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# Peering 101

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July 2016 – JPIX  
Tokyo Japan

Walt Wollny, Director Interconnection Strategy  
Hurricane Electric AS6939

# Who is Walt Wollny?

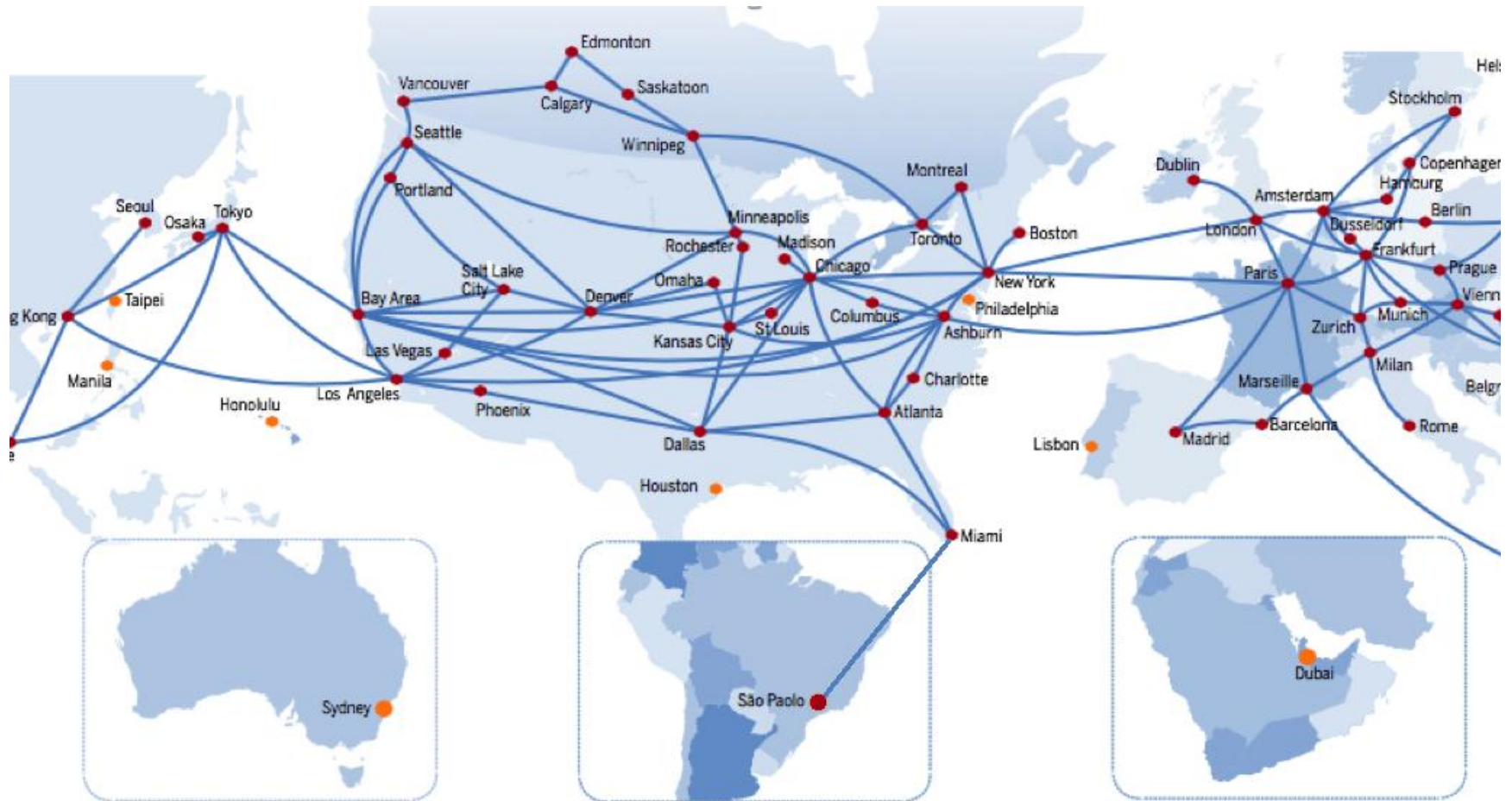
- ❑ Hurricane Electric AS6939 – 2 years
  - ❑ Director Interconnection Strategy – supporting the network to reach to over 33 countries and over 135 Internet Exchanges. Focus on Global connectivity.
- ❑ Amazon AS16509 – 4 years
  - ❑ Developed IP Transit and Peering on five continents.
  - ❑ Primary focus 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, UE and South America.

