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# INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

*Workshop on the Implementation of Amendment 82 to Annex 3 to Chicago Convention and the PANS-MET*

*(Praia, Cabo Verde, 30 March – 3 April 2026)*

*)*

# Session 3: Operational and institutional impacts

## PPT3.5. Upgrading the communication infrastructure for the exchange of weather data in IWXXM format

*Burkina Faso*

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# Overview

01 Introduction / Reminder

02 Architecture of the IWXXM Data Exchange

03 Planning and implementation of the IWXXM infrastructure

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# Introduction

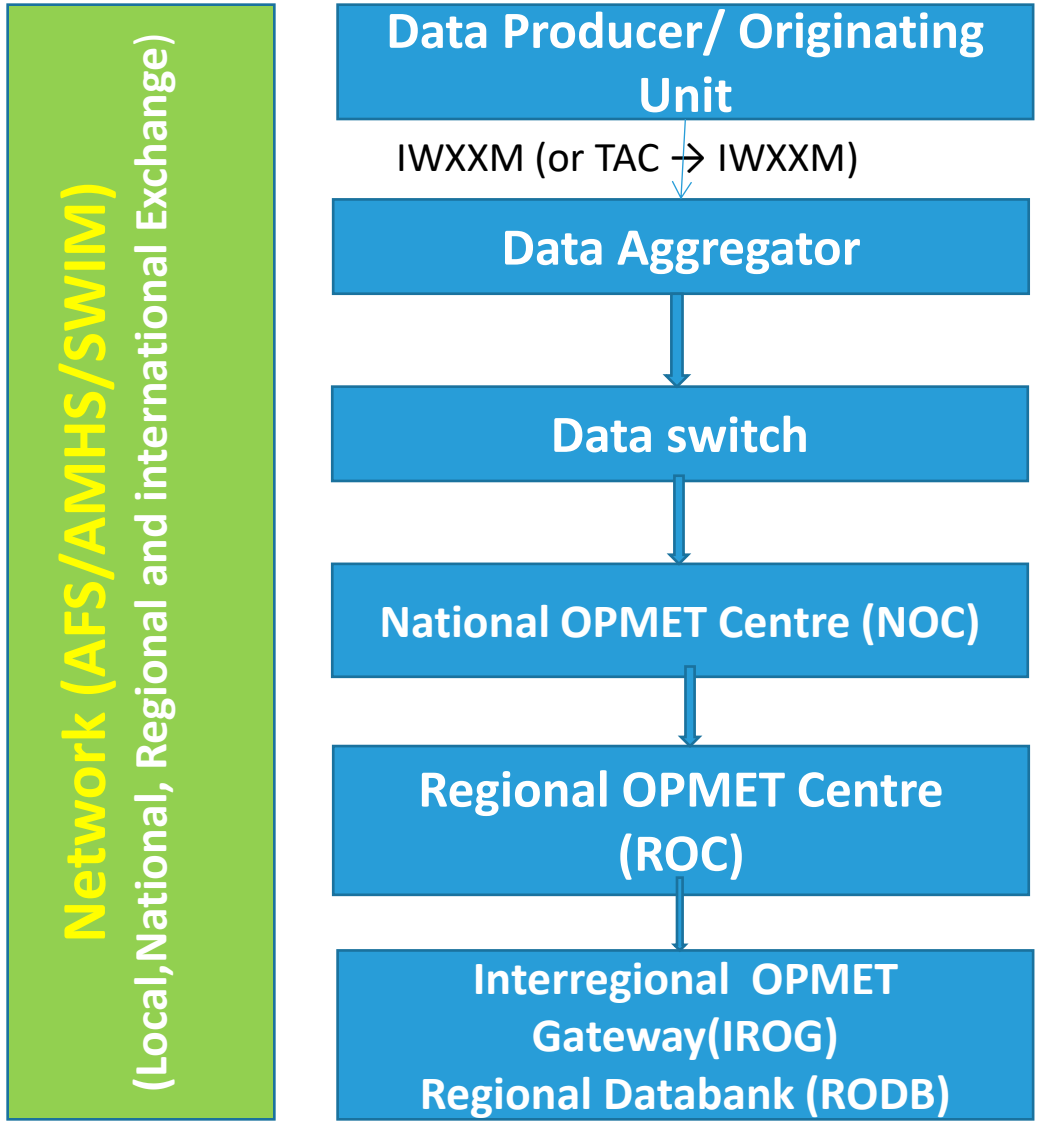
- Since November 2020, and in accordance with Annex 3, Amendment 78, OPMET data shall be provided and exchanged in IWXXM format (in parallel with TAC data).

