Level(3) COMMUNICATIONS

Connecting and Protecting the Networked World™

Can Technology Save Us From Evolving Cybersecurity Threats?

Chris Richter

Senior Vice President, Global Security Services

Level 3 Communications

A Little About Level 3 . . .

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Over **$8B** In Annual Revenue

~12,500 Employees

Connecting **60+** Countries and Counting

200,000+ Route Miles of Fiber Globally

Approx. **360** Multi-tenant Data Centers

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Security from Our Lens

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We **monitor**
~1.3 billion
Security events per day

We **respond** to and
mitigate ~40
DDoS attacks a day

We **identify** and **remove**
at least **one C2**
network a month

We **monitor** over
48 billion
NetFlow sessions per day

We **collect**
~87 TB
of data per day

We perform
daily audits,
protect and monitor
all our products & systems

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Security Landscape Continues to Evolve

Attacks Are Changing In Form, Complexity, Volume and Timing

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431 million new malware variants seen in 2015, an increase of 36%

Source: Symantec Internet Security Report, April 2016

The mean number of days to resolve cyber attacks is 46, with an average cost of $21,155/day (global, standardized into U.S. dollars)

Source: Ponemon 2015 Global Cost of Cyber Crime Study, October 2015

9 breaches in 2015 with more than 10 million identities exposed: a total of 429 million exposed

Source: Symantec Internet Security Report, April 2016

The mean annualized cost of cyber crime to global organizations is $7.7 million/year (standardized into U.S. dollars)

Source: Ponemon 2015 Global Cost of Cyber Crime Study, October 2015

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Internet Access in Developing Nations

Growing at Double-Digit Rates

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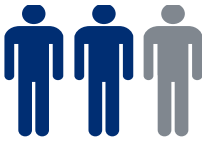
By the end of 2015, the number of Internet users:
3.2 billion

This corresponds to an Internet-user penetration of
43% globally



Two-thirds of the world's Internet users
are from **the developing world**

90%

More than 90 percent of the people who are
not yet using the Internet are from the developing world

Source: The World in 2015: ICT Facts and Figures, International Telecommunications Union, 2015

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What We Face

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- Zero Day and Half Day Attacks
  - The average zero day exploit will last 26 months before being detected
  - The average half day exploit will last 6 months before being patched
- Increase in targeted attacks
  - Significant research prior to attacks
- Growing regulatory and compliance requirements
  - Greater transparency
  - Reaching critical mass
- Significant increase in DDoS attack volume and bandwidth
- Nation state actors beginning to beta test capabilities “contract out” to organized crime
- Black market trading sites increasing

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Who Is Attacking?

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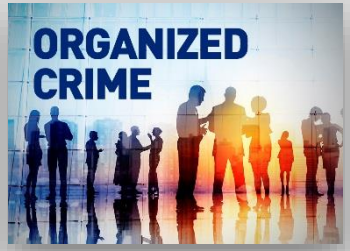

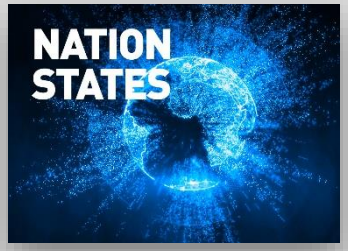

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Hacking Tools Are a Commercial Business

