Cyber Security in M&A

Joshua Stone, CIA, CFE, CISA

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Agenda

- About Whitley Penn, LLP
- The Threat Landscape Changed
- Cybersecurity Due Diligence
  - Privacy Practices
  - Cybersecurity Practices
- Costs of a Data Breach

Bio

Joshua Stone – CIA, CFE, CISA

- Manager within the Whitley Penn Risk Advisory Services team
- Focuses on:
  - Internal audit outsourcing and co-sourcing,
  - SOX 404 implementations and consulting,
  - Process consulting, and
  - Information technology consulting.
- Primary industries: financial institutions, public sector, managed IT services, oil and gas, and consumer goods.
- Active member of: IIA, ACFE, ISACA, AICPA, and TSCPA.
  - Committee member with the Fort Worth chapter of the TSCPA,
  - Certification Committee Chairman of the FW IIA,
  - Chapter Vice President of the FW ACFE, and
  - Board President of the Tri-Cities Baseball Softball Association.
- Bachelors and Masters Business Administration – Accounting w/ Fraud Emphasis
  - Texas Wesleyan University

Whitley Penn, LLP – Risk Advisory Services

- Service Areas:
  - IT Audits and Consulting
  - Internal Control Reviews
  - IT and Business Risk Assessments
  - Internal Audit Services
  - Vulnerability Assessments and Network Penetration Testing
  - Service Organization Control (SOC) Reports – 1, 2, & 3
  - Enterprise Risk Management Implementation and Maintenance

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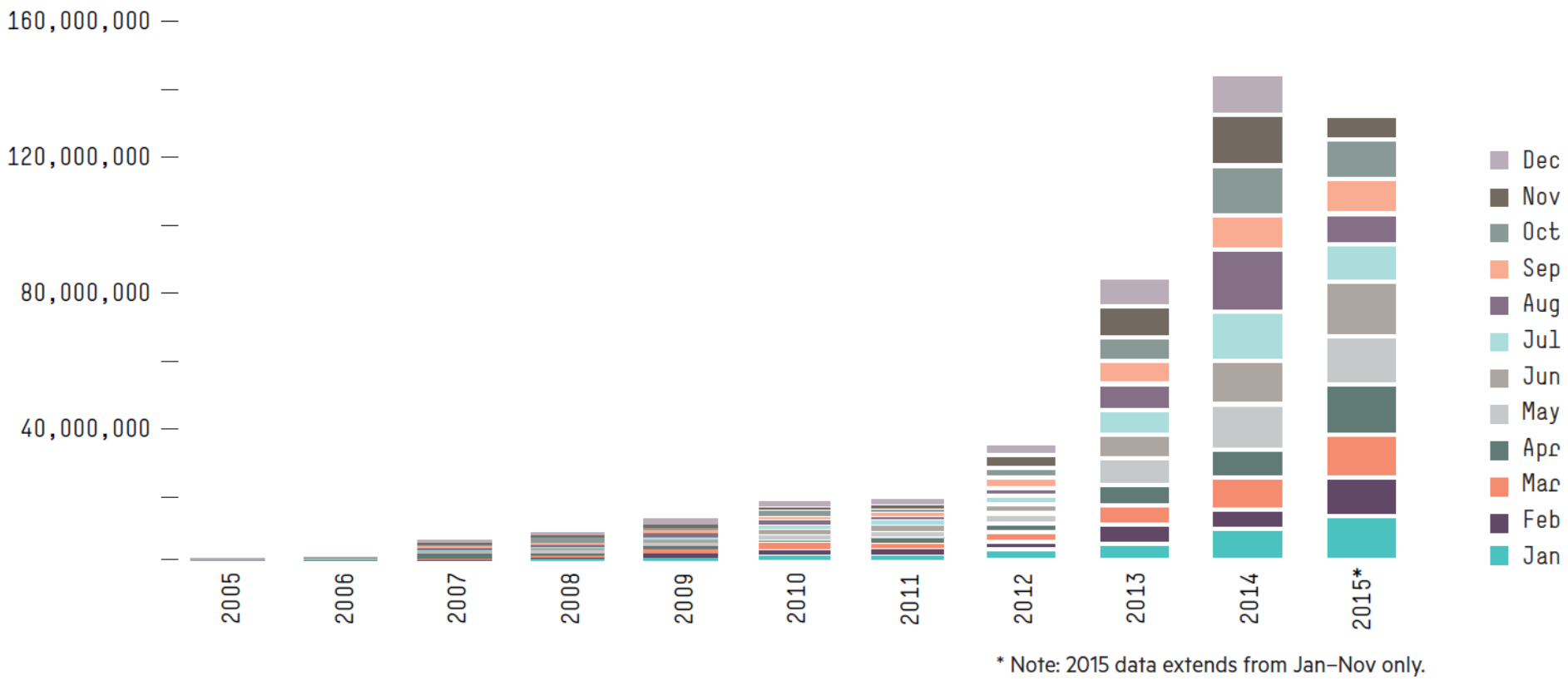
The Threat Landscape Changed

Growth in Malware



* Note: 2015 data extends from Jan–Nov only.

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Breaches By Industry

Incident pattern ►	POS intrusions	Web app attacks	Cyber-espionage	Crimeware	Insider and privilege misures	Payment card skimmers
Industry (NAICS #) ▼						
Accommodation (72)	53%	1%			3%	
Administrative (56)		4%	1%		6%	
Educational services (61)		9%	12%	22%	11%	
Entertainment (71)	58%	11%	11%		5%	
Financial services (52)		17%	1%	21%	6%	7%
Healthcare (62)	7%	8%	3%	3%	20%	
Information (51)		26%	9%	46%	1%	
Manufacturing (31-33)		3%	36%	19%	3%	
Mining (21)			11%		67%	6%
Other services (81)	1%	28%	3%	36%	6%	
Professional services (54)	2%	2%	26%	10%	1%	
Public (92)				18%	26%	
Retail (44-45)	20%	2%		25%	1%	4%
Transportation (48-49)			41%	9%	18%	5%
Utilities (22)		17%	50%	17%		
	▼	▼	▼	▼	▼	▼
Most-relevant scenarios – *the scenarios to read first!*	7, 10, 11, 12, 13 , 14, 16, 17, 18	8, 10, 11, 12, 14, 15, 16, 18	1, 6, 13, 14, 16, 18	2, 9, 13, 14, 15, 16, 18	3, 4, 5, 6, 13, 14, 16, 18	5, 7

