Pathway to Global SWIM

ATIEC 2016

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

Aviation Information World – Forecasting the Future

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

Aviation Information World - Forecasting the Future

Global SWIM Overview

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

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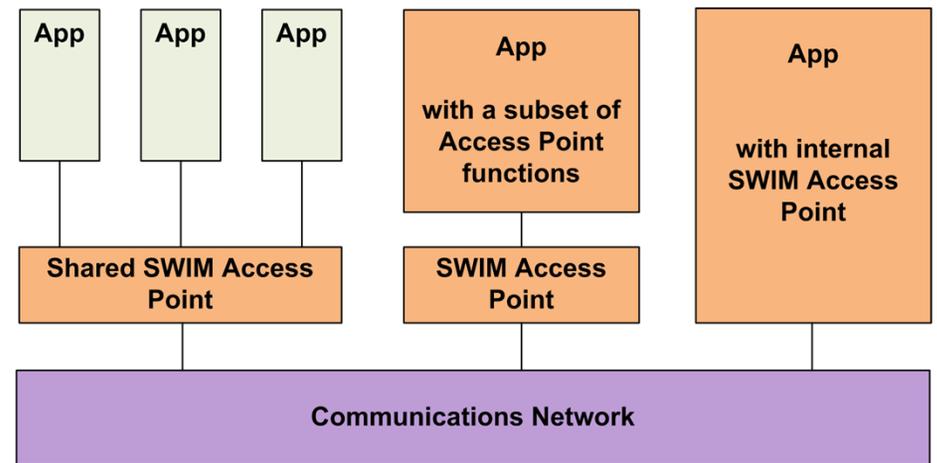
- **Communications Network**
  - Network Connectivity

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)
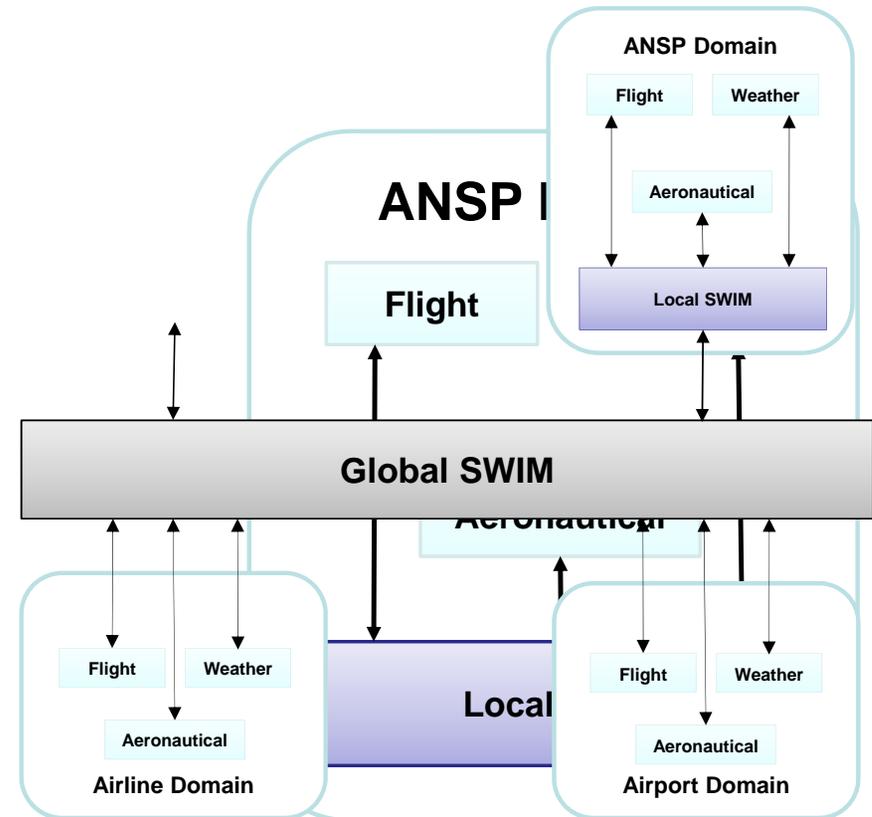
Global Information Sharing

