Pathway to Global SWIM

ATIEC 2016

Presented to: ATIEC Conference - 2016
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Date: September 21st, 2016
Agenda

- Global SWIM Overview
- SWIM as a Service
- Data Sharing Policy Development / Enforcement
- Governance Overview
Global SWIM Research and Development Experience

Mini Global I & II Demonstration
- Led by the FAA,
- Showcased the ability to connect multiple ANSPs, airlines, and third party apps

SESAR Global SWIM Demonstration
- Led by SESAR
- Highlights the ability of ANSPs to integrate with the SESAR SWIM architecture.

SkyFusion
- IATA commercial Global SWIM offering
- Powered by Harris SWIM technology
Global SWIM Overview

- **Applications**
  - ATS
  - ATFM
  - Airline Ops

- **SWIM Access Point**
  - Information Exchange Services
  - Information Exchange Models and Schemas
  - SWIM Infrastructure

- **Communications Network**
  - Network Connectivity

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Figure 8. SWIM Access Point Implementation Options (ICAO Doc. 10039)
Global SWIM as a Service

Local SWIM vs Global SWIM

- **Local**
  - Owned / Operated by ANSP or Governmental Organization
  - Hosted within State borders (centralized)
  - Infrastructure owned and maintained solely by ANSP (using contractors)

- **Global**
  - Owned / Operated by Industry
  - Connects ANSPs and Stakeholders together
  - Hosted globally (distributed)
  - Subscription based procurement
  - Industry enforces information sharing policies defined by providers (ANSP, Airlines, Airports, etc)
Global Information Sharing

• **Problem**
  – Developing and deploying Global SWIM infrastructure is easy; getting countries to share information is difficult

• **Proposed Solution**
  – Development of a common policy for the sharing of aviation information by ANSPs, Airlines, and Airports will be necessary for the success of Global SWIM
    • Any request which falls outside of the previously established agreement will be required to go through a more rigorous thorough approval process
    • Cooperation between Global SWIM service providers will be required to ensure end-to-end policy enforcement
Policy Enforcement through Governance

• Governance is multi-layered starting at the ultimate source and ending at the user
• Governance Enforced by:
  – Technology
    • Applications
    • SWIM
    • Physical Layer
  – Policy
    • Data Sharing Agreements
    • Source optimization
  – Transparency
    • Provenance
  – Interoperability
    • Standardization
    • Mediation
From Policy to Configuration

• **Metadata**
  – Tagging messages with identifying attributes which correspond to specific policy enables Global SWIM infrastructure to correctly distribute information to approved parties
  – Development of a common metadata standard for Global SWIM Service Providers

• **Federated Identity Management**
  – Using single sign-on technology (SSO), end users can be authenticated across multiple application and even across multiple Global SWIM service providers
  – A common source for user authentication supports an industry wide approach to aviation information sharing policy

• **Mediation**
  – Global SWIM Service Providers will be expected to provide mediation between ANSP local SWIM architectures and Global SWIM standards
  – Formatting of metadata and provenance information to conform to Global SWIM Standards

• **Business Rules**
  – QoS: Prioritization of higher quality information over lower quality of information
  – Controlling access to information based on policy
Correlating Policy to Data

- **Example Policy:**
  - Flight Information generated by Wilson Airlines, shall only be published to the following:
    - ANSP’s through which the aircraft will pass
    - Approved 3rd Party Applications:
      - ACME Flight Tracker
    - Departure Airport
    - Arrival Airport

```xml
<ns4:Flight>
  <arrival>
  </arrival>
  <departure>
  </departure>
  <flightIdentification aircraftIdentification="WIL0265"/>
  <flightStatus filed="FILED"/>
  <route routeText="ATL.N50010E006319..SPI.N50309E005374..KOK.N51057E002391..DV R.N51098E001215..DET.N51182E000358..BIG.N51199E000021..UL9..SLANY..MAL OT.N53000W015000..N53000W020000..N53000W030000..N53000W040000..N520 00W050000..TUDEP.N51100W053140..YJT.N48350W058402..BRADD.N43090W06 7000..ACK.N41169W070016..SIE.N39057W074480.J121..ORF.J209..TYI.J79..JOIN TD16">...
  </route>
</ns4:Flight>
```
Governance Example

Airline Files
- Flight Plan

Flight Plan
- ACID
- Dep.
- Route Text
- Arrv.

Flight Plan

ANSP A Domain
- Flight
- Weather
- Aeronautical
  - Local SWIM

ANSP B Domain
- Flight
- Weather
- Aeronautical
  - Local SWIM

Global SWIM

Flight Plan

According to Business Rules
- Encoded based on Policy

Flight Plan Metadata
Conclusion

• Global SWIM technology and infrastructure is already being put in place to support industry wide information sharing

• Data sharing policy needs to be advanced to support the use of Global SWIM by ANSPs, Airlines, and Airports

• Policy can be enforced autonomously by technology

• Enforcement of Data Sharing Policies through a network of Global SWIM Service Providers will require industry collaboration on standards