TREND MICRO™ Securing Your Web World

Next Generation Datacenters & the Realities of Virtualisation Security

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Agenda

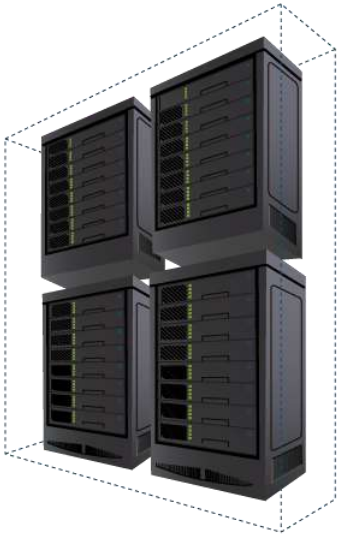
- The Dynamic Data Center & New Security Challenges
- Leveraging Virtualised Infrastructure for improved Security
- Deep Security 7: Overview
- Key Benefits
- Questions

The Dynamic Datacenter

Physical

8 million servers shipped in 2008, ~ 50 million servers deployed
- *IDC*

Virtualised



"30-40% of datacenters are now running critical applications on VMs." - *VMware*
"1 in 4 workloads deployed in 2008 to X86 server was to a VM"
- *Gartner*

Cloud computing

"By 2012, 40% of hardware Infrastructure spending will be as a service."
- *Gartner*

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Software Vulnerabilities are being Targeted

Gas refineries at Defcon 1 as SCADA exploit goes wild

September 8, 2008: Gasoline refineries, manufacturing plants and other critical facilities that rely on computerized control systems just became more vulnerable to tampering or sabotage with the release of attack code that exploits a security flaw in a widely used piece of software.

Critical Windows vulnerability under attack, Microsoft warns

May 28, 2009 Microsoft has warned of a critical security bug in older versions of its Windows operating system that is already being exploited in the wild to remotely execute malware on vulnerable machines.

Next-gen SQL injection opens server door: 1 in 10 sites naked

April 2, 2009 A vulnerability estimated to affect more than 1 in 10 websites could go lethal with the finding that it can be used to reliably take complete control of the site's underlying server.

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High profile breaches

Heartland Payment Systems

May-2008: Security breach cost $12.6 million so far, including legal costs and fines from MasterCard and Visa. More >>

fiserv.

Dec-2008: DNS hijacking puts 5,000,000 check processing accounts at risk. More >>

RBS WorldPay

Dec-2008: PII of 1.5M customers & 1.1M Social Security Numbers. More >>

Federal Aviation Administration

Mar-2009: Hackers hijack PII for 45,000 employees & retirees. More >>

TJX

Aug-2007: Hackers placed software on the company's network, and steal 45 M credit card #'s. Costs soar to $256 M. More >>

Cal University of California Berkeley

May-2009: Hackers broke into 2 databases over a 6 month period, and exposed the data of 160,000+ students. More >>

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Threat Environment

VULNERABILITIES

WEB THREATS

DATA STEALING MALWARE

BOTS

- **More profitable**
  - **$100 billion: Estimated profits from global cybercrime**
    -- *Chicago Tribune, 2008*
- **More sophisticated, malicious & stealthy**
  - **"95% of 285 million records stolen in 2008, were the result of highly skillful attacks"**
  - **"Breaches go undiscovered and uncontained for weeks or months in 75% of cases."**
    -- *Verizon Breach Report, 2009*
- **More frequent**
  - **"Harvard and Harvard Medical School are attacked every 7 seconds, 24 hours a day, 7 days a week."**
    -- *John Halamka, CIO*
- **More targeted**
  - **"27% of respondents had reported targeted attacks".**
    -- 2008 CSI Computer Crime & Security Survey

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Compliance Imperative

More standards:

- PCI, SAS70, HIPAA, ISO 27001, FISMA / NIST 800-53, MITS…

More specific security requirements

- Virtualization, Web applications, EHR, PII…

More penalties & fines

- HITECH, Breach notifications, civil litigation

> "DMZ consolidation using virtualization will be a "hot spot" for auditors, given the greater risk of misconfiguration and lower visibility of DMZ policy violation. Through year-end 2011, auditors will challenge virtualized deployments in the DMZ more than nonvirtualized DMZ solutions.
>
> Neil MacDonald, Gartner, June 2009"

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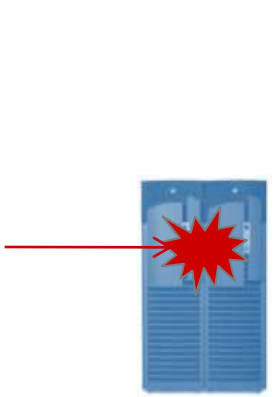
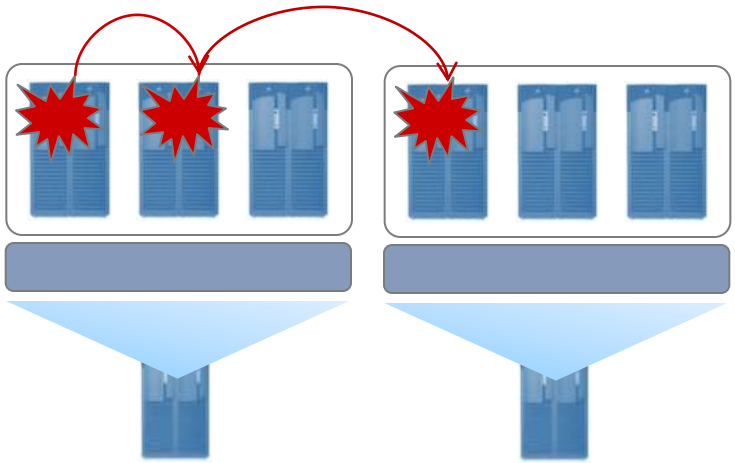
Perimeter defences alone are no longer sufficient

Physical Servers



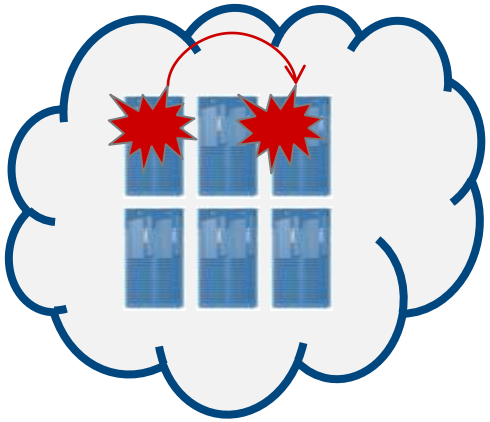
Servers under pressure
- Encrypted attacks
- Wireless networks
- Insider attacks
- Web app attacks

Virtualized Servers



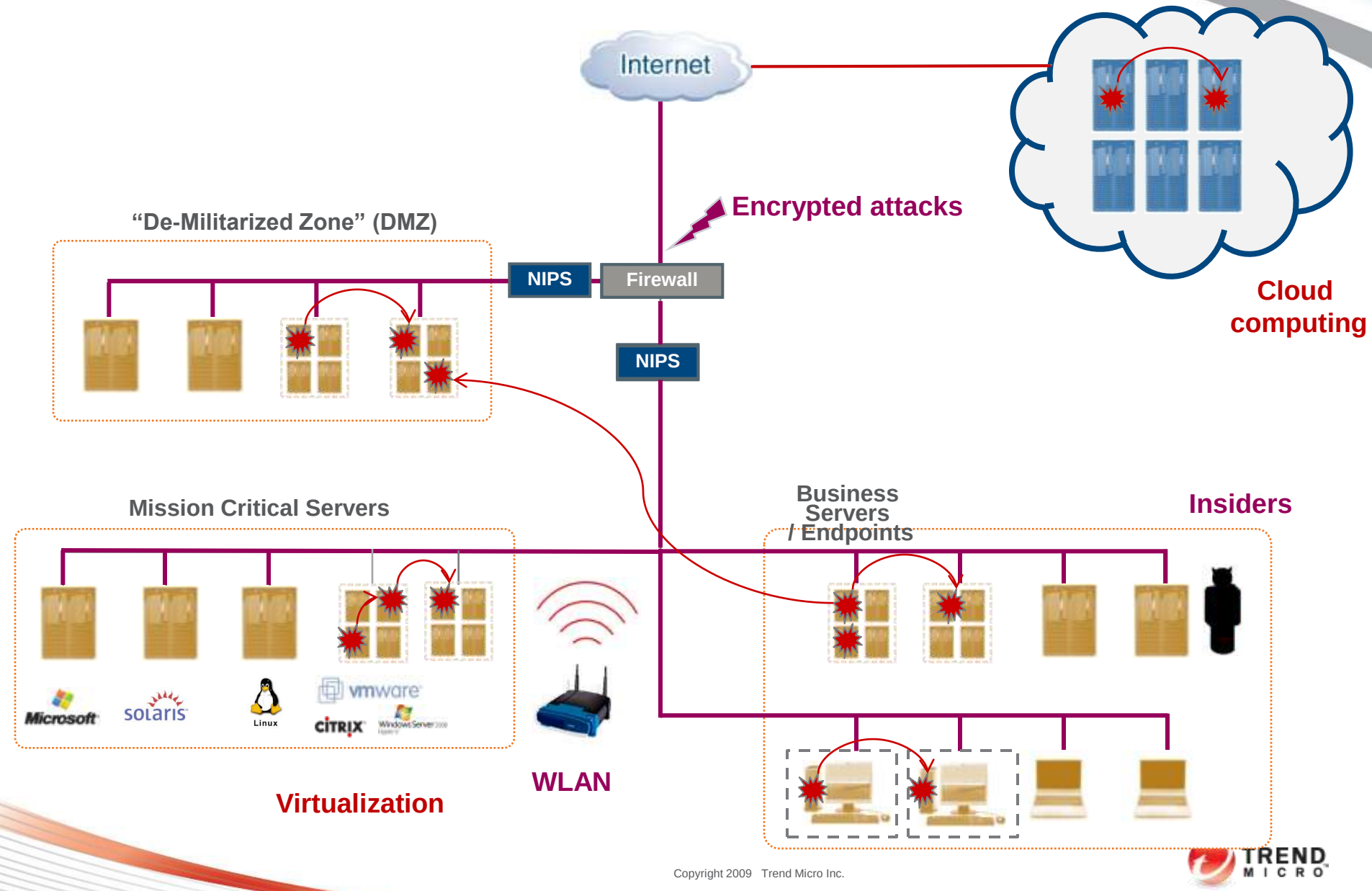
Servers in motion
- Hosting workloads of different sensitivities
- vMotion challenges
- VMs introduced quickly

