

IXP Utilization in Asia

BBIX

Company Overview

Company Profile

Company Name	BBIX, Inc.
Headquarters Location	1-9-10 Roppongi, Minato-ku, Tokyo 106-0032 Japan
Establishment Date	June 13th, 2003
Capital	100 million yen
Shareholders	SoftBank Corp. (100%)
President & CEO	Hidetoshi Ikeda
EVP, Board Director & COO	Michikazu Fukuchi
Company Directors	Keiichi Makizono Kazuhiro Sasaki Takashi Tsutsui Yasuhiro Koyabu
Auditor	Ken Watabe



No Peering, No Internet.



About SoftBank Group



Strategic Holding Company

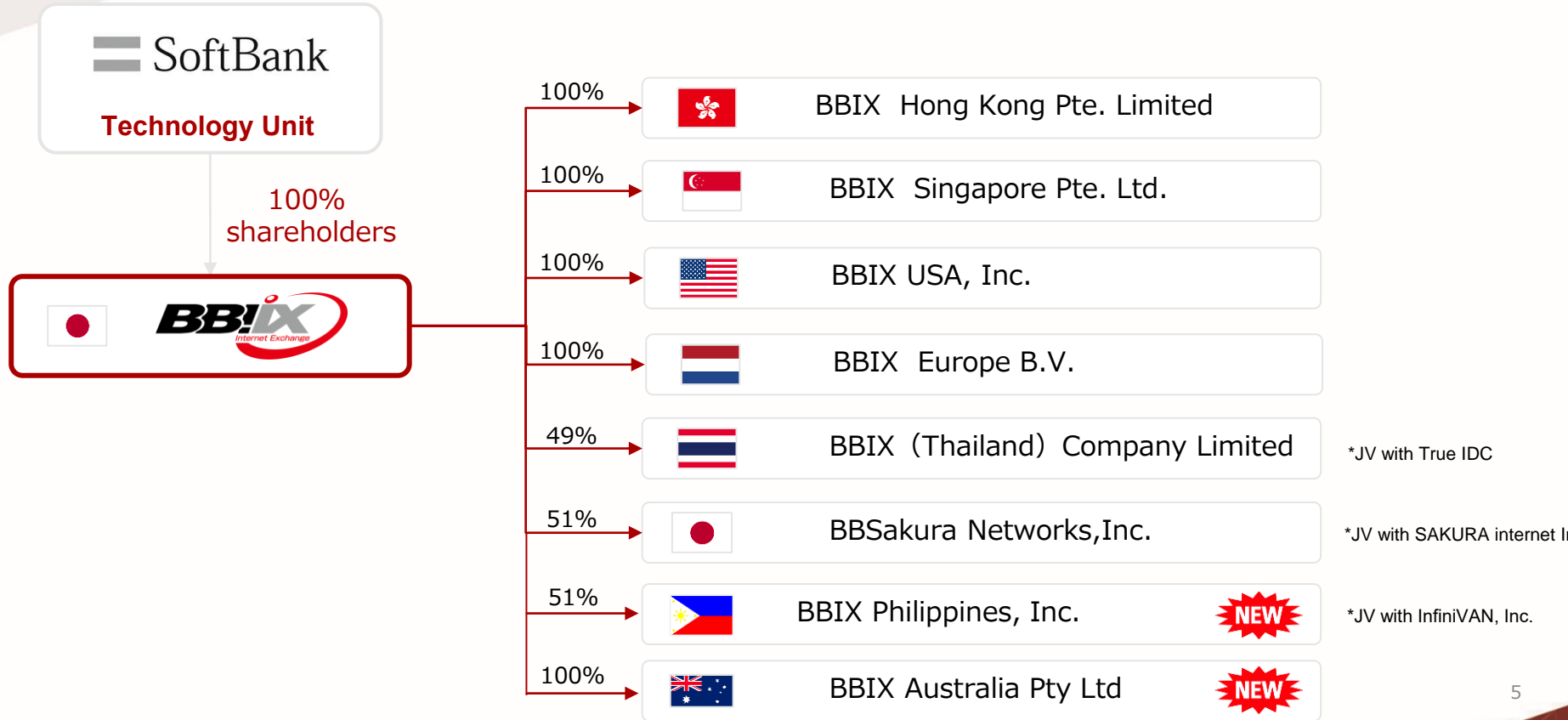
Over 1,300 group affiliates



100%	100%	49%	100%	100%	51%	50%	100%
Hong Kong	Singapore	Thailand	USA	Europe	BBSakura Networks	Philippines	Australia

* As of September, 2022

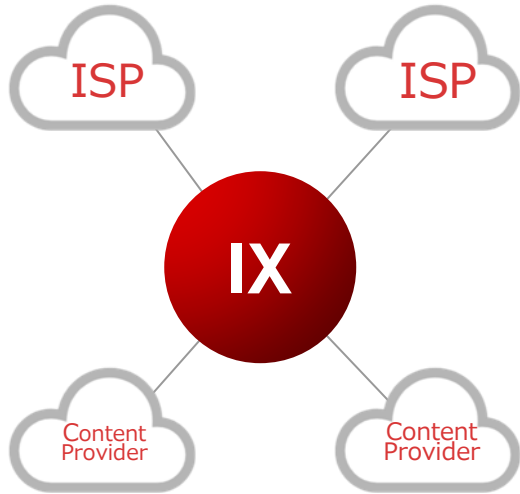
Affiliated Company Structure



Strength in the mixture of Internet & Mobile communications

IX

(Internet eXchange)



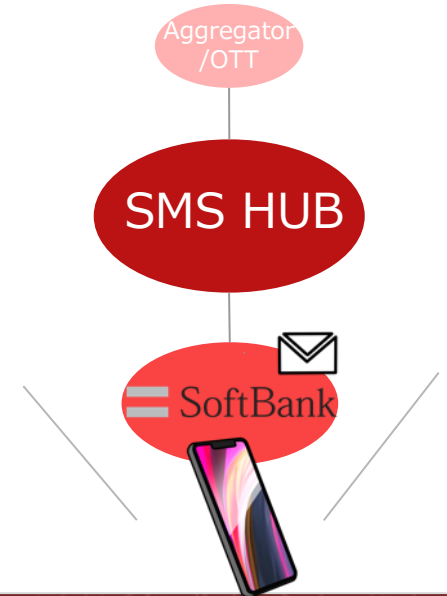
RPX

(Roaming Peering eXchange)



A2P SMS

(Application to Person SMS HUB)



Japan Domestic Connection Points

22 POPs in total

Osaka Zone	
BBIX Osaka No.1	NTT Data Dojima
BBIX Osaka No.2	Equinix OS1
BBIX Osaka No.3	NTT Telepark Dojima No2
BBIX Osaka No.4	AT TOKYO DC12
BBIX Osaka No.5	Sonezaki Data Center
BBIX Osaka No.6	Equinix OS3
BBIX Osaka No.7	Digital Edge OSA1

Fukuoka Zone	
BBIX Fukuoka No.1	QTnet Fukuoka No3/AT TOKYO QC1
BBIX Fukuoka No.2	AT TOKYO QC1

Tokyo Zone	
BBIX Tokyo No.1	NTT Data Otemachi
BBIX Tokyo No.2	Digital Edge TYO2 (ComSpace 1)
BBIX Tokyo No.3	Equinix TY2
BBIX Tokyo No.4	Equinix TY4
BBIX Tokyo No.5	AT TOKYO CC1
BBIX Tokyo No.6	Softbank Maruyama CLS
BBIX Tokyo No.7	NTT Com Nexcenter
BBIX Tokyo No.8	Colt DCS Tokyo Shiohama DC
BBIX Tokyo No.9	Colt DCS Inzai 1 DC
BBIX Tokyo No.10	SCSK netXDC Chiba Center
BBIX Tokyo No.12	Softbank Tokyo No4 Data Center
BBIX Sendai	TOHKnet Sendai Central DC
BBIX Okinawa	FRT Data Center



BBIX Global Connection Points






Country/Area	Zone	Datacenter
Hong Kong	BBIX Hong Kong	Mega-i
		Equinix HK1
Singapore	BBIX Singapore	Equinix SG1 Equinix SG3 (via Campus XC)
		Equinix SG5 Equinix SG2 (via Campus XC)
		Global Switch Tai Seng
		STT Singapore 5 (STT Tai Seng 1)
Thailand	BBIX Thailand	True IDC North Muang Thong
		NT Bangrak Tower
		NTT Bangkok 1 Data Center
Philippines	BBIX Manila	ePLDT VITRO Makati 2
		ePLDT VITRO Makati 1
		ePLDT VITRO Pasig
		Globe Data Center (MK2)
		Total Information Management Corp. Carmona
		Digital Edge MNL1 (NARRA1)

