IDS AirNav

an enav group company

AMHS to SWIM

Ideas on supporting transition on communication patterns

enav group

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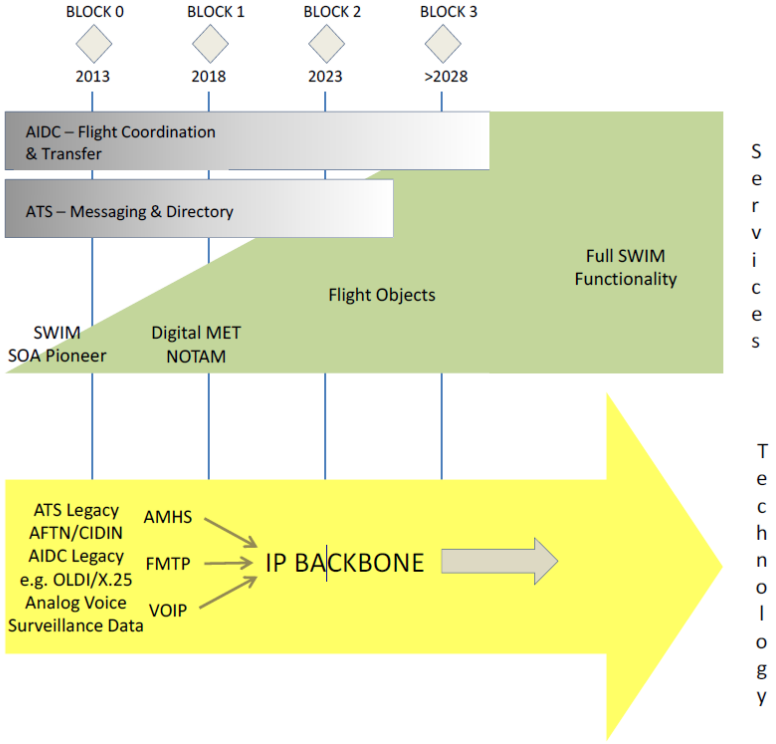
ICAO 10039 – Transition And Mixed Environment
Non swim transition to SWIM

The System Wide Information Management (SWIM) complements human-to-human with machine-to-machine communication, and improves data distribution and accessibility in terms of quality of the data exchanged.

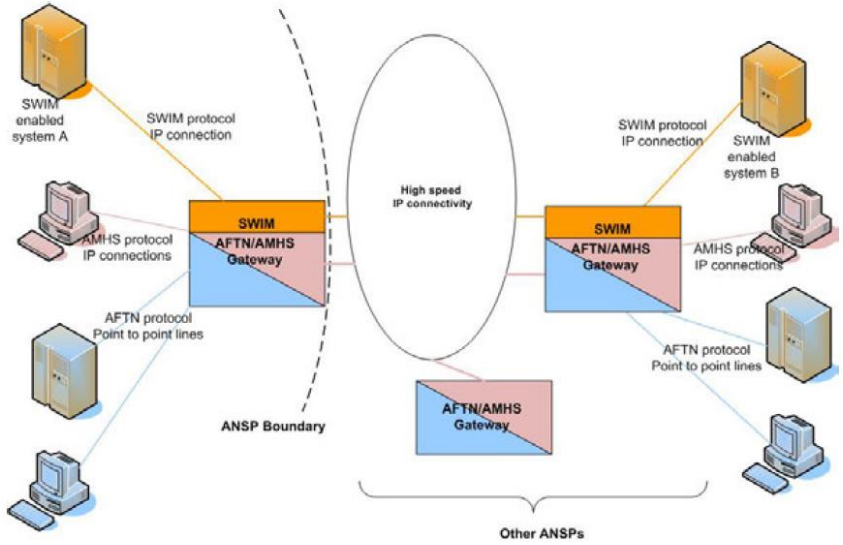
IT systems will increasingly need to “ask for / discover” operationally-relevant facts, depending on the circumstances, rather than remain “being informed” by pre-agreed messages.