**19 years of peering experience**

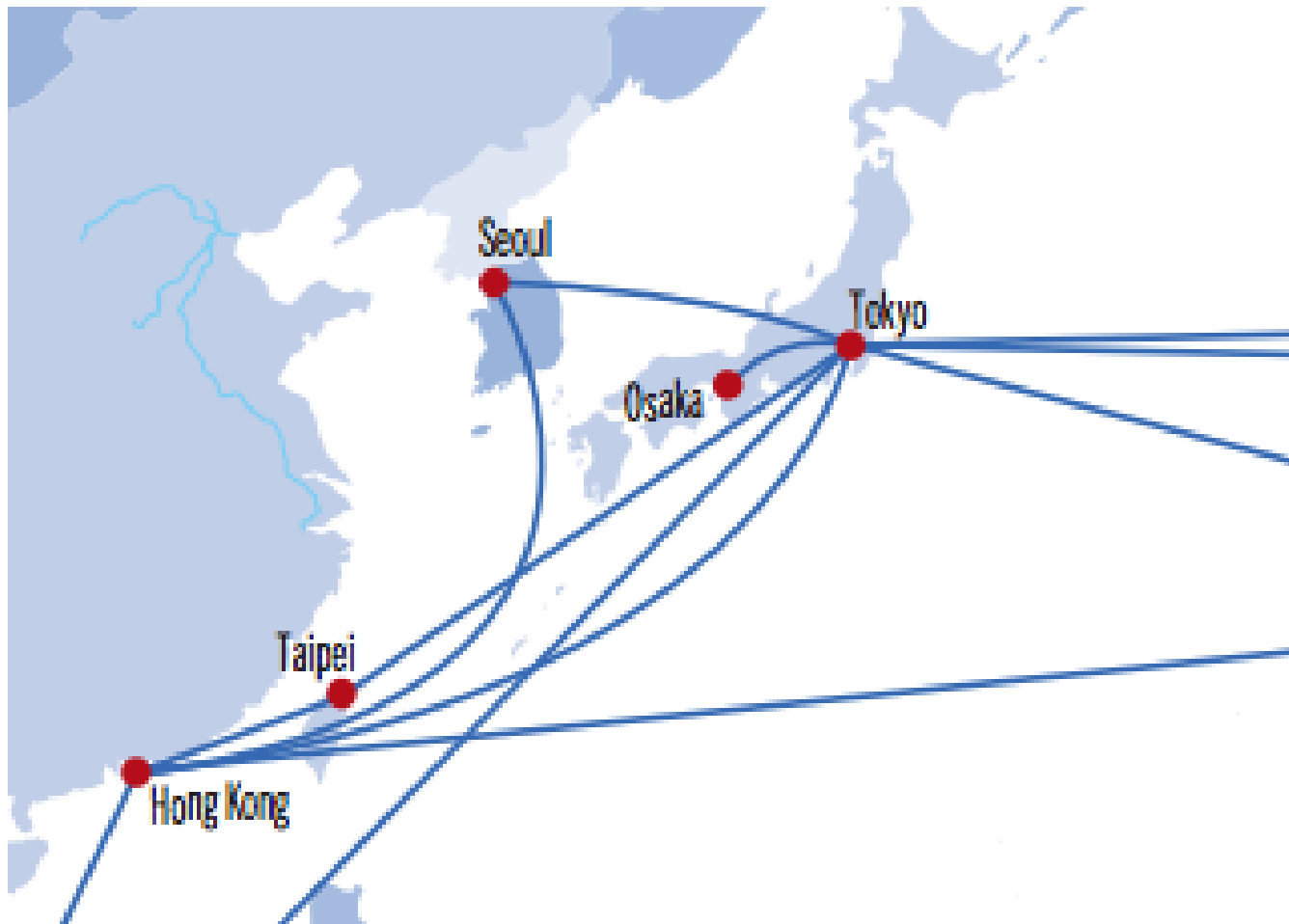
# Agenda

- ❑ Hurricane Electric network update.
- ❑ What is a Peering Manager?
- ❑ What is a Interconnection Manager?
- ❑ A day in the life of a Interconnection Manager.
- ❑ What is the Peeringdb.com
- ❑ What is a Peering Policy?
- ❑ Restrictive Networks Peering Strategy.
- ❑ Peering request email example.
- ❑ Key meetings.