Country/Area	Zone	Datacenter
United Kingdom	BBIX London	Telehouse Docklands North 2
France	BBIX Marseille	Interxion MRS 2 Interxion MRS 1/3 (via Campus XC)
Netherland	BBIX Amsterdam	Interxion AMS9
		Smartdc Rotterdam
United States	BBIX US-West	CoreSite LA1
		Equinix SV5 Equinix SV1/SV10 (via Campus XC)
	BBIX Chicago	Equinix CH1 Equinix CH2/CH4 (via Campus XC)
	BBIX Dallas	Equinix DA6
	BBIX Miami	Equinix MI1
Australia	BBIX Sydney <small>* IX service is not provided in this zone</small>	Equinix SY4



BBIX is the No.1 IXP in Tokyo








	 (SB 100%)	 (NTT / IJ Group)	JPIX (KDDI Group)	 EQUINIX
# of ASN	 302	212	258	131
Total Connected Capacity	 24.0Tbps	20.1Tbps	14.4Tbps	7.6Tbps

* As of September, 2023
From [Peering DB](#) website

BBIX is the No.1 IXP in Osaka



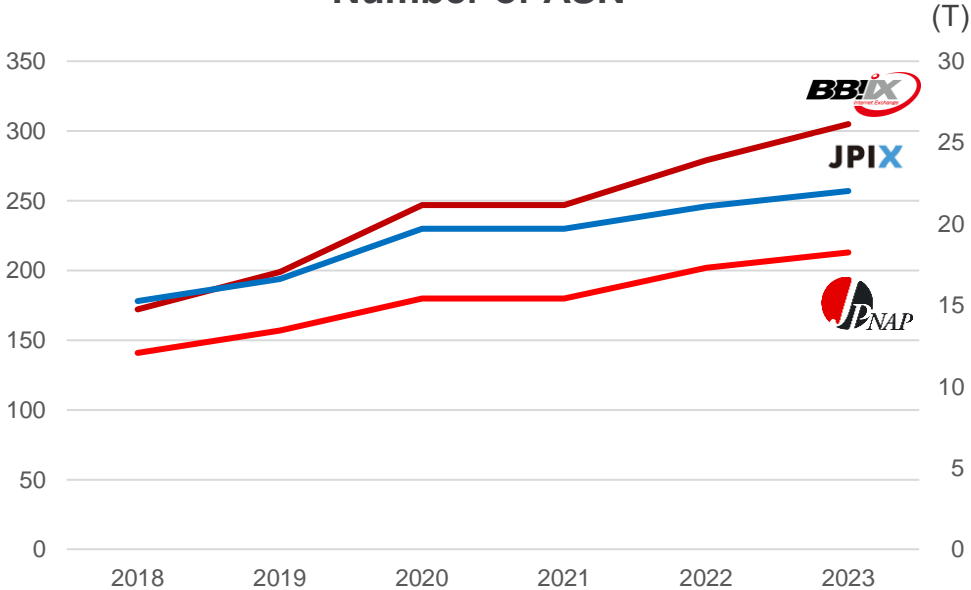
	 (SB 100%)	 (NTT / IJ Group)	JPIX (KDDI Group)	 EQUINIX
# of ASN	 99	89	92	24
Total Connected Capacity	6.9Tbps	 9.0Tbps	6.7Tbps	2.0Tbps

* As of September, 2023
From [Peering DB](#) website

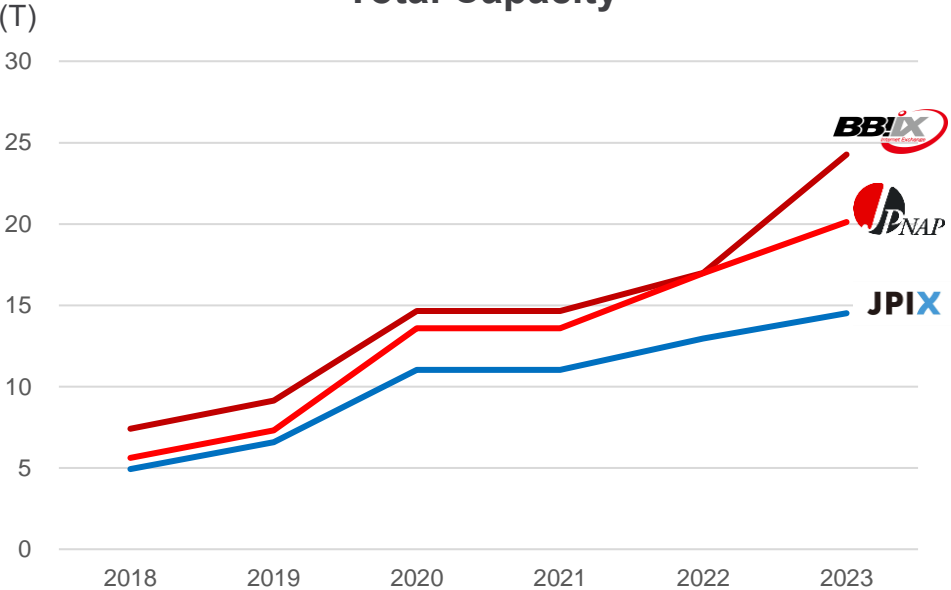
Growth of Japanese IXP (Tokyo)

Healthy competition in the market

Number of ASN



Total Capacity



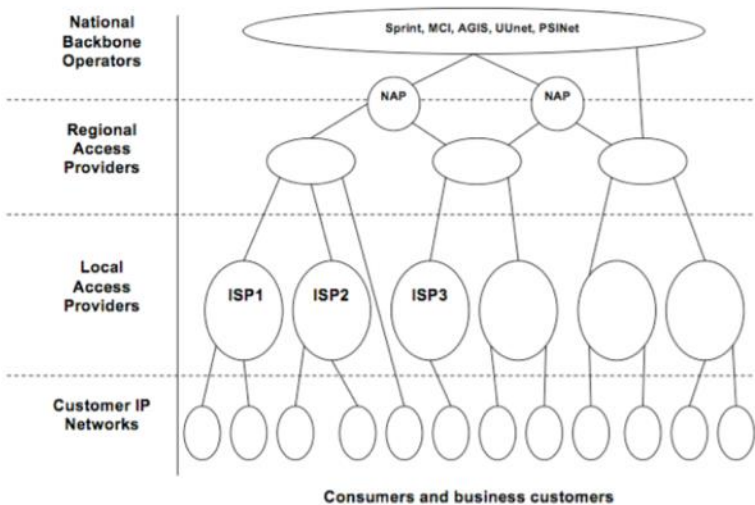
BBIX 20th Anniversary Celebration Event



A Brief History of the Structure of the Internet

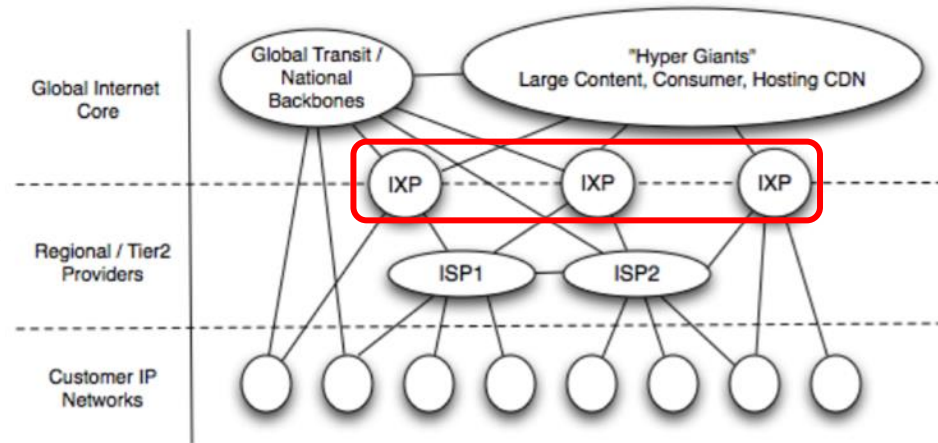
IXP contribute the traffic distribution of "Hyper Giants"

