MANDIANT®
A FireEye® Company

Operationalizing Threat Intelligence

Technical Operations & Program Integration

SECURITY CONSULTING

Cyber Defense Centre Consulting – who we are

Practice Background

- Established in 2012
- Designed 25+ CIRT Teams
- Assessed 50+ Cyber Defense Centers
- Served all industries, most notably: Finance, Oil & Gas, Technology, Energy, and Telco's

Consultant Backgrounds

- Fortune 100 SOC Managers
- Incident Response Leads for Fortune 100
- Forensics Investigators for US Govt.
- Global Presence

Expertise

- Mandiant's consultants have successfully designed and developed some of the world's largest Cyber Defense Centers. Our consultants apply in-depth knowledge and experience gained through hundreds of investigations, intelligence and best-practice implementations.
- Our consultants bring the Mandiant IR framework and real word knowledge to develop and transform CIRT teams into Cyber Defense Centers, from reactive capabilities to proactive capabilities in order to detect, respond and contain today's targeted threats.

Agenda

- Mtrends Report Findings
- Program Components
- Intelligence Collection
  - Open Source Intelligence
  - Third Party Intelligence
- Program Integration
- Information Sharing
- Intel Frameworks
- Program Development
- Samples


31%
victims discovered
the breach internally

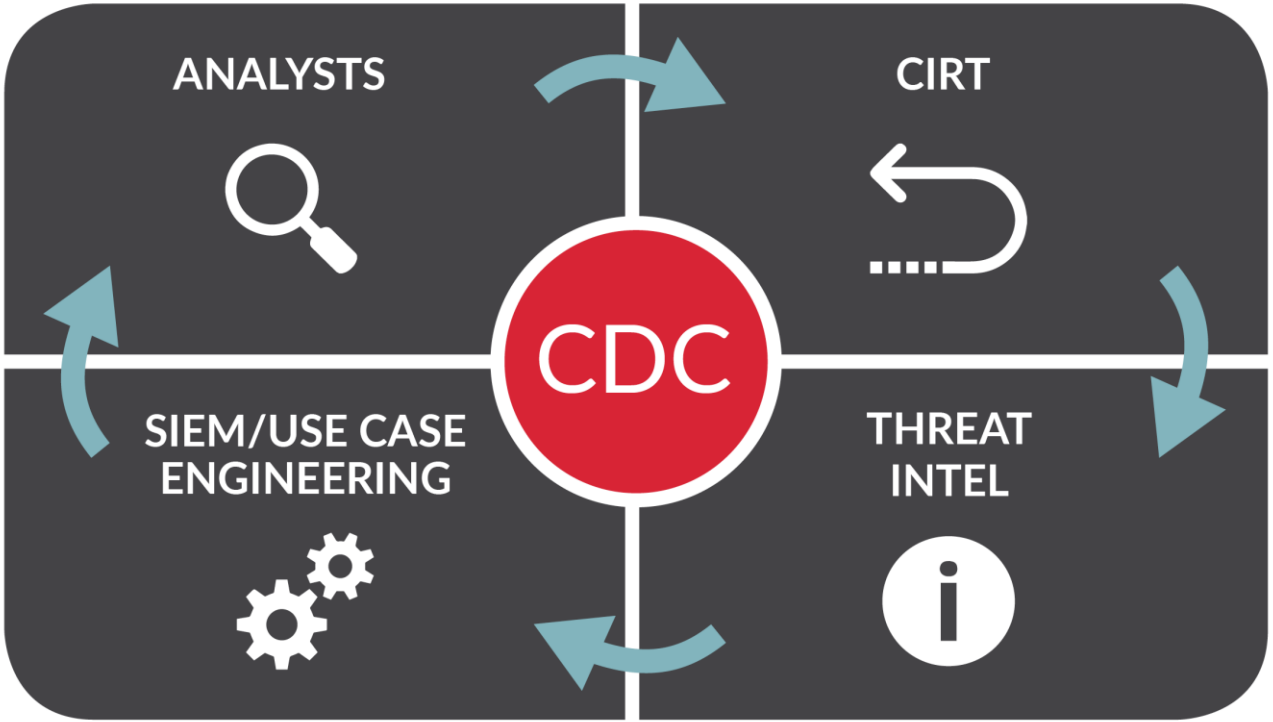

69%
victims notified by
an external entity

DWELL TIME

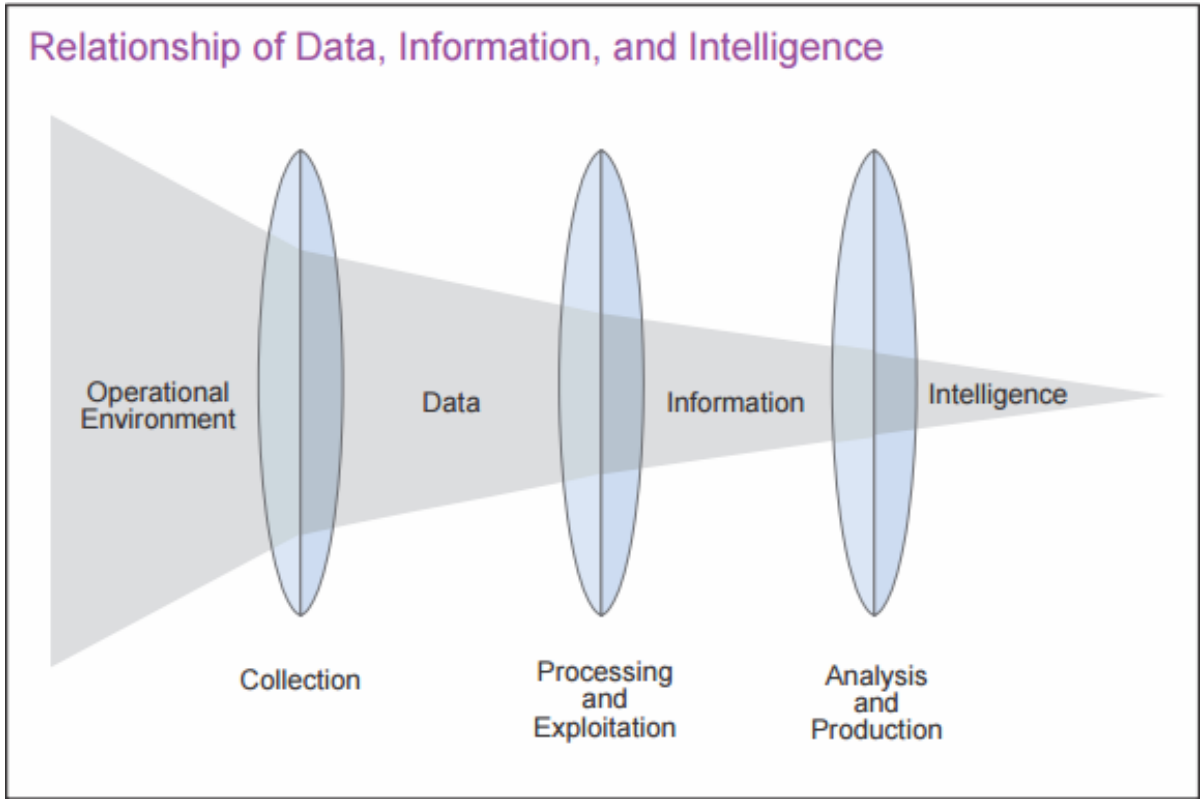
205

Median number of days that threat actors were present on a victim's network before detection

