

**The Invisible Hijacker**



**Cybersecurity in Aviation**  
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**Overview**

- Identify potentially susceptible aviation systems
- Applicable law
  - Claims and defenses from leading civil actions
  - Statutory requirements and standards
- Best practices

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**Overview**

- Cyberattack is "malicious activit[y] aimed at computers or information systems."  
*Congressional Research Report No. R43955, March 27, 2015*
- Cybersecurity is "the process of protecting information by preventing, detecting and responding to attacks."  
*National Institute of Science and Technology*

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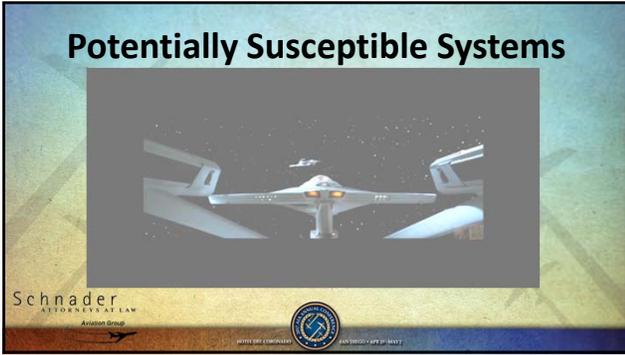
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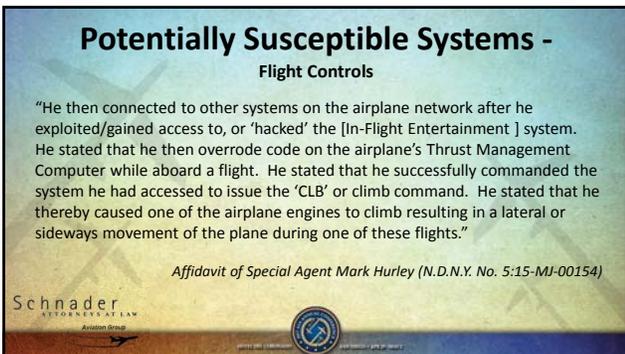
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**Potentially Susceptible Systems -**  
**In-Flight Entertainment (IFE)**

- Reported to be physically independent and separate from flight controls
- Not so fast...
  - Spoofing flight information, *e.g.*, location, destination, speed, and altitude
  - Cabin lighting
  - Public address system

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**Potentially Susceptible Systems -**  
**In-Flight Entertainment (IFE)**



- Worse than a coffee shop:
  - Hotspots can be faked
  - Secure HTTP and VPN blocked
  - Compliant with Communications Assistance for Law Enforcement Act

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**Potentially Susceptible Systems -**  
**Ticketing and Reservation Software and Apps**



- At risk:
  - Credit/Debit card info
  - Name
  - Address
  - Date of Birth
  - Known Traveler Number

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### Potentially Susceptible Systems - Internal or Back-Office Systems

- Systems not intended for consumer or public access, such as production scheduling, inventory management, and human resources
- According to the FireEye, Inc. 2016 Report on Cyber Threats to the Aerospace and Defense Industries:
  - At least **seven** systems of an aerospace defense contractor were compromised by China-based threat group in 2016
  - A different China-based threat group compromised more than 300 systems at an aerospace company for several years

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### Potentially Susceptible Systems



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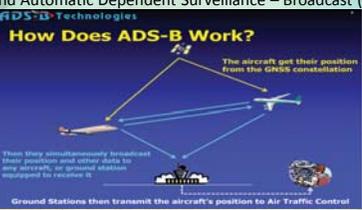
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### Potentially Susceptible Systems - Air Traffic Control

- NextGen and Automatic Dependent Surveillance – Broadcast (ADS-B)



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**Potentially Susceptible Systems -**  
**Air Traffic Control**

➤ ADS-B: communications between aircraft and ground stations are...

**UNENCRYPTED**



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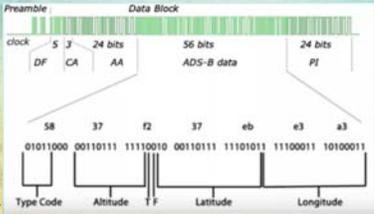
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**Potentially Susceptible Systems -**  
**Air Traffic Control**



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**Potentially Susceptible Systems -**  
**Air Traffic Control**

- So what if it's unencrypted?
- With this equipment:
  - Universal software-defined radio peripheral (USR)
  - RF amplifier
  - Antenna and
  - Personal computer
- A hacker can:
  - Spoof an aircraft or multiple aircraft
  - Track an aircraft
  - Make an aircraft disappear/jam ADS-B transmissions

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**Potentially Susceptible Systems -**  
**Law Firms and Other Vendors to Aviation Industry**

- Confidential communications with aerospace and aviation clients
- Retention of sensitive technical, commercial and personal data from aerospace and aviation clients

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**Claims and Defenses**  
**Article III Standing**

➤ Elements:

- The plaintiff must have
  - Sustained an injury in fact,
  - That is fairly traceable to the challenged conduct of a defendant (causation), and
  - That is likely to be redressed by a favorable judicial decision.