- The transmission of OPMET data in IWXXM format requires digital support for the representation and exchange of OPMET data between meteorological offices, air navigation services, and international gateways.

- The communication infrastructure should evolve at all levels (national, regional, and international) to meet to the new requirements.

# Architecture de l'échange des données au format IWXXM






Meterological Watch Offices (MWO)
Aerodrome Meteorological Office (AMO)

Collects local IWXXM

Routes to other nodes

Stores & distributes IWXXM within a State

Aggregate region products & feeds, connects AFI ↔ others

External Exchange (global archive & access)

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# Planning and implementation of the IWXXM infrastructure



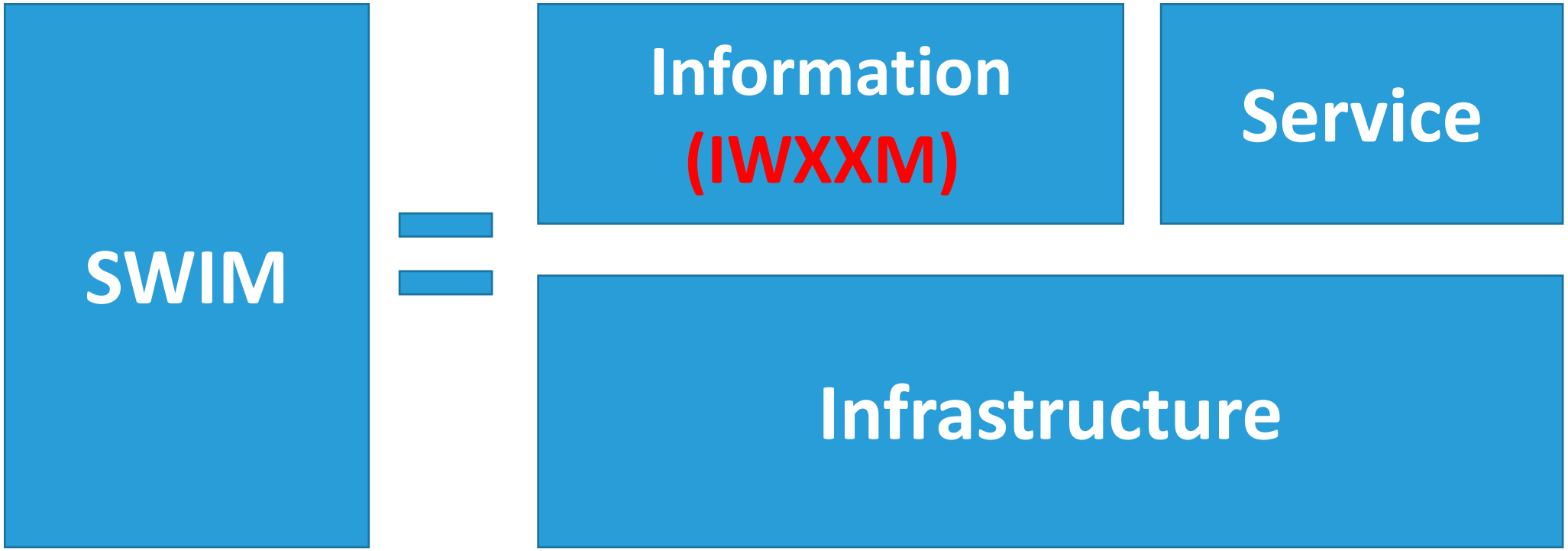
## Roadmap

| | Block 0<br>2013-2018 | Block 1<br>2019-2024 | Block 2<br>2025-2030 | Block 3 and Beyond<br>>2031 |
|---|---|---|---|---|
| **Communication Protocols** | AFTN<br>AMHS Basic | AFTN<br>AMHS Basic<br>AMHS FTBP<br>AMQP/HTTP (optional) | AMHS FTBP<br>AMQP/HTTP | AMQP/HTTP |
| **Information Exchange Services** | RODB TAC request/reply<br>RODB IWXXM request/reply | RODB TAC request/reply<br>RODB IWXXM request/reply<br>RODB IWXXM notification (optional)<br>WFS, WCS, WMS (optional) | RODB IWXXM request/reply<br>RODB IWXXM notification (optional)<br>WFS, WCS, WMS | WFS, WCS, WMS<br>Other web services |
| **Data Types** | Gridded<br>Objects | Gridded<br>Objects | Gridded<br>Objects | Gridded<br>Objects |
| **Data Addressing** | AFS Addressing | AFS Addressing<br>IP (optional)<br>SWIM Registry (optional) | AFS Addressing<br>IP<br>SWIM Registry | IP<br>SWIM Registry |

