

ASBU Implementation Workshop

SWIM

Some Practical Steps

27 November 2015

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Today's Agenda

- SWIM – State of play
- Start SWIMming

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- Start SWIMming



What is SWIM ?



Doc 10039
AN/511



MANUAL ON SYSTEM WIDE
INFORMATION MANAGEMENT
(SWIM) CONCEPT

Disclaimer

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Advanced edition (unedited)

Definition : SWIM consists of standards, infrastructure & governance enabling the management of ATM information and its exchange between qualified parties via interoperable services."

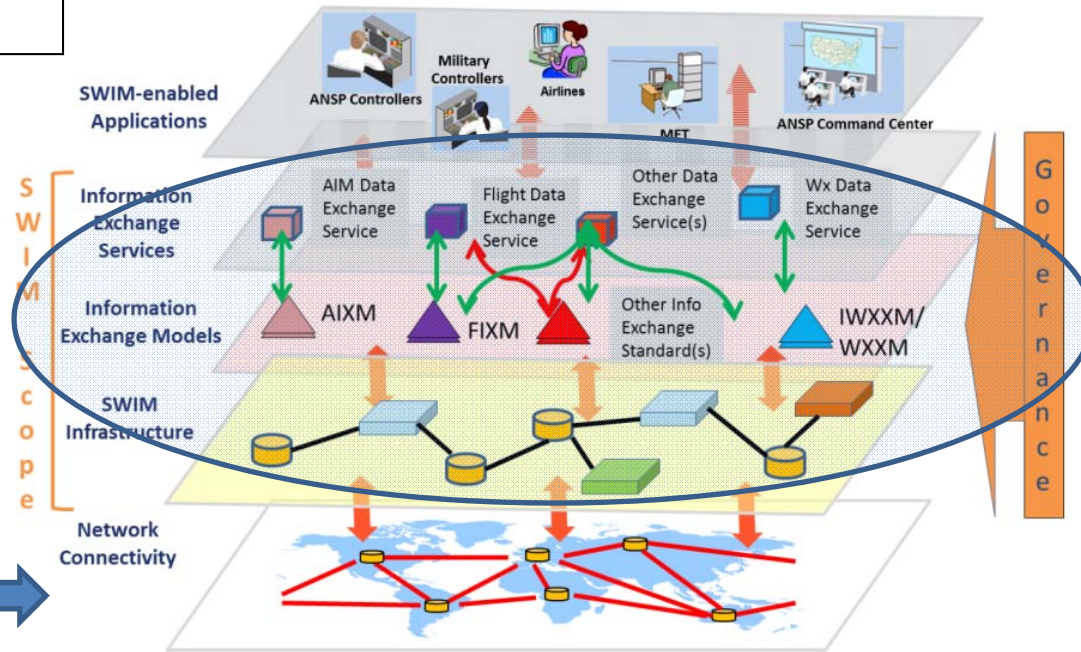
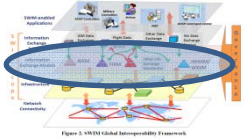


Figure 2. SWIM Global Interoperability Framework

IP = Internet, ...



Information



AIXM

ICAO & Increasing implementations
Digital NOTAM
Lessons learned

WXXM

I(CAO)WXXM
Reality mapping
Data coming

FIXM

V3 / CCB
Towards implementation – V4

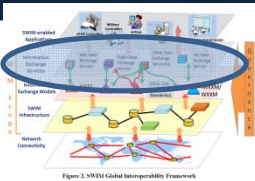
What about me ?

AIDX, AMDB, Asterix, ...



ICAO pick-up

SWIM Pioneer Network Manager B2B Services



sesar factsheet
Today's partners for Tomorrow's aviation www.sesarju.eu

N° 08/2011

SWIM Pioneer (NOP B2B - Business to Business)

Summary - SWIM Pioneer

System Wide Information Management (SWIM) introduces a complete change in how information is managed along its full lifecycle. This is true across the whole of the European ATM system. SWIM is a key enabler for the future SESAR systems. The implementation of SWIM will enable direct ATM business benefits by ensuring that commonly understood quality information (the right information) is delivered to the right people at the right time, so enabling the concept of net-centric ATM operations.

As explained in the SESAR SWIM Factsheet 11.01/2011 - What is SWIM - major SWIM principles have been adopted:

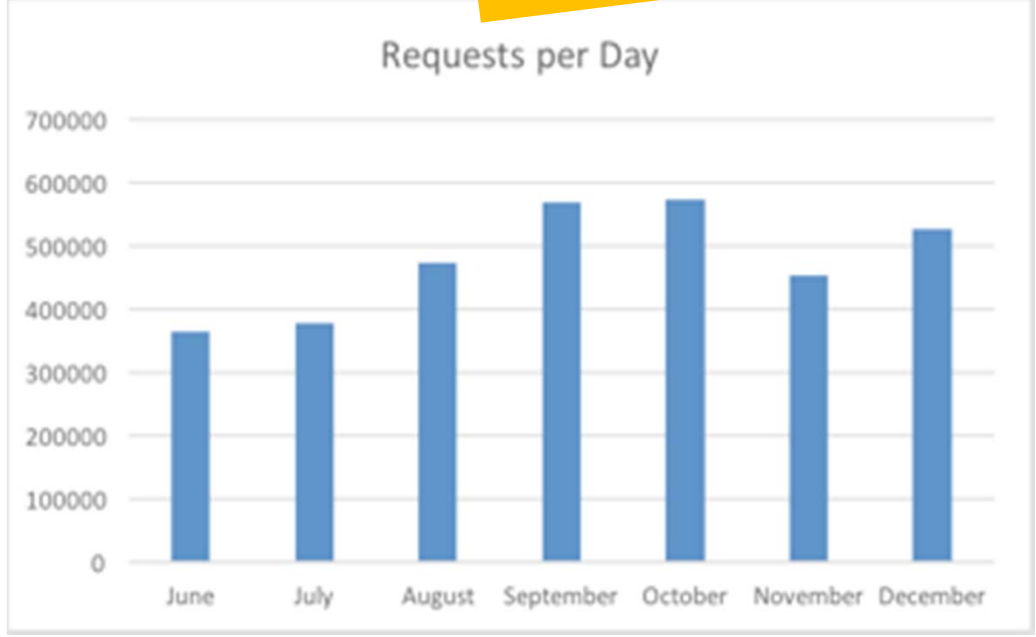
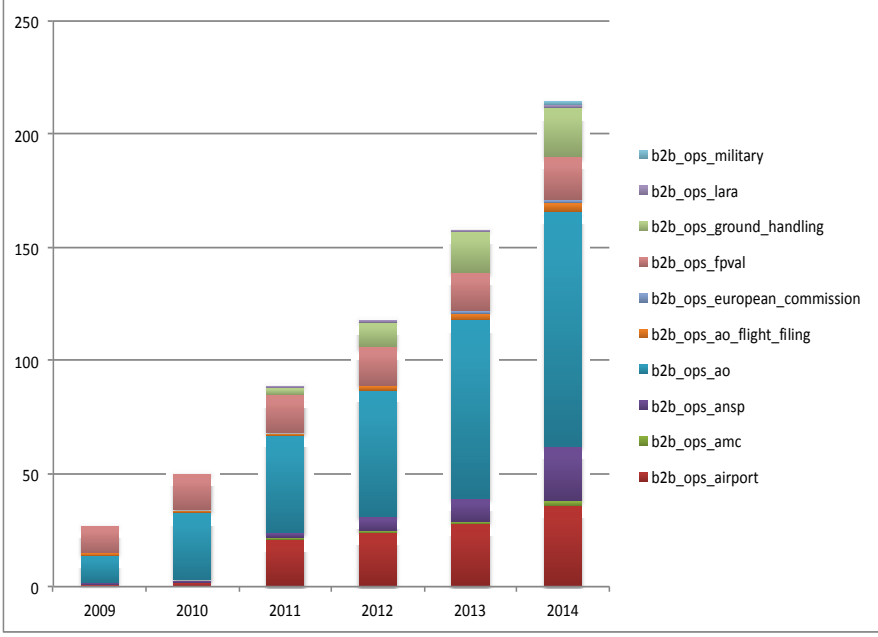
- separation of information provision / consumption in order to decouple producers of information from the possible consumers;
- loose system coupling where each of its components has, or makes use of, little or no knowledge of the definitions of other separate components;
- using open standards and mainstream IT technologies;
- based on Service Oriented Architecture (SOA) principles driven by analysis of business processes and needs functionality, packaged and implemented as a suite of interoperable services that can be used in a flexible way within multiple separate systems from several business domains.

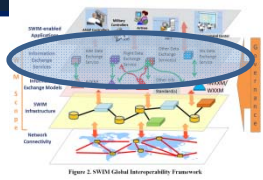
Today, information is already exchanged but in a manner that involves many custom communication protocols, each with their own self-contained information systems and data formats. Some recent developments have however already been made based on SOA principles and making use of existing state-of-the-art standards and mainstream IT technologies. Even if these recent developments have not resulted from the SESAR Development work programme, they are nevertheless complying with the major SWIM principles defined within SESAR.

Services:

- Airspace Management
- Aeronautical Info
- Flight Plan Services

Similar trends FAA & elsewhere



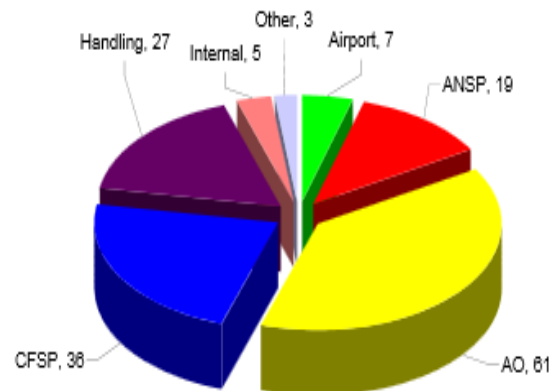


Services

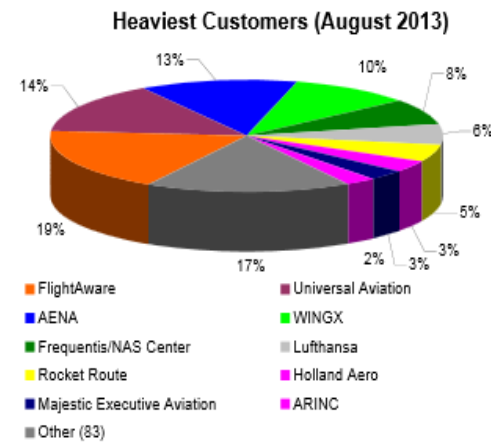
- Examples: Aeronautical, Met, Flight, ...
- More and more being **Developed & Deployed**
- Towards a true **business transformation** !



1. NB OF B2B WEB SERVICES CUSTOMERS

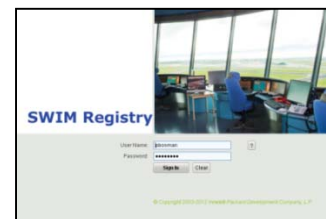


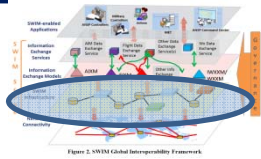
5. B2B WEB SERVICES - LOAD PER CUSTOMER (OPS & PRE-OPS)



- Discovery through so called **Registry**

<http://eur-registry.swim.aero>

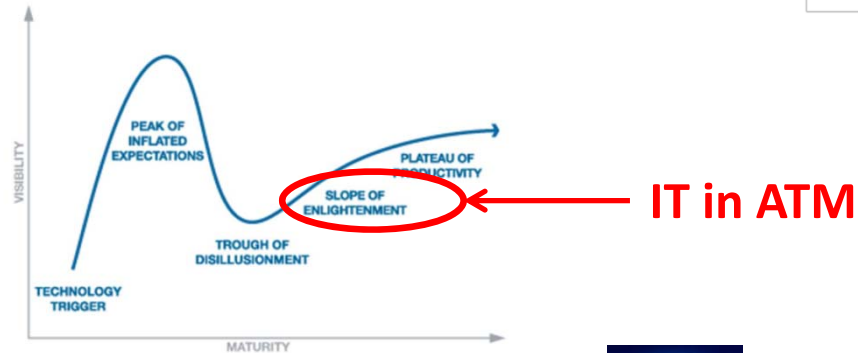




Technical Infrastructure



- IT is found to be mature



- Mostly an issue of agreeing on used (open) standards



- Through so called Technical Profiles (Yellow / Blue / ...)



E.g. Yellow = SOAP1.1/1.2, WSDL1.1/2.0, WSI1.2/2.0, WS-Security1.1, TLS1.0/1.1/1.2, PKI x.509v3, XML-Encryption, XML-Signature, ECRYPT II, XML 1.0/1.1, XML-Schema, WFS/WMS/..., HTTP/1.1, HTTP-GET/POST, MTOM, ... (Red is core, rest is optional for Provider)

Pub/Sub : AMQP1.0





Governance



Initial SWIM (iSWIM)

EU initiative to move towards **SESAR Deployment**
Carrot/Stick approach



What are the SWIM Standards ?

Foundation Standard

- Essential Requirements
- Controlled Vocabulary
- Examples
 - Need for semantic interoperability
 - Based on Open Standards
 - Interoperable Services



Guidance

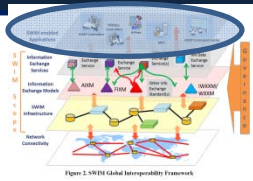
- AIRM
- AIRM Rulebook
- Service Rulebook
- Technical Infrastructure profiles
- Compliance Framework



SWIM Registry

Performance Based Approach

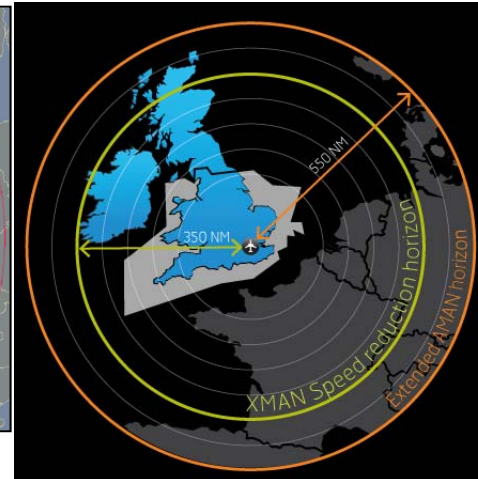
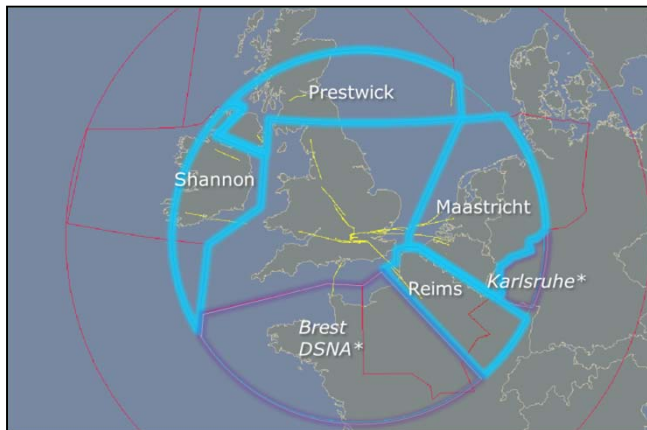