Cloud Computing



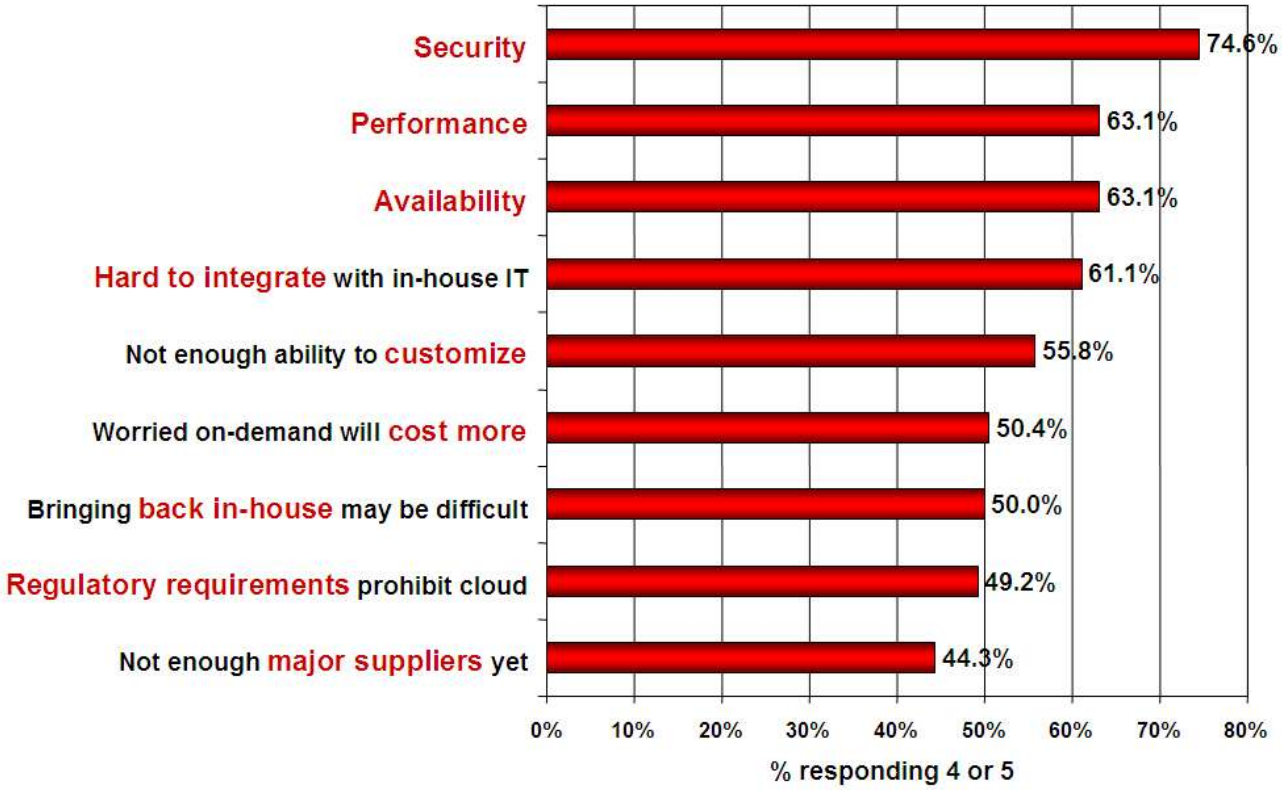
Servers in the open
- Your perimeter provides no protection.
- Cloud computing vendors provide basic, “lowest common denominator” security, which undermines your compliance

Perimeter is cracking



Cloud security is a recognised concern

Q: Rate the challenges/issues ascribed to the 'cloud'/on-demand model
(1=not significant, 5=very significant)



Source: IDC Enterprise Panel, August 2008 n=244

New approaches will be needed to secure cloud-based IT services."

Gartner
***"Cloud-Based Computing Will Enable New Security Services and Endanger Old Ones,"* June 2008**

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Security Challenges

Challenges	Virtualisation	In Cloud
Dynamic virtual machines: VM Sprawl	✓	
Vulnerability exploits & patch management	✓	✓
Web application threats	✓	✓
System & data integrity: compromise via co-location	✓	✓
Policy & compliance	✓	✓
Rogue corporate resources		✓
Service provider security		✓

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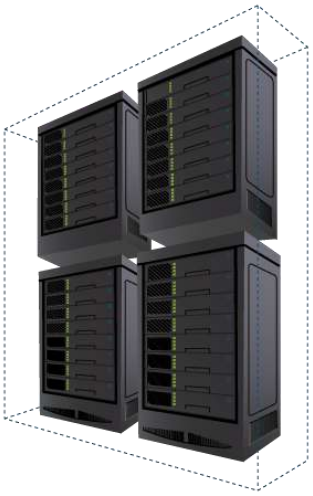
Dynamic Virtual Machines

Dynamic:



→ Reverted

→ Paused

→ Restarted

→ Cloned

→ Moved

Security challenges

- Achieve and maintain consistent security
  - Propagation of vulnerabilities and configuration errors
  - Maintaining an auditable record of the security state

Vulnerability Exploits & Patch Management

"90% of known *"vulnerabilities that were exploited had patches available for at least six months prior to the breach"*

Verizon, 2008

- Cloud-based perimeter control only provides lowest common denominator
- Client perimeter does not protect virtual machines deployed in an external cloud
- Firewall and IDS/IPS functionality can be deployed to protect each VM instance

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Web Application Threats

- SQL injections flaws are the most widespread web application vulnerability type
- Affects commercial and custom web apps
- Web app protection can be deployed in software to protect web apps deployed in cloud

"74% of Web Applications vulnerabilities disclosed had no patch available by end of year"

IBM, 2008

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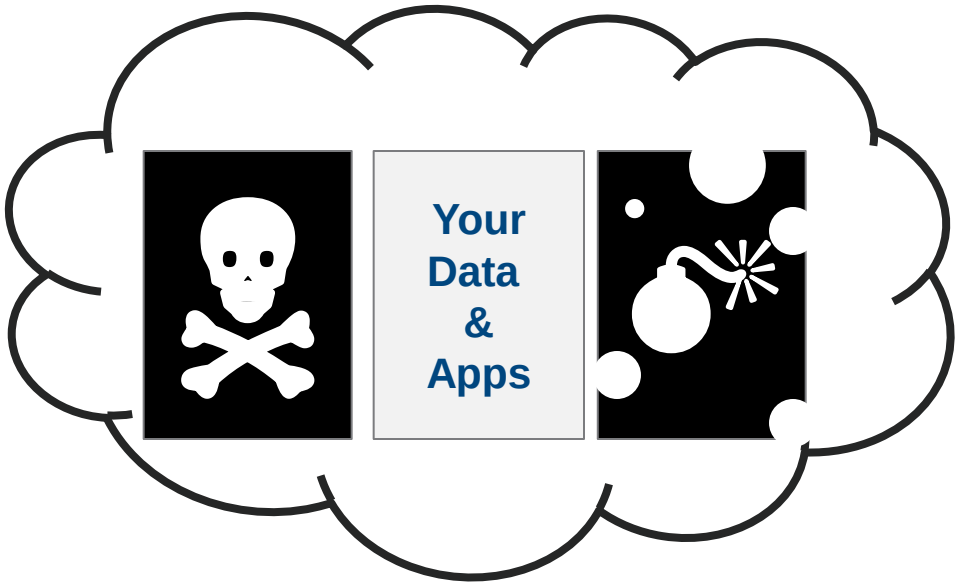
System & Data Integrity

"59% of data breaches resulted from hacking and intrusions"
Verizon, 2008



Security Issues:

- Shared physical infrastructure
- Malicious or unauthorised changes

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Policy & Compliance

- Compliance pressures:
  - PCI, HIPAA, SAS70, ISO, FISMA, COBIT/ COSO…

Challenge:

How do you prove compliance when your servers are in the cloud?

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Leveraging Virtualisation Infrastructure for improved security

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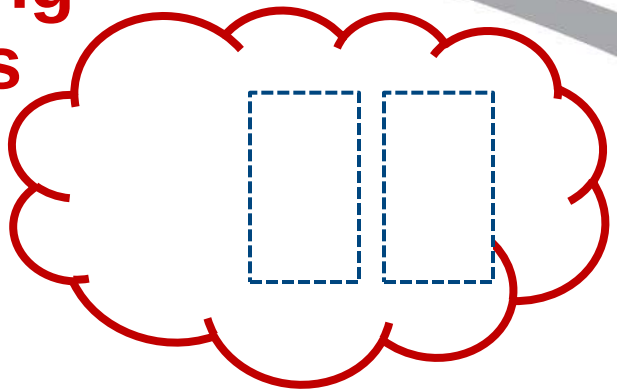
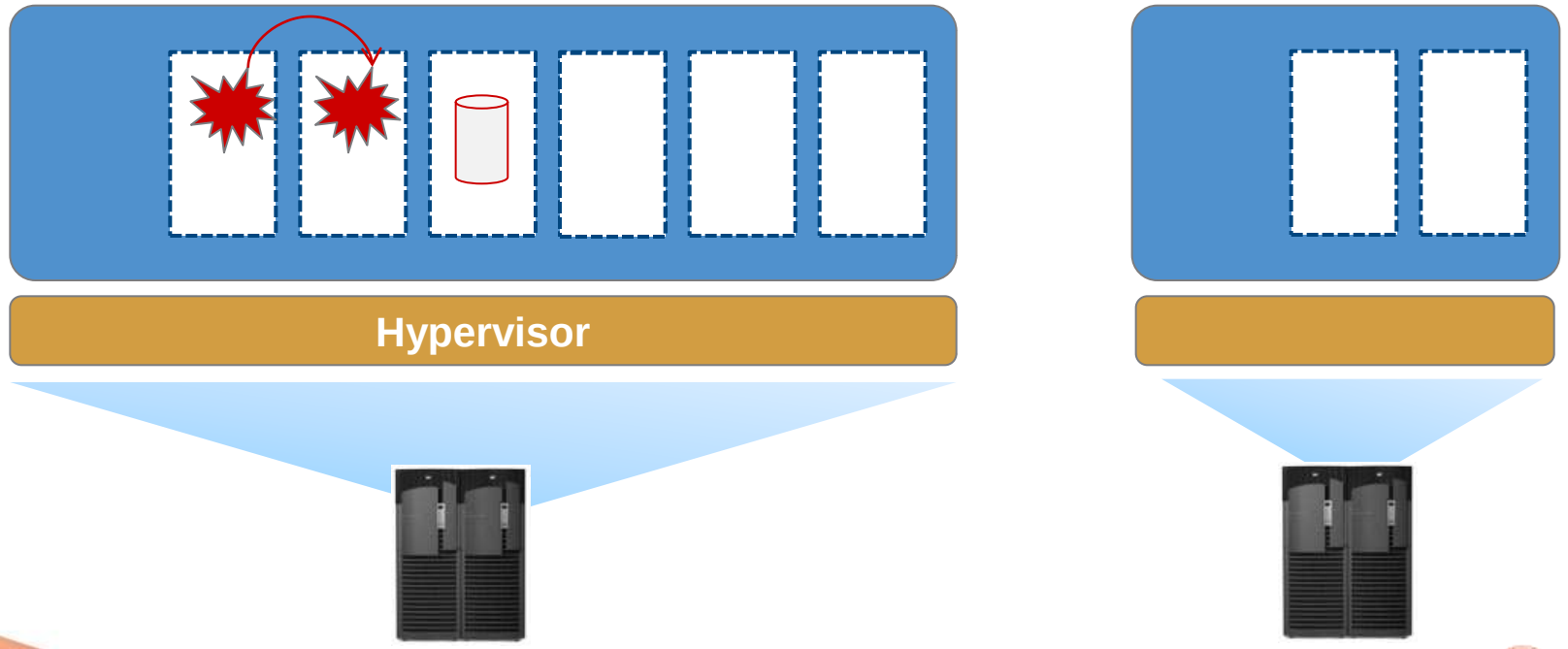
Virtualisation & Cloud Computing Create New Security Challenges