Quadrant Model - Functional Alignment

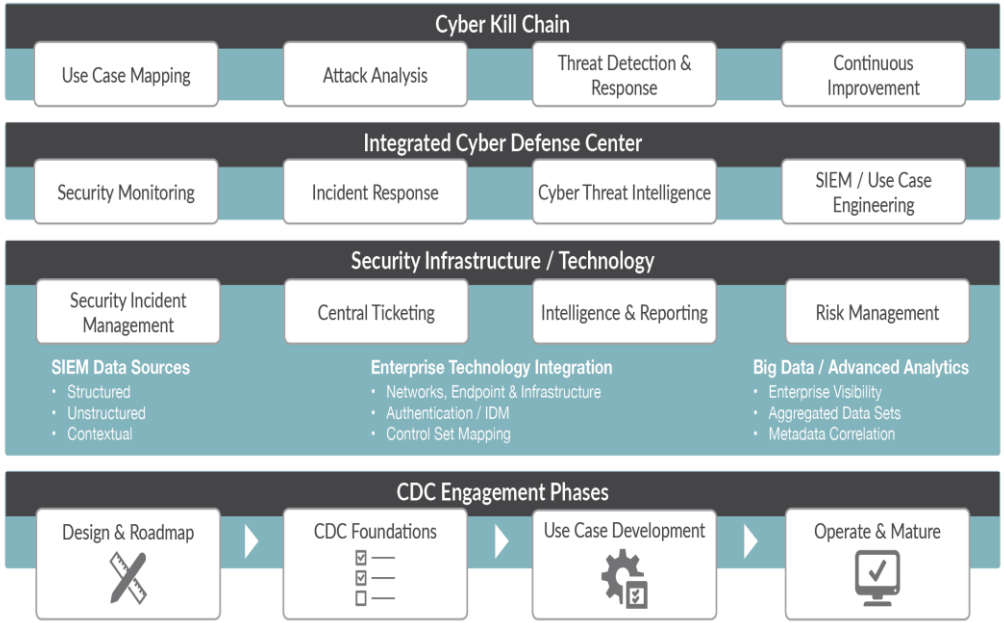


Data > Information > (Actionable) Intelligence



Credit: SANS.org

Program Integration – Collection & Processing



Develop and ***integrate*** threat intelligence capabilities to enable and enhance cyber defense operations, including:

- **Threat / data feeds**
- **Threat Intelligence processes / procedures**
- **Technology Integration (e.g., SIEM, Intel Correlation)**
- **Leverage Security Intelligence Frameworks**

Intelligence Collection Considerations

- Dedicated IOC creation function
- Trend/Historical analysis
- Actionable intelligence only
  - Regular securing tool tuning
    - White/Blacklists
    - IOCs
    - Alerts
  - Updates to security policies
- Quality assurance

Threat Intelligence / Information Sharing Frameworks - Examples

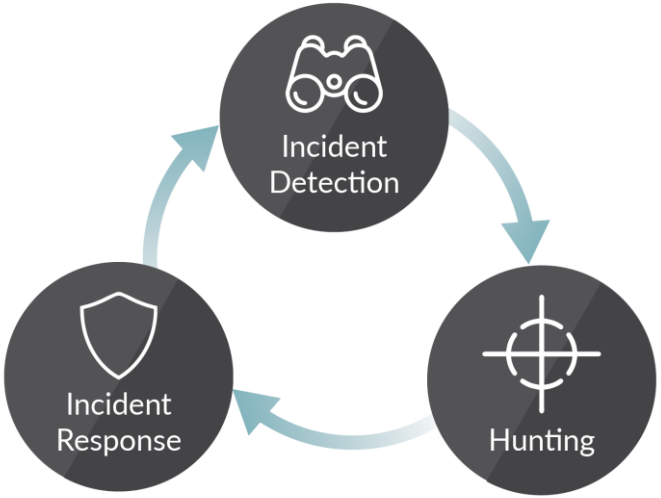
- **SIEM Communities**
  - Qradar Threat Exchange, Splunk feeds, etc.
- **Technical Platforms / Frameworks**
  - OpenIOC
  - OpenTPX – Open Threat Partner Exchange
  - STIX / TAXII
  - Collective Intelligence Framework (CIF)
  - Avalanche/Soltra (FS-ISAC)
- **Relevant Legal Frameworks**
  - E.g, CISA
- **Sector-specific Communities**

  e.g., HITRUST Cyber Threat Xchange
- **Public/Private Programs**
  - DHS / NCCIC / US-CERT
  - CISCP / ECS
  - Country CERTs
  - ISACs
    - Financial Services, Information Technology, Multi-State, Water, Power, etc.
  - ENISA
    - E.g., European Financial Institute – Information Sharing & Analysis Centre
- **Common Vernacular**
  - Cyber Atlas

Program Integration – Analysis & Dissemination

Key questions to consider:

- What data / information is selected for processing?
- What analytical process is employed?
- What systems / technologies are leveraged?
- How is the information shared with stakeholders?

