

AUGUST 2020

AP-IS SUB-REGIONAL INITIATIVES - PACIFIC -

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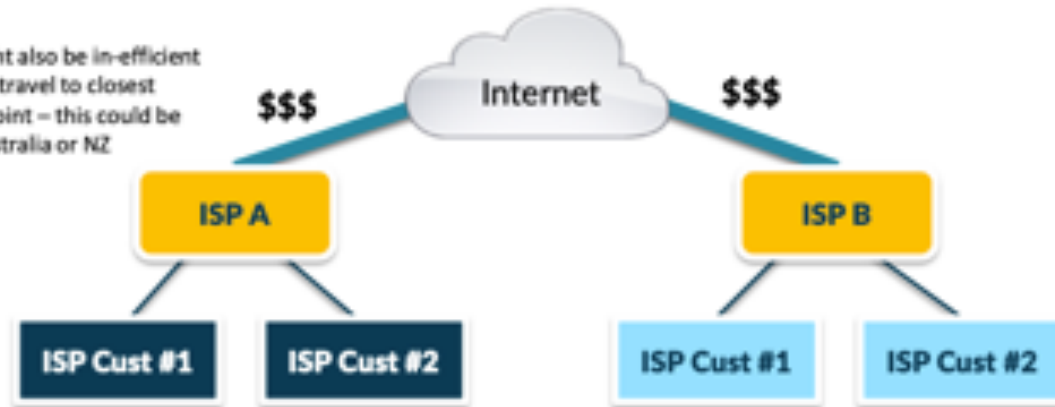
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INTERNET EXCHANGE POINTS (IXP)

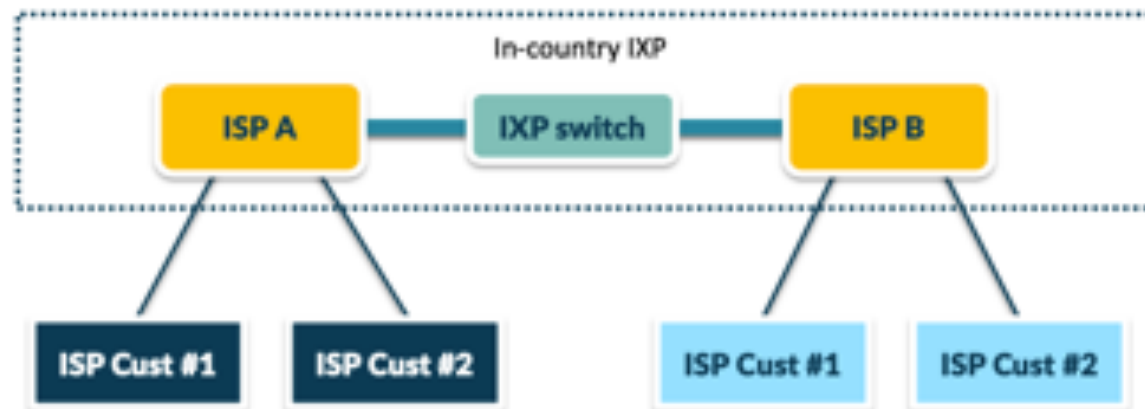
QUICK OVERVIEW

- IXP (Internet eXchange Points) allows Internet providers to pass traffic to each other instead of via transit (\$\$\$\$\$)

Traffic might also be in-efficient as it has to travel to closest common point – this could be the US, Australia or NZ



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Key Benefits

- Keeps local traffic between ISPs local
- Improves latency
- Reduces reliance on external parties for traffic exchange
- Improves efficiency (cost/bandwidth)
- Development of local ICT ecosystem

IS A PACIFIC IXP FEASIBLE?

A. TECHNICAL FEASIBILITY

B. OPERATIONAL FEASIBILITY

TECHNICAL FEASIBILITY STUDY

DR PAUL BROOKS, LAYER 10, DECEMBER 2019

KEY FINDINGS:

- SUBSEA CABLE MAPS CAN BE DECEIVING
- FIBRE PAIRS MAY NOT CONNECT TO WHERE YOU WANT TO TERMINATE
- 2 DISTINCT GROUPINGS FOR THE PACIFIC: NORTH GROUP & SOUTH GROUP
- CONNECTING TO IXP WITHIN A GROUP WILL PROVIDE BETTER BENEFITS
- A DISTRIBUTED IXP IS TECHNICALLY FEASIBLE

"This study determined that the Pacific Island nations were split into two distinct zones – a northern zone surrounding the island of Guam, and a southern zone clustered loosely between Australia, New Zealand and Hawaii"



