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Agenda

- Global Data Compromises
- Cyber Threats and Attacks
- Latest Data Breaches
- Monetizing PII/PHI versus Payment Card Data
- Differences Between Security Standards
- Threats and Risks to Payment Card Data PII/PHI
- Going Above and Beyond Security Standards
- Key Takeaways
Global data compromise events grew 23% in 2014 over those managed in 2013.

The U.S. is the largest contributor, mainly due to its large mag stripe infrastructure and an increase in successful attacks on third party service providers.

VE and AP represent the next largest contributors to known breach events, together compromising a quarter of the total.

Breaches in VE and AP are primarily CNP (93% for VE; 94% for AP).
## Data Compromises

### Breach trends by merchant level and Merchant Category Code

#### Breach Events by Merchant Level

<table>
<thead>
<tr>
<th>Entity Type</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Merchant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>&lt;1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Level 2</td>
<td>&lt;1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Level 3</td>
<td>1%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Level 4</td>
<td>95%</td>
<td>92%</td>
<td>93%</td>
</tr>
<tr>
<td>Agent</td>
<td>&lt;1%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>2%</td>
<td>&lt;1%</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

- While level 4 (small) merchants account for the largest number of known breach events (93% in 2014), the largest impact comes from Level 1 (large) merchant breaches.
- Approximately, 77% of at risk accounts in 2014 were tied back to L1 merchants.

#### Percent of Breach Events by MCC

- Restaurants and “other retail” make up the biggest portion of total known breaches (32% and 19%, respectively, in 2014).
- Quick service restaurants, supermarkets, and lodging make up the other top MCCs.
- High-volume restaurants and retailers continue to be at risk.
Data Compromises
Common breach patterns

Entry

• Hackers targeting internet-exposed remote access systems as initial intrusion points
• Once in, attackers conduct network reconnaissance using diagnostic tools/techniques to identify systems with access to payment data and isolate specific user accounts
• They create custom attack scripts and tools inside the merchant’s network to further extend access

Card Data Theft

• Payment card data is extracted with specialized, difficult to detect malware
• Malware is named to appear as legitimate security software, in some cases
• Card data is encrypted to avoid detection
• In many recent instances, traces of attacker activity are removed, including self-deleting malware

Monetization

• Payment data is used to commit fraud, often across countries via coordinated criminal activity
  - ATMs
  - Gift cards
  - High-value goods
• Cards carry a typical value of between $20-$50 on markets for stolen data

Note: There may be a significant lag between a breach and monetization
Latest Data Breaches

Lester Chan – Merchant Security
CISSP, CISA, CISM, Certified HIPAA Professional
Healthcare Data Breaches Per Year

Number of records

* Source: Forbes, Health Data Breach At Anthem Is A Blockbuster That Could Affect 80 Million, February 5, 2015
Largest Healthcare Data Breaches

Source: HHS Office for Civil Rights
Office of Personnel Management Breach

Not healthcare but PII breach with significant impact

Records include 1.1 million fingerprint records

On June 12, the U.S. government determined an additional 14 million records were stolen by hackers.

The OPM had no dedicated IT security staff until 2013

On June 5, hackers exfiltrated 4.2 million U.S. federal personnel records.

On July 9, OPM discloses that 21 million PII records were compromised by hackers.

Stolen records includes background checks and security clearances for government employees and their families.
Exfiltration and Monetizing Payment Card Data

Fraudsters can easily monetize stolen payment card data

Data Exfiltration
• Cards are stolen with POS malware
• Stolen card data is encrypted to avoid detection
• Traces are removed

Sold on Darknet
• Offered for sale on cyber crime websites
• Offer money-back guarantees and customer support

Price per Account
• Selling for $5 - $50
• Paid with Bitcoin or other online currency
Exfiltration and Monetizing PII and PHI

Stolen PII/PHI are more useful to fraudsters

Data Exfiltration

- Target phishing, credentials compromised
- PII/PHI is identified and collected
- Data is exfiltrated

Sold on Darknet

- Offered for sale on cyber crime websites
- Used to correlate compromised identities
- Can be used to impersonate the victims

Price per Account

- Selling for $20 - $200 per account
- Usually higher than payment card accounts
- Typically more can be done with PHI and PII

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Dumps, “Fullz”, and Payment Card Data on the Darknet
Breach Impact to Victims