ICAO 10039 – Interoperability ensured in the gateway

Due to the current stage of the SWIM implementation at a global level, different possibilities can be contemplated for the SWIM transition of non-SWIM systems and their interoperability.

Actually interoperability arrangements can be different depending on the different services that will be implemented.



SWIM Messaging over AMHS

SWIM Messaging over AMHS could be implemented through the introduction of a **SWIM & AMHS Gateway** (in our case is already available with IDS AIRNAV CRONOS that can act as a router) .

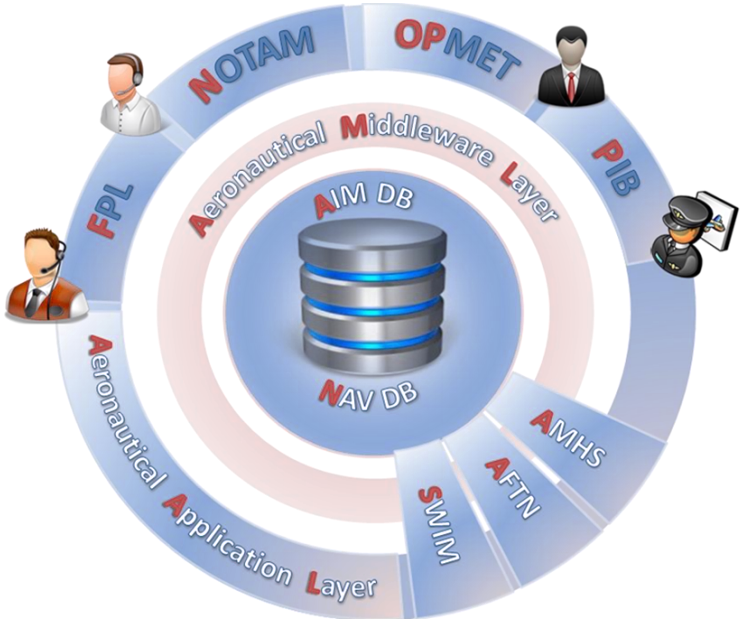
Therefore, Inter-Regional connectivity can be granted by covering the usage of the current AFTN/AMHS systems and the next generation Systems.

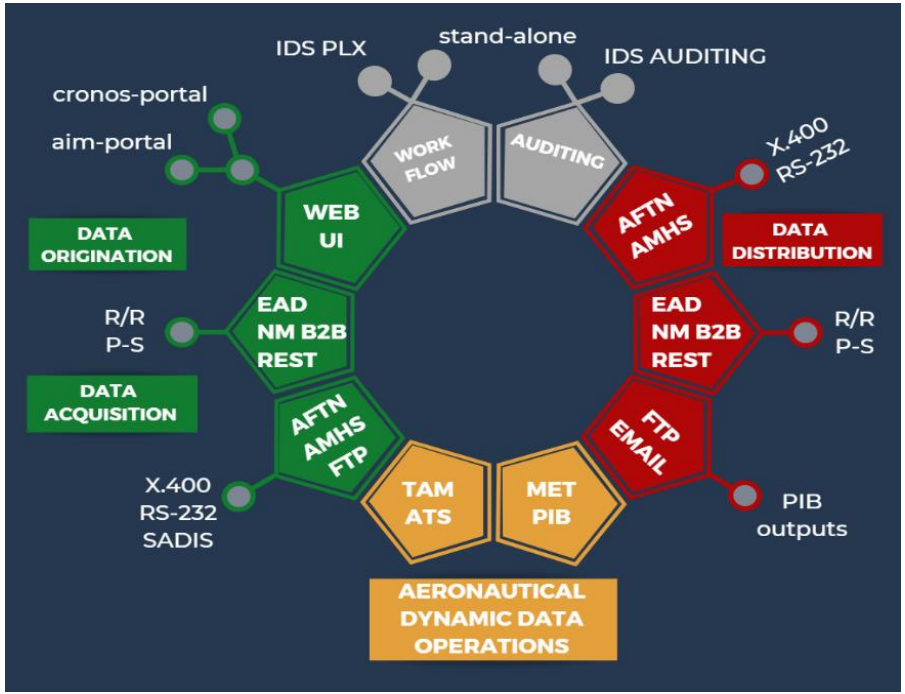
By Acting as a SWIM & AMHS Gateway, the transport layer will publish/consume SOAP and REST Request/Response packages by maintaining also the current data transport technologies:

- XML encoding to be straight-forward
- AMHS would publish XML to SWIM
- ANSP would be able to publish XML directly into Business Services
- SOAP with attachments (*this will require additional investigation*)

As CRONOS system implement FIXM/WXXM/AIXM data exchange formats, ANSPs participating in the initiative would be able to consume or publish XML directly from SWIM

SWIM & AMHS Gateway



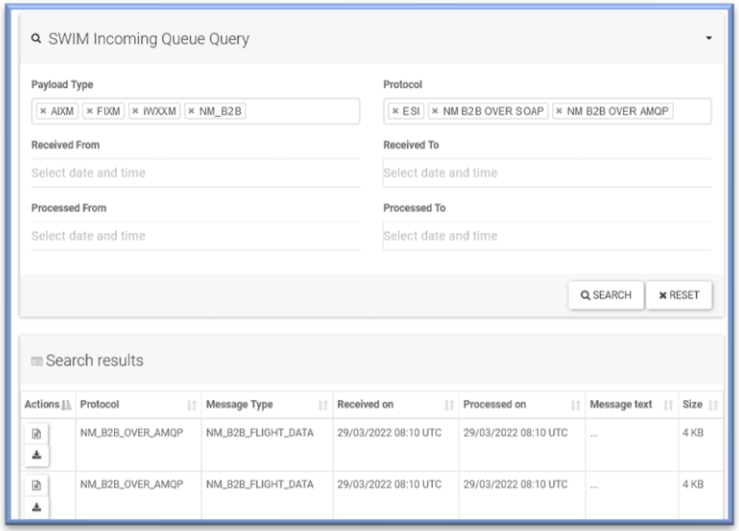


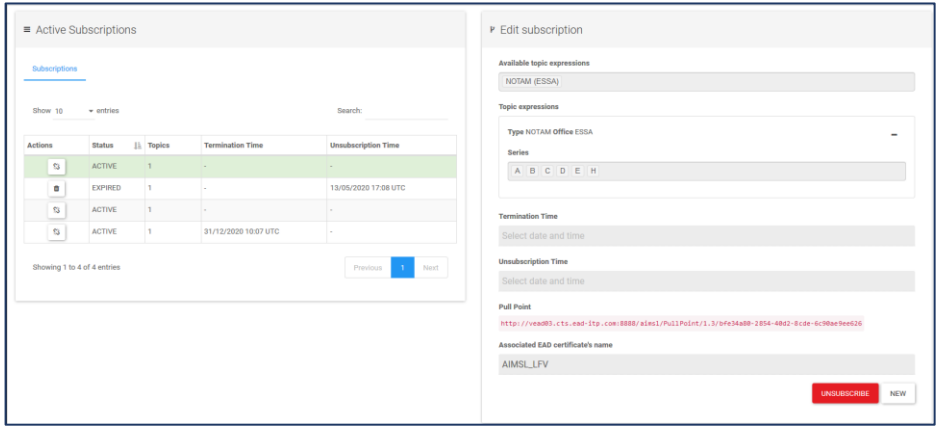
SWIM & AMHS Gateway

- To Supports ICAO Global Air Navigation Plan (GANP) and ICAO Aviation System Block Upgrade (ASBU) program by having included its own SWIM GATEWAY

