



*International Civil Aviation Organization*

**The Fifth Meeting of ICAO Asia/Pacific Air Traffic Flow Management  
Steering Group (ATFM/SG/5)**

Bangkok, Thailand, 30 March – 3 April 2015

---

**Agenda Item 5: Development of Regional ATFM Framework**

**RESEARCH ON WAY OF DATA EXCHANGE IN THE PROCESS OF DATA SHARING**

(Presented by CHINA)

**SUMMARY**

This paper presents the research on way of data exchange in the process of data sharing. Currently, CAAC has adopted the technical scheme listed in this document to realize the data and information related to ATFM efficient interaction between the ANSP and airspace users. This technical scheme meets the requirements of information standards in DOC9971, including syntactic interoperability, data definition, update requirements, information quality, etc.

**1. INTRODUCTION**

1.1 Information exchange between participants serves as the foundation of CDM/ATFM. As DOC9971 indicates, CDM processes operate in a future information-enriched environment, with exchange of data as the primary facilitator of collaboration. Data exchange is critical to CDM as participants in the decision-making process must have the information necessary to make decisions consistent with sought objectives. Since promoting CDM/ATFM, CAAC has always draw experiences from other countries and regions to formulate the information interaction and sharing scheme which fits the need of the actual operation in China. Currently, CAAC has adopted the technical scheme listed in this document to realize the ATFM data and information exchange between ANSPs and airspace users. This technical scheme meets the requirements of information standards in DOC9971, including syntactic interoperability, data definition, update requirements, information quality, etc.

1.2 While promoting the distributed multi-nodal ATFM framework in Asian-Pacific region, the necessity of sharing and interaction of information advocated by CAAC since ATFM/SG3 has been becoming more and more prominent. In the construction of distributed multi-nodal CDM information interaction platform, ATC of China has made a further technical research and developed related constructive work.

1.3 ATMB CAAC has established the message exchange protocol, which has been used for message exchange between ANSP and airlines / airports in the process of Airport-CDM. This is also suit for message exchange between ANSPs. To be noted, this message exchange is limited in a dedicated net internally.

**2. DISCUSSION**

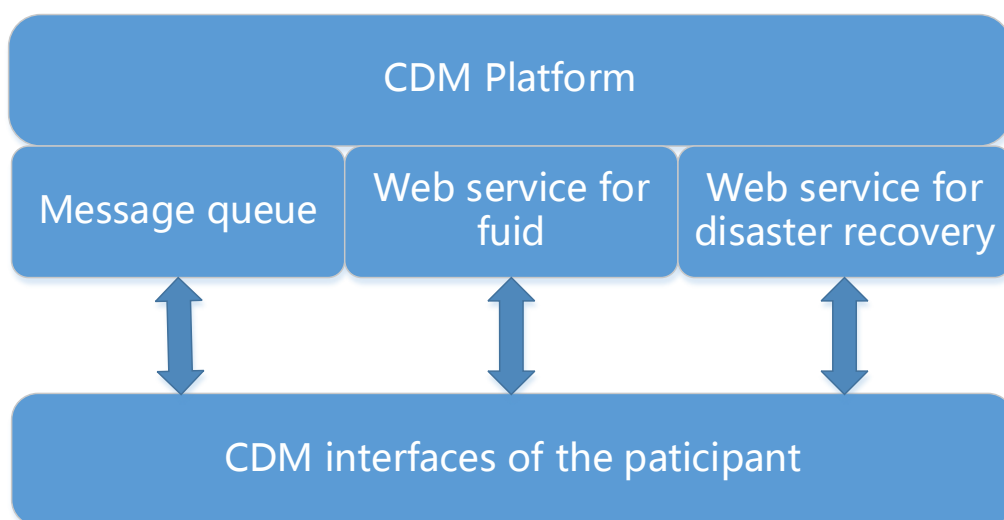
Interconnection mode

2.1 Using TCP protocol, CDM Platform take the role of server, and the participants are clients.

Transmission platform

2.2 CDM platform takes message-oriented middleware named message queue (MQ) as open platform to transform flight information to each other. CDM platform allocates 4 queues for the one who apply to join in: a receive queue, a send queue, and two request queue. One of the request queues is used for CDM platform sending request messages, the other one is for the participant. The MQ parameters are different because of different participant, which would be allocated when she apply to join in.

