



Cyber Security & Aviation

Marcus Labay

FAA Flight Standards Service, Aviation Safety Inspector

Kevin Larson

AAR Corp., VP & CIO

Richard Mutter

Boeing Commercial Aviation Services, IT Sr. Director

Art Wong

Hewlett Packard Enterprise, SVP Enterprise Security Services

April 7,
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Cyber Risk Report 2016

The threat landscape

56%

Organizations
the targets of cyber attacks

8/10

Exploited vulnerabilities
>3 years old

205days

Attackers remain undetected

75%

Mobile apps
w/critical vulns – 35% traditional apps

2/3

Breaches come from 3rd parties
or Supply Chain

80%

Open source apps
w/security feature vulns

Types of Attackers



5 “Bad guy” personas and motivations



Nation-state backed

Motivated by patriotism or military duty; access to more tools, specially trained; attack high-value targets



Hacktivist

Driven by ideology; script kiddies; easily influenced by sense of belonging



Cyber criminal

Motivated by \$; masterminds, programmers, fixers, evasion specialists; profit is the objective



Ego-driven attacker

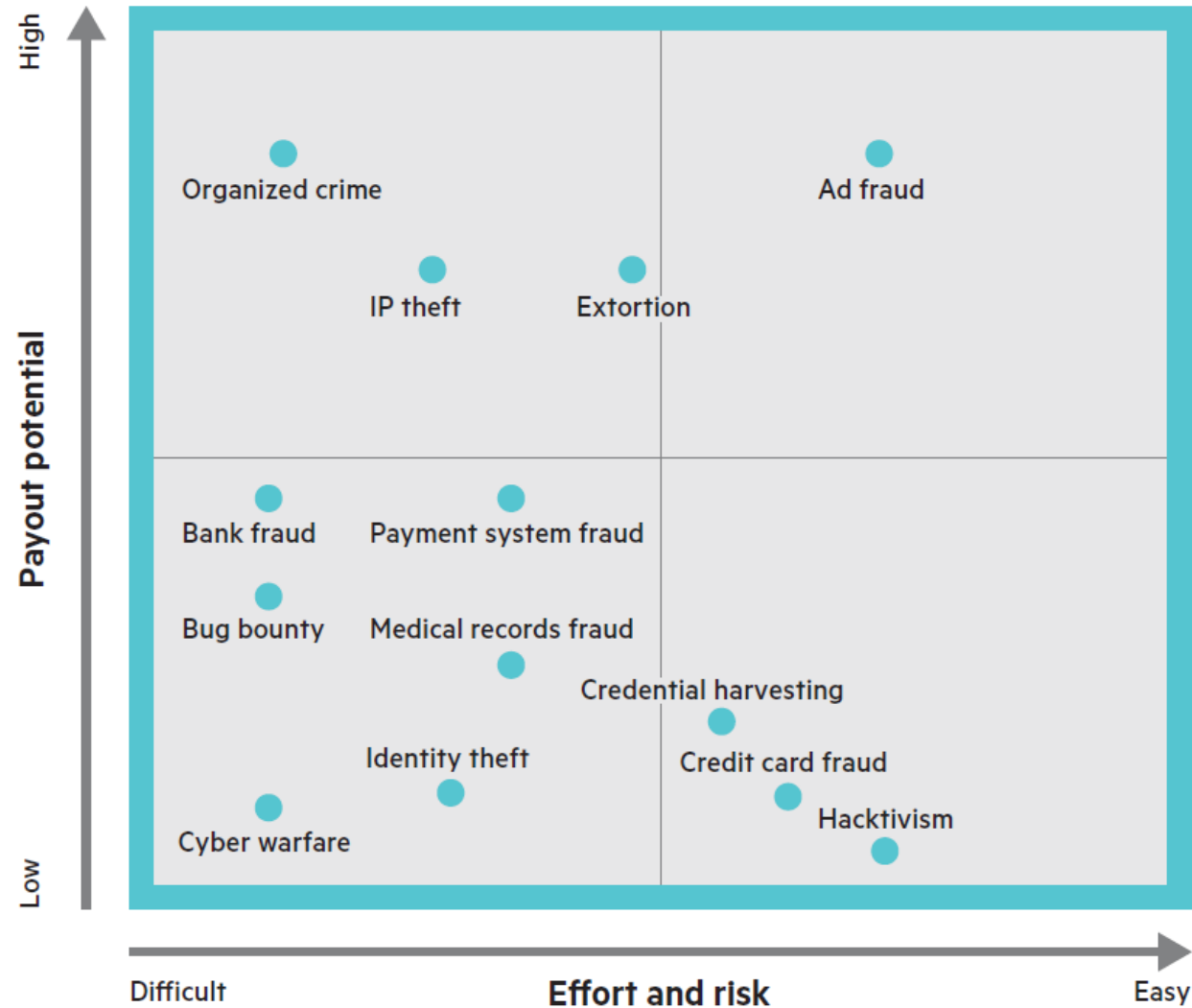
Motivated by fame or recognition; gamify hacking, troll, and taunt their targets; can be highly sophisticated



