International Civil Aviation Organization

Twelfth Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/12)

Denarau Island, Fiji, 23-26 January 2024

Agenda Item 9: States CRV Implementation

Voice and DATA Implementation Status in the Republic of Korea

(Presented by the Republic of Korea)

SUMMARY

This paper presents the result of the Voice and Data implementation of KOREA

1. INTRODUCTION

1.1 The Republic of Korea (ROK) would like to share the current status of its Air Communication Services implemented on CRV (Common AeRonautical Virtual Private Network) in accordance with ICAO Global Air Navigation Plan, and the operational issues.

1.2 For CRV implementation of voice, data and future application traffic within Incheon FIR, both ACCs (Daegu, Incheon) established the sub-network and inter-link between, with the layer 3 switches, to utilize CRV in a practical and cost-effective manner.

2. DISCUSSION

Operation status between countries

2.1 Currently, the ROK is operating Daegu and Incheon ACCs within Incheon FIR, and the operation status of Voice and Data exchanges with Fukuoka and Kobe ACCs, Japan and with Dalian and Shanghai ACCs, China is as below:

States	Sector	Voice	Data	Transmission means
Japan	Daegu – Kobe ACC	O	X	CRV
	Daegu – Fukuoka ACC	O		
	Incheon – Kobe ACC	O		
	Incheon – Fukuoka ACC	O	AIDC	
	Seoul – Fukuoka COM CENTER	X	AMHS	
China	Daegu – Dalian ACC	O	AIDC	IPLC
	Incheon – Shanghai ACC	O	X	
	Seoul – Beijing COM CENTER	X	AMHS	CRV

Figure 1. Operation status

2.2 In early 2021, both Daegu and Incheon ACCs commenced subscribing CRV package-C+ of PCCW Global in order to migrate Voice and Data of Air Traffic Service between States from point-to-point circuits to the CRV network which provides greater inter-connectivity with practical and cost-effective technology.

CRV migration of Voice

2.3 The ROK has successfully completed the migration of its Voice communication circuit from point-to-point circuits to the CRV network with Japan, reducing its service fee by about 40%.

2.3.1 The migration of those circuits to CRV was implemented in phase with the schedule of air space redesign of Japan (2021~2023).

ACCs	Connected Router	No. of Channels migrated	Date	Contract BW
Daegu ACC	Kobe ACC	2 voice channels	2021.4	256k
	Fukuoka ACC	3 voice channels	2022.3	2M
		4 voice channels	2023.9	
Incheon ACC	Kobe ACC	1 voice channel	2021.4	256k
		1 voice channel	2022.3	2M
	Fukuoka ACC	4 voice channels		
		2 voice channels	2023.9	

Figure 2. Voice implantation status

2.3.2 In 2021, Daegu and Incheon ACCs established the CRV link and implemented 3 Voice circuits with Kobe ACC. Also, in case of single failure of the CRV circuit, inter-link between sub-networks of Daegu and Incheon ACCs was set and tested.

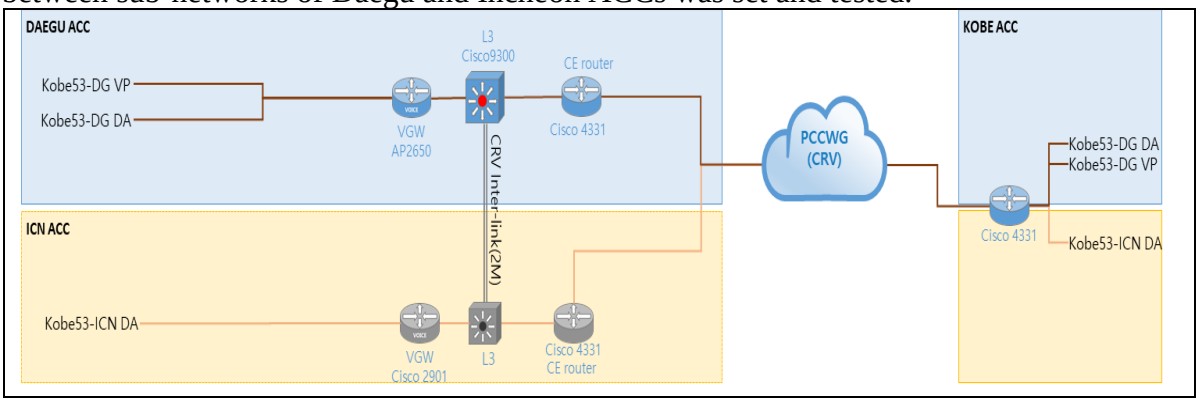


Figure 3. Sub network and Inter-link (2021)

2.3.3 In 2022, for Daegu and Incheon ACCs, the contract renewed to increase the bandwidth to 2Mbps and migrated 8 Voice circuits on CRV with Fukuoka and Kobe ACCs were migrated.