2.3 CDM platform interconnect with participants as follows:



Message Format

2.4 CDM Platform transforms in XML between participants. The document named CDM platform message exchange protocol has described the specific format of messages, which the sender description in it indicates, which is responsible for sending.

Flight Identification

2.5 FUID is adopted as the only identification of flight in CDM platform. When receives FPL, CDM platform generates FUID of the flight, and then sends FUIDAllocateMsg message to each participant who needs. In the CDM platform, the participant gains FUID in two ways: one is receiving FUIDAllocateMsg message, the other is invoking the web service.

Disaster Recovery

2.6 Using Web Service, the participants invoke the web service of CDM platform in order to send messages when MQ is crashed.

Contents

2.7 The attachment ‘CDM Platform Information Exchange Protocol’ has detailed information.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) discuss any relevant matters as appropriate.
- c) propose that ICAO consider to take a reference of this paper on the ATFM framework of APAC.

.....

## ATTACHMENT A

:

# CDM Platform Information Exchange Protocol

## TABLE OF CONTENTS

<b>1</b>	<b><u>INTRODUCTION</u></b> .....	<b>3</b>
1.1	<u>PURPOSE OF THE DOCUMENT</u> .....	3
1.2	<u>SYSTEM ENTRY</u> .....	3
1.3	<u>GENERAL DESCRIPTION</u> .....	3
1.4	<u>XML TAG VALUE AND FORMAT CONSTRAINT DESCRIPTION</u> .....	3
1.5	<u>XML PARSER DESCRIPTION</u> .....	4
1.6	<u>TAG DESCRIPTION</u> .....	4
1.7	<u>UPDATE DESCRIPTION</u> .....	4
<b>2</b>	<b><u>ENTERING MECHANISM</u></b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
2.1	<u>EXCHANGE PLATFORM</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
2.2	<u>ENTERING CHOOSE</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
2.3	<u>SAMPLE DESCRIPTION</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>3</b>	<b><u>MESSAGE DEFINITION</u></b> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
3.1	<u>MESSAGE DEFINITION DESCRIPTION</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
3.1.1	<u>Data item description</u> .....	<i>Error! Bookmark not defined.</i>
3.1.2	<u>Basic type definition</u> .....	<i>Error! Bookmark not defined.</i>
3.1.3	<u>How fluid allocated and canceled</u> .....	<i>Error! Bookmark not defined.</i>
3.1.4	<u>Entry</u> .....	<i>Error! Bookmark not defined.</i>
3.1.5	<u>Message format description</u> .....	<i>Error! Bookmark not defined.</i>
3.2	<u>CAPACITY DATA DEFINITION</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
3.2.1	<u>Airport</u> .....	<i>Error! Bookmark not defined.</i>
3.2.2	<u>Approach</u> .....	<i>Error! Bookmark not defined.</i>
3.2.3	<u>Area</u> .....	<i>Error! Bookmark not defined.</i>
3.3	<u>FLIGHT OPERATING DATA DEFINITION</u> .....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
3.3.1	<u>Actual landing message (ActualLandingMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.2	<u>Boarding start message (BoardingStartMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.3	<u>Boarding end message (BoardingEndMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.4	<u>COBT allocate message (COBTAllocateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.5	<u>CTOT allocate message (CTOTALlocateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.6	<u>Departure from out station message (DepFromOutstationMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.7	<u>ELDT update message (ELDTUpdateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.8	<u>Flight departure cleared message (FlightDepartureClearedMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.9	<u>Flight off-block message (FlightOffBlockMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.10	<u>Flight ready message (FlightReadyMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.11	<u>Flight take-off message (FlightTakeOffMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.12	<u>FUID ALLOCATE MESSAGE (FUIDAllocateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.13	<u>FUID ALLOCATE MESSAGE (FUIDAllocate4ATCMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.14	<u>Ground service end message (GroundServiceEndMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.15	<u>Ground service start message (GroundServiceStartMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.16	<u>In-block message (InBlockMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.17	<u>TOBT update message (TOBTUpdateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.18	<u>TTOT update message (TTOTUpdateMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.19	<u>Start-up approval message (StartUpApprovalMsg)</u> .....	<i>Error! Bookmark not defined.</i>
3.3.20	<u>EIBT update message (EIBTUpdateMsg)</u> .....	<i>Error! Bookmark not defined.</i>