# Hurricane Electric Network



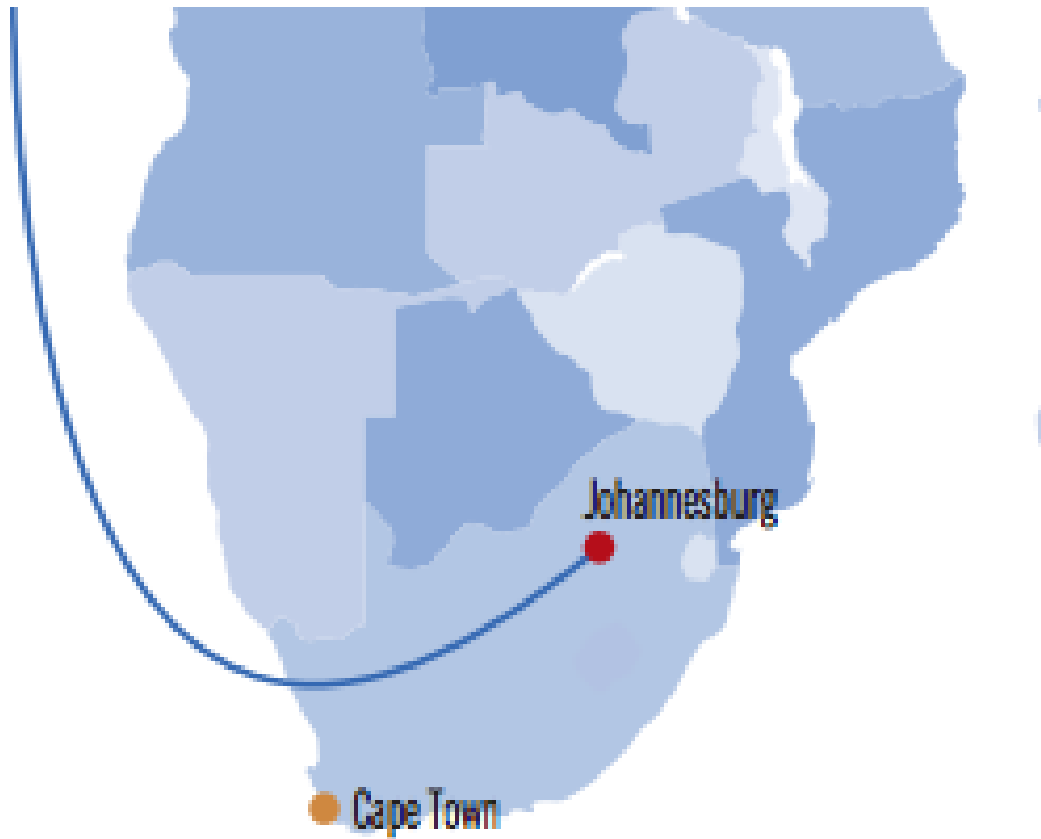
# Network updates APAC



Hurricane Electric - Massive Peering!



# Network updates Africa



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# Peering Manager

- ❑ Can be one or several people
  - ❑ Responsible for ordering and installing cross connects
  - ❑ Responding to peering request
  - ❑ Often a part of the NOC (Network Operation Center)
  - ❑ Responsible for smaller peers
  - ❑ Supports the Interconnection Manager
  - ❑ No travel required
- 
- ❑ A peering manager is not:
  - ❑ A BGP expert
  - ❑ A salesperson

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# Interconnection Manager

- ❑ Often a single person
- ❑ Managing strategic relationships with suppliers and peers
- ❑ Analyzing traffic to make decisions on interconnection points
- ❑ Responsible for new locations and exchanges
- ❑ Partner with engineering providing guidance on traffic engineering
- ❑ Responsible for public peering policy
- ❑ Responsible for interconnection agreements
- ❑ BGP expert



# Interconnection Manager continued

- ❑ Research and analysis of new markets, economic conditions, interconnection trends and other issues
  - ❑ Capacity management, and participation in forecasting
  - ❑ The public face of your company
  - ❑ Heavy travel
  - ❑ Face to face meetings are paramount to your success.
- 
- ❑ A Interconnection Manager is not:
  - ❑ A salesperson
  - ❑ A product manager

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# Interconnection Manager job description

