October 2022

Pacific-IX Internet Exchange ISP Survey September 2022 – Prelim Results

UN-ESCAP Asia-Pacific Information Superhighway (AP-IS) initiative

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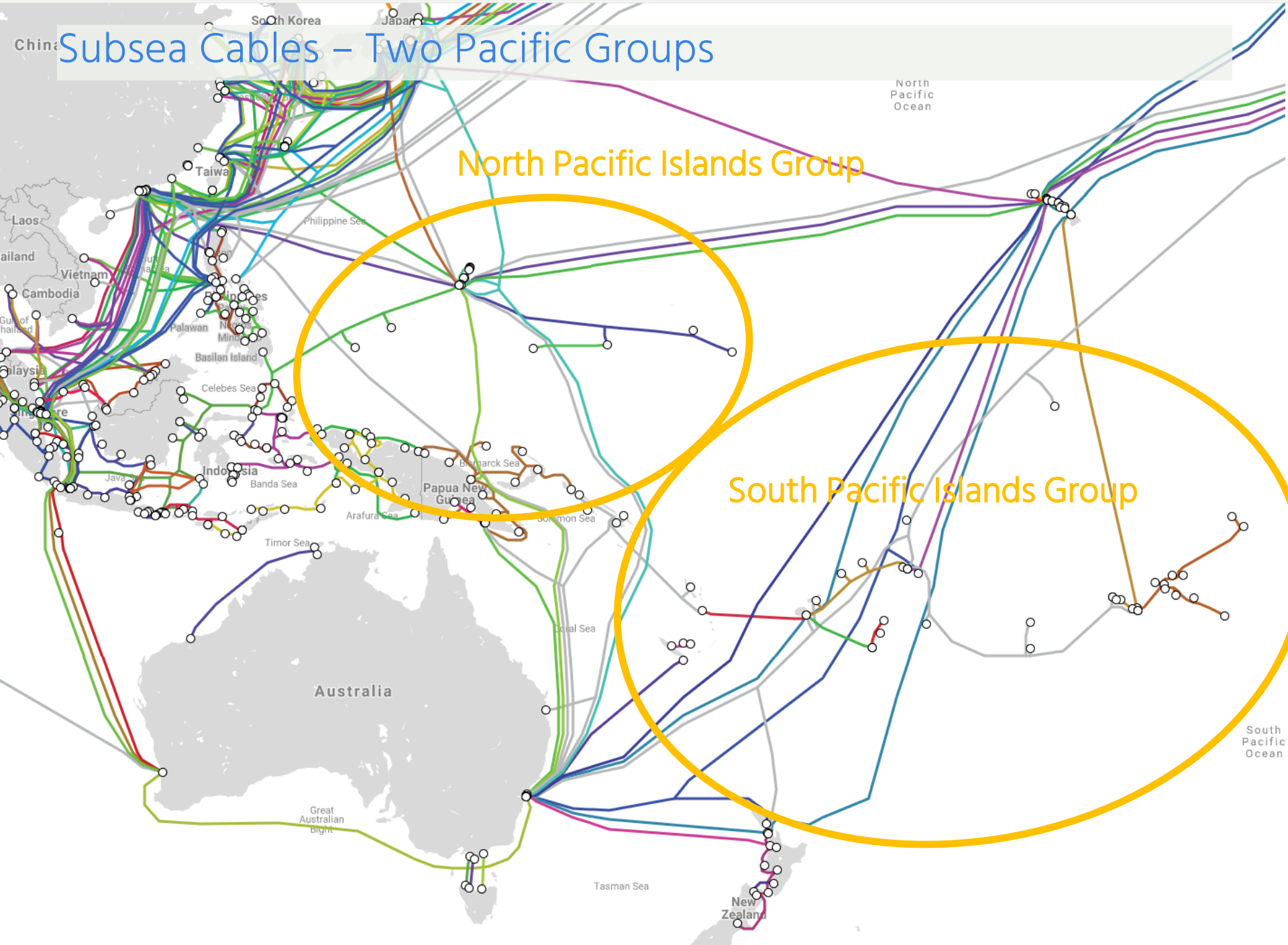
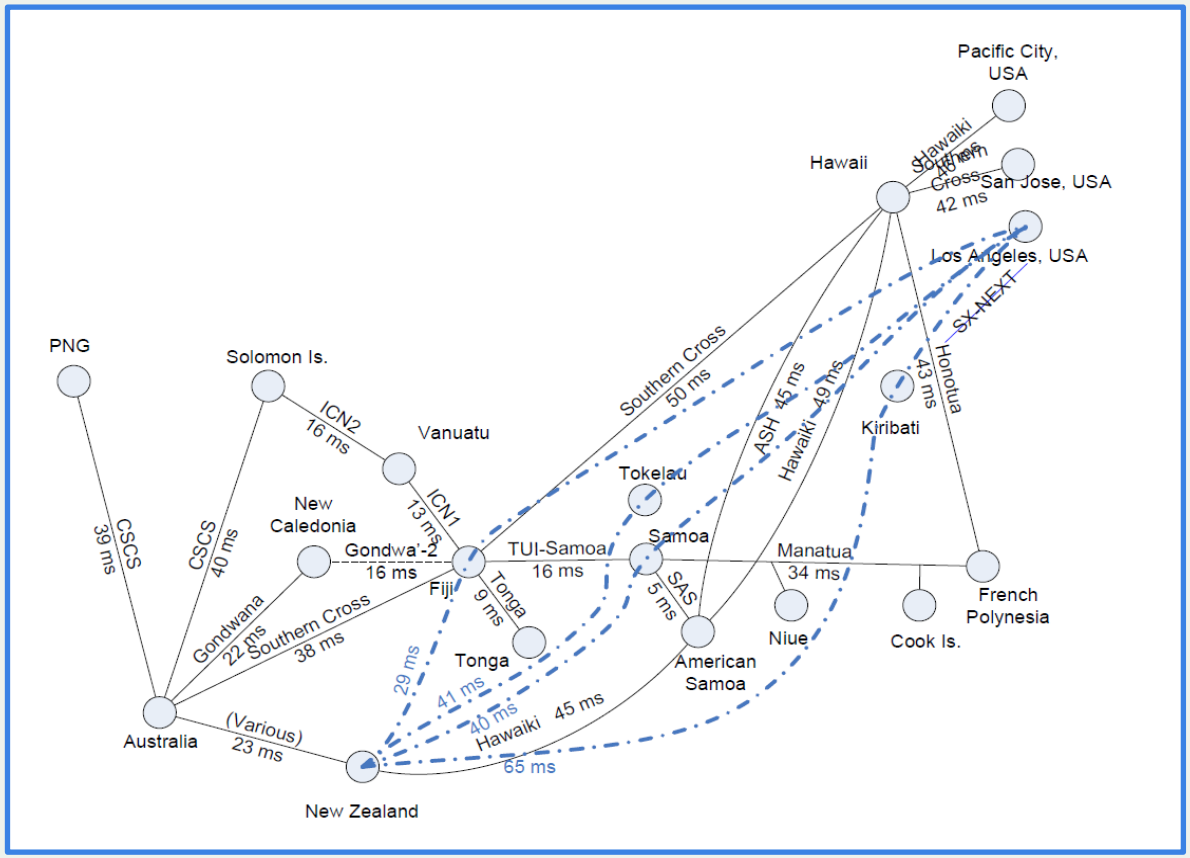
Subsea Cables – Two Pacific Groups



