Death Taxes and a Computer Incident: Designing your Incident Response Plan

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The Entity: State Level University Enterprise

The Event

• A security team for a State University system detected a large file transfer leaving the University network
• Further investigation discovered a Query Server that was “unintentionally” internet facing for two years
• This Query Server had the ability to pull data from every SQL database in the University system

Response

• Consultant was put on the ground within 24 hours
• Recreated the query run by the malicious actor
• Discovered that 298K plus PII records exported in the malicious query
• Determined that log retention not adequate to conduct data loss assessment
• Recommended that the University make notification as required assuming the loss of 298K PII records
Agenda

- Gathering Threats
- Framework for Defense
- Cost of a Breach
- Common Pitfalls
- Incident Response Work Flow
- Building Your Plan
- Exercising Your Plan
- Models to consider
- Case Study
Gathering Threats
Threat Categories

May be some overlap in APT and Insider threat detection

- Phishing with Dynamite
- Automated control for scale
- Can be defended with good Signature based controls
- Buys trade craft
- Can be sophisticated and polymorphic
- Favorite vectors
  - Server compromises
  - Non-targeted phishing
  - Web drive bys
- Smash and grab

- Playing chess
- Human controlled (just for you)
- Custom trade craft
- Favorite vectors
  - Highly targeted phishing
  - Water holing web drive bys
  - Some server compromises
- Highly targeted efforts
- Attempts to cover their tracks
- Will compromise partners to get to you
- **Goal is to log on, become an insider**

- Fly on the wall
- Hardest to detect, tries to hide in normal activity
- Usually has elevated privileges
- In most cases, assumes not being monitored
-Rarely uses tradecraft: when they do, normally crawlers
- Usually has access to data that does not pertain to their job, that is what they take
- Attempts to cover their tracks
- Managers/HR usually not surprised when insider is caught
Intent and Motive

Hacktivists/Revenge
Cyber Warfare

- Disrupt
- Destroy
- Deny
- Revenge
- Embarrass
- Intimidate

Intellectual Property Theft

- Competitive advantage
- Fill in an innovation gap
- Nation-state level espionage

Crime

- Steal your Money
- Steal your clients money
- Identity Theft
- Fraud
Targeted threat wants to log on as you

- Compromised **numerous domain admin accounts**
- **Dozens of external IPs** from different network address blocks and geographic locations, associated with attacker
- Attackers deleted their tools and recovered credentials after use.
- Forensic review identified attacker presence **over 180 days**

Client’s network access points were distributed across multiple sites and access mechanisms, including **different VPN endpoints, Virtual Desktop Infrastructure (VDI) systems, Outlook Web Access (OWA) interface, and several Microsoft SharePoint portals.**
Framework for Defense
Your best defense

Successful defense against advanced threats requires integrated threat intelligence, security operations and incident response.

Each element fuels the others, maximizing your chance of thwarting the adversary.

- Know your adversaries and their methods
- Detect threat activity earlier in the kill chain
- Disrupt the kill chain and stop the attack
- Eradicate actor presence and remove the threat

Incident response

Security operations

Threat intelligence
Cost of a Breach
Average Cost of a Data Breach (2012)

- German companies had the most costly data breaches
  - $188 and $199 dollars per record respectively

- The highest cost breaches were deliberately malicious and criminal attacks
  - $277 per record in the United States

- Average records breached per incident
  - 23,647

- Average cost of a breach (US)
  - >$4.4M

- Average breach notification cost (US)
  - >$500,000
Common Pitfalls
General observations

• Most struggle with an IT architecture designed for delivery, not security
• Poor asset visibility and network access control
• Security Operations Centers have SIEMS, but no analytics
• No Structured Approach for Security Incident Tracking
  – Difficult to spot trends and relevant threats sooner rather than later
  – No clear picture on detection and containment metrics
• Most focus on compliance monitoring instead of Security Monitoring
  – Implementation and process immaturity for security investigation use cases
• Most customers have an incident response plan
  – Few exercise it regularly, Many are outdated
• Most customers don’t have forensics
Commodity Threat Observations

• Attackers leveraging vulnerabilities (zero-days/published) for exploit kits with advanced functionality and agile maintenance cycles

• Commodity/criminal threat actors are becoming more sophisticated
  – Drive-by attacks enumerating platforms and vulnerabilities
  – Polymorphic malware

• Key characteristics are an aggressive style of attack to compromise many victims as fast as possible for financial gain before exploit kit malware is removed
Incident Response Workflow
Incident Response Work Flow
Sample Workflow – IR Engagement

Enterprise Cyber Intrusion Incident Handling Process

<table>
<thead>
<tr>
<th>Identification</th>
<th>Analysis</th>
<th>Notification</th>
<th>Containment</th>
<th>Eradication</th>
<th>Recovery</th>
<th>Follow-Up/Post-Incident Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident Detected</td>
<td>Network Analysis</td>
<td>YES</td>
<td>Network Controls</td>
<td><strong>Removal</strong> Containment Controls?</td>
<td>Incident Report</td>
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<tr>
<td>Confirmation of Indicators</td>
<td>Implement Incident Level monitoring</td>
<td>System Controls</td>
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<td>YES</td>
<td>System Analysis</td>
<td>YES</td>
<td>Host Patching</td>
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<td>Determine Severity Level, Incident Type, and Vector</td>
<td>Malware Analysis</td>
<td>YES</td>
<td>Vulnerability Scanning</td>
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<td>Digital Forensics Analysis</td>
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<td>Application Modifications</td>
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<td>Retrospective Analysis</td>
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<td>Correlation Analysis</td>
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<td>Risk Analysis</td>
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<td>Exploit Analysis</td>
<td>YES</td>
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Classification: Dell SecureWorks/Confidential - Limited External Distribution:
Phase: Identification

