METEOROLOGY PANEL

GANIS/2

Meteorology Session
– Transition to a SWIM environment

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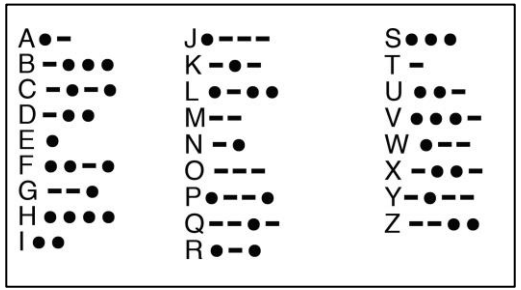
The ICAO Meteorological Information Exchange Model (IWXXM) and the transition to a System Wide Information Management (SWIM) Environment

The introduction of SWIM will see a complete change in the culture and nature of aviation meteorological (MET) services that will evolve over time. It is essential that there is clarity regarding what MET services are required, how users will access MET information in a SWIM environment and what is needed to provide these services. Effective engagement between the suppliers and users of this information is crucial to achieving long term objectives.

Traditional Alphanumeric Code (TAC)

- Transmitted by Morse code and teleprinter
- Limited character length
- Human-readable
- Examples: METAR/SPECI, TAF, AIRMET, SIGMET, VAA, TCA
- Inflexible

Nothing much has changed with the MET code forms in the last 70 years



Aerodrome Forecast

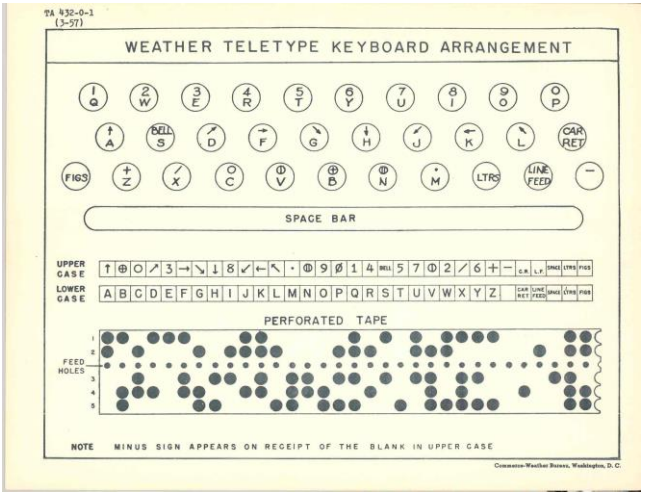
1948: TAMET 00181 UDO 6310 9703/ 88820 43505 55004 92024

2016: TAF YUDO 151800Z 1600/1618 13010 9000 BKN020 BECMG 1606/1608 SCT015CB BKN020 TEMPO 1608/1612 17015G30 1000 TSRA SCT010CB BKN020 FM161230 15010 9999 BKN020

Communications Networks

- AFTN: dedicated lines such as radio-teletype and X.25
- AMHS: move to X.400
- Web Services

There have been steady advances in communications networks



ICAO Meteorological Information Exchange Model (IWXXM)

- MET information in XML/GML
- Supports machine-to-machine
- Integration into decision support tools
- Enables the development of cost-effective MET information displays
- Easy and reliable extraction of specific MET elements

Improving situational awareness and operational decisions.

IWXXM translated from TAC

Coded MET Products
(Traditional Alphanumeric Code)

METAR YUDO 221630Z 24008 0600 R12/1000U
DZ FG SCT010 OVC020 17/16 Q1018 BECMG
TL1700 0800 FG BECMG AT1800 9999 NSW

Translation
(IWXXM Schema & Schematron)

IWXXM
(XML / GML)

