Assessing IT Security Risks and Evaluating IT Security Controls Within Your Organization

Continuing Professional Education
North Carolina Office of the State Controller*

Date: April 15, 2014
2:00pm – 3:30pm

Location: Office of the State Controller, Raleigh, NC and Live Webinar

Objective: To gain an understanding as to the importance of considering IT security risk in the evaluation of internal controls.

Content: As technology continues to march forward, new and more complex cyber risks emerge threatening significant harm to every company's business success – and everyone and every organization is a target. It's no longer a matter of 'if' a company will be attacked – it's 'when'. In this session, we will take a look at some recent government agency data breaches and the impact they have caused as well as look at how other agencies are responding to cyber threats. We will leverage results from other agencies and look at the improvements that they are making in the fight against cybercrime, along with the steps needed to expand and innovate their information security capabilities in today's ever-changing digital environment.

Instructor: Chip Wentz
Executive Director – National Information Security Center of Excellence
Ernst & Young, LLP

CPE Credit Offered: 1.5 hours

Materials: Will be provided in advance

Teaching Method: Lecture

Prerequisites: None

Advance Preparation: None

Level: Basic

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* Click the following links for additional information about the NC Office of the State Controller, the sponsor of this program, and Ernst and Young, the developer of this program.

Chip Wentz Biography

Chip Wentz is an Executive Director in Ernst & Young's National Information Security Center of Excellence. His primary focus is to help companies protect themselves and the privacy of their information from emerging threats. Chip is a highly accomplished executive with experience in information security, data protection, privacy, compliance, IT risk management, controls and governance and leads information security transformation initiatives for global clients headquartered throughout the United States. In his current role, Chip serves as the Information Protection and Privacy services leader for Ernst & Young's Americas Advisory practice supporting global companies in managing their risks and designing information security programs and systems to protect their most important assets.

The North Carolina Office of the State Controller

Assessing IT security risks and evaluating security controls in your organization

April 15, 2014

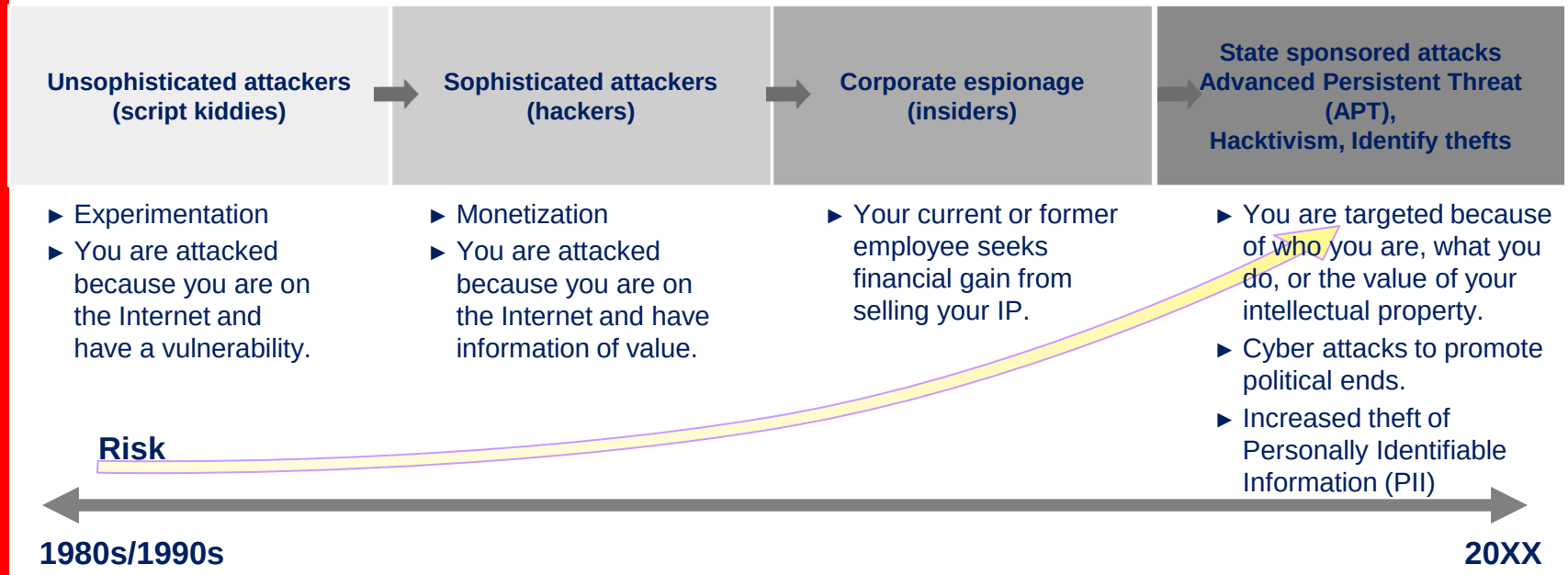
My Background

- Chip Wentz
- Ernst & Young, LLP - Executive Director, Advisory Services
  - Serves as the Americas Information Protection and Privacy services leader and the Southeast Region Information Security leader
  - Experience in IT risk management, information security, data protection, privacy, compliance, controls and governance, with a focus on enabling the business to achieve its objectives through risk mitigation and process improvement.

Cyber threats are constantly evolving

Today's information security programs are challenged to effectively deliver value while managing business risk. Cyber security threats are constantly evolving. Attackers today are patient, persistent, and sophisticated, and attack not only technology, but increasingly, people and processes. The challenges faced today have altered expectations, strained resources, and caused a paradigm shift in information security processes.

Consequently, organizations today need to alter their mindset on how to think about information security threats, risks, and capabilities.



Cyber security threats are more sophisticated today than ever before

Attributes	Organized crime	Hactivists	State sponsored
Motive	► Financial gain	► Visibility to socio-economic cause	► National economic/competitive or military advantage
Characteristics	► Targets individuals and organizations ► Indiscriminate targets of opportunity	► Targets individuals and organizations that counter hacktivist's ideology	► Targets individuals and organizations that operate/compete with a sponsoring states strategic interest
Attack objective (s)	► Conduct unauthorized financial transactions ► Steal banking credentials ► Obtain credit card numbers ► Identity theft ► Maintain access to victim network	► Data destruction/modification (e.g., web-site defacement) ► Service disruption (e.g., DDoS) ► Steal/post personal information for brand or reputation impact	► Steal internal intellectual property ► Understand processes/procedures that drive efficiencies ► Target critical infrastructure ► Maintain access to victim network
Adversary/threat actor examples	► Core flood botnet ► Zeus	► Anonymous ► LulzSec	► The APT
Targeted industries	► Any industry, organization that processes credit cards or performs financial transactions	► Any industry, organization, government agencies, public figures that counter hacktivist's ideology	► Any industry, organization that operates/competes with a sponsoring states strategic interest

Why cybersecurity matters

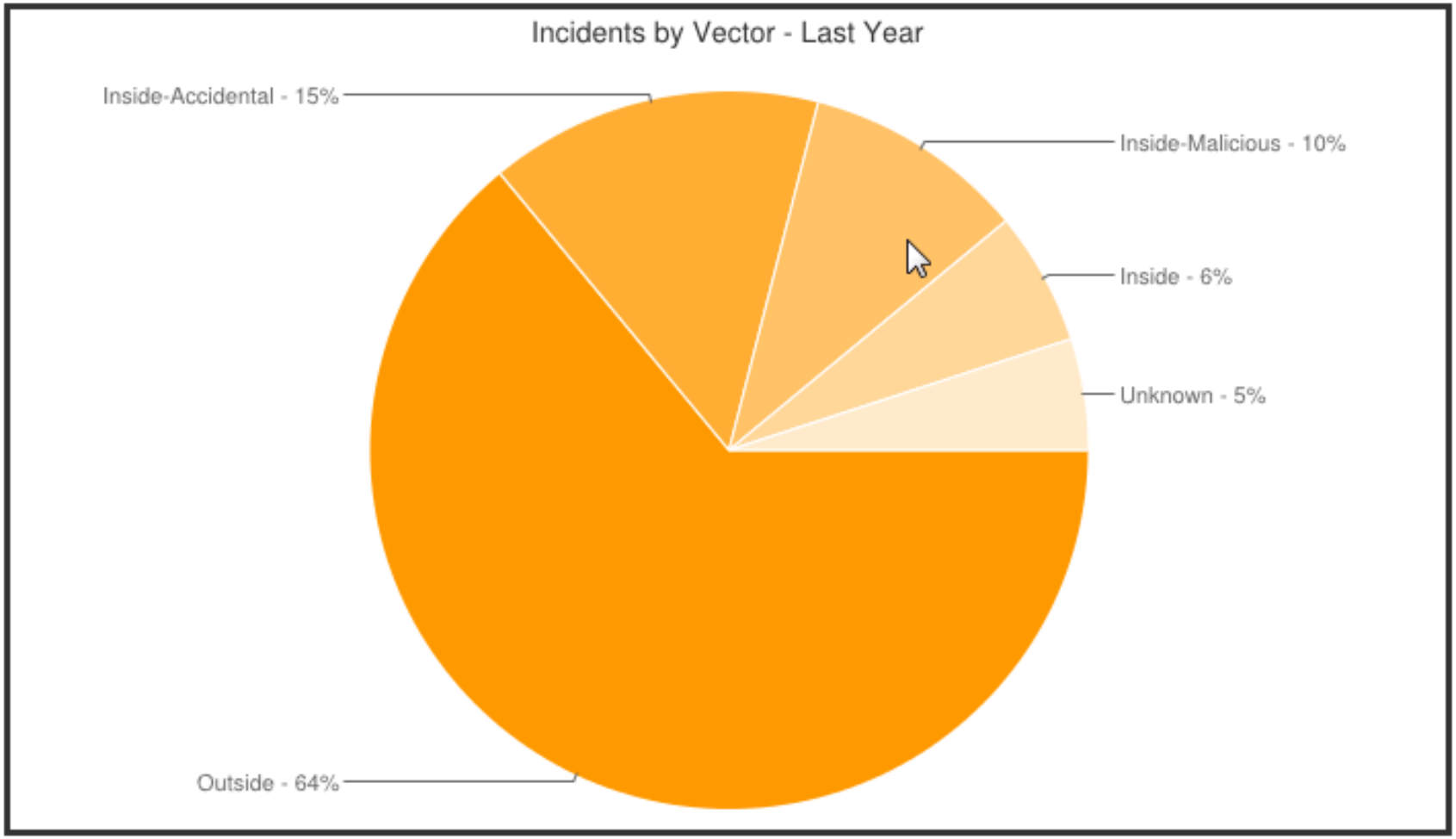
Security threats are real

- From the White House:
  - Between 2008 and 2009, American business losses due to cyber attacks had grown to more than **US$1 trillion of intellectual property.** (White House Cyberspace Policy Review [1])
- From Symantec:
  - From 2006 to 2008, the number of new cyber threats jumped nearly 1,000%.
  - From July to September 2010, Symantec observed 14.6 trillion spam email messages, accounting for 91% of all email messages observed.
  - Symantec now develops **10,000 to 15,000 new virus signatures every day**

- From Verizon 2013 Data Breach Report:
  - Ninety-two percent of data breaches caused by external agents, 14% by insiders and 1% by partners.
  - Fifty-two percent used some form of hacking, 76% exploited weak credentials, 40% used malware, 35% involved physical attacks, 29% employed social tactics, 13% involved privilege misuse.
  - Seventy-five percent were driven by financial motive, 78% rated low difficulty, 69% discovered by external parties, 66% took months to discover.