Hobby hacker and the professional

Motivated by love of hacking; can be sophisticated or a beginner; less anonymity

Motivation of Attackers – the commercial payoff

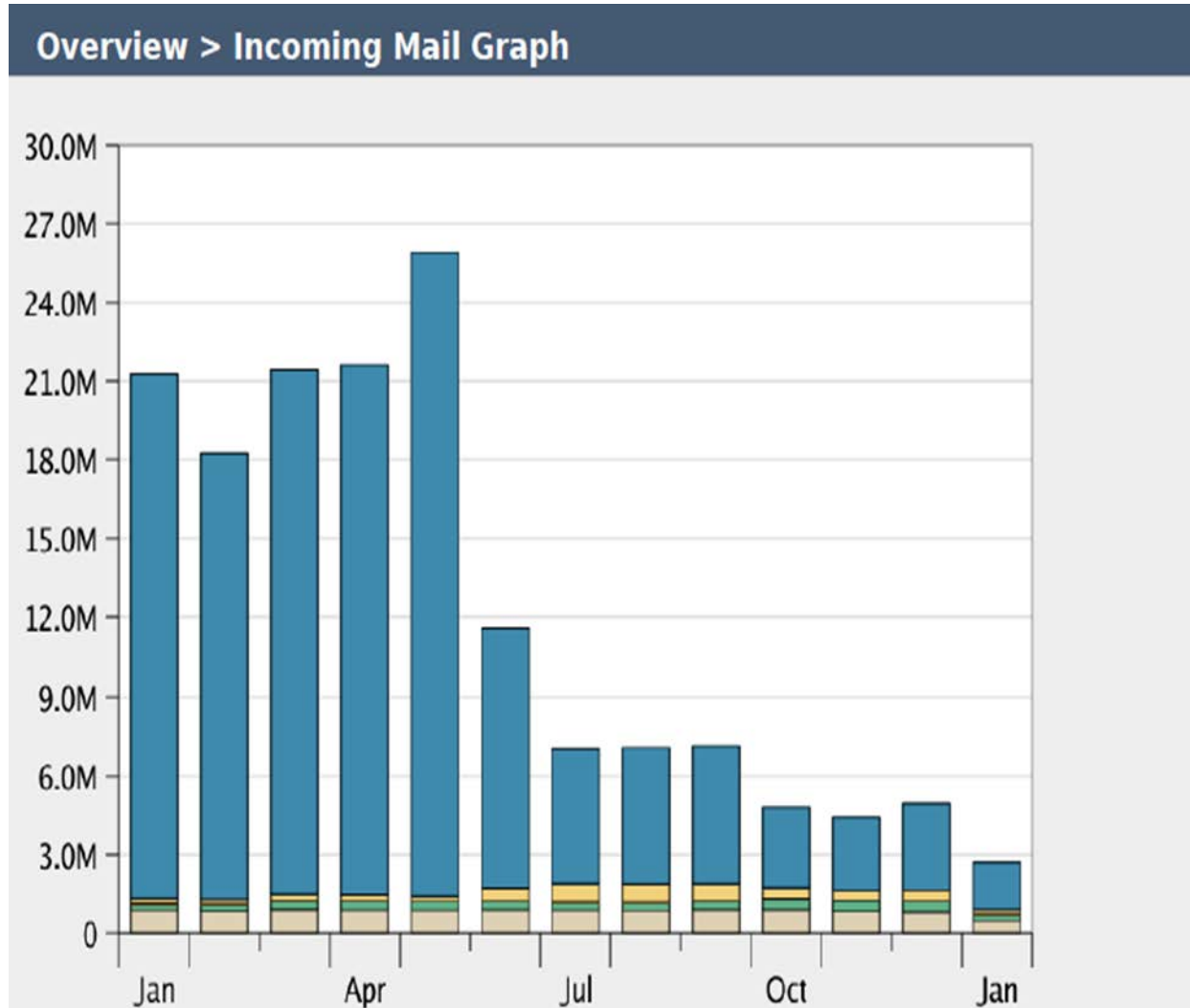




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Email Stats

- 158,000,000 total emails
- 142,000,000 blocked
- 7,600,000 (7%) allowed

Vendor feedback on the shift:

- Drop in incoming messages due to change in spamming tactics?
- More targeted phishing campaigns instead of mass mailing?



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Guiding Principles

➤ Airplanes are Safe

- ✓ Design guidelines
- ✓ Cyber Issue Papers
- ✓ FAA regulatory compliance
 - ☐ *Special Conditions*

➤ Layered protection

- ✓ FAR 25.1309 – Equipment, Systems, & Installations
 - ☐ Critical, Essential, Non-Essential
 - ☐ Failure modes
- ✓ Domain separation
- ✓ Configuration control

➤ Actively manage

- ✓ Fault reporting
- ✓ Log analysis
- ✓ Information sharing

Safe, Secure, Efficient & Resilient Global Air Transportation System

▪ Vision

- ✓ A world confident in the strength, vigilance, efficiency, and resiliency of the aviation system



▪ Mission

- ✓ Advocate for a security system that ensures aviation growth and people's freedom to fly



▪ Goal

- ✓ Public and Private Sector working together to enhance a resilient global commercial aviation system

Safe & Secure Global Air Transportation System

Holistic Cyber Management

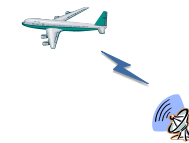
Design strategy

Defense in Depth



- AC 25-1309 design assistance
- DO 178B – Software partitioning
- Domain isolation

Active Management



- Maintenance alerting for anomalies
- Ground infrastructure alerting