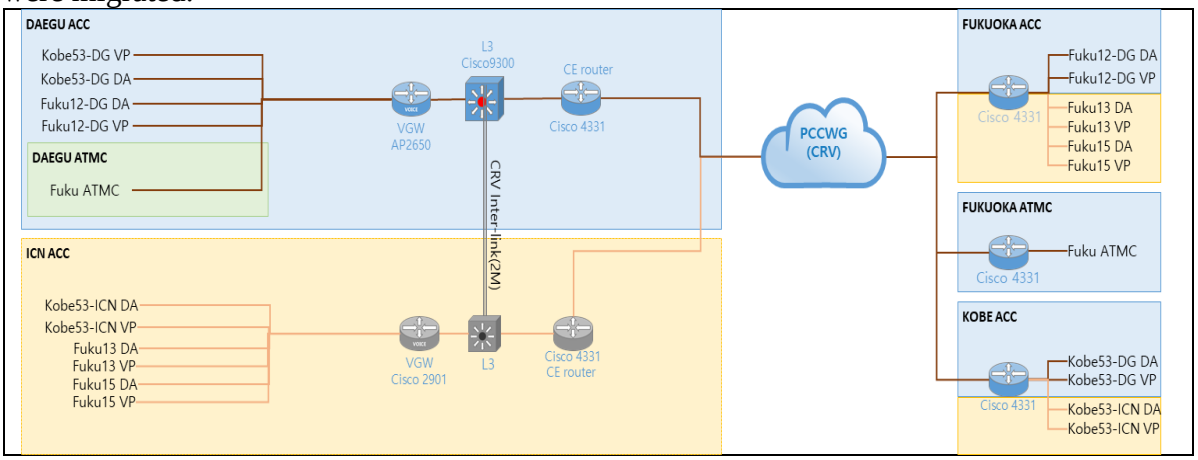


Figure 4. Sub network and Inter-link (2022)

2.3.4 In 2023, Daegu and Incheon ACCs migrated 6 Voice circuits. In case of nature disaster, DR circuits which allow to accommodate all voice traffic at one ACC were set and tested in both ACCs.

