International Civil Aviation Organization

TWENTY SECOND MEETING OF THE COMMUNICATIONS/NAVIGATION AND SURVEILLANCE SUG-GROUP (CNS SG/22) OF APANPIRG

Bangkok, Thailand, 16 - 20 July 2018

Agenda Item 3: Aeronautical Fixed Service (AFS)

3.4 Other AFS related issues

EXTENSIBLE MARKUP LANGUAGE (XML) OPERATIONAL CONSIDERATION

(Presented by Federal Aviation Administration/USA)

SUMMARY

This paper presents the operational planning in order to support XML based messages to be in operation by 2020 as adopted by ICAO Global Air Navigation Plan (GANP) Aviation System Block Upgrade (ASBU) Block 1.

1. INTRODUCTION

1.1 ICAO Annex 3 has identified information distribution will be supported by the year of 2020.

1.2 MET Panel has adopted distribution of XML/Geography (GML) based ICAO Meteorological Information Exchange Model (IWXXM) format over Air Traffic Service Message Handling System (AMHS) by 2020 to comply with ICAO GANP ASBU Block 1.

1.3 System Wide Information Management (SWIM) plans for IWXXM distribution when it becomes available.

2. DISCUSSION

2.1 XML based message is designed to synchronize with application format so it contains more information. This results in bandwidth requirement of fivefold when compared to legacy message. In the IWXXM case, its bandwidth requirement could be five time larger than TAC format as indicated in the study presented at the 22nd North Atlantic and European Aeronautical Fixed Service Group Meeting (AFSG/22).

2.2 The GANP ASBU also specifies for flight plan/clearance/transfer to utilize XML based format Flight Information Exchange Model (FXXM) and Aeronautical Information Exchange Model (AIXM).

2.3 In Asia/Pacific region, AMHS is in the process of replacing its underlining network of dedicated low speed circuits with an Internet Protocol (IP) based Common aeRonautical Virtual Private Network (CRV) that should provide more bandwidth. However, with the introduction of IWXXM, FXXM and AIXM, the bandwidth requirement most likely overwhelm the planned CRV bandwidth and possibly other regional IP networks.

2.4 The current CRV bandwidth requirement is calculated based on compressed Voice over IP (VoIP) channel that compressed 64Kbps to 8kbps and AMHS is assigned a bandwidth of 64 to 128Kbps that support legacy message format for flight plan/clearance/transfer and MET TAC messages. Depending upon location, CRV can support 2Mbps and can be increased as required with additional monthly cost.

2.5 The communication infrastructure (AMHS and CRV) is expected to support both SWIM traffic and legacy messages. In this case, AMHS will support XML/GML based IWXXM and legacy TAC messages until TAC format is phased out of operation. This means additional bandwidth is expected.

2.6 There is also a plan for Flight and Flow Information for a Collaborative Environment (FF-ICE) to be introduced in ASBU Block 1. This will further require additional bandwidth to CRV.

2.7 As projection of increasing bandwidth will result in additional operating cost for CRV, compression of XML based message should be considered to minimize the impact.

2.8 Categorizing of messages into time sensitive messages and non-time sensitive messages as well as prioritizing the messages. This would allow some non-time sensitive messages to utilize public internet through SWIM.

2.9 In order for AMHS to support XML, File Transfer Body Part (FTBP) function will be required.

2.10 There is a concern of AMHS utilizing FBTP attachment could be infected by malicious virus. This would require AMHS to install anti-virus scanning. If scanning of virus at Message Transfer Agent (MTA) level is considered, this would cause a slowdown of processing message. Further analysis should be taken to identify if malicious virus can impact the XML files as well as if other more effective solutions can be recommended.

2.11 To support transition to SWIM environment for IWXXM distribution, FAA AMHS is planning to implement a Java Message Service (JMS) Gateway. Figure 1 provides an overall XML support infrastructure.

2.12 It is noted that there should not be any impact to CRV until IWXXM is fully implemented by major States in the region, which have OPMET Data Bank operation.

2.13 This paper is presented as Information Paper. Further coordination with SWIM organization is also needed.

2.14 As 2020 is fast approaching, States that plan to distribute IWXXM over AMHS should consider implementing virus detection scanning capability to their respective MTA.

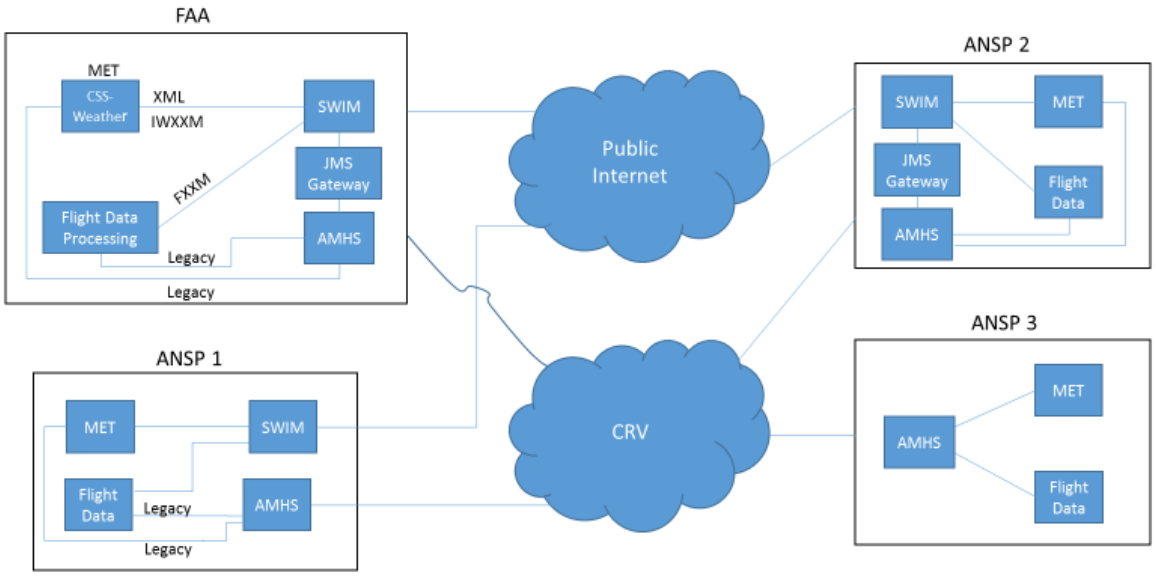

Figure 1. XML based messages distribution infrastructure

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and/or

b) discuss any relevant matter as appropriate.

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