International Civil Aviation Organization

Eighth Meeting of the Common aeRonautical Virtual Private Network Operations Group (CRV OG/8)

Video Teleconference, 17 – 19 May 2021

Agenda Item 6: Review and update the AMHS/ATN Implementation Status table and the APAC CRV Implementation Table

FIJI'S EXPERIENCE IN PROVIDING VOICE AND AMHS SERVICES OVER THE CRV NETWORK USING SLA PACKAGE D

(Presented by Fiji/Fiji Airports)

SUMMARY

This paper presents Fijis experience and performance analysis of in providing voice and AMHS services over the CRV network using SLA Package D.

1. INTRODUCTION

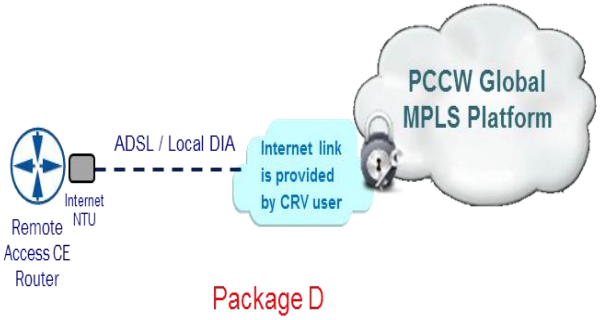
1.1 This paper presents Fiji experience and the performance analysis in providing voice and AMHS services over the CRV network using SLA Package D with Australia, New Zealand & USA

2. DISCUSSION

2.1 Fiji has signed and implemented CRV Package C+ with PCCWG in 2019 operating voice and AMHS services with Australia, New Zealand & USA

2.2 The impact of COVID-19 had reduced the flight movement in Nadi FIR by 80% and affects our revenue directly. To control our operational cost Fiji had consulted with PCCWG to downgrade the CRV SLA from Package C+ to Package D using a dedicated 1.0Mbps internet.. This was implemented in August, 2020. To date we are still operating on SLA Package D using the internet connection and we plan to upgrade to Package B+ in June, 2021 as flight movement is now gradually increasing.

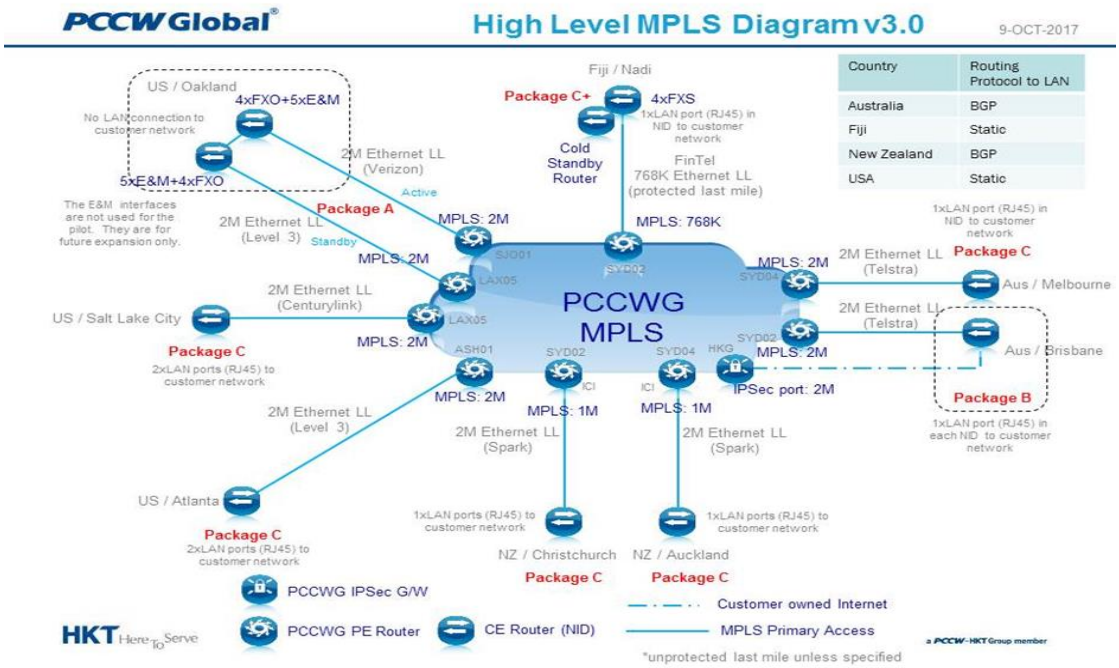
2.3 The PCCWG SLA Package D High Level diagram is provided below with the specified service performance level