Inter-VM attacks

PCI Mobility Cloud Computing



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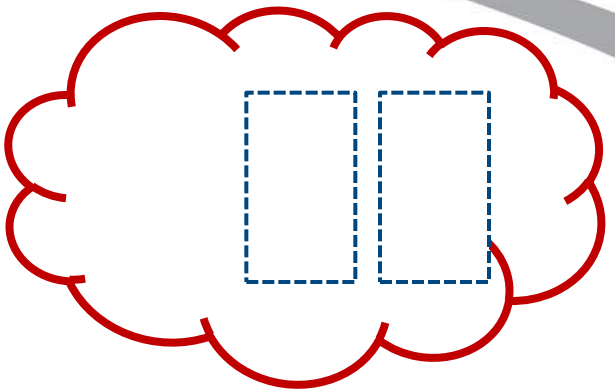
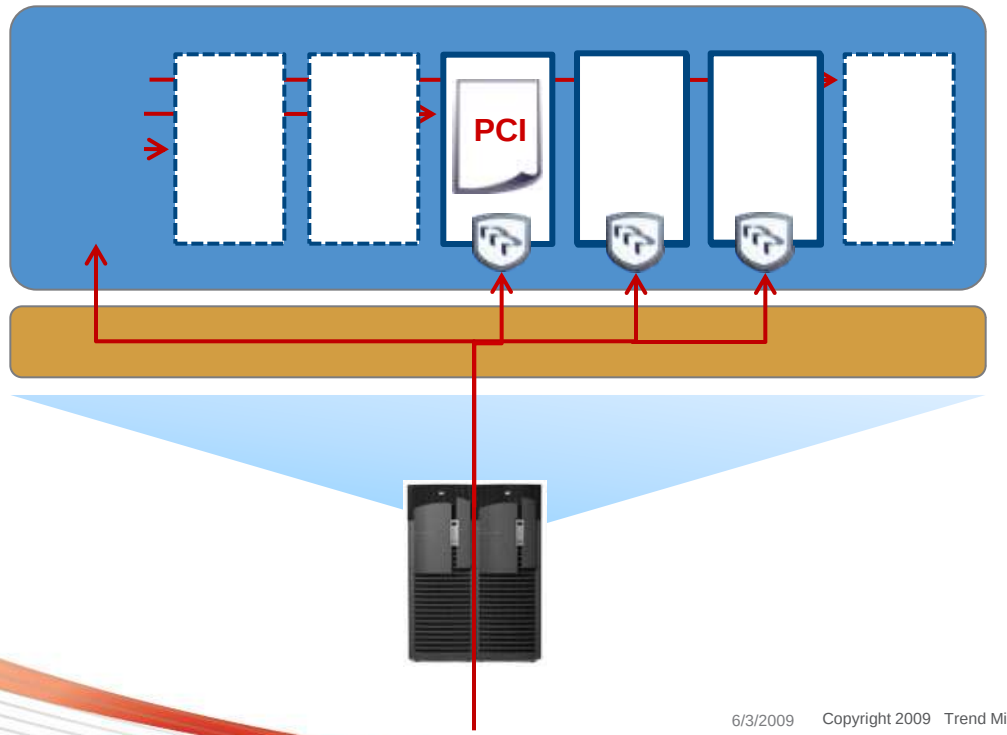
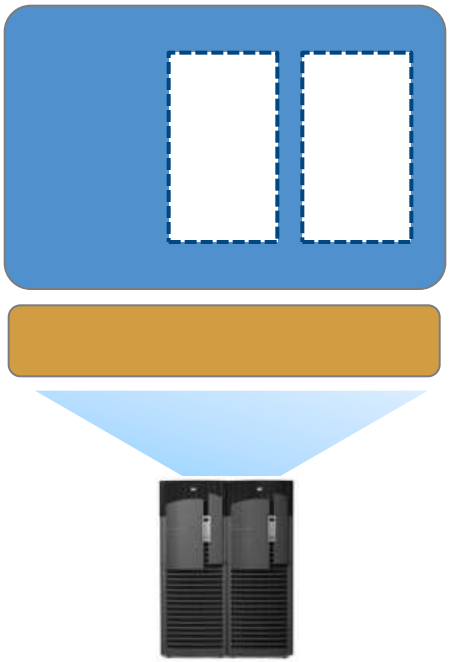
Coordinated Approach

Firewall

IDS / IPS







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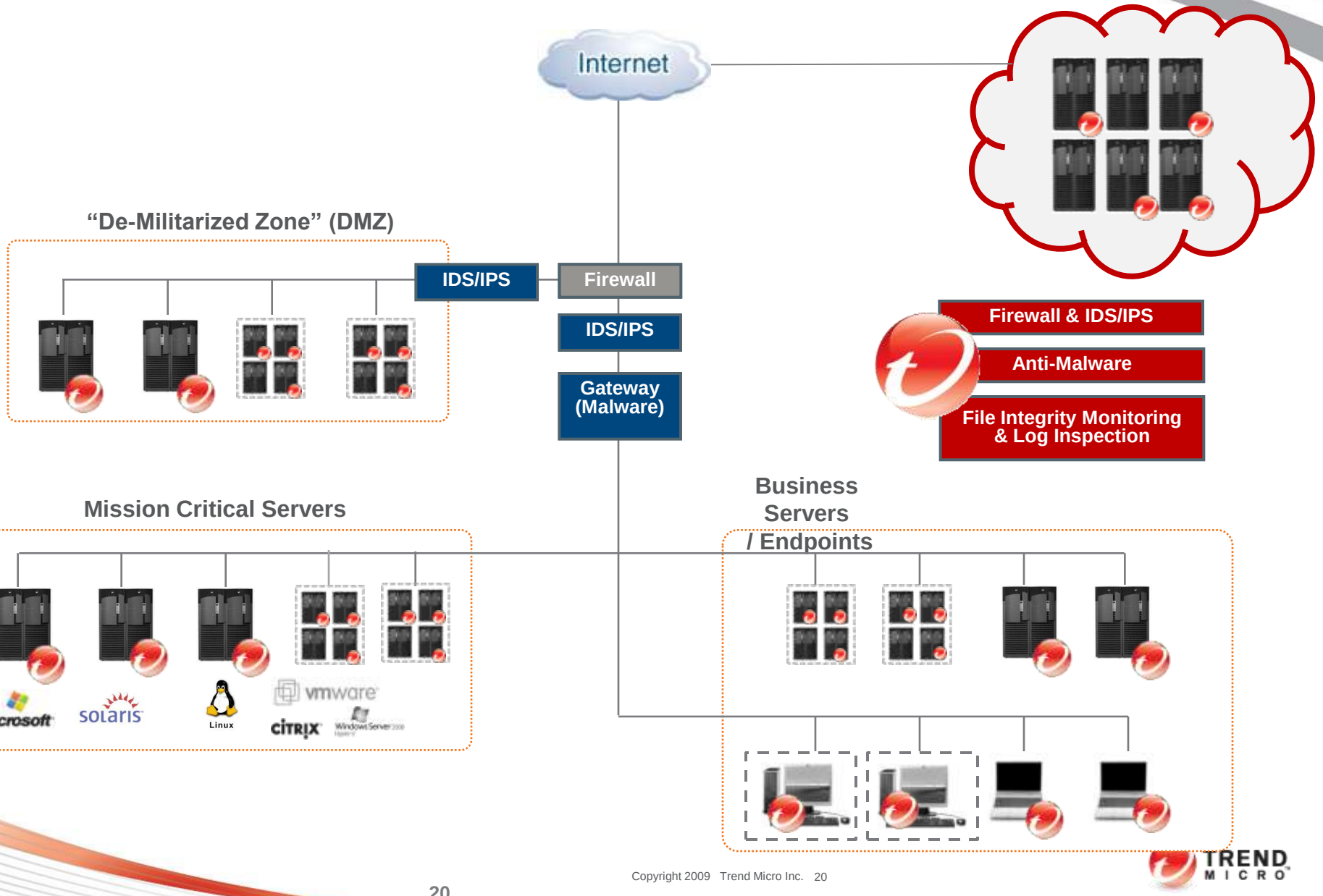
Retreat To The Server (VM)!



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Deep Security 7 Overview

What is Deep Security?

