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MET SWIM **implementation in** **Europe & CP1**

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Future MET SWIM – changes for regulated MET Services

- In **future** SWIM, all regulated MET services will become data based. Current products including TAF and METAR will be replaced by upcoming new MET Information Services
 - Separate services initially for observations and forecasts, later also for warnings and possible new services
 - New Information Services will contain significantly more information as compared to current products. More parameters, more frequent update intervals (especially OBS) and longer valid times (FCST).
 - On an ICAO level, the basic minimum requirements will be based on current products/requirements (eg. METAR, TAF etc), but significantly enhanced services will be enabled and allowed for those capable of producing advanced information
- Change will not happen instantly, old and new services will co-exist for years. At first, the old products in TAC format will be phased out, and at a later phase the same will be done for current IWXXM products.

What are IWXXM's?

METAR in TAC format:

METAR EFHK 240920Z **01007KT 350V050**
9999 VCSH SCT005 BKN033 FEW040CB
15/13 Q1010 TEMPO BKN006=



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    gml:id="uuid.b8fad97f-0fe8-41ed-bf31-9e9637ccec57">
    <iwxxm:airTemperature uom="Cel">15</iwxxm:airTemperature>
    <iwxxm:dewpointTemperature uom="Cel">13</iwxxm:dewpointTemperature>
    <iwxxm:qnh uom="hPa">1010</iwxxm:qnh>
    <iwxxm:surfaceWind>
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        <iwxxm:meanWindDirection uom="deg">10</iwxxm:meanWindDirection>
        <iwxxm:meanWindSpeed uom="[kn_i]">7</iwxxm:meanWindSpeed>
        <iwxxm:extremeClockwiseWindDirection uom="deg">50</iwxxm:extremeClockwiseWindDirection>
        <iwxxm:extremeCounterClockwiseWindDirection uom="deg">350</iwxxm:extremeCounterClockwiseWindDirection>
      </iwxxm:AerodromeSurfaceWind>
    </iwxxm:surfaceWind>
    <iwxxm:visibility>
      <iwxxm:AerodromeHorizontalVisibility>
        <iwxxm:prevailingVisibility uom="m">10000</iwxxm:prevailingVisibility>
        <iwxxm:prevailingVisibilityOperator>ABOVE</iwxxm:prevailingVisibilityOperator>
      </iwxxm:AerodromeHorizontalVisibility>
    </iwxxm:visibility>
    <iwxxm:presentWeather xlink:href="http://codes.wmo.int/306/4678/VCSH"/>
    <iwxxm:cloud>
      <iwxxm:AerodromeCloud>
        <iwxxm:layer>
          <iwxxm:CloudLayer>
            <iwxxm:amount xlink:href="http://codes.wmo.int/49-2/CloudAmountReportedAtAerodrome/SCT"/>
            <iwxxm:base uom="[ft_i]">500</iwxxm:base>
          </iwxxm:CloudLayer>
        </iwxxm:layer>
        <iwxxm:layer>
          <iwxxm:CloudLayer>
            <iwxxm:amount xlink:href="http://codes.wmo.int/49-2/CloudAmountReportedAtAerodrome/BKN"/>
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        </iwxxm:layer>
        <iwxxm:layer>
          <iwxxm:CloudLayer>
            <iwxxm:amount xlink:href="http://codes.wmo.int/49-2/CloudAmountReportedAtAerodrome/FEW"/>
            <iwxxm:base uom="[ft_i]">4000</iwxxm:base>
            <iwxxm:cloudType xlink:href="http://codes.wmo.int/49-2/SigConvectiveCloudType/CB"/>
