



International Civil Aviation Organization

WORKING PAPER

AN-Conf/13-WP/263
29/9/18
(Information Paper)
English only

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

- Agenda Item 3: Enhancing the global air navigation system**
3.1: System-wide information management (SWIM)

UAE'S SWIM GATEWAY

(Presented by the United Arab Emirates)

EXECUTIVE SUMMARY

This paper provides information on the progress made by the United Arab Emirates (UAE) with the implementation of the system wide information management (SWIM) Gateway.

1. INTRODUCTION

1.1 The UAE air traffic management (ATM) community is collaboratively building a nationwide system architecture following the principles of SWIM.

1.2 As one of the first SWIM-enabled services, the UAE SWIM Gateway recently entered into operational service and will provide a major step towards a nationwide SWIM architecture. The UAE SWIM Gateway harmonises and consolidates real-time data of flight-related information between the existing legacy systems and those of new SWIM-enabled capabilities.

2. DISCUSSION

2.1 The objective of the UAE's SWIM Gateway is to enable access to high quality, consistent and consolidated flight-related information to the UAE aviation community. The system collects flight-related information from various systems, validates the information and consolidates this into flight objects.

2.2 Information is gathered through a data aggregation process and starts with the airline schedules, as well as conventional flight plan messages received from the aeronautical fixed telecommunication networks (AFTN). This flight plan information then generates flight objects which are assigned unique identifiers.

2.3 Flight plan information is automatically validated against static airspace data imported into the system using aeronautical information management (AIM) by means of the Aeronautical Information Exchange Model (AIXM).

2.4 Once generated, flight objects are continuously updated with air traffic services (ATS) messages and 4D trajectory information received from multiple data sources, including legacy flight plan data processing (FDPS), arrival manager (AMAN) and the departure flow manager (DFLOW). DFLOW provides functionality to optimise the airspace utilisation by the allocation of assigned calculated take-off times (CTOT) during peak demand.

2.5 An additional source of information is the European Organisation for the Safety of Air Navigation (EUROCONTROL) Network Manager (NM), which supports the UAE SWIM Gateway by providing updates on all flights within the EUROCONTROL NM area which are of interest to the UAE. The UAE SWIM Gateway in return contributes to the EUROCONTROL NM by providing flight update information for flights bound for the EUROCONTROL NM area.

2.6 Information from the various data sources is harmonised and consolidated by the UAE SWIM Gateway and represented as aggregated flight objects encoded in flight information exchange model (FIXM) format, mapping all available information to their FIXM elements. Where necessary, available information is added as custom extensions to the FIXM.

2.7 An application programming interface allows the introduction of additional customised extensions to the FIXM flight objects without the need for software modification. This enables the General Civil Aviation Authority (GCAA) to add and evaluate new business logics and applications which are immediately SWIM-enabled as they are introduced.

2.8 As a pioneering platform for a SWIM infrastructure, the UAE SWIM Gateway enables the sharing of flight information. Such information was difficult to access due to the isolation of the individual systems utilising proprietary data formats and data models. Additionally, access to data in legacy systems raised concerns towards the availability of safety-critical functionality from external systems.

2.9 By introducing the SWIM Gateway, all access to information by external and new internal systems is now channelled through a dedicated platform that maintains accurate copies of flight objects. Access to safety-critical functionality is restricted through the SWIM Gateway as read only. In addition, the UAE SWIM Gateway is safeguarded by a respective IT security environment with strict access control mechanisms.

2.10 The service is available within a secured internet protocol (IP) environment as well as through public internet. The use of the public internet was a specific request by the stakeholders to facilitate simple access without the need for a dedicated communication infrastructure.

2.11 Access is realised in accordance with the EUROCONTROL specifications for the yellow profile and supports request/response services as well as the publish/subscribe pattern. Using the open standards for access and the data presentation encourages stakeholder to support SWIM-enabled applications and harmonisation for the UAE's ATM community. Capability to monitor information is also made available to stakeholders who have not yet invested in SWIM applications by a web-server interface to authorised users.

2.12 Dubai Airports plans to become the first stakeholder to introduce a SWIM-enabled application. All information will become part of the Dubai Airport's operational management systems.

Similarly, Abu Dhabi airport is currently in preparation to integrate their Airport Operation Database (AODB, scheduled Q1/2019) and the Departure Manager (DMAN, scheduled Q4/2019) within the SWIM Gateway. Both airports will not only be data consumers but will become data providers. Emirates Airlines will also pioneer with using an initial SWIM-enabled client application to monitor the movements of their fleet.

2.13 A further step towards SWIM-enabled infrastructure will be the modernisation of the ATM automation system at Sheikh Zayed Air Navigation Centre in 2020.

3. **CONCLUSION**

3.1 The meeting is invited to note the information contained within this paper and the UAE's approach towards the implementation of a SWIM infrastructure by using a flight-related information service through the UAE SWIM Gateway.

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