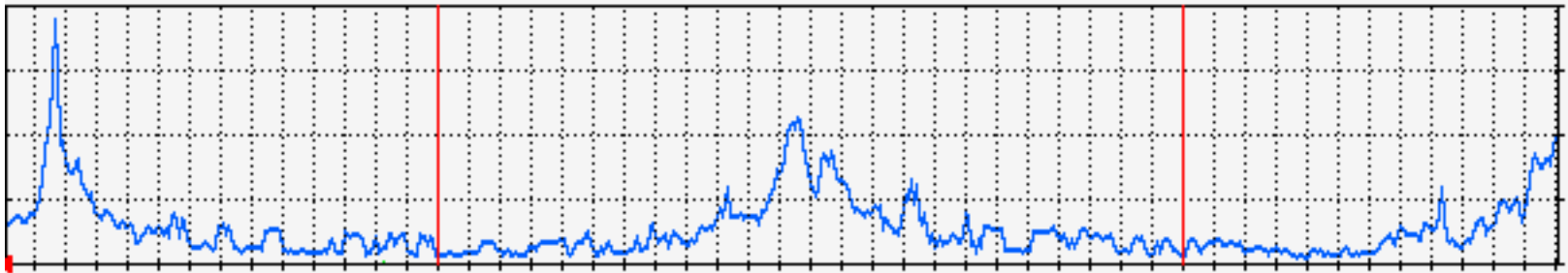
- ❑ <http://www.verizon.com/about/work/jobs/4103246-interconnections-strategy-manager-asia>

# Typical Day for an Interconnection Manager

- ❑ Reviewing peers and performance
  - Know your network
  - Performance Tuning
  - New peering on existing exchanges
- ❑ New market research
- ❑ Contract reviews
- ❑ New peering opportunities

# Know Your Network

- Reviewing peering and performance ....



# Performance Tuning

AS	Name	outBps	outPps	
1234				6939 >1234> AS
				8452 TE-AS

## It is important to review netflow data to know your network

# Performance Tuning



AS8452: TE-AS

TE-AS

6 Possible Sessions for 2016/6/28									
AS	Status	Neighbor	Exchange	Name	Up/Down	State	Group	RcvdRts	SentRts
8452	AT_EXCHANGE	2001:7fb::2104:0:1	DE-CIX Frankfurt	TE-AS	14w1d	-	-	-	-
8452	AT_EXCHANGE	2001:7fb::2104:0:2	DE-CIX Frankfurt	TE-AS	14w1d	-	-	-	-
8452	AT_EXCHANGE	80.81.193.140	DE-CIX Frankfurt	TE-AS	264w2d	-	-	-	-
8452	AT_EXCHANGE	80.81.193.245	DE-CIX Frankfurt	TE-AS	77w15h	-	-	-	-
8452	AT_EXCHANGE	195.68.226.105	LINX	TE-AS	97w5d	-	-	-	-
8452	UP	80.249.211.21	AMS-IX	TE-AS	1w7h	ESTAB	EXTPEER	480	87625

AS8462 we are missing some possible interconnection points  
We are not getting all of the possible routes from AS8452

\* This is an example only and not a reflection of an actual peer



# Performance Tuning – Digging deeper



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INTERNET SERVICES

**AS8452 TE-AS**

## Quick Links

[BGP Toolkit Home](#)  
[BGP Prefix Report](#)  
[BGP Peer Report](#)  
[Exchange Report](#)  
[Bogon Routes](#)  
[World Report](#)  
[Multi Origin Routes](#)  
[DNS Report](#)  
[Top Host Report](#)  
[Internet Statistics](#)  
[Looking Glass](#)  
[Network Tools App](#)  
[Free IPv6 Tunnel](#)  
[IPv6 Certification](#)  
[IPv6 Progress](#)  
[Going Native](#)  
[Contact Us](#)

## AS Info

## Graph v4

## Graph v6

## Prefixes

Company Website:

Country of Origin:

Internet Exchanges: 3

Prefixes Originated (all): 1,732

Prefixes Originated (v4): 1,731

Prefixes Originated (v6): 1

Prefixes Announced (all): 1,734

Prefixes Announced (v4): 1,731

Prefixes Announced (v6): 3

BGP Peers Observed (all): 109

BGP Peers Observed (v4): 109

BGP Peers Observed (v6): 5



# Performance Tuning – Digging deeper



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Search

Networks: Egypt

## Quick Links

[BGP Toolkit Home](#)  
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[World Report](#)  
[Multi Origin Routes](#)  
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[Free IPv6 Tunnel](#)  
[IPv6 Certification](#)  
[IPv6 Progress](#)  
[Going Native](#)

