



ICAO

International Civil Aviation Organization

**The First Meeting of Air Traffic Management
Automation System Task Force of APANPIRG
(ATMASTF/1)**

Web-conference, 28 – 30 October 2020

- Agenda Item 5:** Issues and Challenges in implementation
5.3 Integration with ATFM, CDM and A-SMGCS capabilities

JUNIOR APPLICATION OF CRACP IN FLOW MANAGEMENT SYSTEM

(Presented by China)

SUMMARY

This paper presents the junior application of CRACP in flow management system, from the development stage to the system architecture, interface control documents between China, Japan and ROK, as well as the application performance analysis.

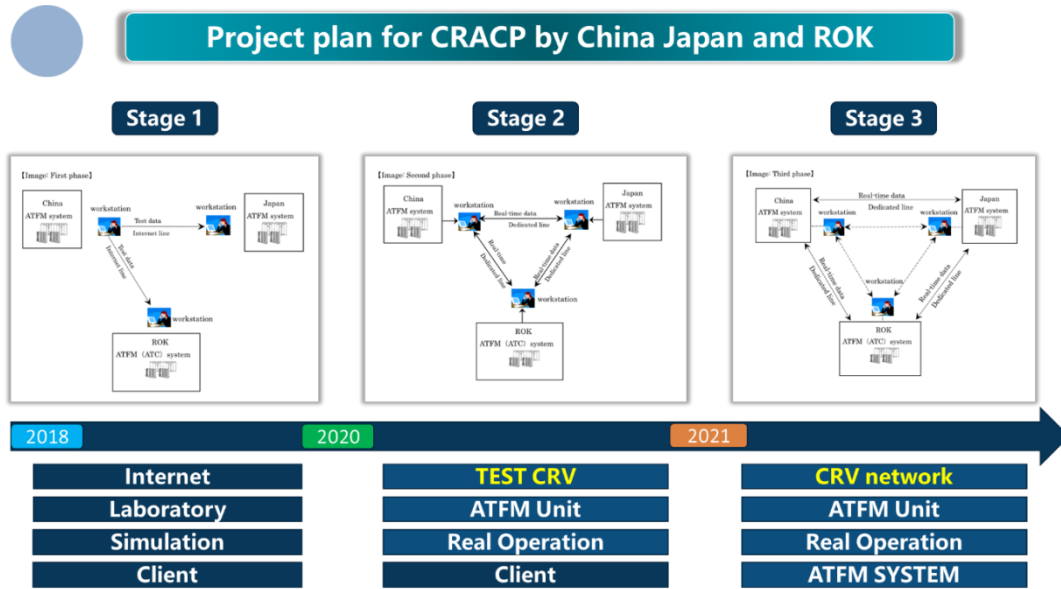
1. BACKGROUND

1.1 In 2014, to respond to the rapidly increasing demand for traffic in Northeast Asia, China, Japan and the Republic of Korea established a sub-regional ATFM group, “Northeast-Asia Regional ATFM Harmonization Group (NARAHG)”. CRACP is a cross-border traffic management solution in Northeast Asia proposed by China at the third NARAHG Conference based on the seamless air traffic control concept of TBO, FF-ICE and ICAO.

1.2 CRACP can realize the data docking between China, Japan and ROK air traffic management units using their respective systems to achieve full situational awareness of cross-border flights from 2 hours before EOBT to the transfer point, and implement more accurate and more limited traffic on this basis Management measures. Thereby reducing the length of traditional interval restrictions and the number of affected flights, and improving the quality of operations.

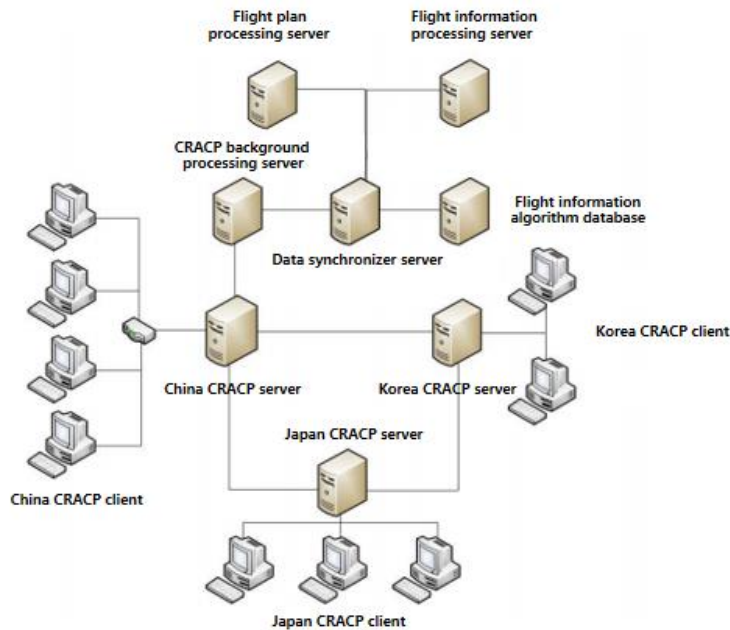
1.3 It is expected to be implemented in three stages:

- Stage1: 2018-2020
CRACP Client and CRACP Server have been deployed in China, Japan and ROK via the internet to exchange the ADP and ATFM/CDN.
- Stage2: 2020-2021
All NARAHG members use CRACP Client via the internet or CRV to test additional functions for cross border ATFM operation.
- Stage3: 2021-
All NARAHG members use own ATFM system via CRV line by the same ICD to operate the cross region ATFM.



1.4 Now the first stages are completed. According to Japan's preparations, it can directly enter the third phase and serve next year's Olympic flight guarantee. China, Japan and ROK jointly compiled the operational concept and submitted it to the International Civil Aviation Organization. Through the upgrading of the client platform, the cross-border operation and technical innovation verification platform is established, which is expected to improve the normality of flights to and from Japan and ROK in Shanghai and the Yangtze River Delta after the implementation of typhoon diversion and transnational GDP operations.

2. SYSTEM ARCHITECTURE



2.1 In the current framework of the CRACP system developed in China, the background service processes the flight message information, air route information and radar track information. After processing and filtering, the message is sent to the CRACP server with a specified format. The CRACP server is mainly responsible for message distribution, data warehousing and statistical data processing.

2.2 The algorithm service sorts the flights and interacts with the front desk service. The servers of China, Japan and ROK are mainly responsible for information exchange and transmission (ZS, RJ and RK). The client sends the message to the local server, and then through the information interaction between the servers, the server sends the message to the local client to complete the message synchronization between the clients. The client's query operations directly access the local server's database.

2.3 For the third stage, in the future, China, Japan and ROK will use their own ATFM system to carry out cross-regional AFTM, so we need to use a unified Interface Control Document (CRACP_ICD) to define the Message format and communication.

2.4 The CRACP_ICD is divided into two parts from the perspective of protocol design and control. The first part is Control Message (base on TCP Sockets), and the second part is Operation/business Message (base on FIXM 4.1.0). Control Message describes the information communication model and communication rules, and is mainly used to ensure that information is communicated end-to-end between two programs. By October 2020, the joint test of Control Message between China and Japan has been successfully completed. Operational Message defines the format of the business layer message based on the definition of the underlying communication by Control Message, and agrees on the type of business interaction between the two parties and its specific format.

3. APPLICATION PERFORMANCE ANALYSIS

3.1 After the 5th NARAHG meeting, members started to deploy Cross-Border ATFM Collaborative Platform (CRACP) and exchanging ADP through CRACP clients since February 2019. Before that, they used E-mail for ADP exchange.

3.2 Regarding ADP, Shanghai ATFMD has regularly exchanged twice a day. Since the CRACP was improved to record ADP history, it became available to update the current ADP additionally as needed, such as when an event affecting cross-border ATFM occurs. Currently, the CRACP connection is stable, and ADPs have regularly been exchanged.

3.3 Information sharing is indispensable in building strategic cross-border ATFM. However, unnecessary surplus information may create confusion. ADP needs to convey only useful information concisely. In particular, ADP exchanged beyond FIR should be considered well and provide more useful items with priority.

3.4 As the next step of CRACP operation, CDN is tested and put in practical use. Firstly, Shanghai ATFMD is considering starting from a short-period trial with Japan ATMC. During this period, the conventional verbal coordination is conducted simultaneously with coordination using CDN function. Real coordination is verbal coordination, and coordination on CRACP is regarded as a test. The primary objective of this trial is to test the CDN function and, at the same time, to familiarize the staff with the CDN function.

Agenda Item 5.3

28 – 30/10/20

4. THE SUMMARY AND OUTLOOK

4.1 This Cross-regional collaboration will shortly take place on platforms based on the ATFM system of China, Japan and ROK. Data transmission will use a dedicated security network with a standardized data exchange format and the operational coordination procedure. Through the operation practice, the three States civil aviation continuously innovate the synergy concept of cross-regional ATFM management and further expand the forward-looking and coordinated effect of ATFM in the States. The optimization of the procedure utilizing advanced technology continuously improves the quality of the civil aviation industry.

4.2 Finally, ATMB thanked the NARAGH members for their valuable advice and cooperation in the development of CRACP.

5. ACTION BY THE MEETING

5.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matter as appropriate