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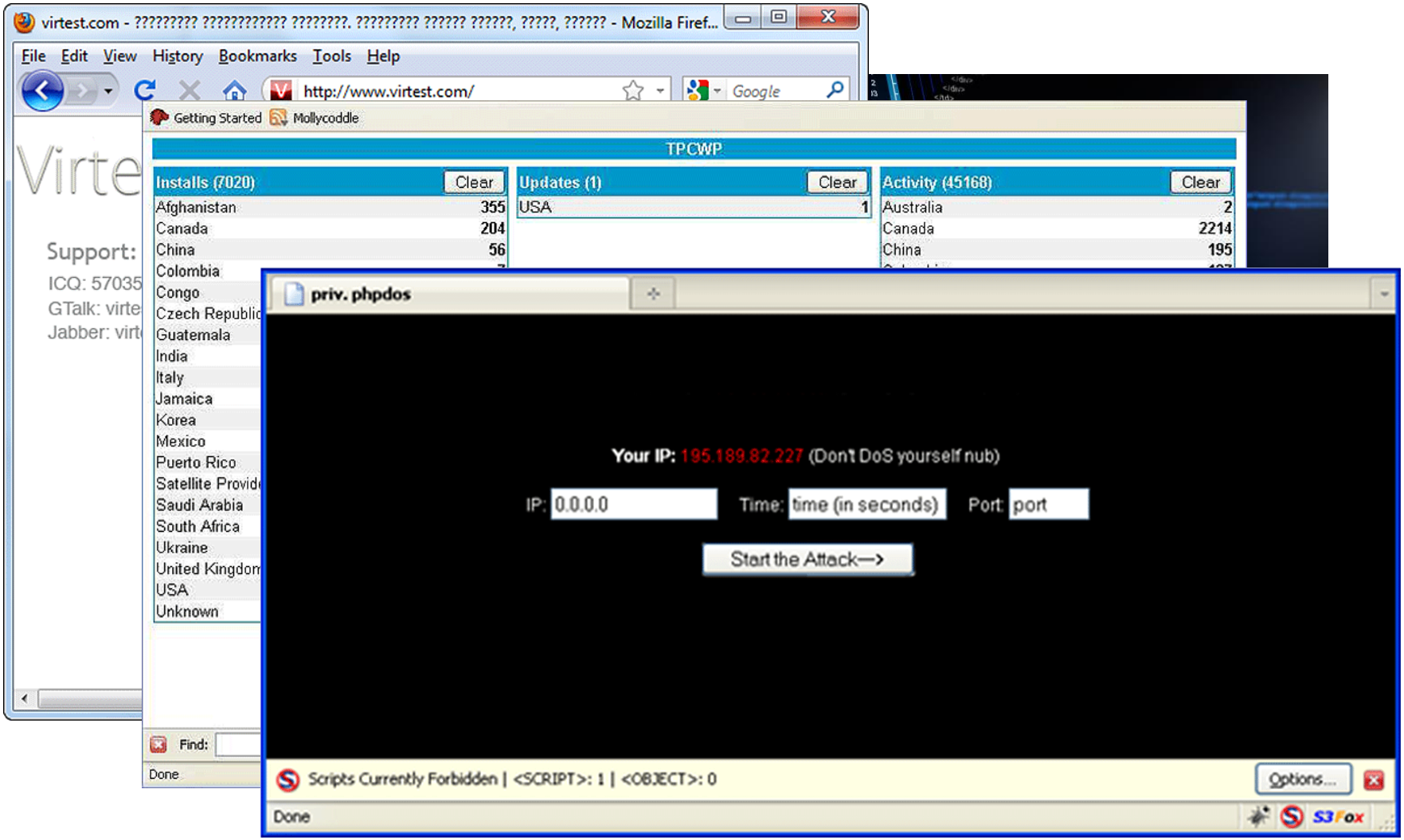

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The Top 10 Data Breaches in 2015

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	Organization	Incident	Reported Attack Vector
✓	IRS Compromise	333,000 records exposed	Misconfigured server
	Anthem	80 million personal records	Suspected sophisticated phishing attack
✓	Securus	70 million prisoner phone calls	Assumed insider release of information
✓	Ashley Madison	PII of 37 million site users	Improperly secured database access
✓	U.S. Government, Personnel Management	PII of 21.5 Million U.S. Gov't employees	Believed social engineering—gained valid credentials
✓	Experian/T-Mobile	PII of 15 million T-Mobile customers	Through third-party vulnerability
✓	MacKeeper	13 Million user records	Weak algorithms used to hash passwords
	VTech	PII of 11.3 customers, including children	SQL injection attack into server
	Premera	PII, health records of 11 million	Suspected sophisticated phishing attack
	Excellus/Blue Cross Blue Shield	PII of 10 million customers	Undisclosed

Sources: DigitalGuardian "The Top Ten Biggest Data Breaches of 2015," https://digitalguardian.com/blog/top-10-biggest-data-breaches-2015
http://thehackernews.com/2015/12/mackeeper-antivirus-hacked_14.html
http://motherboard.vice.com/read/vtech-hacker-explains-why-he-hacked-the-toy-company

