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# New Market Evaluation Strategy Guide

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AusNOG  
2018

Walt Wollny, Director Interconnection Strategy  
Hurricane Electric AS6939

# Who is Walt Wollny?

- ❑ Hurricane Electric AS6939 – 4 years
  - ❑ Director Interconnection Strategy – supporting the network to reach to over 41 countries and over 190 Internet Exchanges. Focus on Global connectivity.
- ❑ Amazon AS16509 – 4 years
  - ❑ Developed IP Transit and Peering on five continents.
  - ❑ Primary focus on Japan, Singapore, Hong Kong, India, Taiwan, Philippines, Australia.
  - ❑ Over 62 new CDN sites.
- ❑ Microsoft AS8075 – 13 years
  - ❑ Developed IP Transit and Peering on four continents.
  - ❑ Primary focus on US, EU and South America.

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# Why is Walt Wolny here?

After 20 years working for two content networks I want to share what I have learned.

These techniques can be adapted to any location

“By failing to prepare, you are preparing to fail.”  
— Benjamin Franklin

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The boss tells you....

“I want a full report for this new network location!”



# Why does the boss want a report?

- Ability to repeat tests over time if launch is delayed.
- Validation of decision after launch in market.
- Improvement of reporting and testing for next market.
- Accountability!

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# Phases of Evaluation

- Desktop Research
- In Country Research
- Other Considerations

# Philippines



# Desktop Research

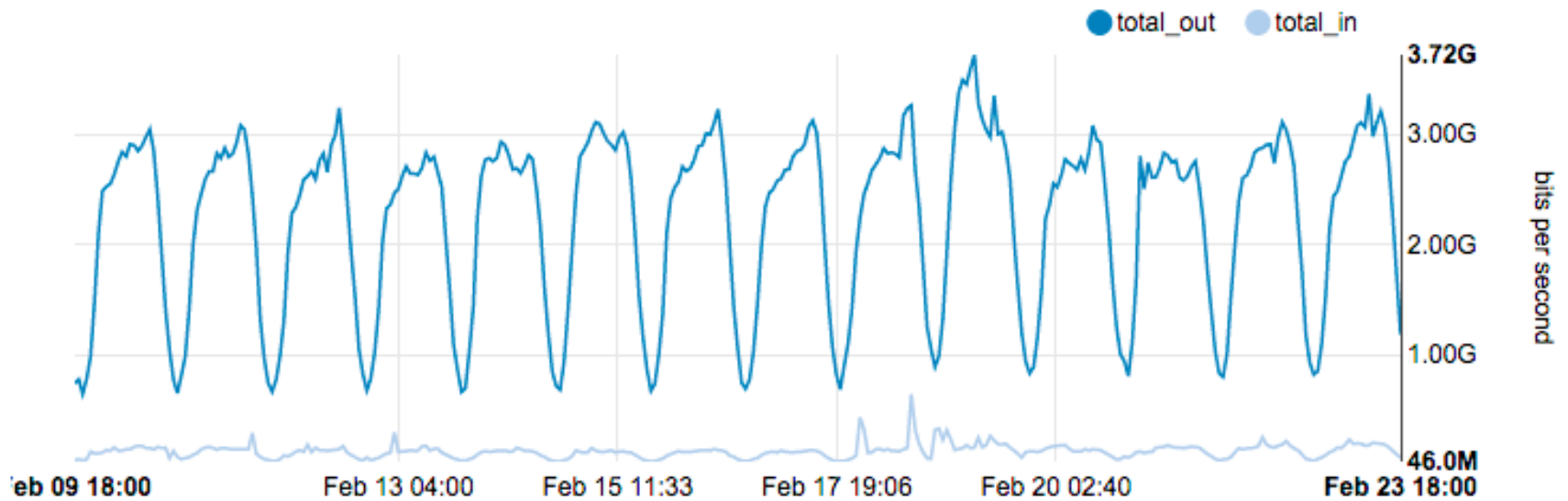
- ❑ NetFlow
- ❑ External CDN Performance
- ❑ <http://bgp.he.net/>
- ❑ <https://mi.renesys.com>
- ❑ <http://www.cedexis.com/>
- ❑ <https://www.peeringdb.com>

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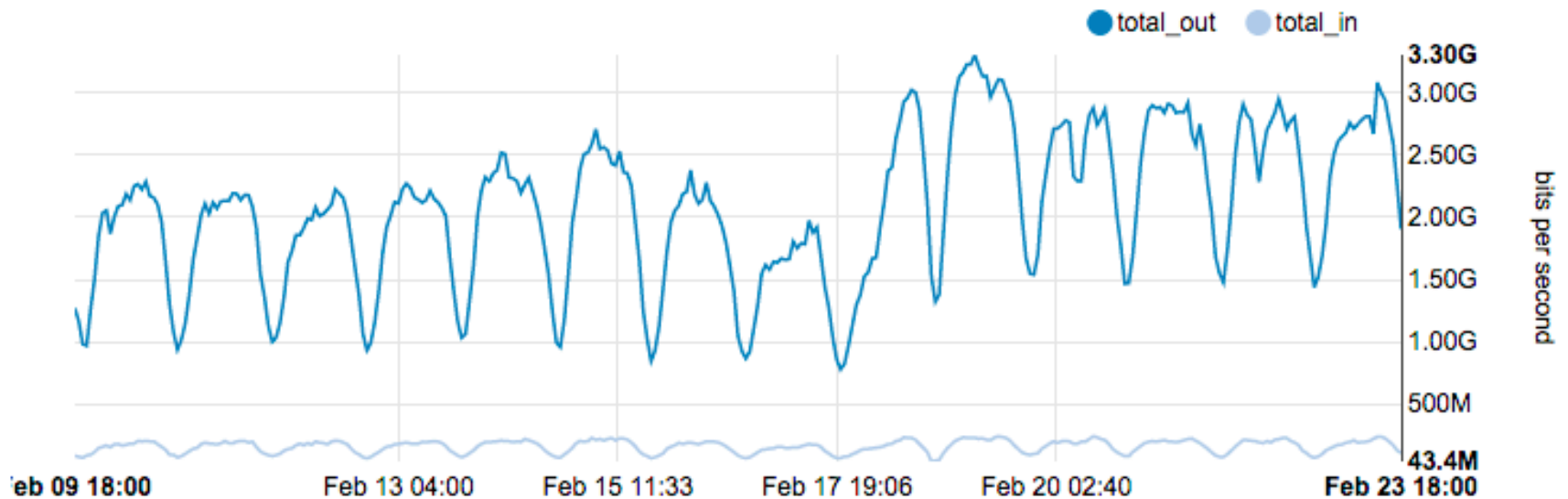
# NetFlow Data

- The next few slides represent traffic from outside the Philippines.
- Once traffic is localized you can expect that CND traffic levels will increase ~20 to 50%.