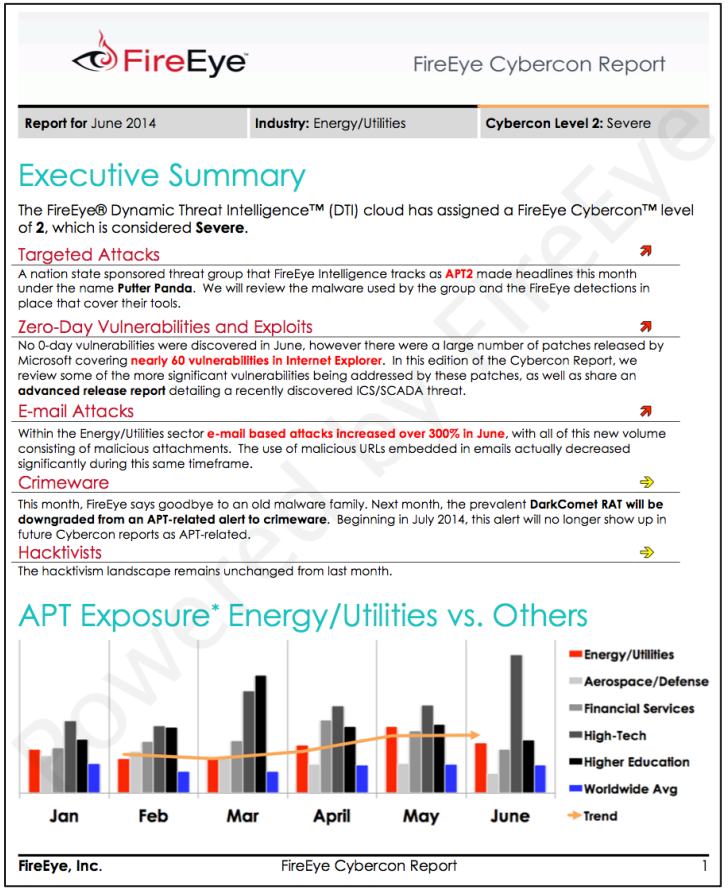


Intelligence Sharing – Portals & Partners

- Use a portal (preferably an existing one) to collectively share intelligence and indicators of compromise across staff. The portal should provide the following minimum capabilities:
  - granular access control
  - quick and easy access by all authorized staff
  - history of changes made to content
  - login history
  - the option for two-factor authentication
  - secure storage of content
- Developing relationships with law enforcement will assist in receiving information they collect from investigations
- Joining information sharing organizations can assist in understanding threats facing others in your industry
- Information sharing should be bi-directional

Understanding & Articulating

- Is this targeted?
- Is this part of a larger campaign? What's the scale?
- Who else is seeing this? What are others saying?
- Or is this an insider threat?
- What are the TTPs? How do you find them?
- How do you remediate?
- How do you share?



FireEye

FireEye Cybercon Report

Report for June 2014	Industry: Energy/Utilities	Cybercon Level 2: Severe

Executive Summary

The FireEye® Dynamic Threat Intelligence™ (DTI) cloud has assigned a FireEye Cybercon™ level of **2**, which is considered **Severe**.

Targeted Attacks

A nation state sponsored threat group that FireEye Intelligence tracks as **APT2** made headlines this month under the name **Putter Panda**. We will review the malware used by the group and the FireEye detections in place that cover their tools.

Zero-Day Vulnerabilities and Exploits

No 0-day vulnerabilities were discovered in June, however there were a large number of patches released by Microsoft covering **nearly 60 vulnerabilities in Internet Explorer**. In this edition of the Cybercon Report, we review some of the more significant vulnerabilities being addressed by these patches, as well as share an **advanced release report** detailing a recently discovered ICS/SCADA threat.

E-mail Attacks

Within the Energy/Utilities sector **e-mail based attacks increased over 300% in June**, with all of this new volume consisting of malicious attachments. The use of malicious URLs embedded in emails actually decreased significantly during this same timeframe.

Crimeware

This month, FireEye says goodbye to an old malware family. Next month, the prevalent **DarkComet RAT will be downgraded from an APT-related alert to crimeware**. Beginning in July 2014, this alert will no longer show up in future Cybercon reports as APT-related.

Hacktivists

The hacktivism landscape remains unchanged from last month.