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**Claims and Defenses**  
**Article III Standing**

➤ *Clapper v. Amnesty International*, 133 S.Ct. 1138 (2013)

- 2008 amendments to Foreign Intelligence Surveillance Act authorized surveillance of foreign nationals without showing of probable cause
- Human rights group claimed increased cost and inconvenience in securely communicating with *probable* targets of surveillance
- The Supreme Court held that plaintiff lacked standing, because "a highly attenuated chain of possibilities does not satisfy the requirement that threatened injury must be certainly impending."

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**Claims and Defenses**  
**Article III Standing**

- Defendants in early data breach cases relied on *Clapper* to challenge plaintiffs' standing
- Arguments:
  - No injury because credit card liability was zero, if timely reported
  - No injury because many banks forgave charges and returned money to accounts
  - No impending injury from identity theft because too speculative
  - Under the foregoing circumstances, no redressability
- Early defense successes: *Remijas v. Neiman Marcus Group, LLC*; *Lewert v. P.F. Chang's China Bistro, Inc.* and *Galaria v. Nationwide Mutual Insurance Co.*

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**Claims and Defenses**  
**Article III Standing – initial victories reversed**

- *Remijas v. Neiman Marcus Group, LLC*, 794 F.3d 688 (7<sup>th</sup> Cir. 2015)
  - 350,000 credit cards compromised, but no theft of DOBs or SSNs
  - 9,200 cards had fraudulent charges
  - Defendant offered one year of paid credit monitoring and ID theft protection
- Plaintiffs have standing:
  - Time and effort monitoring for fraudulent charges, and fear of imminent identity theft are concrete injuries that are not ameliorated by reimbursement
  - Neiman Marcus admits its customer data was compromised, so causation exists
  - Plaintiffs are vulnerable to future harm, so the claims are redressable.

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**Claims and Defenses**  
**Article III Standing – initial victories reversed**

- *Lewert v. P.F. Chang's China Bistro, Inc.*, 819 F.3d 963 (7<sup>th</sup> Cir. 2016)
  - Debit and credit card data stolen from 33 restaurant locations
- Plaintiffs have standing:
  - Once again, fraudulent charges are an injury, even if subsequently reversed
  - Plaintiffs dined at the locations from where data was stolen, so causation is met
  - Judgment would compensate plaintiffs

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**Claims and Defenses**

**Article III Standing – initial victories reversed**

- *Galaria v. Nationwide Mutual Insurance Co.*, No. 15-3386 (6<sup>th</sup> Cir. 2016)
  - 1.1 million customers’ names, DOBs, marital statuses, genders, occupations, employers, SSNs and drivers’ license numbers were stolen
  - Nationwide offered one-year subscriptions for credit monitoring and \$1 million in identity theft coverage
  - Nationwide refused to pay fees for credit reporting agencies to activate and deactivate new account freezes
- Plaintiffs have standing:
  - Court follows *Neiman Marcus* and *P.F. Chang’s*
  - “There is no need for speculation where Plaintiffs allege that their data has already been stolen and is now in the hands of ill-intentioned criminals.”

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**Claims and Defenses**

**Negligence**

- Common allegations:
  - Defendant breached the duty to exercise reasonable care in obtaining, retaining, securing, safeguarding and protecting personal financial information
  - Defendant breached a duty to promptly notify plaintiff of data breach
- Common defense:
  - Economic loss doctrine/rule – plaintiff cannot recover purely economic loss in tort, without personal injury or property damage
- Result:
  - Varies widely from state to state
  - Reformation to negligent misrepresentation – *In re Zappos.com, Inc.*, No. 12-cv- 325 (D. Nev. 2016)

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**Claims and Defenses**

**Breach of Contract**

- Express contract – rare, but when it exists, dependent upon terms
- Implied contract
  - More common
  - Where alleged or allowed to proceed, often question of fact for jury, e.g., *In re Target Corp. Customer Data Security Breach*, 66 F. Supp. 3d 1154 (D. Minn. 2014)
  - Varies greatly from state to state

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**Claims and Defenses**  
**Unjust Enrichment**

- Common allegations:
  - Cost of data security is included in sales price, consequently, data breach means the vendor received a benefit without providing something in return – the “overcharge” theory
  - Plaintiff would not have transacted business with defendant, had he or she known about inadequate data security – the “would not have shopped” theory

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**Claims and Defenses**  
**Unjust Enrichment**

- Result:
  - Varies widely from state to state
  - Where sales price is the same for cash and credit card purchases, the overcharge theory fails as a matter of law, e.g., *In re Target* and *In re Barnes & Noble Pin Pad Litigation*, No. 12-cv-8617 (N.D. Ill. 2016)
  - If the consumer received *any* product or service, no unjust enrichment claim exists, e.g., *In re Zappos.com*

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**Claims and Defenses**  
**State Consumer Protection Statutes**