## Country Info



### Networks: Egypt

ASN	Name	Adjacencies v4	Routes v4 ↓	Adjacencies v6	Routes v6
<a href="#">AS8452</a>	TE-AS	109	1,731	5	3
<a href="#">AS24863</a>	LINKdotNET AS number	25	1,188	2	2
<a href="#">AS36992</a>	Etisalat MISR	24	597	3	162
<a href="#">AS24835</a>	Vodafone Data - Egypt	25	421	3	3
<a href="#">AS36935</a>	Vodafone Egypt Telecommunication S.A.E	1	196	0	0
<a href="#">AS20928</a>	Noor Advanced Technologies ASN	17	71	1	2
<a href="#">AS2561</a>	Egyptian Universities Network (EUN)	2	71	0	0





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# Performance Tuning – Next Steps

- Contact the peer to have them verify their routing policy.
- Enable peering in all shared locations
- Have a face to face meeting at the next regional meeting.
- Next go to the next flow and repeat.

# New Peers - JPIX



## Search Options

Search Entire Network

Sessions by Exchange

JPIX Tokyo

Sessions by Router

Sessions

## 298 Possible Sessions for 2016/7/1

Status	Exchange	Up/Down	State	Rcvd
ADMIN_DOWN	JPIX Tokyo	28w1d	ADMDN	-
ADMIN_DOWN	JPIX Tokyo	28w1d	ADMDN	-
AT_EXCHANGE	JPIX Tokyo	129w1d	-	-
AT_EXCHANGE	JPIX Tokyo	4w5d	-	-
AT_EXCHANGE	JPIX Tokyo	268w1d	-	-
AT_EXCHANGE	JPIX Tokyo	31w3d	-	-
AT_EXCHANGE	JPIX Tokyo	35w3d	-	-
AT_EXCHANGE	JPIX Tokyo	268w1d	-	-
AT_EXCHANGE	JPIX Tokyo	37w1d	-	-
AT_EXCHANGE	JPIX Tokyo	236w5d	-	-
AT_EXCHANGE	JPIX Tokyo	236w1d	-	-
AT_EXCHANGE	JPIX Tokyo	189w5d	-	-
AT_EXCHANGE	JPIX Tokyo	33w3d	-	-
AT_EXCHANGE	JPIX Tokyo	171w1d	-	-
AT_EXCHANGE	JPIX Tokyo	33w3d	-	-
AT_EXCHANGE	JPIX Tokyo	33w3d	-	-



# New Market Research (Philippines)



# Who are the top ISPs?



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INTERNET SERVICES

**BGP Toolkit Home**

## Quick Links

[BGP Toolkit Home](#)  
[BGP Prefix Report](#)  
[BGP Peer Report](#)  
[Exchange Report](#)  
[Bogon Routes](#)  
[World Report](#)  
[Multi Origin Routes](#)  
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[Top Host Report](#)  
[Internet Statistics](#)  
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[Network Tools App](#)  
[Free IPv6 Tunnel](#)  
[IPv6 Certification](#)  
[IPv6 Progress](#)  
[Going Native](#)  
[Contact Us](#)

## Home

Welcome to the Hurricane Electric

You are visiting from **184.105.13**

Announced as **184.104.0.0/15** (I

Your ISP is **AS6939** (Hurricane I



# 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

# Exchange Points & Facilities

## List of Public Exchange Points

<u>Exchange Name</u>	<u>Long Name</u>	<u>City/Region</u>	<u>Country</u>	<u>Continental Region</u>	<u>Media Type</u>	<u>Participants</u>
<a href="#">BAYANTEL</a>	Bayan Telecommunications Internet and Gaming Exchange	Quezon City	PH	Asia Pacific	Ethernet	3
<a href="#">GIX</a>	GLOBE INTERNET EXCHANGE	Makati City	PH	Asia Pacific	Multiple	3
<a href="#">Manila IX</a>	Manila Internet Exchange	Manila	PH	Asia Pacific	Ethernet	6
<a href="#">PHIX</a>	Philippine Internet Exchange	Metro Manila	PH	Asia Pacific	Ethernet	1
<a href="#">PHIX-AP</a>	Philippine Internet Exchange	Metro Manila	PH	Asia Pacific	Ethernet	0
<a href="#">PHOpenIX</a>	Philippine Open Internet Exchange	Metro Manila	PH	Asia Pacific	Ethernet	9

