International Civil Aviation Organization

Seventh Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/7)

Bangkok, Thailand, 20 – 22 January 2020

Agenda Item 9: Next meetings and any other business

SWIM DEMONSTRATION ON CRV

(Presented by Hong Kong China, Thailand, Singapore and PCCW Global)

SUMMARY

This paper presents a proposed SWIM Demonstration on CRV to be hosted by Hong Kong China in March 2020 to demonstrate the exchange of SWIM data over CRV, which is a potential hybrid SWIM infrastructure presented in HKCAD's previous paper at CRV OG/5 meeting. The SWIM Demonstration on CRV will also showcase the operational benefits in using CRV to carry SWIM data and the corresponding services envisaged as necessary or complementary to support implementation of SWIM in APAC region through an operational scenario with real exchange of SWIM data.

1 INTRODUCTION

1.1 The Common aeRonautical Virtual Private Network (CRV) will be used to support SWIM implementation in the APAC region as concluded during CRV OG/5 in January 2019 and re-confirmed during the CRV OG/6 & SWIM TF/3 joint session in May 2019. In November 2019, the SWIM in ASEAN Demonstration was successfully held in Thailand and Singapore. During the event, among others, the benefits of SWIM were demonstrated through operational scenarios with real-time data exchange among participants' on-site SWIM systems located across the APAC region.

1.2 During the SWIM in ASEAN Demonstration event, views were presented and side discussions were held among participants on the potential benefits of SWIM, its development and further initiatives to accelerate its implementation in APAC region. As the SWIM in ASEAN Demonstration was run on a "pseudo-CRV", an Internet-based Virtual Private Network (VPN), a SWIM Demonstration on genuine CRV was contemplated as a next step, riding on the successful SWIM in ASEAN Demonstration. With support and full participation from Thailand, Singapore, Hong Kong Observatory and PCCW Global (the CRV service provider), Hong Kong China proposes to host a

SWIM Demonstration on CRV ("Demonstration") on 20 March 2020. The Demonstration is intended to showcase firstly the exchange of SWIM data over CRV, secondly a potential hybrid SWIM infrastructure presented in HKCAD's previous paper at CRV OG/5 meeting, and thirdly the operational benefits and the corresponding services envisaged as necessary or complementary to the implementation of SWIM in APAC region through a consolidated and extensive operational scenario with real-time exchange of SWIM data among participants' on-site systems located across the APAC region.

2 CRV as Carrier of SWIM Data

2.1 The increasing number of CRV service subscribers has contributed to a growth in usage and diversity in terms of operational, testing or trial ATS data to be carried by the CRV, including both voice and data messages. A sensible next step would be to create a first SWIM service over the CRV. Since 2014, APAC States/Administrations such as Singapore, Thailand and Hong Kong China have been engaging in the Distributed Multi-Nodal ATFM Network Project, which aims at establishing the foundations required for ATFM implementation in the region, including a harmonized Common Operating Procedure and ATFM information exchange using common interface standard. As an anticipated move, the exchange of ATFM information in the SWIM native format, FIXM, over CRV is considered for an upcoming SWIM implementation in APAC region and more so with the adoption of ASIA/PACIFIC FIXM VERSION 4.1 EXTENSION at APANPIRG/30 in November 2019. Hence, a scenario based on the exchange of ATFM information has become the showcase of choice for the Demonstration.

2.2 The name of SWIM Demonstration on **CRV** notwithstanding, the operational CRV is not to be affected by the Demonstration. To fulfill such a requirement, the CRV service provider has kindly agreed to install new links at participants' sites and configure, using hardware and networks identical to the operational CRV to create a purpose-built mini-scale CRV to support the Demonstration.

3 Evolving SWIM Infrastructure

3.1 Reference is made to ICAO's Manual on SWIM Concept (Doc 10039), which contains details and guidelines on SWIM implementation and infrastructure in concept. As SWIM is to be carried over CRV, there is necessary consideration of CRV's security, access restriction control and management, which could shape the evolution of SWIM infrastructure, parties which might be given access to CRV (which thus far is restricted to ANSPs) and how potential complementary centralized services such as registry of services and their discovery, governance, Globally Unique Flight Identifier (GUFI) service would be implemented. Such consideration will become more pressing and necessarily so, as the APAC SWIM community grows in coming years. Hong Kong China had presented a paper at CRV OG/5 in January 2019 on a potential SWIM infrastructure hybrid model. The SWIM Demonstration on CRV configuration, based on the hybrid model, is provided in Figure 1 below.