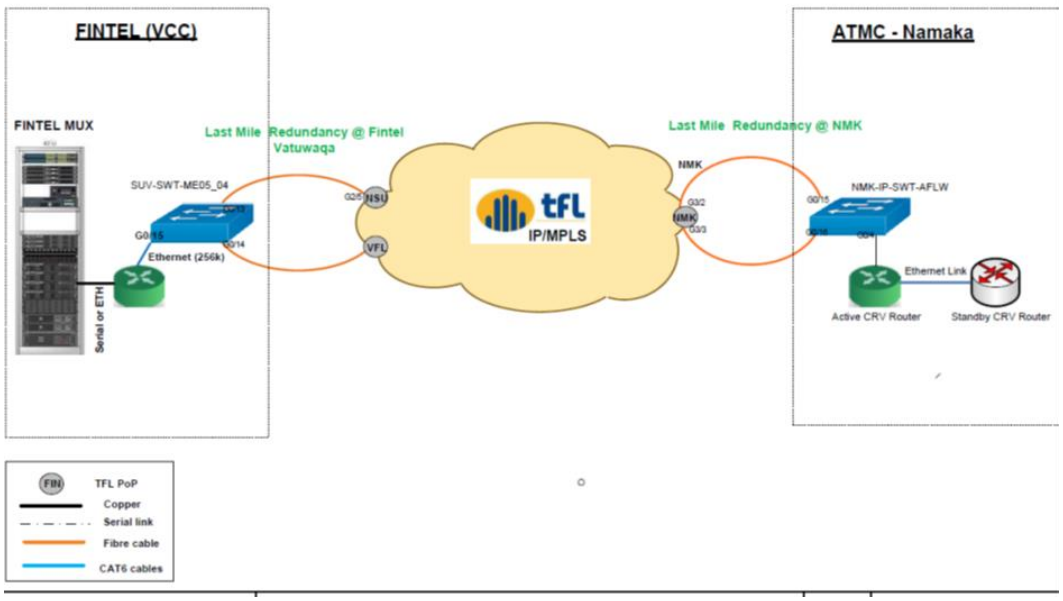
SLA Package	Package D	
Local loop connection	NIL (customer self provided internet)	
NID	1	
IP Sec Gateway (backup)	YES (customer provide internet)	
Availability	99.5% (IP Sec gateway port only)	
Site to Site Round Trip Delay by zone	PoP to PoP 200ms	PoP to PoP 600ms
Site to Site Packet Drop Rate	PoP to PoP <0.5% for Data	
Site to Site Jitter	250ms for Data (PoP to PoP)	
Rebate	No	

The diagram below depicts the CRV Package C+ and the downgraded CRV Package D for the Fiji CRV Connection. It also shows the SLA Package B+ that we will be upgrading to for implementation in June, 2021.