          </iwxxm:CloudLayer>
        </iwxxm:layer>
      </iwxxm:AerodromeCloud>
    </iwxxm:cloud>
  </iwxxm:MeteorologicalAerodromeObservation>
</iwxxm:observation>
```

The now: CP1 requirements for MET

- EU legislation: Common Project 1, setting general requirements for (MET) SWIM Service provision in the EU region
- SESAR Deployment Programme (SDM) outlined requirements in much more detail
- The SWIM Yellow Profile together with the relevant Service Definitions set the technical requirements
- Deadline of MET SWIM requirements in CP1 was 31.12.2025 -> Services were expected to be operational (and in use) by the end of 2025



About MET3SG and CP1

- MET3SG: Meteorological SWIM Services Sub-Group
 - Main group for relevant stakeholders in European MET SWIM, consisting of MET SP's, industry and user representatives
 - Co-chaired by Eurocontrol and EUMETNET
 - Supported by ECTRL and SDM
 - Close collaboration with EUMETNET on SWIM implementation
 - Main tasks of MET3SG:
 - Support all stakeholders in MET CP1 implementation
 - Discuss and agree on a common approach for CP1 MET
 - Develop necessary guidance for the MET SWIM implementation in Europe
 - Main results:
 - Harmonization of MET SWIM for CP1
 - Contribution into updates of the SESAR Deployment Programme
 - Development of Service Definitions for CP1 and beyond
 - Development of necessary guidance for AMQP and EDR implementations



Main requirements for CP1 / MET

CP1 regulation only sets the high-level requirements, the more detailed requirements are listed in the SESAR Deployment Programme.

SD programme update 2024, Family 5.4.1. – Meteorological Information Exchange:

Service	Service Provider	Service Consumer
Volcanic Ash Mass Concentration Information Service	• VAAC London³⁷ • VAAC Toulouse	• ANSPs • NM • Cert. MET providers (MWO, WAFC and other VAACs) • <i>AUs (recommended)</i>³⁸
Aerodrome Meteorological Information Service	• Cert. MET Service Providers ◦ AMS ◦ AMO	• ANSPs • METPs • <i>AUs (recommended)</i>³⁸
En-Route and Approach Meteorological Information Service	• Cert. MET providers ◦ AMO ◦ MWO ◦ WAFC	• ANSPs • <i>AUs (recommended)</i>³⁸
Network Meteorological Information Service	• Cert. MET provider(s) ◦ MWO	• NM • ANSP* • <i>AUs (recommended)</i>³⁸

Relevant Information Services:

~ QVA (VAAC's)

~ IWXXM METAR & TAF

~ IWXXM SIGMET & WAFS (SADIS API)

~ CBCF

Guidance for CP1 MET services

In addition to CP1 and Sesar Deployment Programme:

- Service Definitions, developed by MET3SG, can be found in the Eurocontrol SWIM Registry
 - <https://eur-registry.swim.aero/services/eurocontrol-iwxxm-metar-speci-subscription-and-request-service-10>
 - <https://eur-registry.swim.aero/services/eurocontrol-iwxxm-taf-subscription-and-request-service-10>
 - <https://eur-registry.swim.aero/services/eurocontrol-iwxxm-sigmet-subscription-and-request-service-10>
 - <https://eur-registry.swim.aero/services/eurocontrol-quantitative-volcanic-ash-concentration-information-subscription-and-request>
- Additional in-detail technical documentation has been developed (by MET3SG) to ensure seamless interoperability within MET SWIM. The guidance documentation is available on the ECTRL Confluence site:
 - <https://swim-eurocontrol.atlassian.net/wiki/spaces/MSS/pages/638156804/AMQP+Message+Structure+in+MET-SWIM>
