

International Civil Aviation Organization

ICAO

Tenth Meeting of the Aeronautical Communication Services Implementation Coordination Group (ACSICG/10)
Bangkok, Thailand, 24 - 26 May 2023

Agenda Item 7: Review Table CNS II-1 and II-2 in APAC e-ANP Volume II

TELECOMMUNICATION INFRASTRUCTURE PLAN FOR APAC

(Presented by Federal Aviation Administration/USA)

SUMMARY

This paper presents the telecommunication infrastructure including Common Aeronautical VPN (CRV) and other telecommunication media used in the region. This paper is also presented to CRV OG Ad-Hoc Governance meeting.

1. INTRODUCTION

- 1.1 Air Traffic Service (ATS) Message Handling System (AMHS) has been a communication media to exchange flight plan/clearance, meteorological data, ATS Inter-Facility Data Communication (AIDC) and other data message between communication centers.
- 1.2 AMHS needs to report to EUROCONTROL's air traffic services (ATS) messaging management centre (AMC) for AMHS global routing coordination. A table is maintained by AEROTHAI on behalf of ICAO Asia/Pacific region and coordinated with EUROCONTROL.
- 1.3 CRV has been in operation since 2019 and now has twenty ANSPs and entities as users and continues to grow.
- 1.4 New services are expected such as System Wide Information Management (SWIM), navigation, and surveillance.

2. DISCUSSION

- 2.1 As mentioned above, AMHS has been a centric for telecommunication infrastructure before CRV was implemented. CRV now allowed direct connection over Internet Protocol (IP) network without the need of AMHS routing plan.
- 2.2 The current tracking table developed for AMHS should be modified to reflect CRV infrastructure. This new table should compile all tables developed by CRV OG into this new table for better management and coordination.
- 2.3 The table should also include a section for AMHS coordination with AMC.

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- 2.4 A draft version of Telecommunication Infrastructure table is provided in **Attachment** to this paper for review and recommendation.
- 2.5 It’s recommended this table, when approved by the meeting, to be posted on the CRV OG website for members to update. This table should supersede the Table CNS II-2 — Required ATN Infrastructure Routing Plan in the ANP VOL II part III.
- 2.6 Recommended Conclusion/Decision which is expected from the meeting:

Conclusion/Decision XX/XX - TELECOMMUNICATION INFRASTRUCTURE TABLE			
What: TRACKING TABLE To have a single tracking table with online update capability to support implementation of future services, managing bandwidth, reporting to AMC. This table will supersede all telecommunication tables maintained by CRV OG, ACSICG, and CNS SG.		Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical	
Why: Managing Infrastructure	Telecommunication	Follow-up:	<input checked="" type="checkbox"/> Required from States
When: 26-May-23	Status: Draft to be adopted by PIRG		
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: XXXX			

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.

TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

EXPLANATION OF THE TABLE

Column

- | | |
|---|---|
| 1 | Name of the Administration and Location of the ATN Router |
| 2 | Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1) |
| 3 | Bandwidth: Link Speed expressed in bits per second (bps) |
| 4 | Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6) |
| 5 | Type of services being transported on the linkie
AFTN/AMHS/Voice/Met/Radar |
| 6 | Contract Types (CRV/MPLS/VPN/Dedicated Circuit) |