PHYSICAL

VIRTUAL

CLOUD

Deep Packet Inspection

- IDS / IPS
- Web App. Protection
- Application Control

Firewall

Integrity Monitoring

Log Inspection

Microsoft solaris Linux CITRIX vmware

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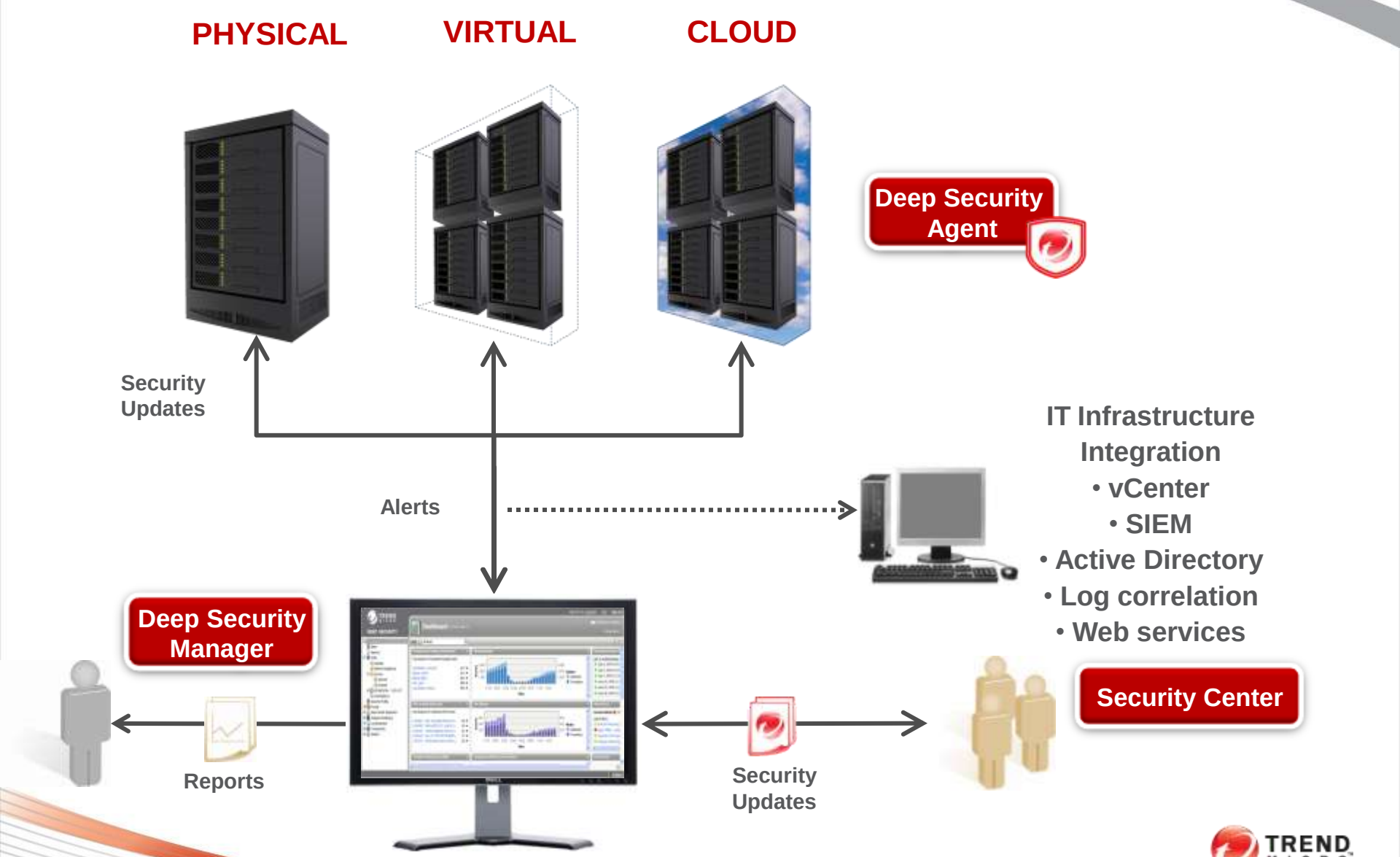
Architecture



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Security Center:
Dedicated Team of Security Experts

- Track global vulnerabilities
  - 100+ sources of information (public, private, govt): SANS, CERT, Bugtraq, VulnWatch, PacketStorm, and Securiteam
  - Member of Microsoft Active Protections Program
- Respond to new vulnerabilities and threats
  - Advisories & Security updates
- Six-step, rapid response process supported by automated tools
- On-going research to improve overall protection mechanisms

Deep Security: Platforms protected

- Windows 2000
- Windows XP, 2003 (32 & 64 bit)
- Vista (32 & 64 bit)
- Windows Server 2008 (32 & 64 bit)

- 8, 9, 10 on SPARC
- 10 on x86 (64 bit)

- Red Hat 3
- Red Hat 4, 5 (32 & 64 bit)
- SuSE 9, 10

- VMware ESX/ESXi Server (guest OS)
- VMware Server (host & guest OS)

Integrity Monitoring & Log Inspection modules

- HP-UX 11i v2
- AIX 5.3

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Certifications

Common Criteria

Evaluation Assurance Level 3 Augmented (EAL 3+)

- Achieved certification across more platforms (Windows, Solaris, Linux) than any other host-based intrusion prevention product.
- Higher certification than any other HIPS vendor
- Validated against US National Security Agency defined profile for IDS

NSS Labs

- Third Brigade Deep Security is the first product to pass NSS Labs' PCI Suitability testing for Host Intrusion Prevention Systems (HIPS).
- Across Windows, Solaris and Linux

Deep Security Modules

Firewall

- Centralized management of server firewall policy
- Pre-defined templates for common enterprise server types
- Fine-grained filtering: IP & MAC addresses, Ports
- Coverage of all IP-based protocols: TCP, UDP, ICMP, IGMP …

Deep Packet Inspection

Enables IDS / IPS, Web App Protection, Application Control

Examines incoming & outgoing traffic for:

- Protocol deviations
- Content that signals an attack
- Policy violations.

Integrity Monitoring

- Monitors critical files, systems and registry for changes
- Critical OS and application files (files, directories, registry keys and values)
- Flexible, practical monitoring through includes/excludes
- Auditable reports

Log Inspection

- Collects & analyzes operating system and application logs for security events.
- Rules optimize the identification of important security events buried in multiple log entries.

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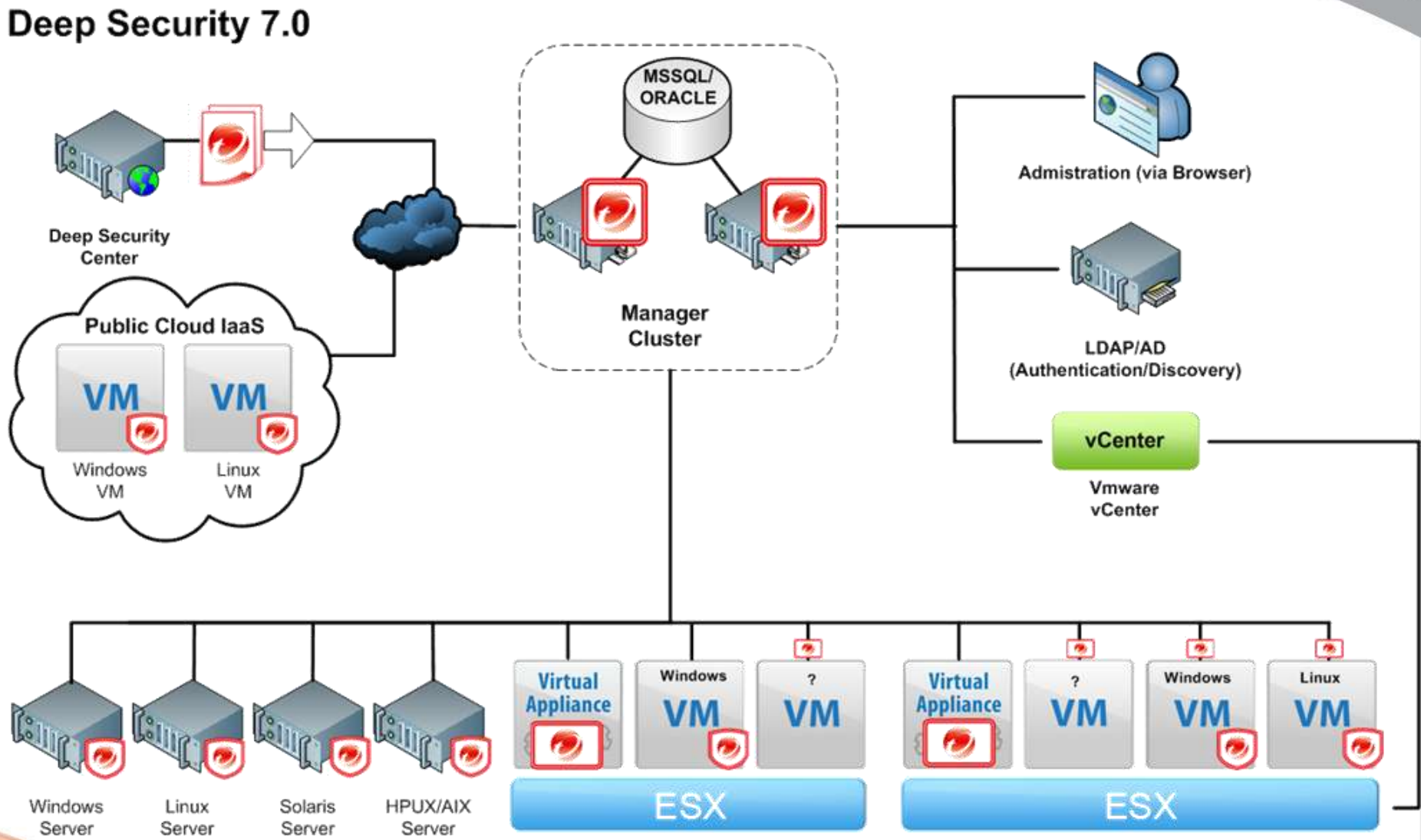
Deep Security 7 Overview



Deep Security Manager

- Centralised, web-based management system
- Manage security profiles
  - Multiple & delegated admin
  - Detailed reporting
  - Recommendation scan
  - Customisable dashboard
  - Automation through scheduled tasks
  - Web services API
  - Software and security updates
  - Integration (VMware vCenter, SIEM, Active Directory)
  - Scalable infrastructure (multiple nodes)

Deep Security Manager Dashboard

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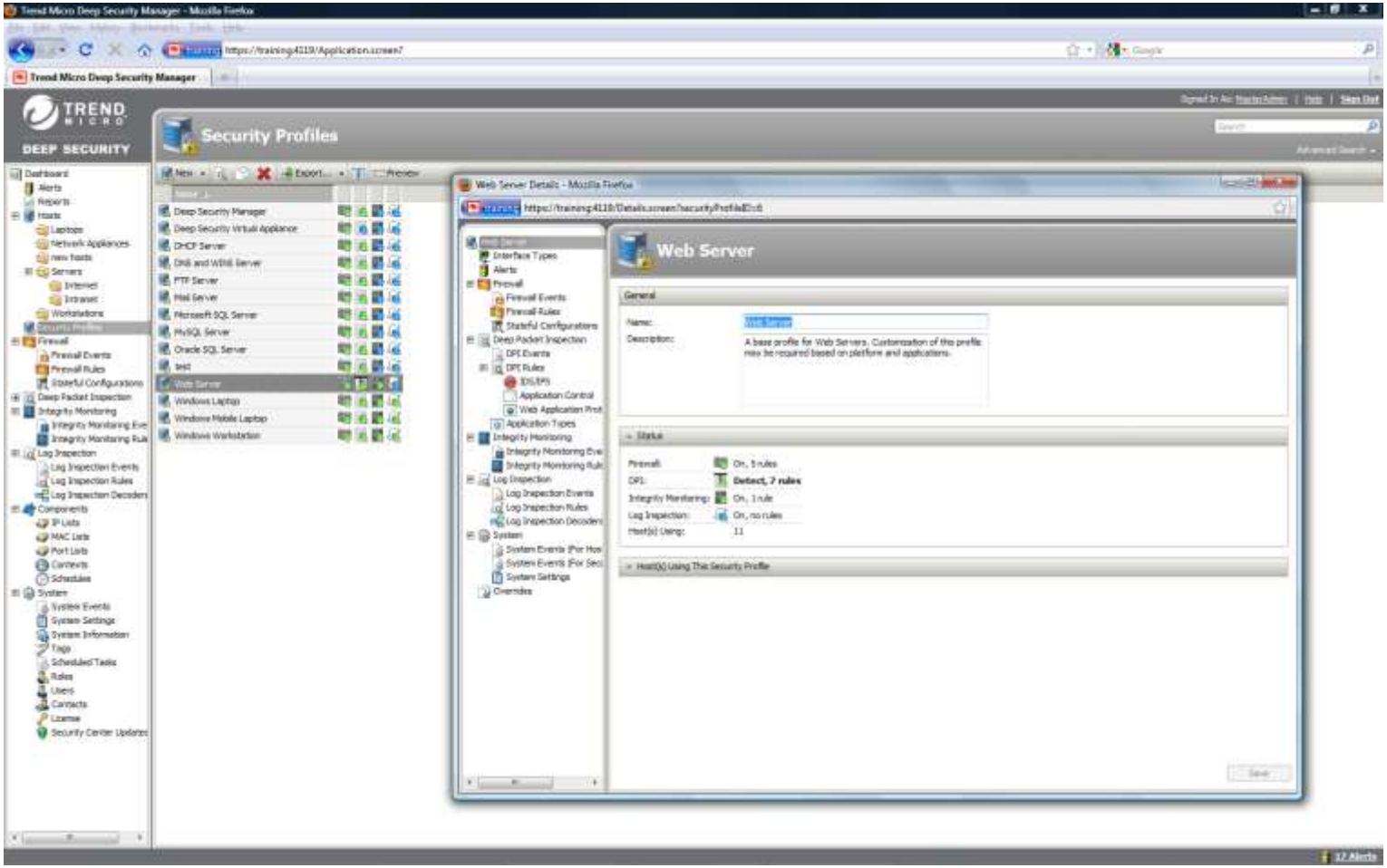
Security Profile