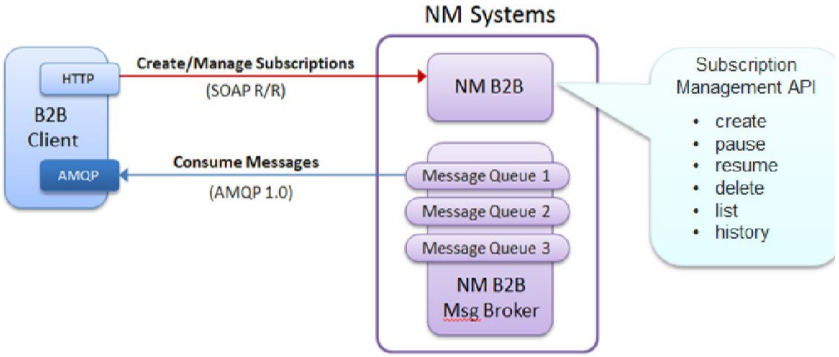
- To support common knowledge and situational display, the information has been made :
  - Aggregated from different available data packages (**AIXM, FIXM, IWXXM**)
  - Consumed via **SWIM** patterns (ESI, NM B2B)
  - Accessible via **Open Interfaces**
  - Standardized and
  - Secured

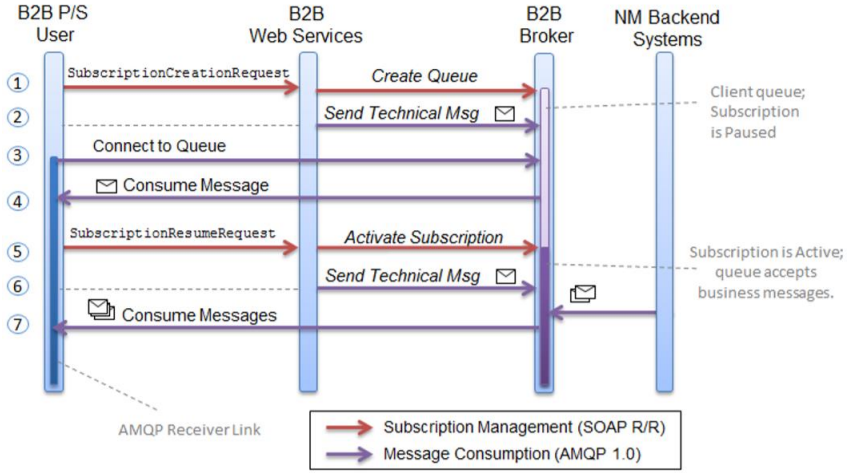
- AFTN / AMHS networks can be configured to act in synch or prioritized as second source of information





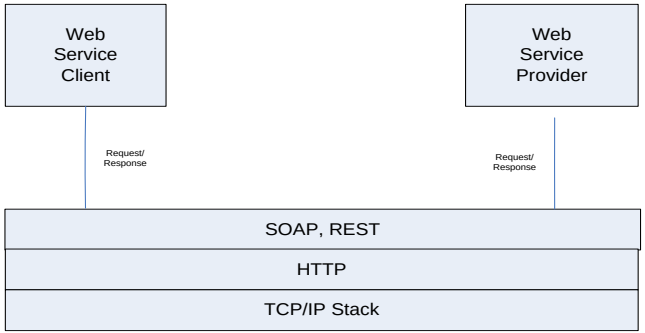
B2B services use case Eurocontrol Network Manager