Complexity, Fragmentation, and Correlation Issues

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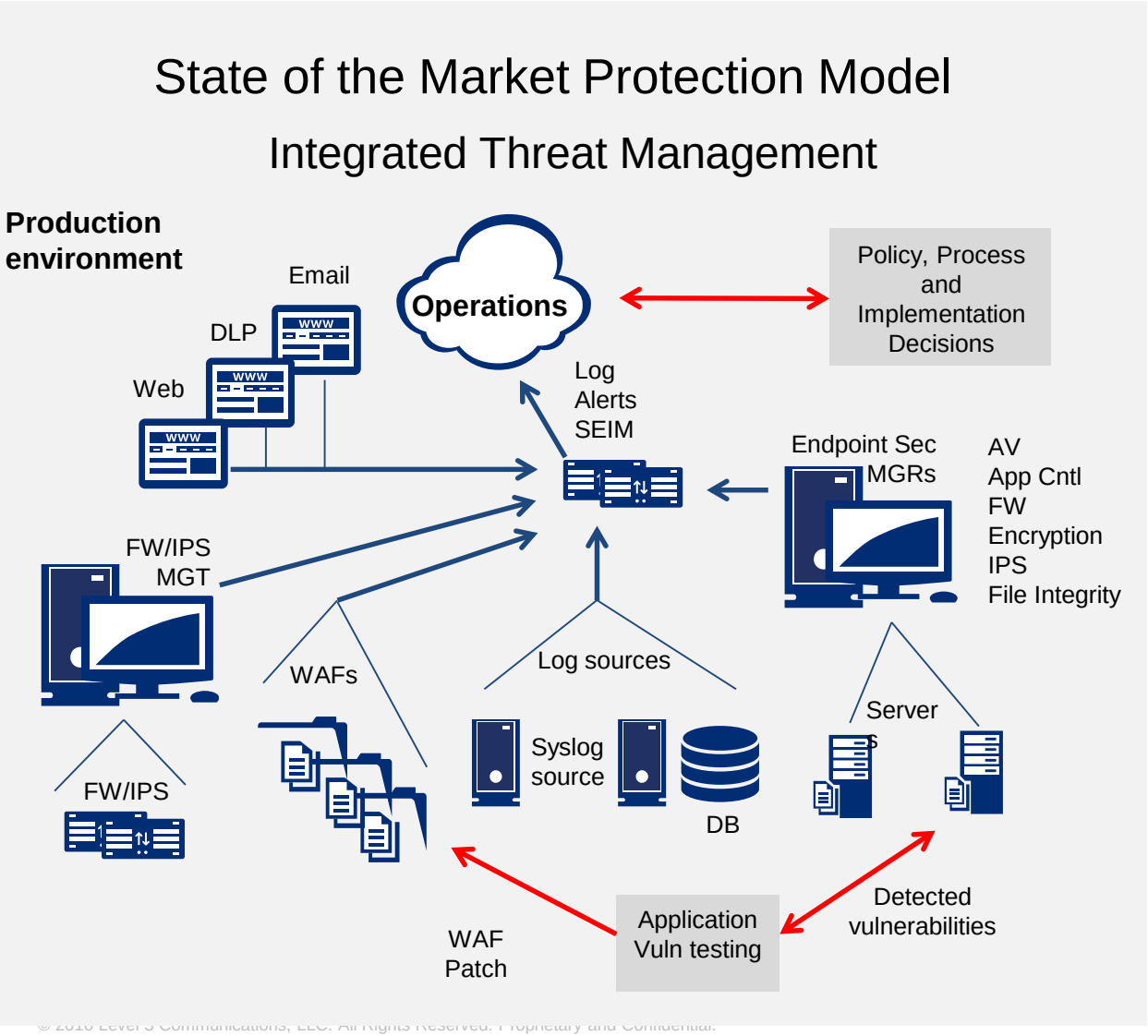

Organizations continue to built a patchwork of point solutions that are difficult to manage, create vulnerabilities, and reduce security

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Challenge: The Costs of Security

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Security costs are rising, and an overwhelming amount of data makes it difficult to determine what information is truly relevant and actionable

The costs of security, and threat intelligence in particular, are growing exponentially

It is a challenge to manage alerts and react quickly to threat situations

Scarcity of in-house security expertise compounds these challenges

Cybercrime costs the average U.S. firm $15 million a year*

**Source: Ponemon Institute© Research Report (October 2015)*

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Average Cost of Cyber Crime In Seven Countries