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Firewall

Decreases the attack surface of physical and virtual servers

- Centralised management of server firewall policy
- Pre-defined templates for common enterprise server types
- Virtual machine isolation
- Fine-grained filtering
  - IP & MAC addresses, Ports
- Coverage of all IP-based protocols
  - TCP, UDP, ICMP, …
- Coverage of all frame types (IP, ARP, …)
- Prevents Denial of Service (DoS) attacks
- Design policies per network interface
- Detection of reconnaissance scans

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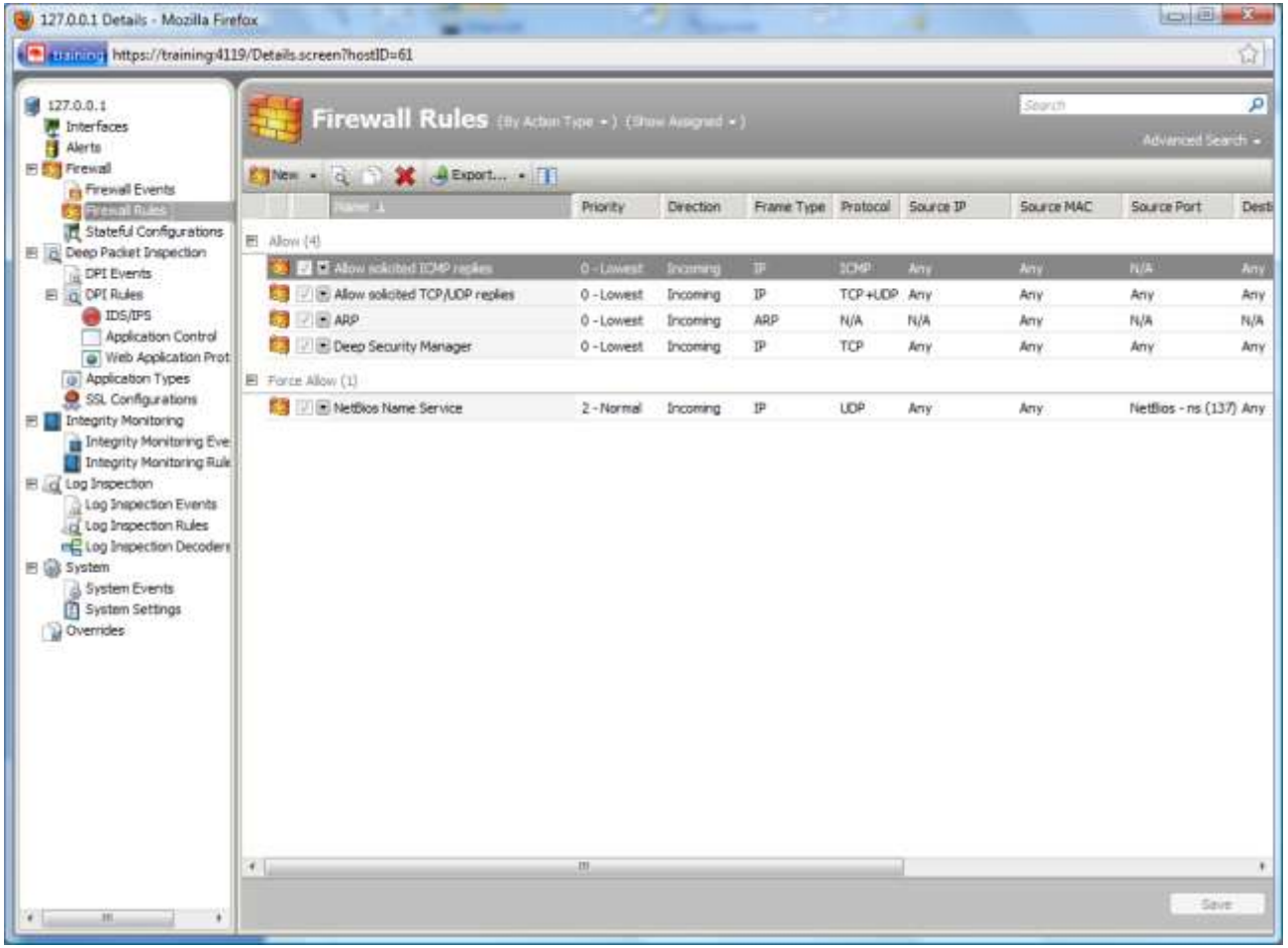
Firewall



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Deep Packet Inspection

IDS/IPS

- **Vulnerability rules**: shield known vulnerabilities from unknown attacks
- **Exploit rules**: stop known attacks
- **Smart rules**: Zero-day protection from unknown exploits against an unknown vulnerability
- Microsoft Tuesday protection is delivered in synch with public vulnerability announcements.
- On the host/server (HIPS)

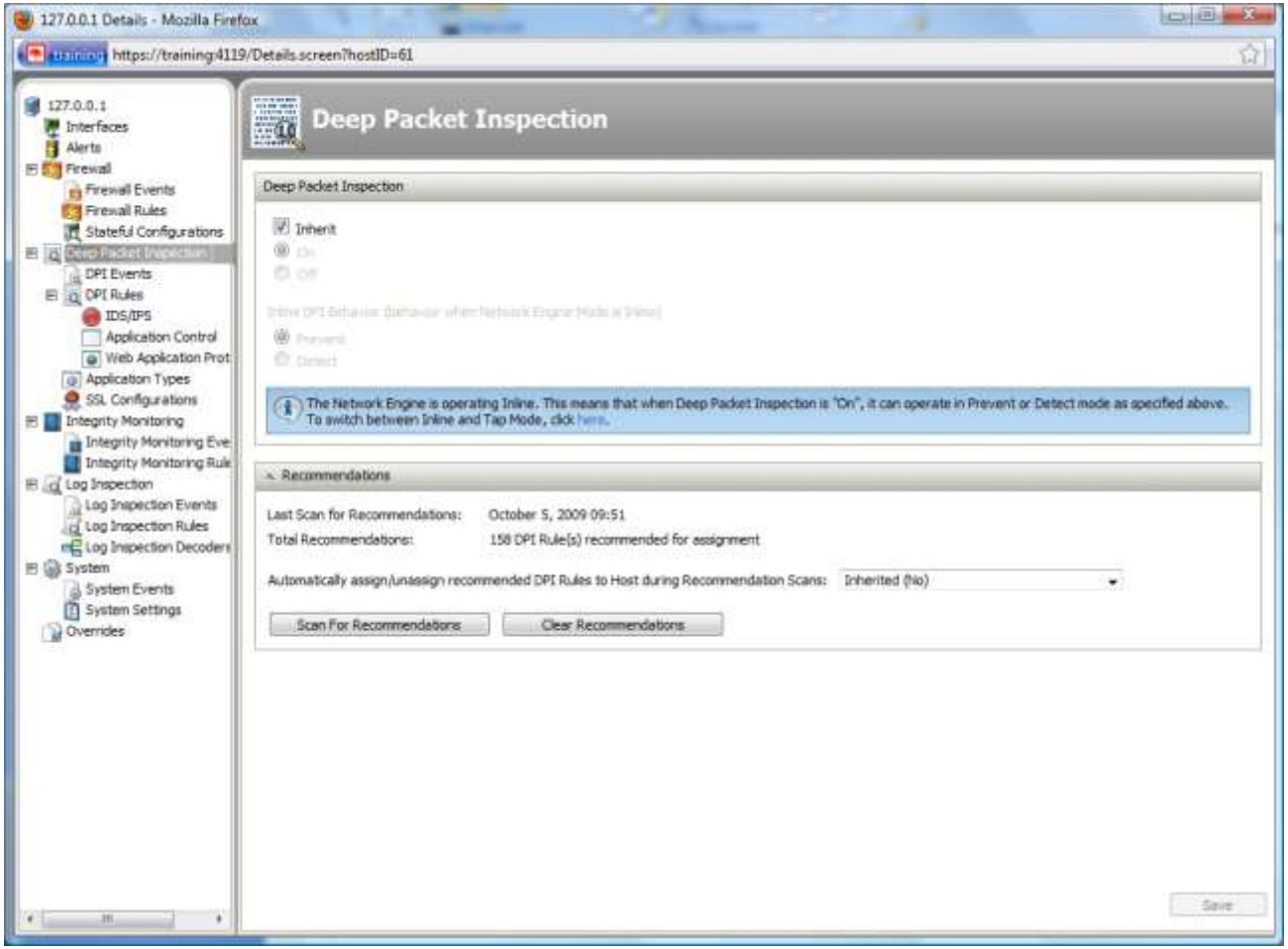
Web Application Protection

- Enables compliance with PCI DSS 6.6
- Shield vulnerabilities in custom web applications, until code fixes can be completed
- Shield legacy applications that cannot be fixed
- Prevent SQL injection, cross-site scripting (XSS)

Application Control

- Detect suspicious inbound/outbound traffic such as allowed protocols over non-standard ports
- Restrict which applications are allowed network access
- Detect and block malicious software from network access