## Attachment A

---

<a href="#">3.3.21</a>	<a href="#">Aircraft type update message (AcftypeUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.22</a>	<a href="#">ATA update message (AtaUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.23</a>	<a href="#">ATD update message (AtdUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.24</a>	<a href="#">ETD update message (EtdUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.25</a>	<a href="#">Stand update message (StandUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.26</a>	<a href="#">EOBT update message (EOBTUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.27</a>	<a href="#">Registration number update message (RegUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.28</a>	<a href="#">COBT confirm message (COBTConfirmMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.29</a>	<a href="#">Flight delay queue message (FlightDelayQueueMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.30</a>	<a href="#">FPL update message (FPLUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.31</a>	<a href="#">Traffic control defination message (TrafficControlDefinationMsg)</a>	<i>Error! Bookmark not defined.</i>
	<b>defined.</b>	
<a href="#">3.3.32</a>	<a href="#">Finished traffic control message (FinishTrafficControlMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.33</a>	<a href="#">Delay flag update message (DlaFlagUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.34</a>	<a href="#">Abolished flag update message (ABSFlagUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.35</a>	<a href="#">Alternate flag update message (AlnFlagUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.36</a>	<a href="#">Return flag update message (RtnFlagUpdateMsg)</a>	<i>Error! Bookmark not defined.</i>
<a href="#">3.3.37</a>	<a href="#">Flight information deleted message (FlightInfoDeletedMsg)</a>	<i>Error! Bookmark not defined.</i>

# 1 Introduction

## 1.1 Purpose of the Document

This document provides a general description of the message protocol for a participant of CDM platform to exchange flight information to each other, like ATC, Airport Company and Airline Company etc. It also contains the description how to exchange information between participants. This document is only for the CDM platform participants.

## 1.2 System entry

entry	description	remark

## 1.3 General description

The document provides a general description of the message protocol, describes when message is generated, and who has responsibility to generated it.

## 1.4 XML tag value and format constraint description

entity	description	remark
N/A	value is meaningless	
[0-9]	value range is integer, 0 to 9	
[a-z]	Value range is lower-case char, 'a' to 'z'	
[A-Z]	Value range is upper-case char, 'A' to 'Z'	
{z-y}	The range of the value width, z is minimum, y is maximum.	For example, S {1-6} stands that it would be a char at least, and 6 chars at

		most.
EMPTY	value could be null	
S	value type is string type	
DateTime	Value type is datetime type	datetime format like: yyyy-MM-dd HH:mm:ss
N	Value type is numeric type, integer or decimal	
I	value type is integer type	Like: 23
D	Value type is decimal type	Like: 0.23
Date	value type is date type	Like : yyyy-MM-dd
Time	Value type is Time type	Like: HH:mm:ss
B	true/false	

## 1.5 XML parser description

CDM platform uses Standard XML format. Because CDM platform is currently in the prototype, and will be gradually improved, standard xml parser like Microsoft MSXML is proposed to participants to parse the messages, otherwise, it may be problems occurred along the profection of CDM platform. In a word, participant chooses XML parser by herself, but it has the responsibility for ensuring that it does not affect the further expansion of the CDM message format specification.

## 1.6 Tag description

In the message format description, tag if labeled “O”label, only a specific content in the corresponding data item will appear in the message body, if labled “M”label, no matter whether there is a corresponding data item will appear in the message body.

## 1.7 Update description

CDM platform is currently in the prototype, and will be gradually improved. The changes due to system improvements will be recorded in the document’s changes incorporated table, and then the document goes a new version.