## List of Interconnection Facilities

<u>Common Name</u>	<u>Management</u>	<u>CLLI</u>	<u>NPA-NXX</u>	<u>City</u>	<u>State/Prov</u>	<u>Postal Code</u>	<u>Country</u>	<u>Participants</u>
No records								



### PeeringDB facilitates the exchange of information related to Peering.

Specifically, we are a database of networks that are peering, where they are peering, and if they are likely to peer with you. If you don't know what peering is, and/or you don't currently engage in peering, this probably won't have any meaning for you.

You are currently viewing a read-only view of the data contained here. If you are a peering network who would like to create an account, [you may register for one here](#). Please register ONLY if you are a peering network.

Still have questions? [Read our FAQ](#)

#### MOST RECENT NETWORK UPDATES

[Sugarnet](#) (202867)  
8 hours ago

[China Unicom](#) (4837)  
14 hours ago

[Pcqnet Internet Ltda](#) (61951)  
17 hours ago

[Titania Telecom](#) (262526)  
19 hours ago

[Younet Internet](#) (28635)  
19 hours ago

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2.0.11

#### [Sponsors](#)

#### **Resources**

[Documentation](#)  
[API Documentation](#)

#### **Contact Us**

[support@peeringdb.com](mailto:support@peeringdb.com)

#### **Global System Statistics**


6714 Peering Networks  
534 Public Exchange Points  
16742 Unique Public Exchange Presences  
2141 Private Facilities  
15600 Private Facility Presences

# What is the peeringdb.com?

- A peering database that every network should have a record.
  - It is important to keep it updated!
  - It is the cornerstone for automation of peering request.
- The peeringdb.com is a reference of exchange points and colocation facilities.
- Publish your information to let other companies know about your network and how to contact and interconnect with you.
  - If your not in the peeringdb.com it adds a layer of difficultly for anyone looking to peer with you.



# What is peeringdb.com?

 **PeeringDB**

Search here for a network, IX, or facility.

daddywalt

Advanced Search

Hurricane Electric

Edit

Organization	<a href="#">Hurricane Electric</a>
Also Known As	
Company Website	<a href="http://he.net">http://he.net</a>
Primary ASN	6939
IRR Record	AS-HURRICANE / AS-HURRICANEv6
Route Server URL	<a href="telnet://route-server.he.net">telnet://route-server.he.net</a>
Looking Glass URL	<a href="http://lg.he.net">http://lg.he.net</a>
Network Type	NSP
IPv4 Prefixes	153000
IPv6 Prefixes	18000
Traffic Levels	1 Tbps+
Traffic Ratios	Balanced
Geographic Scope	Global
Protocols Supported	<input checked="" type="checkbox"/> Unicast IPv4 <input type="checkbox"/> Multicast <input checked="" type="checkbox"/> IPv6
Last Updated	2016-05-14T03:24:12Z
Notes	

Peering Policy Information

Peering Policy	<a href="http://he.net/peering.html">http://he.net/peering.html</a>
General Policy	Open
Multiple Locations	Preferred
Ratio Requirement	No
Contract Requirement	Not Required

Public Peering Exchange Points

Filter

Exchange ▼ ASN	IPv4 IPv6	Speed RS Peer
<a href="#">AMS-IX</a> 6939	80.249.209.150 2001:7f8:1::a500:6939:1	100G ○
<a href="#">AMS-IX BA</a> 6939	206.41.106.27 2001:504:3d:1:0:a500:6939:1	10G ○
<a href="#">AMS-IX Chicago</a> 6939	206.108.115.13 2001:504:38:1:0:a500:6939:1	100G ○
<a href="#">AMS-IX Hong Kong</a> 6939	103.247.139.6 2001:df0:296::a500:6939:1	10G ○
<a href="#">AMS-IX NY</a> 6939	206.126.240.27 2001:504:34:1:0:a500:6939:1	10G ○
<a href="#">B-IX</a> 6939	217.174.157.31 2001:7f8:8e::31	10G ○
<a href="#">BBIX Hong Kong / Singapore</a> 6939	103.231.152.51 2001:df5:b800:bb00::6939:2	10G ○
<a href="#">BBIX Hong Kong / Singapore</a> 6939	103.231.152.47 2001:df5:b800:bb00::6939:1	10G ○
<a href="#">BBIX Osaka</a> 6939	218.100.7.26 2001:de8:c:2::6939:1	10G ○
<a href="#">BBIX Tokyo</a> 6939	218.100.6.74 2001:de8:c::6939:1	10G ○
<a href="#">BCIX</a> 6939	193.178.185.34 2001:7f8:19:1::1b1b:1	10G ○
<a href="#">BIX.BG</a> 6939	193.169.198.70 2001:7f8:58::1b1b:0:1	10G ○
<a href="#">BREM-IX</a> 6939	185.1.35.13 2001:7f8:92::6939:0:1	10G ○
<a href="#">BIX</a> 6939	193.188.137.175 2001:7f8:35::6939:1	10G ○
<a href="#">BIX-AS</a> 6939	193.23.238.16 2001:7f8:35::6939:1	10G ○

