ICAO Global Trust Framework
A Unified Approach for a Single Sky

DRONE ENABLE/2

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Drivers for Change

- **Passenger & freight growth**
- **Capacity and efficiency demands**
- **Digital transformation of the aviation ecosystem**
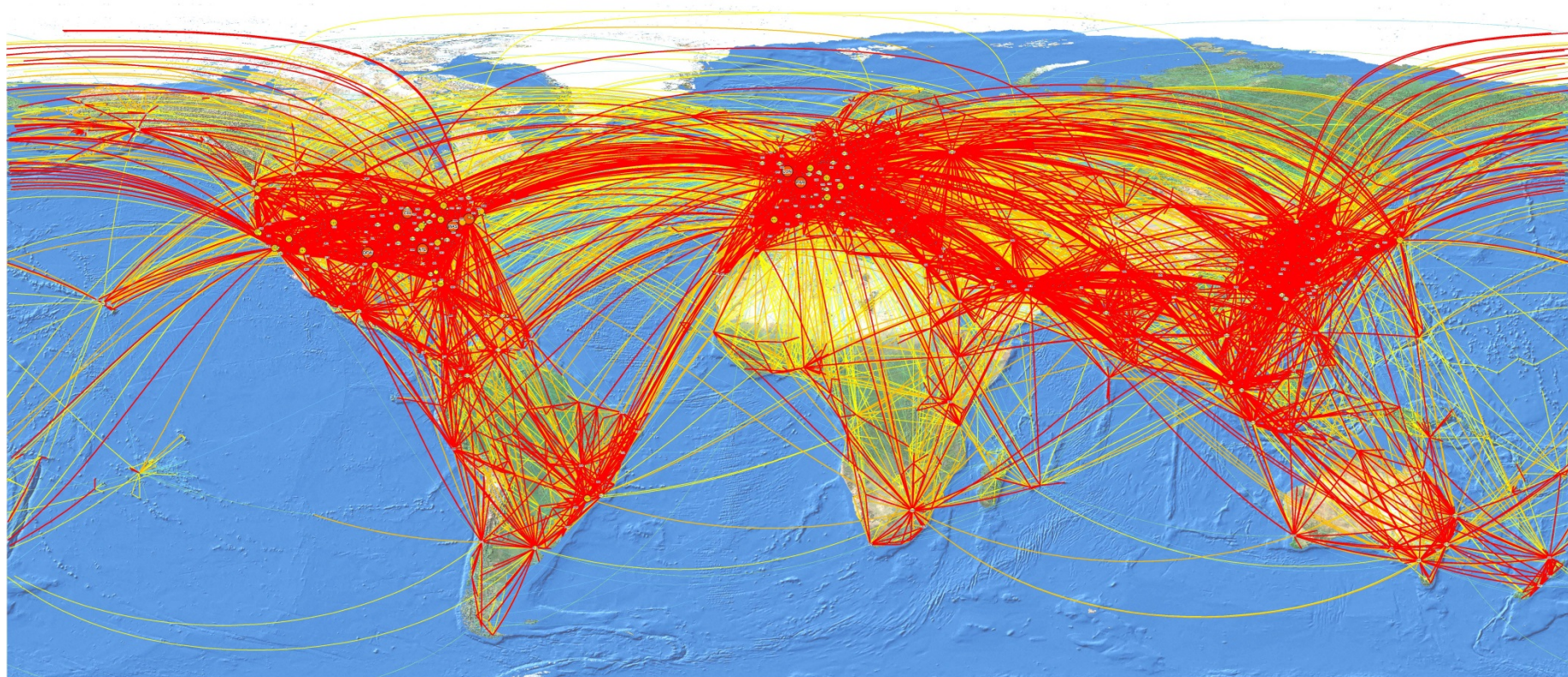- **New entrants**
- **New and emerging cyber threats**