Survey of Pacific Island ISPs

As a form of ‘customer demand study’ for the Pacific-IXP project, we developed an online survey distributed to the major ISPs in each country identified in earlier studies as candidates for connecting to Pacific-IXP, concentrated in the South Pacific islands group:



Approximately 40 different service providers, including some government agency service providers

	Country	Top Level Dc	Org Name	ASN
2	Fiji	.fj	Telecom Fiji/Connect Internet Servic	4638 + 45349
3	Fiji	.fj	Vodafone Fiji Limited	38442
4	Fiji	.fj	Fiji International Telecomunications	9241
5	Fiji	.fj	Digicel Pacific	45355
6	Tonga	.to	Digicel Tonga	38198
7	Tonga	.to	Tonga Communications Corp	38201
8	Tonga	.to	Tonga Cable Limited	132579
9	Tonga	.to	(Tongan Government)	N/A
10	Samoa	.ws	Bluesky Samoa/Vodafone Samoa	17993
11	Samoa	.ws	Digicell Samoa	38800
12	Samoa	.ws	CSL	38227
13	American Samoa	.as	ASTCA Pago Pago	9751
14	American Samoa	.as	Samoa Telco	Part of ASTCA
15	American Samoa	.as	BlueSky Pago Pago	23657
16	American Samoa	.as	(American Samoan Government)	N/A
17	Kiribati	.ki	Vodafone Kiribati (was Amalgamatec	134783
18	Kiribati	.ki	(Kiribati Government)	N/A
19	Niue	.nu	IUSN Foundation	10025
20	Niue	.nu	Niue Telecom	55885
21	Cook Islands	.ck	Telecom Cook Islands	10131
22	Cook Islands	.ck	(Cook Islands Government)	N/A
23	French Polynesia	.pf	ONATi (was OPT)	55943 & 9471
24	French Polynesia	.pf	VINI SAS	9471 see above
25	French Polynesia	.pf	VITI	56017
26	French Polynesia	.pf	(French Polynesia Government)	N/A
27	Vanuatu	.vu	Vanuatu IX	
28	Vanuatu	.vu	Telecom Vanuatu/Vodafone Vanuatu	9249
29	Vanuatu	.vu	Interchange Ltd	45495
30	Vanuatu	.vu	Wantok	45935
31	Vanuatu	.vu	(Vanuatu Government)	N/A
32	Solomon Islands	.sb	Solomon Telekom	45891
33	Solomon Islands	.sb	Solomon Islands Submarine Cable Co	139609
34	Solomon Islands	.sb	SATSOL Ltd	132468
35	Solomon Islands	.sb	Bemobile Solomon Islands Ltd	132462
36	Solomon Islands	.sb	(Solomon Islands Government)	N/A
37	New Caledonia	.nc	OPT	18200
38	New Caledonia	.nc	Offratel	56089
39	New Caledonia	.nc	CANL	17480
40	New Caledonia	.nc	(New Caledonia Government)	N/A
41	Tokelau	.tk	(no '.tk' domains, sites or addresses physicaly located in Tokelau)	
42	Tokelau	.tk	(Tokelau Government)	

The Survey Sample was 28 service providers across 12 Pacific Island countries

Country	Population	Internet Users		Number of ISPs	Responses To Date	Answer Percentage
Fiji	926276	425680		4	4	100%
New Caledonia	282754	201000		3	1	33%
French Polynesia	290373	195275		2	1	50%
Solomon Is	660121	69859		4		0%
Vanuatu	288037	66613		3		0%
Samoa	201316	58508		3	1	33%
Tonga	106398	42552		3	2	67%
American Samoa	50826	17000		2		0%
Kiribati	109367	14649		1	1	100%
Cook Is	11700	5160		1		0%
Niue	1618	1090		2		0%
Tokelau	1285	805		0	0	
TOTAL	2930071	1098191		**28**	**10**	**36%**

Responses

Structure of Survey

Surveys covered 5 main sections of data:

International cable capacity activated – now, 2 years forecast, 5 years forecast
Upstream Internet Transit providers – now, and plans to increase or decrease up to 6 months, 2 years, 5 years forecast
Peering Exchanges present at – now, increase/decrease over 6 months, 2 years, 5 years forecast
Traceroutes to Fiji, Samoa, NZ - to establish current baseline paths and latency to proposed Pacific-IXP nodes
Likelihood of connecting to Pacific-IX, and interface port size likely required (for sizing of switches)

Structure of Survey

Each ISP received an individually customized survey incorporating details specific to that ISP:

- ASN
- Cable routes applicable for that country
- Upstream providers from public BGP-4 sources
- IXPs connected to
- Anticipated closest Pacific-IXP node and expected latency

Where possible, respondents were asked to confirm the details in public databases, instead of inputting data fresh

Survey constructed in SurveyMonkey.com, and emailed a customized URL to each contact provided by PITA

https://www.surveymonkey.com/r/VGTBN78 67% Search
Realtair | Buy & Bid on... Getting Started Most Visited [SDW-11] FortiPortal li... Vocus Product Definition Gui... Email - Paul Brooks

plans.
This data will be used within ESCAP for planning future Pacific Islands development programs and understanding the dynamic demand for international bandwidth.

In this section, please answer with **LIT capacity** - i.e. bandwidth that is activated and available to carry traffic. Do not include unlit/unactivated capacity that your organisation may have reserved, but is not currently able to carry traffic.

All detailed information provided will remain confidential within ESCAP. Only aggregated non-identifying statistics will be published.

* 2. Please provide your **LIT capacity** on each of these subsea cables or satellite systems currently, and estimated requirement in 2 years and 5 years from now.