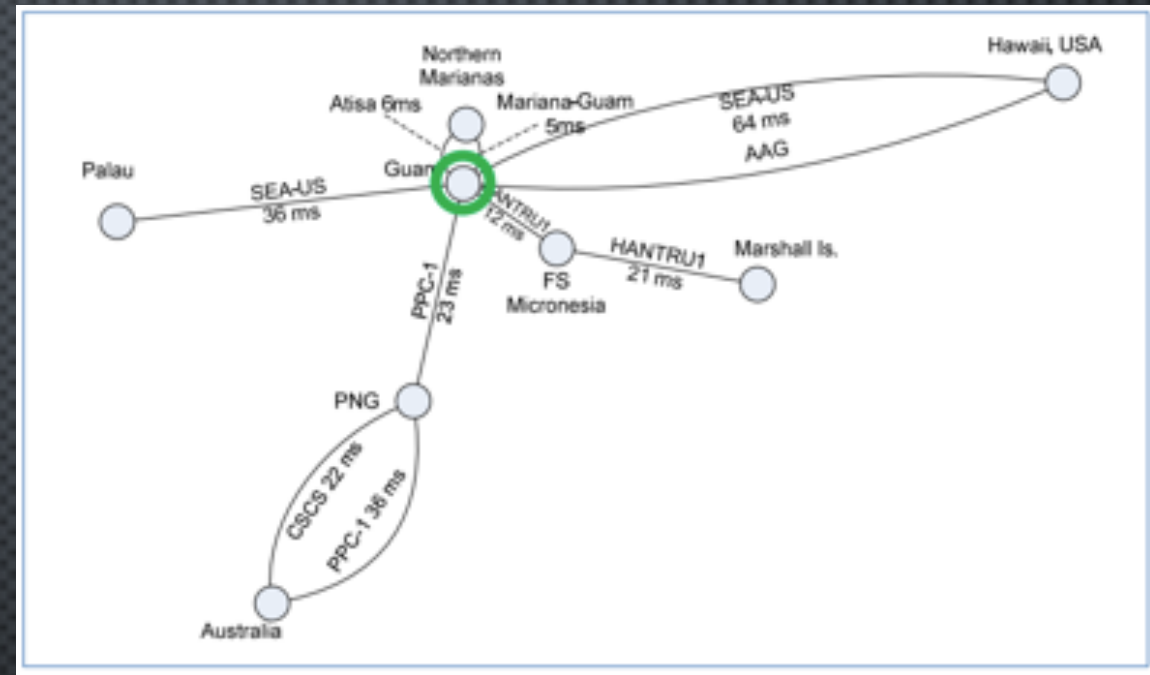
"These two zones are significantly far apart, and no subsea cable connects the two zones together."

"As there are already very large, well-connected IXPs near the cable landings in Australia and USA, these IXPs will always be closer and provide more benefit to a Pacific nation than any IXP located within the other Pacific zone."

"These characteristics make it infeasible for a single IXP to serve all nations, however each zone has a recommended IXP solution that should provide significant performance and efficiency benefits for each Pacific nation."

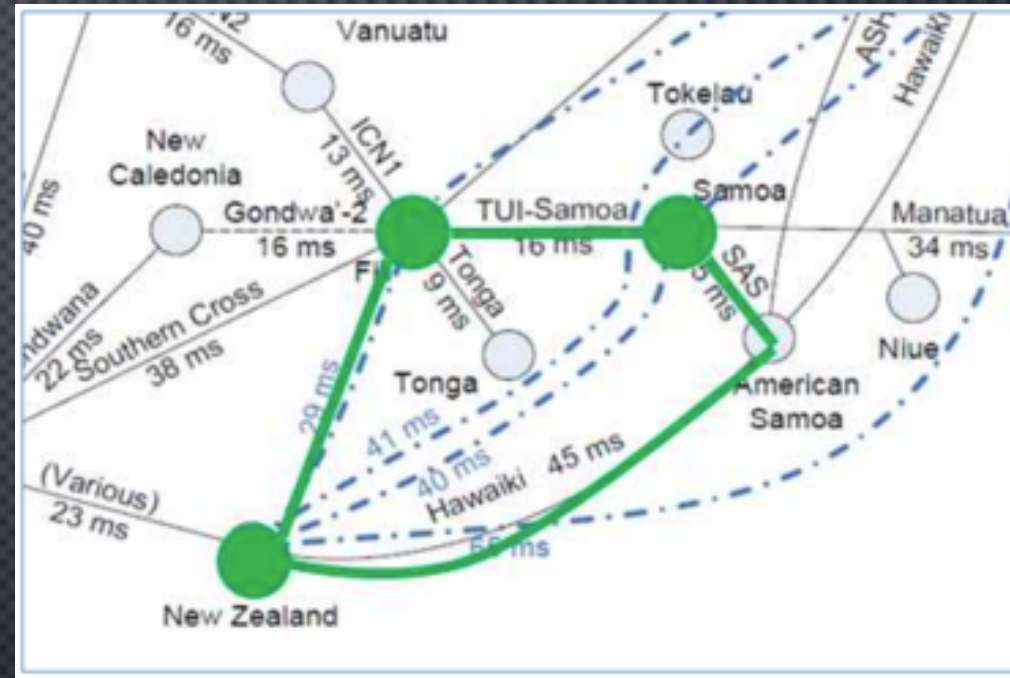
Read more: [Pacific Internet Exchange Point Feasibility Study](#)