2040

Digital Aviation Ecosystem

- Digital transformation affects all stakeholders in the aviation ecosystem

- Both systems and people are fundamentally affected

- Impacts to one area will be felt by all others, intentionally or not

Cyber Threat

- Inevitable consequence of essential connectivity

- Constantly evolving threat requiring constantly evolving defenses

- Best countered with a system architecture that is designed with security as a foundational requirement

- Every State will need to respond to evolving cyber threats, but if every State develops a different architecture, interoperability will be lost
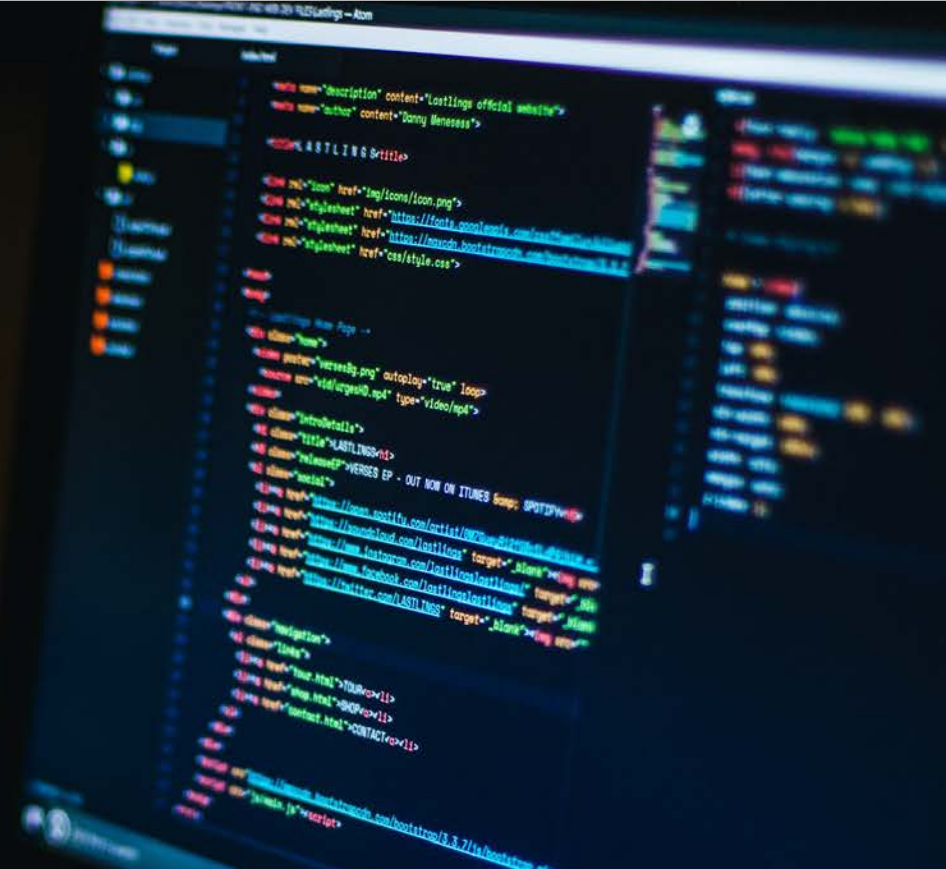
Diverging Efforts

- Economic drivers require the increase of automation, increasing digital data exchange, requiring international interoperability
- Many taking action to secure their own part of the system
- States recognize need for securing their information exchange
- ICAO is ready to act on this need

Converging Strategy

- Recognize interoperability requires global coordination and cooperation
- Identify common needs that can unite the diverse community
- Develop common solutions that build on existing foundations
- Give new entrant community room to innovate -- and a path to converge
- Agree on a common destination -- were there is still one interoperable sky

Trust Framework – A Common Solution

- Foundation - International Law
  - Chicago Convention, Beijing Convention (Article 21), Annexes, etc…
- Trusted Digital Identity
  - Anchored in proven regulatory processes
- Trust Bridge
  - Allows identities to be recognized across boundaries

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

Credibility Flows from the Regulator

- Regulators spend countless hours interacting 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 electronic identity

Licenses, certificates, authorizations and approvals already handled by regulators