APT Exposure* Energy/Utilities vs. Others

FireEye, Inc. FireEye Cybercon Report 1

Strategic vs. Tactical

- Understand the threat
- Weigh counter actions
  - Monitoring
  - Intelligence Collection
  - Tactical countermeasures

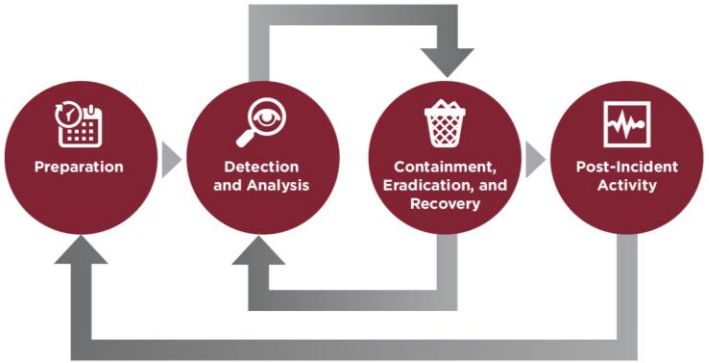
Credit: takisathanassiou.com

Proactive Capabilities – Hunting & Post-Incident Actions

- Hunting the network provides the capability to conduct proactive analysis to develop new IOCs
  - Data mining historical data
  - IOC Sweeps

- A mature IOC capability includes:
  - Dedicated individuals to design and build IOCs
  - Develop and update IOCs regularly (IOC Editor)
  - Processes and tools in place to actively check systems for IOCs

- Post-incident, hunting assists in ensuring remediation and eradication activities were successful



THREAT INTELLIGENCE PROGRAM DEVELOPMENT: TOOLS & TECHNIQUES

Standardize Definitions

- **Event:**
  - Any observable occurrence in a system or network
- **Event of Interest**:
  - Any event with potential of security risk / threat
- **Incident**:
  - Violation or imminent threat of violation of computer security policies, acceptable use policies, or standard security practices
- **Vulnerability:**
  - An unintended flaw in a software code or a system that leaves it open to the potential for exploitation
- **Threat:**
  - Any circumstance or event with the potential to adversely impact organizational operations (including mission, functions, image or reputation), organizational assets, individuals, other organizations, or the Nation through an information system via unauthorized access, destruction, disclosure, or modification of information and/o denial of service.
- **Threat Intelligence:**
  - Evidence-based knowledge, including context, mechanisms, indicators, implications and actionable advice, about an existing or emerging menace or hazard to assets that can be used to inform decisions regarding the subject's response to that menace or hazard. - *Gartner*

Criticality Example – Commodity vs. Targeted Malware

- **<u>Targeted, Advanced Persistent Threat</u>:** High - Critical
  - Well Resourced attacker
  - Methodical, pre-meditated tactics
  - Advanced technical abilities

Vs.

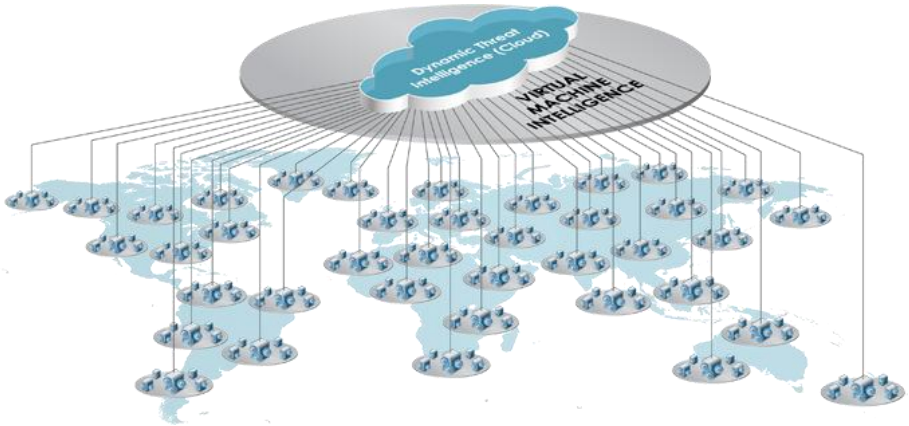
- **<u>Commoditized threat</u>:** Low - Medium
  - Target of opportunity
  - Elementary tools & tactics employed
  - Script kiddie

