal, Regulations, Compliance and Investigations
- ♦ Operations Security

The CISSP was the first credential in the field of information security, accredited by the ANSI (American National Standards Institute) to ISO (International Standards Organization) Standard 17024:2003. CISSP certification is not only an objective measure of excellence, but a globally recognized standard of achievement.



Agenda

- ✦ Security Consolidation
- ✦ The Business Need
- ✦ Cloud Security Models
 - ✦ Cloud Security
 - ✦ Security for Cloud Apps
 - ✦ Additional Security Concerns
- ✦ Who Pays this Guy?



Cloud, Defined

- ✦ NIST Definition*

- ✦ "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.



*SP800-145

Cloud

- ✦ Cloud Security, what does that mean?

- ✦ “Clean Pipe” or Security Services as a Utility

- ✦ Shared Services Model (Multi-tenancy)

- ✦ Integrating with the carrier backbone



- ✦ Cloud Computing

- ✦ SAAS, IAAS, PAAS need Security!

- ✦ How to provision? Is it VM? Is it appliance?



Security as a Service

Security as a Service (Cloud Security)

- * Alternative to purchasing premise equipment
- * Often provided by an Managed Security Services Provider / Carrier
- * No capital expenditure
- * Outsource log / compliance responsibilities
- *

M S S



- ✦ Managed Security Services, Why?

- ✦ Operational Benefits

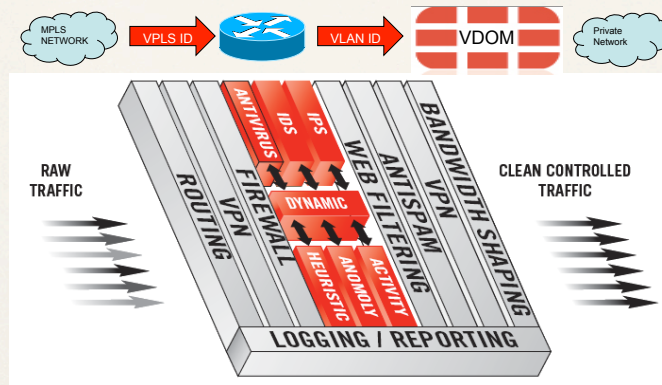
- ✦ No Capital Expenditure

- ✦ Displaced Accountability

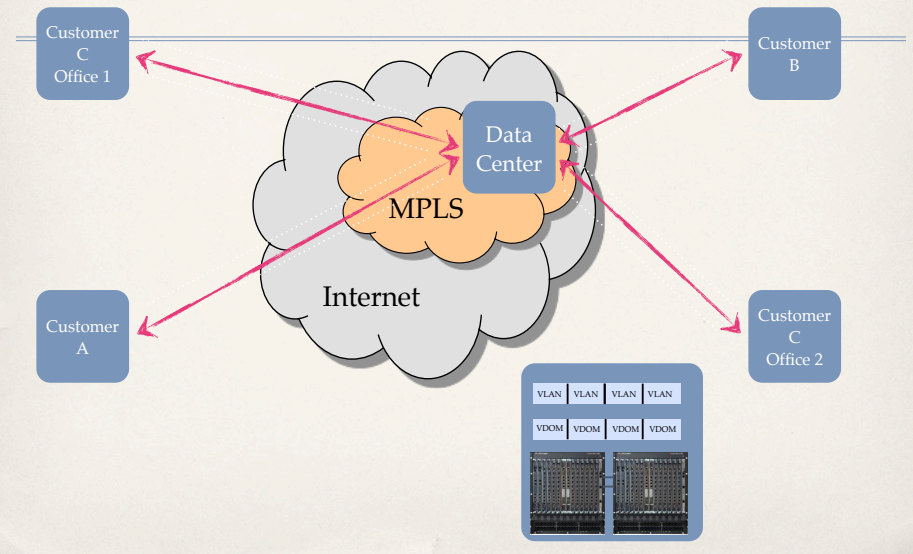
- ✦ “Pure play” vs. Bundled Services / Utility Model

- ✦ Cloud vs. CPE

Cloud Security / Clean Pipe



Cloud Security Example





Cloud Computing / Security

Why move to cloud computing?