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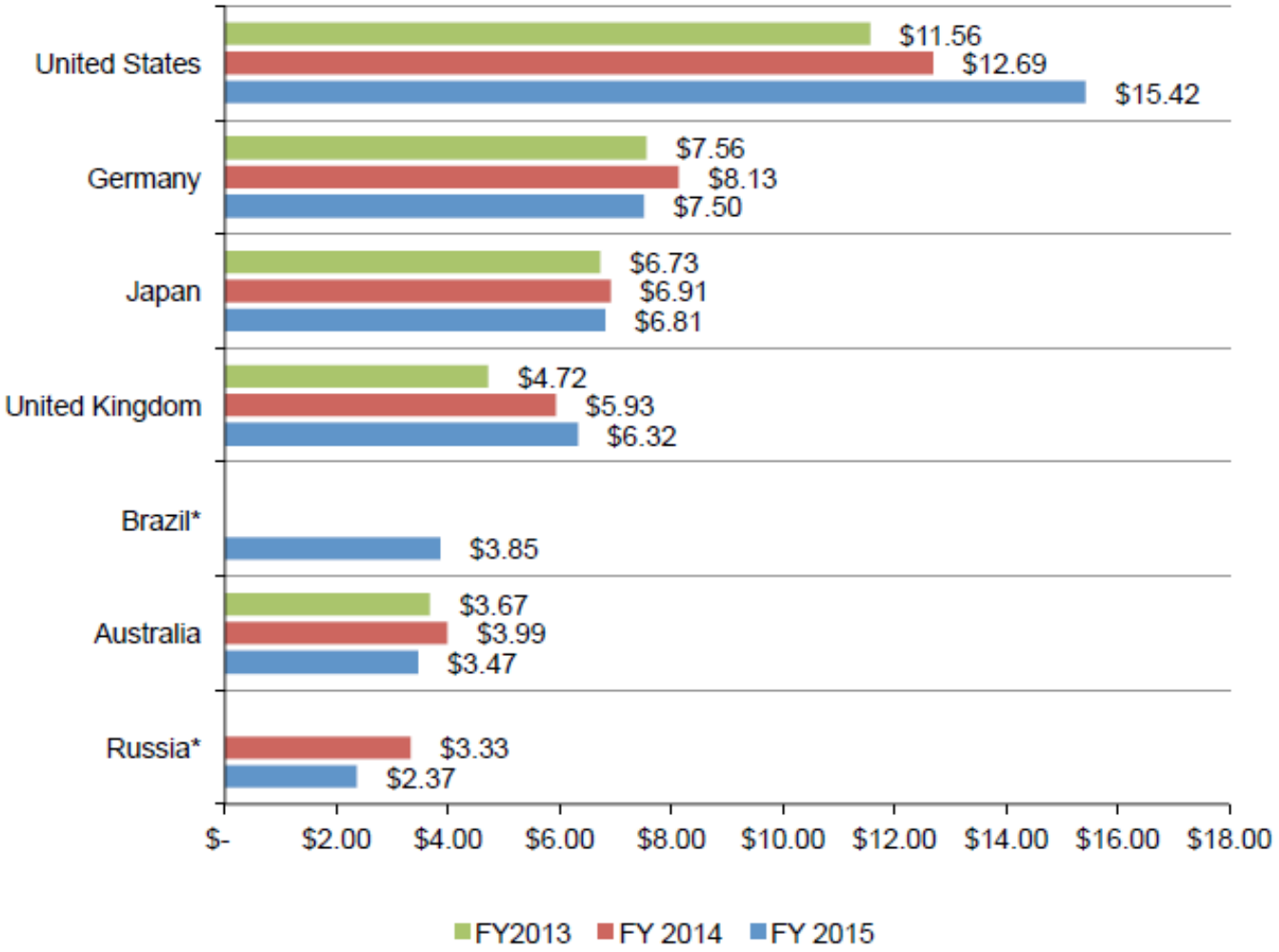
(Costs in U.S. Dollars, 000,000, n=252 companies)



Source: Ponemon Institute© Research Report (October 2015)

