CYBER RESILIENCE

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CYBERSECURITY?

IN THE CONTEXT OF CIVIL AVIATION
Identifying the problem

Future Issues

Data communication to the aircraft is unsecured
1. Discovery through ADS-B
2. Gather Info through ACARS (aircraft communications addressing and reporting system)
3. Exploit through ACARS
   - ACARS frequencies are available on the Internet
   - Kit available on line to change frequencies and spoof commands to the cockpit
   - Hack has been confirmed by an intelligence agency

Current Issues
Drivers for Change

- Passenger & freight growth
- Capacity and efficiency demands
- Digital transformation of aviation ecosystem
- New entrants
- Emerging cyber threats
IT x OT
Protection x Resilience

INCREASE CAPACITY AND EFFICIENCY
Agreed Levels of Safety
Combination of efforts

Trust framework
Diverging Efforts

- Economic drivers require the increase of automation, increasing digital data exchange, requiring international interoperability
- States recognize need for securing their information exchange
- New Entrants need a robust and secure digital network
Converging Strategy

• Interoperability requires global coordination and cooperation
• Identify common needs that can unite the diverse community
• Develop common solutions that build on existing foundations
• Agree on a common destination – where there is still one interoperable sky
Many Viewpoints - Shared Problem...

...Establish Identity and Maintain Trust
Identity and Trust

- The foundational principal of the global aviation network that connects us today
- A core function of ICAO since 1944
- A modern Identity and Trust Framework is now seems essential
  - Based on common standards
  - Anchored in State sovereignty
  - Facilitate global recognition of trust
  - Applied consistently across the system
Trust Framework Elements

• Trust Bridge
  – Allows identities to be recognized across boundaries

• Trusted Digital Identity
  – Anchored in proven regulatory processes

Links to International Law
  – Chicago Convention, Beijing Convention (Article 21), Annexes
Digital Identity

- Public key infrastructure (PKI)
- Widely utilized by many States/Regions
- An easy place to start
- Requires a trusted bridge for interoperability
- Commercial certificate authorities handle the mechanics of electronic certificate issuance under policies and processes developed by States and Industry, and approved by ICAO
Credibility Flows from the Regulator

• Regulators interact with all the components of the aviation ecosystem

• If a State regulator authorizes an electronic certificate to be issued to an airplane, facility, or service under control, the world can trust that digital identity
A trusted digital identity is essential, but so is a modern resilient secure network
A First Step

• Define a Global Resilient Aviation Interoperable Network (GRAIN)

• A federated global network that takes advantage of IP-based infrastructure while providing logical isolation from the public internet

• ICAO requests a large IPv6 address block and Top Level Domain

• These assets will be made “private” and will provide a first layer of logical isolation from the public internet

• ICAO defines the governance and procedures required to allow for secure global interoperability
ICAO and the IATF

• TRUST when using the cyberspace
• This is ICAO responding to States and industry
• ICAO is defining the concept of operations and digital identity and network requirements for the IATF
Thank you.

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