Legacy Internet (1995-2007)



Hierarchical structure of Transit

The New Internet (2009-)



Dramatic improvement in capacity and performance

Global Expansion of Off-net Cache Expands

- Off-net Cache: Major OTT's own CDN

Mechanism for distributing content from a cache server installed within a telecommunications carrier to users within the network



Google Global Cache



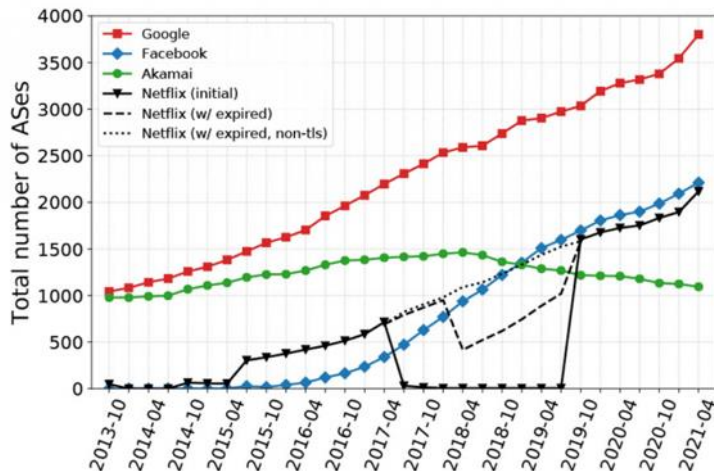
Akamai Accelerated Network Partner



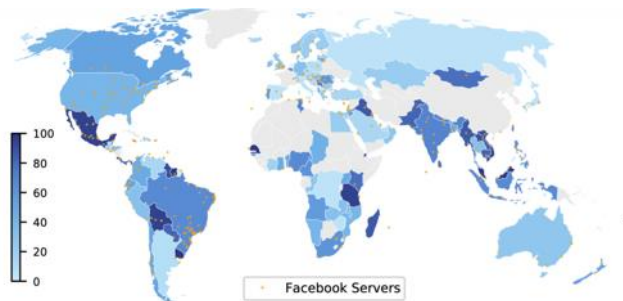
Facebook Network Appliance



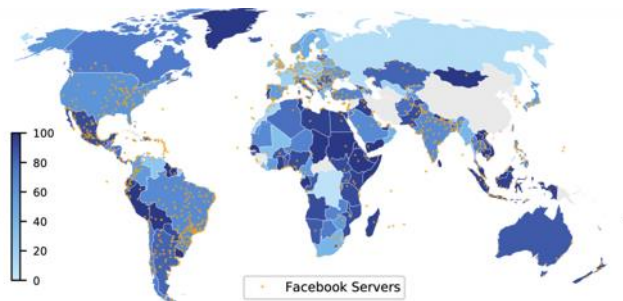
Others with similar programs include Microsoft (Microsoft Edge Caching Program), Apple (Apple Edge Cache), CloudFlare and Verizon Digital Media.



y2013-y2021 Growth of Off-net Footprint of Google, Facebook, Akamai and Netflix (Y-axis: # of ASN)



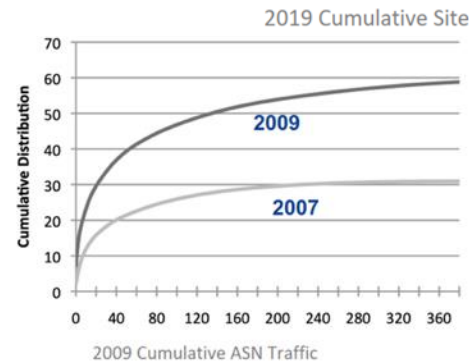
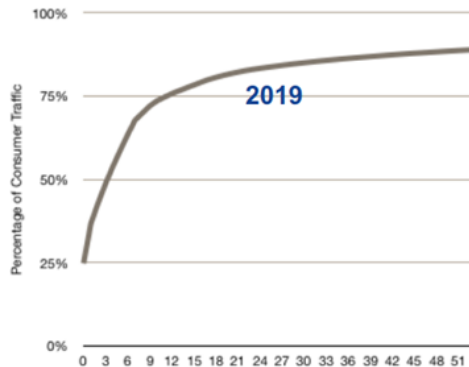
% of ASNs hosting Facebook off-net servers with regards to the number of Internet users in the region (Nov. 2017)



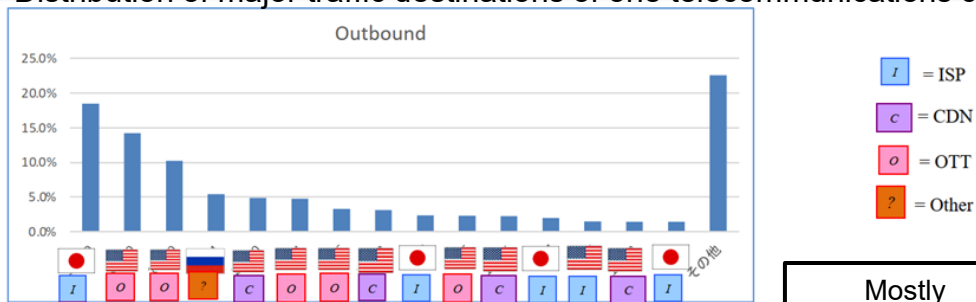
% of ASNs hosting Facebook off-net servers with regards to the number of Internet users in the region (Apr. 2021)

Source: Fernando Kuipers, Matthew Caesar, "Seven Years in the Life of Hypergiants' Off-Nets" (2021), ACM SIGCOMM 2021
<https://dl.acm.org/doi/proceedings/10.1145/3452296>
<https://blog.apnic.net/2021/12/20/seven-years-in-the-life-of-hypergiants-off-nets/>

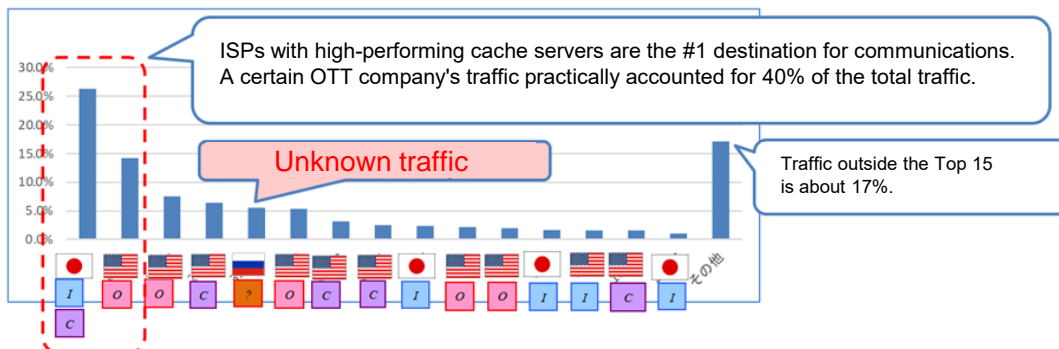
Traffic oligopoly by a few operators



Distribution of major traffic destinations of one telecommunications carrier in Japan



Mostly
U.S. companies



- Practically one company accounted for 40% of all traffic, and top 15 companies accounted for about 83%. [Yoshihama, 2020]
- Destination distribution of the 50% of traffic:
2,000AS (y2007) → 150AS (y2009) → 5 sites (y2019) [Craig, 2019]