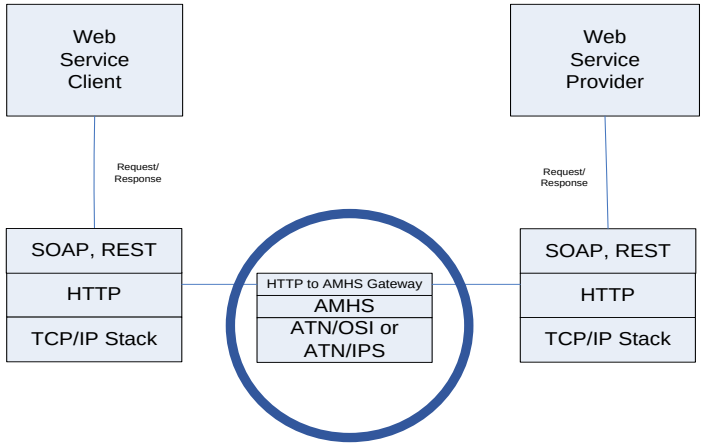


Web Services Communications

Web Services Communications
SWIM



Web Services with an "HTTP to AMHS Gateway"
SWIM+ AMHS



SWIM & AMHS Gateway: AMHS routing

- In AMHS, routing is decided by the operator according to the following practices:
  - For flight planning and related messages
    - The addresses resolution is “dynamic”, as the recipients calculation is a function which depends on the specific flight trajectory (ADEP - Item 15 - ADES) and on the specific flight characteristics (VFR/IFR, military/civil, scheduled/GA, etc..)
    - It’s the operator responsibility to address the flight to the correct concerned ATS units (AFTN addresses)
      - Some software automation exists
  - For NOTAMs:
    - The addresses resolution is “static”
    - Addresses resolution is usually defined at the NOTAM series level
    - The operator only picks the NOTAM series
  - For OPMETs:
    - The address resolution is “static”
    - Addresses resolution is usually defined in the bulletin configuration

SWIM & AMHS Gateway: FPAL - Flight Plan Addressing Language

- **What is FPAL?:** a language which allows the definition of rules to automatically calculate the addressing of flight plans and related messages
- Rule example: "**If** a flight departs from airport LIRF and it is IFR, **then** address the flight to the LIRF ARO"
- The algorithm takes as input a flight, and it returns the addresses based on the FPAL knowledge base

SWIM & AMHS Gateway: NOTAL – NOTAM Addressing Language

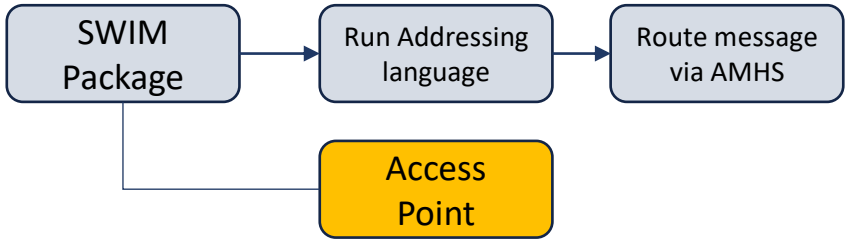
- **What is NOTAL?:** a language which allows the definition of rules which allows the calculation of the addressing of NOTAMs in an automated way
- Rule example: "**If** a NOTAM is about an international airport, **then** distribute it to the NOTAM office y"
- Rule example: "**If** a NOTAM is about a domestic airport, **then** distribute it to the ATS unit z"
- The algorithm takes as input a NOTAM, and it returns the addresses based on the NOTAL knowledge base

SWIM & AMHS Gateway: OPAL – OPMET Addressing Language

- **What is OPAL?:** a language which allows the definition of rules which allows the calculation of the addressing of OPMET in an automated way
- Rule example: "**If** an OPMET is about an international airport, **then** distribute it to the MET office y"
- Rule example: "**If** an OPMET is about a domestic airport, **then** distribute it to the MET office z"
- The algorithm takes as input an OPMET, and it returns the addresses based on the OPAL knowledge base