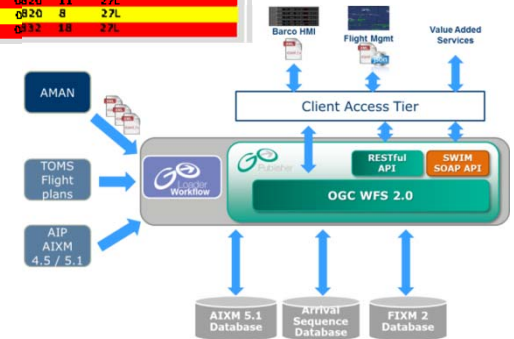
Enabled applications



- Extended Arrival Sequence Service



Callign	Wake	ETA	EAT	Delay	Runway	T.Fix	T.Time
AA112.2	H	0743	0743	0	27L		
AA166	H	0745	0745	0	27L		
AA166	H	0749	0749	0	27L		
ACA862	H	0750	0750	0	27L		
AIC112	H	0751	0753	2	27L		
BAW20R	H	0751	0753	2	27L		
BAW66	H	0752	0754	2	27L		
BAW6W	H	0754	0758	4	27L		
BAW98	H	0756	0800	4	27L		
UAL98	H	0758	0804	6	27L		
BAW176	H	0758	0804	6	27L		
VR46	H	0759	0807	8	27L		
BAW14G	H	0800	0809	9	27L		
ACA848	H	0802	0814	12	27L		
BAW116	H	0802	0816	14	27L		
ACA874	H	0808	0817	9	27L		
BAW206	H	0809	0820	11	27L		
BAW114	H	0812	0820	8	27L		
BAW228	H	0814	0822	11	27L		



- Benefits (/year!)
 - 33.5 M€ fuel saving
 - 32.000 ton of CO2 reduction



Today's Agenda

- SWIM – State of play
- Start SWIMming

Help !

My boss asks me to do/be SWIM

A 'How-To-Get-Started' checklist

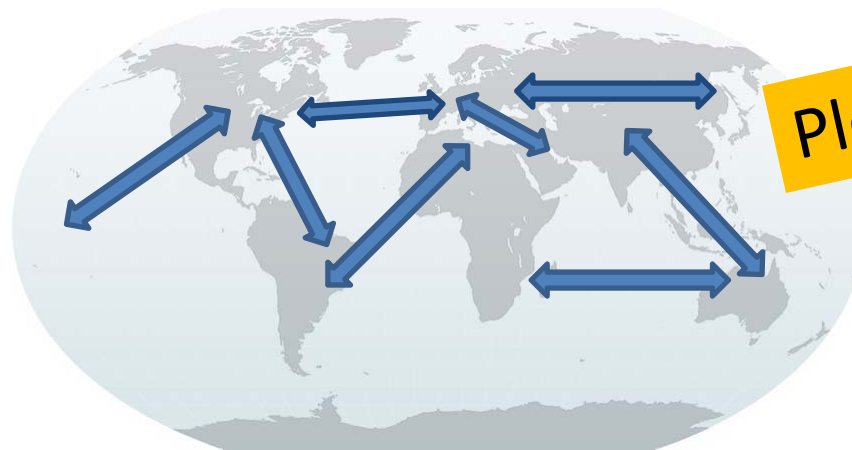
- ✓ Do you have some/all data in Digital Format (XMs, ...) ?
- ✓ Are you able to provide this as a web-service ?
- ✓ Using technos such as SOAP, HTTP, TLS ?
- ✓ Over (secured/open) Internet ?

Then you are SWIM(ming) !

SWIM Global Demos



April – May 2016

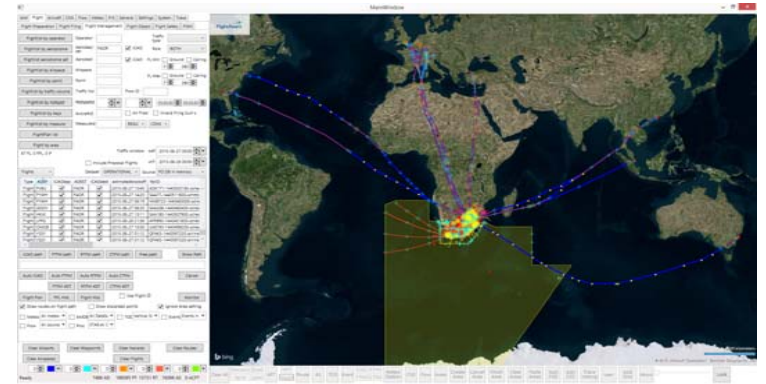


Please all join in !