Significant impact to victims of payment card fraud and PII/PHI theft

**Consumer**

- Payment Card

**Stolen**

- PII/PHI

**Actions**

- Issue New Card
- Credit Monitoring
- Contact SSA
- File Police Report

**Possible Consequences**

- Counterfeit Fraud
- Fraudulent Prescriptions
- Stolen Identity
- Fraudulent Loans & Accounts
Payment Card Industry (PCI) Data Security Standard (DSS)

Health Insurance Portability and Accountability Act (HIPAA) Security
Health Insurance Portability and Accountability Act

HIPAA Security is one section of the HIPAA Rule

- Security Standards: General Rules
  - Administrative Safeguards
  - Technical Safeguards
  - Physical Safeguards
  - Organizational Requirements
  - Policies and Procedures and Documentation Requirements
Regulatory Requirements for Healthcare Data

HIPAA Security Rule (1996)
- Administrative, Physical, and Technical Safeguards for Protected Health Information (PHI)
- Goal is to protect the confidentiality, integrity, and availability of PHI
- Compliance by April 21, 2005 (April 21, 2006 for small health plans)
- Limited enforcement by U.S. Health and Human Services

HITECH Act (2009)
- Part of the American Recovery and Reinvestment Act (ARRA) of 2009
- Accelerate adoption of Electronic Health Records (EHR)
- New civil penalties for violations
- Notification requirements for breach reporting
- Extends requirements to Business Associates

Meaningful Use (2010)
- Incentives for meeting criteria for efficient use of EHRs
- Improve adoption and interoperability of EHRs
- Includes 15 core requirements to complete for incentive payments
- Ensures that Covered Entities must perform risk analysis
PCI Security Standards Council (PCI SSC)

1. Industry-wide standards group founded in 2006
   Visa, American Express, Discover, JCB and MasterCard

2. Responsible for development and management of PCI Security Standards
   PCI DSS, PA-DSS, and PTS

3. PCI DSS applies to any entity that stores, processes, or transmits cardholder data

4. Trains and certifies data security companies
   ASVs, QSAs, PA-QSAs, and PFIs

www.pcisecuritystandards.org
Differences between PCI DSS and HIPAA Security

Key differences in security standards

- Store, process, or transmit payment card data
- Requires self assessment questionnaire for small merchants
- QSA or ISA for large merchants
- Requires vulnerability scanning and pentesting

<table>
<thead>
<tr>
<th>PCI DSS</th>
<th>HIPAA Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>More prescriptive than HIPAA Security</td>
<td>Applies to all size Covered Entities</td>
</tr>
<tr>
<td>Enforced by the card brands</td>
<td>Enforced by the Federal Government</td>
</tr>
<tr>
<td>Twelve high-level security requirements</td>
<td>Administrative, physical and technical safeguards</td>
</tr>
<tr>
<td>Allows for compensating controls</td>
<td>Reasonable and appropriate safeguards</td>
</tr>
</tbody>
</table>

- Applies to Covered Entities
- Penalties can include civil and criminal
- Required versus addressable
- Either stored or transmitted
- Applies to Business Associates
- Document policies and procedures
Changes to PCI DSS Versus HIPAA Security

**HIPAA Key Dates**

- **1996**
  - August 21: The Health Insurance Portability and Accountability Act of 1996 (HIPAA) was signed into law.

- **2003**
  - April 14: Deadline for Covered Entities to comply with the Privacy Rule.

- **2005**
  - April 20: Deadline for Covered Entities to comply with the Security Rule.

- **2009**
  - February 17: The American Recovery and Reinvestment Act of 2009 (ARRA) was signed into law. This is the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009.

- **2013**
  - March 26: The Omnibus Final Rule takes effect.

**Staying ahead latest threats and risks**
Going Above and Beyond
PCI DSS and HIPAA Security
### Threats and Risks to Payment Card Data and PII/PHI

#### Targeted attacks and growing threats

<table>
<thead>
<tr>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeting companies with low security</td>
</tr>
<tr>
<td>Exploit weaknesses with root kits, POS malware</td>
</tr>
<tr>
<td>Database stores of payment card data and/or PII/PHI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email attachments with various exploits</td>
</tr>
<tr>
<td>Keyloggers used to harvest login credentials</td>
</tr>
<tr>
<td>Buffer overflows attacks to create backdoors on systems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve e-commerce security and ensure application security controls are used</td>
</tr>
<tr>
<td>Merchants accepting mag stripe transactions will be targeted</td>
</tr>
</tbody>
</table>
Security Standards Compliance

