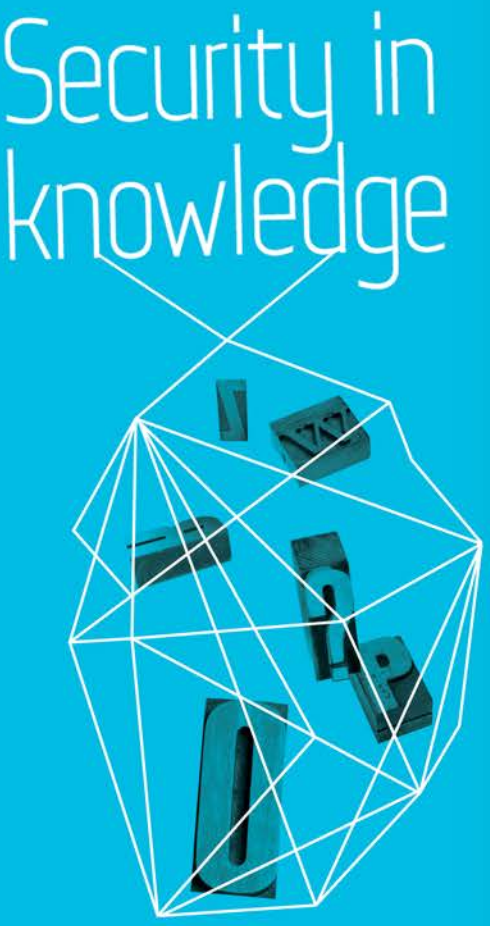
RSA CONFERENCE 2013

The Evolution of Cyber Attacks and Next Generation Threat Protection



Ashar Aziz
Founder, Vice-Chairman and CTO
FireEye, Inc.

Session ID:

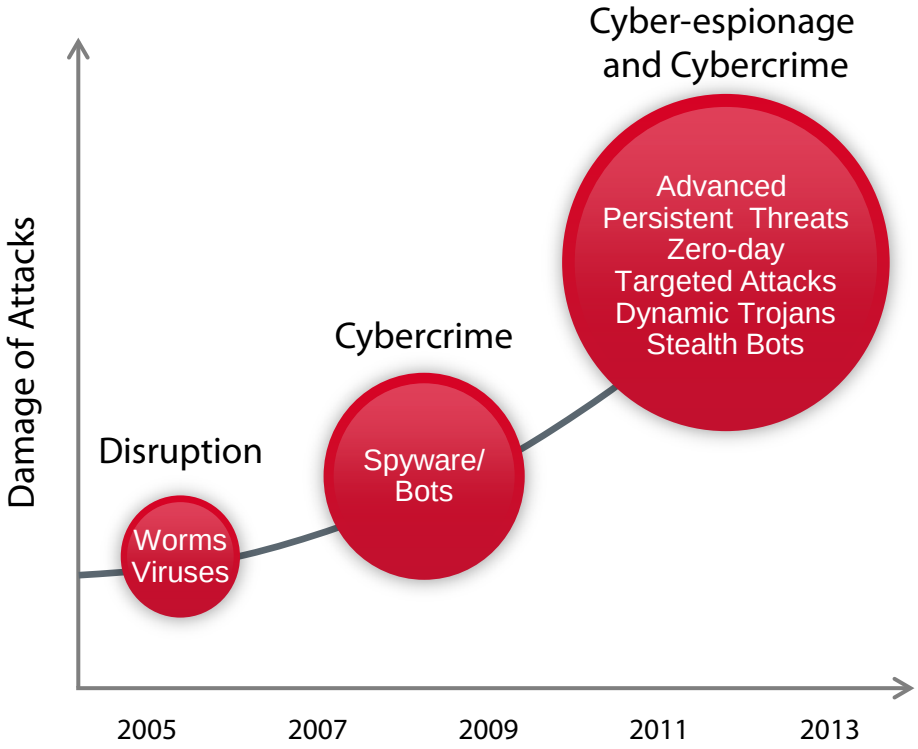
Session Classification:

Agenda

- The New Threat Landscape
- Deep Dive on Advanced Attacks
- Principles of Next Generation Protection

The New Breed of Attacks

- Nature of threats changing
- Today's attacks sophisticated and successful



"Organizations face an evolving threat scenario that they are ill-prepared to deal with….threats that have bypassed their traditional security protection techniques and reside undetected on their systems."

Gartner, 2012

What's Changed?