Status from AMC									
Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS	
Administration/ State	City/Location	Administration/ State	City/Location						
1	2	3	4	5	6	7	8	9	
Afghanistan	Kabul (OAKB)	Pakistan							
American Samoa	Pago Pago	United States	Salt Lake City	64K	IP	AFTN/MET	VPN		
Australia	Brisbane	Fiji	Nadi						
		Indonesia							
		Japan							
		Papua New Guinea		64K	IP	AMHS	VPN		
		New Zealand	Christchurch	64K	IP	AMHS	CRV	Primary	
		New Zealand	Auckland	64K	IP	Voice	CRV	Primary	
		Singapore							
		South Africa							
		United States	Oakland	64K	IP	Voice	CRV		
		United States	Salt Lake City	64K	IP	AMHS	CRV	Primary	
	United States	Atlanta	64K	IP	AMHS	CRV	Backup		
		Melbourne	Fiji						
			Indonesia						
			Japan						
			Papua New Guinea		64K	IP	AMHS	VPN	
			New Zealand						
	Singapore								
		United States (Salt Lake City)		64K	IP	AMHS	CRV		
Bangladesh	Dhaka	India							
		Thailand							
Bhutan	Bhutan	India							
Paro	Paro								
Brunei Darussalam	Brunei Darussalam	Malaysia							
Brunei	Brunei	Singapore							
Cambodia	Cambodia	Thailand							
Phnom Penh	Phnom Penh								
China	China	DPR Korea							
Beijing	Beijing	Hong Kong, China							
		India							
		Japan							
		Kuwait							
		Macau, China							

Status from AMC								
Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS
Administration/ State	City/Location	Administration/ State	City/Location					
1	2	3	4	5	6	7	8	9
		Mongolia						
		Myanmar						
		Nepal						
		Pakistan						
		Republic of Korea						
		Russian Federation						
		Thailand						
		Vietnam						
Taipei	Taipei	Hong Kong, China						
		Japan						
Hong Kong, China	Hong Kong, China	China						
		Macau, China						
		Japan						
		Philippines						
		Taipei						
		Thailand						
		Viet Nam						
Macau, China	Macau, China	China						
		Hong Kong, China						
Cook Island	Cook Island	New Zealand						
Rarotonga	Rarotonga							
DPR Korea	DPR Korea	China						
Pyongyang	Pyongyang							
Fiji	Fiji	Australia						
Nadi	Nadi	Kiribati						
		New Caledonia						
		Tuvalu						
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	Primary
		United States	Atlanta	64K	IP	AMHS	CRV	Backup
		Wallis Islands		Internet	IP		Connect with New Caledonia - Implemente in 2016	
French Polynesia	French Polynesia	New Zealand		64K	IP	AFTN/MET	VPN	
Papeete (NTAA)	Papeete (NTAA)							
India	India	Bangladesh						
Mumbai	Mumbai	Bhutan						
		China						

Status from AMC								
Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS
Administration/ State	City/Location	Administration/ State	City/Location					
1	2	3	4	5	6	7	8	9
		Kenya						
		Nepal						
		Oman						
		Pakistan						
		Singapore						
		Sri Lanka						
		Thailand						
		Nairobi						
Indonesia Jakarta	Indonesia Makassar Jakarta Makassar	Australia		2M	IP	AFTN/MET	MPLS?	
		Singapore		128K	IP	AMHS/MET	CRV	
		United States	Oakland	64K	IP	Voice	CRV	
Japan Tokyo	Japan Tokyo/Fukuoka	Australia						
		China						
		Hong Kong, China						
		Europe						
		Republic of Korea						
		Russia Federation						
		Singapore						
		Taipei						
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	Primary
		United States	Atlanta	64K	IP	AMHS	CRV	Backup
Kiribati Tarawa (NGTT)	Kiribati Tarawa (NGTT)	Fiji						
Lao PDR Vientiane	Lao PDR Vientiane	Thailand						
		Viet Nam						
Malaysia Kuala Lumpur	Malaysia Kuala Lumpur	Brunei						
		Singapore						
		Thailand						
Maldives Male (VRMM)	Maldives Male (VRMM)	Sri Lanka						
Marshall Islands Majuro (PKMI)	Marshall Islands Majuro (PKMI)	United States		64K	IP	AFTN/MET	VPN	