Jumpstart

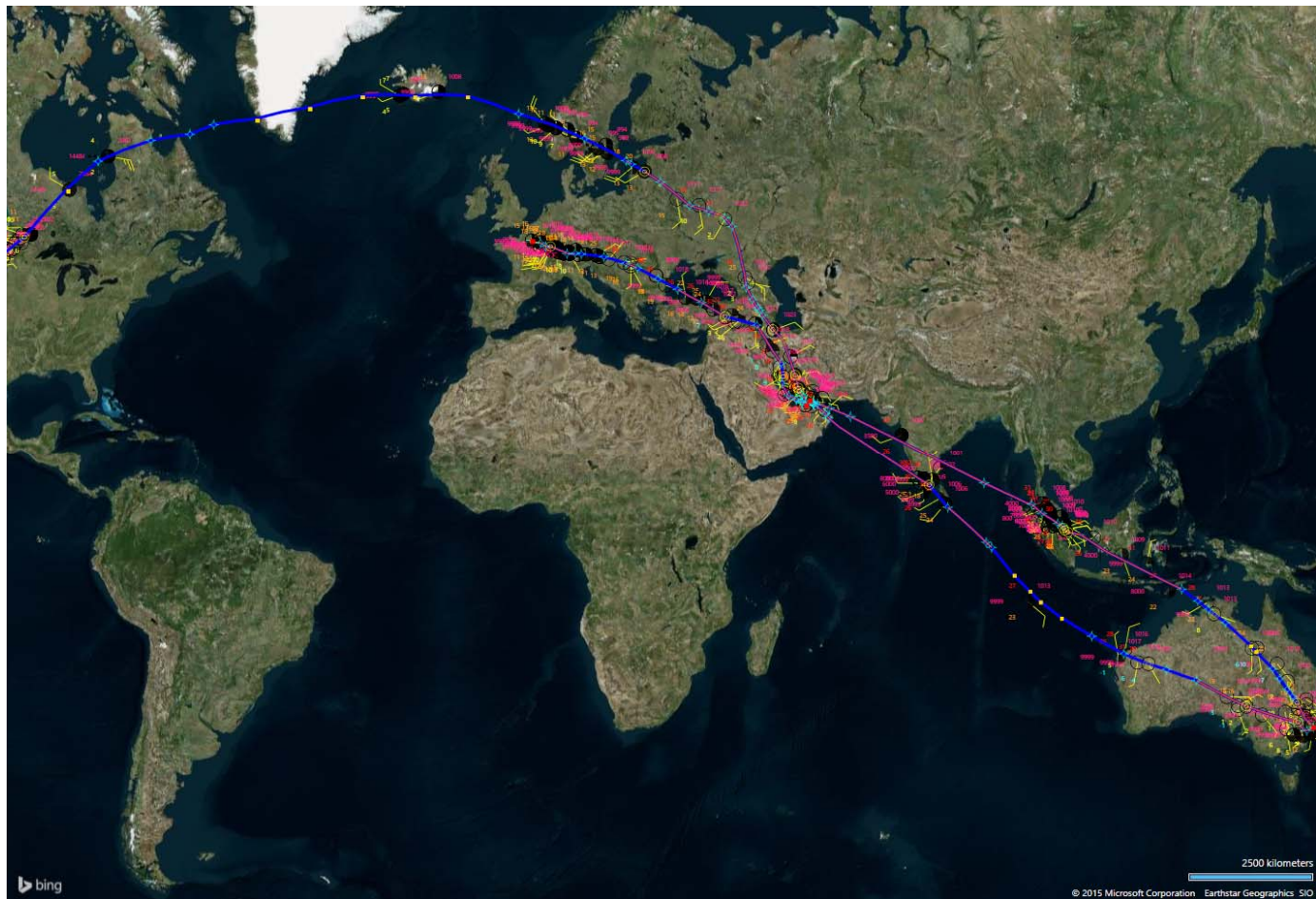
A free SWIM Concept Demonstrator

- **NOT for Operational Use**
- Open source -C#/.NET
- Available upon signing license agreement 😊
- Tested with data sources from around the globe
 - Incl AIM, MET, Flight, Surveillance, ICAO, ...
- Supported (Open) Standards
 - WFS, WMS, WS-N, WSDL, SOAP, REST, HTTP, TLS, PKI, AMQP, XML, JXSD, SON
 - AIXM 5.1 (incl Dig NOTAM), iWXXM, FIXM v2/v3, (NM B2B), ..
- Includes Jumpstart (Cloud-based) Services
 - AIXM4.5 → AIXM5.1
 - METAR/TAF → iWXXM
 - Flightplan2012 → FIXMv2/v3
 - Federated PKI