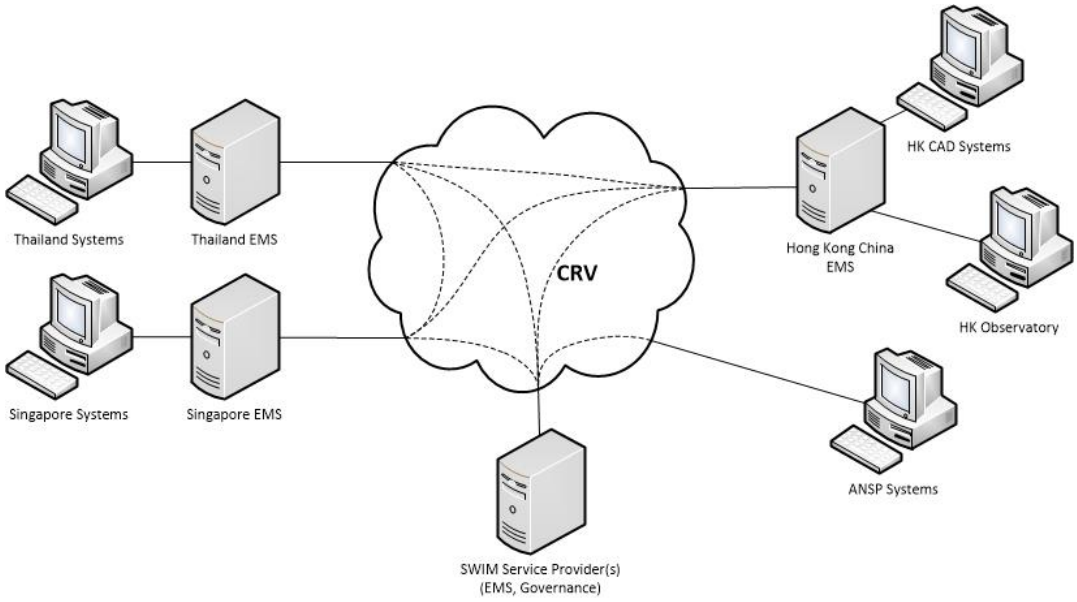

Figure 1 – Block Diagram of SWIM Demonstration on CRV

3.2 An objective of the Demonstration is to illustrate how such services could be realized based on such an infrastructure model, forming part of the operational scenario, which is further discussed in Paragraph 4 below. This part of the Demonstration is intended to elicit further discussion at CRV OG or SWIM TF meetings if such future and necessary services would be provided by designated/volunteering parties or commercial interests.

4 Operational Scenario and Potential SWIM Services

4.1 Further to Paragraph 3, the operational scenario of the Demonstration is expected to start off with simulated centralized services, demonstration of publish-n-subscribe actions by way of such provided services and the exchange of flight and flow information and MET data, with injection of value-added or supplementary services during the course of the operational scenario for a comprehensive experience of SWIM at the event.

4.2 To enrich the attendees' experience, the Demonstration will also feature presentations from participants on potential services such as MET and Surveillance services that would be carried in SWIM.

ACTION BY THE MEETING

4.3 The meeting is invited to:

a) support the proposal in conducting the SWIM Demonstration on CRV in Hong Kong in March 2020; and

b) discuss corresponding services in CRV envisaged as necessary or complementary to support implementation of SWIM in APAC region.

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7th Meeting of the Common aeRonautical Virtual Private Network Operations Group (20-22 Jan 2020)

WP 08:
SWIM DEMONSTRATION ON CRV

(joint paper by Hong Kong China, Thailand, Singapore and PCCW Global)

SWIM over CRV

- The CRV will be used to support SWIM implementation in APAC as concluded at CRV OG/5 in Jan 2019 and reconfirmed at CRV OG/6 & SWIM TF/3 joint session in May 2019.

- SWIM in ASEAN Demonstration held in Thailand and Singapore in Nov 2019 was run on “Pseudo-CRV”, an Internet based VPN.

- Hong Kong China proposes to host **SWIM Demonstration on CRV** with support and participation from Thailand, Singapore and PCCW Global on 20 March 2020.