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Costs by Sector

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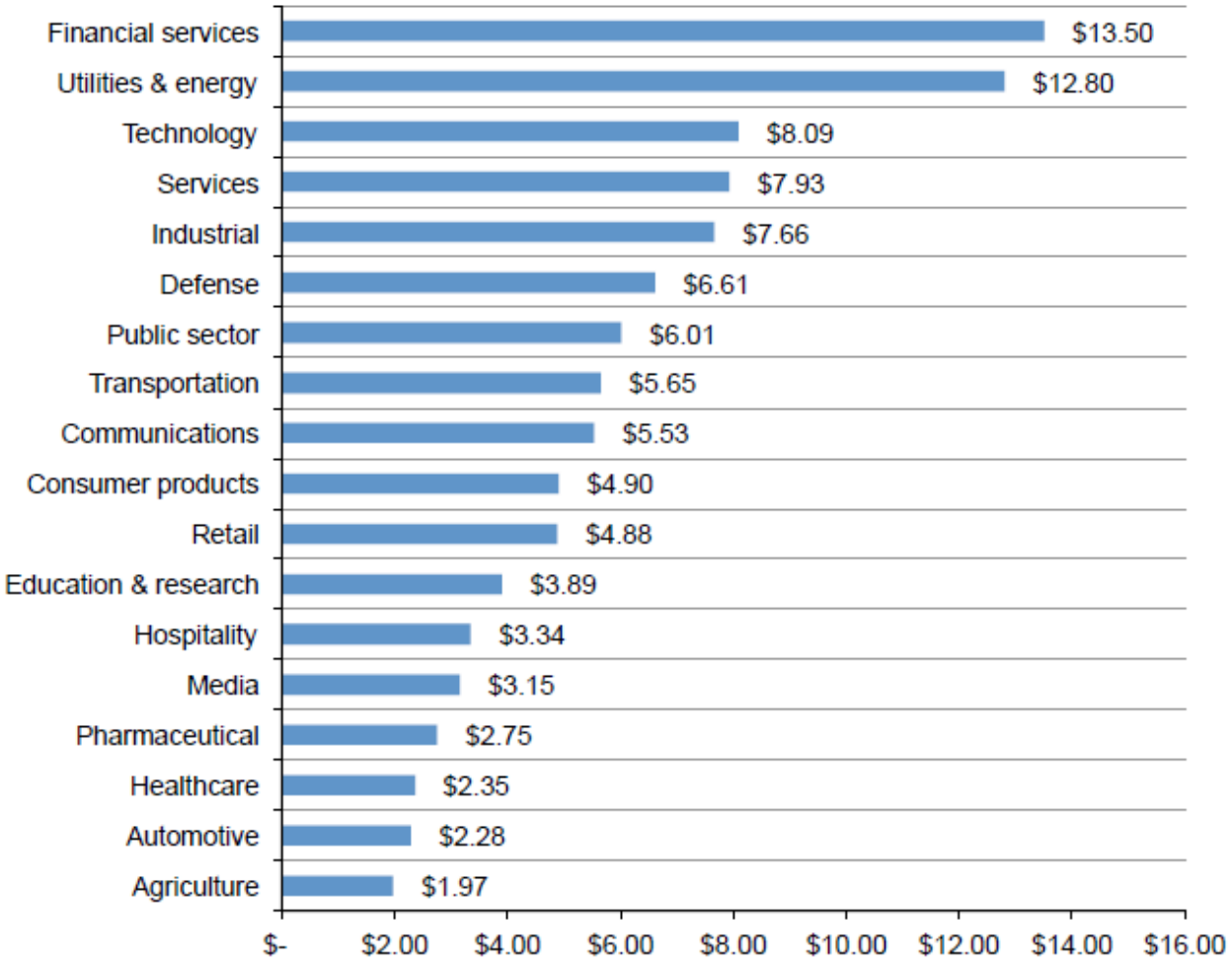
(Annualized costs in U.S. Dollars, 000,000, n=global 252 companies)



Source: Ponemon Institute© Research Report (October 2015)

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Data Classification

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1 Understand the value and location of your data assets