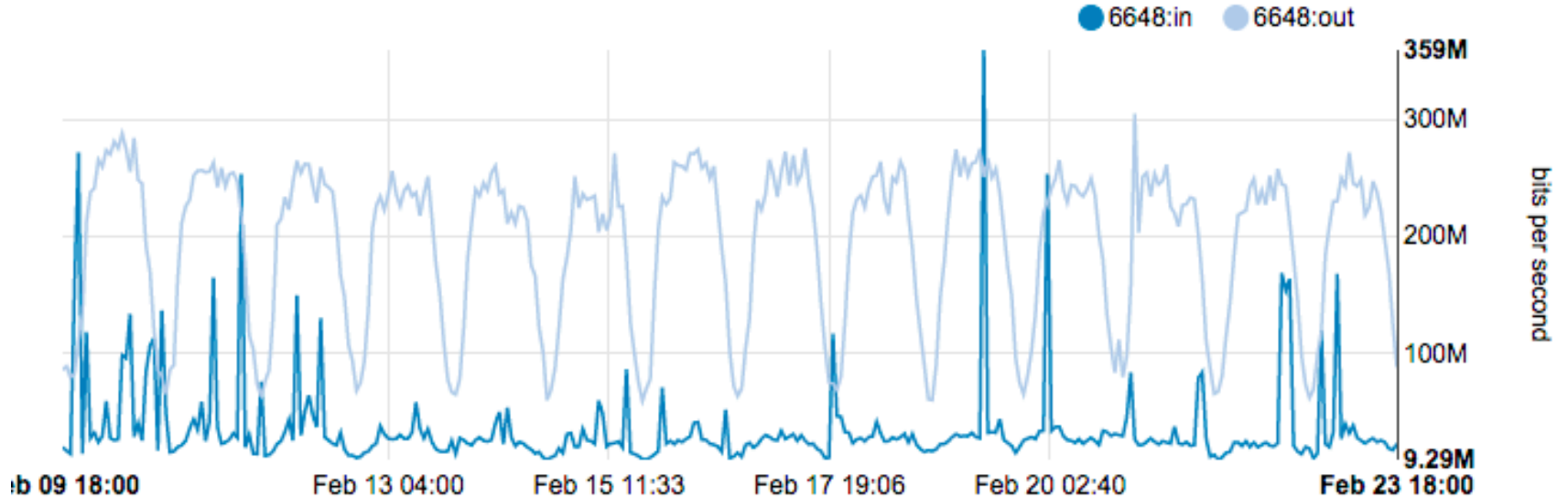
# NetFlow AS9299 PLDT



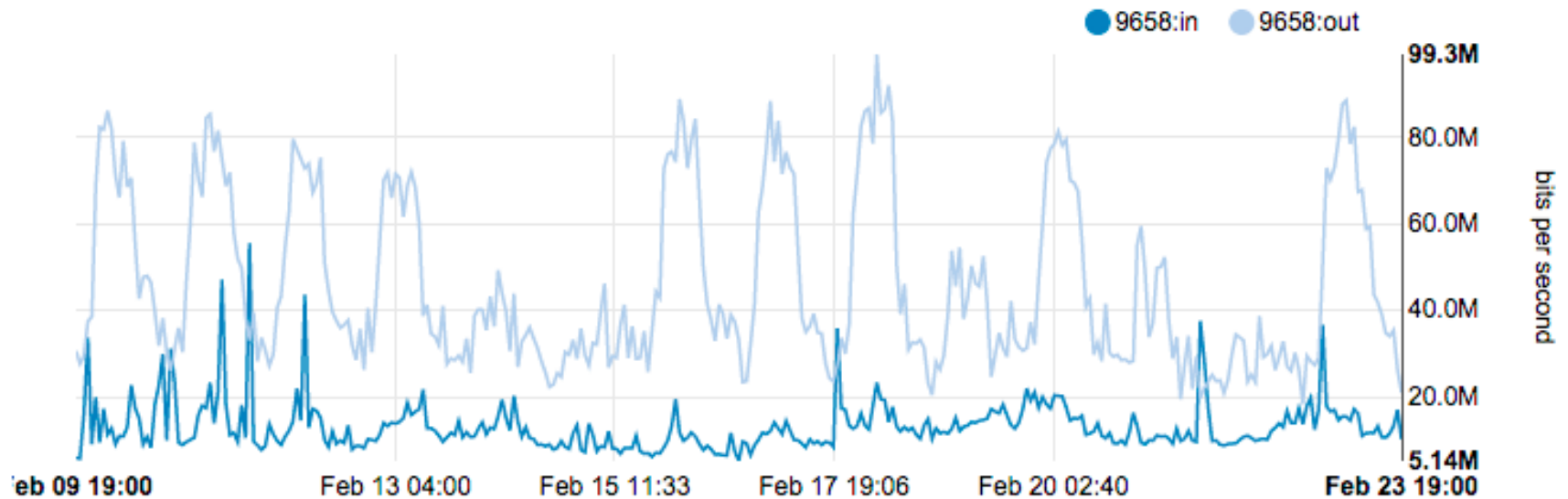
# NetFlow AS4775 Globe Telecom



# NetFlow AS6648 Bayan Telecom



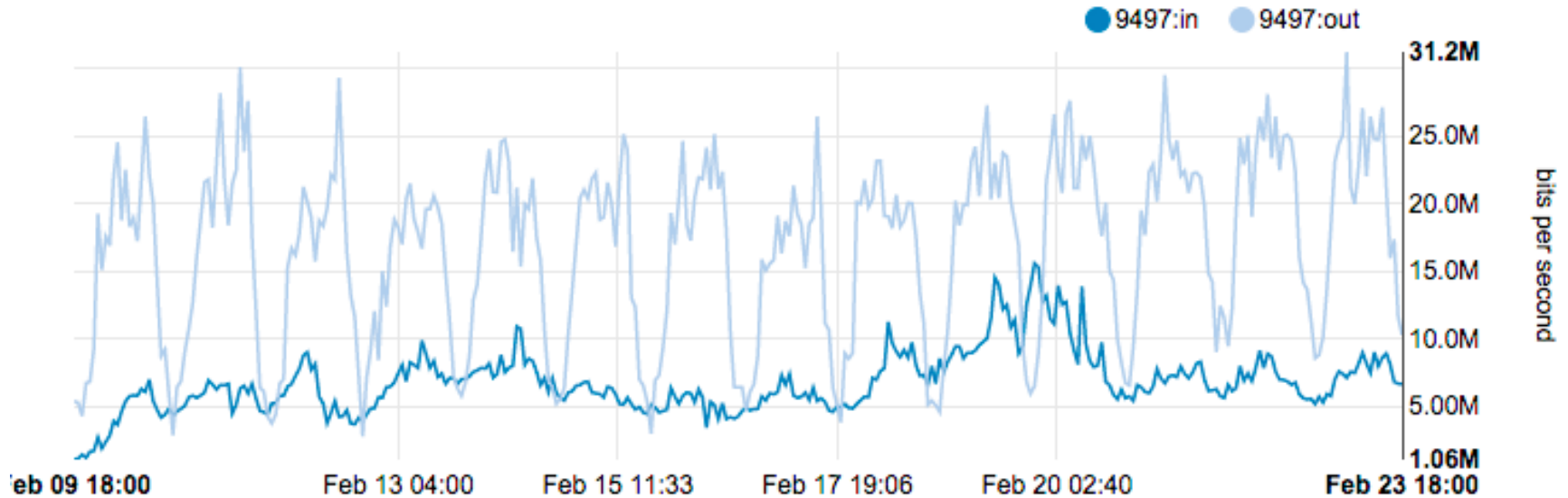
# NetFlow AS9658 Eastern Telecoms



Hurricane Electric - Massive Peering!



# NetFlow AS9497 Digital Telecom



# NetFlow Results

Company	ASN	V4 Routes	Cedexis	DYN Rank	Traffic	Total Traffic %
PLDT	9299				3200	48.63%
Globe	4775				3000	45.59%
Bayan	6648				275	4.18%
Eastern Telcom	9658				80	1.22%
Digital Telcom	9497				25	0.38%

With time limitations we will limit this presentation to the two top traffic destinations.

# External CDN Performance

## Average Traffic Philippines Top ASNs

ASN Label	Hi Lvl Conn Type	% of Traffic	RTT per req ms (excl https)
9299 philippine long distance telco	dailup/dsl	54.77%	162
132199 globe telecom	mobile/satellite	16.98%	131
10139 smart broadband	fixed wireless	9.39%	236
23944 skycable corp	tx/ocx	7.32%	171
17639 comclark network and technology ..	cable	5.57%	125
6648 bayan telecomm	dailup/dsl	1.34%	192
4775 globe telecoms	mobile/satellite	0.83%	153
45754 clear path networks inc	unknown	0.54%	187
56099 click broadband	unknown	0.42%	166
9658 eastern telecoms phils.	dailup/dsl	0.40%	113

# External CDN Performance

## Performance by POP PLDT January 2018 & February 2018

City	% TB Traffic	RTT per req ms (excl http..	Avg miles to POP	Retransmits
Hong Kong	67.01%	132	705	6.24%
Tokyo	10.08%	241	1,858	6.45%
Los Angeles	9.66%	323	7,296	5.43%
San Jose	6.62%	364	7,015	6.37%
Los Angeles	4.00%	285	7,296	4.82%
Singapore	1.90%	161	1,492	5.71%
Seattle	0.18%	227	6,643	4.09%
Tel Aviv	0.06%	424	5,469	6.93%
Chicago	0.05%	295	8,133	3.64%
Vancouver	0.05%	233	6,556	2.28%
Seoul	0.04%	183	1,628	5.64%
Osaka	0.02%	229	1,656	4.46%
Chennai	0.02%	274	2,733	4.38%
Sydney	0.01%	207	3,882	1.65%
Mumbai	0.00%	331	3,190	3.11%
<b>Total</b>	<b>99.67%</b>	<b>161</b>	<b>1,615</b>	<b>6.09%</b>



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## Internet Exchange Report

















# [http://bgp.he.net/report/exchanges#\\_exchanges](http://bgp.he.net/report/exchanges#_exchanges) PLDT

Exchange		CC	City	IPv4	IPv6
<u>AMS-IX</u>		NL	Amsterdam	80.249.213.170	2001:7f8:1::a500:9299:1
<u>AMS-IX Hong Kong</u>		HK	Hong Kong	103.247.139.43	2001:df0:296::a500:9299:1
<u>Any2 Los Angeles</u>		US	Los Angeles	206.72.210.177	2001:504:13::210:177 2001:504:13::177
<u>BBIX Hong Kong</u>		HK	Hong Kong	103.203.158.70	2403:c780:b800:bb00::9299:1
<u>BBIX Singapore</u>		SG	Singapore	103.231.152.118	
<u>DE-CIX Frankfurt</u>		DE	Frankfurt	80.81.195.191	2001:7f8::2453:0:1
<u>Equinix Hong Kong</u>		HK	Hong Kong	119.27.63.173	2001:de8:7::9299:1
<u>Equinix Singapore</u>		SG	Singapore	27.111.229.75	2001:de8:4::9299:1
<u>JPNAP Tokyo</u>		JP	Tokyo	210.173.176.159	2001:7fa:7:1::9299:1
<u>NYIIX</u>		US	New York	198.32.160.48	2001:504:1::a500:9299:1
<u>SGIX</u>		SG	Singapore	103.16.102.117	2001:de8:12:100::117

