International Civil Aviation Organization

The Ninth Meeting of System Wide Information Management Task Force (SWIM TF/9)

Bangkok, Thailand, 14 – 17 May 2024

Agenda Item 4: Updates on SWIM Task Force outstanding activities
- SWIM Implementation Pioneer Ad-Hoc Group (SIPG)

Lesson Learned and Suggestions on SWIM Implementation Pioneer Group

(Presented by China)

SUMMARY

This paper presents the summary of China's participation in the implementation of SIPG, as well as the relevant suggestions for the subsequent work ideas and plans of SIPG.

1. INTRODUCTION

1.1 The SWIM Implementation Pioneer Group (SIPG) was established on the 7th meeting of the SWIM Task Force (SWIM TF/7). The purpose of SIPG is to develop and deploy the prototype/initial version of the regional SWIM before June 2024. Up to now, the overall objective of SIPG has been completed initially.

1.2 The EMS of the eight States/Administrations participating in SIPG adopts a hierarchical approach, which is consisted of four Gateway EMS and four Edge EMS, as shown in Figure 1 below. According to the topological design, China, as the Gateway EMS, has completed the physical connection with Hong Kong, China, Singapore, Thailand, and Korea, and successfully achieved SWIM information exchange based on SIPG, including flight, surveillance, and MET information.

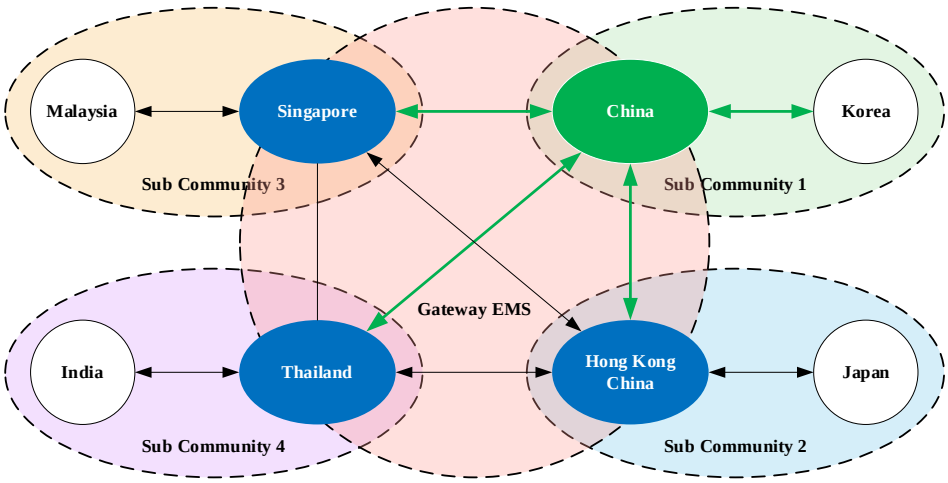

Figure 1 EMS Architecture of APAC SIPG

1.3 Moreover, in order to better support the continuous and stable implementation of SIPG, China has completed the development and deployment of monitoring software for SWIM message exchange, and carried out the research and development on SWIM Discovery Service (SDS).

2. DISCUSSION

2.1 Based on the experience of the above work, for the subsequent work of SIPG, there are three suggestions regarding the SWIM Service Registry, the SWIM Discovery Service (SDS), and Information Services Implementation.

SWIM Service Registry

2.2 SWIM Service Registry is an important way for Information Services registration and discovery. As a component of the SWIM infrastructure in the APAC region, it should be included in the regional SWIM prototype under the leadership of SIPG. Through the SWIM Service Registry, the registration and discovery of regional Information Services can be realized.

2.3 For the Registry Deployment Model, there has been a discussion in the 2nd meeting of SWIM Task Force (SWIM TF/2), comparing three models: the Local Registry Model, the Interoperable Registry Model, and the One Centralized Registry Model. The final conclusion is that the Interoperable Registry Model was the proposed model in APAC region.

2.4 Based on the above conclusion, relying on the work of SIPG, China has completed the development and deployment of the SWIM Service Registry of China. Subsequently, China is willing to cooperate with SIPG to carry out the experimental work on the SWIM Service Registry, in order to reduce some of the documentation collaborative work regarding the registration and discovery of Information Services, and further enhance the work efficiency.