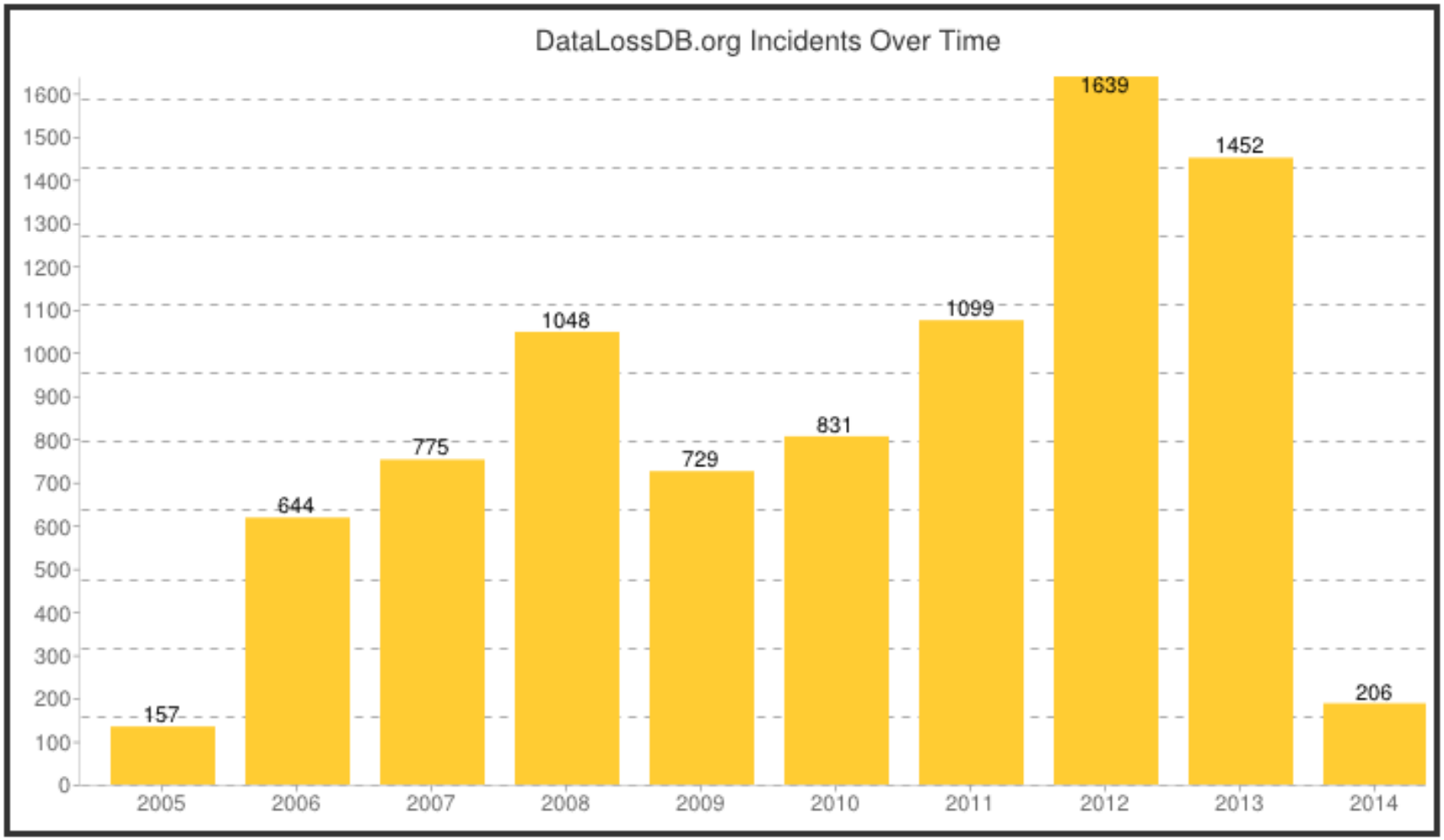
1. See http://www.whitehouse.gov/assets/documents/Cyberspace_Policy_Review_final.pdf quoting "industry sources".
2. "Threat agents" refer to entities that cause or contribute to an incident. There can be more than one agent involved in any incident, therefore the numbers do not add to 100%.
3. Threat actions describe what the threat agent did to cause or contribute to the breach. There are usually multiple actions across multiple categories during a breach scenario.