Legend < 10% 11-19% > 20%

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Vulnerability Marketplace

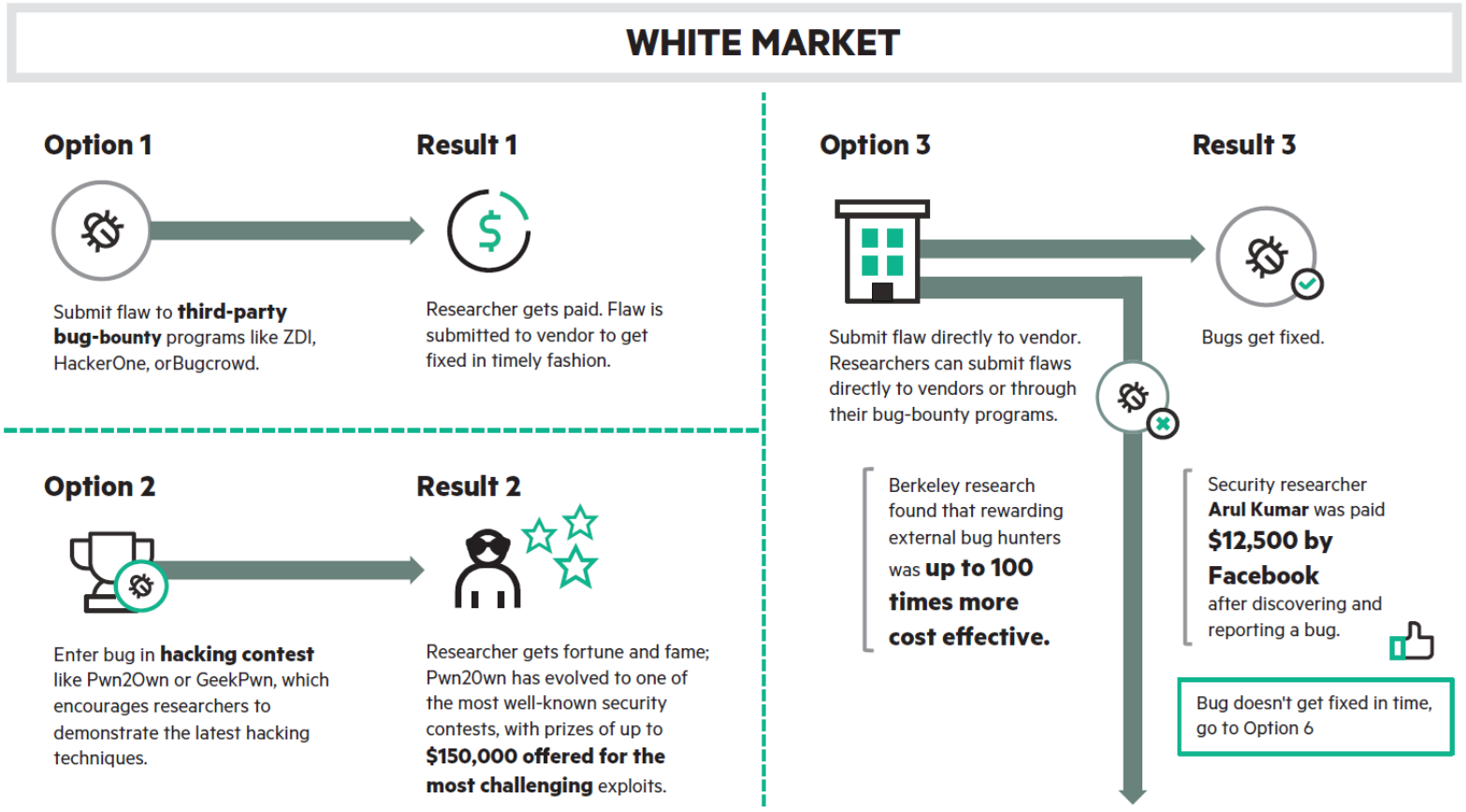

Figure 4. The vulnerability white market

Vulnerability Marketplace

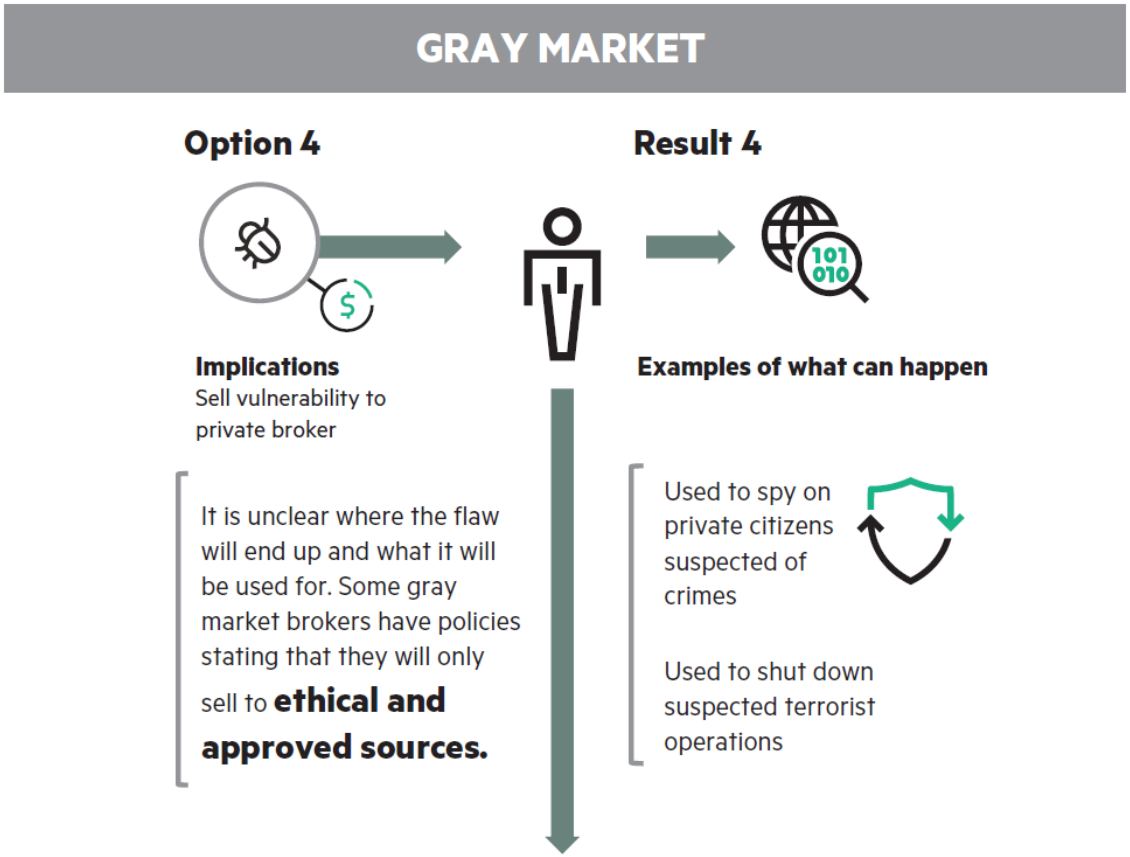

Figure 5. The vulnerability gray market

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Vulnerability Marketplace

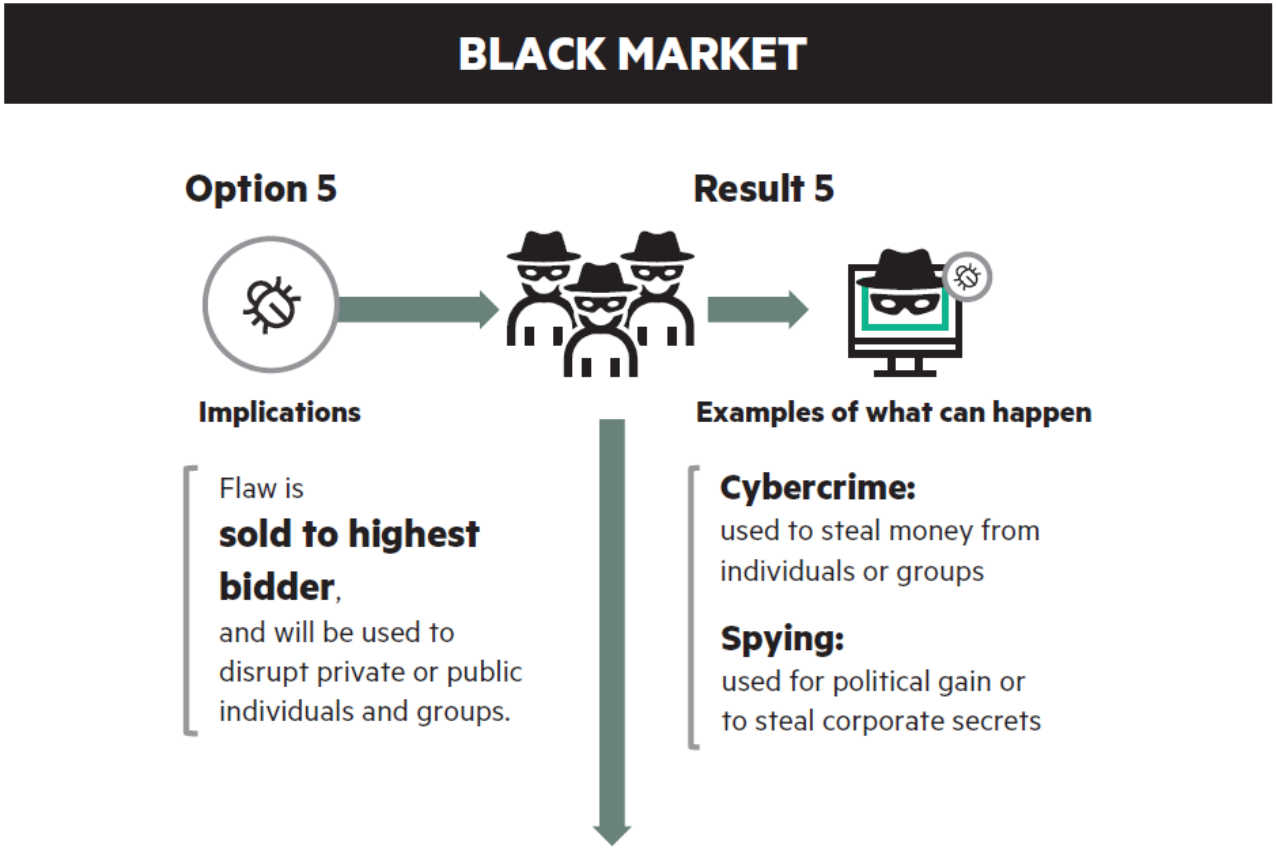


Figure 6. The vulnerability black market

Cybercrime Marketplace

Credit Cards

	Price in 2013	Price in 2014	Recent Prices
Visa and MasterCard (U.S.)	$4	$4	$7
Visa Classic and MasterCard (U.S.) with Track 1 and Track 2 Data	$12	$12	$15
Visa Classic and MasterCard (Canada, Australia, and New Zealand) with Track 1 and Track 2 Data	$19 – $20	$19 – $20	$25
Visa Classic and MasterCard Standard (EU) with Track 1 and 2 Data	$28	$28	$40
Visa Classic and MasterCard Standard (U.K) with Track 1 and Track 2 Data	$19 – $20	$19 – $20	$40
Visa Classic and MasterCard Standard (Japan and Asia) with Track 1 and Track 2 Data	$28	$28	$50
Premium Visa and MasterCard (U.S.) with Track 1 and Track 2 Data		$23 (V); $35 (MC)	$30
Premium Visa and MasterCard (EU and U.K.) with Track 1 and 2 Data		$23 (V); $35 (MC)	$50 – $60
Premium Visa and MasterCard (Canada, Australia and New Zealand) with Track 1 and Track 2 Data		$23 (V); $35 (MC)	$35 for V and MC
Premium Visa and MasterCard (Japan and Asia) with Track 1 and Track 2 Data		$23 (V); $35 (MC)	$80 for V and MC
Premium American Express Card (U.S.) with Track 1 and Track 2 Data		$23 (V); $35 (MC)	$30
Premium Discover Card (U.S.) with Track 1 and Track 2 Data		$23 (V); $35 (MC)	$30
VBV (U.K., Australia, Canada, EU and Asia)	$17 – $25	$28	$25