Graphical MET Products

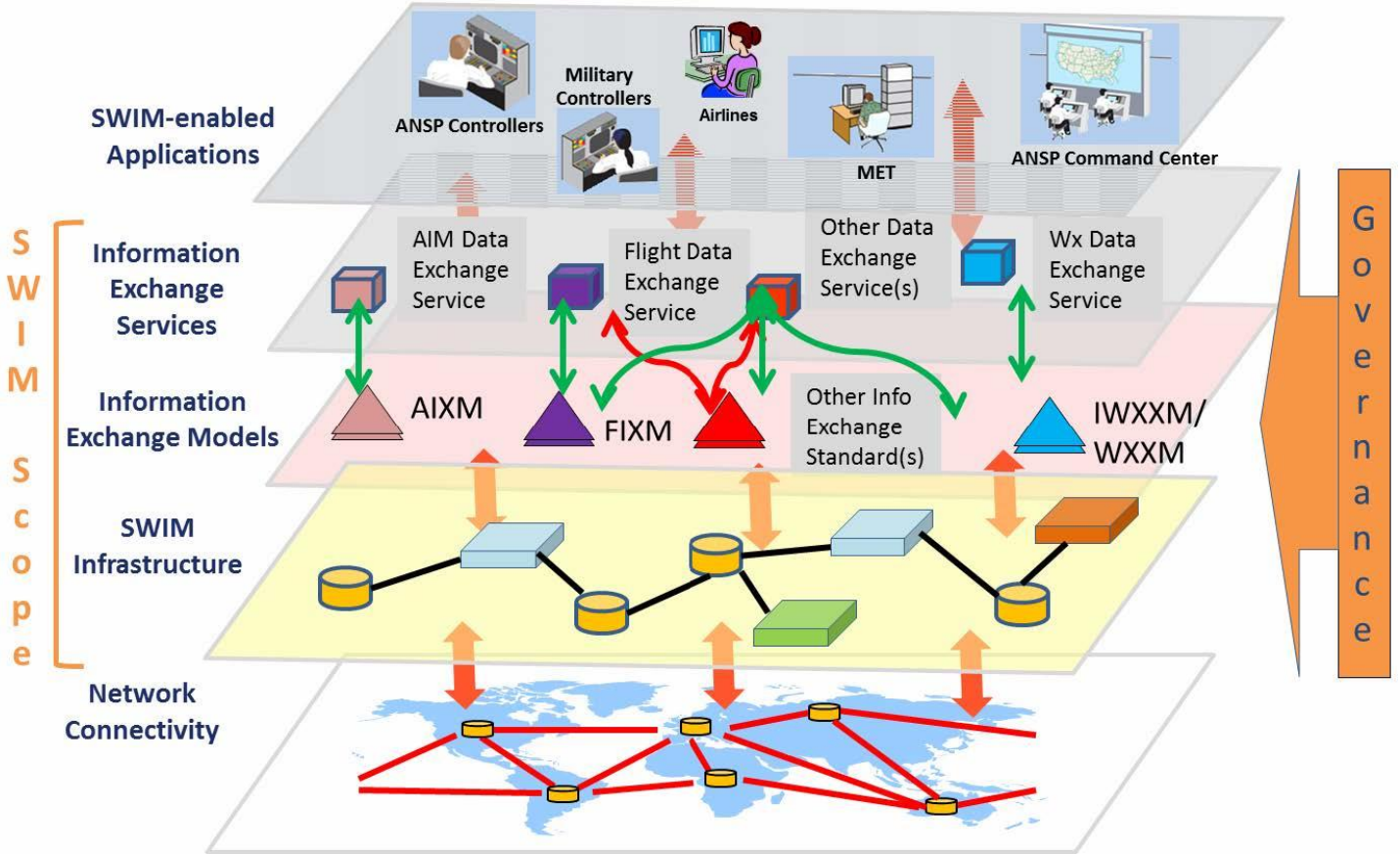
Gridded MET Products

System Wide Information Management (SWIM)

- Increased sharing of information
- Flexible and secure information management
- Common situational awareness
- High quality, timely information in a range of formats for optimal decision-making
- Machine-to-machine communications to complement human-to-human communications
- Improved data distribution and accessibility

Quality information to the right people with the right systems at the right time.

