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Effective IXP strategies for the Asia Pacific

A Comparative Case Study Report

Acknowledgment

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Where local Internet ecosystems are not robust, Internet connections and infrastructure are less reliable and more expensive

What is a Case Study?

Case studies

- A form of qualitative descriptive research used to study individuals, a small group of participants, or a group as a whole

Critical Instance Case Studies

"These examine one or more sites … to call into question or challenge a highly generalized or universal assertion. This method is useful for answering cause and effect questions."

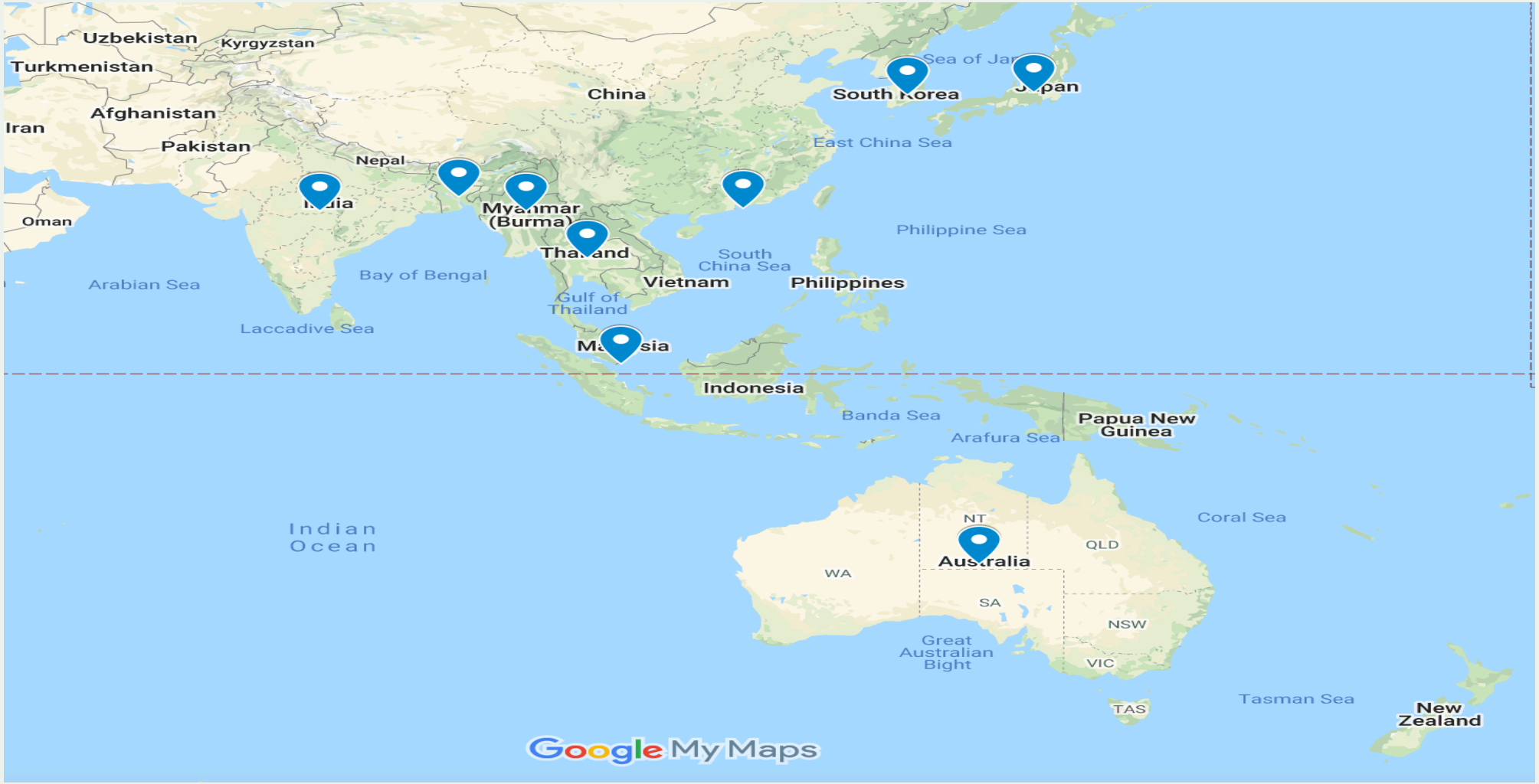
- https://writing.colostate.edu/guides/page.cfm?pageid=1290&guideid=60

Case Study Report Objectives

To assess the current outlook of Internet peering in Asia-Pacific, and how IXPs are contributing to an efficient and economical peering environment.

- What is working in general for the IXPs and, what is not?
- If peering in Asia-Pacific is different than other regions?
- What is the business case of peering in Asia-Pacific?
- Which policies might be able to help promote the establishment and growth of IXPs?
- What are the key factors to run and scale up a successful IXP?