Objectives of the Demonstration

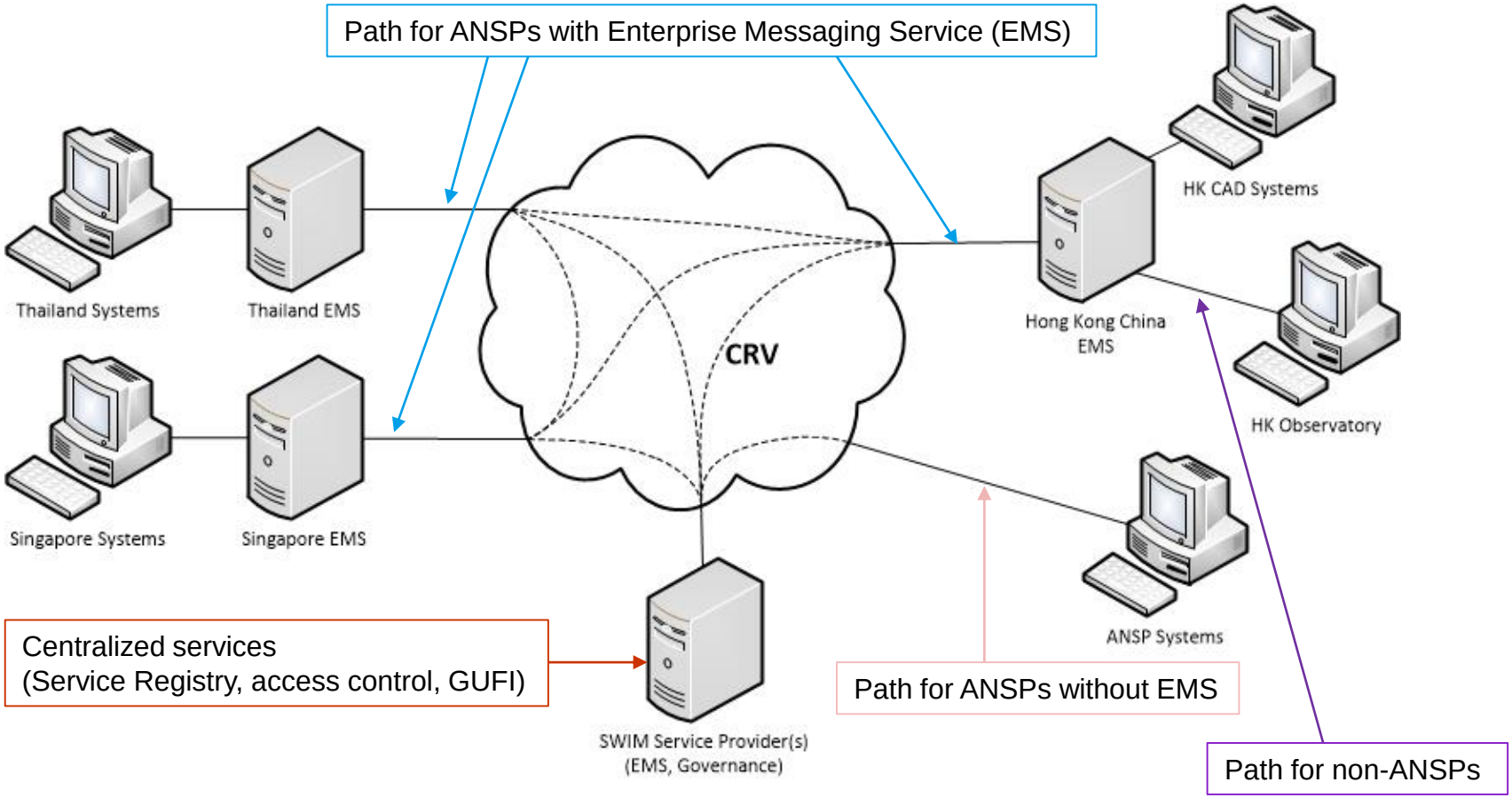
- Demonstration of SWIM data exchange over CRV
- Proof-of-concept on the potential hybrid SWIM infrastructure and potential supplementary SWIM services
- Showcasing a consolidated operational scenario with real-time exchange of data among participants' systems across APAC region
- Facilitation of SWIM implementation in APAC region

SWIM services and data

Potentially the first SWIM service over CRV

- Distributed Multi-Nodal ATFM
- Flight and Flow information in FIXM 4.1 format + APAC Extension (to support ATFM)
- MET data in IWXXM format
  - Remarks:
    - The operational CRV will not be affected
    - New links will be installed and configured to create a mini-scale CRV for the demonstration.

SWIM hybrid infrastructure



Demonstration content

- Centralized services such as service registry, access control, GUFI.
- Publish-n-subscribe message exchange
- Flight and flow information and MET data exchange
- Presentations of other potential SWIM services – surveillance and MET related

Thank you