Cybercrime Marketplace

Hacking Email and Social Media Accounts

	Recent Prices
Popular U.S. Email Accounts (Gmail, Hotmail, Yahoo)	$129
Popular Russian Email Accounts (Mail.ru, Yandex.ru, and Rambler.ru)	$65 – $103
Popular Ukranian Email Accounts (Ukr.net)	$129
Popular U.S. Social Media Accounts	$129
Popular Russian Social Media Accounts (VK.ru and Ok.ru)	$194
Corporate Email Accounts	$500 per mailbox
IP address of Computer User	$90

Tools

	Price in 2013	Price in 2014	Recent Prices
Remote Access Trojans (RATs)	$50 – $250	$20 – $50	$5 – $10
Crypters	N/A	$50 – $150	$80 – $440
Angler Exploit Kit			$100 – $135

Cybercrime Marketplace

Identities, Passports, Social Security Cards and Other Documents

	Price in 2013	Price in 2014	Recent Prices
US Fullz	$25	$30	$15 – $65
Fullz (Canada, U.K.)	$30 – $40	$35 – $45	$20 (Canada) $25 (U.K.)
U.K. Passport Scan			$25
Physical Counterfeit Passports (non-U.S.)	N/A	$200 – $500	$1,200 to $3,000 (European)
Physical Counterfeit Passports (U.S.)			$3,000 to $10,000
Templates for U.S. Passports			$100 – $300
New Identity Package, including scans of Social Security Card, Driver's License and, matching utility bill		$250; matching utility bill an additional $100	$90
Physical Counterfeit Social Security Cards		$250 – $400	$140 – $250
Scans of Counterfeit Driver's License			DL Scans $14 – $20 (U.S.) $14 (U.K., CANADA)
Physical Counterfeit Driver's License (France)			$238
Physical Counterfeit Driver's License (U.S., U.K., Germany, Israel, International Driver's Permit)		$100 – $150	$173

Cybercrime Marketplace

Online Accounts	Recent Prices Price based on account balance
Popular U.S. Online "Business" Payment Account Credentials	Ranges from $20 – 149
Transfer Funds from Popular Online Payment Account to Buyer's Account of Choice	$750 cost $226 $1,500 cost $377 $1,520 cost $385 $2,290 cost $573 $2,999 cost $750 $3,799 cost $950
Popular U.S. Online Payment Account Credentials	$330 cost $80 $400 cost $160 $500 cost $240 $600 cost $320 $950 cost $600

Cybercrime Marketplace

Bank Accounts; Airline and Hotel Points	Recent Prices
Bank Account Credentials	Price based on account balance
Bank accounts — ANZ (Australia)	$18,000 cost $4,750
Bank accounts — ANZ (Australia)	$22,000 cost $2,250
Bank accounts — ANZ (Australia)	$62,567 cost $3,800
Bank accounts with no balance listed — Turkey, Sweden, Norway, Romania, Bulgaria, Croatia,	$400 (flat fee)
Bank accounts — (U.K.)	$27,003 cost $2,000
Bank account — (U.S.)	$1,000 cost $40
Bank account — (U.S.)	$2,000 cost $80
Bank account — (U.S.)	$4,000 cost $150
Bank account — (U.S.)	$7,000 cost $300
Bank account — (U.S.)	$15,000 cost $500
High Quality Bank Accounts with Verified, Large Balances of $70,000 – $150,000	6% of the balance of the account
Large U.S. Airline Points Accounts — varies based on amount	Price based on points in account
	1,500,000 points cost $450
	300,000 cost $90
	200,000 cost $60
Large Middle East Airline Points Accounts — varies based on amount	Price based on points in account
	500,000 cost $150
	450,000 cost $90
	250,000 cost $50
Large International Hotel Chain Points Account	Price based on points in account
	1,000,000 points cost $200
	400,000 cost $80
	300,000 cost $60
	200,000 cost $40
	100,000 cost $20
	50,000 cost $10

Cybercrime Marketplace

Hacking Services	Price in 2013	Price in 2014	Recent Prices
Hacking Tutorials	N/A	$1 each to $30 for 10 (depending on the tutorial)	$20 to $40 for multiple tutorials
Hacking Website (stealing data)	$100 – $300	$100 – $200	$350
DDoS Attacks	Per Hour: $3 – $5 Per Day: $90 – $100 Per Week: $400 – $600	Per Hour: $3 – $5 Per Day: $60 – $90 Per Week: $350 – $600	Per hour: $5 – $10 Per Day: $30-$55 Per Week: $200 – $555
Doxing	$25-$100	$25-$100	$19.99

Cybersecurity Due Diligence

Due Diligence on Information

- What information the seller collects?
- What locations is the information collected from?
- How is that information is utilized?
- Where that information is stored, and who has access to it?
- How the information may and may not be utilized during pre-signing and post-signing phases?
- Is the valuation dependent upon personal data? If so, can that data be used for new purposes?
- What policies and procedures govern that information?
- What state, federal, and foreign laws govern that data?
- What responsibilities have been assigned to a third party vendor?
    - What contract terms are in place with those vendors, and are they adequate?

The Target's Privacy Policy

- The privacy policy can impact how PII, PHI, cardholder data, etc. can be used by the acquirer.
  - Can limit the value of data
  - Can pose legal challenges when expanding to new markets
  - Uncertainty in privacy regulations
    - EU Safe Harbor replaced by Privacy Shield
    - Brexit
- Definitions of PII can vary by jurisdiction, so choose the language in warranties and representations carefully.
- Require all versions of the privacy policy that have been in use.