- **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
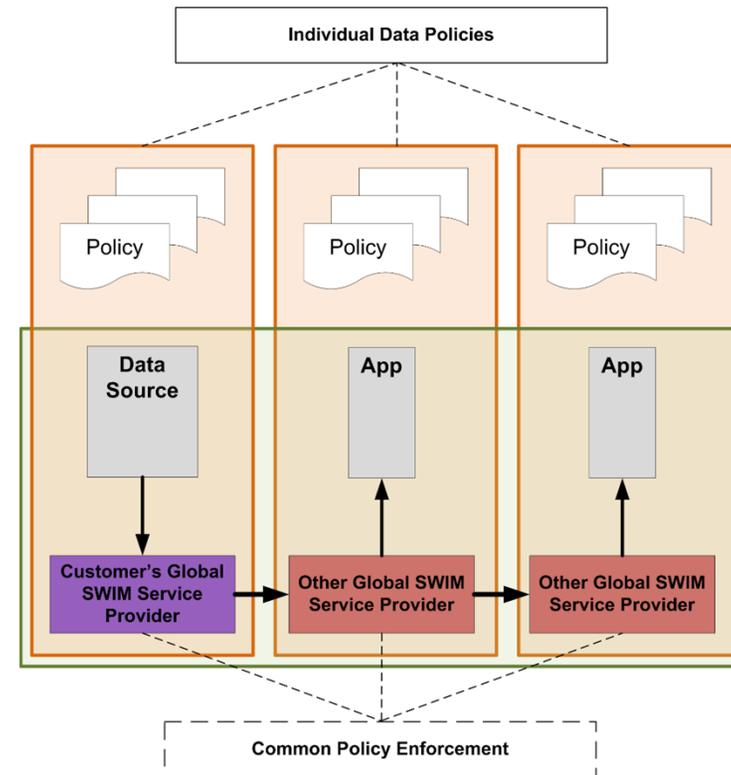
From Policy to Configuration

- **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
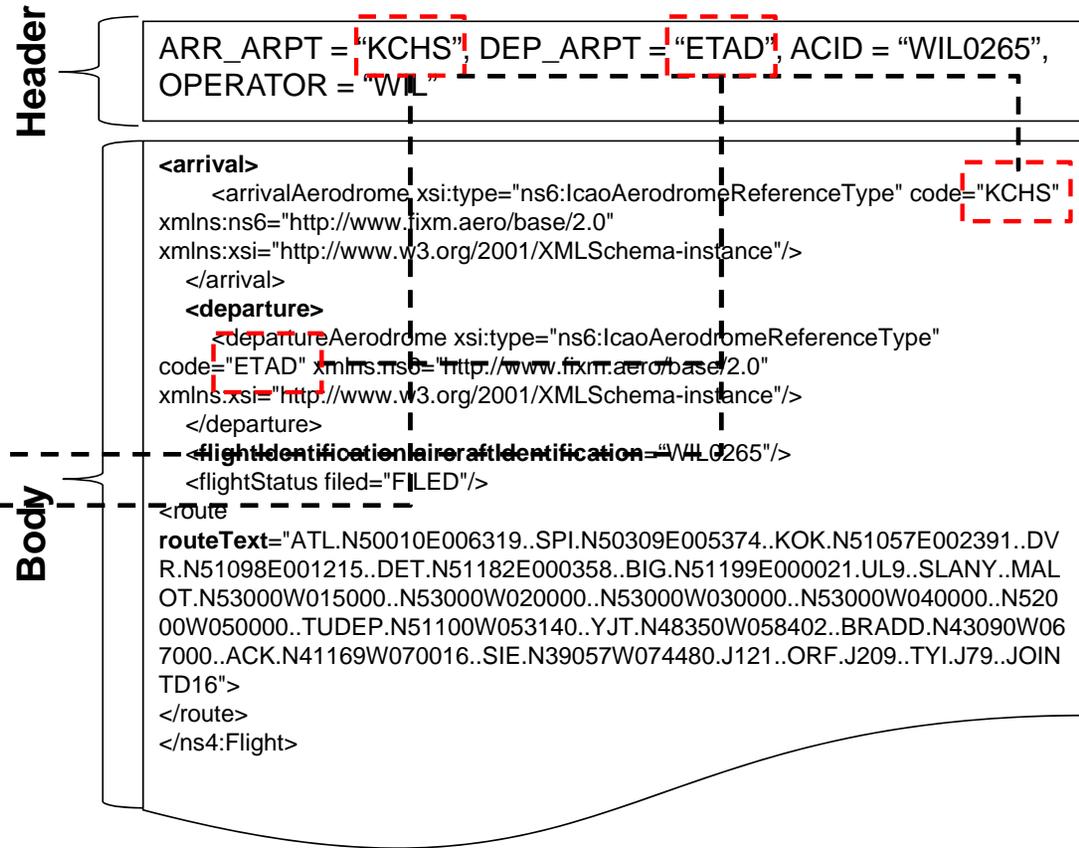 - Formatting of metadata and provenance information to conform to Global SWIM Standards