# Planification et mise en œuvre de l'infrastructure l'IWXXM



## Concept SWIM



# Planification et mise en œuvre de l'infrastructure l'IWXXM



**Migration to AMHS and SWIM systems**

- IWXXM messages (large XML files) cannot be transmitted via the legacy AFTN (Aeronautical Fixed Telecommunication Network).
- Efforts are underway to improve the Aeronautical Fixed Service (AFS) and ensure that all circuits use the Advanced Message Handling System (AMHS) to support the exchange of XML/GML data.
- Requirement: Migrate AFTN switches to modern messaging switches capable of handling digital exchanges (AMHS with File Transfer Body Part (FTBP) capability) and interconnect them. Communication protocols include AFTN, AMHS Basic, AMHS File Transfer Body Part (FTBP), AMQP, and HTTP across various ASBU Blocks.
- Outlook: States will eventually migrate to SWIM (System Wide Information Management), compatible with AMQP, for the exchange of IWXXM messages.
- Conversion and production of data in IWXXM format.

# Planification et mise en œuvre de l'infrastructure l'IWXXM

## IWXXM Data Conversion and Production Software

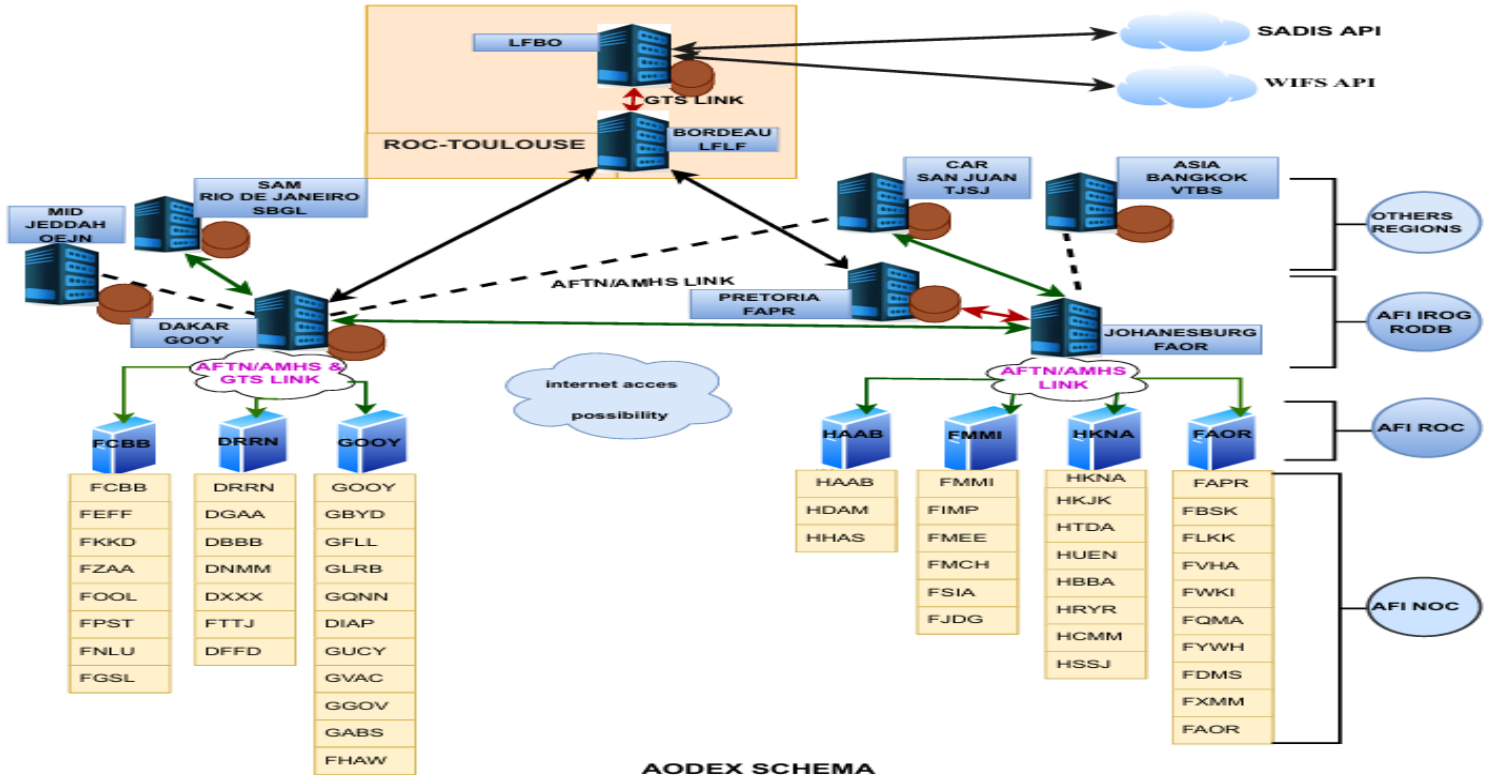
- Translation and Production Tools (Software)
- **Required**: Translation software or translation gateway. This software is mainly used to convert TAC data into IWXXM for international dissemination.
- **Optimal long-term solution**: Native IWXXM production software. Although translation is currently functional, it is not the preferred long-term solution, as future IWXXM elements may not have TAC equivalents.
- **In the long term**, it is necessary to have software capable of natively producing TAF and SIGMET (as well as manually produced METAR) in IWXXM (and initially in TAC).