- Information assurance

Configuration Control



Physical interface

- Network interfaces
- Real time software inventory
- Deliberate change following regulatory change



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Special Conditions

- **AC 20-166A Issue Paper Process**
- **Policy Statement PS-AIR-21.16-02**
- **Special Condition (SC) requirements defined in 14 CFR 11.19 and 21.16**
- **SC is listed on the TCDS**
- **Manufacturers must provide security guidance document to operators if required by SC**



Operator's Responsibility

- **Must comply with manufacturer's guidance thru ANSP OpSpec D301 (121, 121/135,129)**
- **Non-ANSP must follow manufacturer's guidance to maintain an airworthiness certificate.**



MRO Responsibility

- **A MRO is required to follow an operator's program (14 CFR Part 43.13 and 145.205) that should include procedures to comply with SC conditions specified on the TCDS.**



Published Guidance

- **AC 20-166A Issue Paper Process**
- **AC 119-1 Aircraft Network Security Program**
- **FAA Notice 8900.ESSSP (Draft)**
- **Policy Statement PS-AIR-21.16-02**
- **14 CFR 11.19 and 21.16**
- **8900.1 V3 C61 S1**





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The Aviation ISAC – Information Sharing for Aviation



The Aviation-ISAC's purpose is to reduce the risks and costs associated with disruption to aviation operations due to security events

- Non-profit corporation founded September 10, 2014
- Leveraged best practices from other ISAC's
- 17 members – 7 are international
- Information sharing portal and infrastructure up and running

The Aviation ISAC is Aviation's information sharing resource



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