Coordinated Persistent Threat Actors

Dynamic,
Polymorphic Malware

NEW THREAT LANDSCAPE

Multi-Vector Attacks

Multi-Stage Attacks

Multiple Vectors - Targeting An Organization's Valuable Assets

Spear Phishing

CFO

Financial Information

Web-Based Attack

Director of Engineering

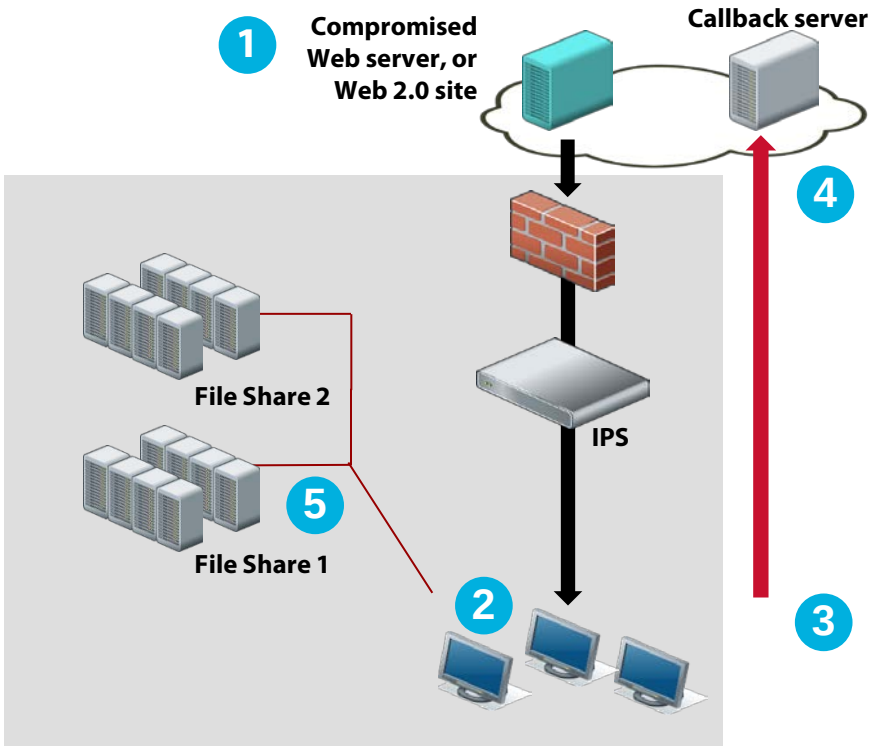
Intellectual Property

File-Based Attack

Government Employee

National Security Info

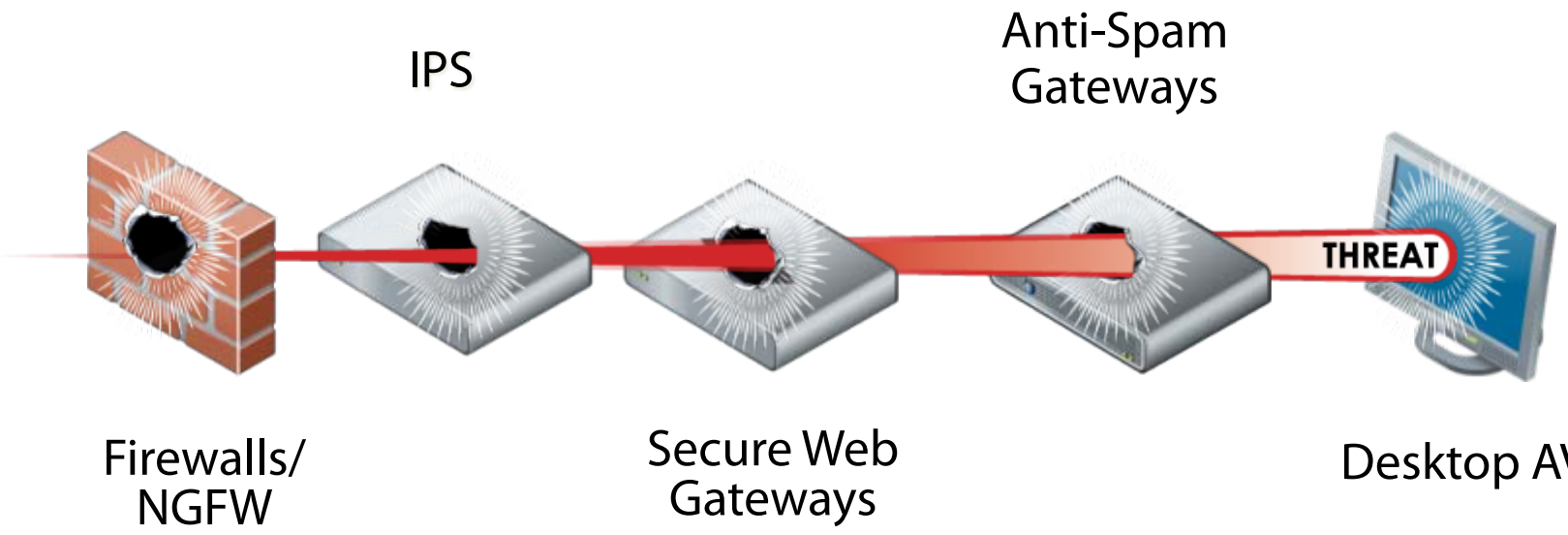
Multiple Stages: The New Attack Life Cycle



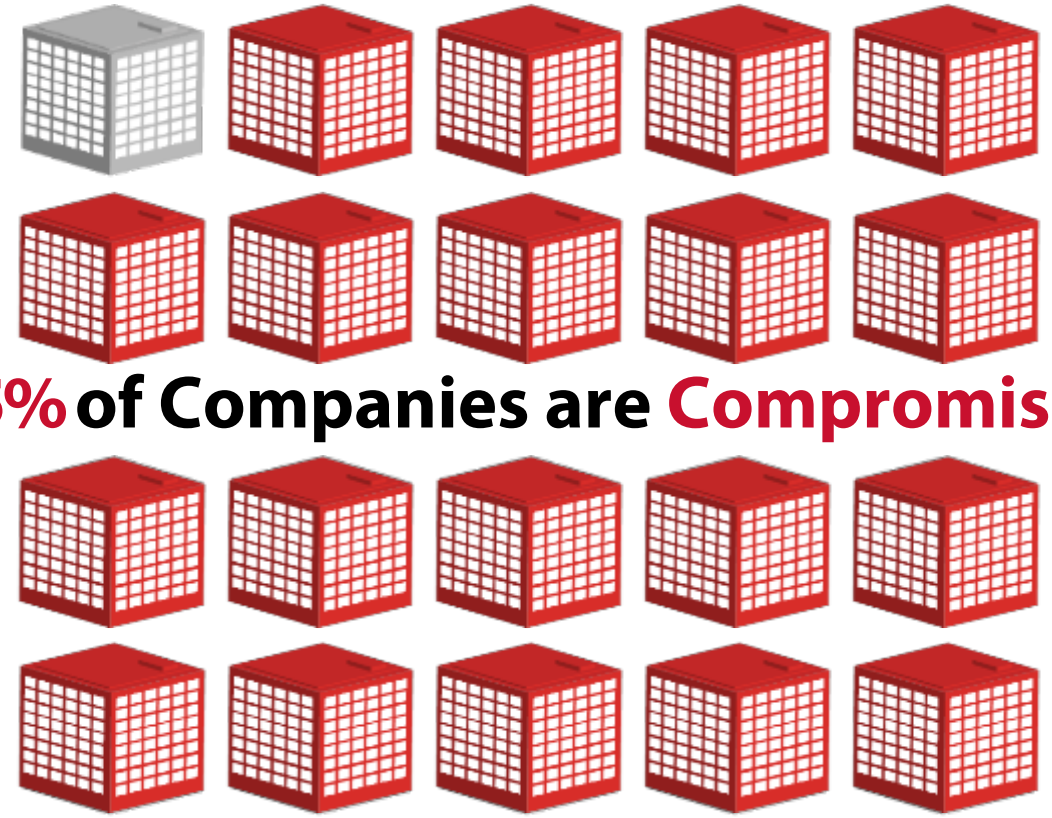
1. **Exploitation of system**
2. **First Callback for malware download**
3. **Malware executable download**
4. **Data exfiltration**
5. **Malware spreads laterally**