# [http://bgp.he.net/report/exchanges#\\_exchanges](http://bgp.he.net/report/exchanges#_exchanges)

## Globe

<u>AMS-IX Hong Kong</u>		HK	Hong Kong	103.247.139.44	2001:df0:296::a500:4775:1
<u>Any2 Los Angeles</u>		US	Los Angeles	206.72.210.197	2001:504:13::197
<u>Any2 New York</u>		US	New York	206.51.45.12	2001:504:13:6::12
<u>BBIX Hong Kong</u>		HK	Hong Kong	103.203.158.83	2403:c780:b800:bb00::4775:2
<u>BBIX Singapore</u>		SG	Singapore	103.231.152.82	2001:df5:b800:bb00::4775:1
<u>BBIX Tokyo</u>		JP	Tokyo	218.100.6.97	2001:de8:c::4775:1
<u>DE-CIX Frankfurt</u>		DE	Frankfurt	80.81.195.224	2001:7f8::12a7:0:1
<u>Equinix Ashburn</u>		US	Ashburn	206.126.237.90	2001:504:0:2::4775:1
<u>Equinix Chicago</u>		US	Chicago	208.115.136.231	2001:504:0:4::4775:1
<u>Equinix Hong Kong</u>		HK	Hong Kong	119.27.63.75	2001:de8:7::4775:1
<u>Equinix Singapore</u>		SG	Singapore	27.111.228.226	2001:de8:4::4775:1
<u>Equinix Tokyo</u>		JP	Tokyo	203.190.230.48	2001:de8:5::4775:1
<u>HKIX</u>		HK	Hong Kong	123.255.90.178	2001:7fa:0:1::ca28:a0b2
<u>JPIX Tokyo</u>		JP	Tokyo	210.171.224.75	2001:de8:8::4775:1
<u>JPNAP Tokyo</u>		JP	Tokyo	210.173.176.232	2001:7fa:7:1::4775:1
<u>LAIX</u>		US	Los Angeles	198.32.146.77	2001:504:a::a500:4775:1
<u>NL-IX</u>		NL	Amsterdam	193.239.118.107	2001:7f8:13::a500:4775:1
<u>NYIIX</u>		US	New York	198.32.160.207	2001:504:1::a500:4775:1
<u>PHOpenIX</u>		PH	Manila	198.32.172.4	2001:478:172::4
<u>SGIX</u>		SG	Singapore	103.16.102.40	2001:de8:12:100::40
<u>SIX</u>		US	Seattle	206.81.80.208	2001:504:16::12a7
<u>SOX Singapore</u>		SG	Singapore	198.32.141.159	2001:de8:d::4775:1



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## World Report



# <http://bgp.he.net/country/PH>

## Country Info



### Networks: Philippines

ASN	Name	Adjacencies v4	Routes v4 ↓	Adjacencies v6	Routes v6
<a href="#">AS9299</a>	Philippine Long Distance Telephone Company	112	822	8	5
<a href="#">AS9658</a>	Eastern Telecoms Phils., Inc.	53	542	0	0
<a href="#">AS6648</a>	Bayan Telecommunications, Inc.	117	432	8	4
<a href="#">AS23930</a>	IP-Converge Data Center, Inc.	42	261	7	2
<a href="#">AS4775</a>	Globe Telecoms	109	243	16	3
<a href="#">AS55303</a>	60 Market Square,P.O. Box 364	12	196	0	0
<a href="#">AS17639</a>	ComClark Network & Technology Corp.	23	157	1	1
<a href="#">AS10139</a>	Smart Broadband, Inc.	1	135	1	1
<a href="#">AS132199</a>	Globe Telecom Inc.	1	124	0	0

# <http://bgp.he.net/country/PH>

Country Info



## Networks: Philippines

ASN	Name	Adjacencies v4	Routes v4 ↓	Adjacencies v6	Routes v6
<a href="#">AS9299</a>	Philippine Long Distance Telephone Company ●	112	822	8	5
<a href="#">AS9658</a>	Eastern Telecoms Phils., Inc.	53	542	0	0
<a href="#">AS6648</a>	Bayan Telecommunications, Inc.	117	432	8	4
<a href="#">AS23930</a>	IP-Converge Data Center, Inc.	42	261	7	2
<a href="#">AS4775</a>	Globe Telecoms ●	109	243	16	3
<a href="#">AS55303</a>	60 Market Square,P.O. Box 364	12	196	0	0
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<a href="#">AS10139</a>	Smart Broadband, Inc. ●	1	135	1	1
<a href="#">AS132199</a>	Globe Telecom Inc. ●	1	124	0	0



HURRICANE ELECTRIC  
INTERNET SERVICES

## Route Propagation

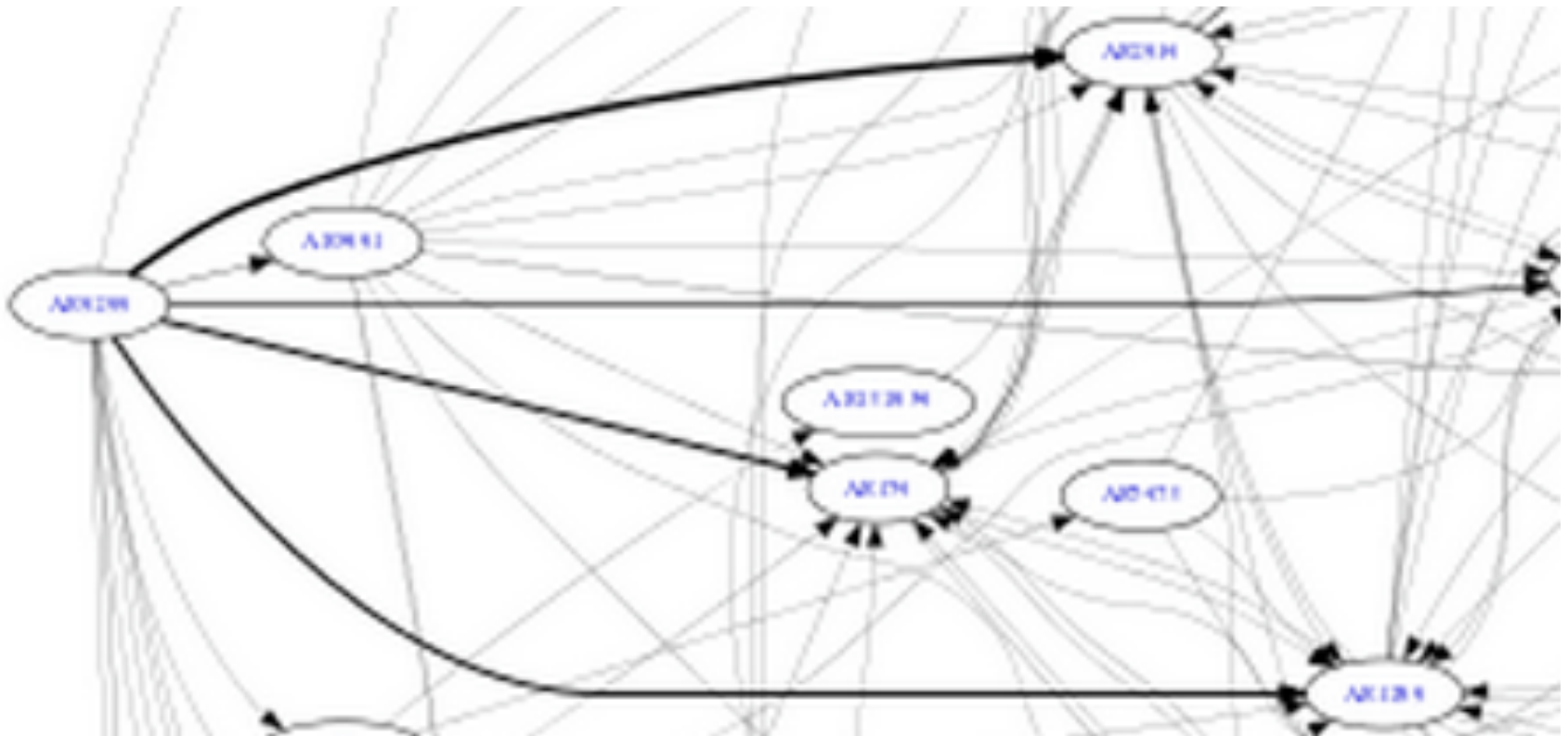


# Route propagation is to the following networks:

<b>Company</b>	<b>ASN</b>	<b>Company</b>	<b>ASN</b>	<b>Company</b>	<b>ASN</b>
Hurricane	6939	TiNet	3257	Sparkle	6762
Qwest	209	Dtag	3320	Cogent	174
UUnet	701	Level3	3356	AT&T	7018
UUnet Europe	702	GBLX	3549	Comcast	7922
Cable and Wireless	1273	Savvis	3561	Telefonica	12956
Sprint	1239	Orange	5511	Abovenet	6461
Telia	1299	TATA	6453	IJJ	2497