Internal vs. External breach stats



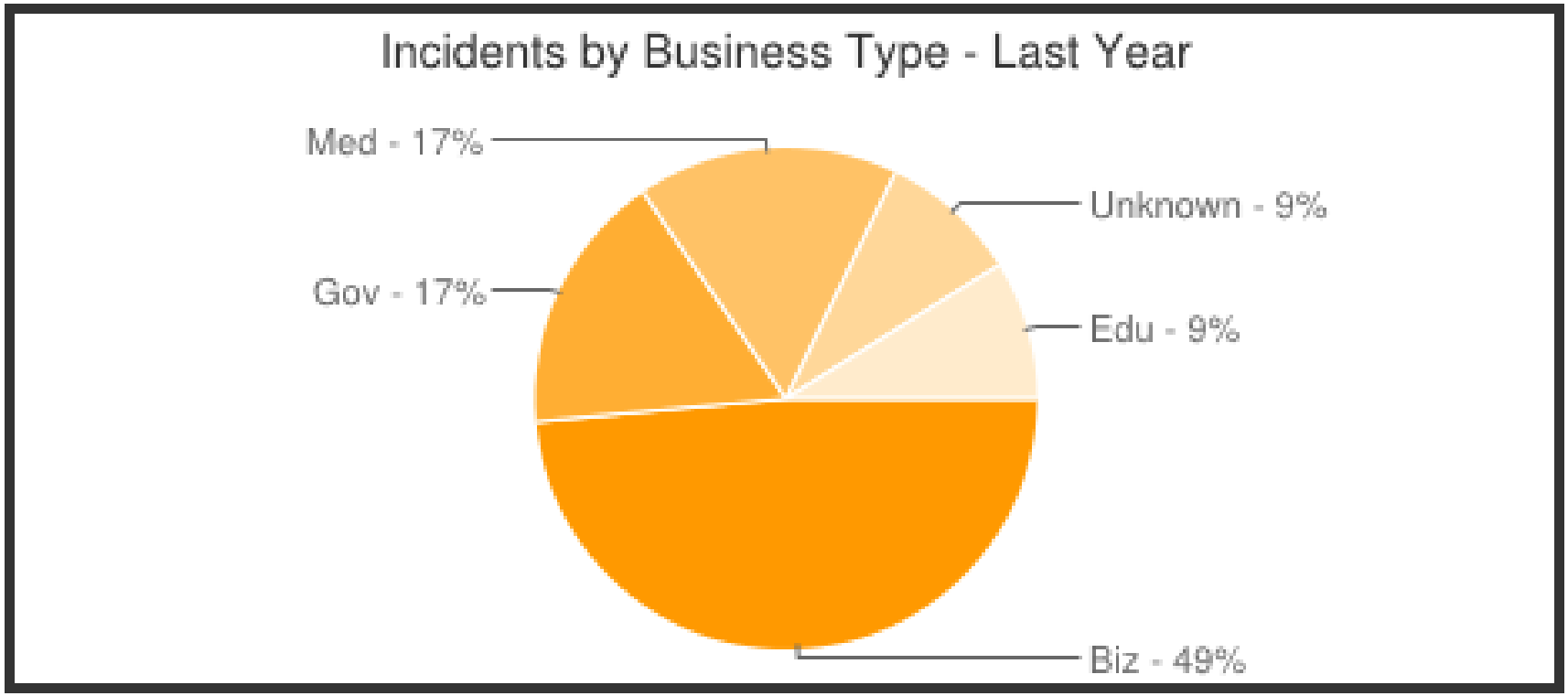
Source: Datalossdb.org

Data loss incidents over time



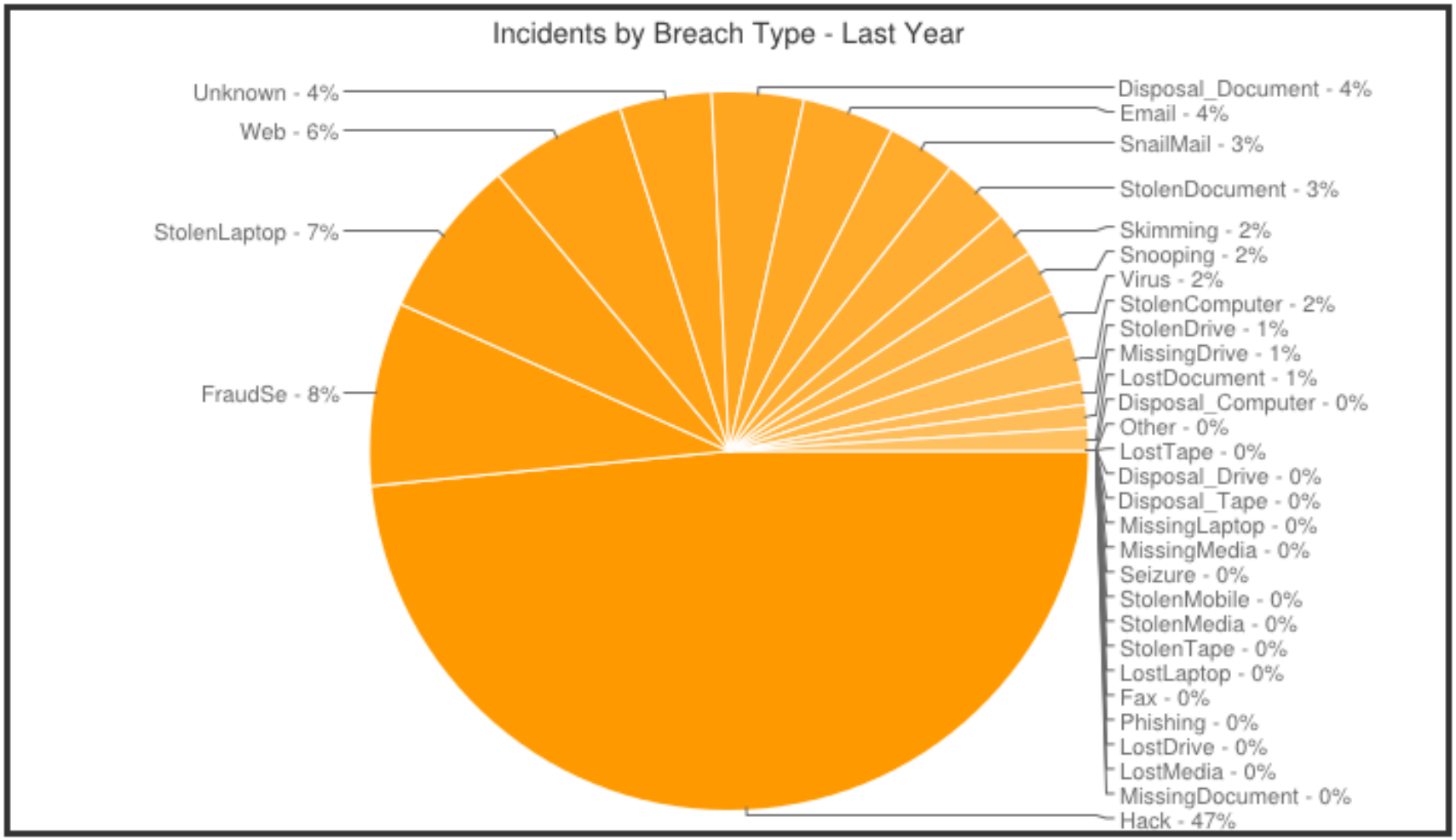
Source: Datalossdb.org

Incidents by Business Type



Source: Datalossdb.org

Incidents by breach type - 2013



Source: Datalossdb.org

Sample Data Loss Events – Govt

Organization	Incident Details
Fulton County Georgia; City of Burlington, Vermont	An undisclosed number of names, Social Security numbers, and dates of birth exposed on public court website
City of Detroit	1,700 employee names, dates of birth, and Social Security numbers compromised after a malware infection
Texas Comptroller's Office	Personal details for 3.5 million teachers and other employees of the state of Texas were accidentally published on the Internet. Information released included names, social security numbers and birthdates. This data had been posted on the Internet for over a year without the organization realizing it.
California DMV	An unknown number of credit or debit card numbers with expiration dates and three digit security codes compromised due to a security issue with the credit card processing service
NC DHHS	• 48,752 names, dates of birth, and Medicaid identification numbers exposed when children's Medicaid insurance cards were sent to the wrong addresses • Missing flash drive contained unencrypted names, SSN, dates of birth and addresses for more than 50,000 medical providers
NC DOR	Files on 30,000 taxpayers on stolen laptop
NC ABC	Malware has compromised multiple stores point-of-sale systems
NC Dept of State Treas	As many as 26,000 envelopes mailed in January partially or fully exposed the retirees' Social Security numbers

Source: Datalossdb.org

Incidents involving “North Carolina”

- http://datalossdb.org/search?utf8=%E2%9C%93&query=North+carolina&show_fringe=no&commit=SEARCH

Organizations	Incidents	Records
Johnston County North Carolina	2	61,000
Mecklenburg County North Carolina	1	400
University of North Carolina	3	242,000
North Carolina State University	1	1,800
North Carolina Utilities Commission	1	???
North Carolina Department of Revenue	1	30,000
North Carolina Department of Transportation	1	25,000
North Carolina Department of Correction	1	???
North Carolina Community College System	1	51,000
North Carolina Employment Security Commission	1	1,771
Wake County North Carolina Emergency Medical Services	1	4,642
University of North Carolina at Greensboro	3	2,815
University of North Carolina School of Arts	1	2,700
North Carolina Division of Medical Assistance	1	???
North Carolina Division of Motor Vehicles	2	16,013
University of North Carolina at Charlotte	3	350,148
North Carolina Department of State Treasurer	1	26,000
North Carolina Alcoholic Beverage Control Commission	1	???
State Climate Office of North Carolina	1	2,608
North Carolina Division of Aging and Adult Services	1	85,045
University of North Carolina Lineberger Comprehensive Cancer Center	1	3,500
North Carolina Department of Health and Human Services	5	100,520

Common risks associated with sensitive information – What could go wrong?

- Considering what could go wrong is important for understanding what needs to be done to effectively manage and protect sensitive information. However, these challenges are often tactical challenges or symptoms of broader issues.

- **Common challenges**
  - Lost or stolen media
  - Over-sharing of personal information
  - Good intentions but misused data
  - Third party service provider weaknesses
  - Web site leakage
  - Hackers (inside and outside)
  - Unwanted marketing communications (telephone, email)
  - Fraudulent transactions
  - Social engineering, including phishing

Business drivers - Staying out of the headlines

Impact of data loss incidents:

- Reputational damage
- Regulatory fines
- Loss of customer confidence
- Direct loss of business
- Loss of competitive advantage

The cost of a breach

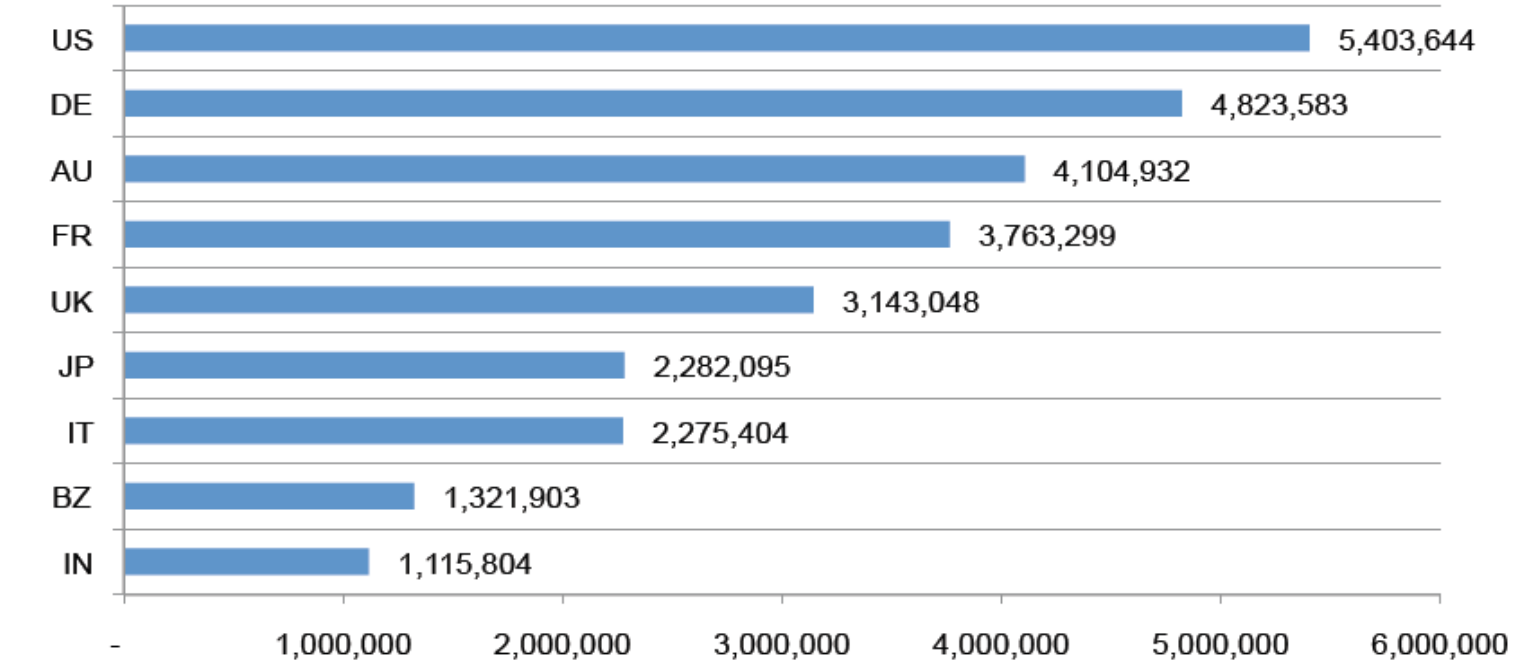
The cost of a breach, broken out for three sample companies

		Cost per record		
Category	Description	Company A: Low-profile breach in a non-regulated industry	Company B: Low-profile breach in a regulated industry	Company C: High-profile breach in a highly regulated industry
Discovery, notification, and response	Outside legal counsel, mail notification, calls, call center, and discounted product offers	$50	$50	$50
Lost employee productivity	Employees diverted from other tasks	$20	$25	$30
Opportunity cost	Customer churn and difficulty in getting new customers	$20	$50	$100
Regulatory fines	FTC, PCI, SOX	$0	$25	$60
Restitution	Civil courts may ask to put this money aside in case breaches are discovered	$0	$0	$30
Additional security and audit requirements	The security and audit requirements levied as a result of a breach	$0	$5	$10
Other liabilities	Credit card replacement costs. Civil penalties if specific fraud can be traced to the breach	$0	$0	$25
Total cost per record		**$90**	**$155**	**$305**

Source: Forrester Research, Inc.

The cost of a breach (continued)

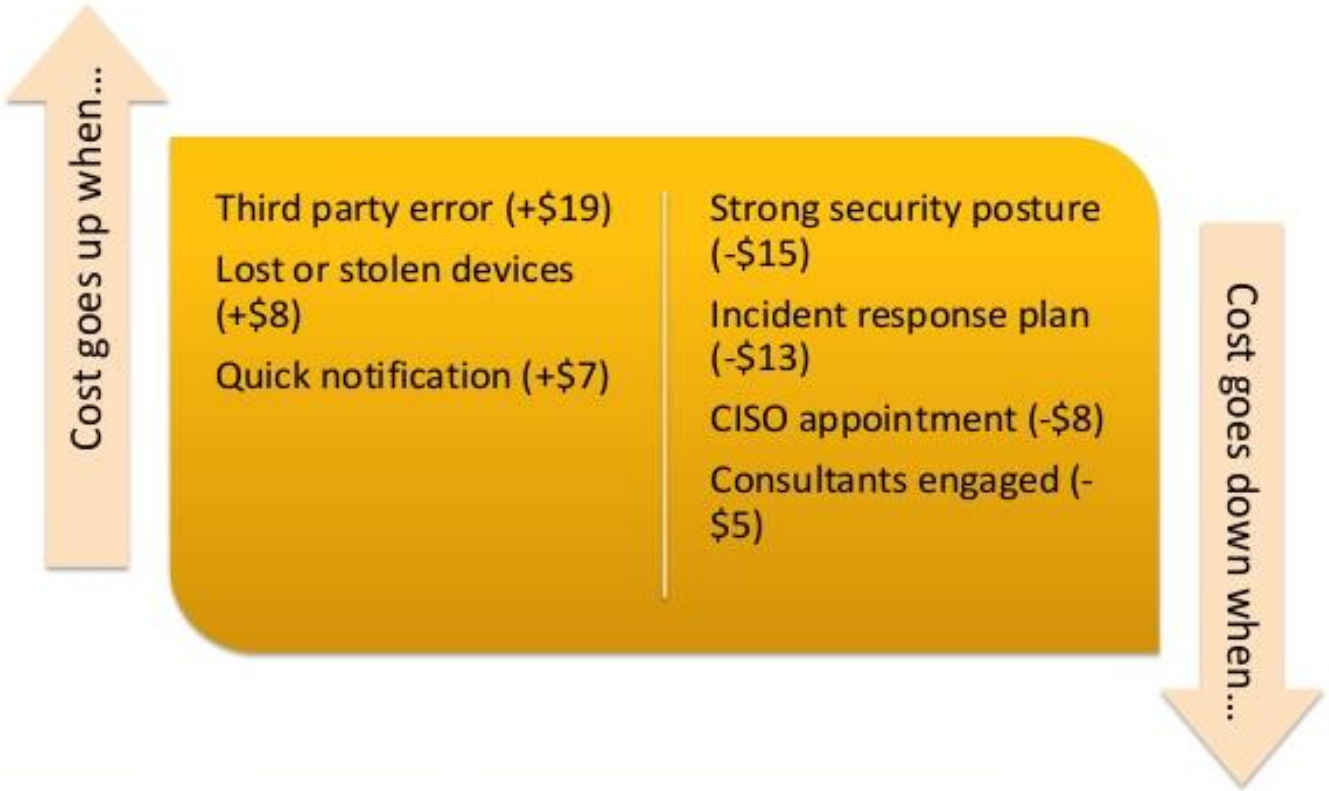
Figure 3. The average total organizational cost of data breach
Measured in US$