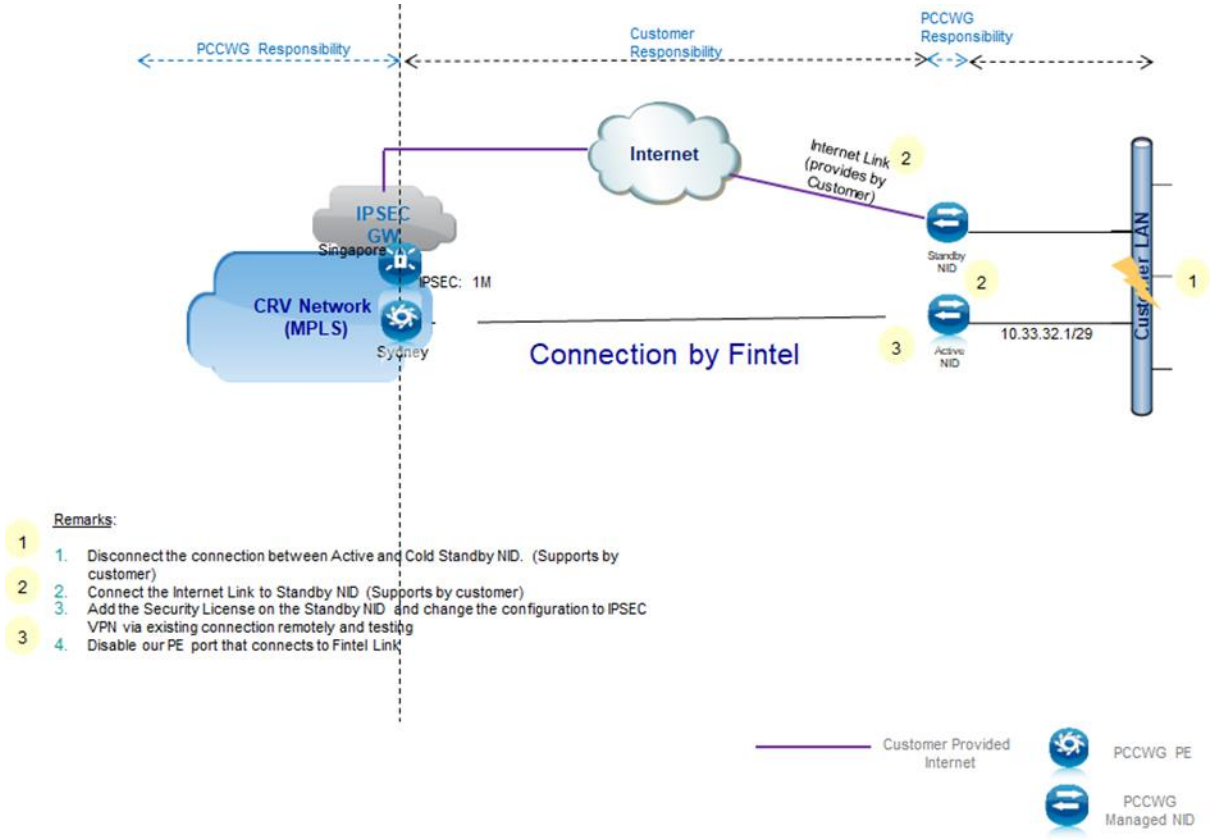
Fiji High Level CRV Diagram



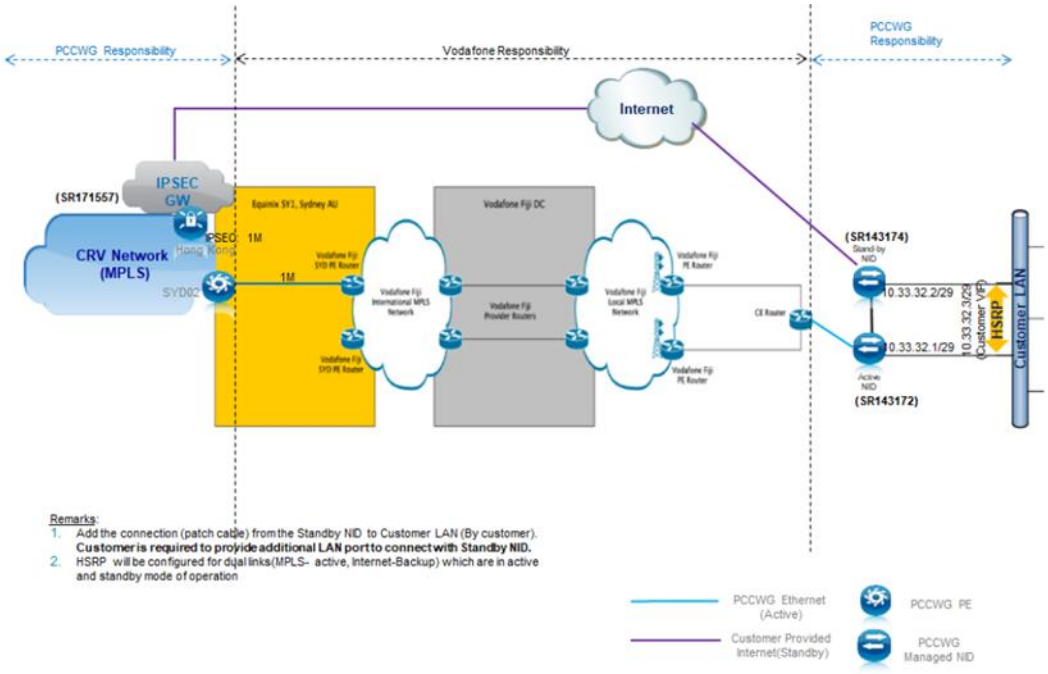
CRV SLA Package C+ High Level Diagram



CRV SLA Package D High Level Diagram



CRV SLA Package B+ High Level Diagram



2.4 CRV Package D Performance Analysis

2.4.1 We have conducted a performance analysis of the CRV Package D from August 2020 to February, 2021 to compare with the performance of CRV Package C+ based on the data provided by PCCWG NOC. This is summarised in the table below and the detail is provide in Appendix 1.0 of this paper.

#	Test Period	Availability		Response Time		Jitter		Packet Loss	
		Package C+	**Package D**	**Package C+**	**Package D**	**Package C+**	**Package D**	**Package C+**	**Package D**
1	**Package C+** Jan – Jul, 2020 **Package D** Aug 20 – Feb 21	100%	100%	81ms – 285ms%	408ms – 578ms	0.5ms	1.9ms – 2.4ms	0%	0.2% - 0.6%

Source of data: PCCWG NOC

2.4.2 The reliability of the CRV Package D operation is dictated by the quality and performance of the local internet connection from the local ISP. Initially we were recording some routing flaps on the connection and after resolving connectivity issues on the local internet connection the network performance improved and we observed 100% availability.

2.4.2 Given the experience Fiji has with CRV Package D and the result of the performance analysis, Fiji is recommending SLA Package D as the CRV solution for small ANSP like Pacific Island States and other small ANSP in the region to operate voice & AMHS services.

3. ACTION BY THE MEETING

3.1 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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Appendix 1.0 - Detail CRV Package D Performance Analysis

(A)This is the report for site availability. The site availability is excellent for both Packages. (Package D & Package C+)

			Package D							Package C+						
Country	City	GSMP ID	Feb-21	Jan-21	Dec-20	Nov-20	Oct-20	Sep-20	Aug-20	Jul-20	Jun-20	May-20	Apr-20	Mar-20	Feb-20	Jan-20
FIJI	Nadi	NAD(PCG) IP007484	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(B)This is the report for response time, Jitter and Packet Loss for Package D.