Healthcare/PHI

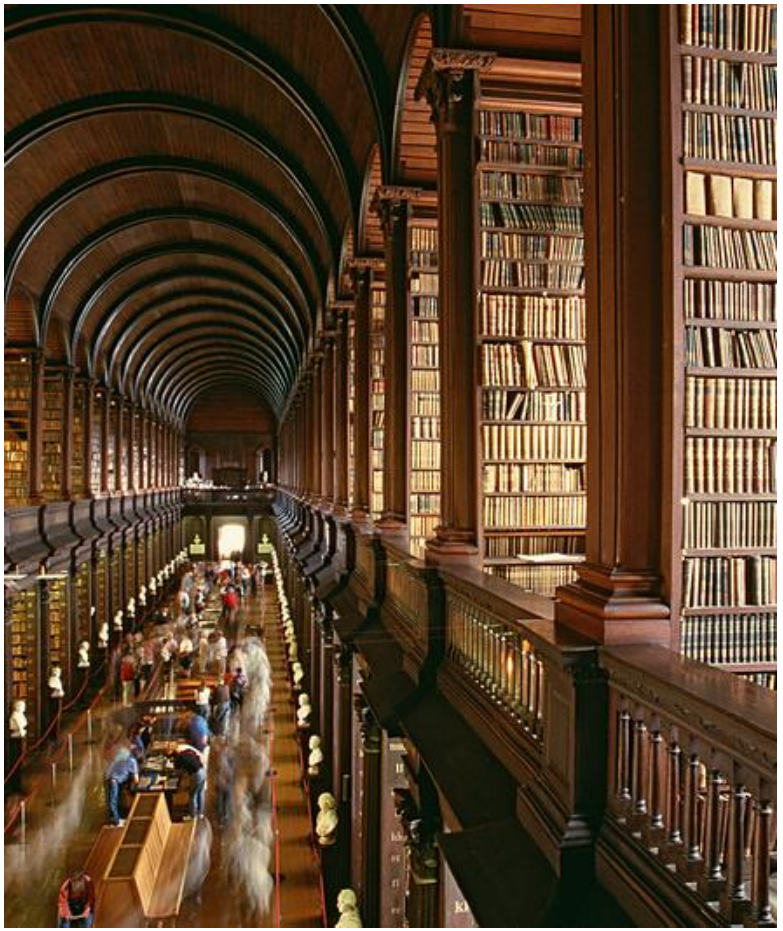
Legal documents

Financial

Marketing

Cardholder data

Newsfeeds/Blogs



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Evaluate Your Applications

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2 Understand your applications' security and the data they control and access

Payment processing

ERP

e-Commerce

CRM

Test and Development

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IT Infrastructure

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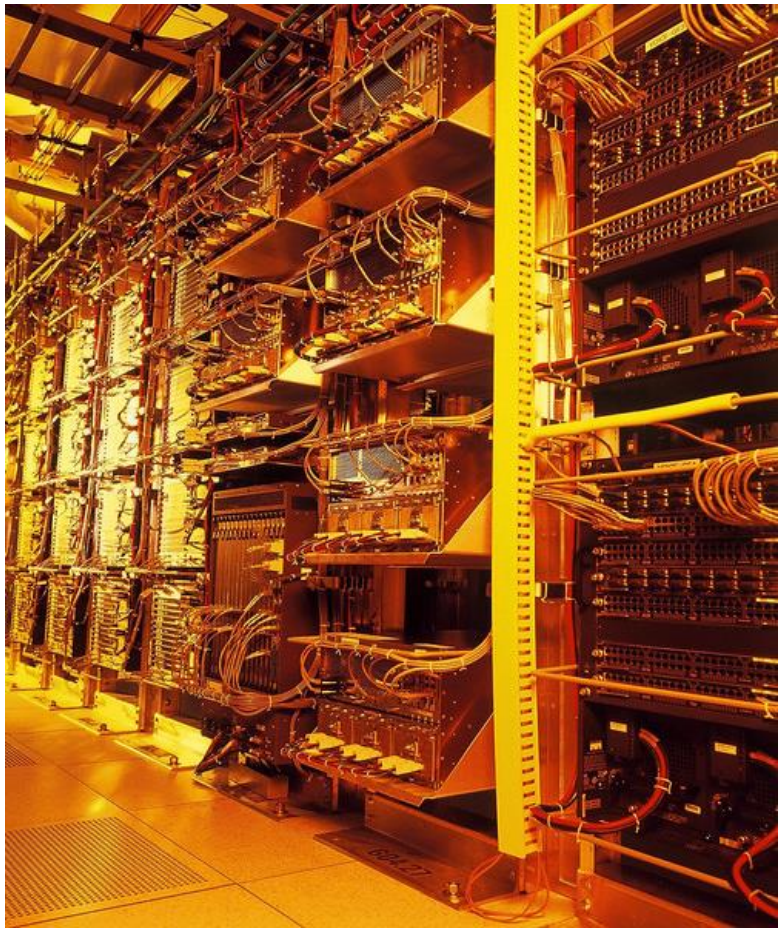
3 Audit your architecture