SWIM


SWIM-enabled Applications
ANSP Controllers
Military Controllers
Airlines
MET
ANSP Command Center
SWIM Scope
Information Exchange Services
AIM Data Exchange Service
Flight Data Exchange Service
Other Data Exchange Service(s)
Wx Data Exchange Service
Information Exchange Models
AIXM
FIXM
Other Info Exchange Standard(s)
IWXXM/ WXXM
SWIM Infrastructure
Network Connectivity
Governance

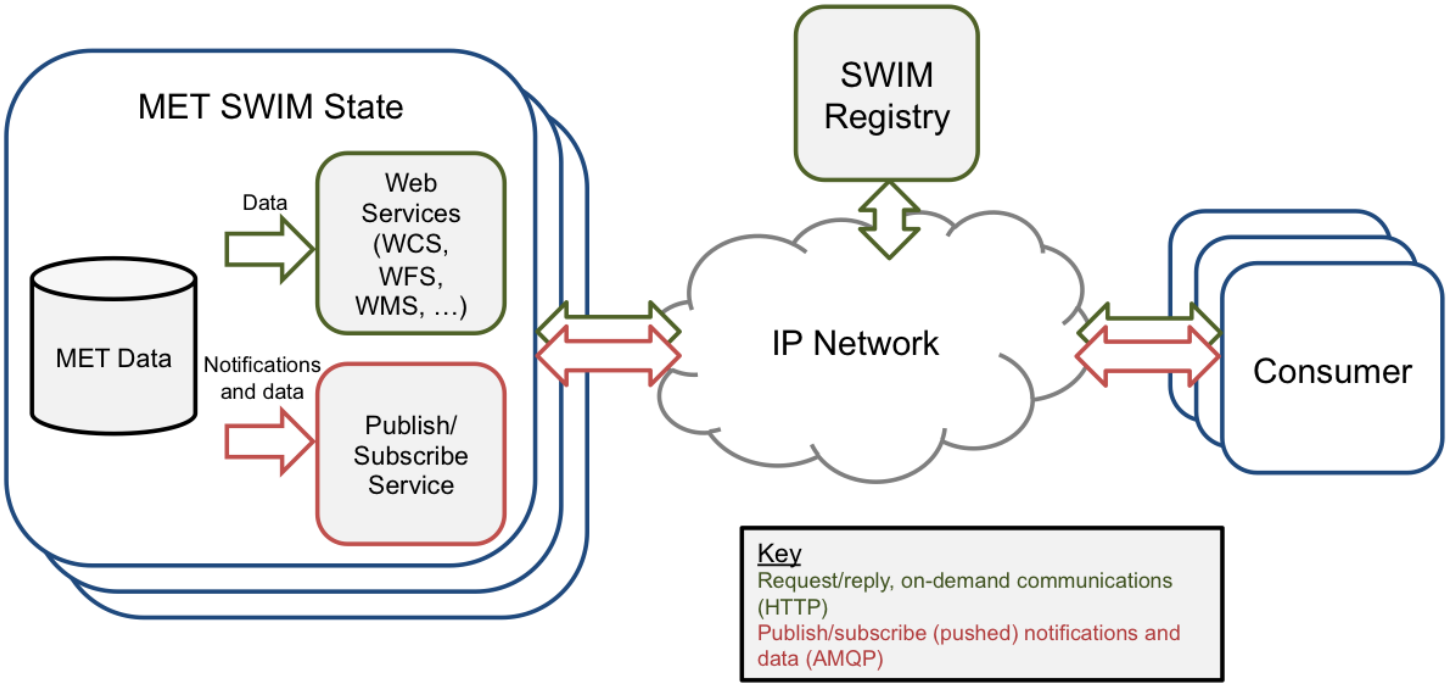
MET in SWIM

Supporting:

- ✈ Flexible airspace management
- ✈ Airborne re-routing
- ✈ Improved situational awareness
- ✈ Collaborative decision-making
- ✈ Dynamically optimized flight trajectory planning
- ✈ ATM impact conversion and ATM decision support
- ✈ Hazard avoidance

Supporting operational efficiency and safety

MET in SWIM


MET SWIM State
Data
Web Services (WCS, WFS, WMS, …)
MET Data
Notifications and data
Publish/ Subscribe Service
SWIM Registry
IP Network
Consumer
Key
Request/reply, on-demand communications (HTTP)
Publish/subscribe (pushed) notifications and data (AMQP)

MET in SWIM

Improved Services:

- Higher temporal and spatial resolution
- Improved and user-defined visualisation
- Change from product-centric to data-centric information
- Phenomena-based rather than FIR-based
- Improved climatological data and climate change information.

MET is an enabler for a future globally interoperable aviation environment

New Services:

- Probability of occurrence and forecast uncertainty
- Space weather, Sulphur dioxide (SO_2), High ice water content

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Thank you!