Source: Symantec & the Ponemon Institute – May 2013: Cost of a Data Breach Study

Factors that affect cost

Seven factors that raise / reduce cost of a data breach



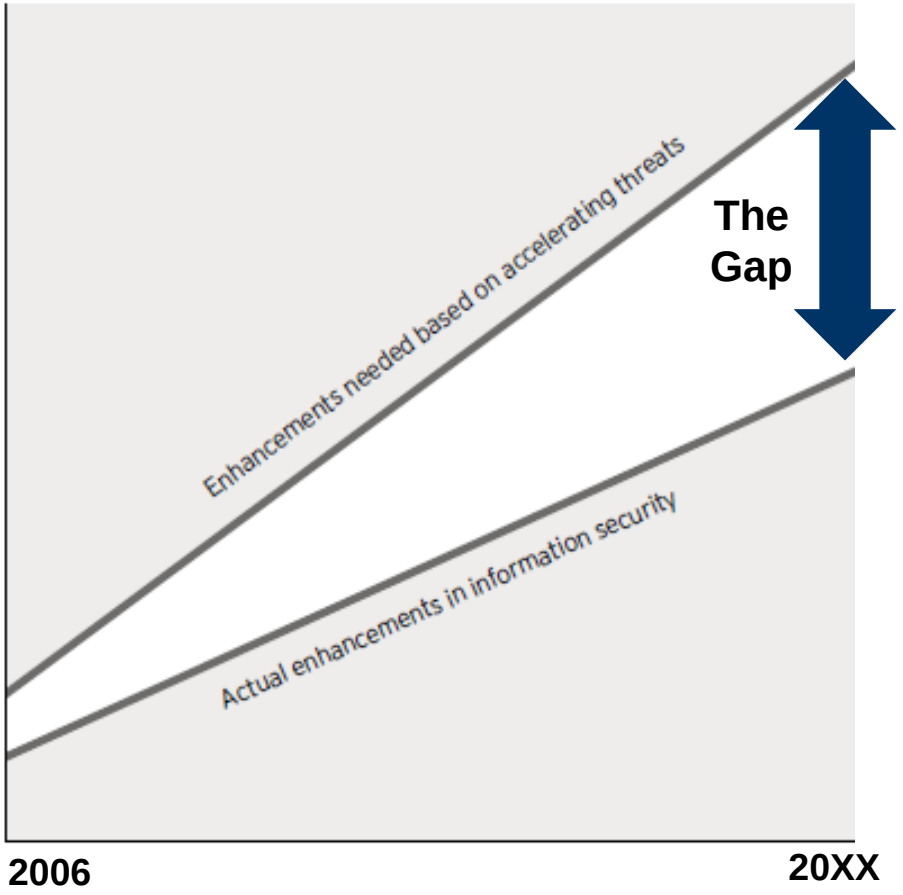
2013 Annual Study: Global Cost of a Data Breach - June 5, 2013

Symantec.

9

Organizations are fighting to close the security gap of the advancing threat.

- Companies have implemented “point solutions” to respond to known security threats.
- However, the number and sophistication of threats has also increased.
- Organizations are challenged to grow its security controls at pace with the rising threats.
- As a result, the gap between what the information security function *is* doing and *should* be doing has widened.

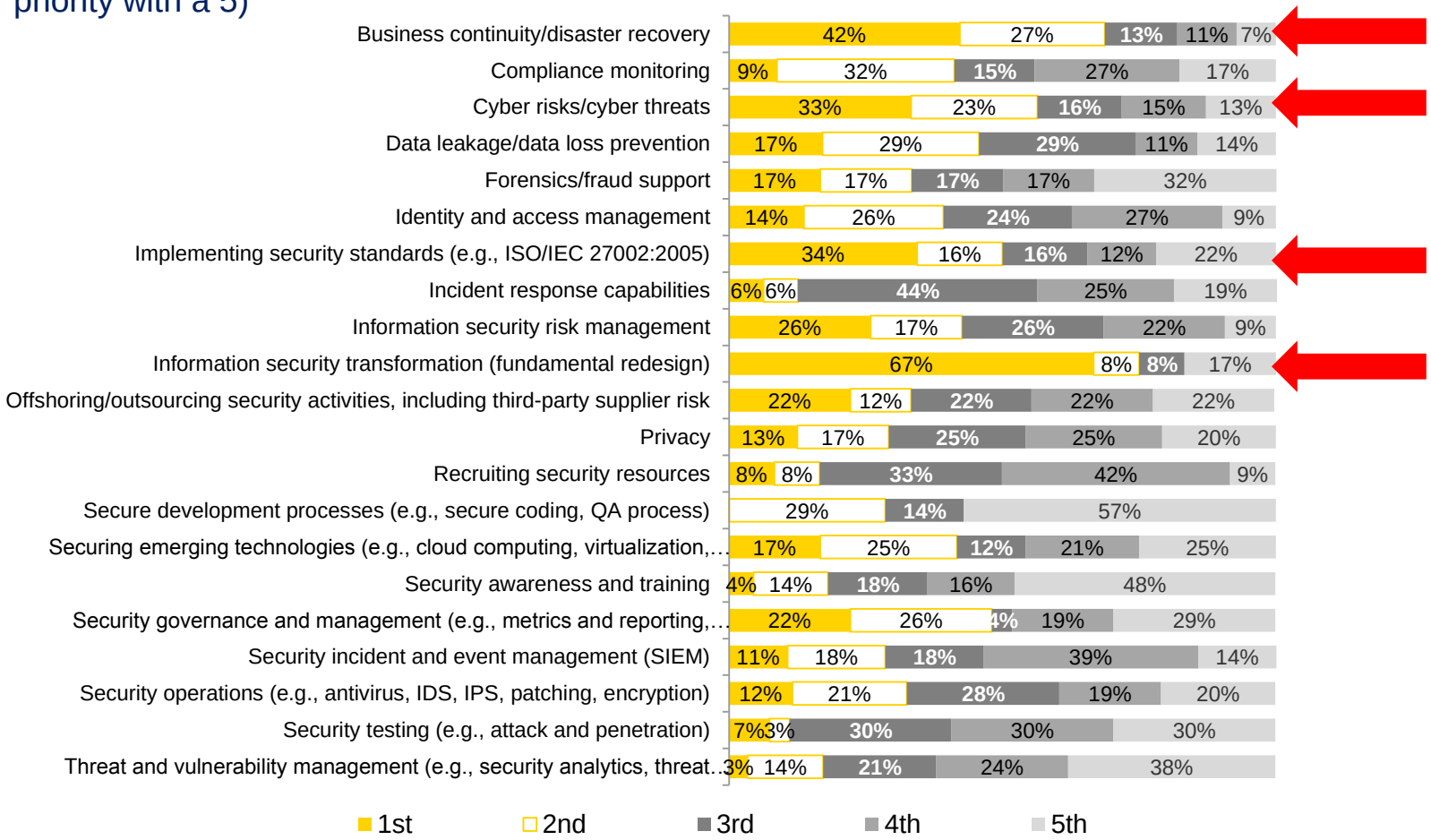


Introduction to EY's Global Information Security Survey Results

- Now in its 16th year, EY's Global Information Security Survey is among the world's leading sources of information and insight into the global state of information security.
- This year's 1,909 respondents (128 from Govt and Public Sector) from 64 countries represent most of the world's largest and most-recognized global companies, and include some of the world's leading information security authorities.
- Strong data, blended with EY's industry-leading perspectives help our clients focus on the most critical risks, identify their strengths and weaknesses, and improve their information security.
- The following slides are related to the Government and Public Sector respondents data.

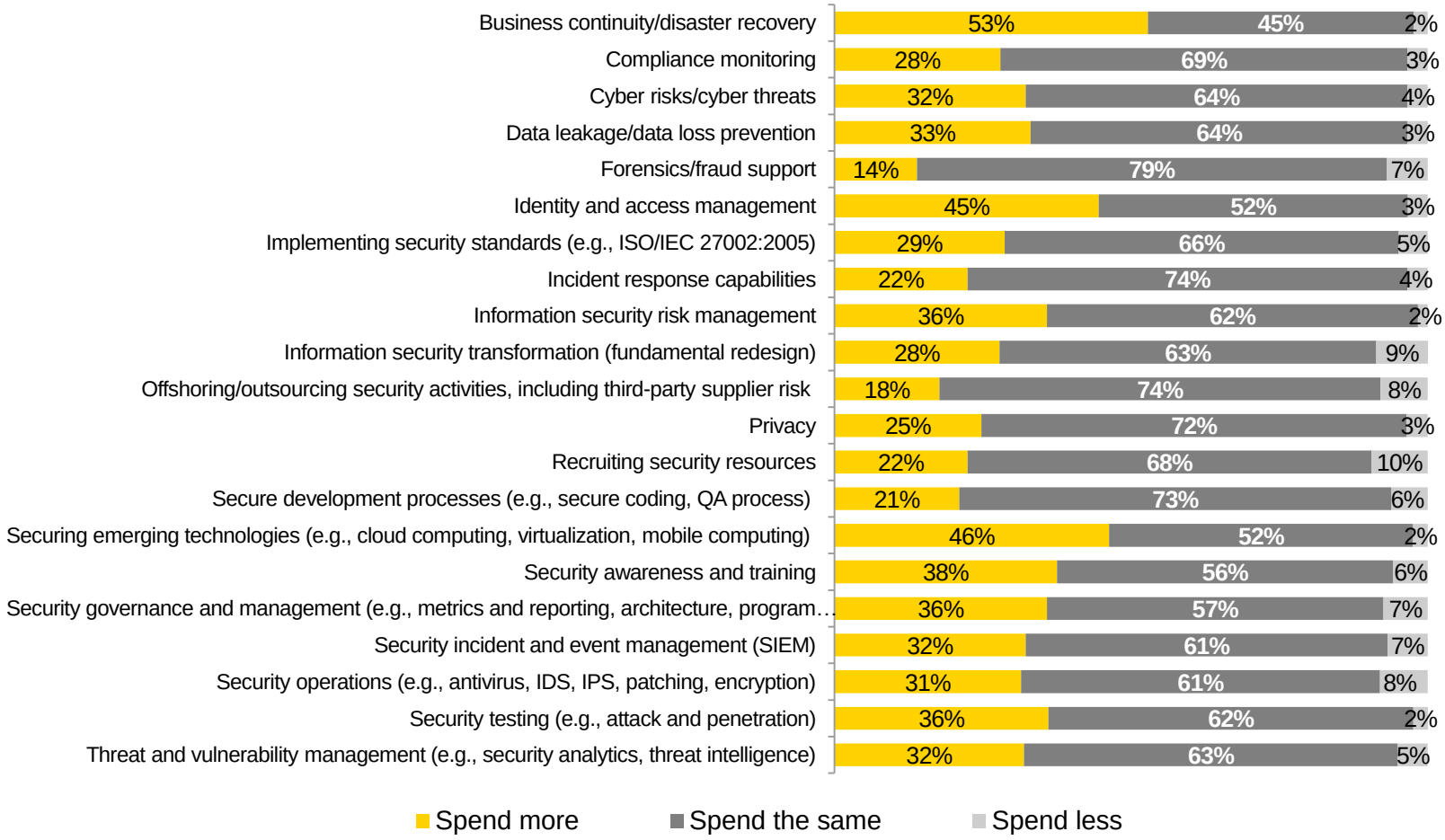
Security budget and investments

Which of the following information security areas are defined as “top priorities” over the coming 12 months? (Please mark five items showing your top priority with a 1 to your fifth priority with a 5)