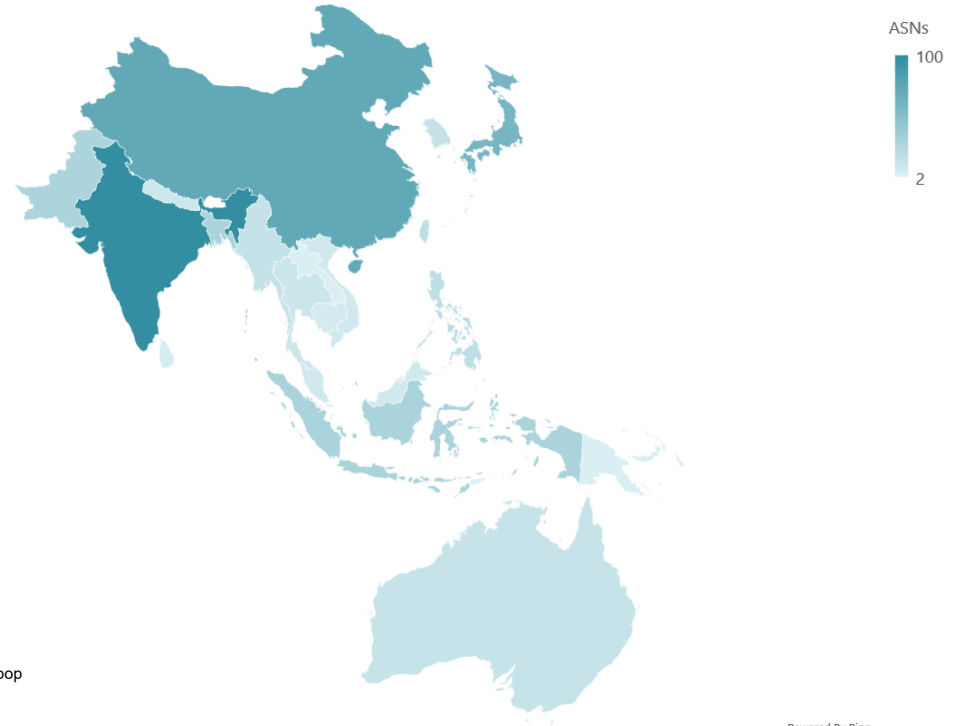
Internet in Asia



Number of ASN who has over 100,000 Users in Asia

VN is next to HK

TLD	ASNs	TLD	ASNs
IN	100	TH	12
CN	73	NP	11
JP	61	HK	10
ID	31	VN	9
BD	31	MY	9
PK	30	KH	7
TW	20	LK	6
PH	20	PG	3
MM	16	LA	3
KR	16	TL	2
AU	15	BN	2
SG	13		



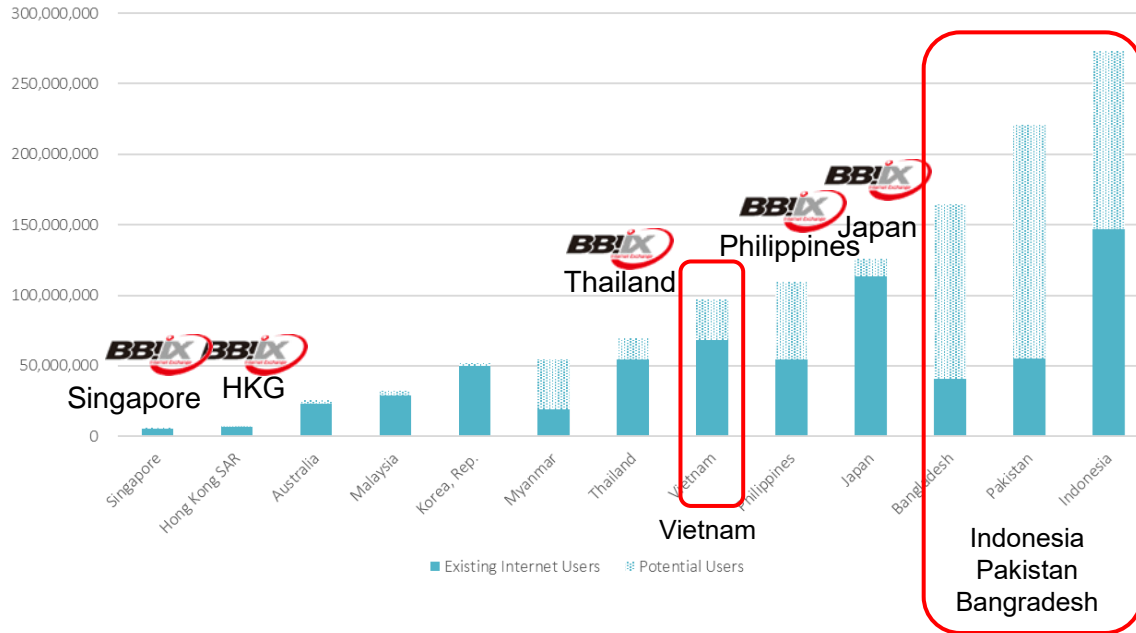
Source: APNIC Estimation, Jun 2022
<https://stats.labs.apnic.net/cgi-bin/aspop>

Internet User Ratio in Asia

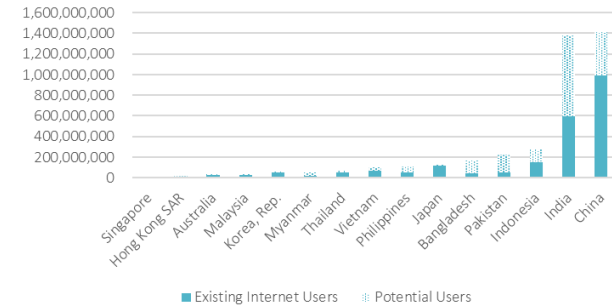


Potential Further Growth!

Individuals using the Internet in APAC (excl. China and India)



Individuals using the Internet in APAC



Upside

Source: WorldBank, 2020
<https://data.worldbank.org/indicator/IT.NET.USER.ZS>
<https://data.worldbank.org/indicator/SP.POP.TOTL>

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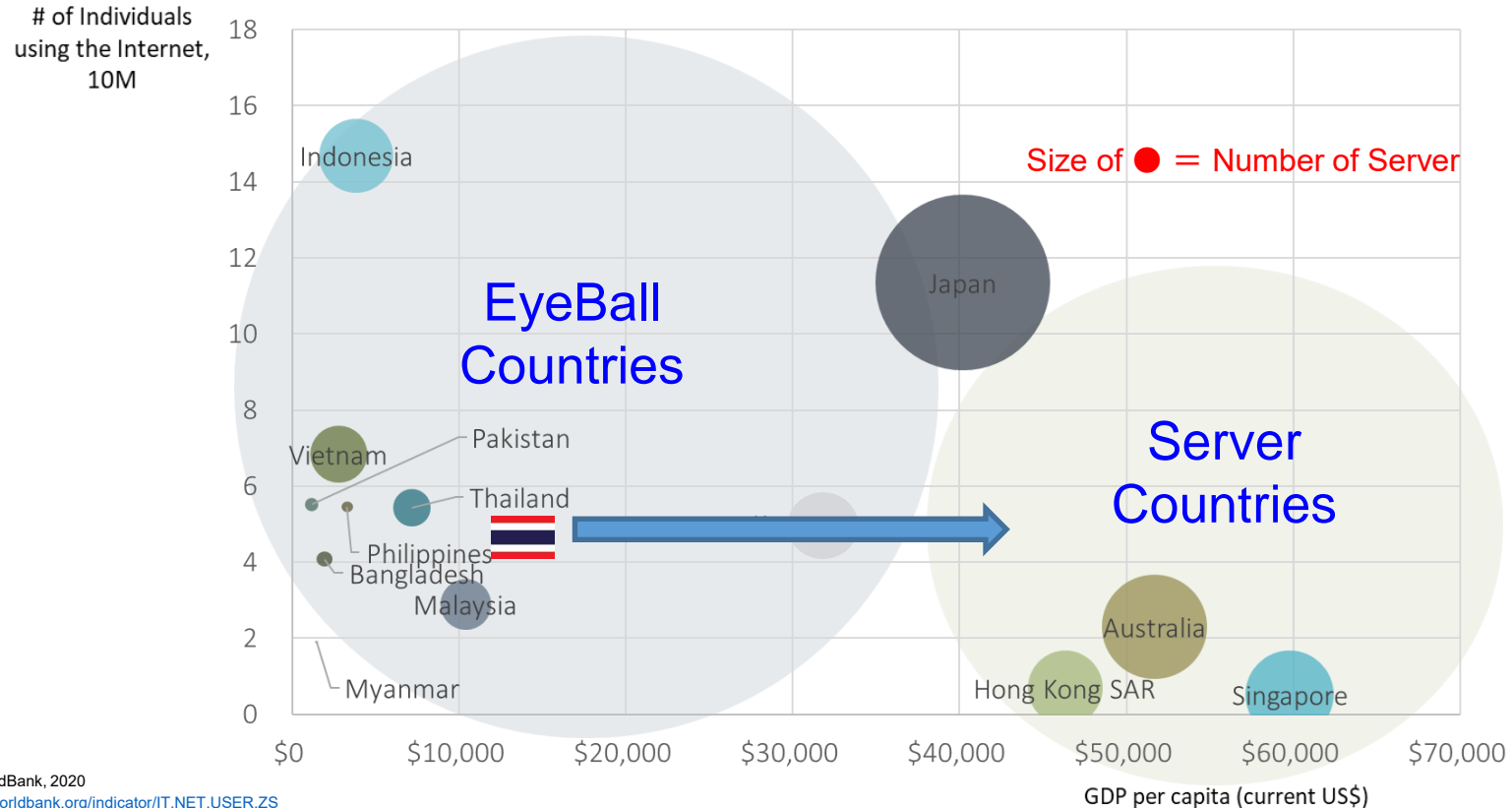
Growth of DC & Internet in Thailand