Traditional Defenses Don't Work

The new breed of attacks evade signature-based defenses



The Security Gap is Broad



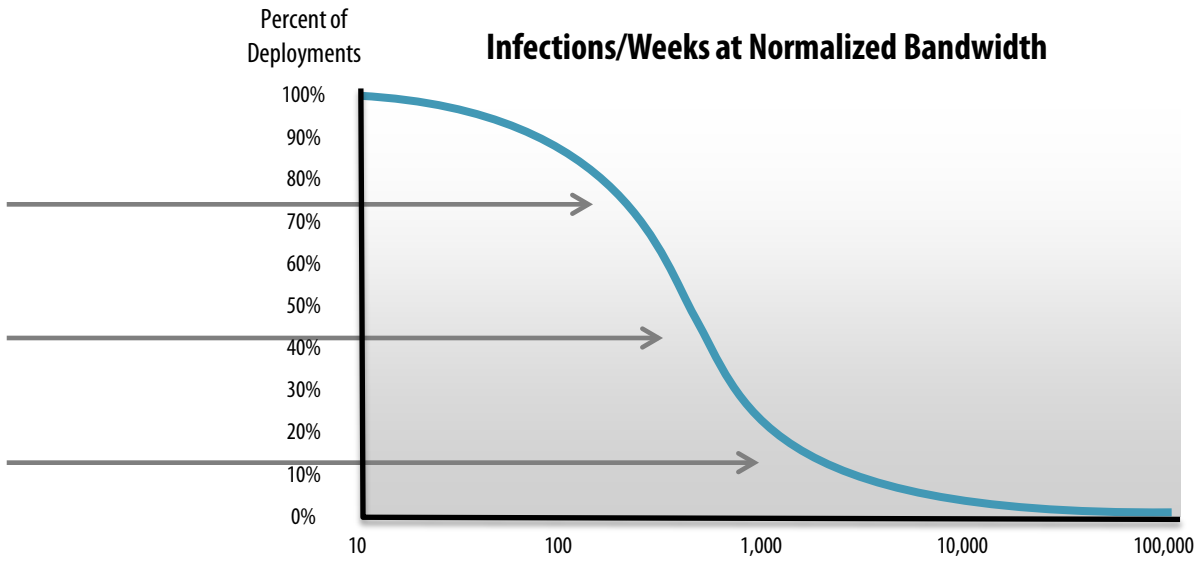
95% of Companies are Compromised

The Degree of Compromise is Significant

98.5% of deployments see at least 10 incidents/week

Median is about **643** incidents/week

20% of deployments have thousands of incidents/week



Source: FireEye Advanced Threat Report, Feb. 2012

643 Median Net New Infections Per Week!

Spectrum of Frequent Advanced Attacks

For 2012/2013

Mass Website Compromises

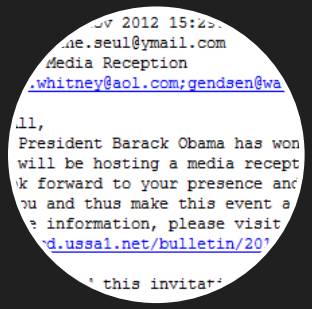
- Exploit toolkits
- Zero-day exploits (rare)
- Sophisticated crimeware

Watering Hole Attacks

- Compromised site specific to industry vertical
- Zero-day exploits more common
- Frequently nation-state driven

Weaponized Email Attachments

- Common file formats
- Legit work product presented (decoy)
- Preferred by nation-states



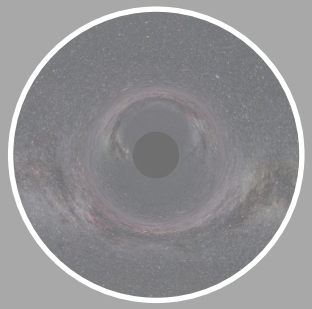
Malicious URLs in Email (Spear phish)

- Exploits specific to target environment
- Only exploit if visited from target network(s)
- Use existing trust relationships

1000+ Victims ← → **~1-2 Victims**

(Easiest to Detect) **(Hardest to Detect)**

Watering Hole Attacks



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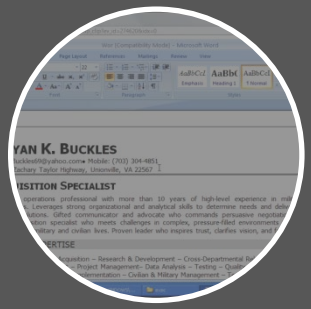

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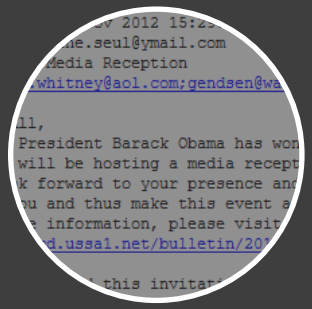