Site2Site Report - NAD(PCG) IP007484

Site2Site	Source	Destination	Response Time	Jitter	Packet Loss
-NAD(PCG)-IP007484_To_ATL(PCG)-IP007611_GOLD-	NAD(PCG) IP007484	ATL(PCG) IP007611	577.6ms	2ms	0.3%
-NAD(PCG)-IP007484_To_AUC(TNZ)-IP007482_GOLD-	NAD(PCG) IP007484	AUC(TNZ) IP007482	418.6ms	2ms	0.4%
-NAD(PCG)-IP007484_To_BNE(PCG)-IP007485_GOLD-	NAD(PCG) IP007484	BNE(PCG) IP007485	415.5ms	2.2ms	0.3%
-NAD(PCG)-IP007484_To_CHC(TNZ)-IP007483_GOLD-	NAD(PCG) IP007484	CHC(TNZ) IP007483	436.2ms	2.4ms	0.6%
-NAD(PCG)-IP007484_To_MEL(PCG)-IP007486_GOLD-	NAD(PCG) IP007484	MEL(PCG) IP007486	408.5ms	1.9ms	0.2%
-NAD(PCG)-IP007484_To_OAK(PCG)-IP007608_GOLD-	NAD(PCG) IP007484	OAK(PCG) IP007608	495.7ms	2.2ms	0.4%
-NAD(PCG)-IP007484_To_OAK(PCG)-IP007609_GOLD-	NAD(PCG) IP007484	OAK(PCG) IP007609	509.1ms	2ms	0.2%
-NAD(PCG)-IP007484_To_SLC(PCG)-IP007610_GOLD-	NAD(PCG) IP007484	SLC(PCG) IP007610	520.6ms	2.3ms	0.4%

(C) This is the report for response time, Jitter and Packet Loss for Package C+.

Site2Site Report - NAD(PCG) IP007484

Class Of Service Gold	Site2Site	Source	Destination	Response Time	Jitter	Packet Loss
GOLD	-NAD(PCG)-IP007484_To_ATL(PCG)-IP007611_GOLD-	NAD(PCG) IP007484	ATL(PCG) IP007611	284.7ms	0.5ms	0%
	-NAD(PCG)-IP007484_To_AUC(TNZ)-IP007482_GOLD-	NAD(PCG) IP007484	AUC(TNZ) IP007482	79.8ms	0.6ms	0%
	-NAD(PCG)-IP007484_To_BNE(PCG)-IP007485_GOLD-	NAD(PCG) IP007484	BNE(PCG) IP007485	81ms	0.5ms	0%
	-NAD(PCG)-IP007484_To_CHC(TNZ)-IP007483_GOLD-	NAD(PCG) IP007484	CHC(TNZ) IP007483	94.7ms	0.5ms	0%
	-NAD(PCG)-IP007484_To_MEL(PCG)-IP007486_GOLD-	NAD(PCG) IP007484	MEL(PCG) IP007486	--	--	--
	-NAD(PCG)-IP007484_To_OAK(PCG)-IP007608_GOLD-	NAD(PCG) IP007484	OAK(PCG) IP007608	209.1ms	0.5ms	0%
	-NAD(PCG)-IP007484_To_OAK(PCG)-IP007609_GOLD-	NAD(PCG) IP007484	OAK(PCG) IP007609	217.3ms	0.5ms	0%
	-NAD(PCG)-IP007484_To_SLC(PCG)-IP007610_GOLD-	NAD(PCG) IP007484	SLC(PCG) IP007610	226.6ms	0.5ms	0%

Report generated for PCCW Global Internal User_IPSM_Customer Reports

(D) CRV Service Level Agreement

SLA Package	Package A	Package B+	Package B	Package C+	Package C	Package D
Local loop connection	2	1	1	1	1	NIL (customer self provided internet)
NID	2	2	1	2	1	1
IP Sec Gateway (backup)	NIL	Yes (customer provides internet)	Yes(customer provides internet)	No	No	Yes (customer provide internet)
Availability	99.97% (connectivity + router)	99.95% (connectivity+ router)	99.5% (connectivity+ router)	99.7% (connectivity+ router)	99.5% (connectivity+ router)	99.5% (IPSec gateway port only)
Site to Site Round Trip Delay by zone	200ms / 600ms	200ms / 600ms	200ms / 600ms	200ms / 600ms	200ms / 600ms	PoP to PoP 200ms / PoP to PoP 600ms
Site to Site Packet Drop rate	<0.1% for Voice; <0.5% for Data	<0.1% for Voice; <0.5% for Data		<0.1% for Voice; <0.5% for Data		PoP to PoP <0.5% for Data
Site to Site Jitter	15ms for Voice; 250ms for Data	15ms for Voice; 250ms for Data		15ms for Voice; 250ms for Data		250ms for Data (PoP to PoP)
Rebate	Yes	Yes		Yes		No