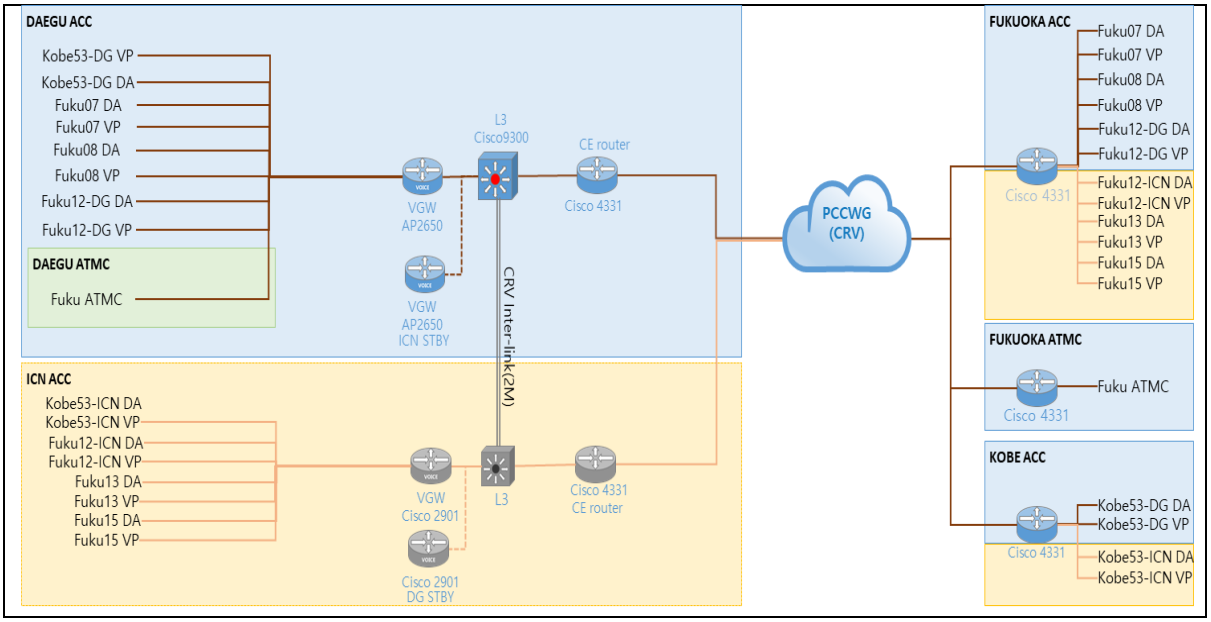


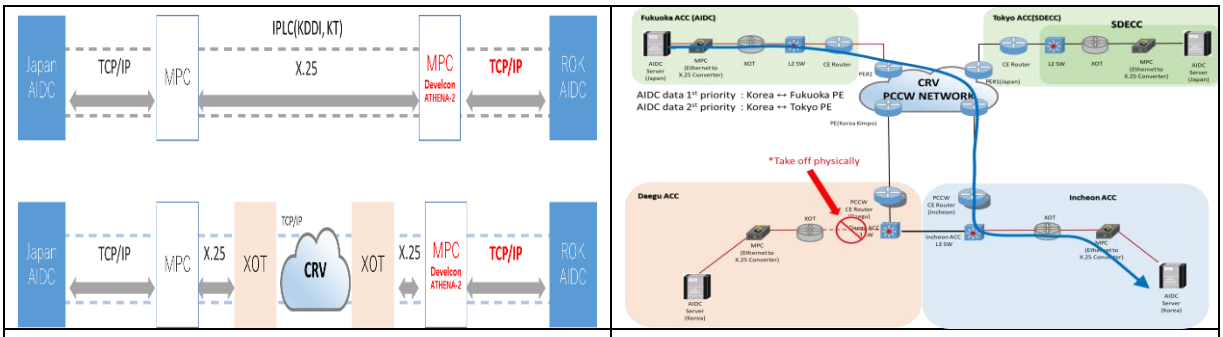
Figure 5. Sub-network and Inter-link (2023)

CRV migration of AIDC

2.4 AIDC is scheduled to be migrated to the CRV network, in 1Q 2024, to interlink Incheon ACC with Fukuoka ACC.

2.4.1 To encapsulate X.25 over TCP/IP, XOT (X.25 over TCP/IP) routers were added before the CRV CE router in both Incheon and Fukuoka ACCs.

2.4.2 Daegu ACC and SDECC in Tokyo ACC, are set as a back-up operating site of AIDC, in case of failure.



Dataflow | Network Structure

Figure 6. AIDC Dataflow and Network Structure

AFTN/AMHS DR Center relocation project

2.5 The ROK has established its plan to relocate DR Center of AFTN/AMHS to Incheon ACC to secure its geographical separation from the main site in 2023.

2.5.1 In case of natural disaster in the main site, a backup or recovery system implemented in DR Center shall take over its operation and keep its connection to the CRV network through Incheon ACC.

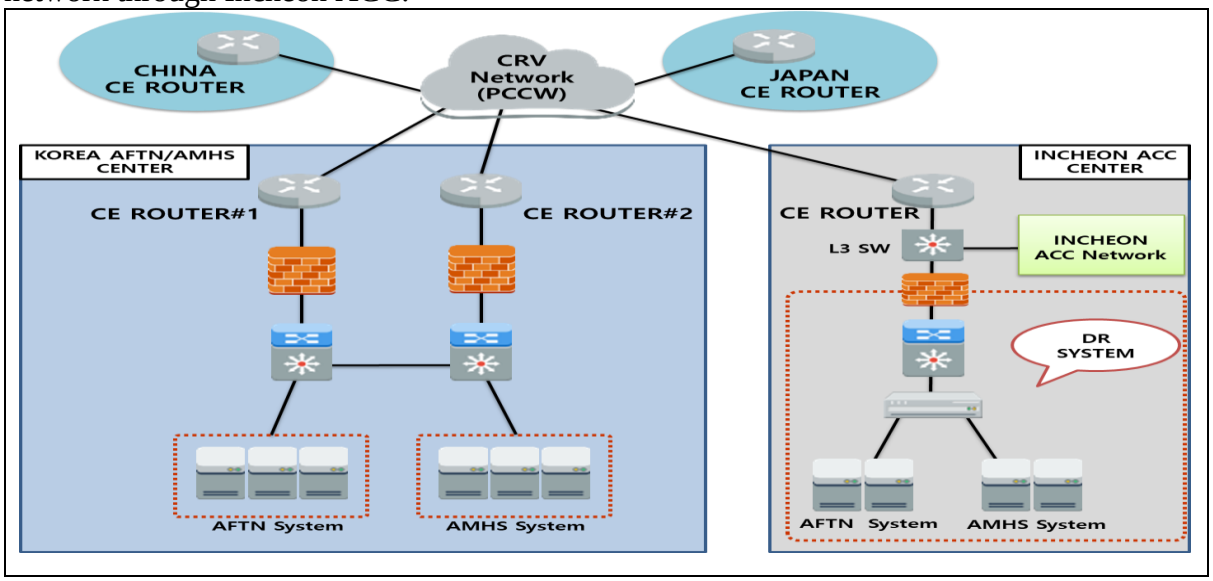


Figure 7. AFTN/AMHS Network Structure

2.5.2 The schedule of relocation, is expected to be commenced in April 2024 and completed in June 2024. The ROK will continue to discuss related matters with ANSP (China,Japan) and PCCW for the relocation of the AFTN/AMHS DR Center.

2.6 The current status of CRV use for data/voice between the ROK and China and between the ROK and Japan is as follows:

	CRV contract	**CRV bps**	**Current usage**
AMHS(data)	Package A	2Mbps	10~20kbps
INCHEON ACC(voice&data)	Package C+	2Mbps	1008kbps
DAEGU ACC(voice)	Package C+	2Mbps	990kbps

Figure 8. CRV Bandwidth Utilization

3. ACTION BY THE MEETING

1.1 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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