Private Peering Facilities

Filter

Hurricane Electric - Massive Peering!



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# Peering Policies

- A peering policy is designed to define the minimum requirements for interconnection.
- Peering policies should be defined by a company's engineering, sales and managements teams.

\*Peering policies are different for every company and these are not a refection of the whole ecosystem.

# Types of peering policies

- Open
  - They will peer with everyone
  
- Selective
  - Network will peer with certain requirements
  
- Restrictive
  - Network will generally not peer

# Open peering policy

- Networks that are concerned with performance
- Networks that do not have a significant market share or have lower traffic volumes
- Networks that have traffic profiles that are very imbalanced

\* AS6939 is concerned with performance. The other two items do not apply to Hurricane Electric .

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# Selective peering policy

- Carrier networks that have traffic profiles that are imbalanced
- Networks that do not have an significant market share but with higher traffic volumes
- Networks that are most concerned with revenue

# Restrictive peering policy

- Networks that have close to monopolistic market share
- Networks that are most concerned with revenue than performance

# Peering Requests

- Know your network
  - Your traffic makes you interesting. It is not necessary to have eyeballs or transit customers.
  - What is unique about your traffic?
  - Where does your traffic come from and where does it go?
    - Netflow data is key!
  - Make a list of the top network destinations that you are exchanging traffic, and are not peering by traffic levels.

# Research your possible new peer

- Before the first contact find out the following:
  - What is their policy? Open / Closed / Restrictive
  - Check the [peeringdb.com](http://peeringdb.com)
  - Check the JPIX website and any other IXs that are reachable.
  - Does your target participate on the route-servers?
  - Make a list of the top networks that you are exchanging traffic that you are not peering by traffic levels.



# Restrictive Networks Peering Strategy

## ■ Have your data

- ❑ Being told “No” is ok.
- ❑ Positive take away is that they are talking with you!
- ❑ Don't be discouraged. It is not personal.
- ❑ Be respectful, courteous and polite.
- ❑ Timing is everything. You may catch the peer with a performance issue.
- ❑ Do not nag or pester.
- ❑ Try to build a personal relationship.
- ❑ Strive to have face to face meetings.
- ❑ Keep asking.
- ❑ It took me 6 years to get one peer!

# Example peering request email



Subject: AS13335 – AS6939 peering request @ JPIX

Hey Walt

I see that we are sending you traffic over our transit provider and it looks like it is around 3G of total traffic. (See the netflow data below) As you have an open peering policy we would like to add a session on the JPIX and we have enabled the session on our routers to save time. Let me know if this works for you.

Here are our details:

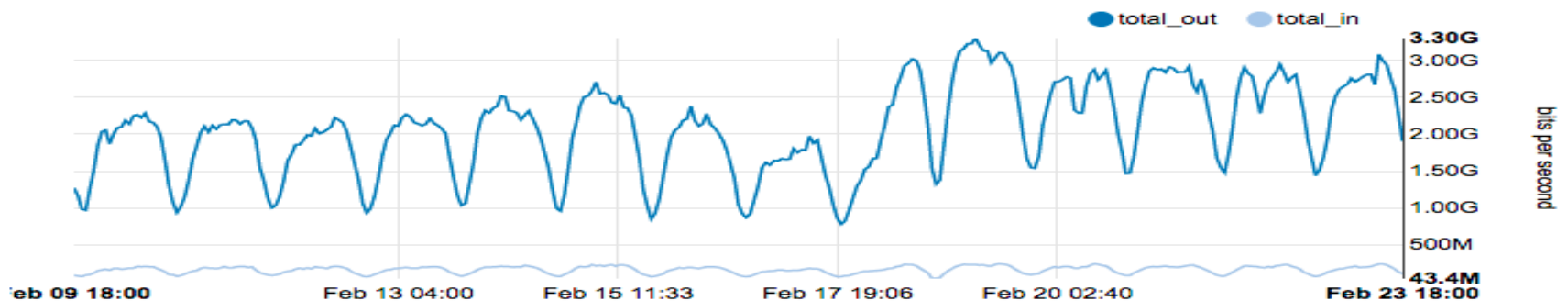
AS13335

210.171.224.134

2001:de8:8::1:3335:1

With Thanks

Tom Paseka



Subject: AS13335 – AS6939 peering request @ JPIX <https://translate.google.com>

ちょっとウォルト

我々はトランジットプロバイダーの上にあなたのトラフィックを送信していることを私は見て、それが総トラフィックの3Gの周りにあるように見えます。あなたは私たちがJPIXにセッションを追加したいのオープンピアリングポリシーを持って、私たちは時間を節約するために私たちのルータ上でセッションを有効にしているように(下のNetFlowデータを参照してください)。これはあなたのために働くなら、私に教えてください。

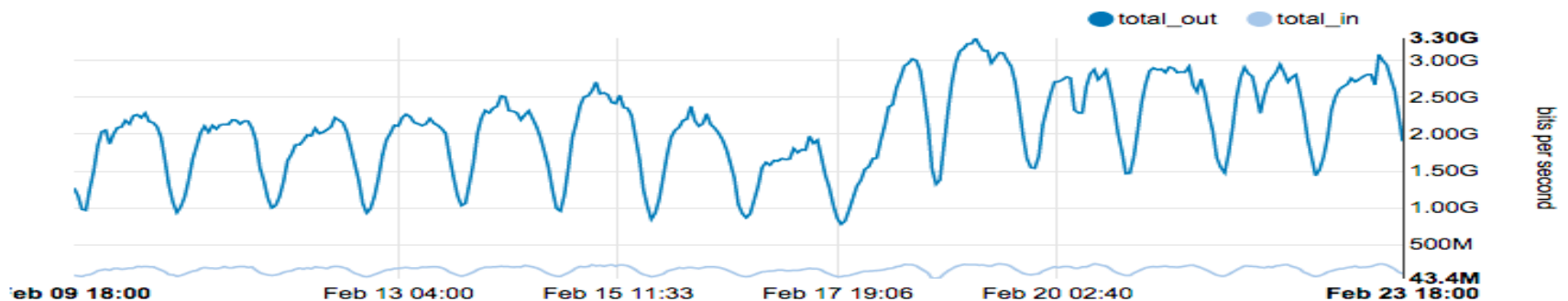
ここに私たちの詳細は、次のとおりです。

AS13335

210.171.224.134

2001:de8:8::1:3335:1

おかげ付き



# Key Meetings

- JANOG ([Japan Network Operators Group](#))
- Local IX meetings (JPIX, JPNAP, BBIX, ETC... )
- APF ([Equinix Asia Peering Forum](#))
- ACC ([Asian Carriers Conference](#))
- NANOG ([North American Network Operators' Group](#))
- PTC ([Pacific Telecommunications Council](#))
- APRICOT ([Asia Pacific Regional Internet Conference on Operational Technologies](#))

The more global your network the more meetings you should attend

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# Summary

- Dedicate a person(s) to interconnection strategy.
- Create a peering strategy that fits your network.
- Attend local and regional meetings.
- Join [peeringdb.com](http://peeringdb.com)
- Know as much about your target network as you can.
- Send the right people to the right meetings.
- As a friend reminded me in that in the end, it's all performance, dollars and sense.

# Hurricane Electric Peering

- ❑ Open Peering Policy
- ❑ <http://AS6939.peeringdb.com>
- ❑ Now on 134 IXs globally
- ❑ Over 5,400 unique peers!
- ❑ First network in the world to pass 5,000 peers
  
- ❑ **FREE** IPv6 certification (<http://ipv6.he.net/certification/>)
- ❑ **FREE** IPv6 Transit

# Questions?

Walt Wollny, Director Interconnection Strategy  
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walt@he.net