- **Business Rules**
  - QoS: Prioritization of higher quality information over lower quality of information
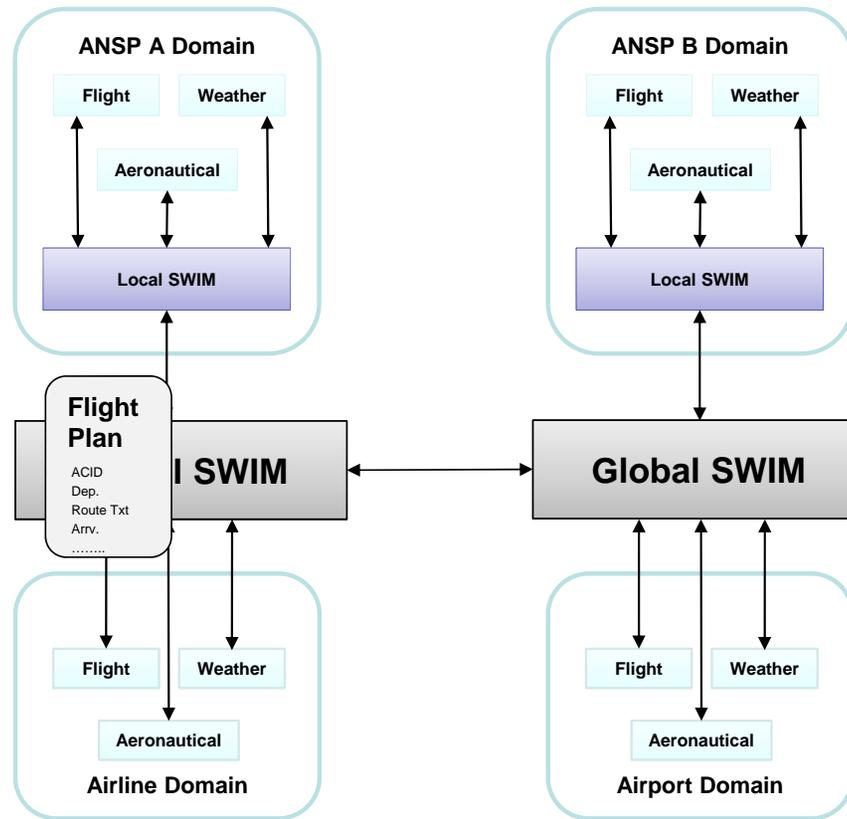 - Controlling access to information based on policy

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

Header

ARR_ARPT = "KCHS", DEP_ARPT = "ETAD", ACID = "WIL0265", OPERATOR = "WIL"

Body

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<arrival>
      <arrivalAerodrome xsi:type="ns6:IcaoAerodromeReferenceType" code="KCHS"
xmlns:ns6="http://www.fixm.aero/base/2.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
   </arrival>
   <departure>
      <departureAerodrome xsi:type="ns6:IcaoAerodromeReferenceType"
code="ETAD" xmlns:ns6="http://www.fixm.aero/base/2.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
   </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..N5200
00W050000..TUDEP.N51100W053140..YJT.N48350W058402..BRADD.N43090W06
7000..ACK.N41169W070016..SIE.N39057W074480.J121..ORF.J209..TYI.J79..JOIN
TD16">
</route>
</ns4:Flight>
```

Governance Example

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**