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1) Offense: Watering Hole Methods

- Growing in popularity among nation-state threat actors
- Useful when precise targeting intel is unknown
- Compromise website likely visited by target
- Start campaign when target is distracted (e.g. holidays)
- Once victim compromised, clean up site
- Or, leave exploit for opportunistic attacks

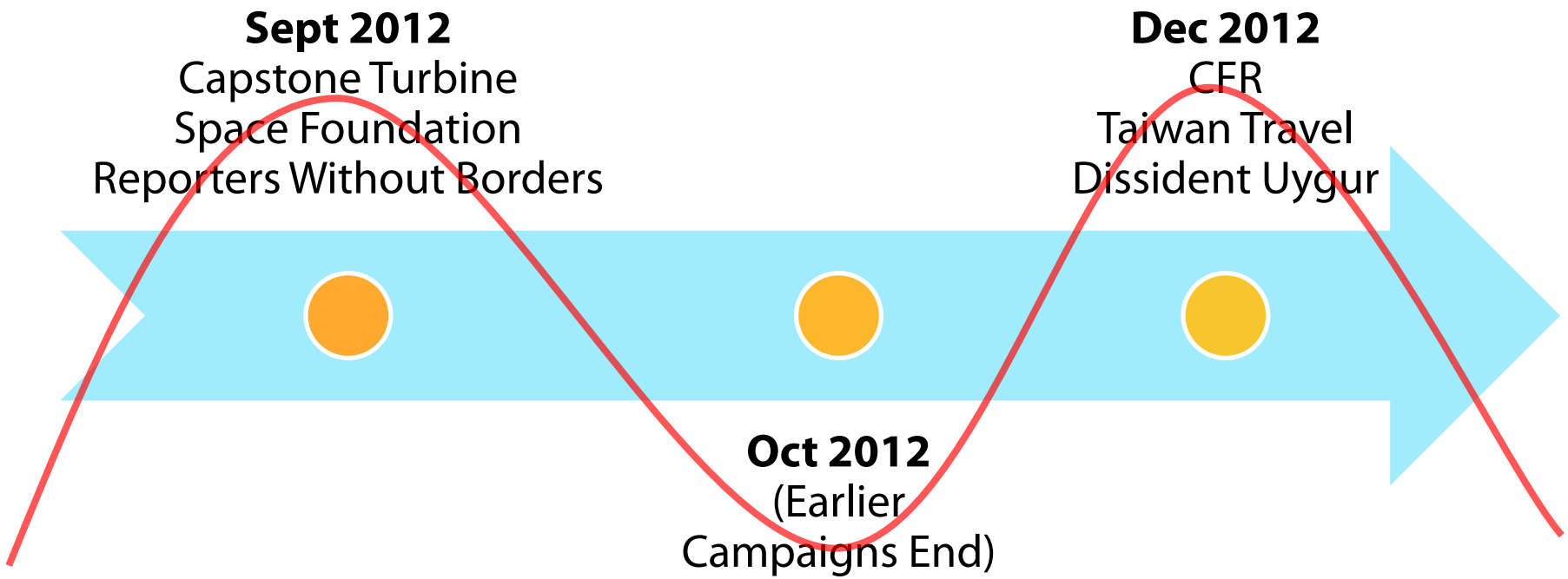
1) Offense: Watering Hole Methods

Ex: Council on Foreign Relations (CFR)

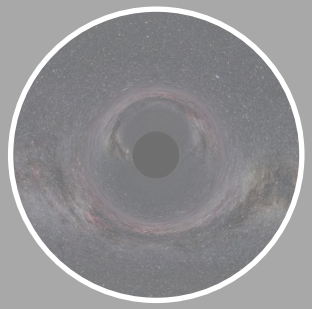
- On Dec 21, 2012, FireEye detected attacks from cfr.org to 4 major customers
  - Victims: large scale ISP, large US financial, US media outlet, and local government
  - Only worked from US, JP, KO, and CN systems
  - Exploit triggers only one time (cookie tracking)
  - First reported IE 8 zero-day exploit (CVE-2012-4792)
  - Obfuscated JS + Heapspray via Flash + IE 8 exploit
  - Fetches xsainfo.jpg as XOR encoded backdoor
  - Loads backdoor as "shiape.exe"
  - Callbacks to dynamic DNS C2 provider as normal HTTP POST traffic
  - More at: http://blog.fireeye.com

1) Offense: Watering Hole Methods

CFR is not the first…nor the last…



Email Attacks



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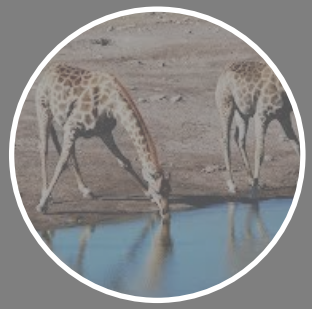

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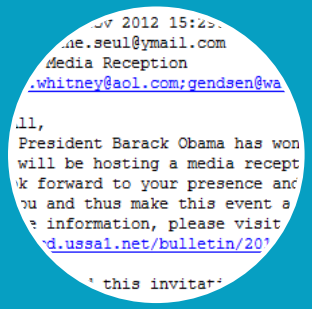