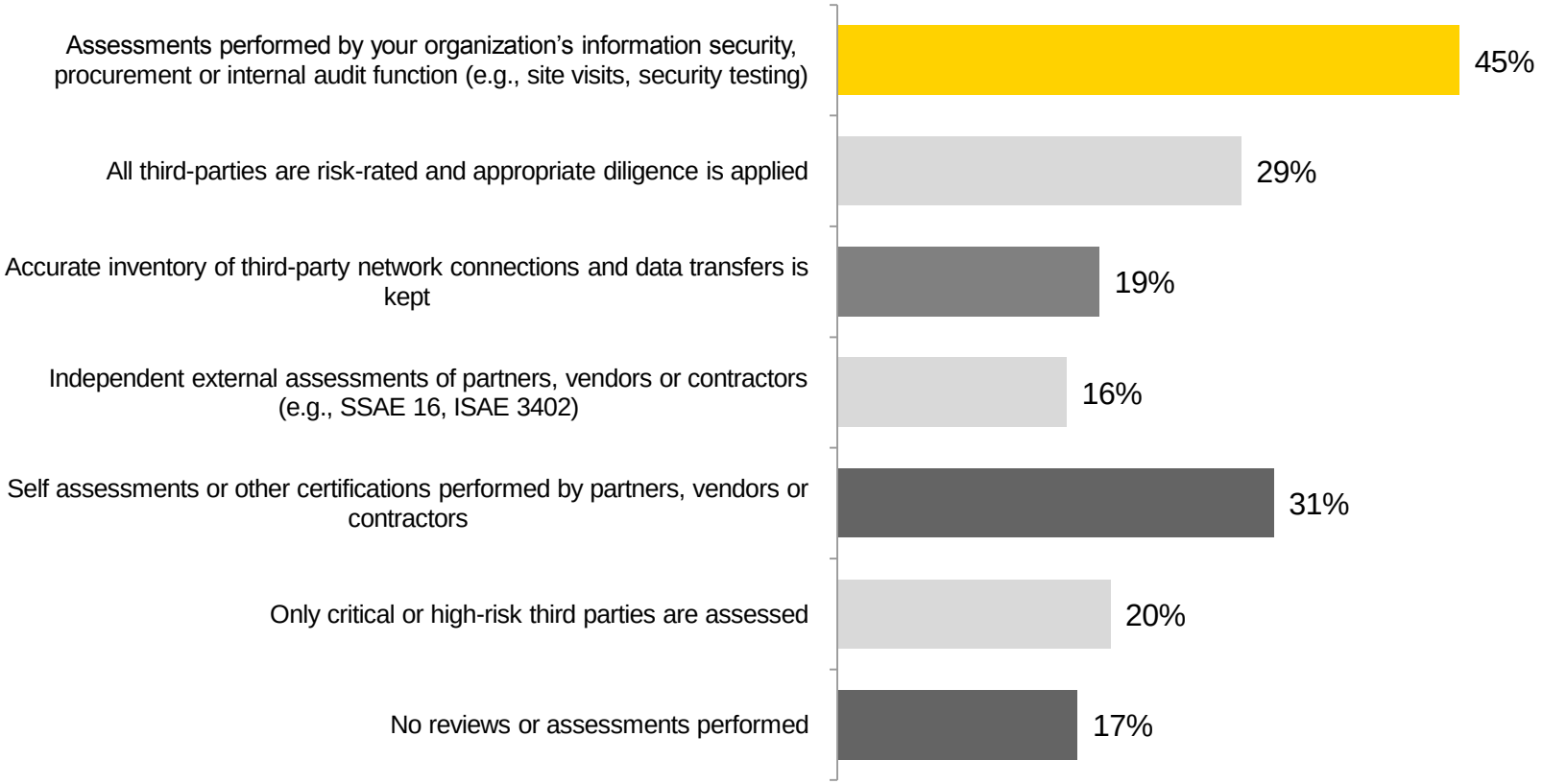
Security budget and investments

Compared to the previous year, does your organization plan to spend more, less or relatively the same amount over the coming year for the following activities?



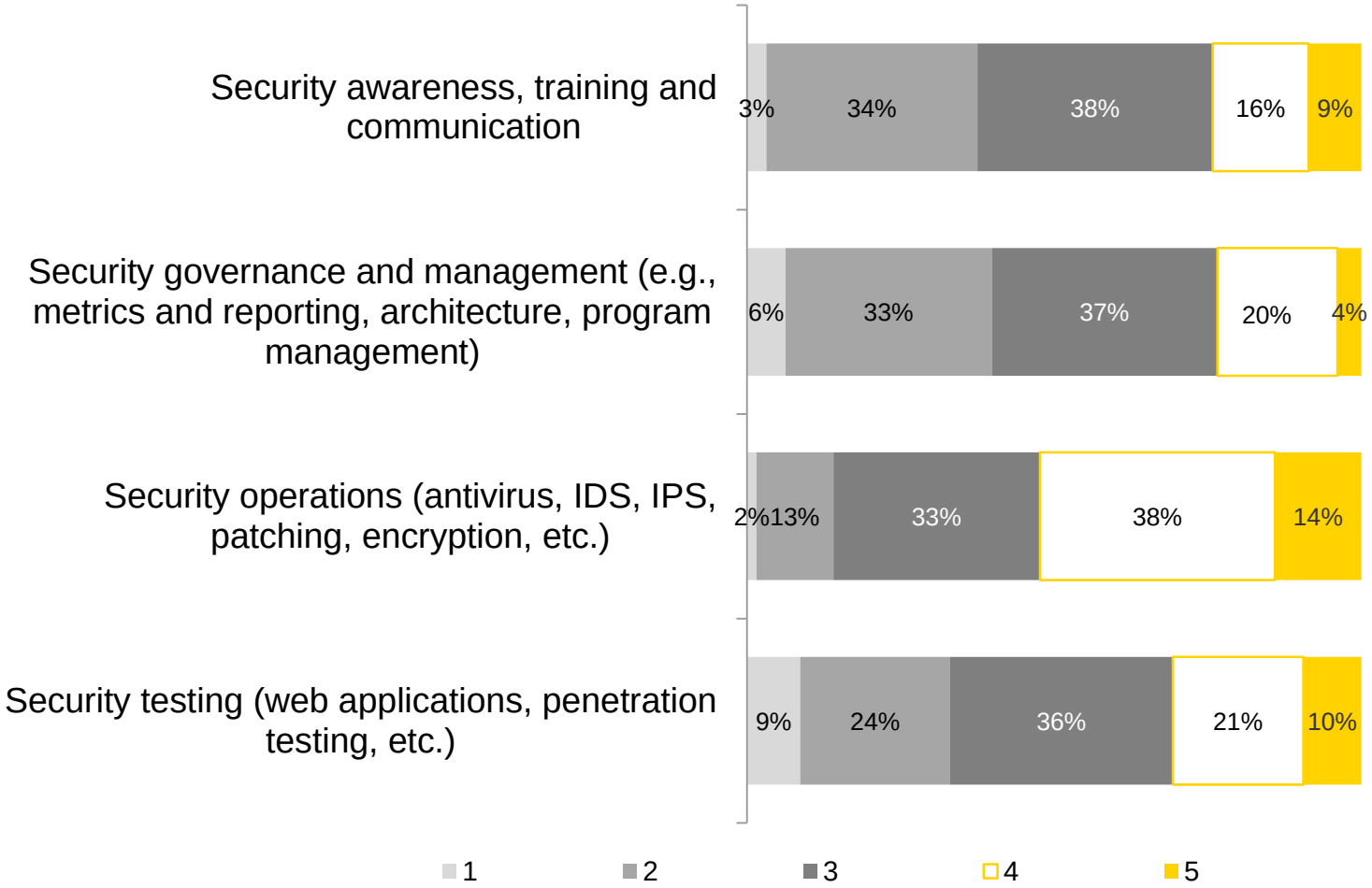
Security governance

How do you ensure that your external partners, vendors or contractors are protecting your organization's information? *Choose all that apply.*



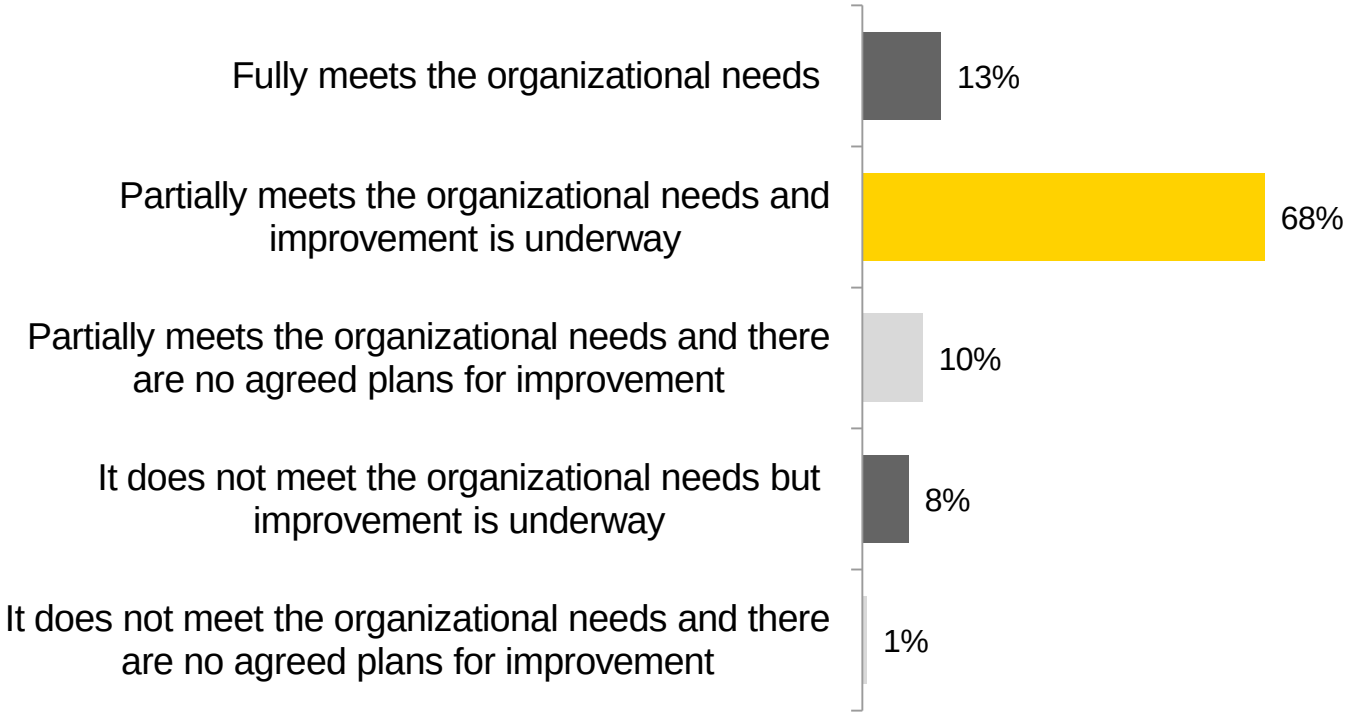
The effectiveness of information security