Focus on simplicity

- Complexity is a risk
- Segmentation
- APIs
- Orchestration
- Storage and backup
- Access controls



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Accept the "New Normal"

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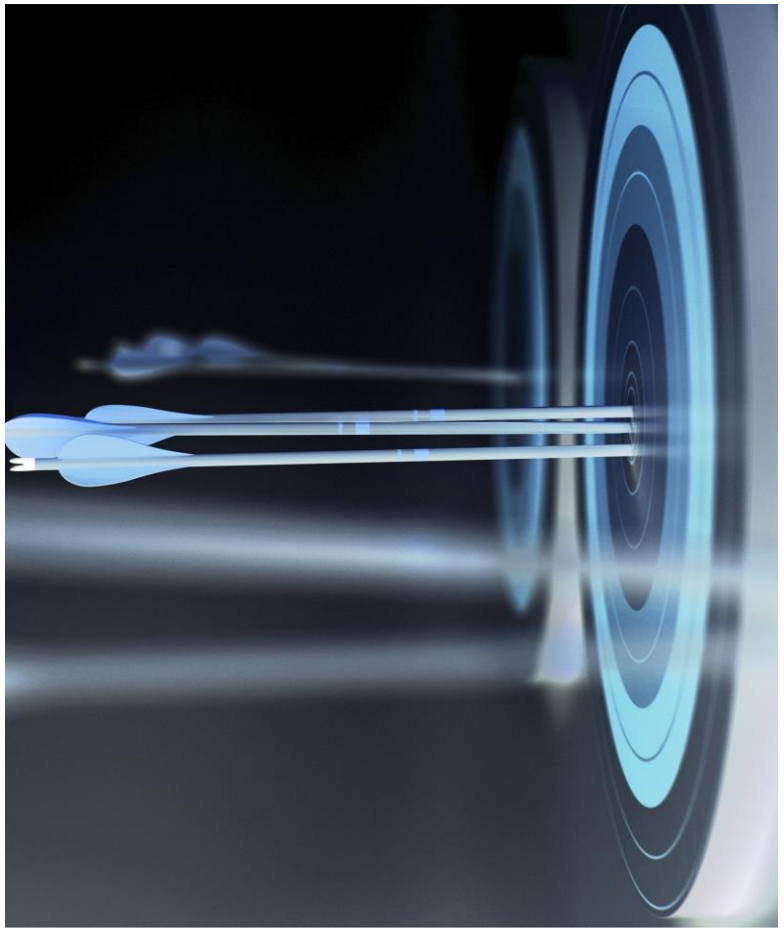
4 Understand threats to your data and What makes *you* a target

Threats

- Internal
- External
- Physical

Targeting

- Provocative actions
- Public announcements, contracts, and other public data
- Nature of your organization's business and culture



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Governance, Risk and Compliance

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5 Fear the hacker, not the auditor

- Being compliant does not equal secure
- Look beyond standards and regulations
- Develop a risk-based approach to managing threats and vulnerabilities
- Establish and adhere to a governance, risk, and compliance (GRC) framework (many to choose from!)

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Collaboration

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6 Collaborate with service providers and peers

- Some controls are better suited for delivery by service providers (network, cloud, MSSPs, risk assessments, etc.)
- Collaboration with peer organizations is vital
- Take advantage of government resources: standards, programs, events, consortiums, services

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Where Is Security Technology Heading?