Participating IXPs



IGF BPF Framework

Internet Governance Forum

- A global multistakeholder platform that facilitates the discussion of public policy issues pertaining to the Internet.

Best Practice Forum

- 2015 IGF B*est Practice Forum on Internet Exchange Points (IXPs)*

  "*Enabling Environments to Establish Successful IXPs*" describes the purpose of Internet Exchange Points and how to create an enabling environment.

- 2016 IGF B*est Practice Forum on Internet Exchange Points (IXPs)*

  "*Contributing to the success and continued development of Internet exchange points (2016)*" continues the work of 2015 "*to serve as a resource for policymakers, regulators, governments, and decision-makers in the private sector*".

Questions:

1. Is the IGF BCP Framework valid for the Asia Pacific region?
2. Are the IXPs in APAC true to the type described in the IGF?
3. Can this provide insight into opportunities for the future?

Asia Pacific Case Studies

MMIX	BKNIX	SGIX
• Launched in 2017 • Small exchange with 13 peers and 7Gbps traffic • Myanmar is a UN LDC • Exchange launch supported by capacity building agencies • Government and legal uncertainty	• Launched in 2015 • Growing exchange with 38 peers and 26Gbps traffic • Thailand's first neutral exchange • Challenging to get content players to join	• Launched in 2009 • 10 sites in a small country • 167 peers with ~500Gbps average traffic • Government run exchange

Asia Pacific Case Studies

BDIX	NIXI	JPNAP
• Launched in 2004 • Funded by development agency • 120 peers and 44Gbps traffic • Not sure if regulator will allow BDIX to charge for cache fill	• Launched in 2003 • PPP with multistakeholder board • 32 peers and 40Gbps traffic • History of restrictive policy	• Launched in 2001 • Carrier Operator, neutral exchange • 174 peers and 1.5Tbps traffic • One of three big Carrier exchange operators

Asia Pacific Case Studies

KINX	IX Australia	HKIX
• Launched in 2000 • 64 peers and 274Gbps traffic • Sending Party Network Pays settlement regime • Content Providers' Traffic Stabilization Law	• Launched in 1997 • 228 peers and 283Gbps traffic • Manages NZIX as a service • NZIX peering across 'entire national infrastructure'	• Launched in 1995 • 333 peers and 1.1Tbps traffic • Traffic growing ~30% annually • Direct cloud connection becoming important

Economy	IXP Name	Location	Launch	Model	Population (Millions)	Land Area (Thousands)	Peers	Ave. Traffic	Prefixes (on PCH)
Myanmar	MMIX	Yangon	2017	Community	54	676km^2	13	7.3Gbps	N/A
Thailand	BKNIX	Bangkok	2015	Community	66	513km^2	38	26Gbps	14,594
Singapore	SGIX	Singapore	2010	Government	5	<1km^2	167	493Gbps	295,147
Bangladesh	BDIX	Dhaka	2004	Community	166	143km^2	120	44Gbps	4,640
India	NIXI	Delhi	2003	Government	1,312	3,287km^2	32	39.3Gbps	N/A
Japan	JPNAP	Tokyo	2001	Commercial	126	377km^2	174	1.5Tbps	N/A
Korea (Rep. of)	KINX	Seoul	2000	Commercial	51	99km^2	64	274Gbps	191,654
Australia	IX Australia	Sydney	1997	Community	25	7,741km^2	228	283Gbps	137,458
Hong Kong (SAR)	HKIX	Hong Kong	1995	University	7	1km^2	333	1.1Tbps	648,896

Overview of Other Regions

Case Studies on sample IXPs in each other region

- DE-CIX, KINX, IX.br, Equinix

By Region

- Europe has the most IXPs per capita
- United States has the most IXPs for a single country
- Latin America is growing some large exchanges
- Africa is still an emerging IXP market
- Asia Pacific IXP growth is highly varied

Key Messages

Asia has a range of IXP business models

- No business model guarantees success

Advanced networks/economies have competing exchanges

- For-Profit and Not-For-Profit

IGF BPF enabling environment provides opportunities

- Healthy ecosystem supports peering and interconnection

IXPs are great attractors

- Successful IXPs support the ecosystem

Reflections on best practice

The growing importance of the edge

- Content sharing, Cloud computing, and IXPs
- The question of datacenters

Starting or Scaling an IXP

- Do the best with what you have got
- Business models are less important than the ability to meet a market need

Fostering a supportive ecosystem

- IXPs are a product of their environment: community, economy, geography
- IXPs can prosper in the right ecosystem

Conclusion

Select a business model that reflects development status and community expectations
Healthy exchanges pursue growth

- More sites, more locations, and more national borders

IXPs might migrate closer to the edge of the network

- What might be the right model for that?

Thank you.

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