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Guidelines for the Implementation of OPMET Data Exchange using IWXXM in the EUR Region (EUR Doc 033)

EUR DMG (Data Management Group)

ROC/IWXXM Implementation Workshop, Cairo/12-13 Nov 2017

Brief History (1)

- Work on first draft started March 2013 by DMG (together with PT/MARIE & Eurocontrol)
- AMD 76 to ICAO ANNEX 3 (Nov. 2013) enabled states in the position to do so, to exchange OPMET data also in XML
- First version of CONOPS - Concept of Operations (EUR Doc 033) issued Nov. 2015
- CONOPS adopted as global document by METP in Oct. 2016 and renamed into "*Guidelines for the Implementation of OPMET Data Exchange using IWXXM*"
- Each ICAO-Region to maintain a regional version to cover regional features
  - EUR Doc 033 V2.0 - 23.09.2016
  - EUR Doc 033 V3.0 - 23.09.2017

Brief History (2)

- AMD 77 to ICAO ANNEX 3 (Nov. 2016) ➔ states **should** disseminate data also in IWXXM

1.1.2   **Recommendation**.— *TAF should be disseminatedin* digital *form in addition to the dissemination of the TAF in accordance with 1.1.1.*

1.1.3   TAF if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

1.1.4   TAF if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model, XML/GML and the metadata profile is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information *(Doc 10003).*

Brief History (3)

- AMD 78 to ICAO ANNEX 3 (Nov. 2018) ➔ states **shall** disseminate data also in IWXXM beginning 5 November 2020

1. **CRITERIA RELATED TO TAF**

1.1 TAF format

. . .

1.1.2   **Recommendation.—** *Until 5 November 2020,* TAF should be disseminated in ~~digital~~ IWXXM GML *form* in addition to the dissemination of the TAF in accordance with 1.1.1.

1.1.3   ~~TAF if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).~~ From 5 November 2020, TAF shall be disseminated in IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.

~~1.1.4   TAF if disseminated in digital form shall be accompanied by the appropriate metadata.~~

Note.— Guidance on ~~the information exchange model~~ IWXXM, ~~XML/GML and the metadata profile~~ is provided in the Manual on the ICAO Meteorological Information Exchange Model (IWXXM) ~~Digital Exchange of Aeronautical Meteorological Information~~ (Doc 10003).

Why not staying with TAC?

- WMO decision to move to BUFR
- TAC data is not geo-referenced
- Coding exceptions are commonly used by states
- Extension of TAC code not easily possible
- IWXXM is necessary as a first step towards SWIM (System Wide Information Management)

What to find in EUR Doc 033?

- Current Operations and Capabilities
- Principles for the transition from TAC to IWXXM
- Definitions of the new Functionalities
- Requirements to Transition

New Functionalities & Definitions (1)

- Originating Unit ➔ New Description as
  - TAC-Data Producer; or
  - IWXXM-Data Producer
- NOC ➔ Functions as
  - Data Aggregator
  - Data Switch
  - Data Translator
- ROC ➔ Functions as
  - Data Aggregator
  - Data Switch
  - Data Translator

New Functionalities & Definitions (2)

- IROG ➔ Functions as
  - Data Switch
- RODB ➔ Supports
  - TAC requests ~ RQM/
  - IWXXM requests ~ RQX/

Exchanging IWXXM-Data (1)

- IWXXM-Data 50-70 times bigger than AFTN-Limit of 1800 characters

- Solution ➔ Send as File using Extended AMHS

    – FTBP (File Transfer Body Part)

    – Compression ➔ still 2-5 times bigger

- File naming according to WMO naming convention

- Bulletin Header included in Filename (necessary for MET-Switch to route data properly)

Exchanging IWXXM-Data (2)

METAR (34 METARs)
=====
TAC bulletin size: 3.6Kb
IWXXM bulletin size: 198Kb
GZIP-compressed IWXXM bulletin size: 9.9Kb

TAF (12 TAFs)
===
TAC bulletin size: 1.4Kb
IWXXM bulletin size: 103Kb
GZIP-compressed IWXXM bulletin size: 5.2Kb

Exchanging IWXXM-Data (3)