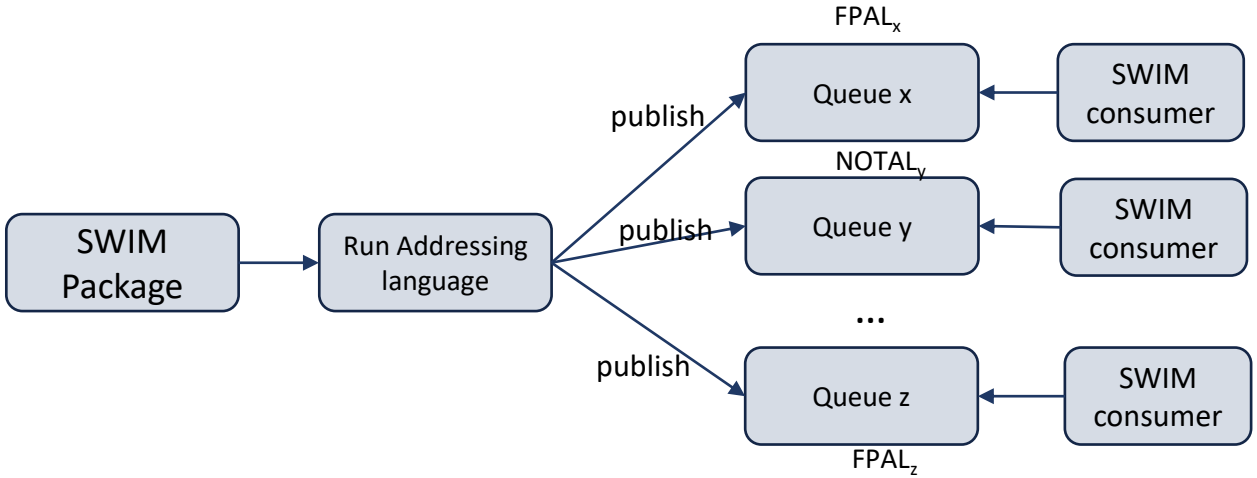
SWIM & AMHS Gateway: SWIM to AMHS routing

- If the message is of type ***FIXM***:
  1. Evaluate ***FPLA*** on the XML package
  2. Collect the calculated addressing list
  3. Transform FIXM to ICAO Raw text
  4. Route ICAO Raw text via AMHS
- If the message is of type ***AIXM*** *(Event/*Digital NOTAM):
  1. Evaluate ***NOTAL*** on the XML package
  2. Collect the calculated addressing list
  3. Transform AIXM into ICAO TAM raw text
  4. Route TAM via AMHS
- If the message is of type ***IWXXM*** :
  1. Evaluate ***OPAL*** on the XML package
  2. Collect the calculated addressing list
  3. Transform IWXXM to TAC
  4. Route TAC via AMHS