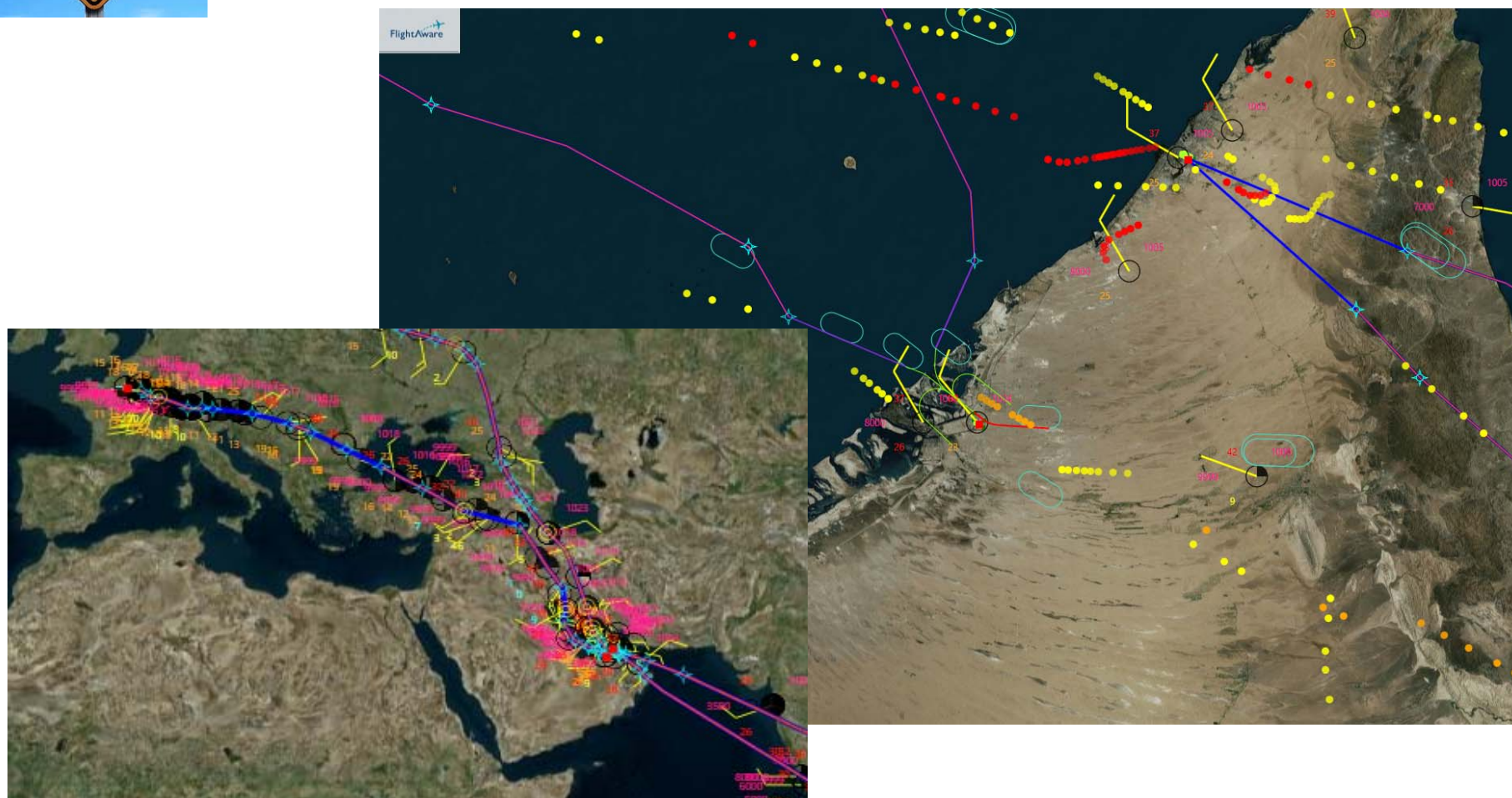
How real is this all ?



Sources (All live !): FAA NASR56, NM B2B, SADIS, FlightAware, ...