	NOW	2 Years	5 Years
Southern Cross (north to Hawaii)			
Southern Cross (south to Australia)			
Southern Cross NEXT			
ICN1			
Tonga Cable			
TUI-Samoa Cable			

Other international network path not listed

3. (optional) Are there any other plans or observations about future international connectivity you would like to share?, please add your notes here.

Observations

PITA contact database consisted primarily of CEOs/Managing Directors, while survey was targeted at CTOs / network planners and engineers.

Reliant on recipient to forward within the organisation to someone with sufficient knowledge to answer it.

Significant M&A activity over past 2 years means many of the contact details were out of date, left the company, or distinct provider networks have merged.

Significant and ongoing telephone followups and investigation of each provider required to improve responses by identifying correct individuals and re-targeting the survey emails to elicit responses

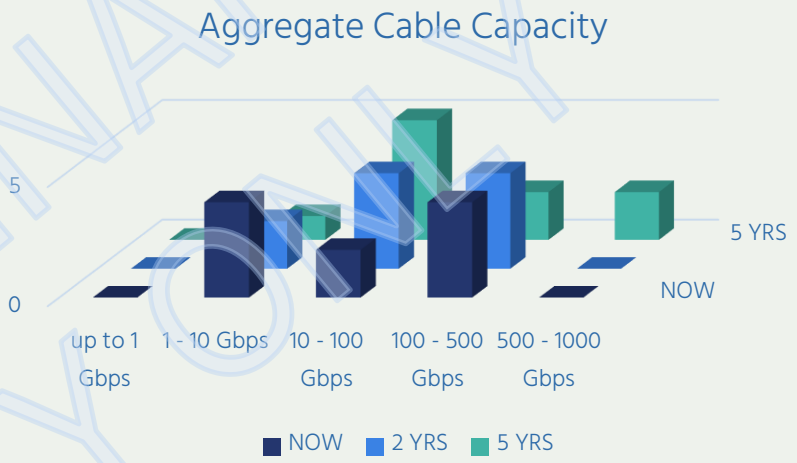


Section 1 – Cables and Bandwidth

PRELIMINARY SURVEY ONLY

Q2: Please provide your LIT capacity on each of these subsea cable systems currently, and estimated requirement in 2 years and 5 years from now.

	Q2 LIT CAPACITY		
	NOW	2 YRS	5 YRS
up to 1 Gbps	0	0	0
1 - 10 Gbps	4	2	1
10 - 100 Gbps	2	4	5
100 - 500 Gbps	4	4	2
500 - 1000 Gbps	0	0	2
TOTAL (Gbps)	1120	1210	2255



Majority of subsea connections currently running at less than 10 Gbps capacity, with some cables utilising whole 100Gbps channels (likely very underutilised)

Over 2 years ISPs anticipate growing to 10G per link technology, and over 5 years to move to multiple 100G links.

Aggregate capacity forecast to grow only modestly over 2 years (~10%), but over 5 years to double

PRELIMINARY SURVEY ONLY

Q3: Free-form comments '(optional) Are there any other plans or observations about future international connectivity you would like to share?'

- Tonga requires another fibre cable for redundancy purposes as the existing cable has been severed twice in a 3 year period.
- (Fiji)We would like to get connected to all Pacific Island Countries whose cables are transiting or terminating in Fiji
- (New Caledonia)Future submarine cable beetween New Caledonia and Vanuatu, planned for 2025
- (Tonga)There's been an ongoing feasibility study, of a secondary/backup international connectivity but still in the preliminary stage right now. nothing has been decided, whether it would be a satellite or cable, available capacity and to which POP, etc.
- (Samoa)We have Kacific and O3b terminals on island with no committed capacity yet.
- If the Southern Cross NEXT has 100G interface for the wet segment.