WMO naming convention

A_TTAAiiCCCCYYGGgg*BBB*_**C**_CCCC_YYYYMMddhhmmss**.xml.[compression_suffix]**

- Elements in **black and bold** are fixed elements
- TTAAiiCCCCYYGGgg is the current WMO header with the date time group
- *BBB* is optional (as usual)
- CCCC is the repeated CCCC part from TTAAiiCCCC
- YYYYMMddhhmmss is the date/time group
- Compression suffix is not officially defined

Exchanging IWXXM-Data (4)

WMO T_1T_2 definitions for IWXXM data

- Aviation Routine Report (*METAR*):   *LA*
- Aerodrome Forecast (*"short" TAF*) (VT < 12 hours):   *LC*
- Tropical Cyclone Advisory   LK
- Special Aviation Weather Reports (*SPECI*):   *LP*
- Aviation General Warning (*SIGMET*):   *LS*
- Aerodrome Forecast (*"long" TAF*) (VT >= 12 hours):   *LT*
- Volcanic Ash Advisory   LU
- Aviation Volcanic Ash Warning (*VA SIGMET*):   *LV*
- AIRMET   LW
- Aviation Tropical Cyclone Warning (*TC SIGMET*):   *LY*

Operating Principles (1)

- Managing the Transition
  – Dedicated Group per Region beneficial (DMG in EUR; BMG in MID)
  – METP WG-MIE (Meteorological Information Exchange) to co-ordinate on a global level
- Variances to the IWXXM Model
  – National extensions to comply to IWXXM-model
  – Only supported when accompanied by necessary XML-tags
  – Prevention of abuse of extensions

Operating Principles (2)

- Translation
    - Target is to produce TAC & IWXXM at source
    - Translation shall only take place once to prevent different versions
    - No translation from IWXXM to TAC
    - Translation Centre and date/time of translation to be included in IWXXM-message
    - If translation fails IWXXM message shall be produced without any MET-parameters but containing the original TAC-message

Operating Principles (3)

- Data Collection
  - Bulletin realized by "feature collection"
  - Aggregating Centre Identifier and date/time group in XML
  - *All report types shall use "feature collection, not only METAR or TAF but also types like SIGMET, AIRMET or advisories*
  - One bulletin only contains either TAC or IWXXM data
  - Single File contains only one bulletin
- Transmission & Routing
  - AMHS will be used for exchange
  - Filename used as data identifier

Operating Principles (4)

- Compliance Testing
  - Software/Testing Platforms will be made available for states
    http://wmo-icao-validator.rap.ucar.edu/

- Databank
  - ICD will be provided to describe query structure, answers,…
  - IWXXM-requests use similar rules as for TAC
- Aeronautical Information Metadata
  - Included as metadata in IWXXM
  - Problem especially for Translation Centres to have this available (e.g. FIR shape)
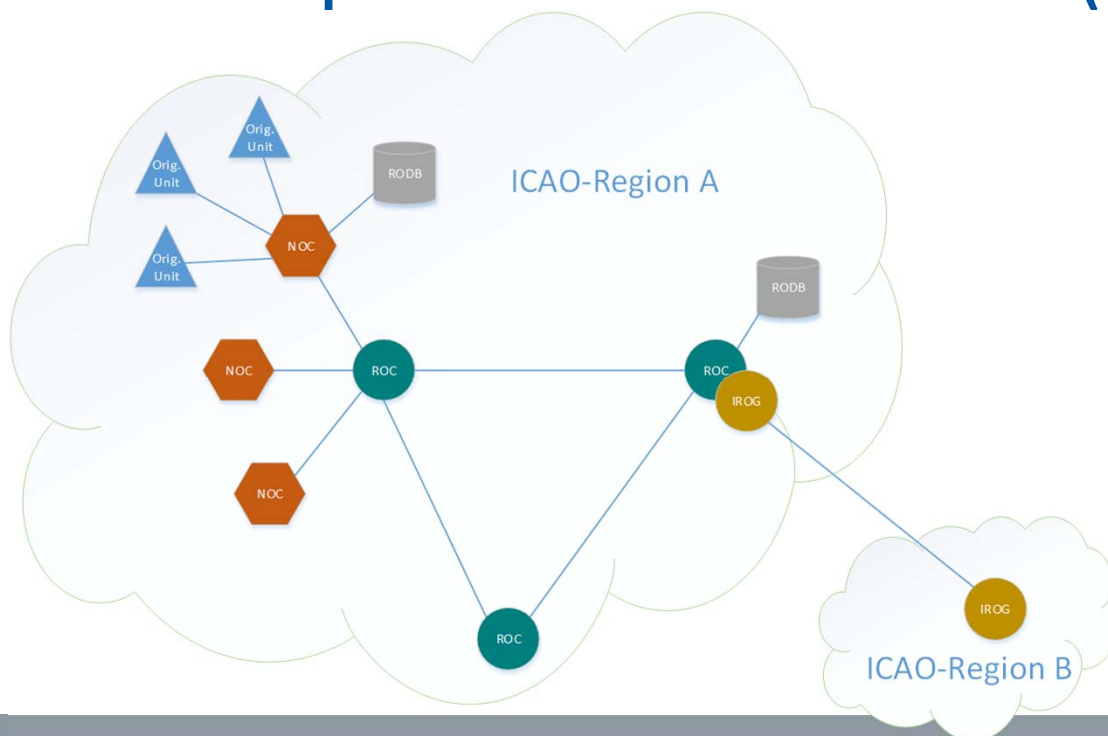 - Could be provided via a link to the AIXM-model