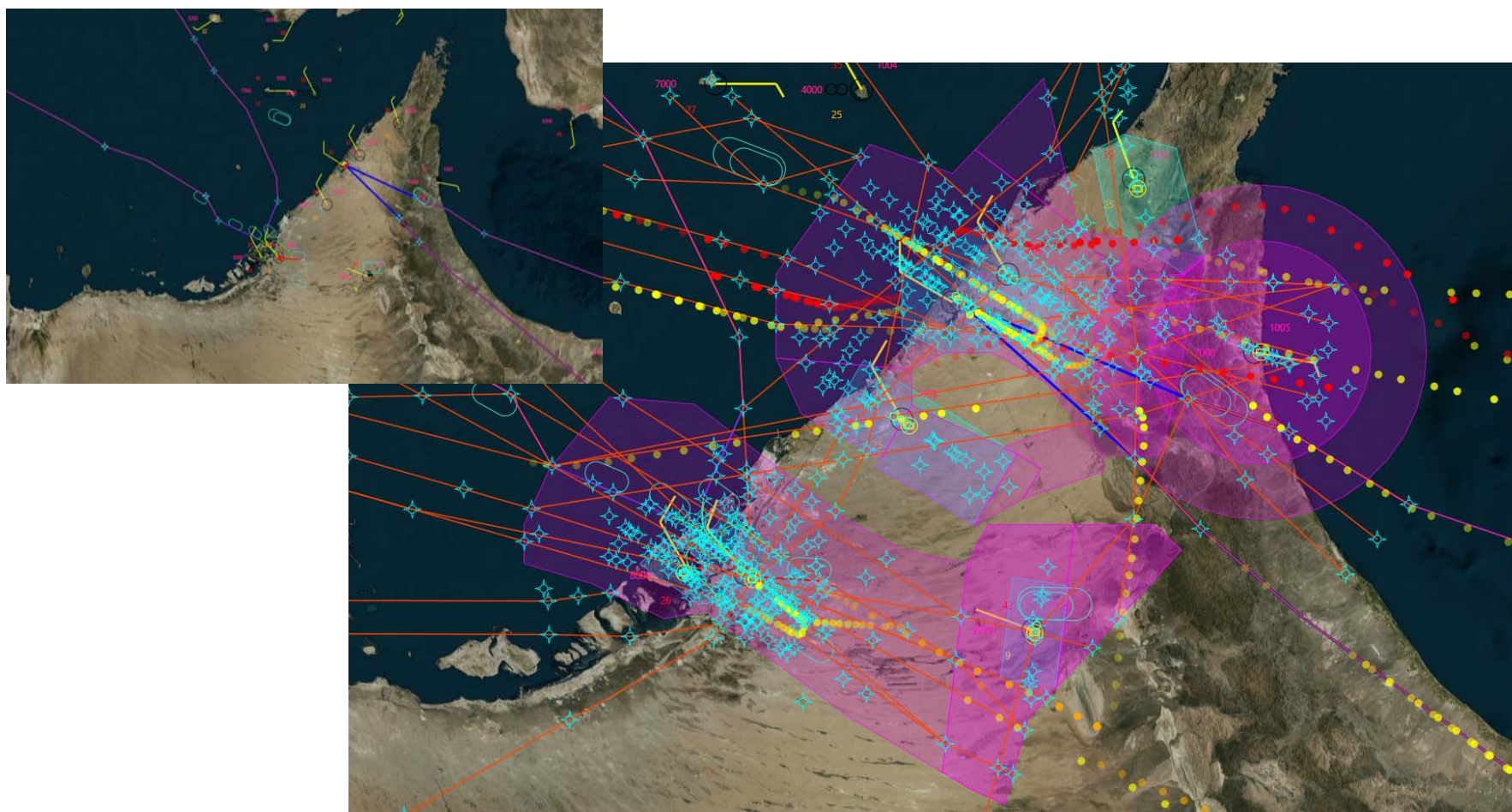
How real is this all ?



Sources: NMB2B, SADIS, **GCAA**, FlightAware, ...



How real is this all ?



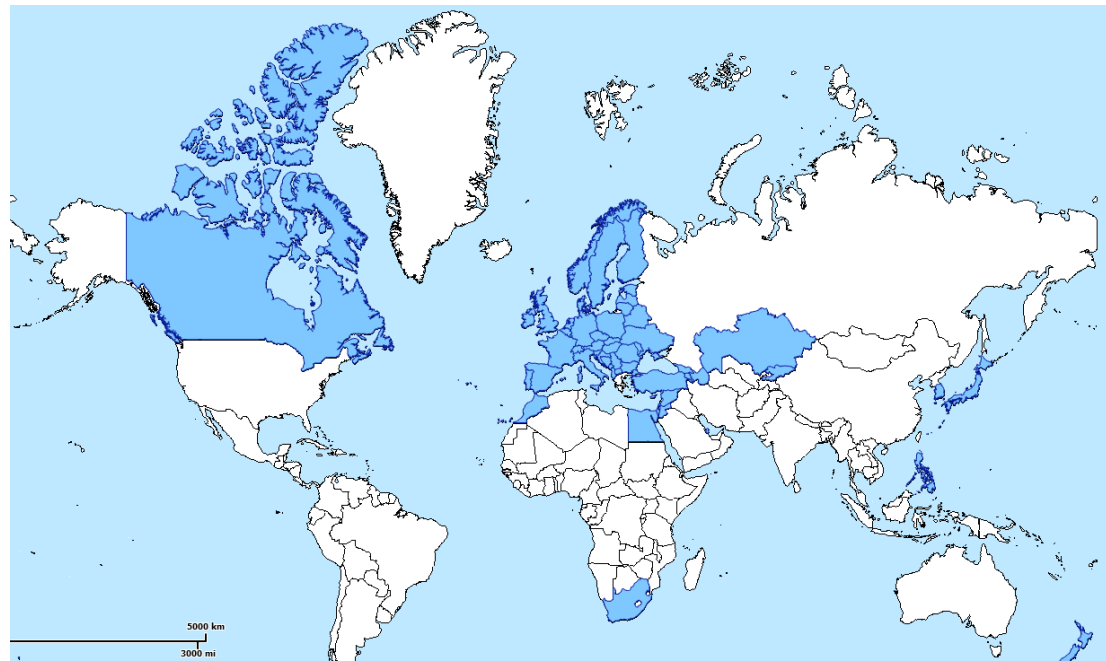
Sources: EAD, FlightAware, GCAA, SADIS, ...