Categorizing threats

	Nuisance	Data Theft	Cyber Crime	Hacktivism	Network Attack
Objective	 **Access & Propagation**	 **Economic, Political Advantage**	 **Financial Gain**	 **Defamation, Press & Policy**	 **Escalation, Destruction**
Example	Botnets & Spam	Advanced Persistent Threat	Credit Card Theft	Website Defacements	Destroy Critical Infrastructure
Targeted	☒	☑	☑	☑	☑
Character	Automated	Persistent	Opportunistic	Conspicuous	Conflict Driven

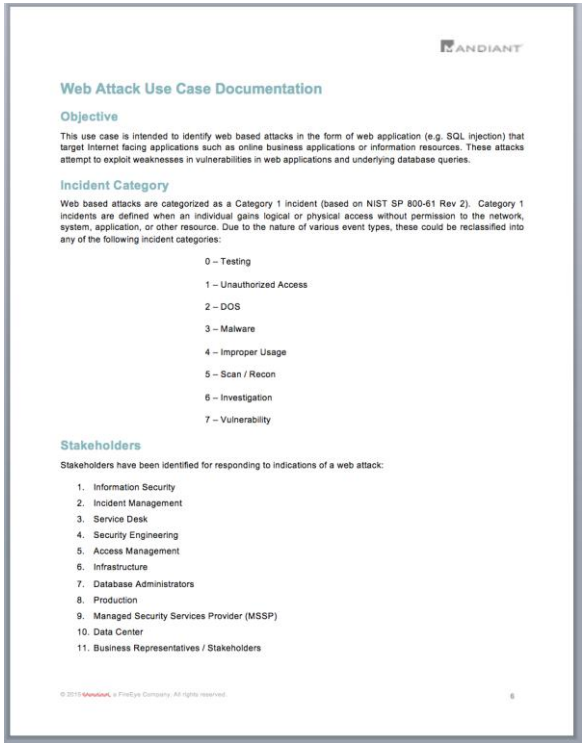
Formalize & Institutionalize Threat Intelligence Program

- **Mission & Strategy**
- **Service Catalog**
- **Use Case**
- **Threat Intel Playbook**
- **Enterprise Process Workflow**



Use Case Documentation

- **Use Case Overview – Threat Intelligence**
  - Additional Intelligence Related Use Cases
    - Detection / Triage (Alerting)
    - Data Loss
    - Malware
    - Unauthorized Access
    - DoS / DDoS
    - Web Attack
    - Pen Testing
    - Cyber Hunting



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Web Attack Use Case Documentation

Objective

This use case is intended to identify web based attacks in the form of web application (e.g. SQL injection) that target Internet facing applications such as online business applications or information resources. These attacks attempt to exploit weaknesses in vulnerabilities in web applications and underlying database queries.

Incident Category

Web based attacks are categorized as a Category 1 incident (based on NIST SP 800-61 Rev 2). Category 1 incidents are defined when an individual gains logical or physical access without permission to the network, system, application, or other resource. Due to the nature of various event types, these could be reclassified into any of the following incident categories:

0 – Testing

1 – Unauthorized Access

2 – DOS

3 – Malware

4 – Improper Usage

5 – Scan / Recon

6 – Investigation

7 – Vulnerability

Stakeholders

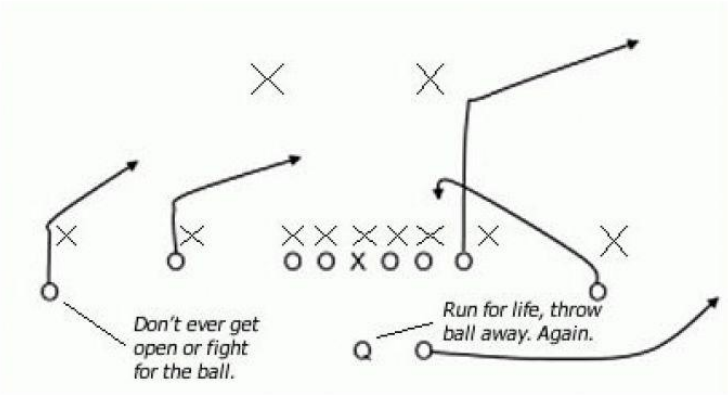
Stakeholders have been identified for responding to indications of a web attack:

1. Information Security
2. Incident Management
3. Service Desk
4. Security Engineering
5. Access Management
6. Infrastructure
7. Database Administrators
8. Production
9. Managed Security Services Provider (MSSP)
10. Data Center
11. Business Representatives / Stakeholders