- * Elastic Services
- * Pay as you go
- * Utility Computing
- * No capital expenditure
- * Offsite Storage
- * Disaster Recovery App Replication
- * Mobility applications
- * BYOD Support

Cloud Computing Offerings

- ✦ Infrastructure as a Service (Sometimes Hardware as a Service HAAS)
 - ✦ Outsourcing of equipment to SP - Examples are Storage, Processing, "Elastic Computing"
- ✦ Platform as a Service
 - ✦ Outsourcing of the computing platform to SP - Allows for custom development and flexibility (OS or web platform delivered as a service)
- ✦ Software as a Service
 - ✦ Complete application outsourced (WP, SF.com, etc.)

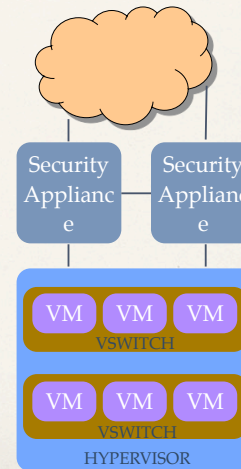
Securing Cloud Applications

- ✦ Most cloud applications are virtualized
- ✦ Hypervisor is a fundamental component
 - ✦ Hypervisor is a program that allows multiple operating systems to share a single hardware host. Each operating system appears to have the host's processor, memory, and other resources all to itself. However, the hypervisor is actually controlling the host processor and resources, allocating what is needed to each operating system in turn and making sure that the guest operating systems (called virtual machines) cannot disrupt each other. *
- ✦ Three primary methods of securing cloud apps
 - ✦ Extra-Hypervisor
 - ✦ Intra-Hypervisor
 - ✦ Host

*thanks techtarget

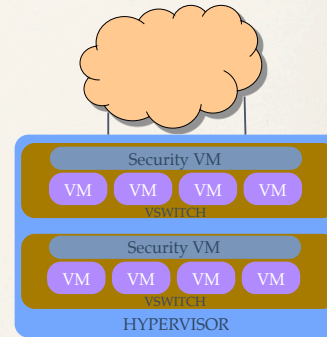
Extra-Hypervisor Security

- * Outside the VM platform
- * Typically an appliance
- * Pros: Fast / Mature
- * Cons: Lack of Visibility into VM space



Intra-Hypervisor Security

- * VM based
- * Typically leverages API for integration with the hypervisor
- * Pros: Visibility to intra-VM communication
- * Cons: Takes CPU from VM execution



The VM Security Problem

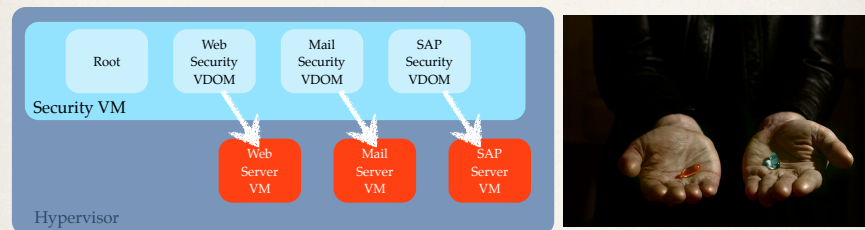
- ✦ VSwitch is not a switch
- ✦ VMWare has retracted some API options
- ✦ High Availability is more complicated
- ✦ Takes Resources from VM application operations
- ✦ *Easy* to create new applications!

Protected Provisioning

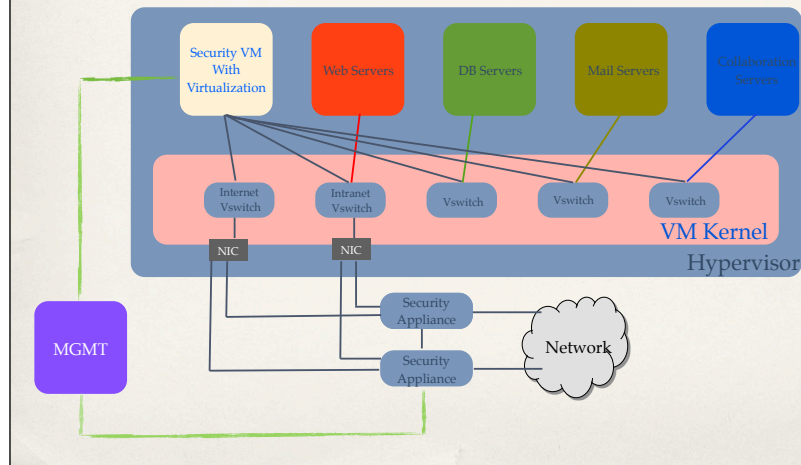
- ✦ VM security element is dynamically created based on policy.
- ✦ Application templates are pre-defined
- ✦ UTM Policy templates are pre-defined
 - ✦ Mail Server -> FW VM, IDP, AntiSpam
 - ✦ Web Server -> FW VM, WAF <- Automatic VA

The Wormhole

- ✦ Many security products have built in virtualization
- ✦ What happens when you virtualize them?



