



Transition to SWIM

Transition from AIS to AIM

2016 - 2021

George Kerlin

Aeronautical Information Services, Engineering IT

SOA Pioneers

1. Systems in the AIS sub-domain manage and distribute aeronautical, meteorological and flight information: will be most impacted by, and used to realise B1-SWIM
2. Mix of internally-developed and acquired from vendors with internal and contracted support
3. Since mid-2000s, modifications and additions adopted general principles underpinning SWIM (service oriented architecture, extensible computing) wherever possible: more formalised since publication of the ATMRPP SWIM concept (now ICAO DOC 10030).
Two illustrative examples are:
 - NAIPS Internet Service (flight briefing and planning) in 2012
Loose-coupling between the legacy NAIPS API and pilot UI and web services exposed to commercial flight-planning service providers
 - Flight Information Broker (supports traffic displays and ATFM) in 2009
Flight entity aggregated from various sources, defined before the flight object model and FIXM exchange standard were mature.

SOA Pioneers built on some SWIM

4. Although these pioneering changes were not informed by the SWIM concept per se, they do constitute elements of the expected information exchange and SWIM infrastructure:
- ✓ Information exchange services, interface definition (WSDL)
 - × Information exchange standards (FPL2012, TAC OPMET, conventional NOTAM)
 - × Enterprise service management
 - × Quality of service
 - ✓ Data representation (XML, XSD)
 - ✓ Messaging (SOAP, JMS)
 - ✓ Transportation (HTTP)
 - ✓ Boundary protection (F5)
 - × Service registry

Governance for SOA Pioneers

5. Service lifecycle aspects of the SWIM governance model met by the CASA-endorsed system management framework which is being migrated to the engineering management system.
6. Intent of design-time service discovery met by sharing and updating WSDLs under contract with controlled group of service consumers.
7. NIS flight planning will be a SWIM application service when migrated from NAIPS to ATMIS; no initiative yet proposed for pre-flight briefing and conventional NOTAM management
8. FIB will not adopt SWIM exchange standards; will support dependant ATM service providers until they themselves migrate to these standards. The SWIM-compliant ATMIS will then subsume the role of FIB

ATM Information Services (ATMIS)

- A SWIM application service built on SWIM core services.
 1. ATMIS flight planning and search and rescue deployed as SWIM application services supported by underlying SWIM infrastructure in 2015; services will start to be consumed in 2018 but not by SWIM-enabled users. Will support current service delivery by constructing flight objects from the intentions of NIS users as well as from FPL2012 received over the AFTN for exchange using either FIXM or FPL2012 depending on the requirements of the recipient ground system.
 2. SWIM core services specified as non-functional requirements increasing compliance as compared to the SOA pioneers:
 - ✓ Information exchange standards (FIXMv4, AIXM5.1)
 - ✓ Enterprise service management (SNMP)
 - ✓ Quality of service (reliable messaging for publish/subscribe, WS-reliable messaging may be used for request/response TBC, SSL)
 - ? Service registry

ATM Information Services (ATMIS)

3. The timely achievement of this component of B1-SWIM will enable B1-FICE over 2018-2023: as major airlines upgrade their flight planning systems to FIXM and the FIXM-compliant/2012FPL-capable CMATS begins operation.
4. Initial FF-ICE is achieved with the exchange of ground-ground flight intent before departure. The mixed FPL2012 and FIXM environment is supported by ATMIS's backward compatibility (supports the distribution of flight intent by FPL2012 messages for as long as any legacy ground system or airspace user requires) and the SWIM/AFS and AFTN/AMHS gateways.

AIS to AIM, the transition to IM

- The ICAO AIS to AIM roadmap identified three phases: consolidation, going digital and information management.
- 1. Prior to the commissioning of Mercury, Airservices AIS product-centric operational capability had been *consolidated*: assured suitable data quality, complied with the Annex 4 and 15 SARPs, adhered to the AIRAC update process, used the WGS-84 reference and had access to terrain and obstacle data
- 2. Commissioning Mercury's AIXM5.1 AeroDB and integrated IDS software tools and third-party utilities in 2015 commenced *going digital*. This will be completed when IDS's electronic publications (eAIP) product and repository is operational, electronic access to EAD is available and aerodrome mapping has been completed.
- 3. *Information management*, described by B0-DAIM, enables the data-centric AIM global concept. The Mercury AeroDB will exchange information using AIXM with ATM systems as they become compatible. Progress has been slower than hoped with defects in Mercury's AIXM extract. Airservices developed a validation tool that has helped produce the AIXM extract needed to update the aeronautical information used by FIB and ATMIS. Rectification continues on achieving full AIXMv5.1 compliance.

B0-DAIM, B1-AMET, B1-SWIM and B1-FICE

- Airservices expects to have achieved B0-DAIM by 2018
- Working with the Australian MET authority and vendors towards meeting Amendment 78 to Annex 3 by 2019 (B1-AMET): BoM will either consume ADIA-NG web services or establish a P3 connection, international distribution will be over AMHS
- Some progress towards the B1-SWIM upgrade; ATMIS flight planning in the concept stage and will deploy the SWIM infrastructure described in DOC 10039 and the first ATM service as a SWIM application (which will enable the achievement of B1-FICE over the required timeframe).