Status from AMC

Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS
Administration/ State	City/Location	Administration/ State	City/Location					
1	2	3	4	5	6	7	8	9
Micronesia Federated State of Chuuk (PTKK) Kosrae (PTSA) Ponapei (PTPN) Yap (PTYA)	Micronesia Federated State of Chuuk (PTKK) Kosrae (PTSA) Ponapei (PTPN) Yap (PTYA)	United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
			Salt Lake City	64K	IP	AFTN/MET	VPN	
		United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
		United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
		United States	Salt Lake City	64K	IP	AFTN/MET	VPN	
Mongolia Ulanbaatar	Mongolia Ulanbaatar	China						
Myanmar Yangon	Myanmar Yangon	China						
		Thailand						
Nepal Kathmandu	Nepal Kathmandu	China						
		India						
New Caledonia Noumea (NWWW)	New Caledonia Noumea (NWWW)	Fiji						
New Zealand Christchurch	New Zealand Christchurch	Australia						
		Cook Is.						
		French Polynesia						
		Samoa						
		Tonga						
		United States	Oakland	64K	IP	Voice	CRV	
United States	Salt Lake City	64K	IP	AMHS	CRV	Primary		
United States	Atlanta	64K	IP	AMHS	CRV	Backup		
New Zealand Auckland	New Zealand Auckland	Australia			IP	Voice	CRV	
		Cook Is.			IP	Voice	PASNET	
		Fiji			IP	Voice	CRV	
		Samoa			IP	Voice	PASNET	
		Tonga			IP	Voice	PASNET	
		United States	Oakland	64K	IP	Voice	CRV	
Pakistan Karachi	Pakistan Karachi	Afghanistan						
		China						
		India						
		Oman						
		Iran						
		Kuwait						
Papua New Guinea	Papua New Guinea	Australia		64K	IP	AMHS	CRV	

Status from AMC

Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS
Administration/ State	City/Location	Administration/ State	City/Location					
1	2	3	4	5	6	7	8	9
		United States (Oakland)		64K	IP	Voice	CRV	
Philippine:	Philippine:	Hong Kong, China		2 M	IP	AMHS	CRV	
		Singapore		2 M	IP	AMHS	CRV	
		United States	Oakland	64K	IP	Voice	CRV	
		United States	Salt Lake City	64K	IP	AMHS	CRV	Primary
		United States	Atlanta	64K	IP	AMHS	CRV	Backup
Republic of Korea Seoul	Republic of Korea Seoul	China						
		Japan		2 M	IP	AMHS	CRV	
Samoa Ealeolo (NSEA)	Samoa Ealeolo (NSEA)	New Zealand		1.1 Mb	IP	AFTN/MET	VPN	
Singapore Singapore	Singapore Singapore	Australia		2 M	IP	AMHS	CRV	
		Bahrain						
		Brunei						
		India						
		Indonesia						
		Japan						
		Malaysia						
		Philippines						
		Sri Lanka						
		Thailand						
		United Kingdom						
		Viet Nam						
		Sri Lanka Colombo	Sri Lanka Colombo	India				
Maldives								
Singapore								
Thailand Bangkok	Thailand Bangkok	Bangladesh						
		Cambodia						
		China						
		Hong Kong, China						
		India						
		Italy						
		Lao PDR.						
		Malaysia						
		Myanmar						