Local or Central ?

SWIM is not prescriptive

Depends on your local business case

Importance is to unlock & share your data !



EAD Participating States, more welcomed !

ICAO



Information Management Panel

- Air Navigation Conference 2012 conclusion
- Participants
 - Australia, Brazil, Canada, China, France, Germany, India, Japan, Russian Federation, Saudi Arabia, Singapore, South Africa, Sweden, Turkey, United Arab Emirates, United States, ASECNA, CANSO, EUROCONTROL, IATA and the International Coordinating Council of Aerospace Industries Associations (ICCAIA)
- Building from ICAO ATMRPP SWIM Concept (Doc 10039)

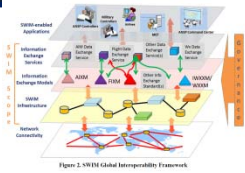


- **Planned deliverables (work in progress!)**
 - Updated SWIM Concept Manual (Doc10039)
 - Initial IM SARPs
 - New NOTAM Concept / replacement proposal
 - AIRM Package
 - Global registry proposal ?
 - **All by November 2018**

So what can you do ?

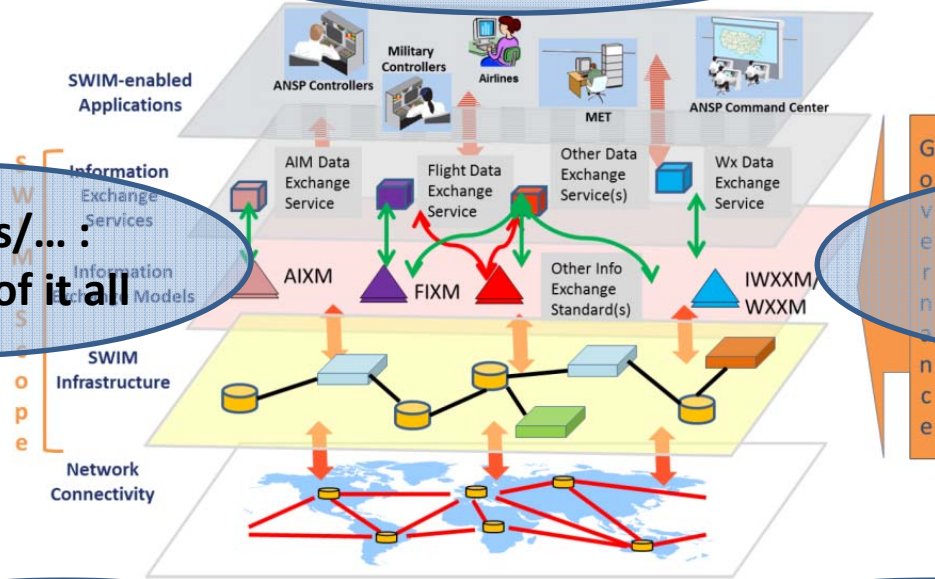
- Free : Follow SWIM Webinars
 - www.sesarju.eu/swim/resources
- Free : Install & Use Jumpstart
 - www.sesarju.eu/swim/resources
- Free : Participate to SWIM Global Demos (till Q2/2016)
 - www.swim.aero
- Free : Follow IMP proceedings
 - www.icao.int/airnavigation/IMP/Pages/default.aspx

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Conclusions

SWIM is becoming a reality with impressive Benefits



AIRM/XMs/... :
Foundation of it all

ICAO IM Panel ++

(Web)-Services :
Booming

More global trials /
demos will further demistify and obtain more benefits

Questions & Contact Information

- **SESAR Joint Undertaking**
www.sesarju.eu/swim
Linked in http://www.linkedin.com/groups?gid=3748809&trk=hb_side_g
- **Email** swim@sesarju.eu
- **Registry**
<http://eur-registry.swim.aero>
- **Data Exchange models**
 - *Aviation Information Data Exchange* www.aidx.aero
 - *AIXM - Aeronautical Information Exchange Model* www.aixm.aero
 - *WXXM – Weather Information Exchange Model* www.wxmx.aero
 - *FIXM - Flight Information Exchange Model* www.fixm.aero
- **AIRM** <http://im.eurocontrol.int/wiki/index.php/AIRM>
- **Some additional info**
www.eurocontrol.int/im & im.eurocontrol.int/wiki
- **IM Panel** <http://www.icao.int/airnavigation/IMP/Pages/default.aspx>