Recommendation Scan



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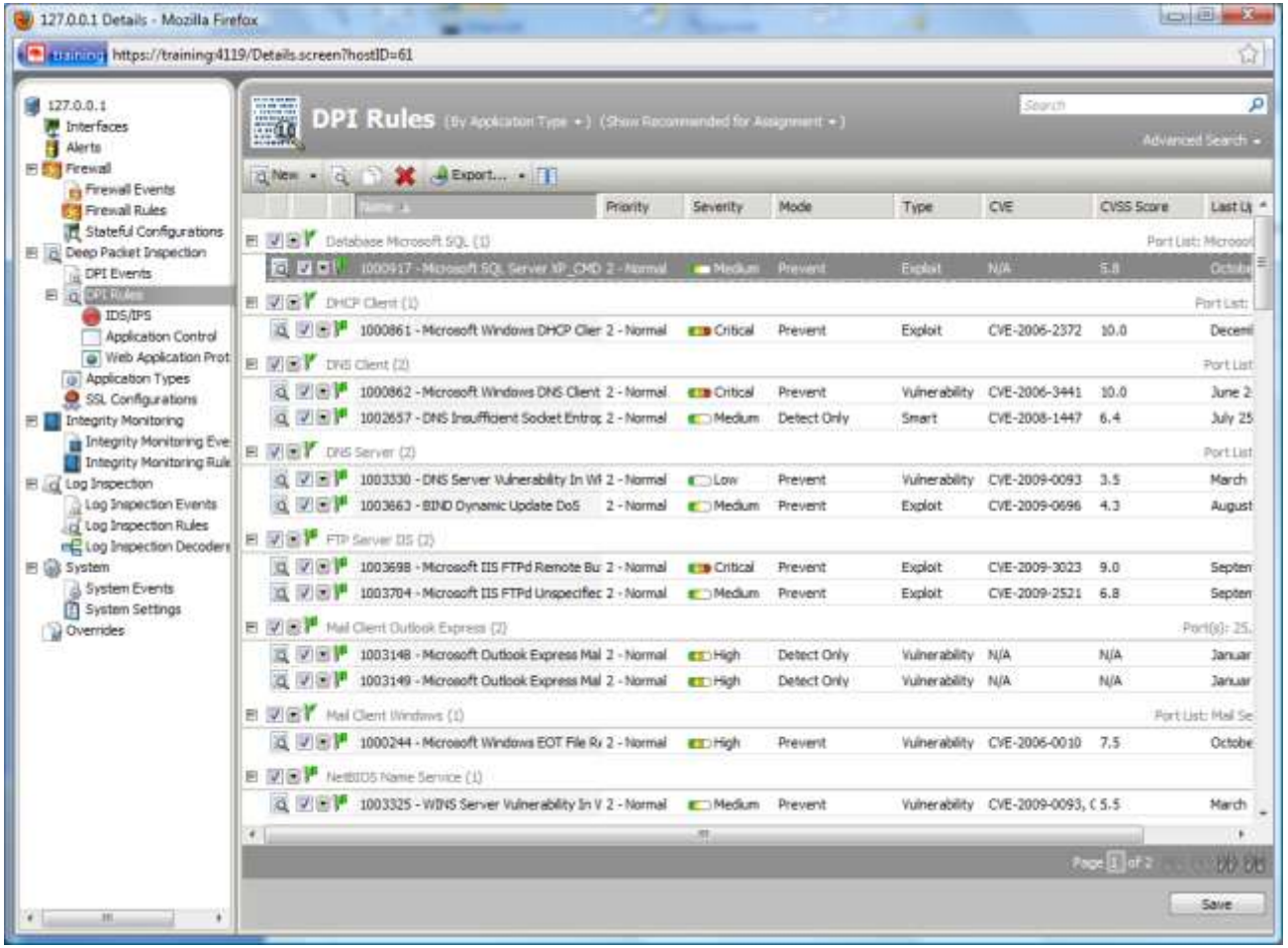
Recommendation Scan



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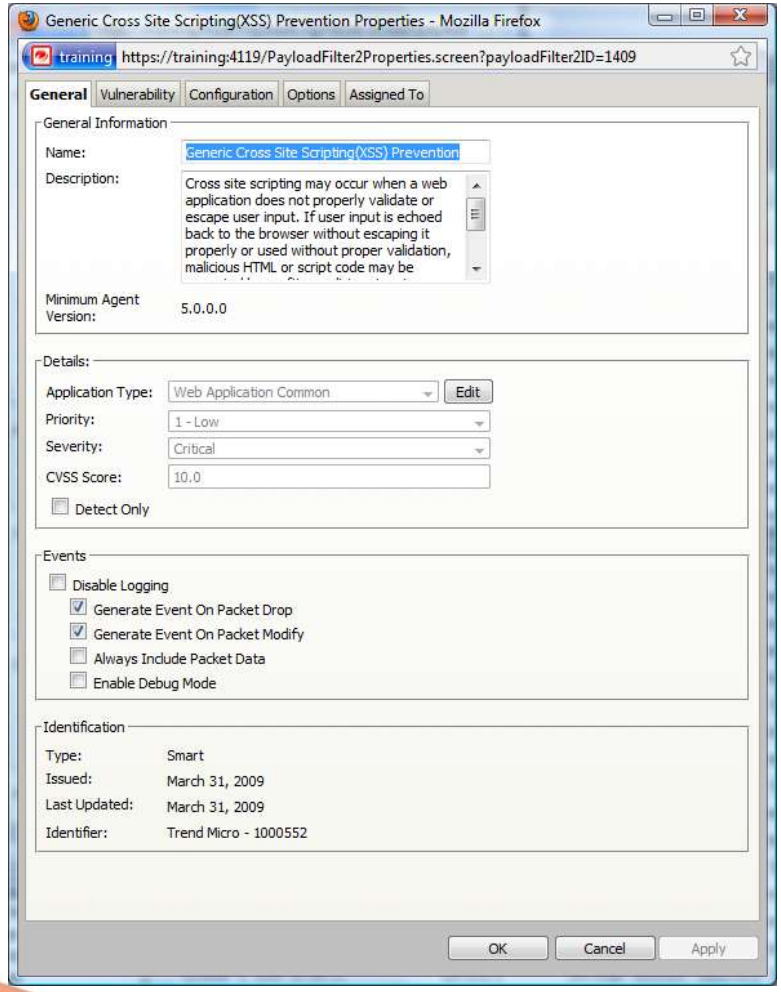
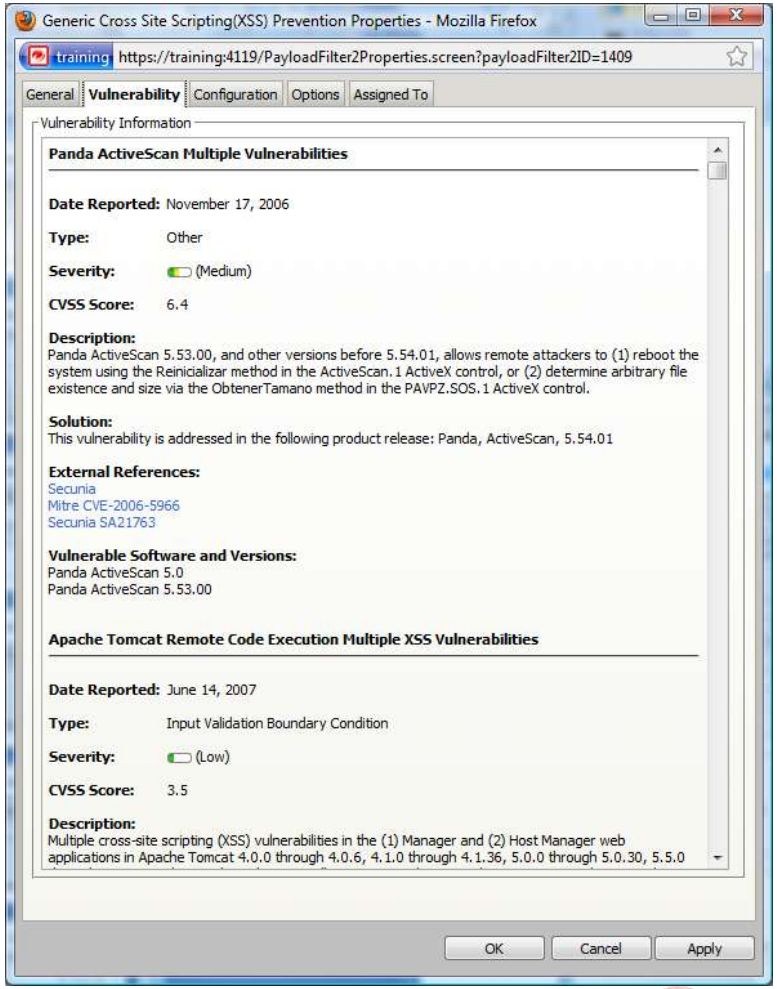
DPI Detail





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Integrity Monitoring

Monitors files, systems and registry for changes

- Critical OS and application files (files, directories, registry keys and values, etc.)
- On-demand or scheduled detection
- Extensive file property checking, including attributes (PCI 10.5.5)
- Monitor specific directories
- Flexible, practical monitoring through includes/excludes
- Auditable reports

Useful for:

  - Meeting PCI compliance
  - Alerting on errors that could signal an attack
  - Alerting on critical system changes

