



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY SIXTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION
PLANNING AND IMPLEMENTATION REGIONAL GROUP
(APANPIRG/26)**

Bangkok, Thailand, 7 – 10 September 2015

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.2: ATM

PARTICIPATION IN MINI-GLOBAL TO ENHANCE AIR TRAFFIC MANAGEMENT AND PROMOTE COLLABORATIVE DECISION MAKING

(Presented by Japan, Singapore and Thailand)

SUMMARY

This paper presents the participation of Japan, Singapore and Thailand in the Mini Global Demonstration project led by USA. It details the activities that have been conducted so far and the plans going forward towards the actual demonstration in 2016. Moreover, the paper highlights scenarios of interest to the three participating nations to explore various SWIM applications.

Strategic Objectives:

B: Air Navigation Capacity and Efficiency—Increase the capacity and improve the efficiency of the global aviation system

1. INTRODUCTION

1.1 The Mini Global Demonstration is a project led by USA to demonstrate the applicability of the global information exchange models for flight information, aeronautical information and weather information using the internationally standardized formats, i.e. FIXM (Flight Information Exchange Model), AIXM (Aeronautical Information Exchange Model), and IWXXM (ICAO Weather Information Exchange Model), respectively. The project demonstrates how Air Navigation Service Providers (ANSPs) and other aviation stakeholders are able to collaboratively make decisions using the integrated information within and across the regions to improve ATM as envisaged in the ICAO Global ATM Operation Concept.

1.2 In September 2014, the Mini Global Demonstration Phase I (MG I) held at the Florida NextGen Test Bed at Embry-Riddle Aeronautical University was conducted successfully. The MG I showcased the possible architecture for a global SWIM (System-Wide Information Management) and many use cases were prepared and demonstrated. In MG I, most of the use cases centered on the exchanging of FIXM and AIXM messages. With this remarkable accomplishment, it was announced, at the end of the MG I demonstration that the Mini Global project will be continued in Phase II, namely MG II, as a demonstration to extend the use cases as well as to build on the lessons learnt from the first demonstration.

2. DISCUSSION

2.1 The MG II project commenced in September 2014. The demonstration is planned for the week of 23 April 2016 at the Florida NextGen Test Bed.

2.2 As part of the project activities, a Technical Interchange Meeting with the Asian partners was held from 29 June to 3 July 2015 in Bangkok, Thailand. The main purpose of the meeting was to have a detailed discussion on the test scenarios / use cases to be demonstrated by the partners during the MG II demonstration as well as the technical update from the FAA and partners on the current progress of the project.

- 2.3 The project objectives are as follows
- To demonstrate the Global Enterprise Messaging Service (GEMS) interoperability
 - To establish messaging standards, governance ,and interoperability business rules
 - To extend international partnerships
 - To develop and execute complex use cases
 - To demonstrate new applications and services to benefit global aviation.

2.4 In Mini Global Demonstration project, as the way to realize the global network to connect local and regional SWIMs, the Global Enterprise Messaging Service (GEMS) is proposed. In particular, the GEMS services provided by GEMS providers offer services for FIXM/AIXM/IWXXM message exchange between the participating parties. By utilizing the GEMS, the global interoperability and harmonization options could be better assessed and analyzed through the demonstrations. It is worth mentioning that in MG I only two EMS providers were available, i.e., Harris Corporation (Harris) and Indra Sistemas, S.A. (Indra), and almost all participants connected their systems via the service provided by Harris. In MG II, Mosaic ATM (Mosaic) will join to be the third EMS provider thus creating the GEMS infrastructure.