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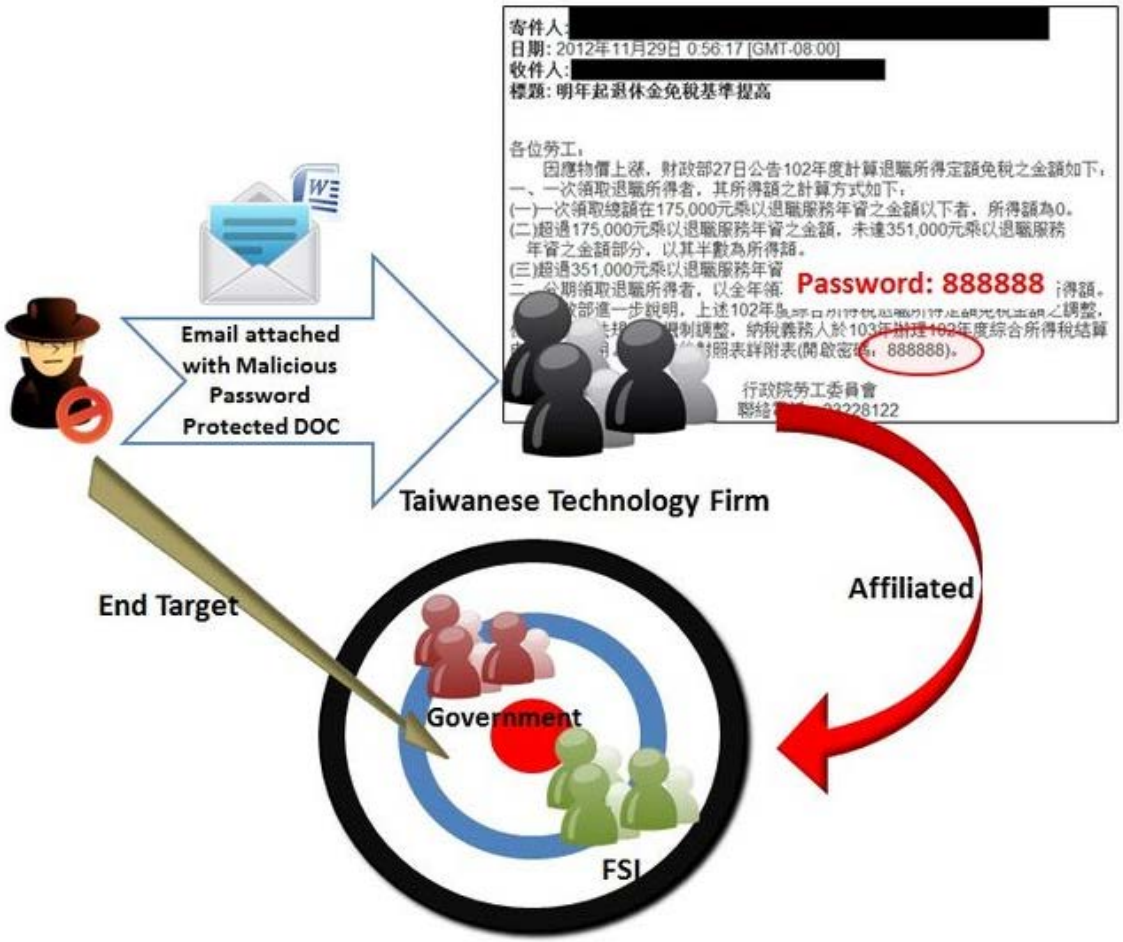
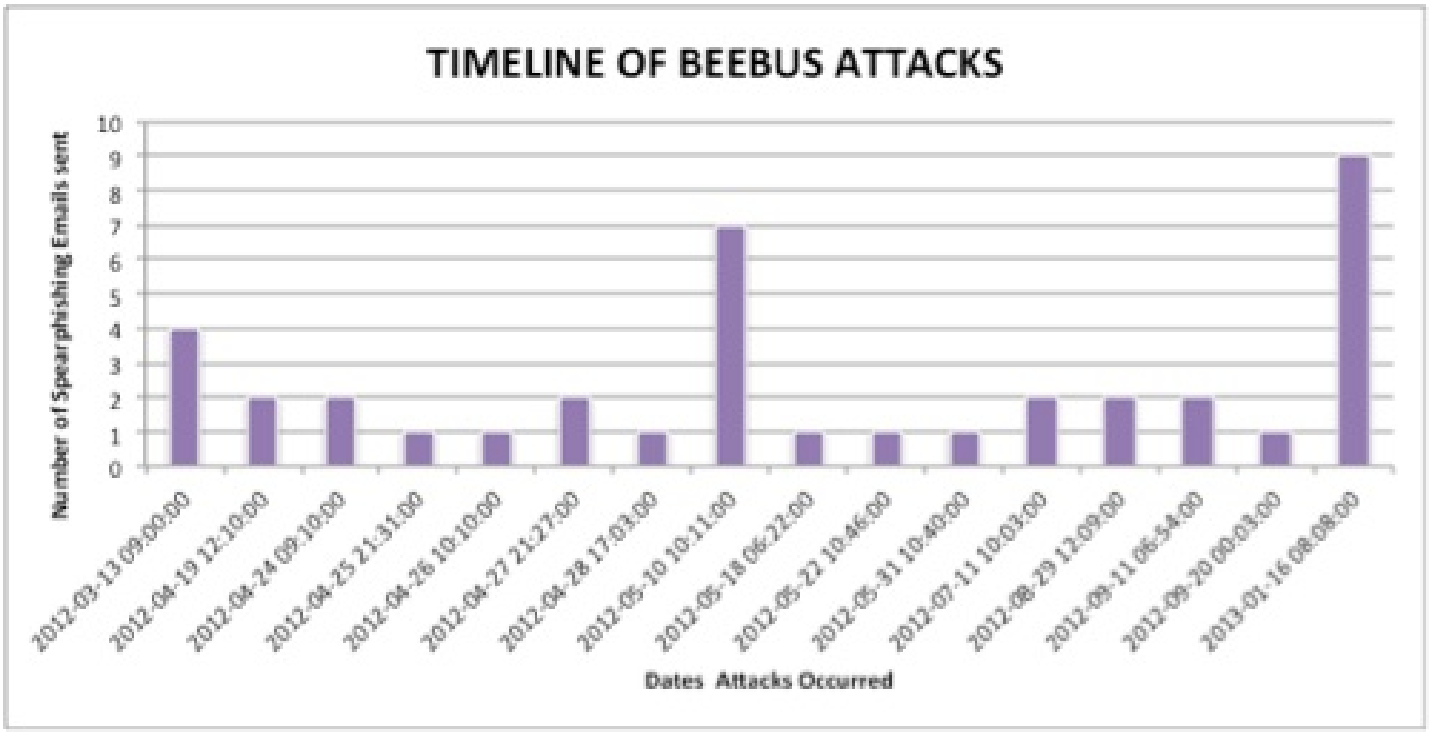
Targeting a Large Taiwanese Technology Firm