- Aerodromes
- Air Operators
- Aviation Maintenance Organizations
- Producers of aircraft, engines, propellers and parts
- Air Traffic Service Provision
- MET Service Provision
- AIS Service Provision

- Telecommunications and Navigation Facilities
- Design of aircraft, engines and propellers
- RVSM Monitoring Agencies
- Personnel
- **Remotely Piloted Aircraft Systems**
- **Unmanned Traffic Management (UTM)**
- **Upper class E Traffic Management (ETM)**
- **Future Autonomous Systems?**

Existing Manual Process
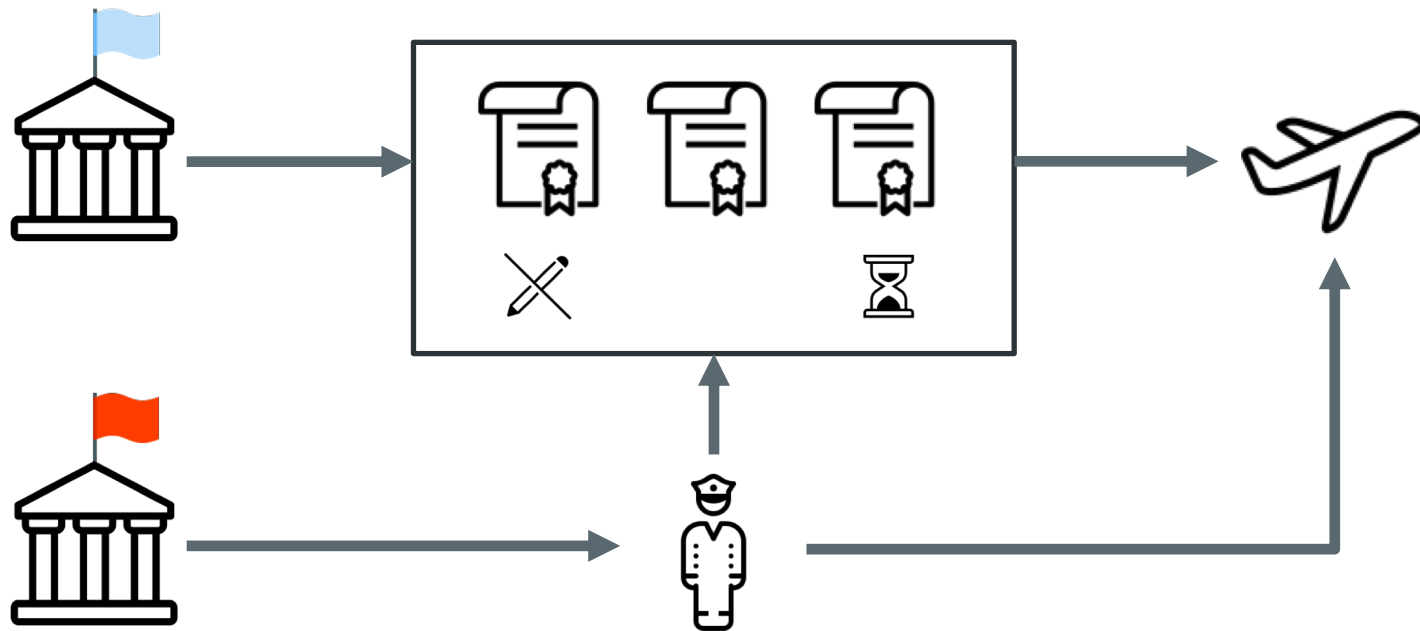
Digital Identity

- Public key infrastructure (PKI)

- Utilized by some States/Regions

- Potentially a solution all can agree upon

- States could authorize certificate issuance

- Commercial certificate authorities could handle the mechanics of electronic certificate issuance using existing processes with ICAO/State oversight