Please rate the following information security management processes in your organization in terms of maturity (on a scale of 1 to 5 where 1 is nonexistent and 5 is very mature)



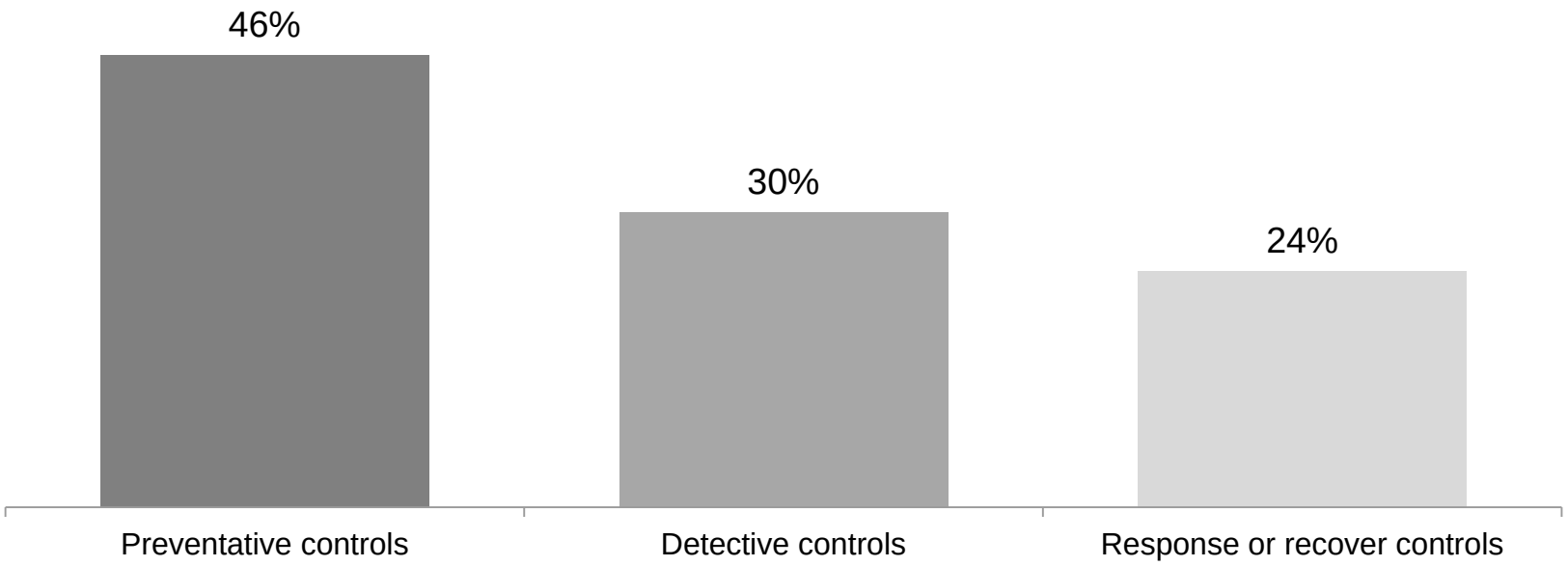
The effectiveness of information security

How would you characterize the extent to which the Information Security function is meeting the needs of your organization? *Choose one.*



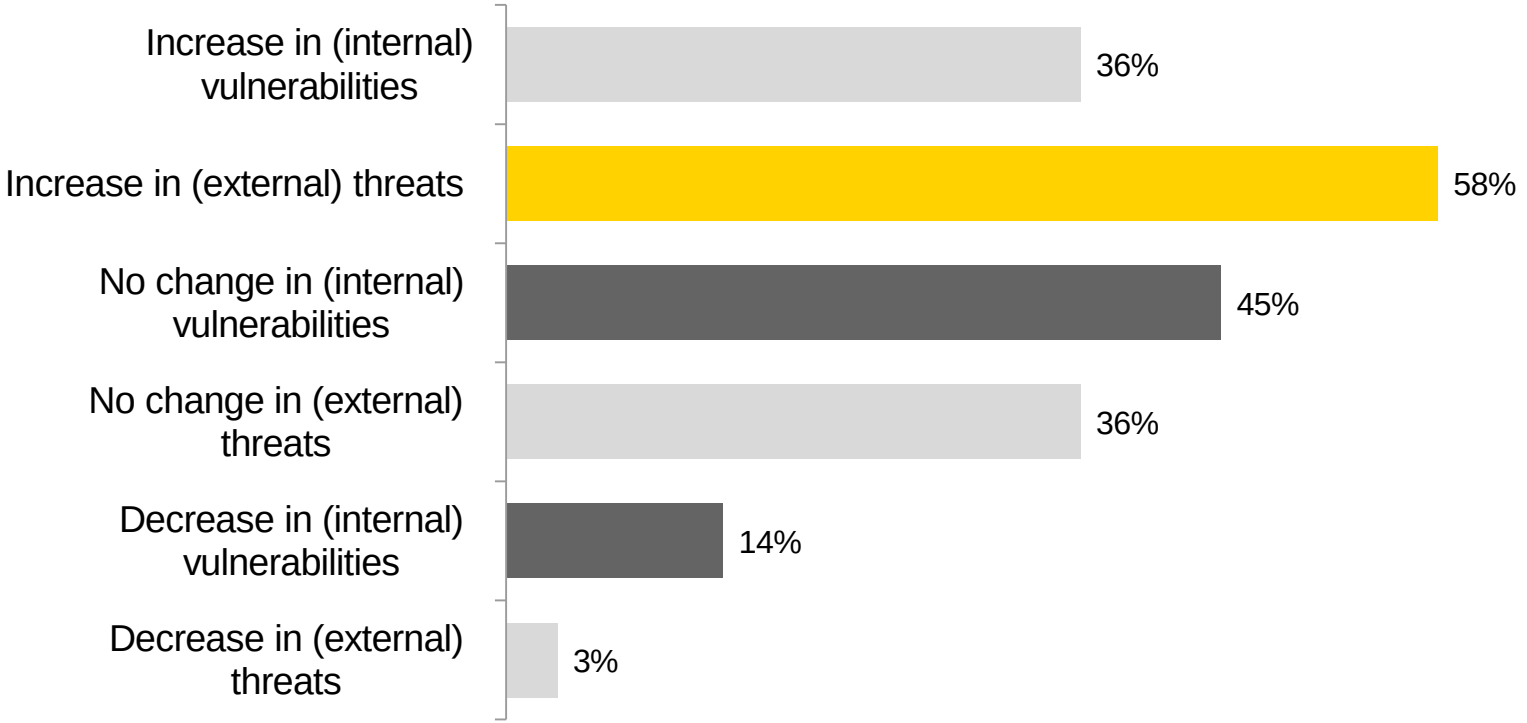
Information security environment

What percentage of your spending or effort is allocated to information security controls?
Please allocate percentages to add to 100%.



Information security environment

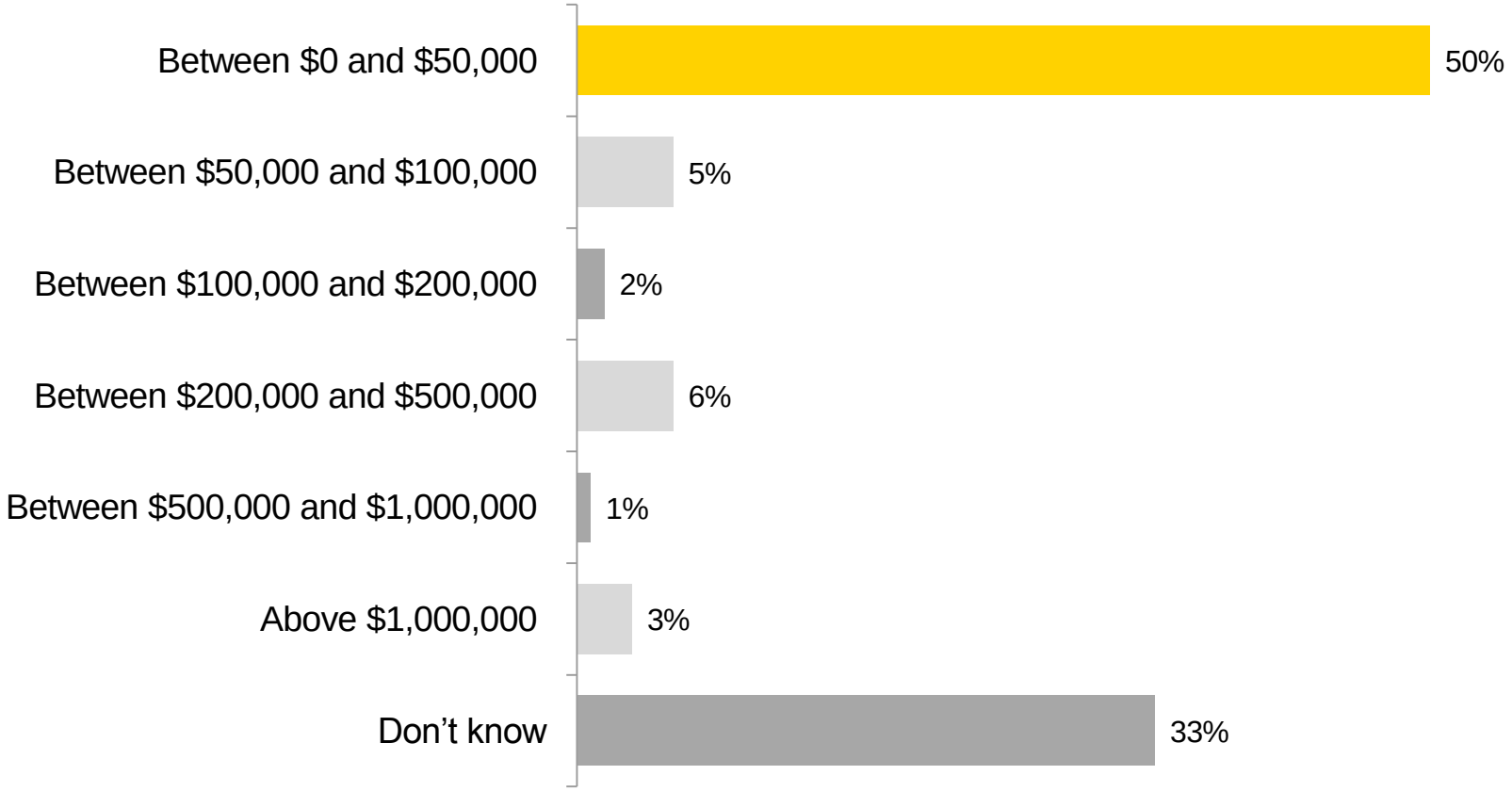
How has the risk environment in which you operate changed in the last 12 months? *Choose all that apply.*



Because respondents could select more than one option, data will not total 100%.