Attack Campaigns: Operation BeeBus

- Coordinated and sustained attacks on Aerospace and Defense contractors



A New Model is Required

Legacy Pattern-Matching Detection Model

MATCH

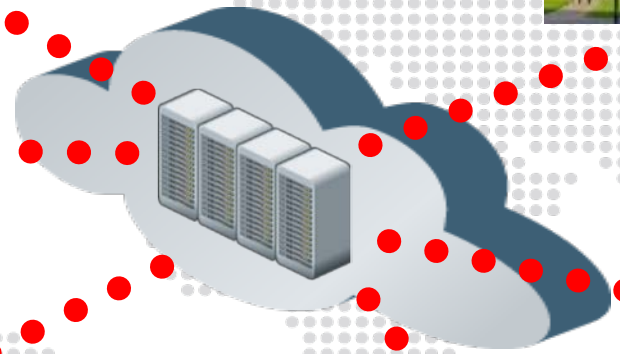
10101101010110100010111000110101010101100110111110010101100100100100010010011100101010101011011010101000

- Signature-based
- Reactive
- Only known threats
- False positives

New Virtual Execution Model

- Signature-less
- Dynamic, real-time
- Known/unknown threats
- Minimal false positives
- Dynamic Threat Indicator creations

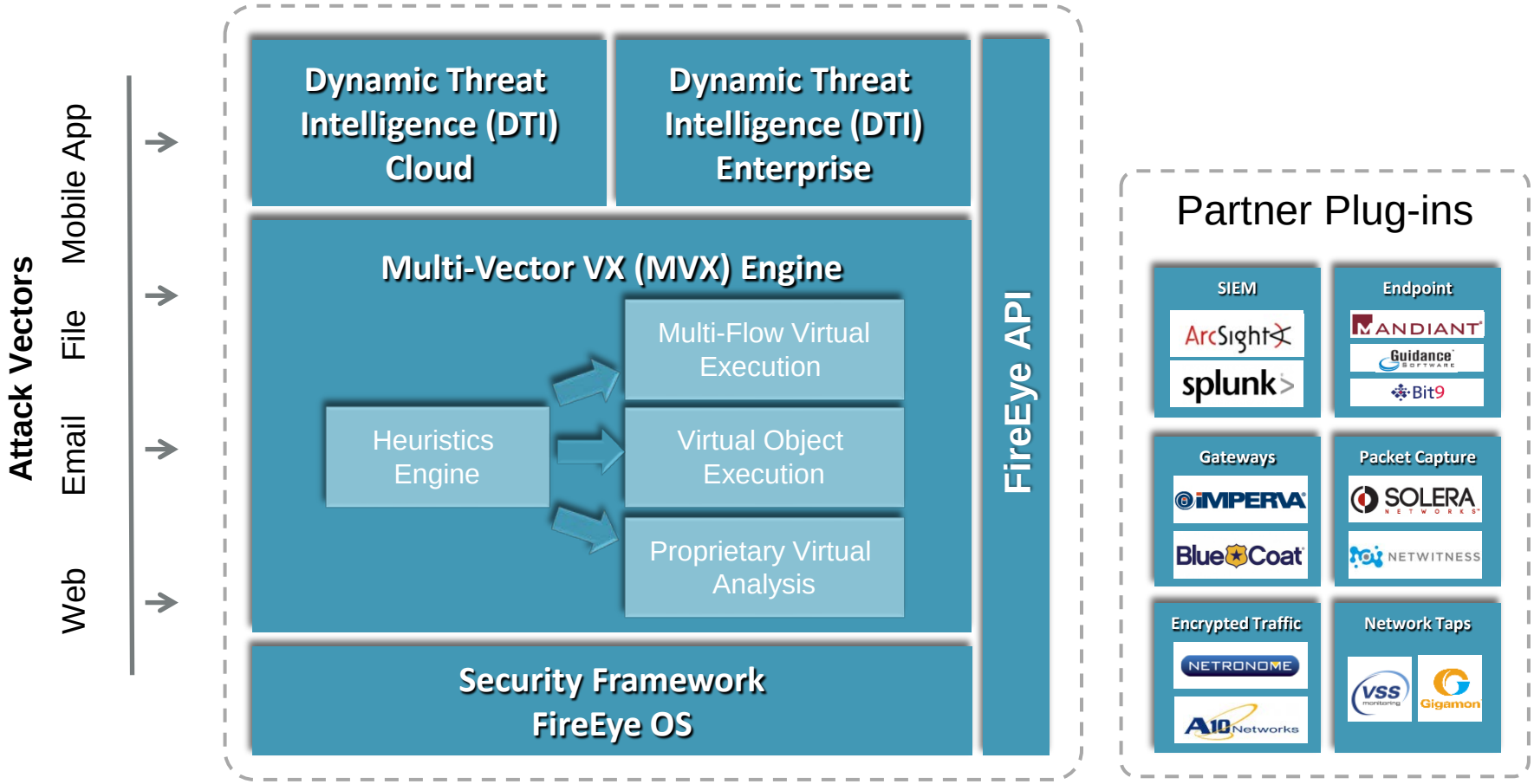
With Dynamic Cloud Threat Intelligence



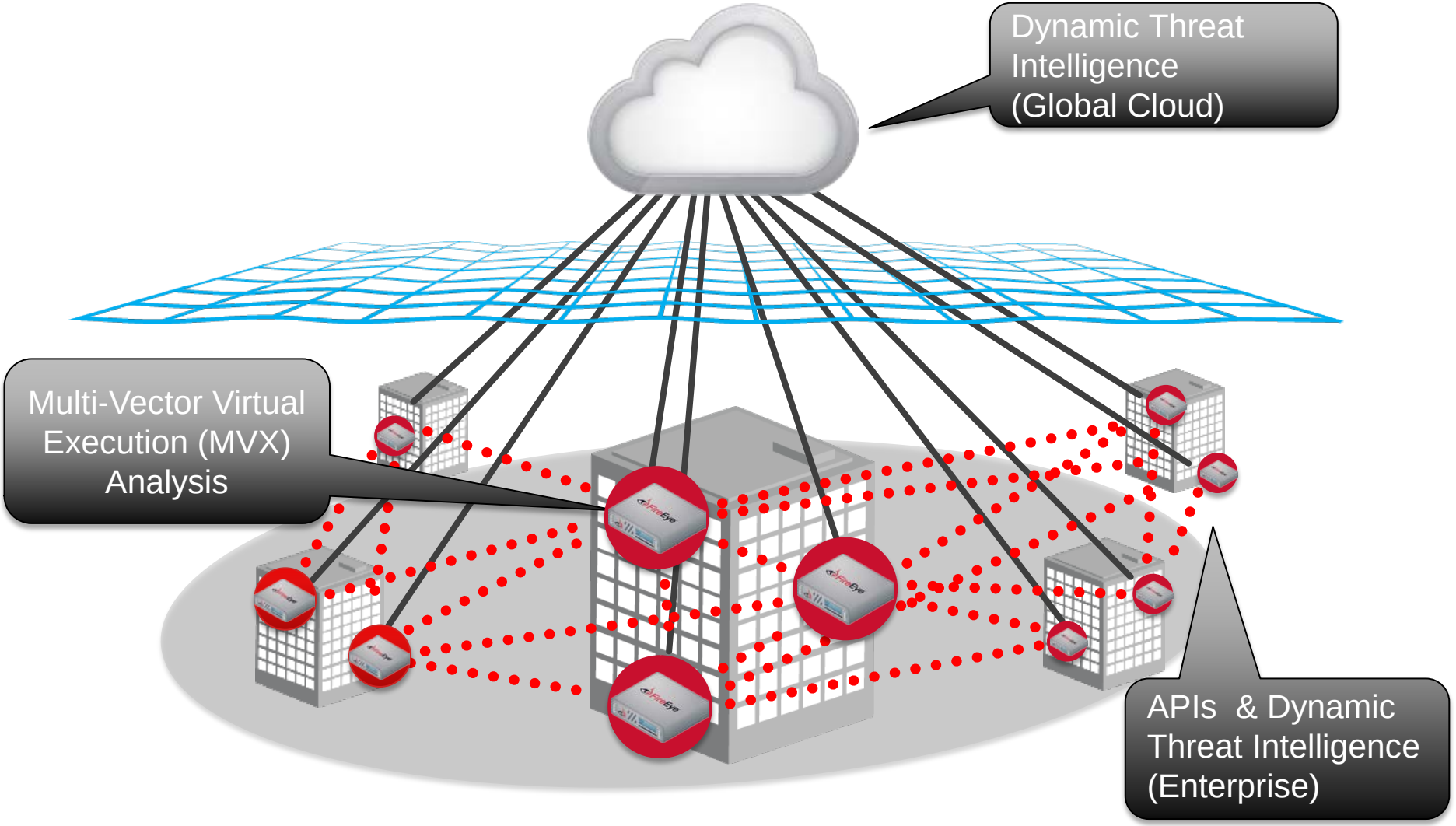
5 Design Principles of Next-Generation Threat Protection

- Signature-less detection engine
- Multi-vector coverage of attacks
- Multi-stage protection architecture
- Dynamic Threat intelligence for global sharing
- Dynamic Threat Intelligence for enterprise internal sharing with API's for validation/interdiction/remediation

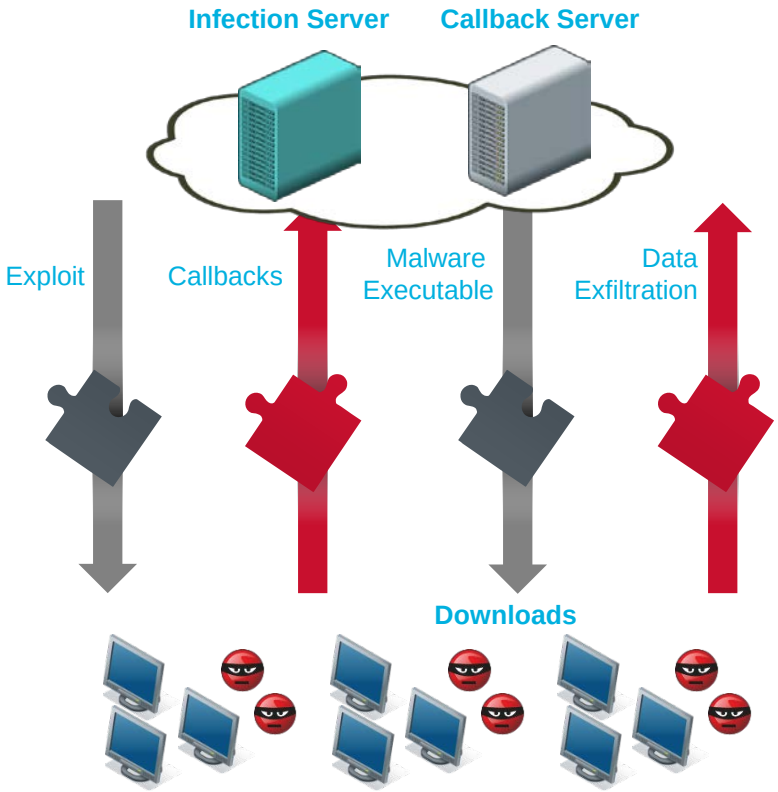
FireEye's DynamicThreat Protection Platform