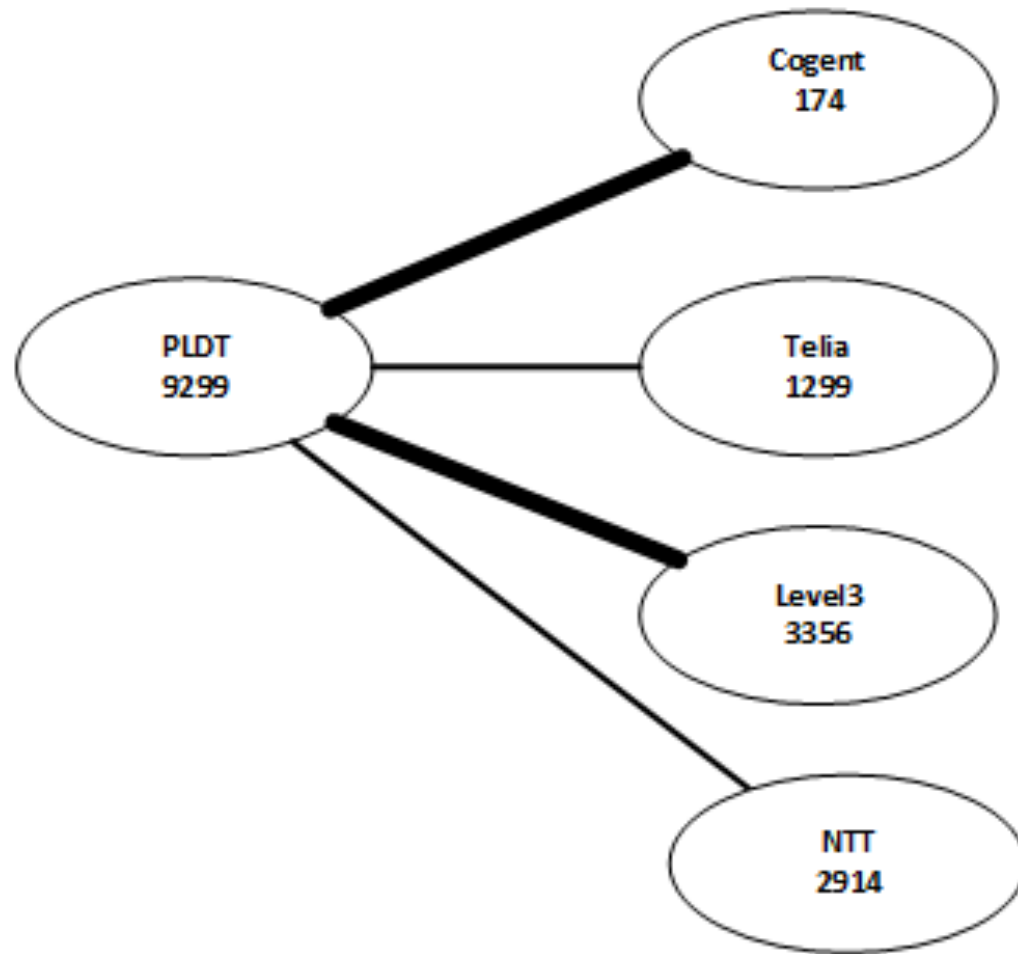
Data gathered from public sources

[http://bgp.he.net/AS9299#\\_graph4](http://bgp.he.net/AS9299#_graph4)

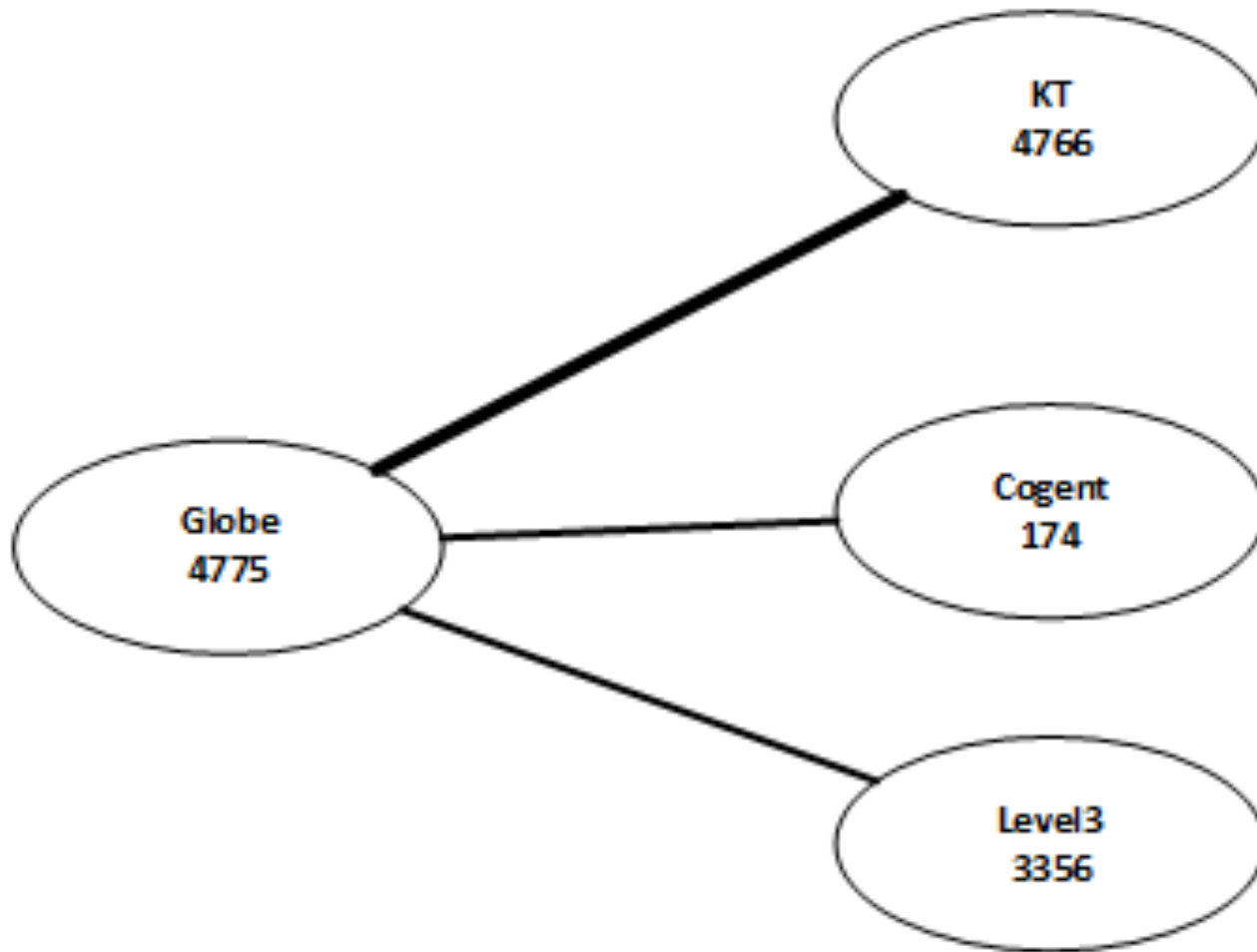


# AS9299 PLDT

## Route Propagation



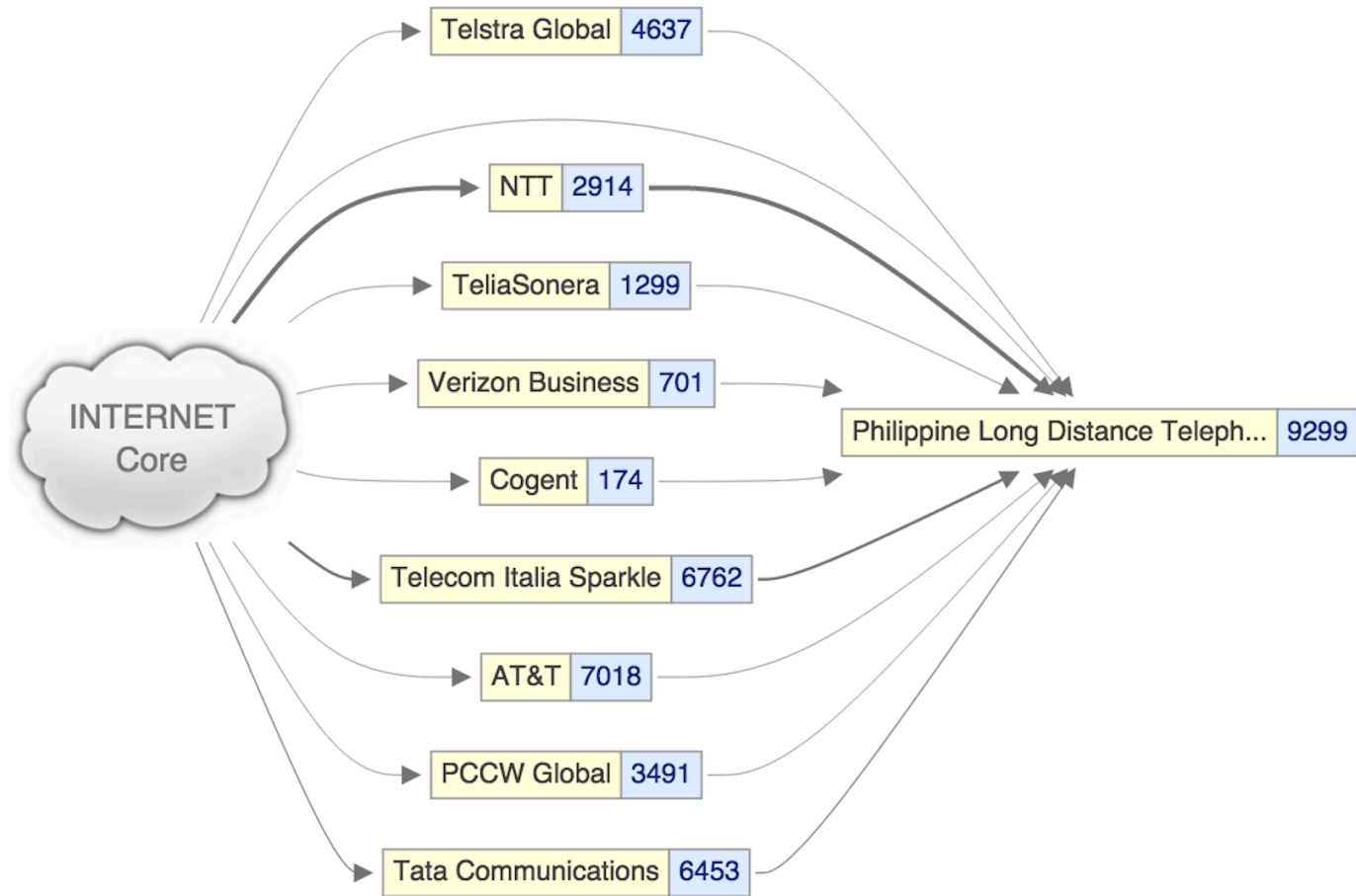
# AS4775 Globe Telecoms Route Propagation