Status from AMC								
Local		Remote		Bandwidth (bps)	Network Protocol (IP/X.25/Non Protocol)	Type of Service (AFTN/AMHS/Voice/Met/Radar)	Contract Types (CRV/MPLS/VPN/Dedicated Circuit)	REMARKS
Administration/ State	City/Location	Administration/ State	City/Location					
1	2	3	4	5	6	7	8	9
		Singapore						
		Viet Nam						
Tonga Tongatapu (NETE)	Tonga Tongatapu (NETE)	New Zealand		85K	IP	AFTN/MET	VPN	
Tuvalu Ealeolo	Tuvalu Ealeolo	Fiji		64K	IP	AFTN/MET	VPN	
United States Salt Lake City	United States Salt Lake City with Atlanta as backup (CRV Package C/2MB at SLC and ATL)	Australia		64K	IP	AMHS	CRV	
		Australia		64K	IP	AMHS	VPN	BACKUP
		American Samoa	Pago Pago	64K	IP	AFTN/MET	VPN	
		Fiji		64K	IP	AMHS	CRV	
		Japan		64K	IP	AMHS	CRV	
		Marshall Islands		64K	IP	AFTN/MET	VPN	
		Micronesia, Federated State of		64K	IP	AFTN/MET	VPN	
		New Zealand		64K	IP	AMHS	CRV	
		Philippines		64K	IP	AMHS	CRV	
United States Oakland	United States Oakland (CRV Package A/2MB)	Fiji (Nadi)		64K	IP	Voice	CRV	
		Indonesia (Makassar)		64K	IP	Voice	CRV	
		Japan (Fukuoka)		64K	IP	Voice	CRV	
		New Zealand		64K	IP	Voice	CRV	
		Papua New Guinea		64K	IP	Voice	CRV	
		Philippines (Manila)		64K	IP	Voice	CRV	
Viet Nam Ho Chi Minh/Hanoi	Viet Nam Ho Chi Minh/Hanoi	Hong Kong, China						
		Lao PDR.						
		Singapore						
		Thailand						
Wallis Islands (NLWW)	Wallis Islands (NLWW)	Fiji		64K	IP	AFTN/MET	VPN	

Still have plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark	Last update in AMC
China Beijing	BBIS	Inter-Regional	Kuwait	64000 bps	X.25		Router Implemented	
	BIS	Intra-Regional	Myanmar	64000 bps	IPS		Implementation on going/Plan Q4/15	
	BIS	Intra-Regional	Mongolia	9600 bps	X.25		Router Implemented	
	BBIS	Inter-Regional	Russian Federation	64000 bps	X.25		Router Implemented	
Hong Kong, China	BIS	Intra-Regional	Viet Nam	64000 bps	X.25	DDN	TBD	
India, Mumbai	BBIS	Intra-Regional	Nairobi	64000 bps	IPS			
Lao PDR Vientiane	BIS	Intra-Regional	Viet Nam	9600 bps	X.25			
Malaysia Kuala Lumpur	BIS	Intra-Regional	Brunei	2 M	IPS			
	BIS	Intra-Regional	Singapore	2 M	IPS	CRV	Scheduled for Q3/2022	29042022
Myanmar Yangon	BIS	Intra-Regional	China	64000 bps	IPS			
Singapore Singapore	BIS	Intra-Regional	Malaysia	2 M	IPv4	CRV	Scheduled for Q3/2022	29042022
Thailand Bangkok	BIS	Intra-Regional	Viet Nam	64000 bps	IPv4	VSAT	PLan to implement in Q3/2023	from Thailand
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD	
	BIS	Intra-Regional	Lao PDR.	9600 bps	X.25			
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	PLan to implement in Q3/2023	from Thailand

15-Jan-23

Red character is present status in AMC

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Afghanistan Kabul (OAKB)	BIS	Intra-Regional	Pakistan	64000bps	VPN		Intra-domain
	BIS	Inter-Regional	Iran	50	AFTN		
Australia Brisbane	BBIS	Intra-Regional	Japan	64000 bps	IPS/IP-SNDCF	VPN	Not implemented
	BBIS	Inter-Regional	South Africa	64000 bps	TBD		Not implemented
Brunei Darussalam Brunei	BIS	Intra-Regional	Singapore	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
China Beijing	BIS	Intra-Regional	Vietnam	9600 bps	X.25		
Cook Islands Rarotonga			New Zealand	796 kbps	IPS		Intra-domain
DPR Korea Pyongyang	BIS	Intra-Regional	China	9600 bps	X.25		
Fiji Nadi	BIS	Intra-Regional	Kiribati	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015
	BIS	Intra-Regional	New Caledonia	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
	BIS	Intra-Regional	Tuvalu	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015
	BIS	Intra-Regional	Wallis Islands	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016
French Polynesia Papeete (NTAA)			New Zealand	64000 bps	IPS		Intra-domain
Indonesia Jakarta	BIS	Intra-Regional	Australia	64000bps	IPS		Not Implemented
Japan	BBIS	Intra-Regional	Australia	64000 bps	IPS/IP-SNDCF	VPN	Schedule after CRV
	BBIS	Inter-Regional	Europe	64000 bps	IP SNDCF	DDN/ TBD	