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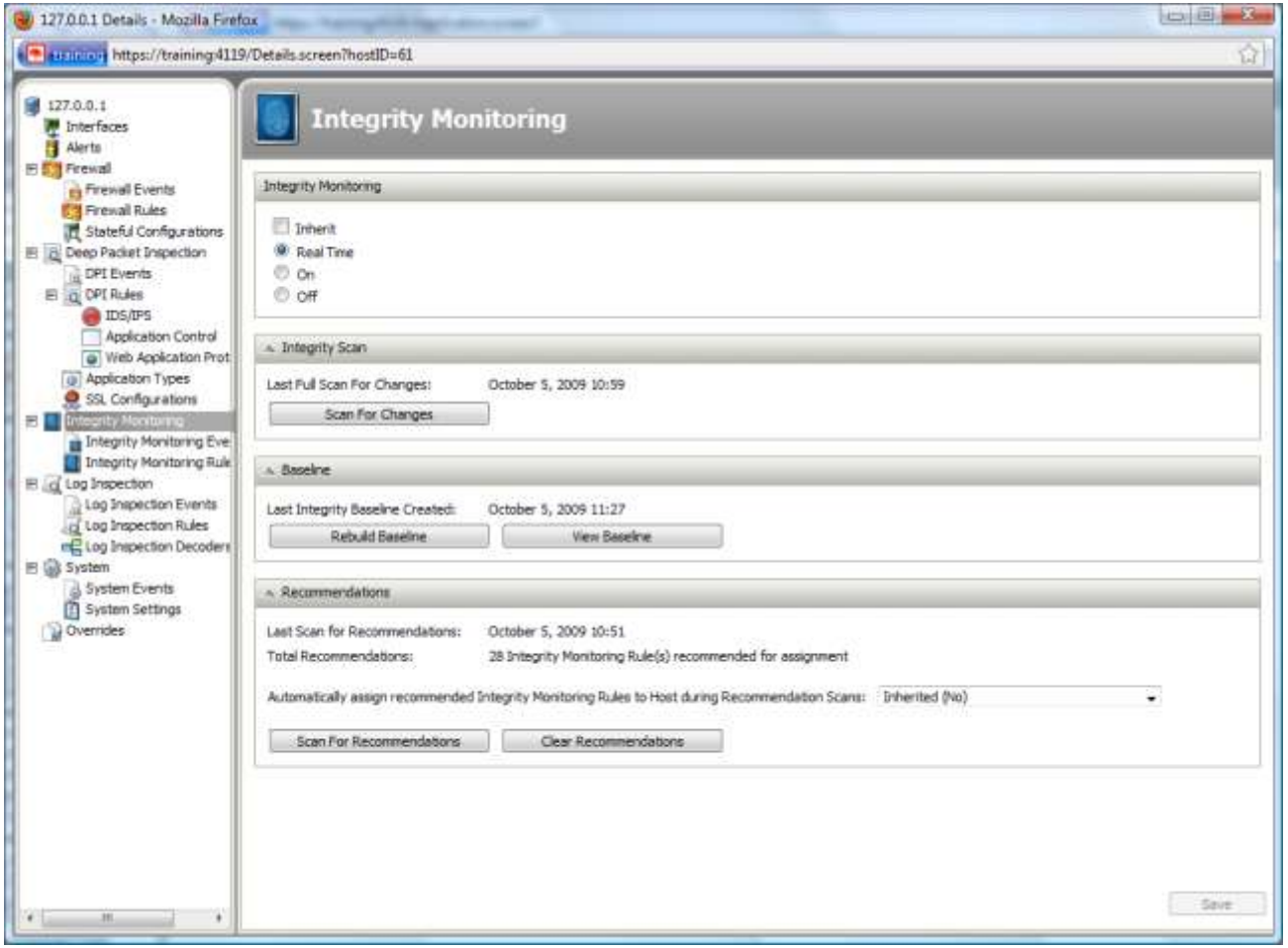
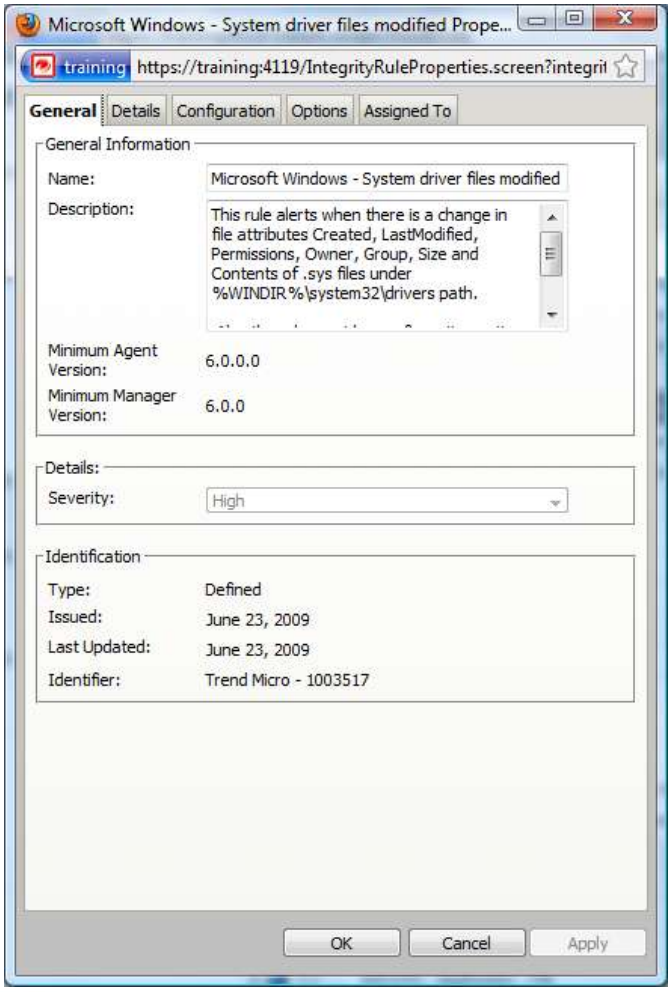
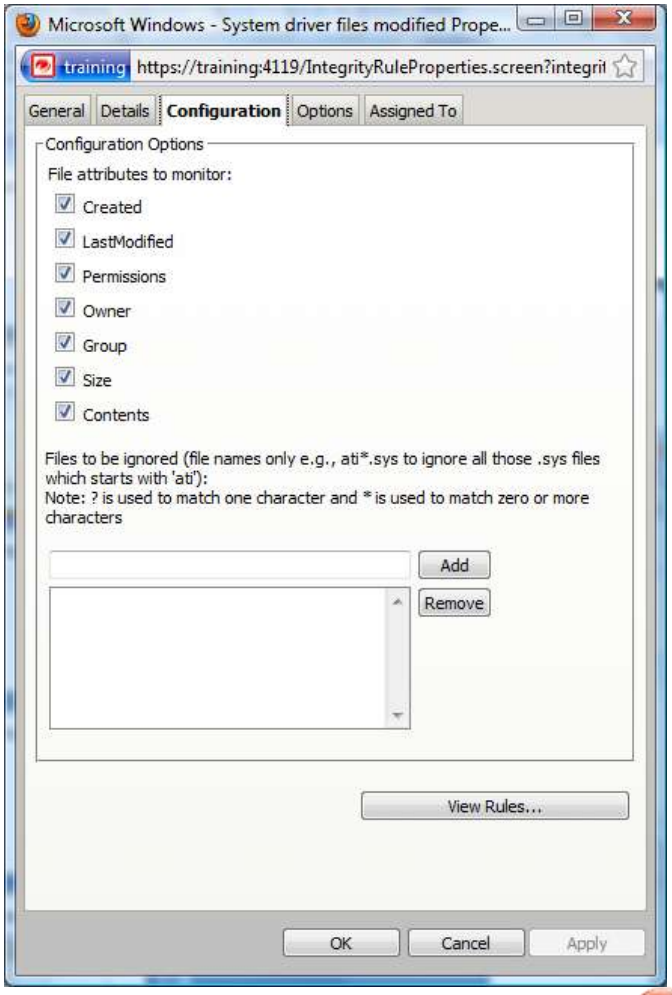
Integrity Monitoring



Integrity Monitoring Configuration





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Log Inspection

Getting visibility into important security events buried in log files

- Collects & analyses operating system and application logs for security events.
- Rules optimise the identification of important security events buried in multiple log entries.
- Events are forwarded to a SIEM or centralized logging server for correlation, reporting and archiving.

Useful for:

- Suspicious behaviour detection
- Collection of security-related administrative actions
- Optimised collection of security events across your datacenter
- Advanced rule creation using OSSEC rule syntax

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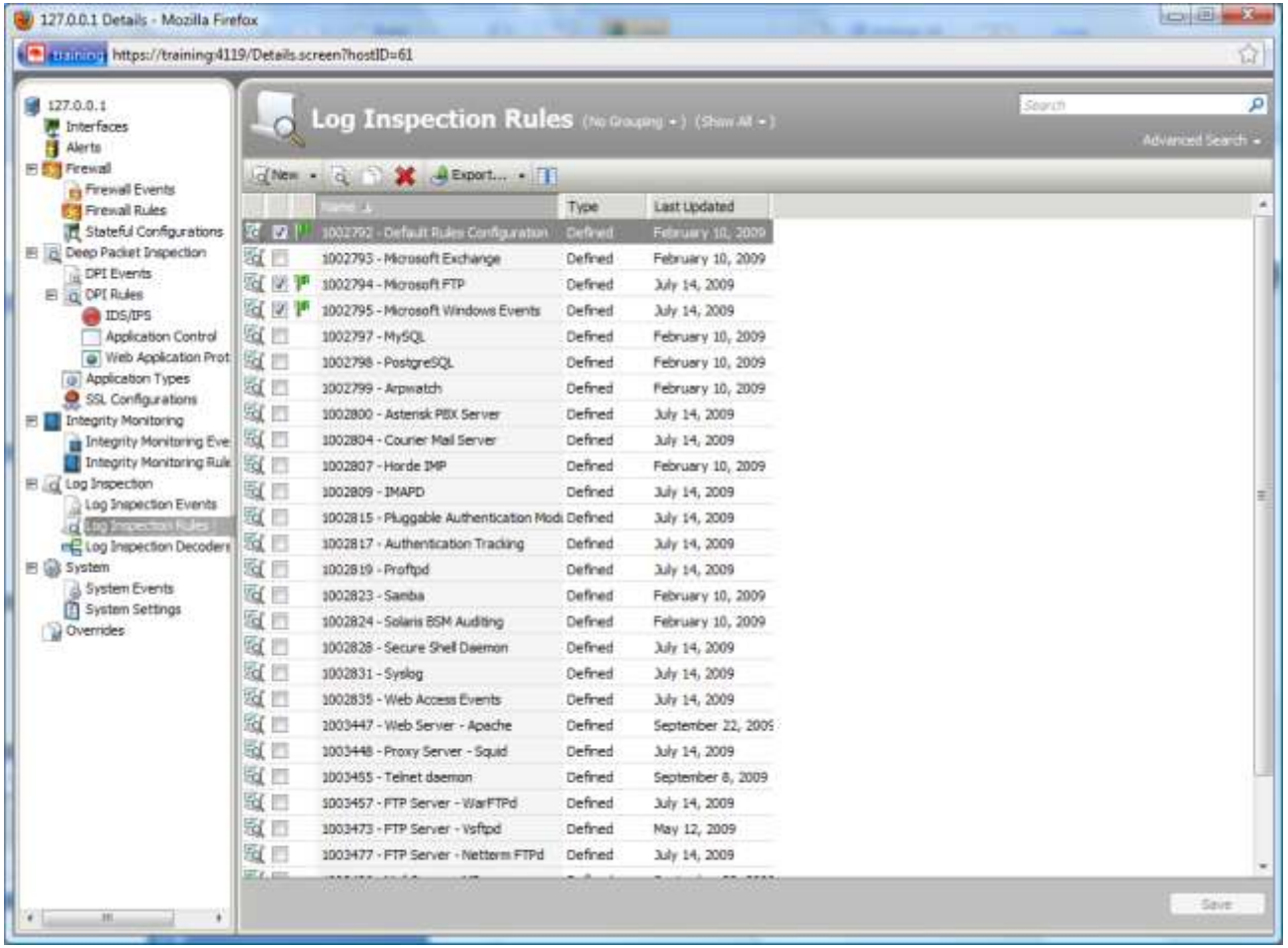
Log Inspection