The Target's Cybersecurity Risks

- How knowledgeable is management and board about the company's cybersecurity risks?
- What types of information does the company manage?
  - Credit card data
  - Protected Health Information ("PHI")
  - Personally Identifiable Information ("PII")
  - Financial Account Information
  - Intellectual Property
  - Controlled Unclassified Information ("CUI")
- Is the seller considered "Critical Infrastructure"
- Does the company host this information, or does a third party?
- Is the company a service provider?
- Who are their customers?
- Is their network connected to any third parties?
- Is they're business model susceptible to Distributed Denial-of-Service ("DDoS") or ransomware attacks?

The Target's Cybersecurity Practices

- Has the company established an information security management program?
  - Risk Assessment
  - Clearly defined responsibility
  - Documented policies and procedures
  - Vulnerability and patch management
  - Security event monitoring and incident response
  - Documented and tested disaster recovery and business continuity plan
  - Is security awareness training provided to all employees?
- Has the program been assessed by a third party?
  - Vulnerability scanning and penetration testing
  - Security assessment or audit
- Has internal or external legal counsel reviewed the company's security compliance?
- Do they have cyber insurance, at what level, and do they comply with any warranties or representations?
- Are there significant gaps that require remediation?

The Target's Vendor Risks

- Does the company have a vendor management program?
  - Have they documented the control objectives that they rely on third parties to perform?
  - How do they monitor vendor performance?
  - Are the contract terms adequate?

Third Party Reporting

- SSAE16 Service Organization Control (“SOC”) 1 – Internal controls over financial reporting
  - Type I – Point-in-Time
  - Type II – Period-in-Time
- SOC2 – Internal controls over security, confidentiality, availability, processing integrity, and privacy.
  - HITRUST
  - NIST
  - Cloud Security Alliance
  - COSO
  - COBIT
- PCI-DSS Attestation of Compliance
  - Point-in-Time
- ISO 27001 – Certification Information Security Management System
  - Point-in-Time

Types of Cybersecurity Due Diligence

- Legal:
  - Review legal obligations, privacy policies, customer contracts, vendor contracts, policies, procedures, and etc.
- Compromise
  - Investigation to identify if the seller is currently compromised.
  - Investigation to identify if the seller's proprietary or confidential information is available for sale on the internet or darknet.
- Audit
  - Evaluate the design and operation of controls to meet security and privacy obligations.
  - Remediation testing.

Disclosures, Warranties, Indemnities and Escrows

Common representations and warranties:

(a) operated its business at all times in compliance with all applicable privacy and data security laws;
(b) complied with its corporate polices applicable to data privacy, data security and “personal information” at all times; and
(c) not experienced any incident in which “personal information” or other sensitive data was or may have been stolen or improperly accessed.

Disclosures, Warranties, Indemnities and Escrows

Warning: I am not a lawyer.

- Breach disclosures may not be an effective means of discovering if a company has been breached. Consider using indemnities or escrows instead, or in addition to.

- Avoid overly broad disclosures and warranties, such as “complies with all relevant data security and privacy laws”.

- For technology service providers, transaction processors or other entities that aggregates large volumes of personal data:
  - Closing conditions tied to the non-occurrence of a breach.
  - Indemnity may cover actual losses associated with a breach.

Integration Plan

- Determine what information can be integrated.
- Develop a process to cleanse information that cannot be integrated, or gain authorization for information that requires opt-in.
- Plan for who will be responsible for complying with information security and privacy requirements during the integration period.
- IT hardware and software maintenance agreements and patch levels can impact insurance coverage in the event of a breach.
- If the buyer is taking on new compliance requirements from the seller, the buyer should consider performing an internal gap assessment.
- Train employees on new or changed responsibilities, policies, and procedures.