Rush to Build Data Centers in Thailand



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OTTs are going into Thailand ⇒ Position will be changed soon



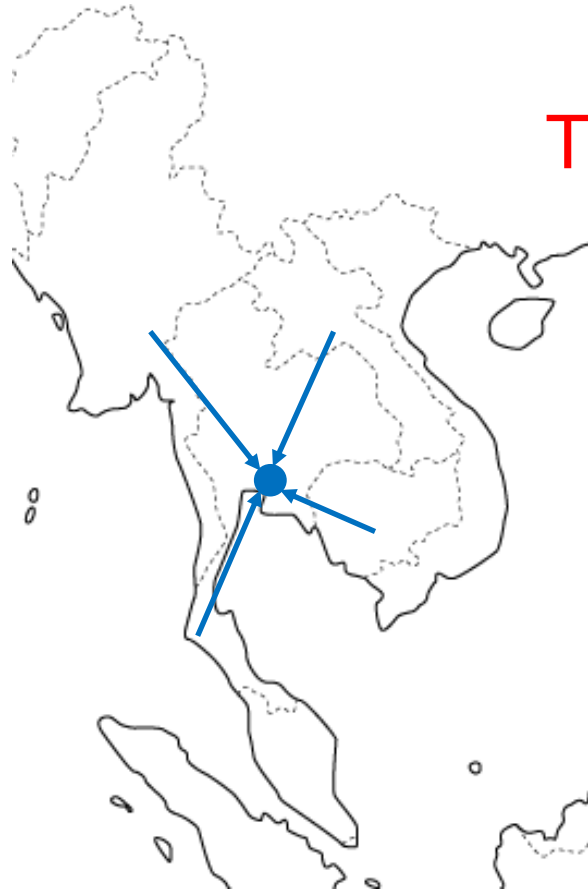
Source: WorldBank, 2020
<https://data.worldbank.org/indicator/IT.NET.USER.ZS>
<https://data.worldbank.org/indicator/SP.POP.TOTL>
<https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

BBIX brings its
experience to
Thailand



Bangkok collects all the traffic from neighboring countries.

They are aiming for third HUB status.



Hong Kong is losing its Hub function due to national politics

Singapore is saturated with electricity, making it difficult to build new DCs

BBIX's New Location Philippines

General Information

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Item	Philippines		Japan
Population	114,597,229	92%	124,214,766
Internet Penetration	50%	55%	90%
Number of ASN	367	38%	974
IPv4 /24 Prefixes	1,010	27%	3,693
IPv6 /48 Prefixes	7,536,736	92%	86,376,573

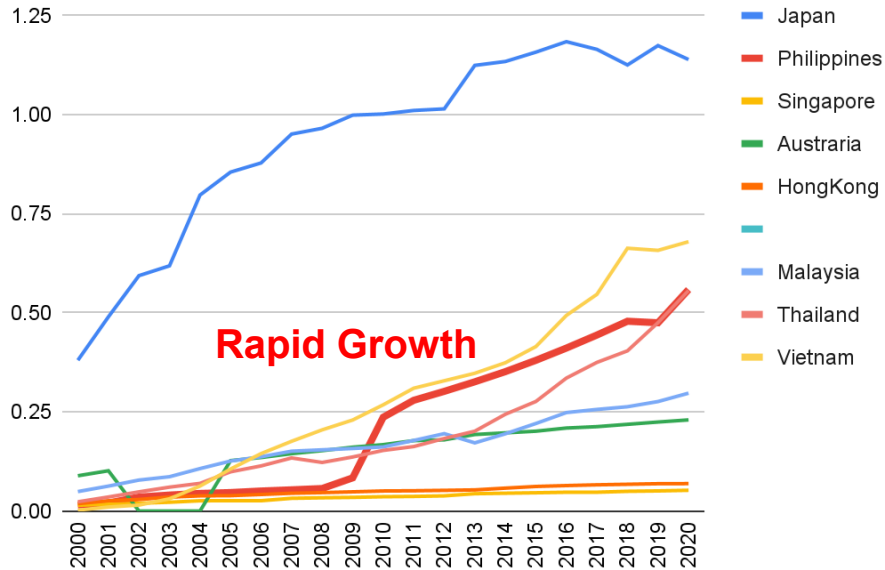
Source : APNIC, JPNIC, CIA

Passage of Internet User Population in Asia

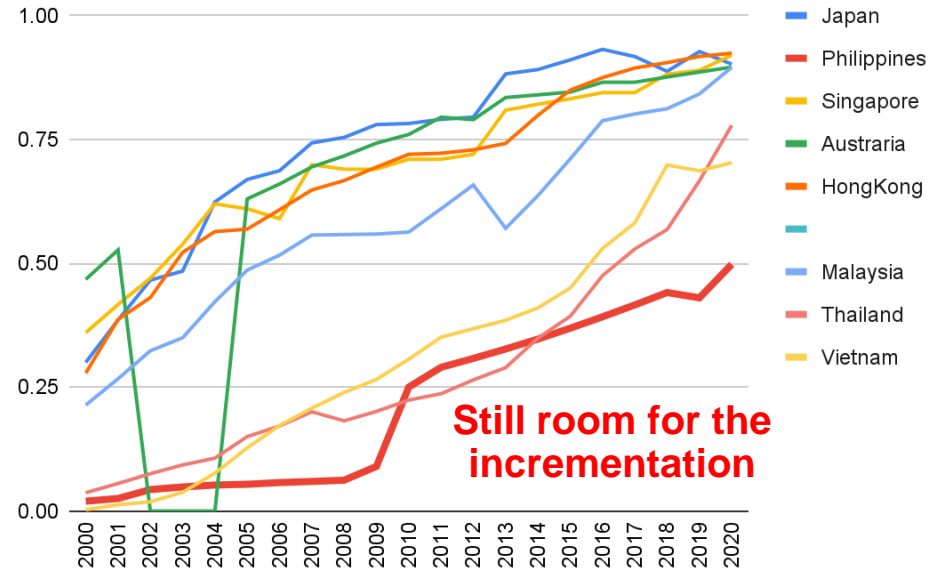
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→ Potentially **Eyeball**

Internet User Population (100M)



Internet Penetration

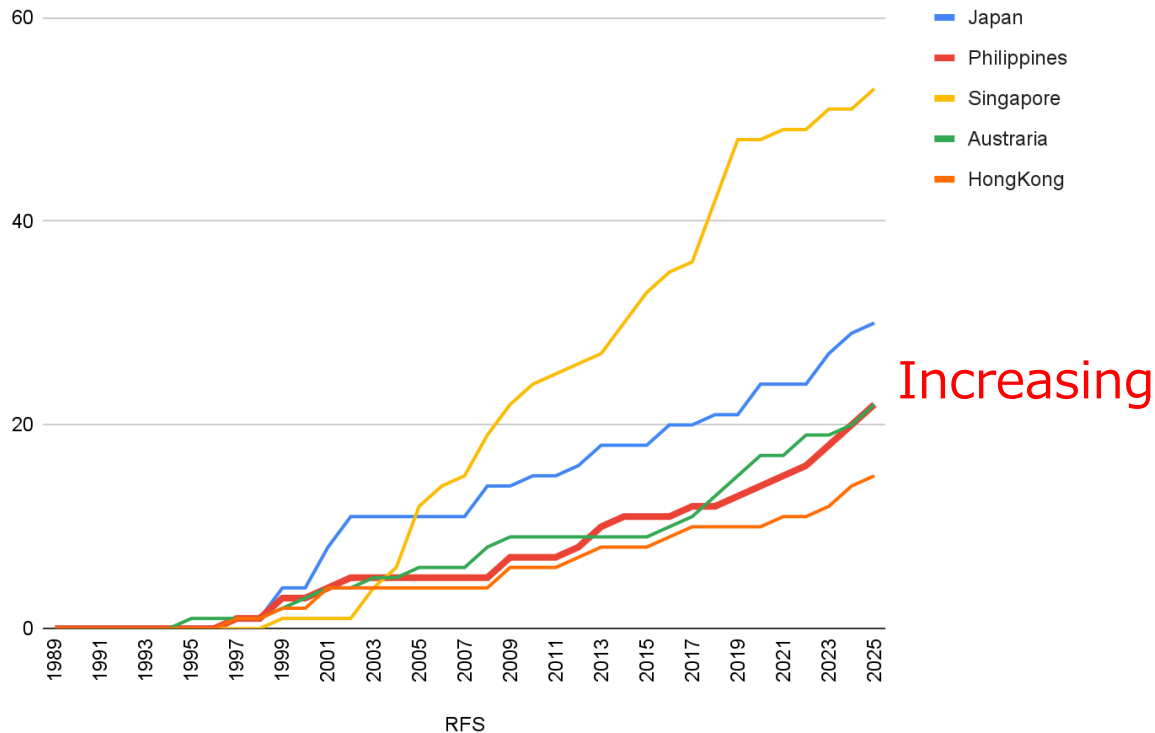


Number of Cable Landing Station

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→ **Can be a Hub to Asia, US**