NO
CONNEC
TION IN
AMC

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Tokyo	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	VPN	TBD
	BIS	Intra-Regional	Republic of Korea	64000 bps	IPS(IPv4)	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	Russia Federation	64000 bps	IP-SNDCF	DDN/ VPN	TBD
Kiribati Tarawa (NGTT)	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015
Maldives Male (VRMM)	BIS	Intra-Regional	Sri Lanka	64000 bps	X.25		
Marshall Islands Majuro (PKMJ)	BIS	Inter-Regional	United States	64000 bps	IP		VPN over Internet Intro-domain
Micronesia Federated State of Chuuk (PTKK) Kosrae (PTSA) Ponapei (PTPN) Yap (PTYA)	BIS	Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Nepal Kathmandu	BIS	Intra-Regional	China	9600bps	X.25		Router Implemented
New Caledonia Noumea (NWWW)			Fiji	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
New Zealand Christchurch			Cook Is.	2.4 K	IPS		Intra-domain
			French Polynesia	64000 bps	IPS		Intra-domain
			Samoa	2.4 K	IPS		Intra-domain
			Tonga	85000 bps	IPS		Intra-domain
Pakistan Karachi	BIS	Intra-Regional	Afghanistan	64000 bps	IPS		
	BIS	Intra-Regional	China	64000 bps	X.25		
	BIS	Inter-Regional	Oman	64000 bps	-		

No Plan information in AMC

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Inter-Regional	Iran	64000 bps	-		
Republic of Korea Seoul	BIS	Intra-Regional	Japan	64000 bps	IPS(IPv4)	VPN	Implementation from 2016 onwards scheduled after CRV
Samoa Faleolo (NSFA)			New Zealand	1.1 Mb	IPS		Intra-domain
Singapore Singapore	BIS	Intra-Regional	Brunei	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
Sri Lanka Colombo	BIS	Intra-Regional	Maldives	64000 bps	X.25		TBD
Tonga Tongatapu (NFTF)	BIS	Intra-Regional	New Zealand	85000 bps	IPS		Intra-domain
Tuvalu Faleolo	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
United States Salt Lake City			American Samoa		IP		Intra-domain
		Intra-Regional	Marshall Islands	64000 bps	IP		Intra-domain/Internet
		Intra-Regional	Micronesia, Federated State of	64000 bps	IP		Intra-domain
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	Singapore	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
Wallis Islands (NLWW)	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016

TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

EXPLANATION OF THE TABLE

Column

- 1 Name of the Administration and Location of the ATN Router
- 2 Type of Router (in end systems (ES) of the Administration shown in column 1)
- 3 Type of Interconnection:

Inter-Regional: Connection between different Regions/ domains
Intra-Regional: Connection within a Region/ domain.
- 4 Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1)
- 5 Bandwidth: Link Speed expressed in bits per second (bps)
- 6 Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)
- 7 Via: The media used to implement the interconnection of the routers. (in case of IP service bought from a service provider, indicate VPN)