# Status of implementation of the IWXXM at the global level

**Implementation status of the communication infrastructure for IWXXM data exchange**

# Etat de  mise en œuvre de l'infrastructure de communication pour les échanges des  données IWXXM

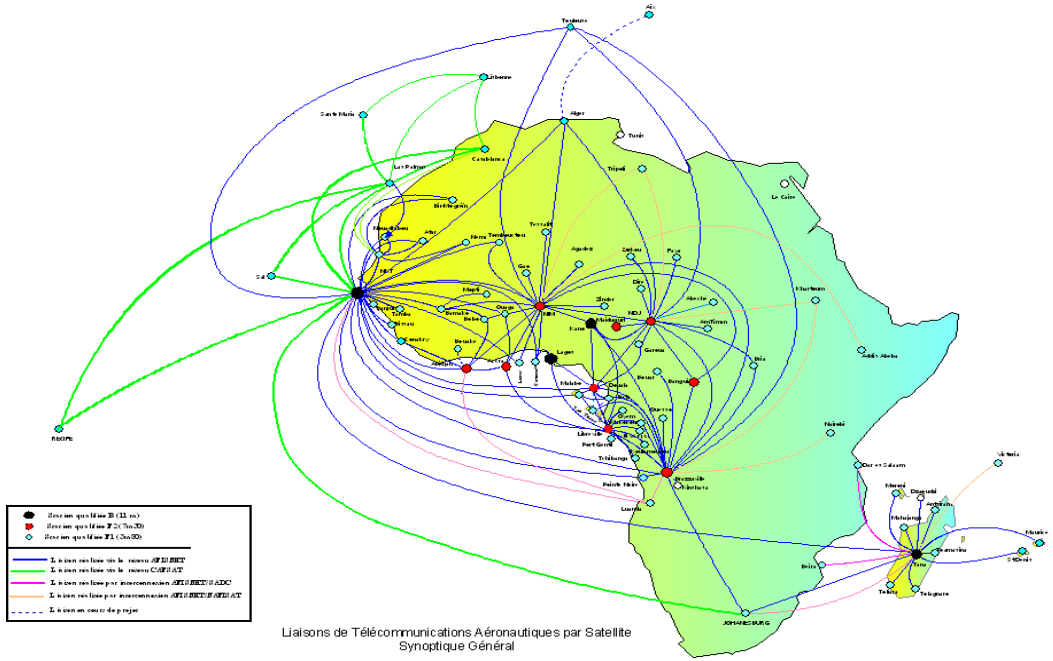
## Architecture des échanges des données OPMET (TAC/IWXXM)