- Requires a trust bridge for interoperability

Global Trust Framework

Trust Bridge

Certificate Directory
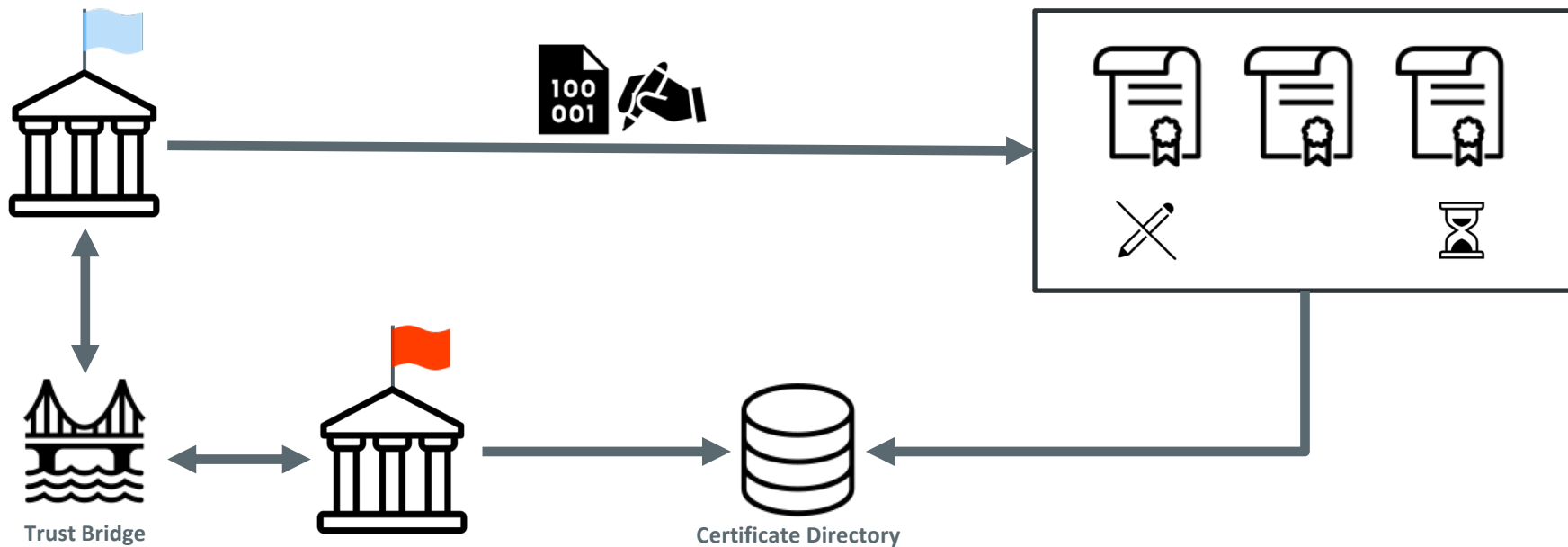
Logical Isolation - An Additional Layer of Protection

- ICAO can act on behalf of the global aviation system to achieve a level of logical isolation from the internet
  - ICAO could request a large IPv6 address block and global Top Level Domain (gTLD)
  - These assets could be made "private" and could provide a first layer of logical isolation from the public internet
  - Requires cooperation and approval of internet governing bodies (ICANN and IETF), and that coordination is proceeding.
- Logical isolation - combined with global exchange of trusted identity – can provide an architecture than can benefit all

Summary

- Develop a Trust Framework for mutual recognition of digital certificates.

- Procure a global Top-Level Domain dedicated to aviation to limit threat surface

- Obtain a private block of IPv6 addresses that allows for increased shielding of safety-focused communication from public attacks

- Enable global interoperability and a single digital sky

Note: These are actions being considered by ICAO on behalf of global system users. This is not intended to be a mandate. System users should be allowed to drive their own transition based on business advantages – which should be substantial

Choices

- **Innovate rapidly independently**
- **Produce the winning technology that becomes the standard**
- **Accept a longer path to integrated operations**

- **Collaborate with conventional aviation on common identity, trust, and network solutions**
- **Lay the groundwork for future integrated operations**

Consequences

What will be invented that is more important to humanity than a single sky?

ICAO – UNITING AVIATION