DDN (public telecomm leased line)
VSAT
VPN
- 8 Remarks

ACSICG/10
Attachment A to WP/09

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Afghanistan Kabul	BIS	Intra-Regional	Pakistan	64000bps	IPS		Intra-domain
	BIS	Inter-Regional	Iran	9600 bps	IPS		
American Samoa Pago Pago			United States				Intra-domain
Australia Brisbane	BBIS	Intra-Regional	Fiji	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000 bps	IPS		Not implemented
	BBIS	Intra-Regional	Japan	64000 bps	IPS/IP-SNDCF	VPN	Not implemented
	BIS	Intra-Regional	New Zealand	64000 bps	IPS	VPN	Not implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	South Africa	64000 bps	TBD		Not implemented
	BBIS	Inter-Regional	United States	64000 bps	DDN lease line/IPS		
Bangladesh Dhaka	BIS	Intra-Regional	India	64000 bps	IPS		Implemented
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Bhutan Paro	BIS	Intra-Regional	India	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
Brunei Darussalam Brunei	BIS	Intra-Regional	Malaysia	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
Cambodia Phnom Penh	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented
China Beijing	BIS	Intra-Regional	DPR Korea	9600 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Router Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	VPN	Implement from 2016 onwards
	BBIS	Inter-Regional	Kuwait	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Mongolia	9600 bps	X.25		Router Implemented

ACSICG/10
Attachment A to WP/09

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Myanmar	64000 bps	IPS		Implementation on going/Plan Q4/15
	BIS	Intra-Regional	Nepal	9600 bps	X.25		Router Implemented
	BIS	Intra-Regional	Pakistan	64000 bps	X.25		Router Implemented
	BIS	Intra-Regional	Republic of Korea	64000 bps	X.25		Implemented
	BBIS	Inter-Regional	Russian Federation	64000 bps	X.25		Router Implemented
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	
	BIS	Intra-Regional	Vietnam	9600 bps	X.25		
Taipei	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD
	BIS	Intra-Regional	Japan	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
Hong Kong, China	BBIS	Intra-Regional	China	64000 bps	X.25	DDN	Router Implemented
	BIS	Intra-Regional	Macau, China	64000 bps	X.25	DDN	Implemented
	BBIS	Intra-Regional	Japan	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BIS	Intra-Regional	Philippines	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BBIS	Intra-Regional	Taipei	64000 bps	X.25	DDN	TBD
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	X.25	DDN	TBD
Macau, China	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	Implemented
Cook Islands Rarotonga			New Zealand	796 kbps	IPS		Intra-domain
DPR Korea Pyongyang	BIS	Intra-Regional	China	9600 bps	X.25		
Fiji Nadi	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF (IPv4)	DDN	Implemented
	BIS	Intra-Regional	Kiribati	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015
	BIS	Intra-Regional	New Caledonia	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
	BIS	Intra-Regional	Tuvalu	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015

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Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BBIS	Inter-Regional	United States	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BIS	Intra-Regional	Wallis Islands	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016
French Polynesia Papeete			New Zealand	64000 bps	IPS		Intra-domain
India Mumbai	BIS	Intra-Regional	Bangladesh	64000 bps	DDN leased line/IPS		Implemented
	BIS	Intra-Regional	Bhutan	64000 bps	IPS		TBD. Presently using AFTN via VPN through public internet
	BBIS	Intra-Regional	China	64000 bps	X. 25/IPS	DDN	IOT/POT completed. - Migrate to IPS
	BIS	Inter-Regional	Kenya	64000 bps	TBD	TBD	Presently using AFTN via VPN via public internet
	BIS	Intra-Regional	Nepal	64000 bps	IPS		Implemented
	BIS	Inter-Regional	Oman	64000 bps	IPS		IOT completed. POT planned. TMC to be signed
	BIS	Intra-Regional	Pakistan	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BBIS	Intra-Regional	Singapore	64000 bps	X.25	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPS	DDN	IOT/POT Ccompleted.
	BBIS	Intra-Regional	Thailand	64000 bps	X. 25	DDN	Implemented
Indonesia Jakarta	BBIS	Intra-Regional	Nairobi	64000 bps	IPS		
	BIS	Intra-Regional	Australia	64000bps	IPS		Not Implemented
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan O1/16
Japan Tokyo	BBIS	Intra-Regional	Australia	64000 bps	IPS/IP-SNDCF	VPN	Schedule after CRV
	BBIS	Intra-Regional	China	64000 bps	IPS/IP-SNDCF	VPN	Implement from 2016 onwards Schedule after CRV
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/SNDCF	VPN	Scheduled for Q4/2017
	BBIS	Inter-Regional	Europe	64000 bps	IP-SNDCF	DDN/ VPN	TBD