- For example, the following conduct violates the Michigan Consumer Protection Act:
  - Representing that goods or services are of a particular standard, quality, or grade, or that goods are of a particular style or model, if they are of another
  - Making a representation of fact or statement of fact material to the transaction such that a person reasonably believes the represented or suggested state of affairs to be other than it actually is
  - Failing to reveal facts that are material to the transaction in light of representations of fact made in a positive manner

Mich. Comp. Laws § 445.903

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**Claims and Defenses**  
**State Consumer Protection Statutes**

- Claims and results vary widely from state to state
- Highly dependent upon the text of the statute itself with respect to:
  - Standing
  - Actionable conduct
  - Available remedies

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**Claims and Defenses**  
**State Notice Statutes**

- For example, the California Database Breach Act provides:

Any person or business that conducts business in California, and that owns or licenses computerized data that includes personal information, shall disclose any breach of the security system following discovery or notification of the breach in the security of the data to any resident of California whose unencrypted personal information was, or is reasonably believed to have been, acquired by an unauthorized person. The disclosure shall be made in the most expedient time possible and without unreasonable delay, consistent with the legitimate needs of law enforcement . . . or any measures necessary to determine the scope of the breach and restore the reasonable integrity of the data system.

Cal. Civ. Code. § 1798.82(a)

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**Claims and Defenses**  
**State Notice Statutes**

- Claims and results vary widely from state to state
- Highly dependent upon the text of the statute itself with respect to:
  - Standing
  - Actionable conduct
  - Available remedies

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**Federal Statutes**  
**Federal Trade Commission Act**

- Section 5 of the FTC Act provides that "unfair or deceptive acts or practices in or affecting commerce . . . are . . . declared unlawful." 15 U.S.C. § 45(a)(1).
- *FTC v. Wyndham Worldwide Corp.*, 799 F.3d 236 (3d Cir. 2015).
  - FTC alleged that Wyndham's systems were compromised on three separate occasions between 2008 and 2010, resulting in disclosure of over 619,000 credit/debit card numbers and loss of more than \$10.6 million
  - FTC alleged Wyndham liable for lax security practices
  - Wyndham challenged FTC's authority over data security and breaches
  - The court held that the FTC has the authority to commence and prosecute enforcement actions for inadequate data security

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**Federal Statutes**  
**Cyber AIR Act**

- Cybersecurity Standards for Aircraft to Improve Resilience Act of 2017
- Recently introduced by Senators Edward Markey and Richard Blumenthal
- Material provisions:
  - Airlines and OEMs would be required to disclose to the FAA any successful or attempted cyberattack on any system aboard an aircraft
  - DOT, DHS, FCC and National Intelligence Director would be required to collaborate on cybersecurity standards to be imposed upon holders of air carrier and production certificates
  - Mandatory isolation of aircraft software systems

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**Federal Statutes**  
**Legacy Acts**

- The original trifecta of cybersecurity:
  - 1996 Health Insurance Portability and Accountability Act (HIPAA)
  - 1999 Gramm-Leach-Bliley Act
  - 2002 Federal Information Security Management Act (FISMA)
- Not aviation-specific – healthcare, banking and federal agencies
- Mandate "**reasonable**" protection of systems and information

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### Federal Statutes

#### Recent Acts

- [2015 Cybersecurity Information Sharing Act \(CISA\)](#): public-private partnership for sharing internet traffic information
- [Cybersecurity Enhancement Act of 2014](#): variation on public-private partnership that includes workforce development and education
- [Federal Exchange Data Breach Notification Act of 2015](#): requires health insurers to notify insureds of breach within 60 days
- [National Cybersecurity Protection Advancement Act of 2015](#): authorizes government info sharing with additional entities




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### State Statutes

- In 2016, at least 28 states introduced new or additional cybersecurity legislation
- Mostly addressing consumer transactions, handling of public records and criminalization of misconduct
- Slightly more than half were passed
- [www.ncsl.org/research/telecommunications-and-information-technology/cybersecurity-legislation-2016.aspx](http://www.ncsl.org/research/telecommunications-and-information-technology/cybersecurity-legislation-2016.aspx)




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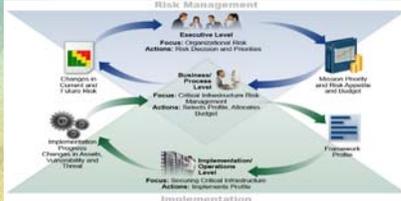
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### Best Practices

- Comply with National Institute of Science and Technology standards




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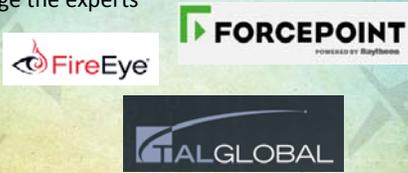
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### Best Practices

- Engage the experts



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### Best Practices

- Cultivate a culture of security
  - Email scams and phishing
  - External media storage devices
  - Personal electronic devices



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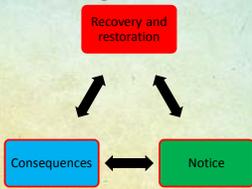
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### Best Practices

- Have a plan and a go-team to implement it



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