NORTHERN PACIFIC ZONE



“The nations in the Northern Zone are generally all connected directly to Guam by cable, and the optimum location for a ‘Northern Pacific Zone IXP’ is for all ISPs to connect to one or both of the existing IXPs in Guam, to exchange traffic with each other and with the other networks present at those exchanges. These Guam IXPs either already have the major content networks connected, or are more likely to attract major content networks in future, than any separate IXP formed solely for the Pacific Island nations.”

SOUTHERN PACIFIC ZONE



“...the Southern Zone nations would be well served by a distributed Pacific IXP infrastructure, with nodes located in Fiji, Samoa, and New Zealand...”

Each ISP in each nation would connect to the closest node of the IX (as well as to any in-country national IXP), and would then be able to establish peering interconnections to any other nation's ISP connected to the same node, or either of the other two nodes within the IX infrastructure. This minimises the costs of international capacity for those nations that are not hosting one of the nodes within their borders, and allows optimal sharing of resources and economies of scale in the solution for traffic sharing and keeping regional traffic regional.”

Consider NZ, Fiji, Samoa as possible IXP locations

- Find lowest-latency path from each country to target location
- Calculate 'Weighted Average Latency' - Weighting by 'Internet Users' per country
- Identify location for IXP that minimises average latency across all paths

Country	Population	Internet Users	Latency to NZ	Weighted Latency	Latency to Fiji	Weighted Latency	Latency to Samoa	Weighted Latency	Latency to closest	Weighted Latency
Fiji	926276	425680	29	11.24	0	0.00	16	6.20	0	0.00
New Caledonia	282754	201000	45	8.24	60	10.98	32	5.86	32	5.86
French Polynes	290373	195275	74	13.16	50	8.89	34	6.05	34	6.05
Solomon Is	660121	69859	58	3.69	29	1.84	45	2.86	29	1.84
Vanuatu	288037	66613	42	2.55	13	0.79	29	1.76	13	0.79
Samoa	201316	58508	40	2.13	16	0.85	0	0.00	0	0.00
Tonga	106398	42552	38	1.47	9	0.35	25	0.97	9	0.35
American Sam	50826	17000	45	0.70	21	0.33	5	0.08	5	0.08
Kiribati	109367	14649	65	0.87	94	1.25	105	1.40	65	0.87
Cook Is	11700	5160	66	0.31	42	0.20	26	0.12	26	0.12
Niue	1618	1090	44	0.04	20	0.02	4	0.00	4	0.00
Tokelau	1285	805	41	0.03	70	0.05	81	0.06	41	0.03
TOTAL	2930071	1098191	54.08	44.42	41.75	25.55	41.25	25.36	26.67	15.99
				NZ		FUJ		SAMOA		All THREE

Almost identical benefit, whether IXP is in Fiji or Samoa

OPERATIONAL FEASIBILITY STUDY

ANDREW KHOO (IN PROGRESS)

TO IDENTIFY:

- POSSIBLE DESIGN OPTIONS AND LOCATION
- ECONOMICS OF DEPLOYMENT
- OPERATIONAL MODALITIES

Second Working Group on Pacific Internet Exchange Point (IXP) and capacity training workshop on IXP's operational modalities (5 August 2020)

- Presentation by Brooks and Khoo on key findings
- In-depth discussion on operationalising a distributed Pacific IXP with member states

KEY POINTS

- Fiji and Samoa are both well connected (+ new cables coming)
- Other Pacific Island countries are on subsea cable spurs from Fiji and Samoa
- From technical POV Fiji and Samoa are key locations for the distributed IX nodes
- The third node in New Zealand can connect with CDNs/Caches
- Other Pacific Island economies will see benefits if they connect
- Any distributed IX deployment should be complementary to in-country IXP
- No need to over-capitalise: start small and expand

fa'afetai lava!

malo 'aupito!

vinaka!

thank you!

meitaki maata!

fakafetai lasi!

tangkyu!