Combined Architecture





Additional Security Concerns

Do you *trust* Your Provider?

- * Multi-tenant Data Stores...what does that mean?
- * Cross contamination
 - * If another cloud customer is compromised, can it spread?
 - * Is the Hypervisor hardened?
 - * How is log data handled / stored?
 - * Forensics / Incident Response

The Legal Lag

- ✦ If an incident occurs, what is the provider's responsibility?
- ✦ How can log data be extracted? How quickly?
- ✦ Can data evidence be extracted in a legally admissible format?
- ✦ Does the contract allow you to run Incident Response test plans? Will the provider participate?



Cloud Security Alliance and NIST

NIST References

NIST Definition of Cloud Computing: SP 800-145

Guidelines on Security and Privacy in Public Cloud
Computing: SP 800-144

U.S. Government Cloud Computing Technology Roadmap,
Release 1.0: SP 500-293

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Cloud Security Alliance (CSA)

- * Vendor and customer supported organization driving standards in cloud computing and cloud security.
- * Sees itself as a “standards incubator”
- * Works closely with the Federal Government and NIST

Security Guidance

Security Guidance for Critical Areas of Focus in Cloud Computing.
14 Domains - Version 3.0 - <http://www.cloudsecurityalliance.org>

- ♦ Cloud Architecture
- ♦ Governance and Enterprise Risk Management
- ♦ Legal: Contracts and Electronic Discovery
- ♦ Compliance and Audit
- ♦ Information Management and Data Security
- ♦ Portability and Interoperability
- ♦ Traditional Security
- ♦ Business Continuity and Disaster Recovery
- ♦ Data Center Operations
- ♦ Incident Response
- ♦ Notification and Remediation
- ♦ Application Security
- ♦ Encryption and Key Management
- ♦ Identity and Access Management
- ♦ Virtualization and Security as a Service

CSA STAR

- * STAR = CSA SECURITY, TRUST AND ASSURANCE REGISTRY
 - * Cloud providers self assess their security
 - * Launched in Q4 of this year
 - * <https://cloudsecurityalliance.org/star/faq/>

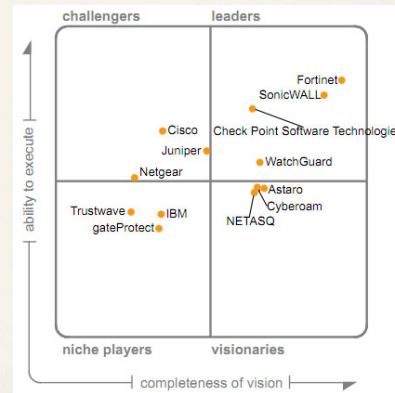
Concluding

- * Business finance objectives pushing enterprises to the cloud
- * Managed Services / Utility and Cloud Security offers a viable alternative to self managed
- * Evolution of physical to virtual driving security architecture in new directions
- * Policy and Process must be automated to ensure proper compliance and protection for virtual assets
- * The legal and audit standards have not caught up to cloud adoption
- * There is hope NIST / CSA

I Work @ FTNT



- ✦ Founded in 2000
- ✦ Nasdaq Listed FTNT
- ✦ ~1600 Employees
- ✦ Over 600k units shipped
- ✦ Over 100k customers



Thank You!

* Questions?

Consolidate, *they* said.

- ✦ Gartner
- ✦ IDC
- ✦ Frost & Sullivan

- ✦ Point of Failure, Multiple Consoles, Troubleshooting Difficulty, Licensing



U T M

* Unified Threat Management

- * Fortinet Maintains the Lead
- * Cisco and Juniper Follow


* Why UTM?

- * Consolidated Approach
- * Economic Benefits
- * Architectural Benefits
- * Security Benefits (Best of breed not best after all?)



<-- Not Rhetorical

Case Study - UTM

- ✦ Massive Organization
 - ✦ Too Many Internet Connections
 - ✦ Too Many Devices
 - ✦ Too Many Vendors
 - ✦ Too Many Management Consoles
- 
- ✦ **Carrier Partner Delivers Connectivity**
 - ✦ **Hosted Security in Wiring Center**
 - ✦ **Multitenant**
 - ✦ **Multi-discipline (UTM)**
 - ✦ **Customer Portal**