Number of Cable Landing Station



Philippines CSL

CLS	Submarine Cable System
Batangas	APCN-2, ADC (2023), EAC-C2C, SMW-3
Cavite	C2C
La Union	AAG, SEA-H2X (2024)
Nasugbu	SJC
Pagudpud	CAP-1 (2023)
Baler	Apricot (2024), Pacific Light
Daet	ASE, JUPITER
Davao	Apricot (2024), ACC-1, Bifrost, SEA-US

Hyper Scaler in Philippines

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GAFAM's investment to Philippines

PHILIPPINES

DATA CENTRE PORTFOLIO: 4 LIVE SITES, 2 UNDER DEVELOPMENT SITES

6 DCs in prime locations within Metro Manila, Cavite and Davao with existing operational capacity of 22MW, and a further ~180 MW under development in secured land banks

Metro Manila

- **MK2** is in the prime district of Makati, Chino Roces Ave. Existing design capacity in MK2 of 3.7 MW. MK2 Zone F expansion RFS date is in Q3 2023.
- **QC2** is in Quezon City with design capacity of 5.5 MW.
- **Fairview** is a 28,800 sqm greenfield site well located in Quezon City, Regalado Ave. Development of data center campus underway with ability to scale up to 128 MW of IT load capacity. RFS date is in Q1 2025.

Cavite

- **CAV1** is in Gateway Business Park, which is Cavite's premier high-tech business park situated in the city of General Trias. The site is about 60 km from Metro Manila and enjoys direct connectivity via a highway link to the Capital. Current operating capacity of 2.3MW with on-going expansions upgrading the site to 3MW capacity in Q3 2023.
- **CAV2** is a 6MW capacity, planned for services in Q4 2024.

Davao

- **DV1** is in Davao city with 0.5 MW operational capacity and is located right on a cable landing station in south of the Philippines.



ST Telemedia
Global Data Centres

PHILIPPINES MK2 Data Center

Overview

- A Tier 3 Data Center in Metro Manila's premier business district
- 5 Megawatt IT Load
- 1300 rack capacity
- 100% Renewable energy
- 2N Power
- MK2 has a total of **14 Peering Partners** including GIX (Globe Internet Exchange) and PhIX (Philippine Internet Exchange).

Peer Name / IPv4	ASN / IPv6	Speed
Clear Path Networks 45.114.21.222	42/104	10G
CONVERGE ICT SOLUTIONS	17639	20G
45.114.21.226	159851	10G
DTIC Telecommunity Corporation	45.114.21.212	10G
Easton Telecommunications Philippines, Inc.	9558 45.114.21.203	10G
Globe Globe Service	18392	1G
45.114.21.81	9304	10G
ISGC 45.114.21.204	135607	10G
Infonani 45.114.21.215	18233	100M
TELIX 45.114.21.211	55821	10G
Radius Telecoms Inc. 45.114.21.220	23944	10G
SBCable Corporation 45.114.21.210	18187	10G
Southern Telecoms 45.114.21.233	135423	10G
Total Information Management 45.114.21.213		

ST Telemedia
Global Data Centres



Google, Meta, Amazon are showing the interest in DC build.

DC in Philippines

Now is the time for IX! Data Centers are coming to Philippines



NARRA1 (MNL1)
10MW
Laguna



DIGITAL HALO
Backed by Arch Capital
70MW (Planned)
Cainta



Fairview 1
124MW (U/C)
Quezon



69MW (Planned)
Cavite



49MW (Planned)
Paranaque City



Vitro Santa Rosa
100MW (U/C)
Santa Rosa

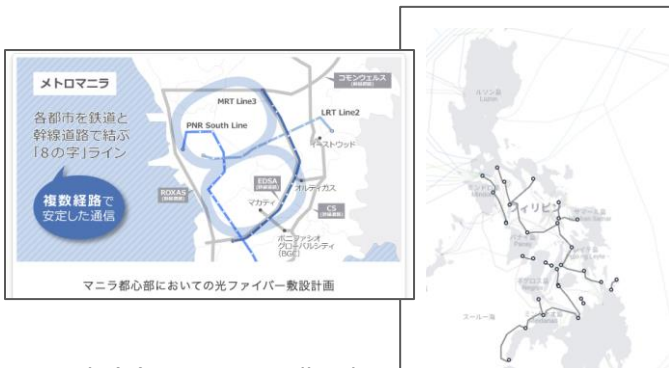
Establish JV with INFIVAN



- Eyeball in Philippines
(Acquired 500 CATV within 5 years)
- Well experienced in PH
- Fiber all over PH