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Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Republic of Korea	64000 bps	IPS(IPv4)	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	Russia Federation	64000 bps	IP-SNDCF	DDN/VPN	TBD
	BBIS	Intra-Regional	Singapore	64000 bps	IPS/SNDCF	DDN	Scheduled for Q1/2018
	BIS	Intra-Regional	Taipei	64000 bps	IPS	VPN	Implement from 2016 onwards Scheduled after CRV
	BBIS	Inter-Regional	United States	64000 bps	X.25-SNDCF	DDN/VPN	Implemented
Kiribati Tarawa	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation Q3 2015
Lao PDR Vientiane	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25		
Malaysia Kuala Lumpur	BIS	Intra-Regional	Brunei	64000 bps	IPS		
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	Implemented
Maldives Male	BIS	Intra-Regional	Sri Lanka	64000 bps	X.25		
Marshall Islands Majuro	BIS	Inter-Regional	United States	64000 bps	IP		VPN over Internet Intro-domain
Micronesia Federated State of Chuuk Kosrae Ponapei Yap	BIS	Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
		Inter-Regional	United States	64000 bps	IP	VPN	VPN over Internet/Intra-domain
Mongolia Ulanbaatar	BIS	Intra-Regional	China	9600 bps	X.25		Router Implemented
Myanmar Yangon	BIS	Intra-Regional	China	64000 bps	IPS		

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Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Thailand	32000 bps	IPv4	VSAT	Implemented
Nepal Kathmandu	BIS	Intra-Regional	China	9600bps	X.25		Router Implemented
	BIS	Intra-Regional	India	64000 bps	IPS		Implemented
New Caledonia Noumea			Fiji	64000 bps	IPS (IPv4)	DDN	Intra-domain - Implementation 2016 Connect with Wallis
New Zealand Christchurch	BIS	Intra-Regional	Australia	64000 bps	IPS	VPN	Not Implemented
			Cook Is.	796 kbps	IPS		Intra-domain
			French Polynesia	64000 bps	IPS		Intra-domain
			Samoa	1.1 Mb	IPS		Intra-domain
			Tonga	85000 bps	IPS		Intra-domain
	BIS	Inter-Regional	USA	64000 bps	IPS		
Pakistan Karachi	BIS	Intra-Regional	Afghanistan	64000 bps	IPS		
	BIS	Intra-Regional	China	64000 bps	X.25		
	BIS	Intra-Regional	India	64000 bps	IPS		IOT/POT completed. TMC to be signed
	BIS	Inter-Regional	Oman	64000 bps	-		
	BIS	Inter-Regional	Iran	64000 bps	-		
	BIS	Inter-Regional	Kuwait	64000 bps	-		
Philippines	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25/IPS	DDN	Scheduled for Q4/2016
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	2016
		Intra-Regional	United States	64000 bps	IPS		to be implemented in 2016
Republic of Korea Seoul	BIS	Intra-Regional	China	64000 bps	X.25		Implemented
	BIS	Intra-Regional	Japan	64000 bps	IPS(IPv4)	VPN	Implementation from 2016 onwards scheduled after CRV
Samoa Faleolo			New Zealand	1.1 Mb	IPS		Intra-domain
Singapore Singapore	BBIS	Intra-Regional	Australia	64000 bps	CLNP/IP-SNDCF	DDN	ATN/AMHS trial planned to completed by end 2015
	BBIS	Inter-Regional	Bahrain	64000 bps	IPv4	DDN	