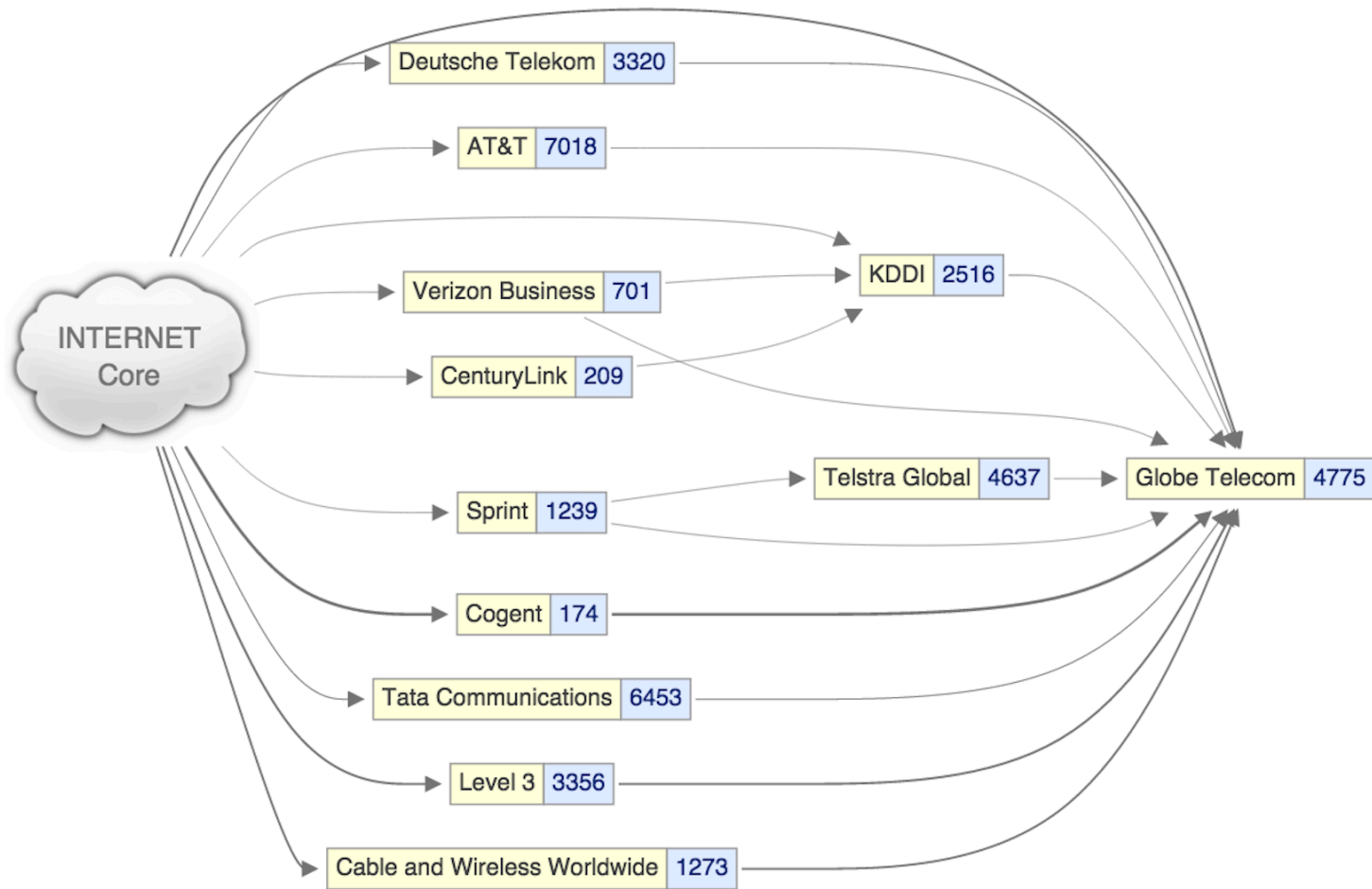
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# **Dyn | IP Transit Intelligence**

# AS9299 PLDT



# AS4775 Globe



# Dyn Internet Intelligence Philippines

IPv4 Customer Base: Retail				
1	☆	Philippine Long Distance Telephone Company	9299	<div></div>
2	☆	Bayan Telecommunications	6648	<div></div>
3	☆	Globe Telecom	4775	<div></div>
4	☆	Digital Telecommunications Philippines	9497	<div></div>
5 ↑ 1	☆	Eastern Telecoms Phils.	9658	<div></div>
6 ↓ 1	☆	Smart Broadband	10139	<div></div>
7 ↑ 1	☆	Globe Telecom Inc.	2.1127	<div></div>
8 ↓ 1	☆	INFOCOM Technologies	7629	<div></div>
9	☆	DMPI, Digitel Mobile Philippines Inc.,	24106	<div></div>
10 ↑ 1	☆	IP-Converge Data Center, Inc.	23930	<div></div>
<a href="#">View Listing</a>				

# AS9299 PLDT

**IPv4 Provider Profile (Global)**

★ **Philippine Long Distance Telephone Company**

AS 9299

**Market:** Multinational

**Market Breakdown:**

4	Continents
9	Countries
5	US States or Canadian Provinces

**Customers:**

98	AS Customers
12	Critically Dependent
963	IPv4 Originated Networks
694	Transited Networks

**Providers:** 11

**Selected Peers:** 34

# AS9299 PLDT

IPv4 Critically Dependent AS Customers (Philippines)			?
★ Philippine Long Distance Telephone Company			AS 9299
			sort by Relative Contribution
1	★ Smart Broadband	AS 10139	
	since 1 Jan 2006		
2	★ INFOCOM Technologies	AS 7629	
	since 1 Jan 2006		
3	★ PhilCom Corporation	AS 18396	
	since 2 Jan 2006		
4	★ ePLDT Inc.	AS 2.1134	
5	★ Amazon	AS 16509	
	since 1 Oct 2013		
6	★ Asian Development Bank	AS 56128	
	since 17 Mar 2011		

# AS4775 Globe

**IPv4 Provider Profile (Philippines)** ?

★ **Globe Telecom** AS 4775

**Market:** National

**Market Breakdown:**

3	Continents
6	Countries
3	US States or Canadian Provinces

**Note:** The following information describes this provider's relationships within *Philippines*. (Switch to global view.)

**Customers:**

63	AS Customers
12	Critically Dependent
69	IPv4 Originated Networks
309	Transited Networks

**Providers:** 16

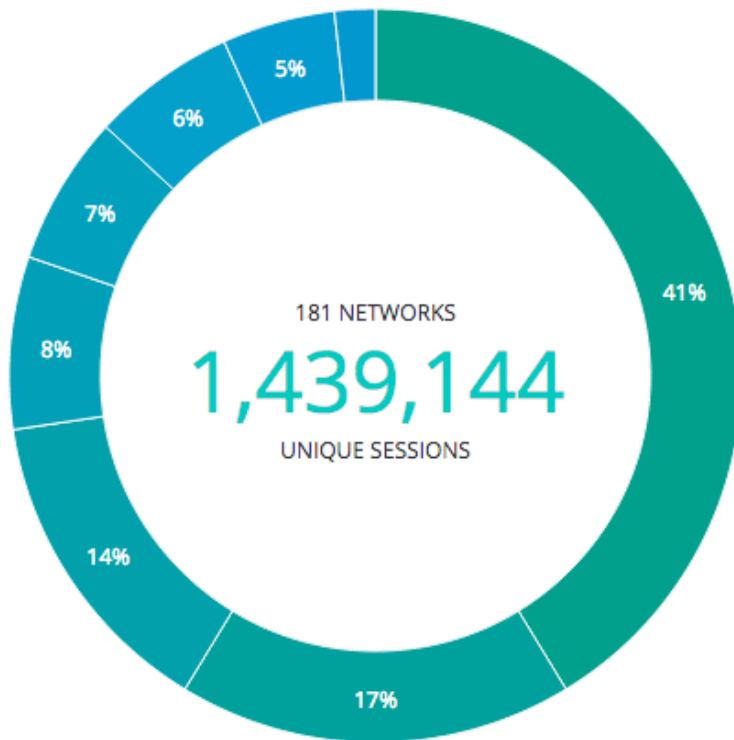
**Selected Peers:** 23

# AS4775 Globe

IPv4 Critically Dependent AS Customers (Philippines)			?
★ <b>Globe Telecom</b>			AS 4775
			sort by Relative Contribution
1	★ <b>Globe Telecom Inc.</b>	AS 2.1127	
2	★ <b>AyalaPort Makati, Inc. / Data Center Operator</b>	AS 17894	
	since 1 Jan 2006		
3	★ <b>Webstream Bldg</b>	AS 55939	
	since 6 Sep 2013		
4	★ <b>8F Tower 2 The Rockwell Business Center</b>	AS 2.1157	
5	★ <b>Aditya Birla Minacs Worldwide Ltd</b>	AS 23994	
	since 23 Aug 2013		
6	★ <b>OFFICETIGER DATABASE SYSTEMS INDIA PVT LTD</b>	AS 24222	
	since 18 Jun 2009		