Higher education, hospitals, etc. have multiple regulatory requirements

- Hospitals have HIPAA, JCAHO, PCI DSS, Sarbanes-Oxley, FDA, etc.
- Some are challenging environments to assess, multiple locations, stores, parking, kiosks, etc.
- Validate compliance independently but leverage key activities
- Executive sponsorship is a must
- Document all findings especially risk assessment, gap analysis, and key controls
Layered Security Approach

Other secure technologies – EMV chip, tokenization, point-to-point encryption

- SIEM, WAF, Application whitelisting
- Vulnerability scanning and penetration testing
- IDS/IPS, APT threat protection

PCI DSS

HIPAA Security

Policies, Procedures & Training
Maturing Information Security

PCI DSS COMPLIANT

Validate to Version 3.1

After April 2015, all merchants must validate to PCI DSS version 3.1.

Version 3.1 continues to evolve the PCI DSS standard controls to address current threats and vulnerabilities.

Note the penetration testing requirement (11.3) effective after June 30, 2015.

Implement P2PE, EMV Chip, and Tokenization

EMV Chip - Creates a unique cryptogram for each transaction

Tokenization - Token replaces account number with unique digital token

P2PE - Encrypt from the point of sale to the point where the third-party payment processor or acquirer decrypts the data for processing

Proactive Security Controls

- Use two-factor authentication especially for remote access
- File integrity monitoring to protect against malware
- Application whitelisting to allow only those allowed applications
- Improve segmentation between CDE and core network
- Web application firewalls (WAF)
- Properly segment CDE
Additional Security Controls for Large Merchants

**SIEM**
- Security intelligence and correlation
- Alerts and notification
- Tuning

**Vulnerability Management**
- Frequency of scans
- Zero day vulnerabilities
- Remediation and tracking

**Antivirus**
- Keep signatures updated
- Ensure settings cannot be altered

**Patch Management**
- Keep all software, hardware, appliances up to date
- End of life systems
- Vulnerability window
### Examples of Small Merchant Security Safeguards*

<table>
<thead>
<tr>
<th>Step</th>
<th>Security Practice</th>
<th>Ease of Implementation</th>
<th>Cost</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Change Default Passwords</td>
<td>Easy</td>
<td>None</td>
<td>Medium</td>
</tr>
<tr>
<td>2.</td>
<td>Install Antivirus</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>3.</td>
<td>Enable Remote Access Only When Needed</td>
<td>Easy</td>
<td>None</td>
<td>High</td>
</tr>
<tr>
<td>4.</td>
<td>Segment Network</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>5.</td>
<td>Conduct Employee Training &amp; Awareness</td>
<td>Easy</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

*Based on PCI Forensic Investigation Reports of Small Merchants
Key Takeaways

Lessons Learned

1. **PII/PHI versus payment card data** – PII/PHI is typically worth more on the darknet than payment card data

2. **Hackers targeting path of least resistance** – Hackers know companies that have weak or low security controls

3. **After liability shift, fraud will migrate to other channels** – Shift to card not present channels such as e-commerce

4. **Devalue the data** – Make payment card data, PII/PHI unusable to fraudsters when compromised

5. **Implement secure technology** – Consider point-to-point encryption, tokenization, and EMV chip to protect data

6. **Go above PCI DSS and HIPAA Security** – Both security standards are a floor, not ceiling, implement complimentary controls for a layered security approach
Visa is hosting a must-attend event that will focus on trends and developments related to cyber security, mobile payments, e-commerce and Visa’s global authentication strategy. In order to secure the future of commerce all stakeholders including merchants, acquirers, agents and Visa need to collaborate on key initiatives in addressing today’s most relevant issues. This event will be held in the San Francisco Bay Area at the Hyatt Regency Hotel just south of San Francisco.
Upcoming Events and Resources

Upcoming Webinars – Under Merchant Resources/Training on www.visa.com
  • **Implementing Effective Penetration Testing**, August 25, 2015
  • **The Importance of Containment and Remediation of Compromised Payment Processing Environments**, September 2, 2015

Visa Online Merchant Tool Kit provides helpful information to make a seamless EMV transition
  • Streamline your chip migration – www.VisaChip.com/business/toolkit

Visa Data Security Website – www.visa.com/cisp
  • Alerts, Bulletins
  • Best Practices, White Papers
  • Webinars

PCI Security Standards Council Website – www.pcissc.org
  • Data Security Standards, QIR Listing
  • Fact Sheets – Mobile Payments Acceptance, Tokenization, and many more...
Thank you for attending!

Questions? Comments?