PRELIMINARY SURVEY ONLY

Q4: Proportion of incoming data from each upstream transit provider

Q5: Do you have plans to increase or decrease the number of upstream transit providers (next 6 months, 6 months – 2 years, 2 to 5 years)

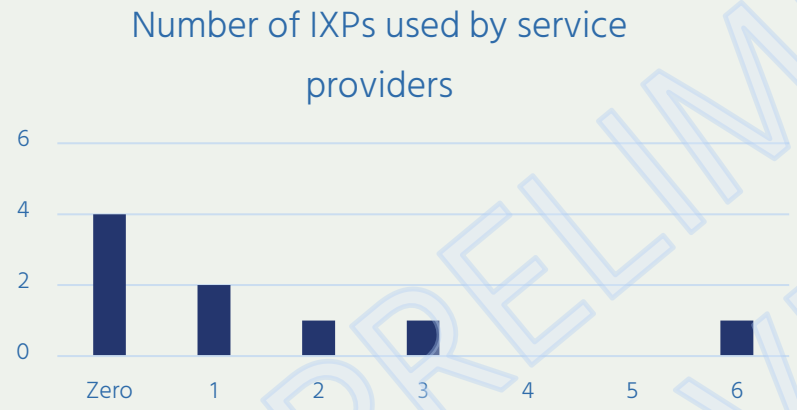
Q4 NUMBER UPSTREAM PROVIDERS			
	inc/dec 6m	inc/dec 2y	inc/dec 5y
increase	1	3	5
same	7	4	3
decrease	1	2	1

Two providers report planning to reduce the number of upstream transit providers – Majority of providers are planning to stay the same or increase the number of upstream providers, primarily to access better routes to international destinations.

PRELIMINARY SURVEY ONLY

Section 2 – Peering Exchange Presence

Q8: This table identifies Internet Exchange Points that your network currently participates in:
Do you have plans to increase or decrease the number of IXPs your network connects to.



	IXP increase/decrease plans	inc/same/dec	inc/same/dec
	6m	2y	5y
increase	2	4	4
same	7	4	4
decrease	0	1	1

Many service providers do not have presence at any IXP (as there aren't any close by). Those that do are generally connecting to a national IX , while a small number have a link to peering centres in Australia

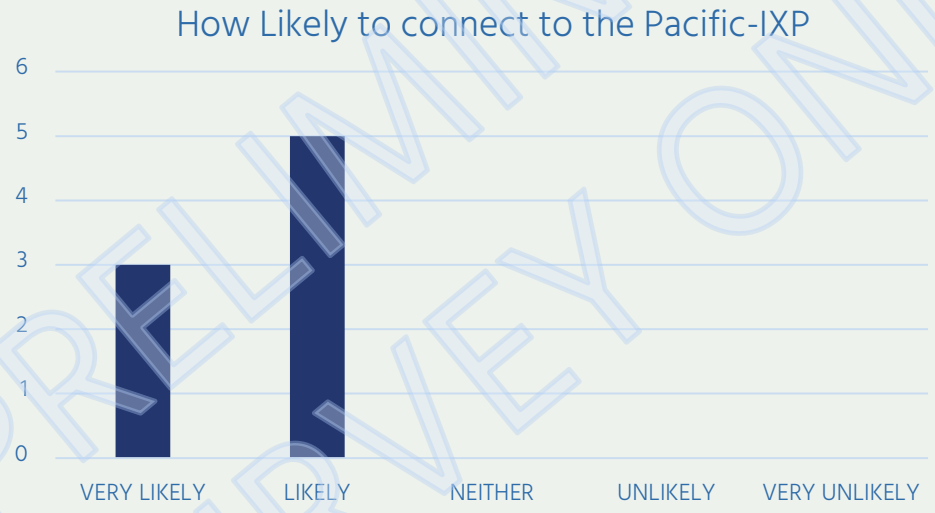
Most ISPs are planning in increase the number of IXPs they participate in.

PRELIMINARY SURVEY ONLY

Section 4 – Pacific IXP

Based on subsea cable maps, we estimate your network's shortest path to connect will be
9 milliseconds to XXXX node along the XYZ Cable System.

Q16: How likely are you to connect your network to the Pacific-IXP when built?



100% of all survey returns indicated they were LIKELY or VERY LIKELY to connect to the Pacific IXP. No responses selected any other option.
This provides strong support for the continued development of the proposal towards implementation.
The previous question indicates this may be the only IXP that many of the providers can feasibly connect to.

PRELIMINARY SURVEY ONLY

Next Steps

Structure, governance and formation of the NFP ‘Steering Committee’ to develop and adopt the detailed processes for the community

Operating Principles (up for debate)

All participants should be stakeholders (members) including facilities providers

Transparency to all participants - traffic statistics available to all members

All participants are treated the same - size shouldn’t matter

Equal costs shared by participants (perhaps on port basis)

Operated as a not-for-profit to benefit all members regardless of nation

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Thank you.



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