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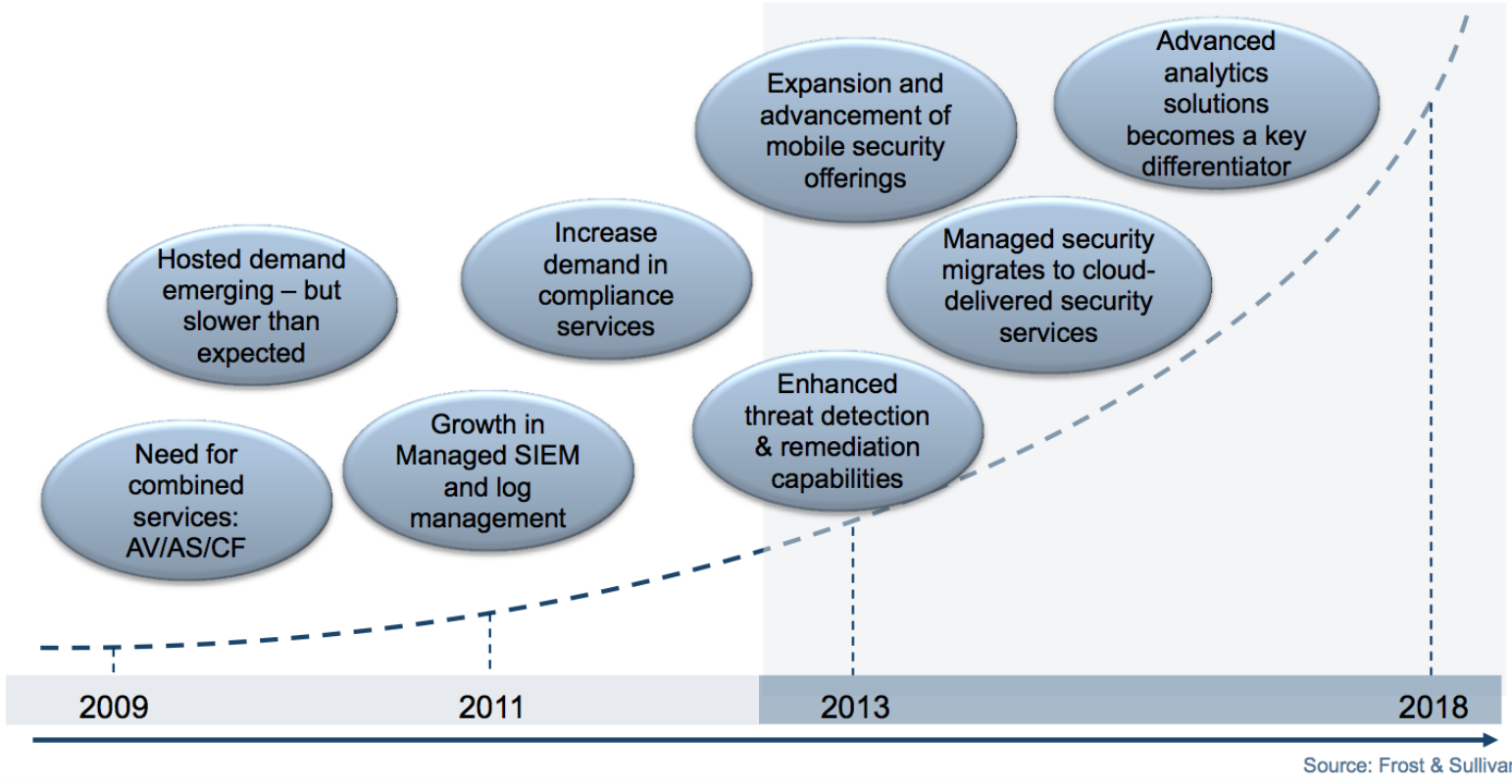
Market Overview—Service Technology Road Map

Key Takeaway: MSS evolve to secure changing technology and in parallel with the perceived threat.

Total Managed Security Services Market: Service Technology Road Map, North America, 2009–2018



Source: Frost & Sullivan

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Summary

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- The threat landscape is evolving rapidly due to nation-state, organized crime, and cyber terrorism
- Organizations must assume the “new normal” -- at least some parts of their networks have been compromised
- Your data is an asset—understand its value, location, and movement
- Establishing and adhering to a governance framework is critical
- Perform regular security evaluations, risk assessments, and awareness training for employees
- Determine core competencies, perform functions that you do well, outsource others to trusted, skilled firms
- Some security functions must be done in partnership with your service provider(s)
- Information sharing partnerships are essential
- Technology-based controls are important, but are not a cybersecurity panacea

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