SWIM Discovery Service

2.5 SDS is proposed as a means to achieve the Interoperable Registry in APAC region, making it possible to exchange Information Services metadata between independently managed SWIM projects.

2.6 It is suggested to include SDS in the subsequent work of SIPG. In the early stage, the USA/FAA, Korea/KAC, China/ATMB, and Japan/ENRI have jointly conducted researches on the adaptation and improvement of SDS in APAC region, and China is also willing to participate in the implementation and experimental work of SDS in SIPG.

2.7 Regarding the implementation method of SDS, one consideration is to combine the existing hierarchical approach of SIPG EMS, and deploy the SDS at each EMS node, where the Gateway EMS is responsible for responding and forwarding the SDS requests, and the Edge EMS is responsible for responding to the SDS requests, as shown in Figure 2 below.

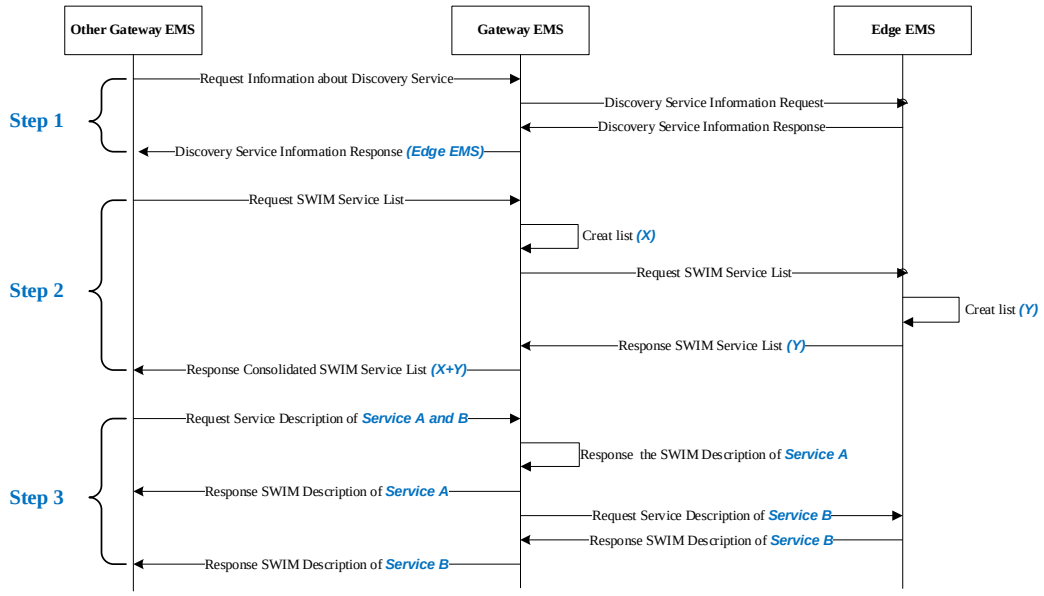

Figure 2 A proposal regarding the SDS experiment of SIPG

Information Services Implementation

2.8 SIPG has established great foundation for the prototype of the regional SWIM, for example, SWIM node of China has achieved message exchange with Hong Kong, China, Singapore, Thailand, and Korea, and serves as a Gateway EMS, to realize the message routing and forwarding functions based on the RECIPIENT_LIST information in the message headers. Now, there are four types of messages that are received and forwarded by the SWIM EMS of China, which are heartbeat, flight, surveillance, and MET messages.

2.9 In order to continuously promote the establishment of the prototype of the regional SWIM, it is suggested to continue to sustain the SWIM architecture, and strengthen the sharing and coordination with the newly established FF-ICE Ad hoc Group and other working groups, facing the operational requirements and application scenarios, and further research on the following aspects:

2.9.1 The application scenarios and use cases of regional Information Services.

2.9.2 List of regional Common Information Services.

2.9.3 The unified standards of regional Common Information Services, specifically to the version of message exchange models, message format types (XML/JSON/Other), and message exchange pattern (MEP, publish/subscribe, request/response).

2.9.4 The Service Level Agreement (SLA) and Quality of Service (QoS) of regional Common Information Services.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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