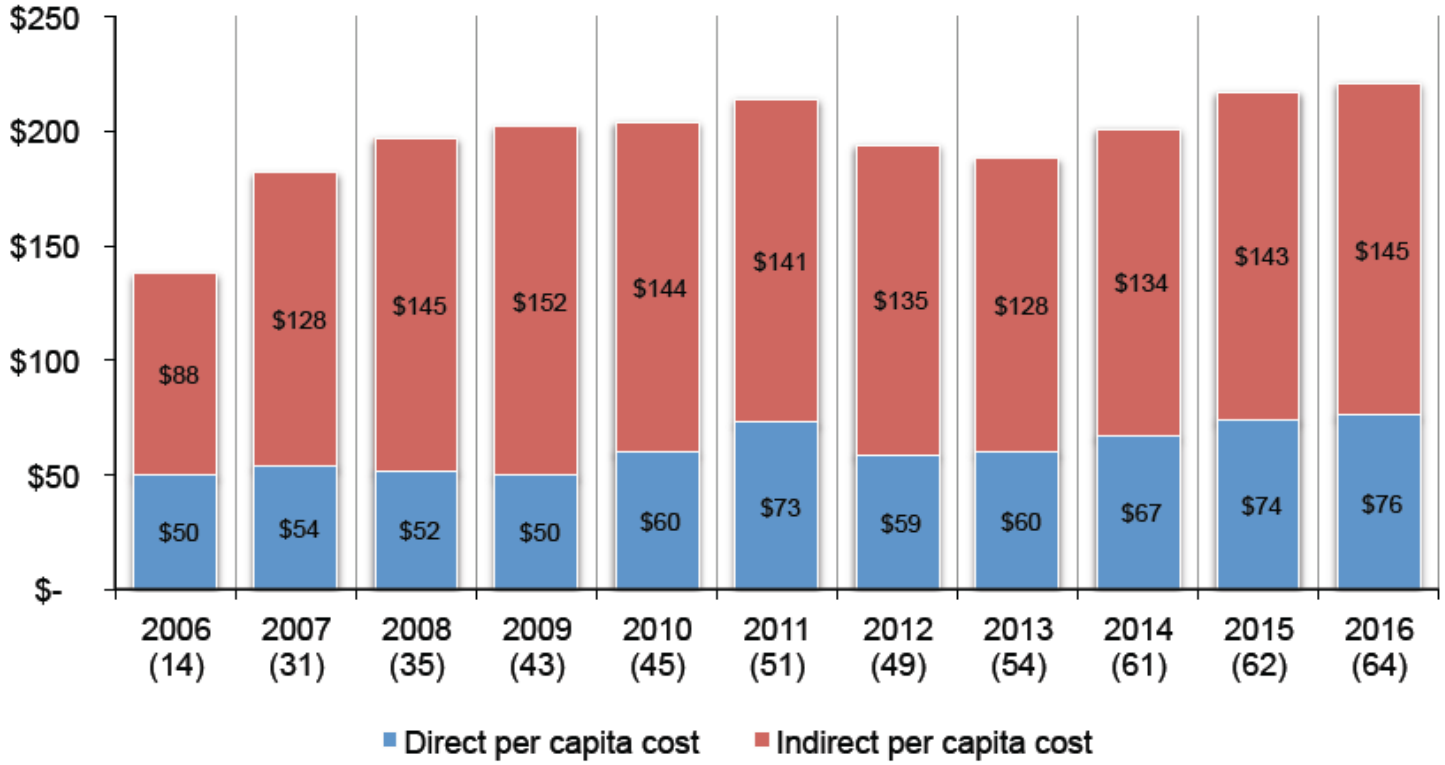
Considerations for Public Companies

- Pressure to disclose board's level of knowledge regarding cybersecurity.
- Under Regulation S-K, the SEC may require cybersecurity disclosures in the following areas:
  - Risk Factors
  - MD&A
  - Description of Business
  - Legal Proceedings
  - Financial Statement Disclosures
  - Disclosure Controls and Procedures

Costs of a Data Breach

Per Capita Cost of a Data Breach

Figure 15. Direct and indirect per capita data breach costs over 11 years



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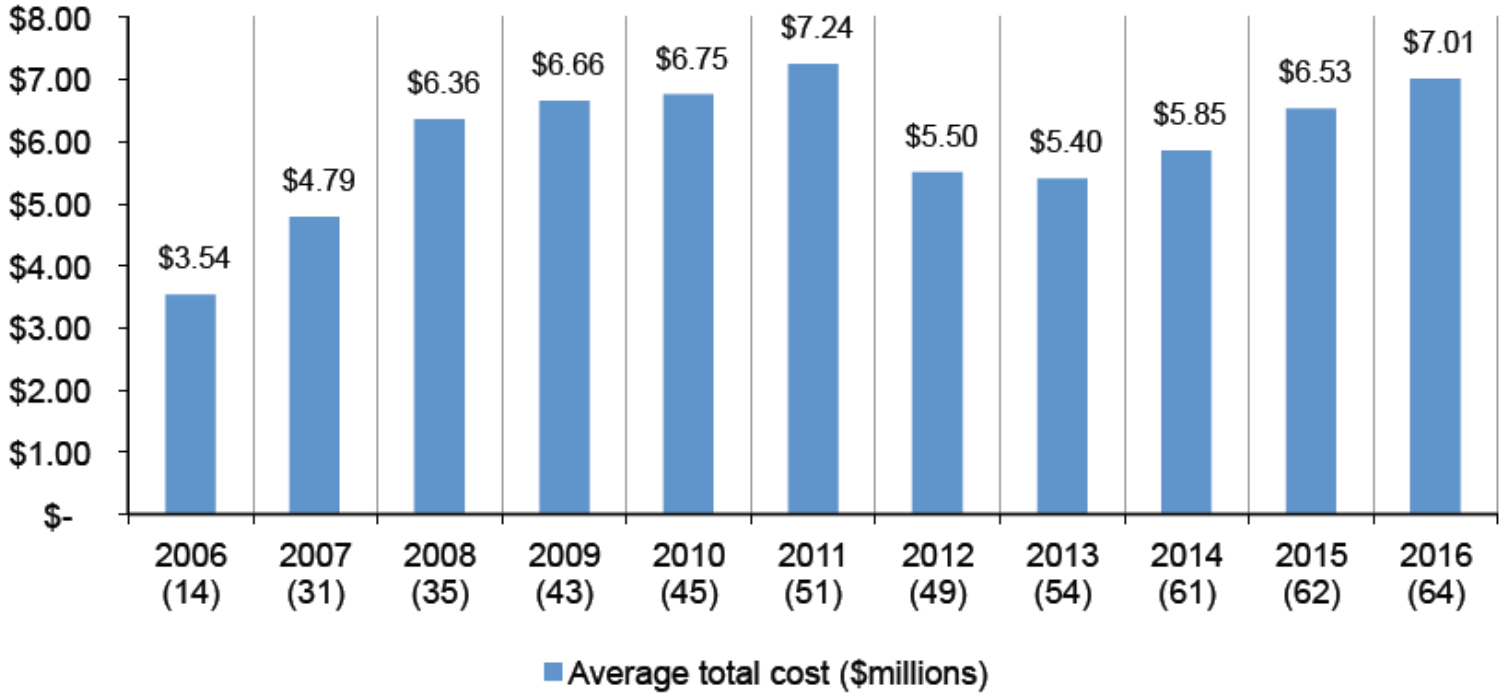
Total Organizational Costs of a Data Breach

Figure 2. The average total organizational cost of data breach over 11 years
(millions)