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Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
	BIS	Intra-Regional	Brunei	9600 bps	IPv4	DDN	ATN/AMHS trial commence on 2017
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented
	BIS	Intra-Regional	Indonesia	64000bps	IPv4	VSAT	ATN/AMHS trial to be completed by end 2015. Implementation Plan Q1/16
	BBIS	Intra-Regional	Japan	64000 bps	IPS/SNDCF	DDN	ATN/AMHS trial commence on 2017 Scheduled for Q1/2018
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Scheduled for Q1/2018
	BIS	Intra-Regional	Philippines	64000 bps	IPv4	DDN	2016
	BIS	Intra-Regional	Sri Lanka	64000 bps	IPv4	DDN	Implementation Plan Q1/16
	BBIS	Intra-Regional	Thailand	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Inter-Regional	United Kingdom	128000 bps	IPv4	VPN	Implemented
	BIS	Intra-Regional	Viet Nam	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
Sri Lanka Colombo	BIS	Intra-Regional	India	64000 bps	IPS	DDN	Implementation Plan Q4/15
	BIS	Intra-Regional	Maldives	64000 bps	X.25		TBD
	BIS	Intra-Regional	Singapore	64000 bps	IPv4	DDN	Implementation Plan Q1/16
Thailand Bangkok	BIS	Intra-Regional	Bangladesh	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Cambodia	64000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	China	64000 bps	CLNP/X.25	DDN	
	BBIS	Intra-Regional	Hong Kong, China	64000 bps	CLNP/X.25	DDN	Implemented
	BBIS	Intra-Regional	India	64000 bps	X.25	DDN	Implemented
	BBIS	Inter-Regional	Italy	64000 bps	IPv4	DDN	
	BIS	Intra-Regional	Lao PDR.	32000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Malaysia	64000 bps	IPv4	VSAT	Implemented
	BIS	Intra-Regional	Myanmar	32000 bps	IPv4	VSAT	Implemented
	BBIS	Intra-Regional	Singapore	64000 bps	CLNP/X.25	DDN	Implemented
	BIS	Intra-Regional	Viet Nam	64000 bps	IPv4	VSAT	
Tonga Tongatapu	BIS	Intra-Regional	New Zealand	85000 bps	IPS		Intra-domain

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Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remark
1	2	3	4	5	6	7	8
Tuvalu Faleolo	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Intra-domain (User Agent) - Implementation O3 2015
United States Salt Lake City	BBIS	Inter-Regional	Australia	64000 bps	IPS		
			American Samoa				Intra-domain
	BBIS	Inter-Regional	Fiji	9600 bps	CLNP/X.25-SNDCF	DDN	The protocol will upgrade to IPS/SNDCF in 2016
	BBIS	Inter-Regional	Japan	64000 bps	X.25-SNDCF	DDN/ VPN	Implemented
		Intra-Regional	Marshall Islands	64000 bps	IP		Intra-domain/Internet
		Intra-Regional	Micronesia, Federated State of	64000 bps	IP		Intra-domain
	BIS	Inter-Regional	New Zealand	64000 bps	IPS		Implemented
		Intra-Regional	Philippines	64000 bps	IP		to be implemented in 2016
Viet Nam Ho Chi Minh/Hanoi	BIS	Intra-Regional	China	9600 bps	X.25		
	BIS	Intra-Regional	Hong Kong, China	64000 bps	X.25	DDN	TBD
	BIS	Intra-Regional	Lao PDR.	9600 bps	X.25		
	BIS	Intra-Regional	Singapore	9600 bps	X.25	DDN	ATN/AMHS trial planned to completed by end 2015
	BIS	Intra-Regional	Thailand	64000 bps	IPv4	VSAT	
Wallis Islands	BIS	Intra-Regional	Fiji	Internet	IPv4	VPN	Connect with New Caledonia - Implemente in 2016