- Experience as IXP
- Relationship with OTT

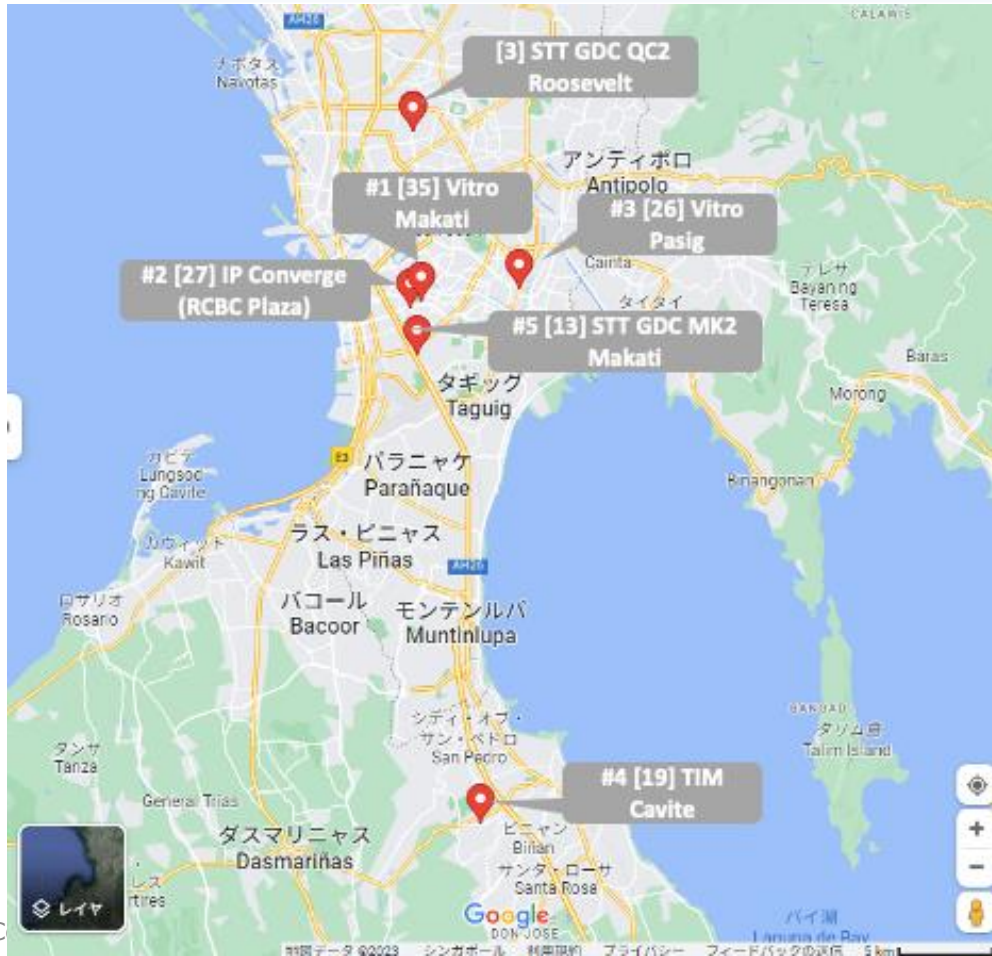


Our existing Philippines customer

Our existing OTT customer

Many solutions for small operator

Major Carrier hotel in Manila

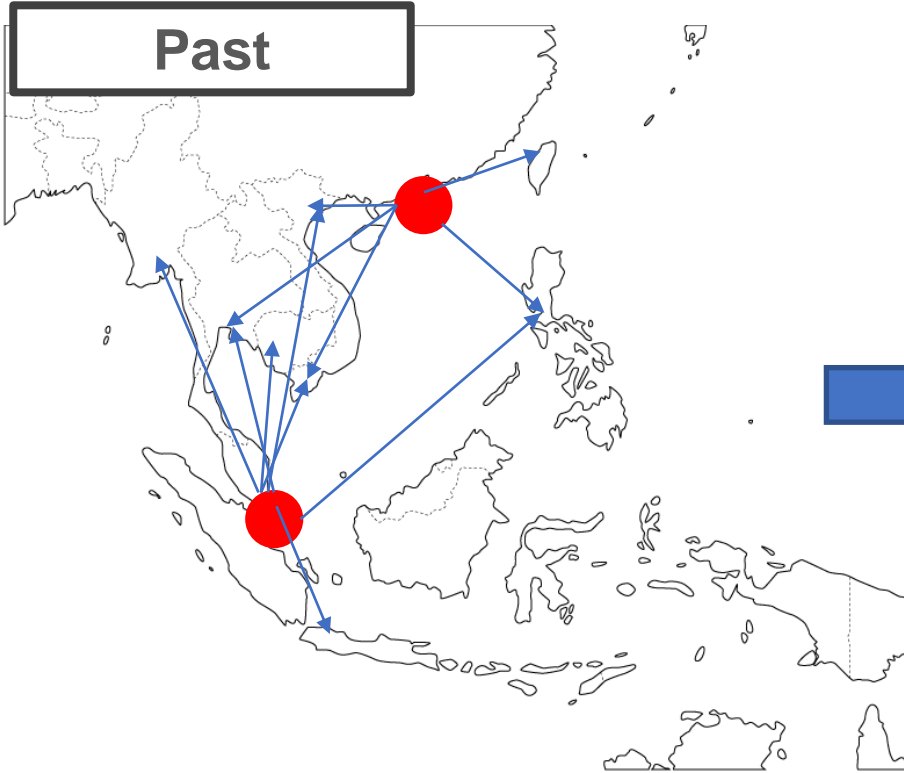


PoP
Total Information Management Corp. Carmona
Globe Data Center (MK2)
ePLDT VITRO Pasig
ePLDT VITRO Makati 2
ePLDT VITRO Makati 1
Digital Edge MNL1 (NARRA1)

Available Interface
1Gbps LX/10Gbps LR/100Gbps LR1/100Gbps LR4

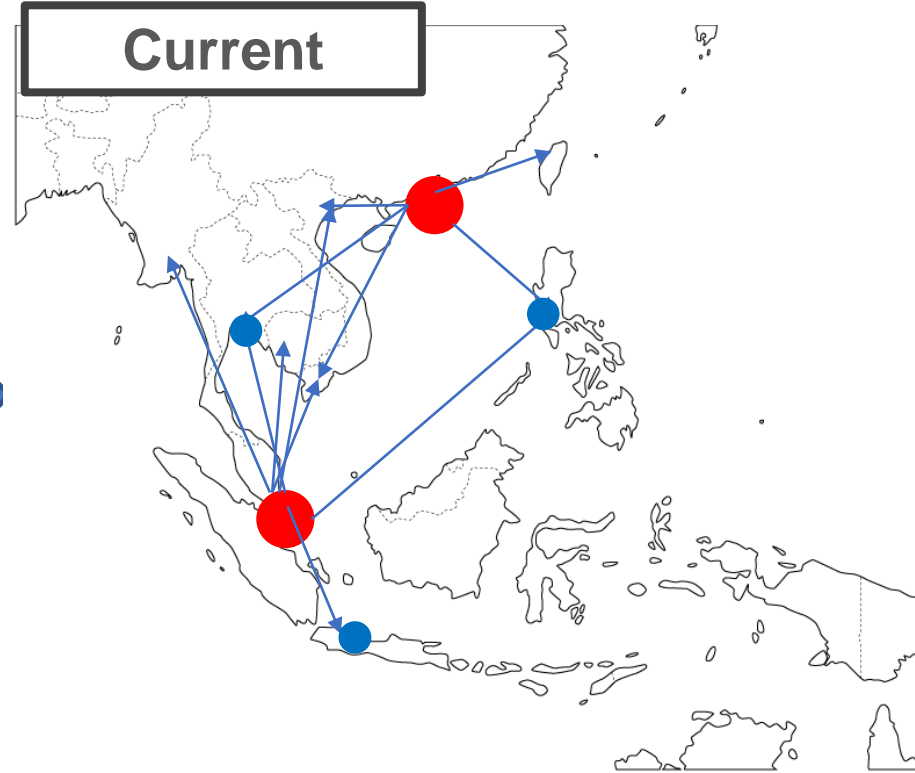
POP Expansion Plan of an OTT

Past



Centralized in Singapore or Hong Kong

Current



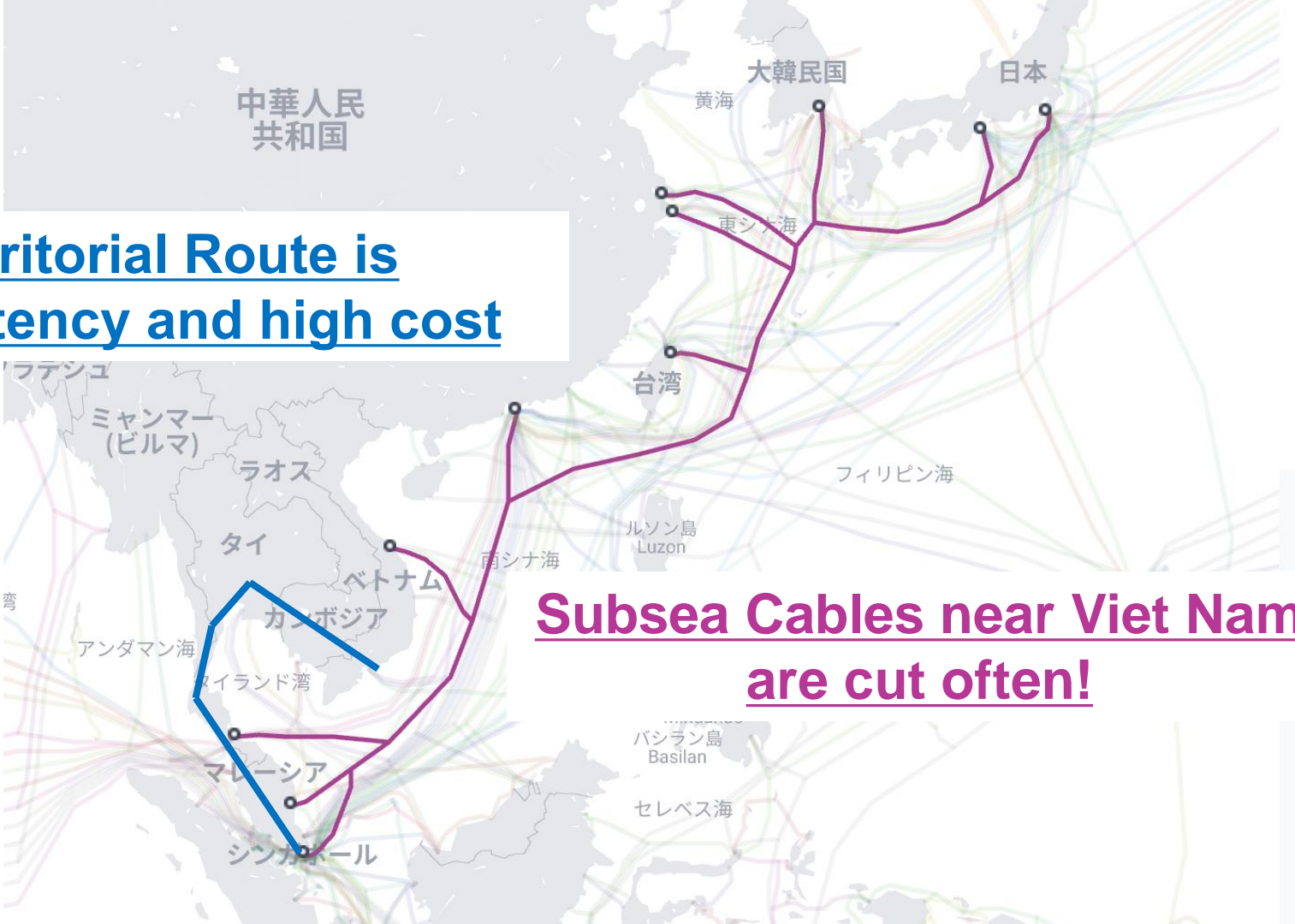
**Centralized in Singapore or Hong Kong
Moving to Thailand, Philippines, Indonesia**

What's Next??