People and Skillsets
- Educated User – Detects and Report Anomalies
- Incident Analyst – Correlates Events
- Trained IT Staff – Corroborate Activities
- Incident Manager – Leads

Process
- Risk Analysis
- Incident Team Activation
- Artifact Preservation
- Escalations
- Notifications

Technology and Tools
- Well Configured Devices
- Logging Infrastructure
- SIEM
- Network Access to Required Information
Phase: Analysis

**People and Skillsets**
- Incident Analyst
- Incident Manager
- Network Forensics Analyst – Review Network Traffic
- Systems Forensics Analyst – Host Forensics
- Malware Analysts

**Process**
- Risk Analysis of Current Threat
  - Threat to Business Operations
  - Select Response Option
- Incident Response Playbook (Checklists)
- Artifact Collection, Storage, and Preservation
- Iterative

**Technology and Tools**
- System Forensics (FTK, EnCase)
- Log Parsing (Splunk, LogLogic)
- Intelligence Correlation (Palantir)
- Host/Network
Phase: Notification

People and Skillsets
- Incident Manager – Consolidate Technical Input
- CISO/CSO – Prepare Executive Recommendations
- Legal – Provide Risk Assessments
- Business Owners – Operational
- Corporate Communications – Messaging

Process
- Notifications
  - Internal Employees
  - Customers
  - Vendors
  - Law Enforcement
- Public Affairs Statement

Technology and Tools
- Pre-Prepared Notifications
- Method
  - E-Mail
  - SMS
  - Snail Mail
Phase: Containment

People and Skillsets
- CIO/CISO – Strategic Guidance
- Incident Manager – Develop Implementation Plan
- IT Staff – Knowledge of System Capabilities
- Security Staff – Internal Research

Process
- Containment Requirements & Phasing
  - IP/DNS Blocks
  - AV DAT Push
- Change Criticality
  - Immediate
  - Deliberate

Technology and Tools
- Active Directory
- Access Control Lists
- FW/IPS/Proxy Changes
- Anti-Virus
- DNS Black holing
Phase: Eradication

People and Skillsets
- IT Staff – Implementers
- Security Staff – Validate Actions
- External Vendors
  - AV
  - FW/IPS

Process
- System Remediation
  - Clean versus Rebuild
- Rescan
  - Internal
  - External
- Validation

Technology and Tools
- Vulnerability Scan (Qualys, NESSUS)
- Penetration Testing (Red Teaming)
- Web App Testing
- Malware Reverse Engineering
Phase: Recovery

People and Skillsets
- Users – Notification and Heightened Alerting
- IT Staff – Restore Systems to Full Function
- Incident Analyst – Focus on Previously Affected Systems

Process
- Normal IT Operations

Technology and Tools
- Normal IT Operations
Phase: Post-incident activities

People and Skillsets
- CEO/CIO – Interest in Post-Mortem
  - Executive Buy-In
- CISO – Refine Incident Response Processes
- IT Director
  - System/Network Changes
  - Purchase/Upgrade

Process
- Refine Incident Playbook
- Refine Signatures on FW/IPS/Proxy
- Conduct Data Loss Analysis
- Conduct Gap Analysis on Infrastructure
- Update

Technology and Tools
- Follow-Up Notifications
  - E-Mail
  - SMS
  - Snail Mail
Building Your Plan
CSIRP Construction

COMPUTER SECURITY INCIDENT RESPONSE PLAN
(CSIRP)
Exercising Your Plan
Tabletop Lifecycle

- Conception
- Goals
- Training Audience
- Trusted Agent
- Remediations
- Implement
- Lessons Learned
- Delivery
- Scenario Development

2014 Enterprise Security Summit

Classification: Dell SecureWorks/Confidential - Limited External Distribution
Models to consider
Incident Response models to consider

100% insource your Response Team
- Advantage: most responsive
- Disadvantage: $$$$, may not have the repetition to stay current

Insourcing your Incident Management, outsource perishable and high-dollar Forensics skills
- Advantage: Maintain the leadership/responsibility within the organization
- Disadvantage: Full team not together except during a live incident and rehearsals

100% outsource your Response Team
- Advantage: Turn key solution, allows an IT Service team to focus on delivery, optimal for small staffs with no security personnel
- Disadvantage: $$$$$$$$, and you maintain no staff expertise
Case Study
Incident Case Example
Provided by the Incident Response and Digital Forensics team

The Entity: Health Care provider in the Northeast

The Event
- The client discovered an outbreak of w32.changeup (VOBFUS) on their networks, not detected by Anti-virus (AV)
- Client disconnected from the Internet to prevent further spread of the worm
- Contacted Dell SecureWorks IR team to assist
- Critical that the client be reconnected by Monday to conduct business

Response
- Consultant was put on the ground within hours
- IR team discovered the w32.changeup worm was polymorphic in nature, allowed it to allude AV detection
- IR team also found Zeus and Medfos Trojans as a stage two infection (Criminal Tradecraft)
- Initial infection vector was through normal user activity (web drive-by infection)
- Command and Control blocked and systems cleaned before exfiltration of financial data
- Client reconnected before business started on Monday
Forces that Work on an Incident

- Delay Onset
- Shorten Time to Restoration
- Limiting Severity

Impact to Organization

Time

Utility
Conclusion

Pick your model
• 100% insourced
• Insource Incident Manage/outsourced critical forensics skills
• 100% outsourced

Develop a plan with your model in mind

Exercise your plan with all of the key players
• IT staff
• Security Staff
• Business owners/Decision makers
• Outsource players

Continue improving your plan after every incident and rehearsal
Thank you.

Contact Dell SecureWorks at:
US - (877) 838-7947