# <http://www.cedexix.com/>

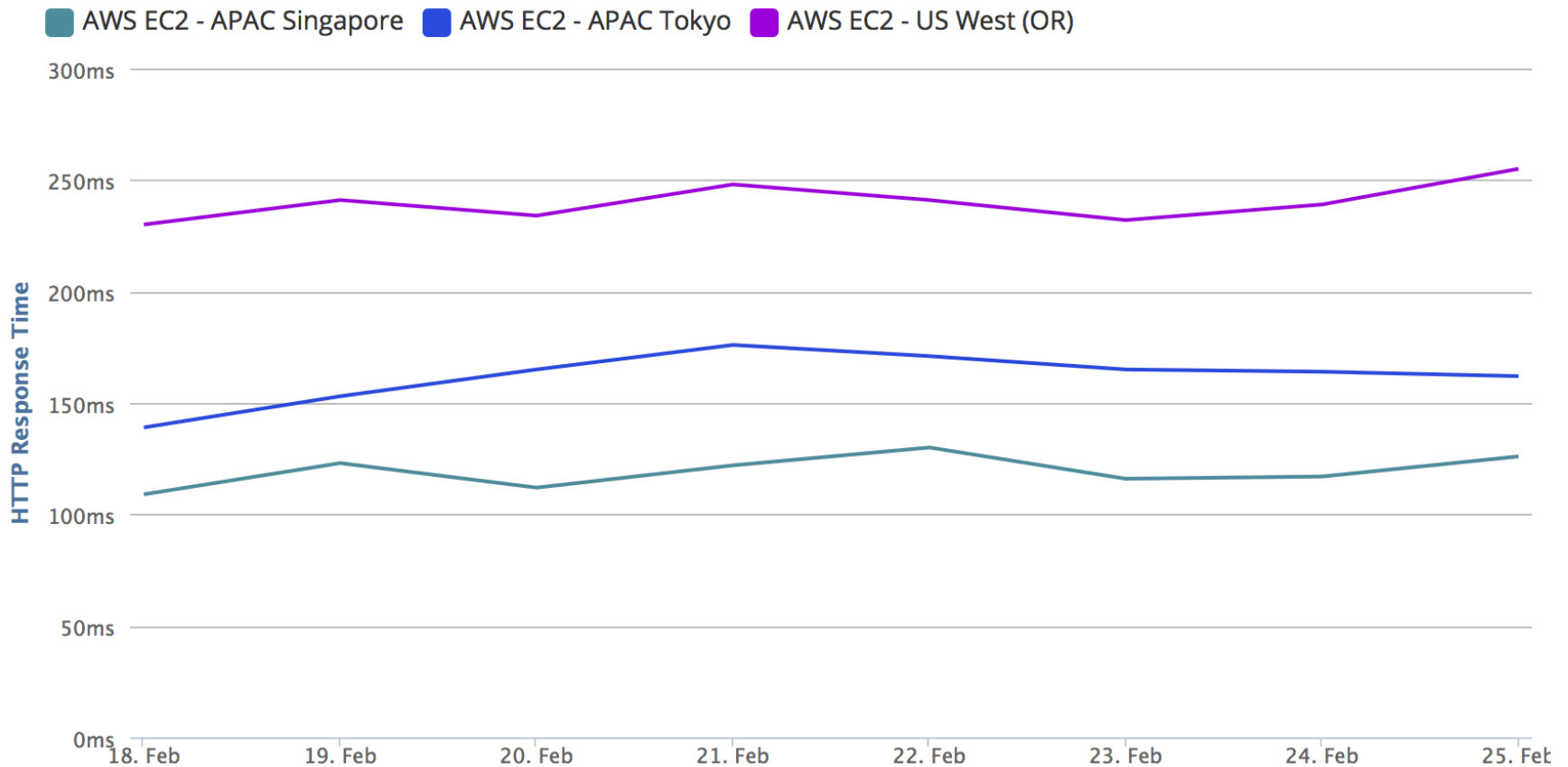


## ISPs ranked by percentage of sessions

We identify each network as part of our Radar benchmarking method. This can tell you where your users are most likely to be coming from within a country.

41%	Philippine Long Distance Teleph...
17%	Globe Telecom Inc.
14%	Smart Broadband Inc.
8%	Others
7%	Globe Telecoms
6%	Bayan Telecommunications Inc.
5%	Skycable Corporation
2%	Comclark Network & Technolog...

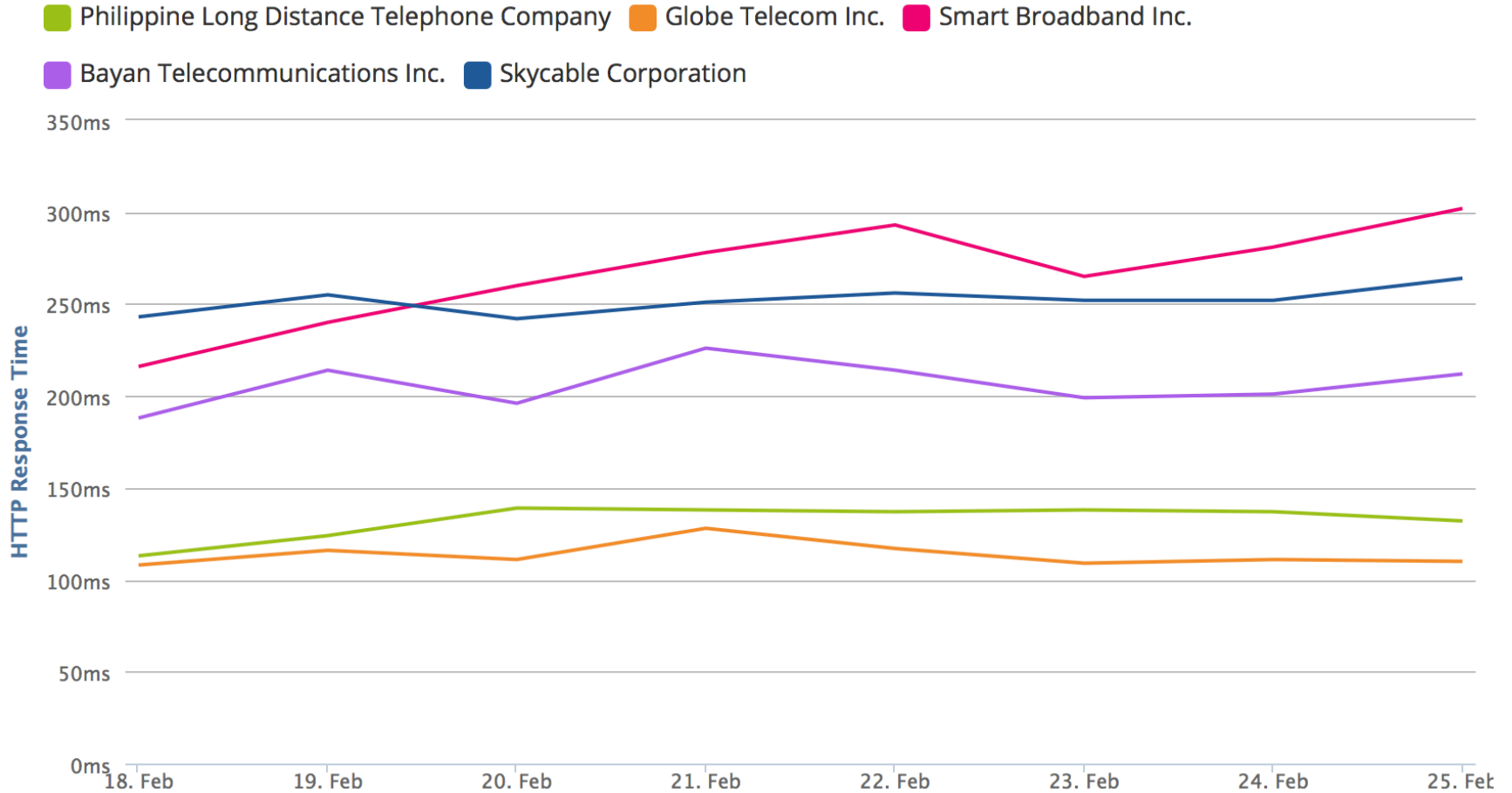
<http://www.cedexix.com/>



Hurricane Electric - Massive Peering!