 - <https://swim-eurocontrol.atlassian.net/wiki/spaces/MSS/pages/630194181/MET+SWIM+OGC+EDR+Guidance>



CP1 MET services in the EU (provision)

- CP1 MET SWIM services to be **provided** by all European MET SP's are:
 - **METAR, TAF, SIGMET in IWXXM format**
 - Same operational data as shared via AFS
 - TAC messages not shared via interfaces at all
 - One SWIM service per state (per service type, e.g. METAR)
 - **Services to be made available via:**
 - **Publish-subscribe: AMQP1.0**
 - **Request-reply: OGC EDR API**
 - Older OGC standards also still allowed, new services should be EDR API
- SADIS API and QVA data provided by relevant ICAO mandated centres: Met Office (WAFC & VAAC) and Meteo France (VAAC)
- CBCF provided by EUMETNET



CP1 MET services in the EU (consume)

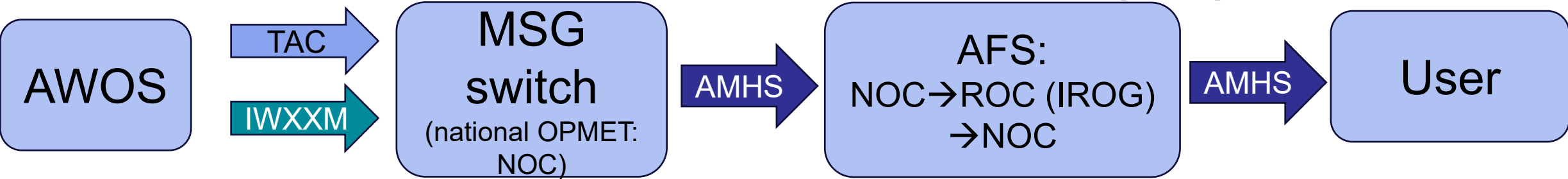
CP1 MET services to be **consumed** by MET SP's and ANSP's:

- METAR, TAF and SIGMET SWIM API's
 - At least neighbouring countries?
 - At the FMI: via the NAMCON common broker
- SADIS API
 - WAFC London: Met Office EDR API
 - New and improved SADIS gridded data
 - New SIGWX data in IWXXM format
- QVA (Quantitative Volcanic Ash)
 - VAAC London (Met Office) & VAAC Toulouse (Meteo France)
 - New volcanic ash data, both gridded data (deterministic and probabilistic) and IWXXM objects

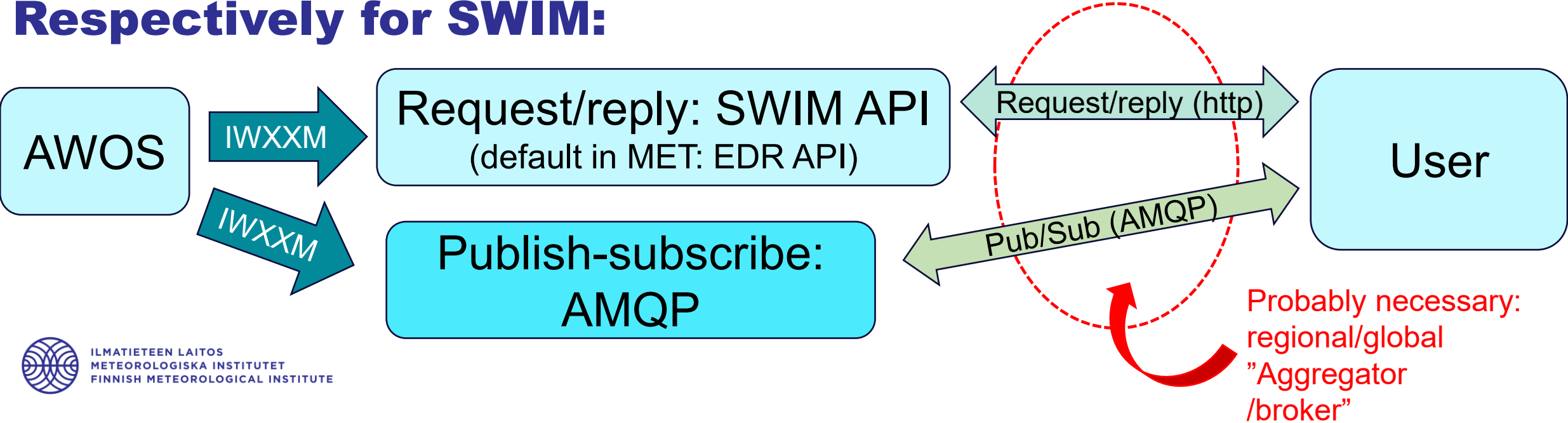


Example: Current production chain vs SWIM: Aviation observations / AWOS

Operational production chain via AFS network (FMI):



Respectively for SWIM:



CP1 implementation status

- As the necessary guidance was late in being developed, implementation timelines were very tight
- However, most MET SP's managed to get their SWIM Information Services operational by the end of 2025
- SADIS API and the QVA information services also became operational in 2025
- Understandably, users have had difficulty making the deadlines (as services just became online), and it will take several years for all the users to adopt their systems to using the new services
- Basically, for METAR, TAF and SIGMET the same IWXXM's are now offered via SWIM Services (vs. AMHS). Users can decide how to access the data.
- **Maybe most importantly, the MET SWIM infrastructure is now in place in Europe, enabling implementation of future new Information Services much more easily!**



MET SWIM schedule (EU), as seen in 2024

1. EU-regulation, CP1: by the end of 2025

- Current operational "legacy" IWXXM-services via SWIM
 - METAR, TAF, SIGMET
- SWIM APIs in operation

DONE!
(well, mostly)

2. New SWIM MET Information Services

- ICAO regulation still under development, **likely approved by METP/7 in late 2027**
- Current estimates for the EU region:
 - Aerodrome Observation Information Service ~2029
 - Aerodrome Forecast Information Service ~2030
 - Hazardous Weather Information Service (HWIS) ~2030

Might be pushed forward a little?

3. Global implementation timelines likely to be somewhat later

	Q1- Q2/2024	Q3- Q4/2024	Q1- Q2/2025	Q3- Q4/2025	Q1- Q2/2026	Q3- Q4/2026	Q1- Q2/2027	Q3- Q4/2027	Q1- Q2/2028	Q3- Q4/2028	Q1- Q2/2029	Q3- Q4/2029	Q1- Q2/2030	Q3- Q4/2030
AMOIS														
AMFIS														
HWIS information Service														



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Thank you for listening!