EUR Doc 033 – ver. 3.0 (Sep 2017)

– Provided link to the EUR Doc 020 ➔ new App. H

- AMHS-Schema for IWXMM data
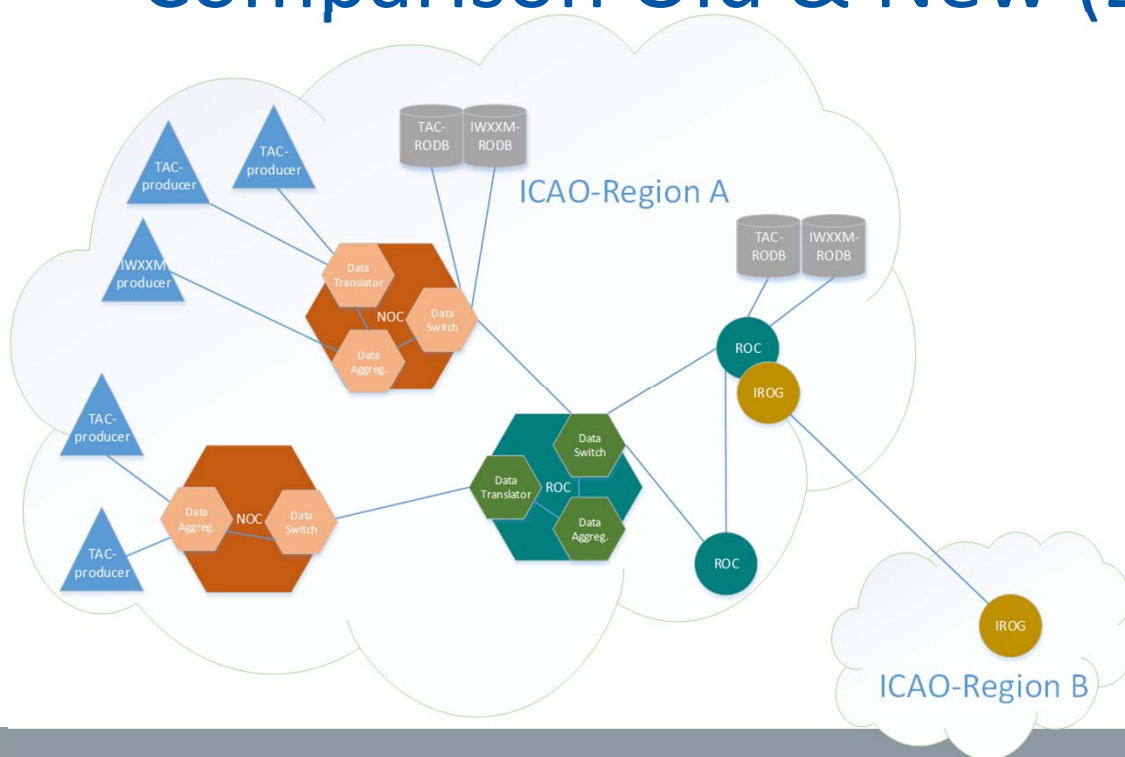- Test scenarios for exchanging IWXXM UA ⇔ MTA

Comparison Old & New (1)

Comparison Old & New (2)