I believe!!



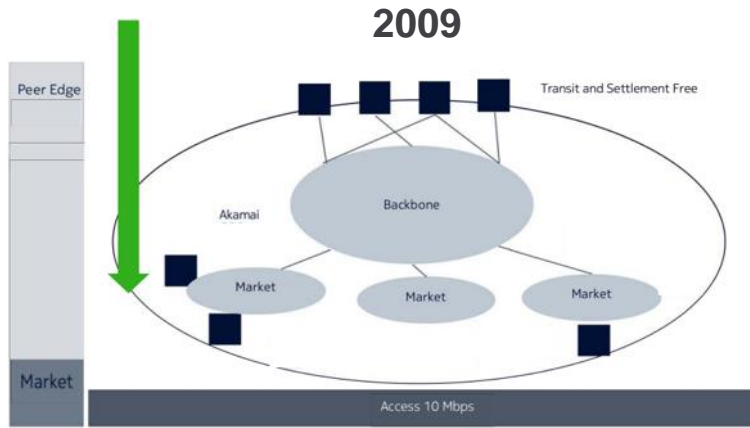
Territorial Route is high latency and high cost



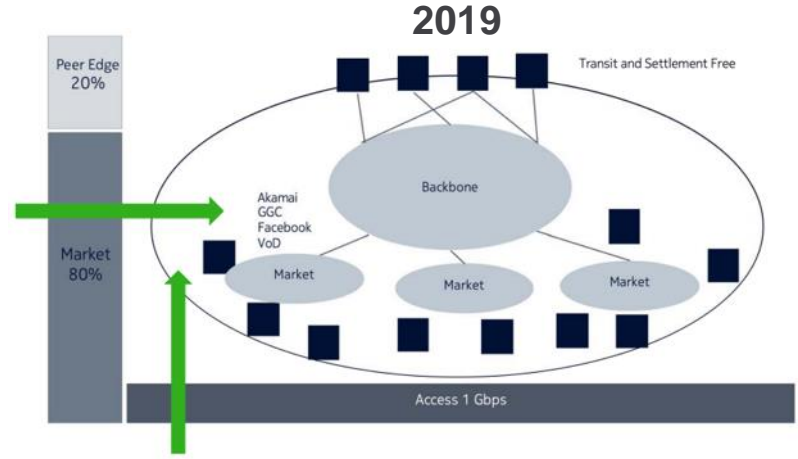
Subsea Cables near Viet Nam are cut often!

Traffic is shifting from Inter Country to Intra Country Traffic

Transit / peering on a country-by-country basis

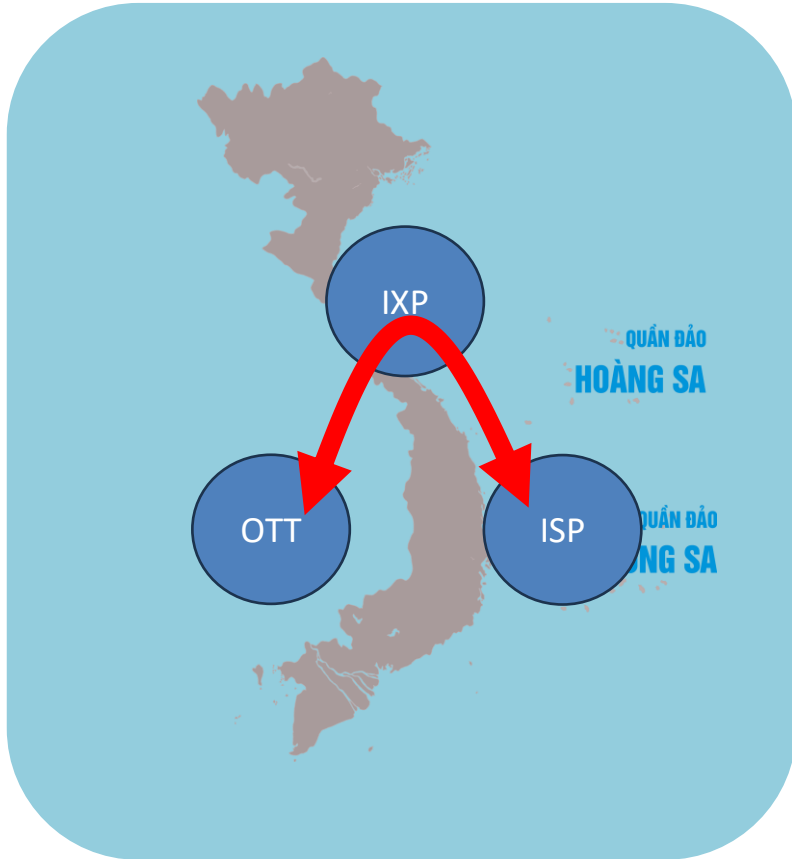


On-net CDN via intra-regional Peering



Background is the Traffic Growth of CDN

Time for Intra Country Peering

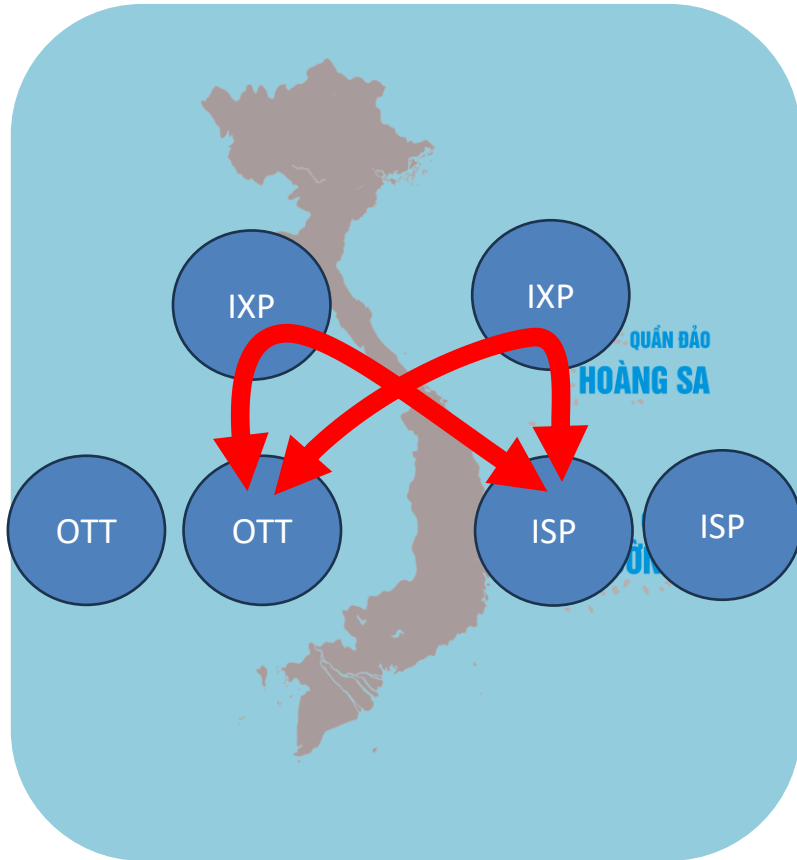


Escape from Cable Cut Issue
Explore the Opportunity to be a Hub

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Time for Intra Country Peering



**They needs IXP diversity
due to traffic stability.**

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No Peering, No Internet.