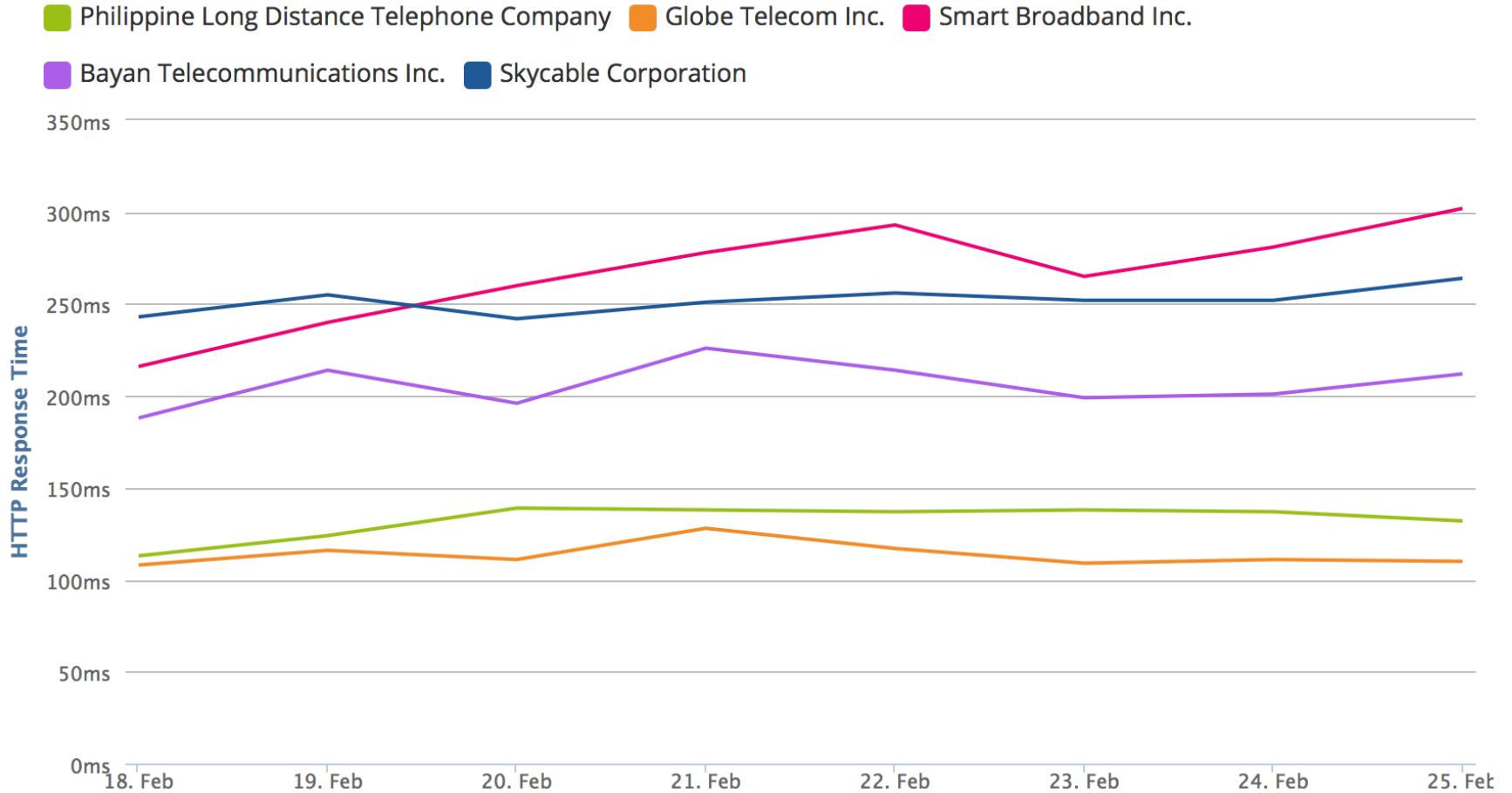
# AWS Tokyo



Hurricane Electric - Massive Peering!



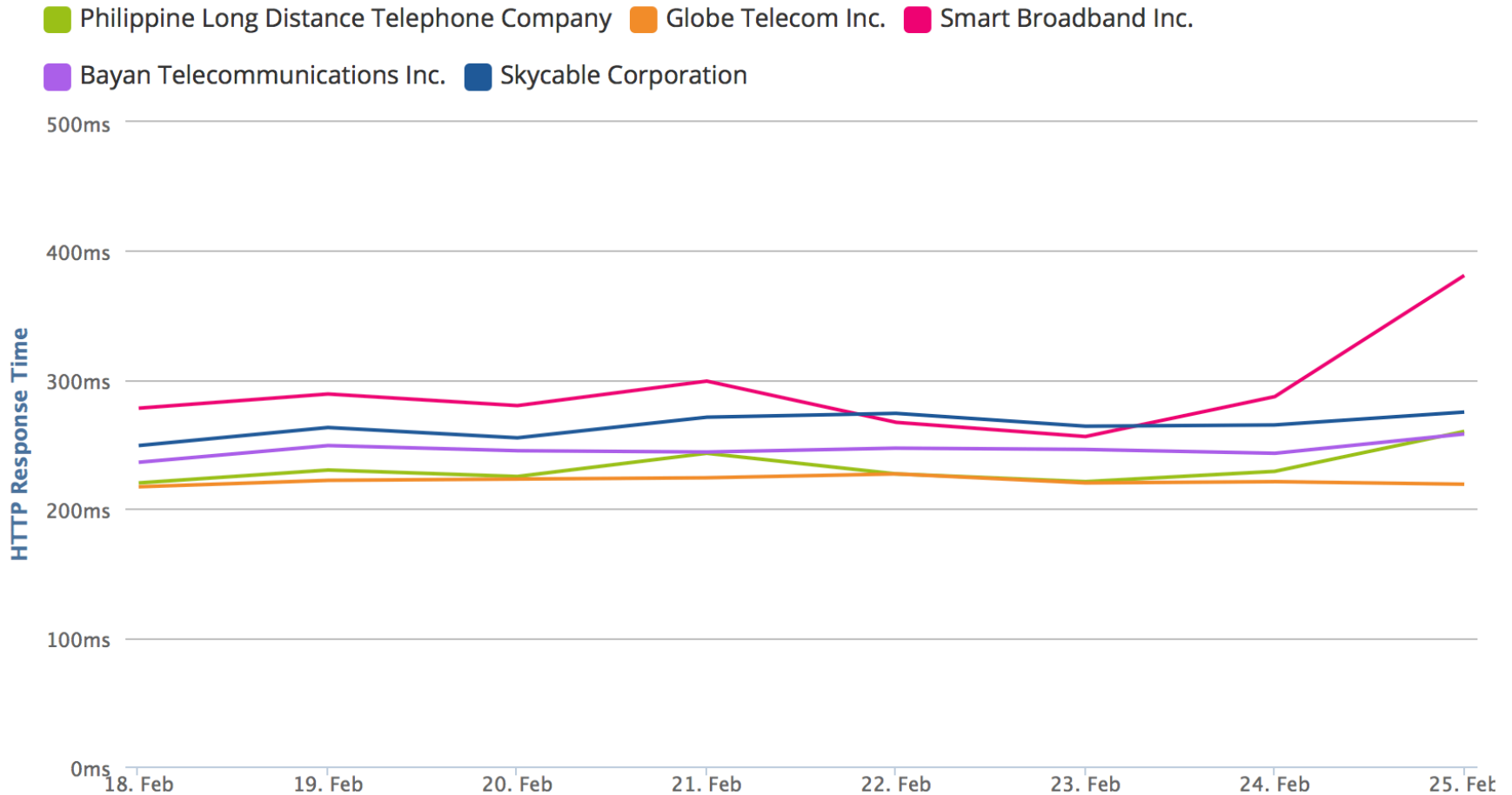
# AWS Singapore



Hurricane Electric - Massive Peering!



# AWS Oregon



Hurricane Electric - Massive Peering!



# Network Data Results

Company	ASN	V4 Routes	Cedexis	DYN Rank	Traffic	Total Traffic %
PLDT	9299	957	55%	1	3200	48.63%
Globe	4775	367	24%	3	3000	45.59%
Bayan	6648	432	6%	2	275	4.18%
Eastern Telcom	9658	542	n/a	5	80	1.22%
Digital Telcom	9497	84	n/a	4	25	0.38%

# Exchange Points & Facilities

<a href="#"><u>BAYANTEL</u></a> Bayan Telecommunications Internet and Gaming Exchange	Ethernet	PH	Quezon City
<a href="#"><u>GIX</u></a> Globe Internet Exchange	Multiple	PH	Makati City
<a href="#"><u>Manila IX</u></a> Manila Internet Exchange	Ethernet	PH	Manila
<a href="#"><u>PHIX</u></a> Philippine Internet Exchange	Ethernet	PH	Metro Manila
<a href="#"><u>PHIX-AP</u></a> Philippine Internet Exchange	Ethernet	PH	Metro Manila
<a href="#"><u>PhOpenIX-Cebu</u></a> Philippine Open Internet Exchange (Cebu)	Ethernet	PH	Cebu
<a href="#"><u>PhOpenIX-Davao</u></a> Philippine Open Internet Exchange (Davao)	Ethernet	PH	Davao
<a href="#"><u>PhOpenIX-Manila</u></a> Philippine Open Internet Exchange (Manila)	Ethernet	PH	Manila

# Exchange Points Results

<b>IX Name</b>	<b>9299</b>	<b>9658</b>	<b>6648</b>	<b>4775</b>	<b>9497</b>
Bayantel	6648				
GIX					
Manila IX	6648	9658			
PHIX	9299				
PHIX-AP					
PHOpenIX	4775				

<http://phoenix.net/members/>

## Members

	Organization	ASN	100Mb or less	1Gb	10Gb	NOC Contact
9	Globe	4775		Yes		Vincent Atienza
50	PLDT	7707		Yes		Roy Resurreccion