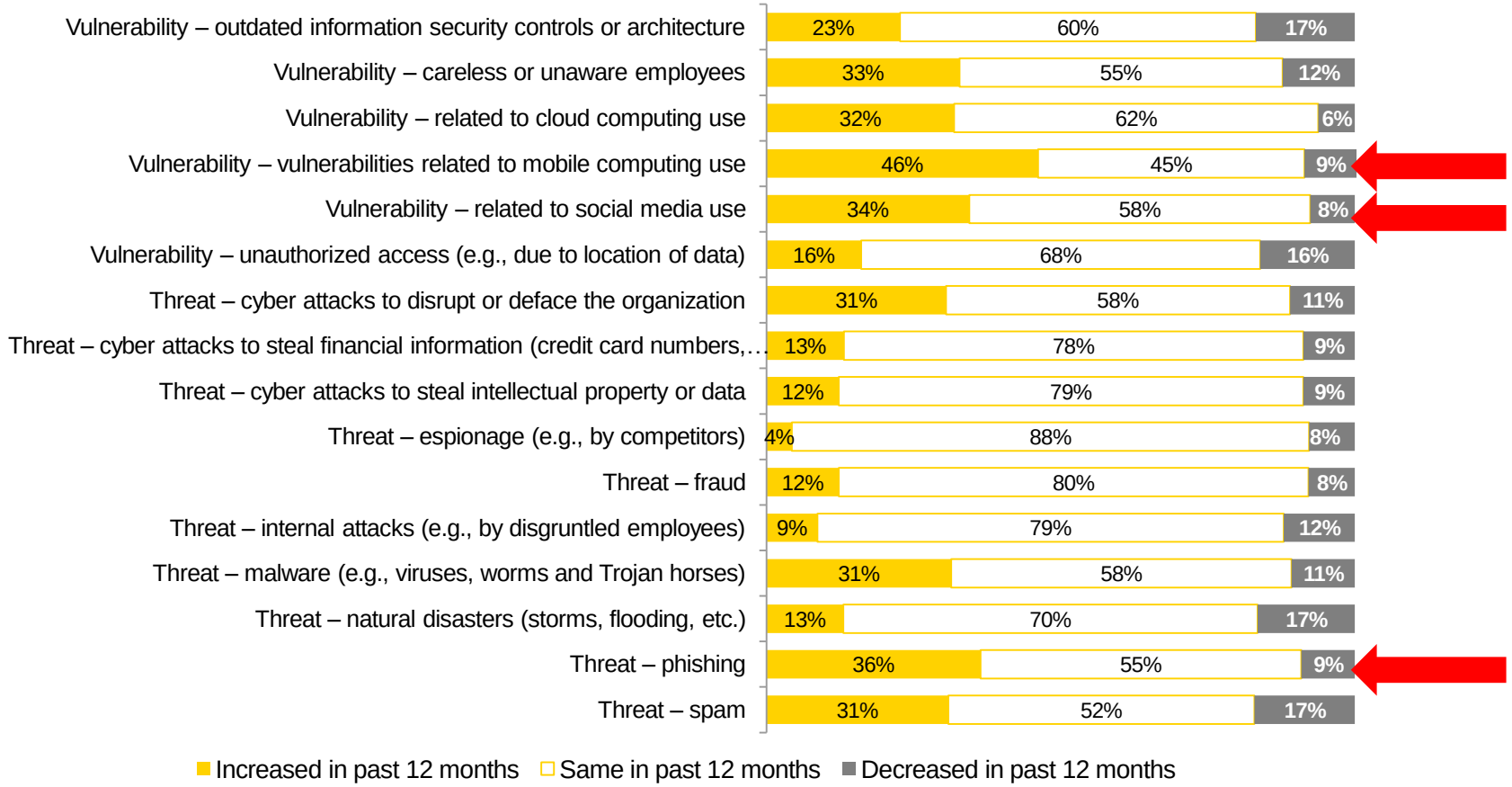
Information security environment

What is your estimate of the total financial damage related to information security incidents over the past year (this includes loss of productivity, regulatory fines, etc.; the estimate excludes costs or missed revenue due to brand damage)? *Choose one.*



Information security environment

Based on actual incidents, which threats* and vulnerabilities** have most changed your risk exposure over the last 12 months?

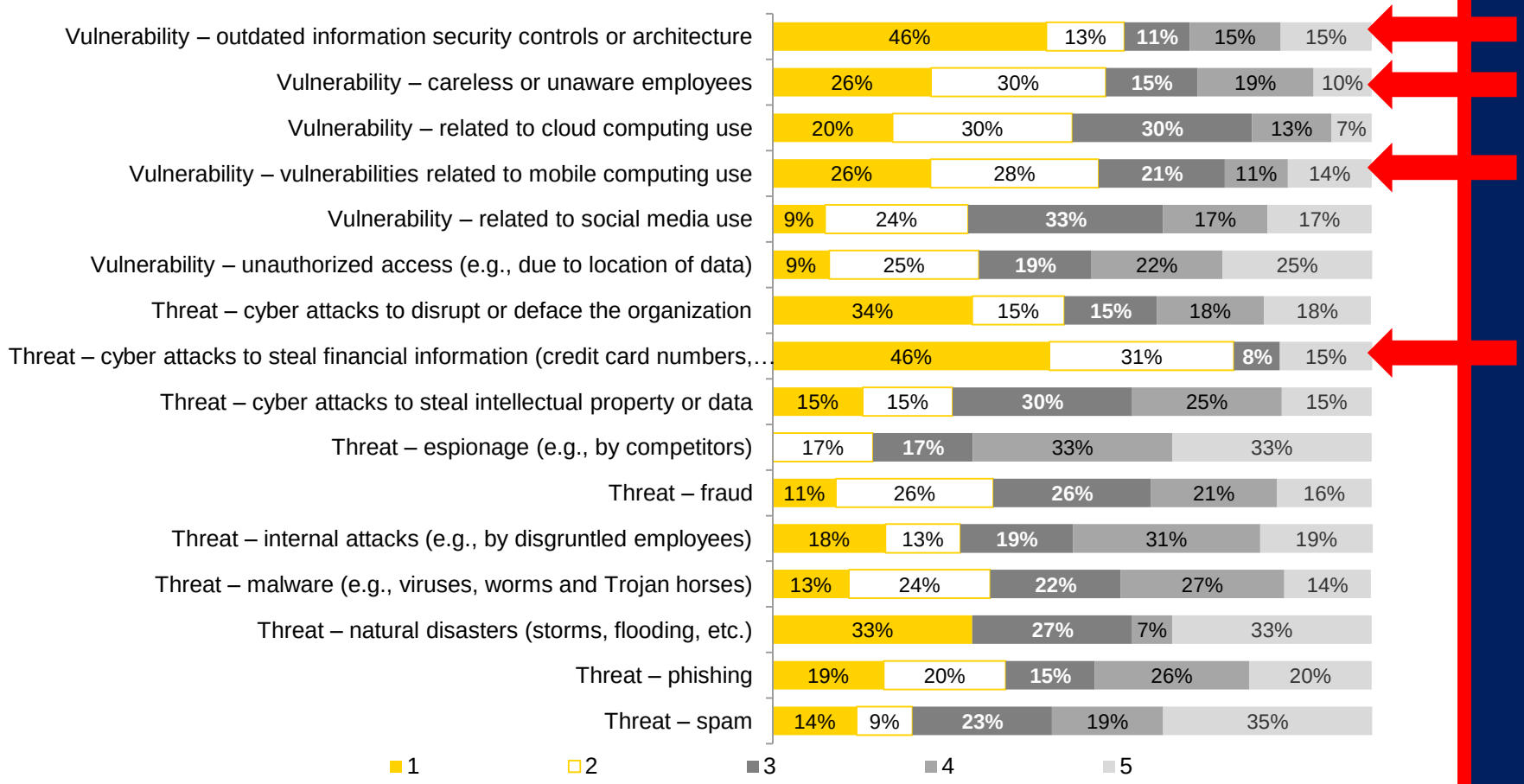


* Threat is defined as a statement to inflict a hostile action from actors in the external environment

** Vulnerability is defined as the state in which exposure to the possibility of being attacked or harmed exists

Information security environment

Which threats* and vulnerabilities** have most increased your risk exposure over the last 12 months *Please select five of these items, marking your top item with a 1, your second with a 2, etc.*



Most information security programs are not well positioned to deal with today's cyber risks.

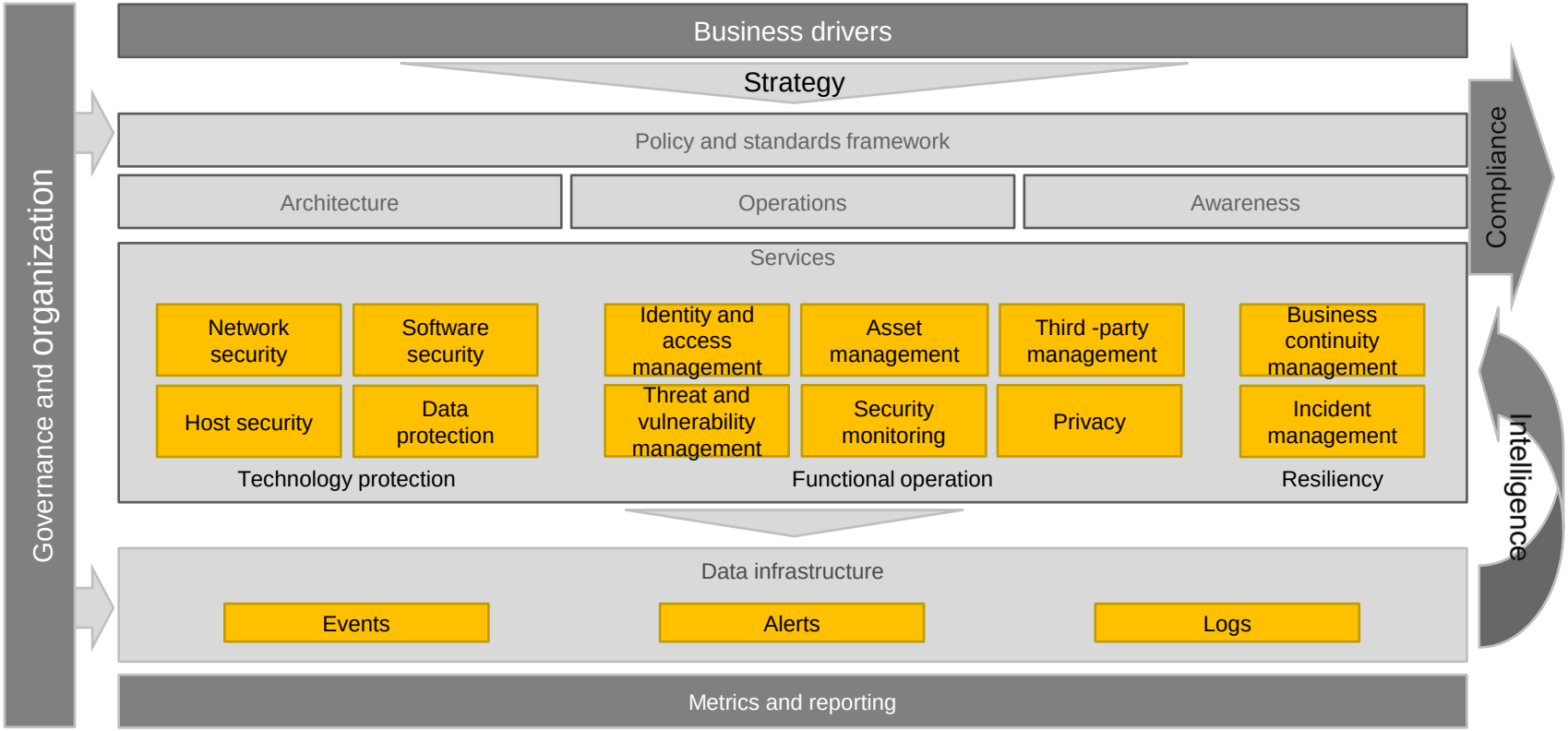
Some top of mind questions for today's information security executives are:

- How does my information security program compare against those of my peers in the industry?
- Is my information security strategy aligned with business objectives?
- How well do we protect high-value information, especially given today's increasingly mobile workforce?
- Are we well prepared to monitor, detect, and respond to information security threats?
- Do we have the right people and skillsets?
- Are we spending on the right information security priorities?
- Am I or have I been the victim of an attack or a breach?