Notional Mini Global II Architecture

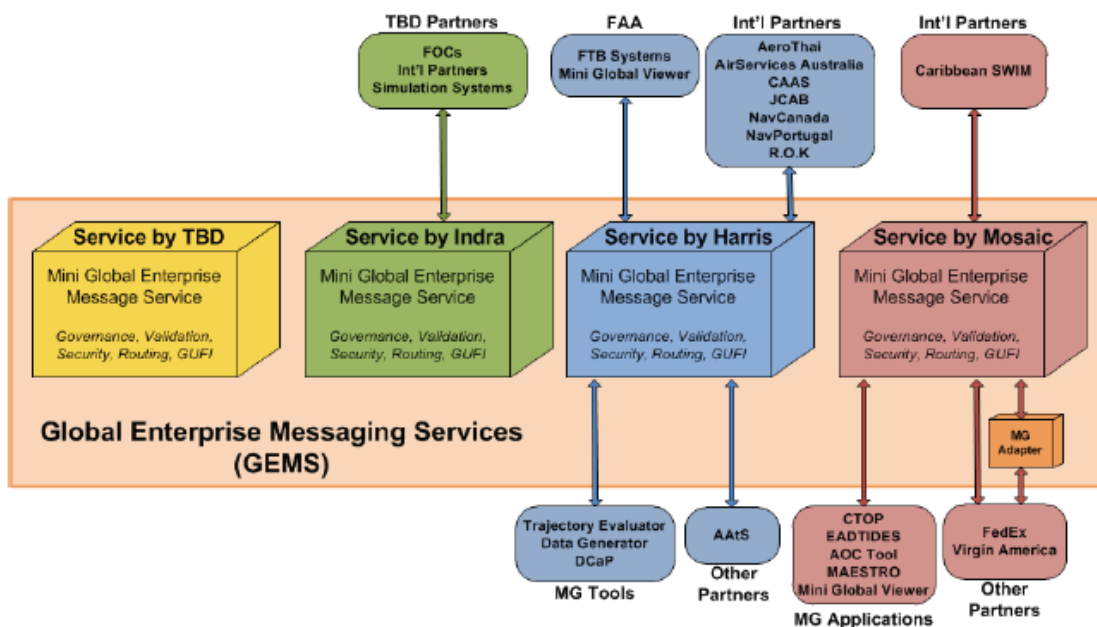


Figure 1: Notional Mini Global II Architecture

2.5 The GEMS Working Group was established to address issues related to governance and business rules for Inter-EMS data exchange in order to support regionally diverse EMS providers. Currently, Harris, Mosaic and Indra all have representatives in the Working Group.

2.6 The MG II project will continue to foster new international partnerships in order to promote the awareness and communication with global partners. Participation in this project will bring greater awareness about SWIM and the possible benefits that SWIM may bring to global ATM. Participants of MG II can be divided into four service levels, based on the participant's technological capability.

- Participation in the MG II project is still open until 28 September 2015 for following Service Levels.
 - Level 2 – Native System Consumer & Producer, i.e., the participant is able to consume and produce AIXM/IWXXM/FIXM messages using the Mini Global adaptor provided,
 - Level 3 – AIXM/IWXXM/FIXM Consumer & Producer, i.e., the participant is able to consume and produce AIXM/IWXXM/FIXM messages using his own system, and
 - Level 4 – AIXM/IWXXM/FIXM Flight Object Manager, i.e., the participant is able to consume and produce AIXM/IWXXM/FIXM messages using his own system having Flight Object Manager capability.
- Participation at following Service Level will remain open until 4 January 2016.
 - Level 1 – Consumer, i.e. the participant is only able to consume data from MG but not able to publish any data back.

2.7 It can be expected that more complex use cases will be exhibited in MG II demonstration. The focus will be given towards operational usage, in particular, how SWIM will be able to support Operations and Traffic Management as well as Data Governance concepts.

2.8 There are two proposed scenarios that are of particular interest to the participating partners. One is to investigate how SWIM can be used to support the Multi-Nodal ATFM effort that is currently undertaken by the ANSPs concerned of which Singapore and Thailand are involved in the operational ATFM trial. Another is to explore how Global Unique Flight Identifiers (GUFIs) are assigned and handled for transit flights where the same aircraft is used for both legs of the flight with a short turn-around time.

2.9 The other point of interest is the management of Data Governance by the GEMS providers. Essentially, partners in the MG II project should be able to determine the recipients of the data that they distribute. For example, the transmission of surveillance track data, which is a flight departing and arriving to/from certain airports, should only be accessible to the ANSPs where the flight operates and traverse, in order to reduce the network bandwidth required for information exchange and for the confidentiality reason. By sharing track data, ANSPs are able to extend their air situational awareness beyond their own surveillance coverage capabilities.

2.10 New applications and services, such as flight object exchange service as well as data verification and conformance service that utilize the data available in MG II, will be developed. Moreover, the applications will be evaluated through the GEMS infrastructure to demonstrate their usefulness for future consideration and potential commercialization. Participants are encouraged to develop these applications to leverage on the flexible infrastructure and rich data source.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

- a) note the information contained in this paper;
- b) consider joining the MG II demonstration project as partners;
- c) discuss how the MG II would be able to progress the APAC Seamless ATM plan;
and
- d) discuss any relevant matters as appropriate.

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