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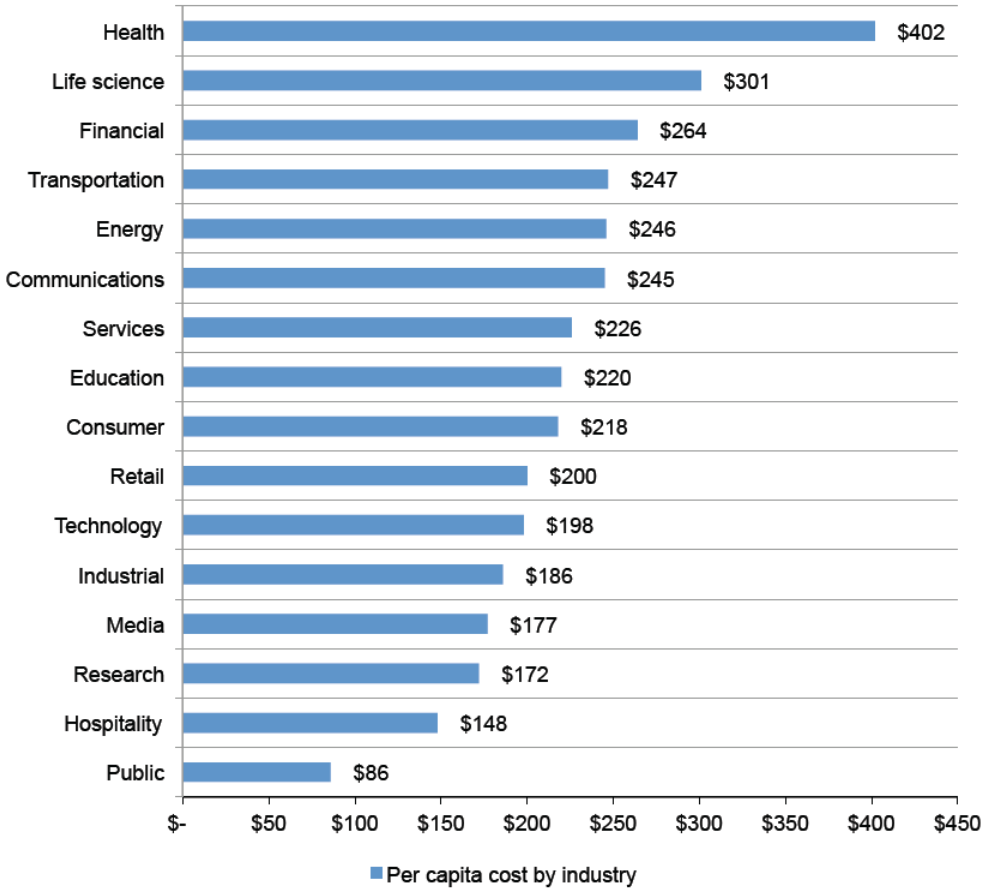
Per Capita Costs by Industry

Figure 4. Per capita cost by industry classification of benchmarked companies



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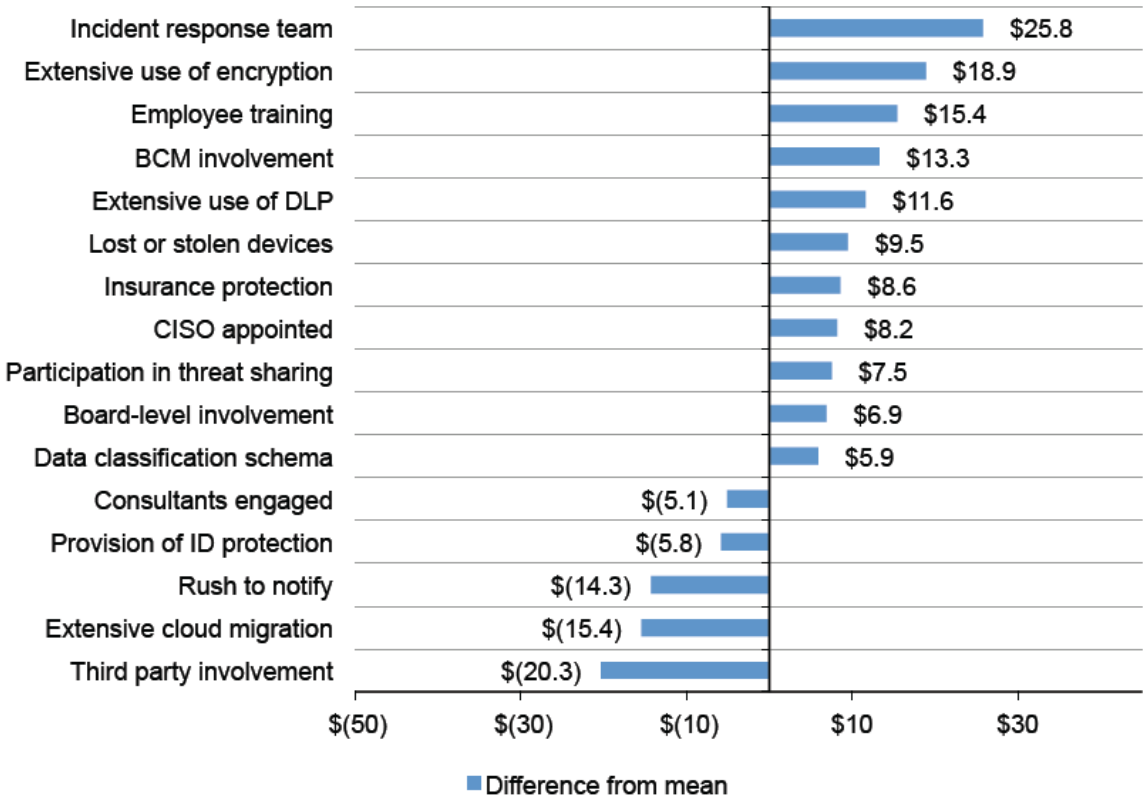
Factors that impact the per capita cost