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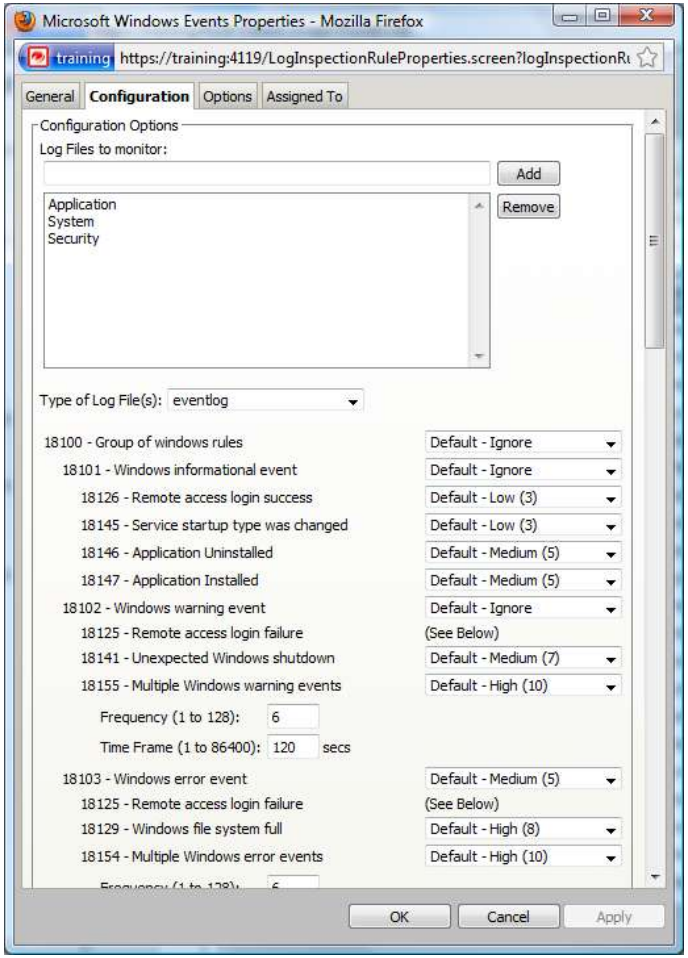
Log Inspection Configuration



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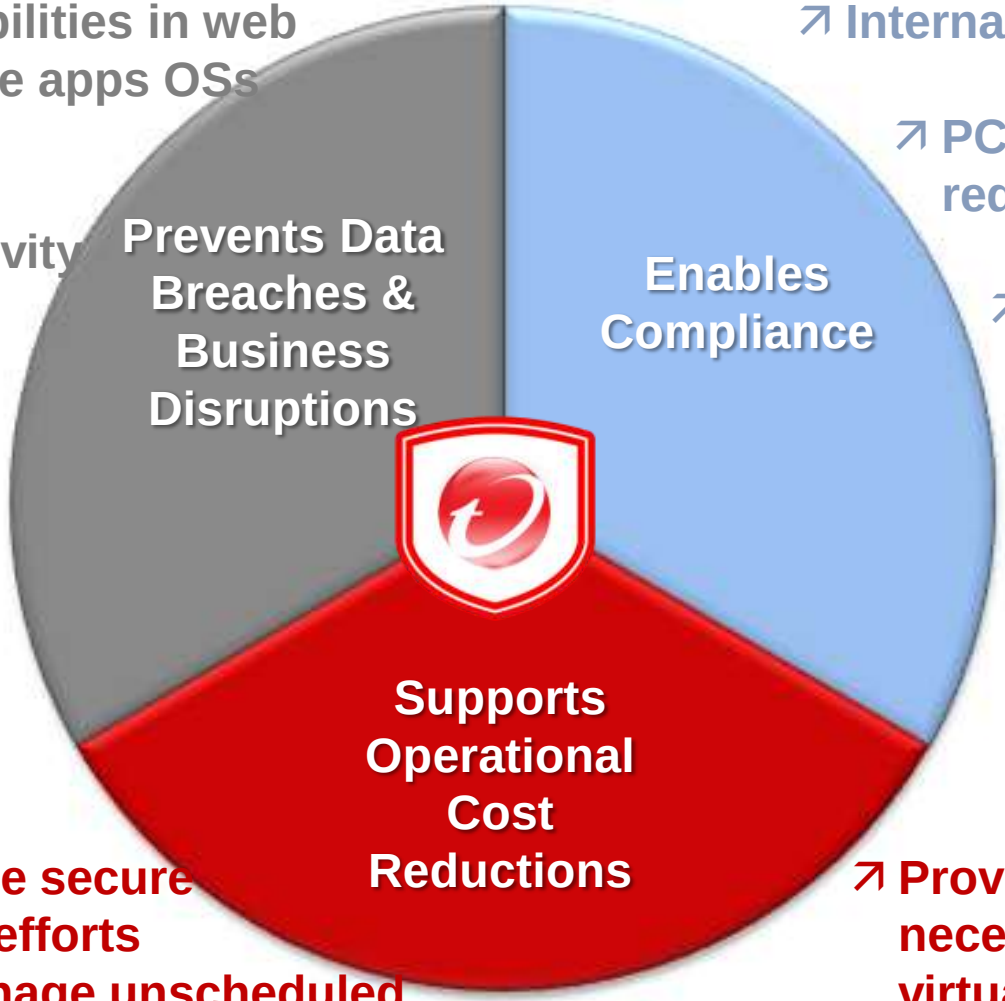
Deep Security for Virtualisation

Category	Requirement
NW Segmentation & VM Zoning	– Isolation of virtual machines on shared servers – Independent of vSwitches and network architecture – Stateful firewall, groupings, security policy enforcement
Virtualisation Security Mgmt	– Automation via web services API, template deployment – VMsafe coordinated approach – Visibility into virtual and physical servers, server state
Integrity Monitoring & Log	– Monitor critical system, application, log files for changes – Forward system and application log events via Syslog to centralized logging servers or SIEMS
IDS / IPS & Virtual Patching	– InterVM attack prevention – Protection against known & zero-day attacks – Shield until patching: <30 day patching required – Shield systems that can't be patched – Suspicious behavior detection – Detailed audit logs & SIEM integration
Web Application Protection	– Protection against Web-based attacks such as SQL Injection, Cross-Site Scripting, and many more – Deployed where WAF cannot reach

Deep Security: Key benefits

- Shield vulnerabilities in web apps, enterprise apps OSs
- Detect & block suspicious activity



- Internal policies
- PCI & other requirements
- Detailed reports document prevented attacks & compliance status

- Prioritize secure coding efforts
- Manage unscheduled patching
- Provides security necessary to realise virtualisation savings
- Increased value from SIEM investments

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Evolution of Server & Application Protection Systems

Past	Today
Perimeter security	Security at the server / VM
Appliance-based	Software-based
Threat protection: Basic, external attacks	Threat protection: Basic to sophisticated internal & external attacks
Firewall IDS/IPS Vulnerability Scan	Firewall IDS/IPS Vulnerability Scan Web Application Protection File Integrity Monitoring Log Inspection Configuration Assessment
Weak / limited integration	Enterprise Integration: Virtualisation Management platform (vCenter), SIEM.

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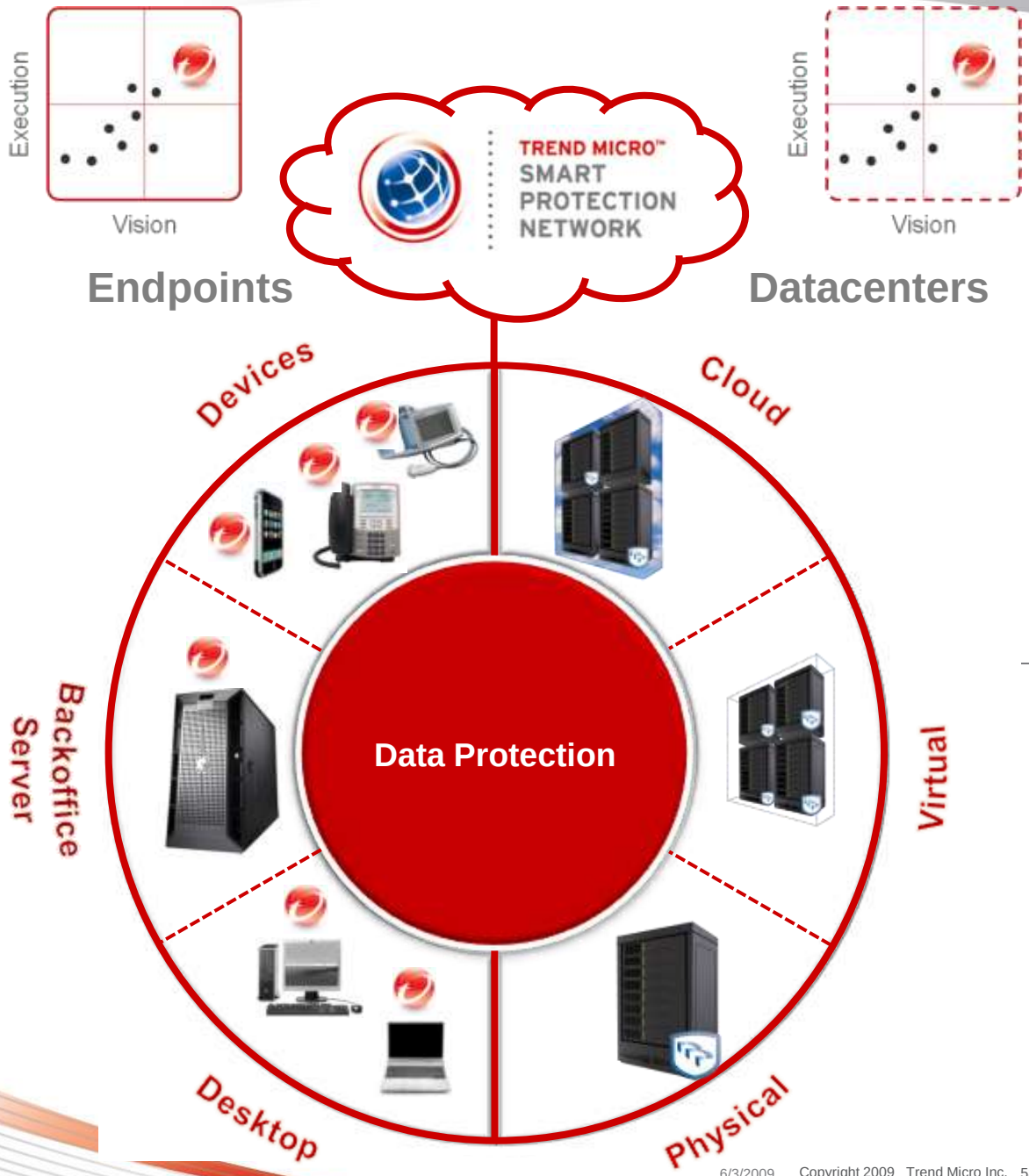

Vision

Every network-connected host must be able to defend itself from attacks.

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THANK YOU!

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