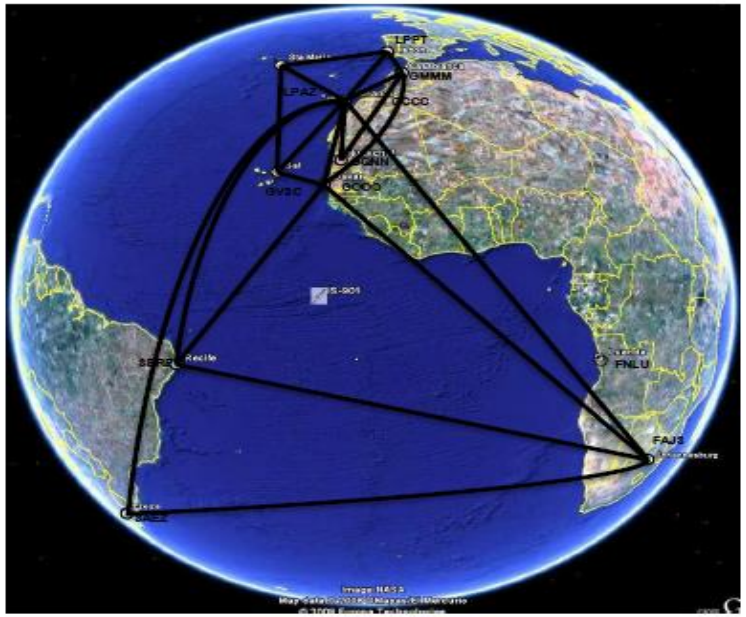


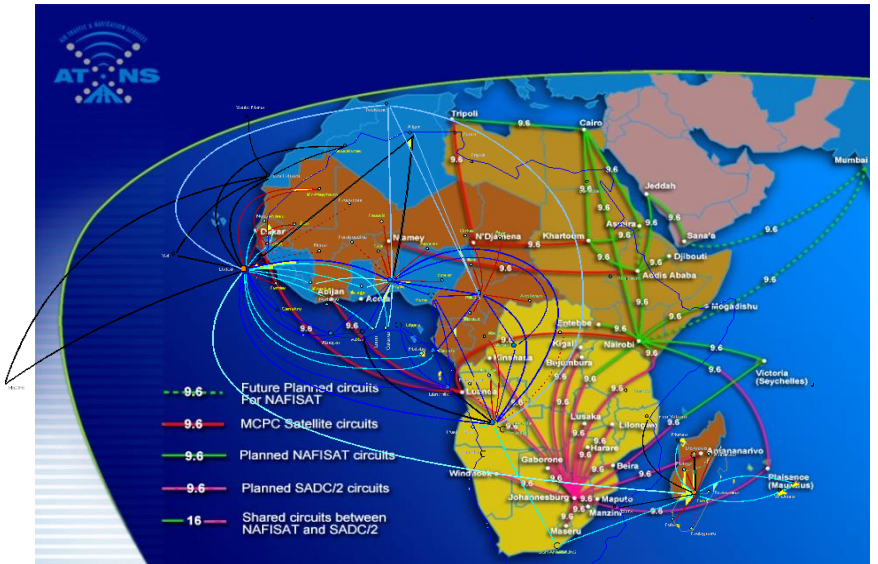
# Status of the communication infrastructure for IWXXM data exchange