Figure 7. Impact of 16 factors on the per capita cost of data breach



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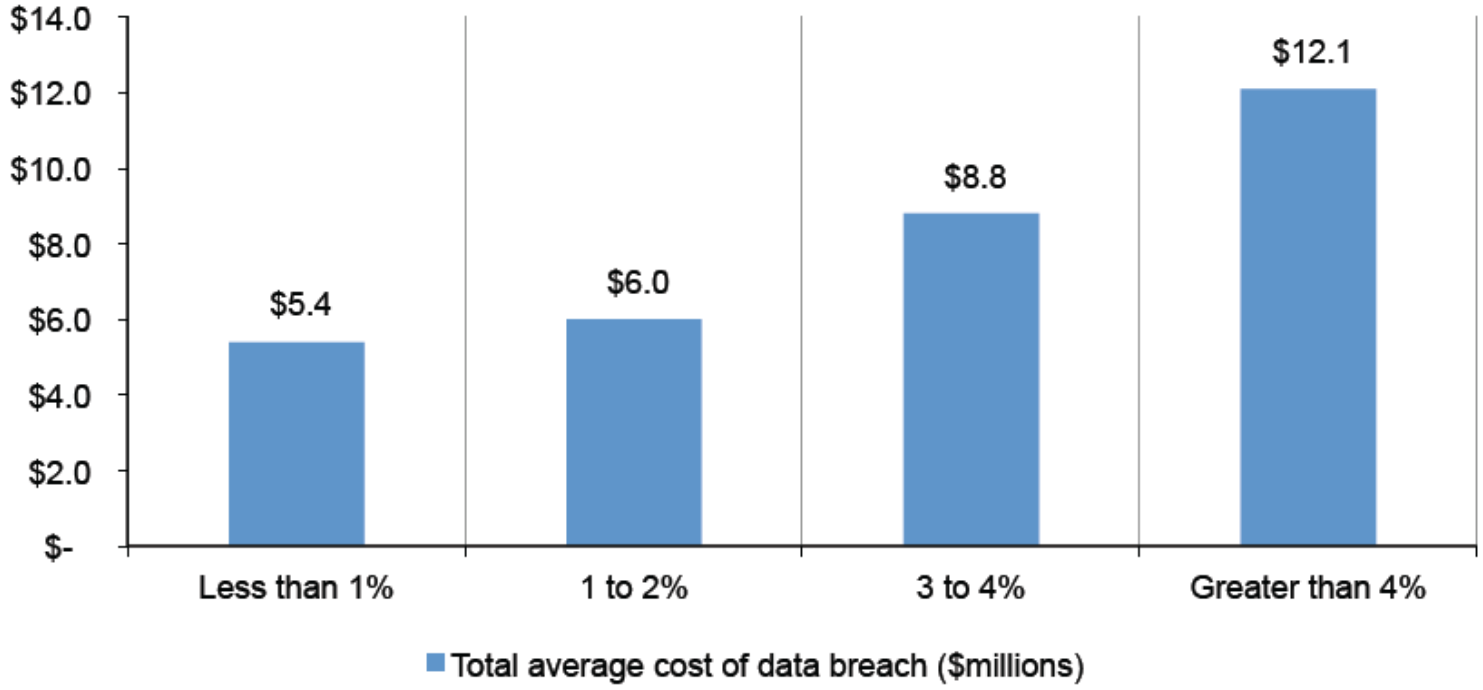
Impact of Abnormal Churn Rates

Figure 9. Total cost of data breach by abnormal churn rate



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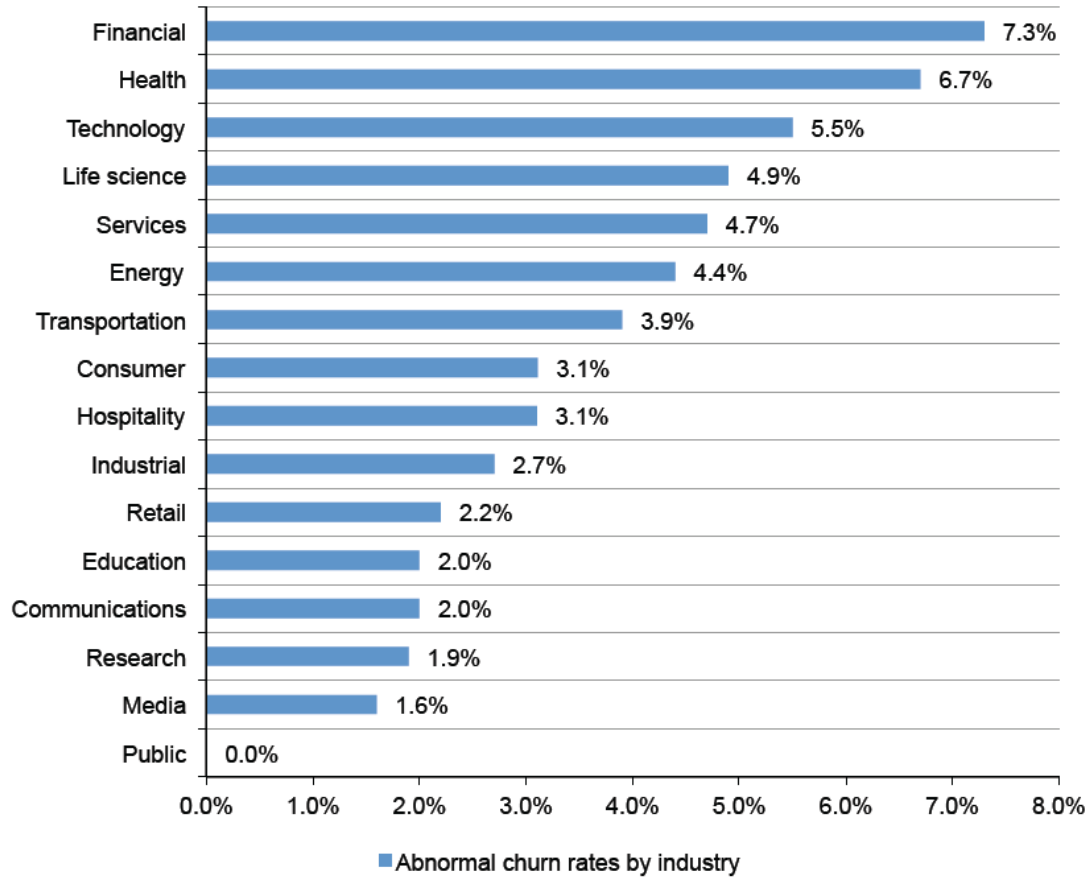
Abnormal Churn Rates by Industry

Figure 10. Abnormal churn rates by industry classification of benchmarked companies



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Questions

References

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- Dell SecureWorks – 2016 Underground Hacker Markets