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# Globe – PLDT Peering

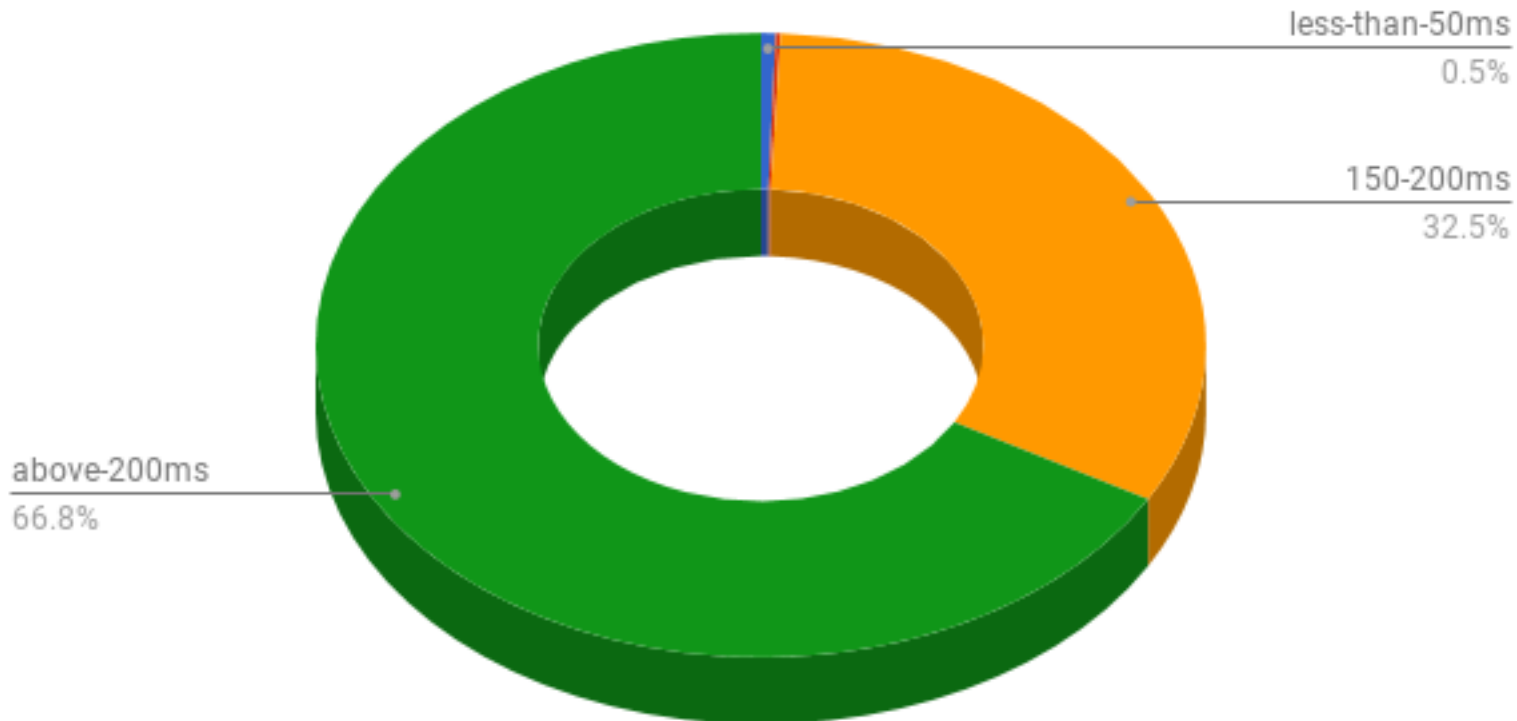
- In 2015 there was no peering
- June 16, 2016 – Leading telecoms and digital services provider PLDT has moved to establish a bilateral IP peering arrangement with Globe Telecom that will help improve local internet traffic quality.

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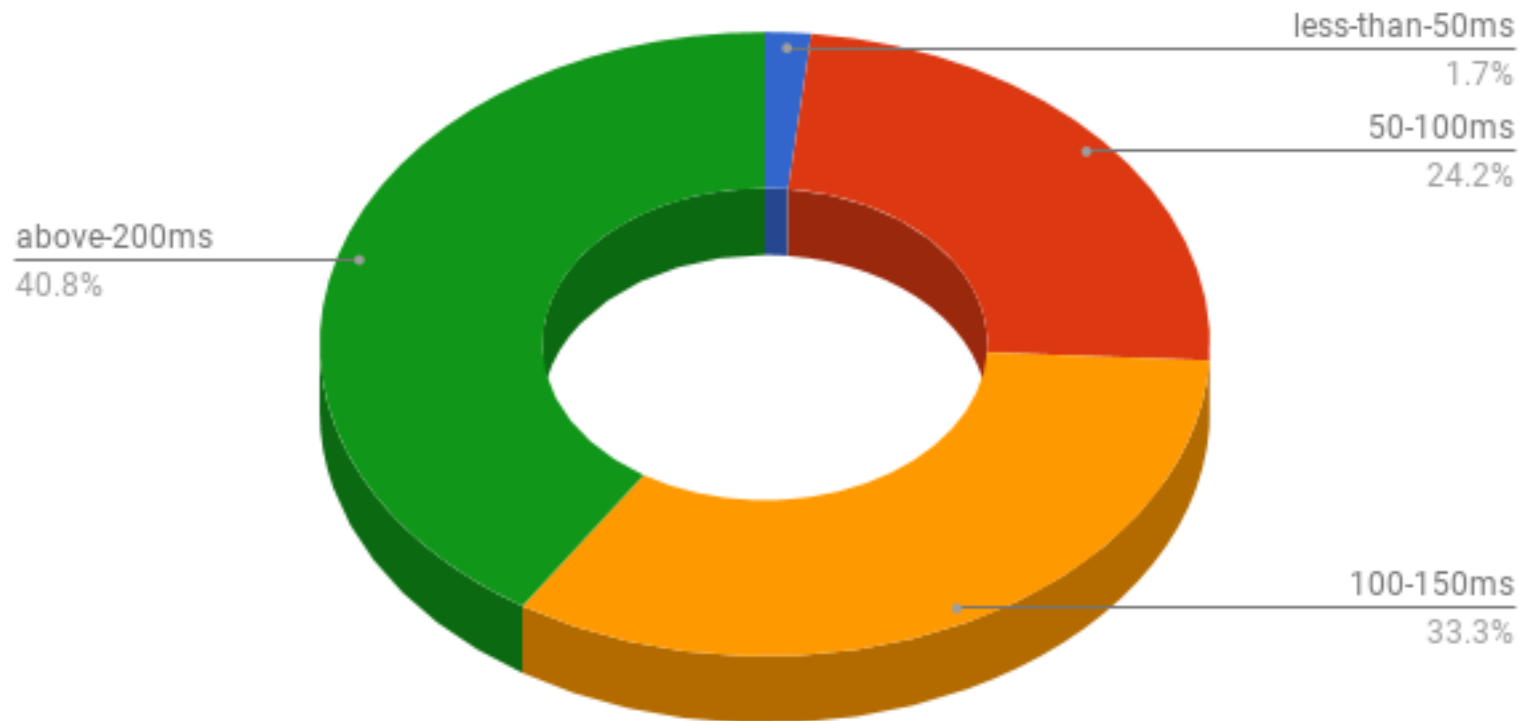
# Globe - PLDT Peering?

- What does the data show?

# Globe -> PLDT



# PLDT -> Globe



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# Globe – PLDT Peering?

- What does the data show?
- Globe – PLDT local peering is under 2%
- The rest is exchanged in Los Angeles

data from <https://atlas.ripe.net/>

# Time to Fly to Manila



Total travel time from Seattle ~23 hours

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# In Country Research

- ❑ Local Datacenters
- ❑ Exchange Points
- ❑ Local Networking

# Datacenter Checklist

- ❑ Visit the top providers datacenters.
- ❑ Inspect networking hardware.
- ❑ Telco and meet-me room evaluation.
- ❑ Cross connects can you get to everyone on every floor?
- ❑ Are you 100% sure?
- ❑ Get it in the contract.

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# Local Exchange Points

- ❑ Visit all the local exchange operators.
- ❑ Understand the hardware and physical layout.
- ❑ Who is actually on the exchange?

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# Local Networking

- ❑ Connect to the main providers on Wi-Fi and test local and international destinations.
- ❑ Do the top providers peer locally?
- ❑ Does your traffic stay local?
- ❑ Does your traffic hit the US before coming back to the local country?

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# Other Considerations

- ❑ Culture
- ❑ Manners
- ❑ Holidays

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# Cold vs. Warm cultures

- ❑ Task based vs. Relationship based
- ❑ Direct vs. Indirect Communication
- ❑ Individualism vs. Group Identity
- ❑ Time and Planning

# Manners

- ❑ Initial greetings are formal and follow a set protocol of greeting the most important person first.
- ❑ Appointments are required and should be made 3 to 4 weeks in advance.
- ❑ Face-to-face meetings are preferred.
- ❑ Wait to be told where to sit.
- ❑ Dress well. Appearances matter and you will be judged on how you dress.
- ❑ Once a relationship has been developed it is with you personally.
- ❑ Give your business card first always with two hands.
  
- ❑ “Yes” may mean “no”. Avoid yes or no questions!

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# Holidays

- ❑ Understand the local holidays and how it may impact your timelines and expectations.
- ❑ The United States has 6 paid holidays.
- ❑ The Philippines has 36 paid/unpaid holidays.

# Resources

- ❑ <http://bgp.he.net>
- ❑ <https://mi.renesys.com>
- ❑ <http://www.cedexis.com>
- ❑ <https://www.peeringdb.com>
- ❑ <https://atlas.ripe.net/>
- ❑ <http://www.timeanddate.com/holidays/philippines/>
- ❑ <http://www.thegreatcourses.com>
- ❑ [https://en.wikipedia.org/wiki/Public\\_holidays\\_in\\_Sweden](https://en.wikipedia.org/wiki/Public_holidays_in_Sweden)
  
- ❑ Foreign to Familiar: A Guide to Understanding Hot - And Cold - Climate Cultures, by *Sarah A. Lanier*
- ❑ Customs of the World: Using Cultural Intelligence to Adapt, Wherever You Are, by *Professor David Livermore Ph.D*, *The Great Courses*
- ❑ *[Boss clipart](#)*

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Thanks!

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