Building Blocks of Our Fabric



Advanced Analysis Techniques Multi-flow Virtual Execution



- FireEye uses multi-flow virtual execution analysis to capture the full context of today's new breed of cyber attacks
- Stateful attack analysis enables customers to see full attack life cycle
- Point products only focus on a single attack object (e.g., malware executable), thereby missing the attack and full life cycle view

The Rising Tide of Mobile Malware

- Diverse app markets with millions of apps, billions of app downloads
- Mobile an attractive target for malware
  - 50% of Android phones have unpatched vulnerabilities [2]
  - Mobile malware increased from 14,000 to 40,000 from July '11 to May '12 [3]

Sources:
[1] Managing cybersecurity risks: mobile and cloud open doors to opportunities and threats, Aug 2012
[2] Duo Security, X-Ray tool report, Sep 2012
[3] Cybersecurity Policy Report, Sep 2012

Current Solutions

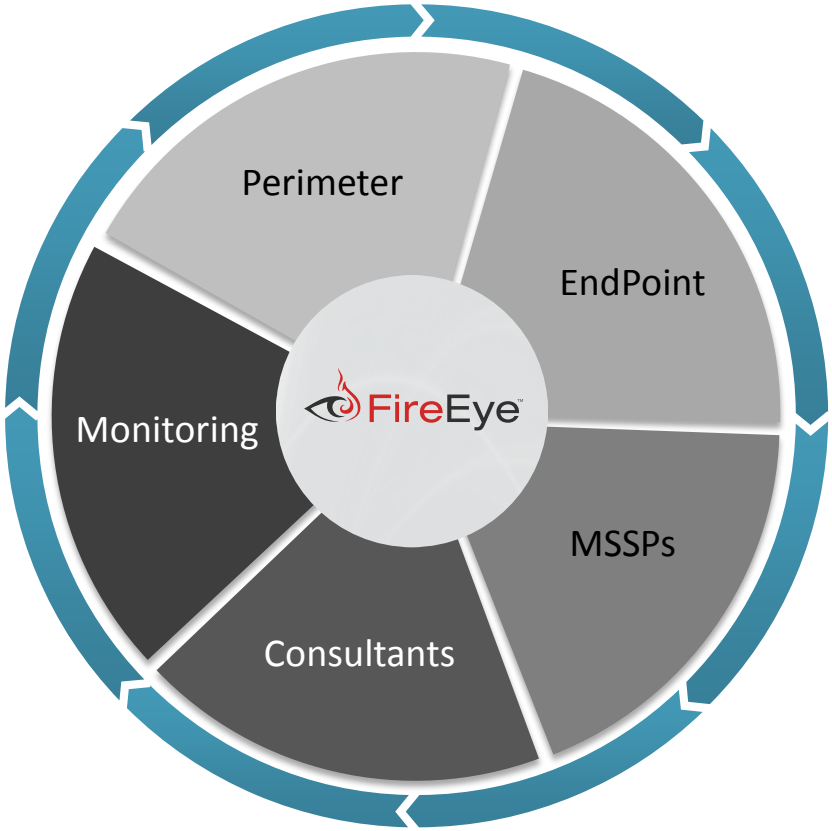
- Anti-virus tools
  - Signature-based for known malware
  - Easy to evade: code morphing, obfuscation

- MDM tools
  - Little to no knowledge about app behaviors
  - Can not reason about high-level security properties

Mobile Malware Malicious Behaviors

- Privacy violation
- Data theft
- Location tracking
- A/V recording

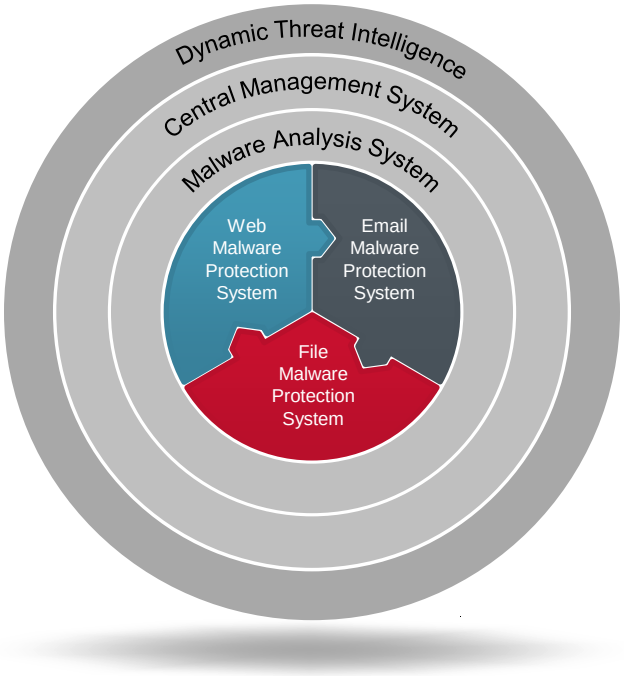
FireEye Platform Partners



Next-Generation Threat Protection Portfolio

- Protects across all major threat vectors, Web, email, file and mobile
- Protects against the lateral movement of malware within the enterprise
- Most comprehensive portfolio to stop the infiltration mechanisms of today's cyber attacks and its persistence

Complete Protection Against Next-Generation Threats



Summary

- The new breed of attacks are more advanced and sophisticated, affecting all verticals and all segments
- Traditional defenses (NGFW, IPS, AV, and gateways) can't stop these attacks
- Real-time, integrated signature-less solution is required across Web, email, mobile, and file attack vectors

Complete Protection Against Next-Generation Threats