Today's information security programs must enable business objectives and defend against threats while investing in the right priorities.

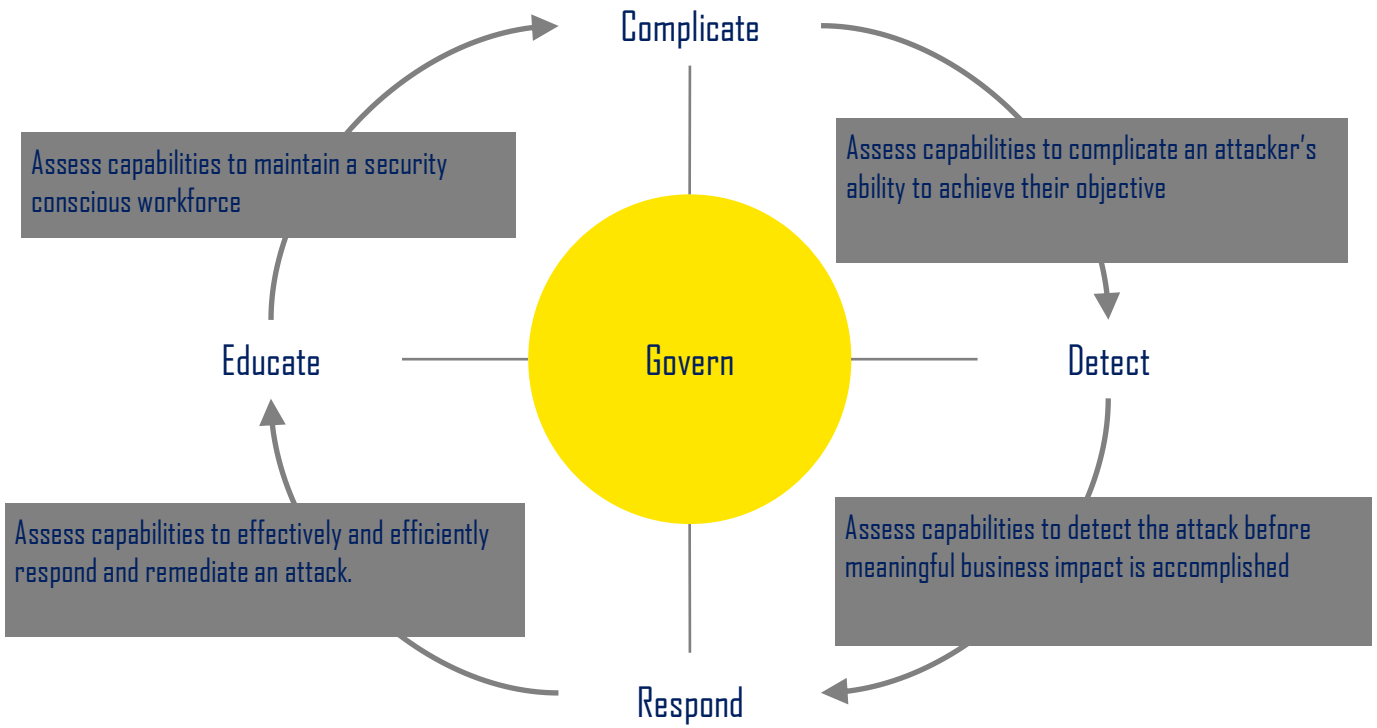
A good security framework reflects how organizations operate.

A security framework also aligns with industry standards and regulations, and will help you assess and improve your information security program.



A new approach to assessing cyber security resiliency

- Assume you are a target and you will be compromised
- Take “prevent” out of your dictionary – there is a high likelihood of success if you are targeted
- Protect what matters most



What needs to be discussed

- Top four risks
  - State-sponsored attacks
  - Cloud computing and new data risks
  - Social media and reputation risks
  - Mobile device security breaches
- Broadening discussion with CIO of IT risks beyond financial controls
- Hot topics:
  - Protecting sensitive information
  - Changing focus of information security
  - Monitoring compliance

What executives are asking

- Is information security focused on protecting the assets that make money for our organization?
- How do we measure the effectiveness of our information security program?
- How has the Information Security program kept pace with the evolution of our IT landscape (e.g., cloud, mobile, social, BYOD)?
- Is the information security organization appropriately organized, trained, equipped, staffed and funded?
- What are other companies like us doing?

Evolution of cybersecurity threats

Summary of key points

- Cyber risks are very real and emanate from a wide range of sources:
  - APT, cyber spies and criminals, foreign intelligence, wire transfer fraud, poor software development methods, malware, botnets, third-party business partners, vendors, malicious insiders, underfunded IT, etc.
- Securing “data” and “processes” from cyber attack must be one of your highest priorities — the “network” cannot be secured.
  - Threats emanate from both internal and external sources, so don’t forget about an insider threat program
- Knowledge of what attackers are doing must inform your defenses:
  - Anticipate that certain attacks will occur – prepare for them now.
  - Malware has developed to the point that it enables attackers to monetize their botnets and steal valuable IP.
    - Weaponized malware now enables governments to use cyber capabilities to produce desired effects in the physical world.
  - Terrorists will have these capabilities in the future.
- Users are key — they are both the primary target and the first line of defense.
- New strategies require strong governance.

Challenges others are facing

Assess whether such challenges exist and begin working on them as soon as possible

Cultural

- Establishing and maintaining a sense of urgency
  - Effective remediation is a marathon, not a sprint
  - Combating false sense of security that stagnates improvement (e.g., we have ABC tools)
- Working through a change-resistant culture
  - Negative IT/Information Security reputation and/or perceived as not relevant to business
  - Difficult to establish rapid changes
    - Long lead time to establish new policies
    - Long test and approval cycle to implement end-point or infrastructure changes
- Coordinating across the enterprise
  - Silos of asset ownership
  - Competing projects/demands
- Setting effective staffing and resource levels
  - Resistance to increased headcount in IT or information security
  - No history of outsourcing or co-sourcing key responsibilities

Challenges others are facing

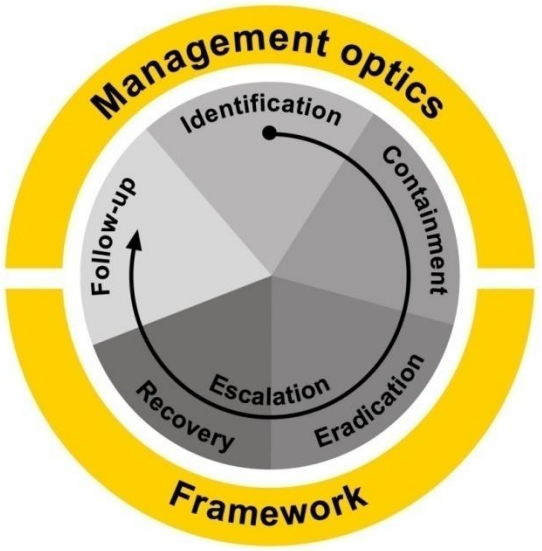
Assess whether such challenges exist and begin working on them as soon as possible

Technical

- Gaps in ability to deploy software and patches across the enterprise
- Network bandwidth limitations
- Legacy operating systems and hardware
- Poor documentation of service/application account ownership and life cycle management
- Poor asset inventory and management system

Other

- No intellectual property/crown jewel inventory
- No formally established incident response capability
- No CISO or single point of focus for cybersecurity
- European Works Council notification/approval time lines
- Ineffective project management practices
- Finalizing terms and conditions with vendors/procurement



What should we be doing

Identify the real risks:

- Develop a security strategy focused on business drivers and protecting high-value data
- Define the organization's overall risk appetite
- Identify the most important information and applications, where they reside and who has/needs access
- Assess the threat landscape and develop models highlighting your real exposures

Protect what matters most:

- Assume breaches will occur – improve processes that complicate, detect and respond
- Balance the fundamentals with emerging threat and vulnerability management
- Establish and rationalize access control models for applications and information
- Protect key identities and roles because they have access to the crown jewels

Sustain your security program:

- Get governance right – make security a board-level priority
- Allow good security to drive compliance – not vice versa
- Measure leading indicators to catch problems while they are still small
- Accept manageable risks that improve performance
- Know your weaknesses – and address them!

Embed security in the business:

- Make security everyone's responsibility — it's a business problem, not just an IT problem
- Align all aspects of security (information, privacy, physical and business continuity) with the business
- Spend wisely in controls and technology – invest more in people and process
- Selectively consider outsourcing or co-sourcing operational security program areas

"Corporations need to figure out what their crown jewels are. You can't protect everything and defend your entire corporate network equally. It's not all equally important, either."

Richard Clarke, "Preparing for a future Cyber War, http://www.computerworld.com/s/article/9182783/Richard_Clarke_Preparing_For_A_Future_Cyberwar

Key takeaways

1. Cyber risks are real.
2. Cyber risks must be managed with as much discipline as financial risk.
3. CISOs must be business leaders and risk managers.
4. Eliminate unnecessary data; keep tabs on what's left.
5. Ensure essential controls are met; regularly check that they remain so.
6. Without deemphasizing prevention, focus on better and faster detection through a blend of people, processes, and technology.

QUESTIONS

Thank You!

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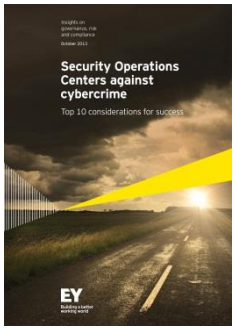
Further information

- See the full report: **Under cyber attack: EY's Global Information Security Survey 2013**
  on: www.ey.com/giss2013

- For further GRC thought leadership, please refer to our Insights on governance, risk and compliance series on:
  www.ey.com/GRCinsights

Want to learn more?



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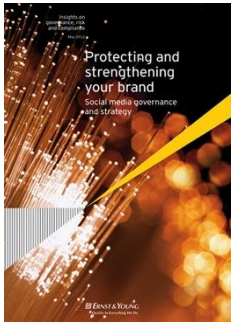

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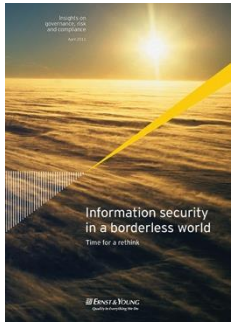

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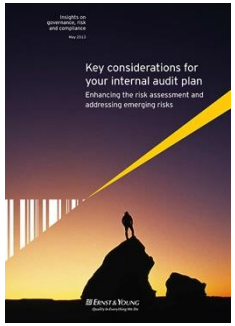

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