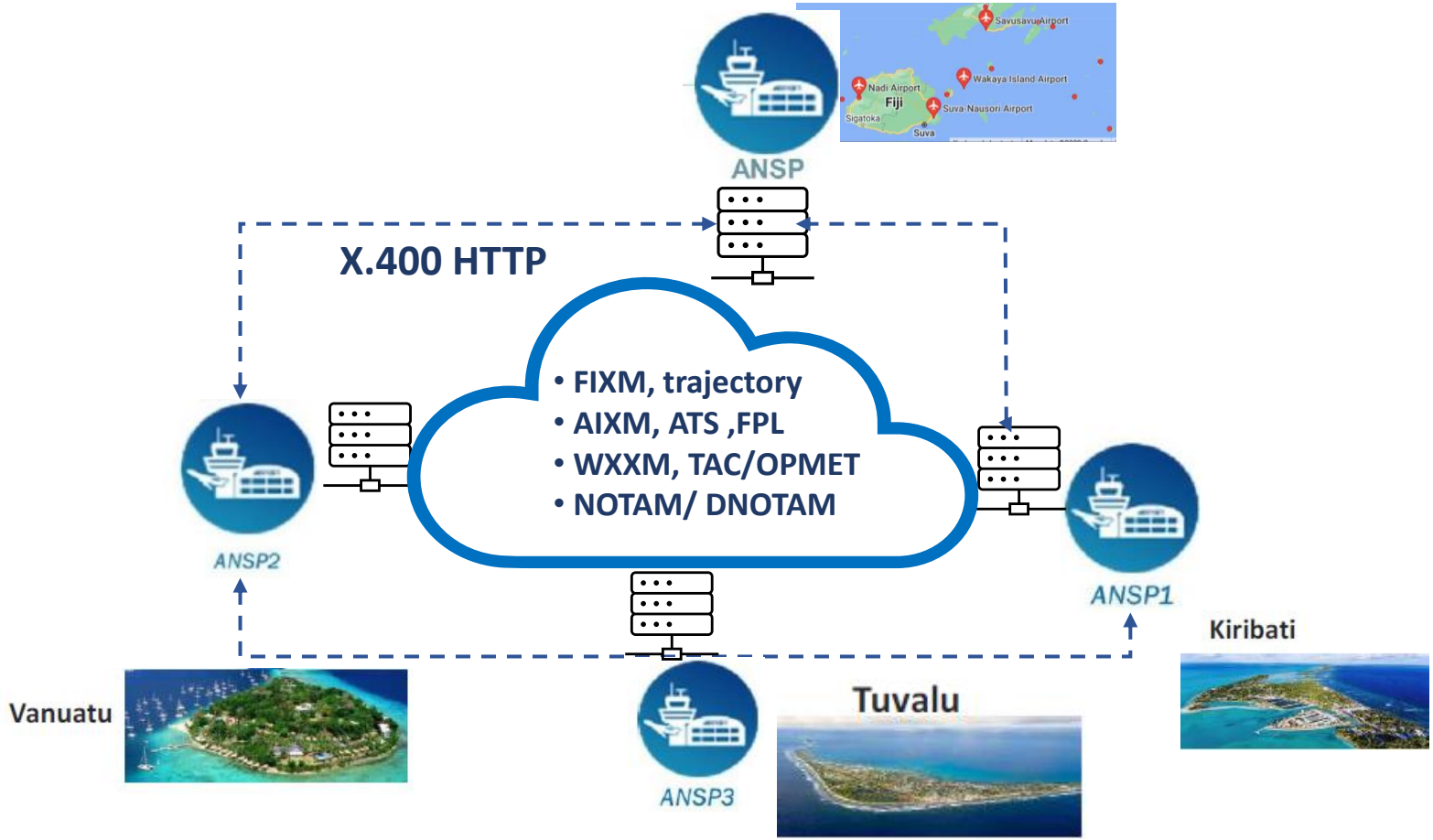


SWIM & AMHS Gateway: SWIM from AMHS routing

- Idea: use the same addressing language as a filter for the publish/subscribe mechanism
- Rule example: "**If** an IFR flight departs from LIRF airport, **then** ~~address the flight to the LIRF ARO~~ publish the message to the queue x"
- Whoever is subscribed to queue x will receive the SWIM package



A SWIM & AMHS Gateway to support CRV initiative



IDS AIRNAV Experience - EU SWIM Events

IDS AIRNAV actively attended last two SWIM global events using the same foundation frameworks and components behind ATFM Suite.

SESAR SWIM
Global Demonstration

DEMO 3 **Day 2: 09:15 – 10:30**

Joint interoperability demonstration:
Australia - United Arab Emirates - Europe

Air Services Australia, Austro Control, UAE General Civil Aviation Authority (GCAA), Dubai Air Navigation Services (DANS), Emirates Airlines, Qantas, EUMETNET, Eurocontrol, UAE National Centre for Meteorology and Seismology (NCMS), Frequentis, Honeywell, Ingegneria Dei Sistemi S.p.A. (IDS), Thales, TOPLINK, Boeing Jeppesen, Comsoft