6

Playbook Overview

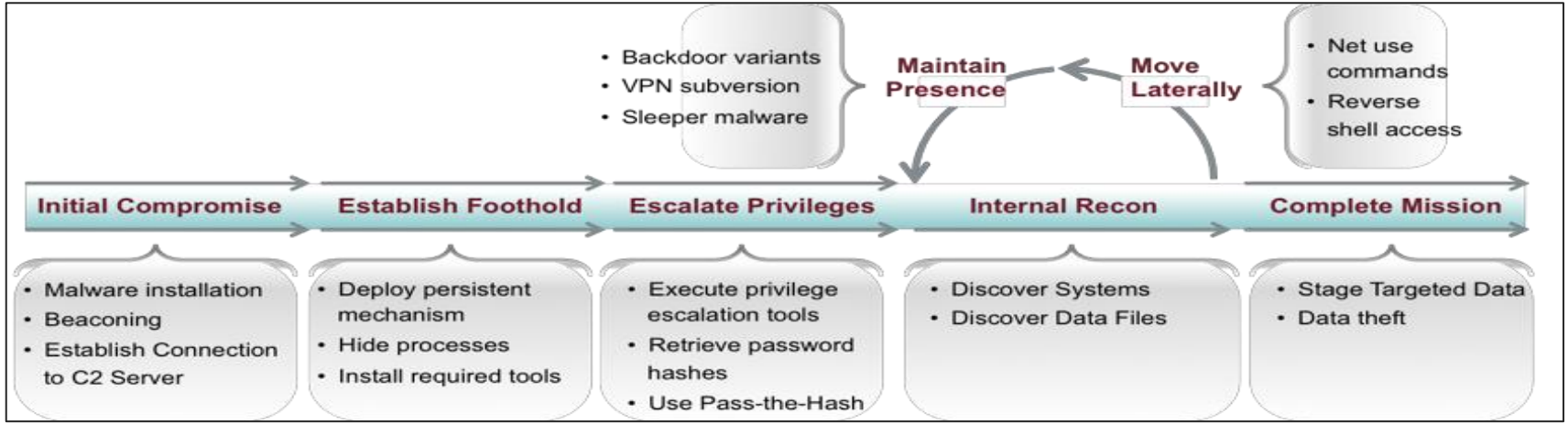
- Functional Roles
  - **Event Analyst**
  - **Incident Analyst**
  - **Incident Responder**
  - **Security Team Manager**
  - **Relevant Stakeholders**
    - Executives
    - Network Operations
    - System Owners
    - Security Team Members/Stakeholders
    - Relevant stakeholders / Business Reps



Credit: Athlonsports.com

Use Cases

Mandiant implements use cases at each stage within the kill chain.
This ensures complete visibility and allows the CDC to detect and respond to cyber threats earlier, in order to reduce exposure and loss.



Source as many IOCs as you can

- APT Reports & White Papers - 2015
  - Behind the Syrian Conflict's Digital Frontlines
  - APT30
  - Hiding in Plain Sight (with Microsoft)
  - HAMMERTOSS (APT29)
  - WITCHCOVEN
- Intel Sharing Frameworks
- Intelligence Sources
- Service Providers
- Email Distros
- Blogs
- Etc.

Source as many IOCs as you can (cont.)

- **Sample APT Report**

External data collection

90+ Managed Defense customers

Hundreds of consulting engagements

One of the industry's largest malware clearinghouses

Global sinkholes to detect malware activity

Nucleus, patented **32 million** node graph-based engine, mines data with **200** terabytes of storage, and **500M+** captured network streams

Helix malware triage system uses proprietary sandboxing, machine learning, and genotyping tech to identify new samples of interest

Team of 25 PhDs, linguists, analysts, and foreign policy experts from NSA, CIA, DIA, and military put intelligence into context

Q & A

Discussion

51 GB of command and control monitored

40 Current industry-specific threat profiles

150,000 Indicators of compromise

20 million compromised computers check in with Mandiant every hour

2,700 Advanced malware samples from client engagements analyzed last year

200 Attack groups tracked

400,000 Unique malware samples gathered every day

1 Landmark report which shifted the industry dialog: *Exposing APT1*

17 Million unique compromised devices observed every day