## Backbone of the AFI Satellite Communications Network





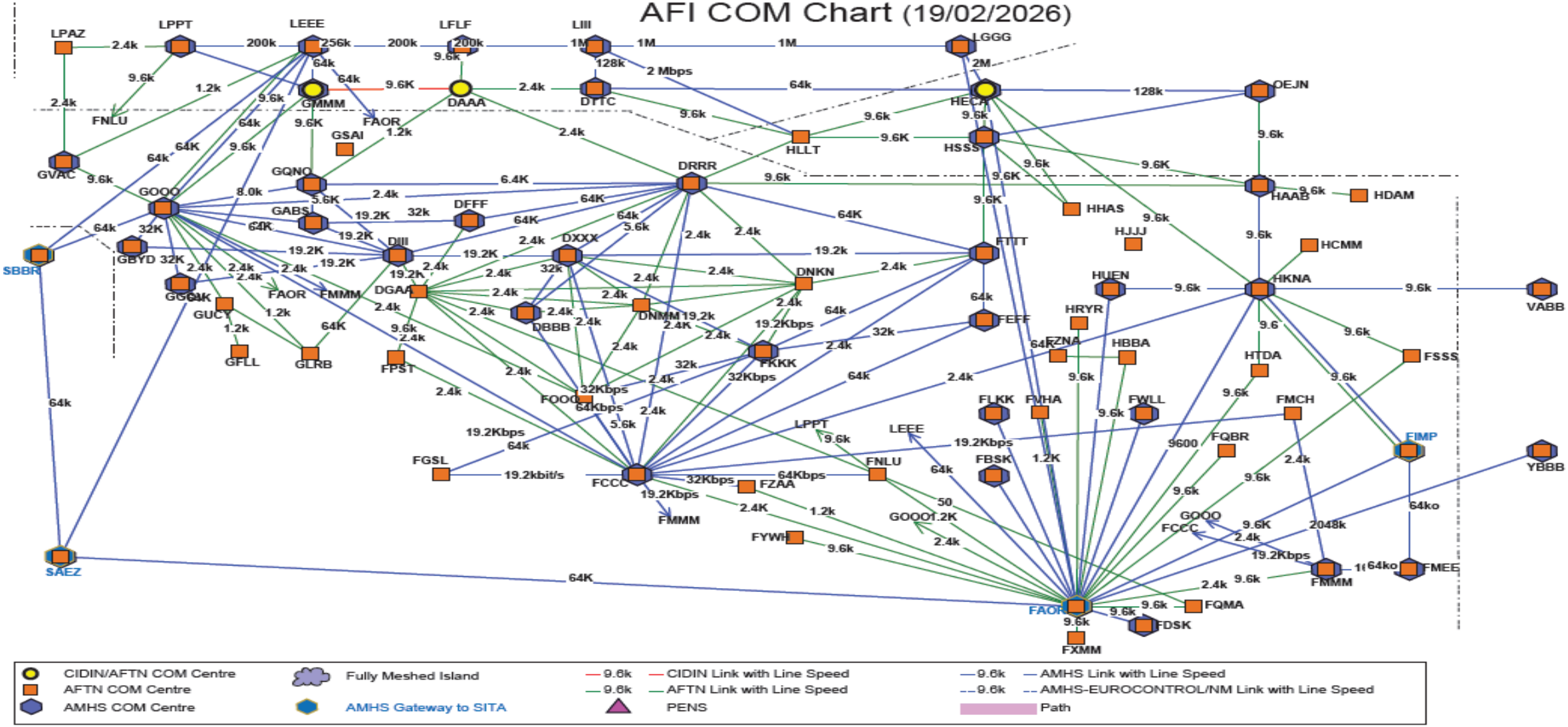

Aeronautical VSAT network infrastructure operating in C-Band supporting:

- **AM(R)S (extended VHF )**
- **AFS Aeronautical Fixed Service**
- **ANRS (GNSS GBAS, SBAS)**
- **Meteorological Data exchanges**
- **Surveillance data exchanges**

# Status of the communication infrastructure for IWXXM data exchange



## Etat de mise en œuvre de l'AMHS en support de l'IWXXM dans région AFI.



# Implementation challenges

**Challenges remain, including:**

- Production and exchange of Data in IWXXM format;
- Interconnections of systems and networks of the different ANSPs in the AFI region;
- Deployment of a secure IP network infrastructure (ATN/IPS) across the AFI region;
- Upgrading the communication infrastructure of the AFI VSAT networks necessary to support future ATM & MET services (AMHS, SWIM-IWXXM);
- Operationalization of connections between AMHS systems;
- Organization of data exchange tests in IWXXM format;
- Capacity building for MET/COM staff.

# Conclusion



- **Implementing a communication infrastructure that meets the requirements is essential** to ensure the exchange of IWXXM data across the AFI region and with other regions.
- Gradually:
  - the region should focus on the **smooth migration of the region to the AMHS system with FTBP capability;**
  - **Upgrading** the **regional VSAT AFI infrastructure**;
  - **Implementing the SWIM architecture in a proper manner**, transporting and disseminating aviation weather information in structured XML format throughout the AFI region and worldwide**.**

# Thank You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