CRONOS - Aeronautical NOTAM system

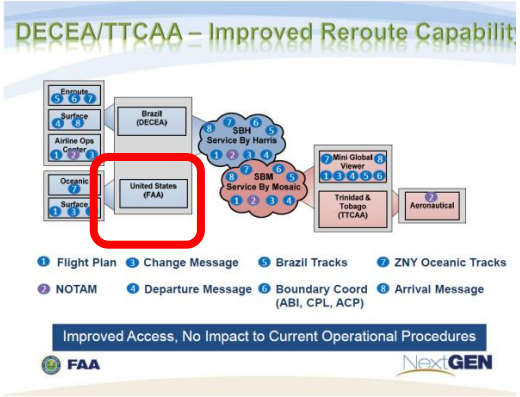
Ingegneria Dei Sistemi - IDS

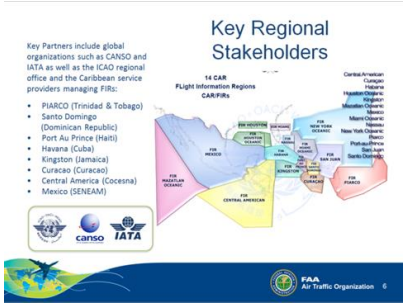
CRONOS is the IDS solution for an aeronautical 'dynamic' data management system that involves operational processes and is intended to be used by NOTAM offices (NOF) and aeronautical information services (AIS).

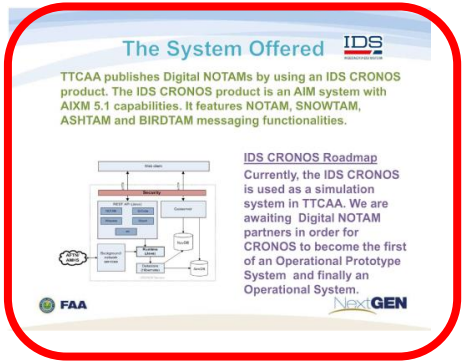
10 SESAR SWIM Global Demonstration, Rome ACC, 8-9 June 2016

IDS AIRNAV - FAA SWIM Events

IDS AIRNAV actively attended SWIM Mini Global (FAA) and supports Caribbean data provision to FAA via SWIM (FIXM adapter to FAA).







IDS AIRNAV CRONOS Implemented

- ***IDS CRONOS in 2017 Solutions***
  - ***DECEA: integrated D-NOTAM System***
    - *Fully Integrated aeronautical dynamic data management system commissioned*
    - *Interoperability between IDS PLX, AeroDB, Auditing, Identity Manager*
    - *REST API for Services' interoperability*
    - *AMHS x.400 P3*
  - ***INAC F2: NOTAM & OPMET***
    - *NOTAM & OPMET messaging system commissioning accomplished*
    - *AFTN RS-232*

IDS AIRNAV CRONOS implemented

- ***IDS CRONOS in 2018-19 Solutions***
  - ***IWBS A.M.: Integrated Web Briefing System***
    - *commissioning of SAIP: a fully Integrated aeronautical dynamic data management system*
    - *Interoperable with IDS PLX, AeroDB, Auditing, Identity Manager*
    - *REST API for other services' interoperability*
    - *AMHS x.400 P3*
    - *NOTAM, FPL, OPMET, PIB modules*
    - *FPL integrated with ECTRL-NM 21*
    - *PIB Library EAD – AIMSL integrated*
    - *Min-SDO Geography import from AIXM5.1*

IDS CRONOS Current implemented

IDS CRONOS in 2018-19 Solutions

- ***LFV ISAVIA NAVIAIR ADQ 15:***
  - *commissioning of NOTAM, OPMET, Briefing system:*
  - *fully Integrated aeronautical dynamic data management system*
  - *Interoperable with IDS PLX, AeroDB, Auditing, Identity Manager*
  - *REST API for other services' interoperability*
  - *AFTN Interface*
  - *NOTAM, OPMET, PIB modules*
  - *Integrated with ECTRL-Network Manager*
  - *PIB Library EAD – AIMSL integrated*
  - *Min-SDO Geography import from AIXM5.1*

THANKS FOR YOUR ATTENTION

Product Presentation