HURRICANE ELECTRIC
INTERNET SERVICES

Peering 101

July 2016 – JPIX
Tokyo Japan

Walt Wollny, Director Interconnection Strategy
Hurricane Electric AS6939

Who is Walt Wollny?

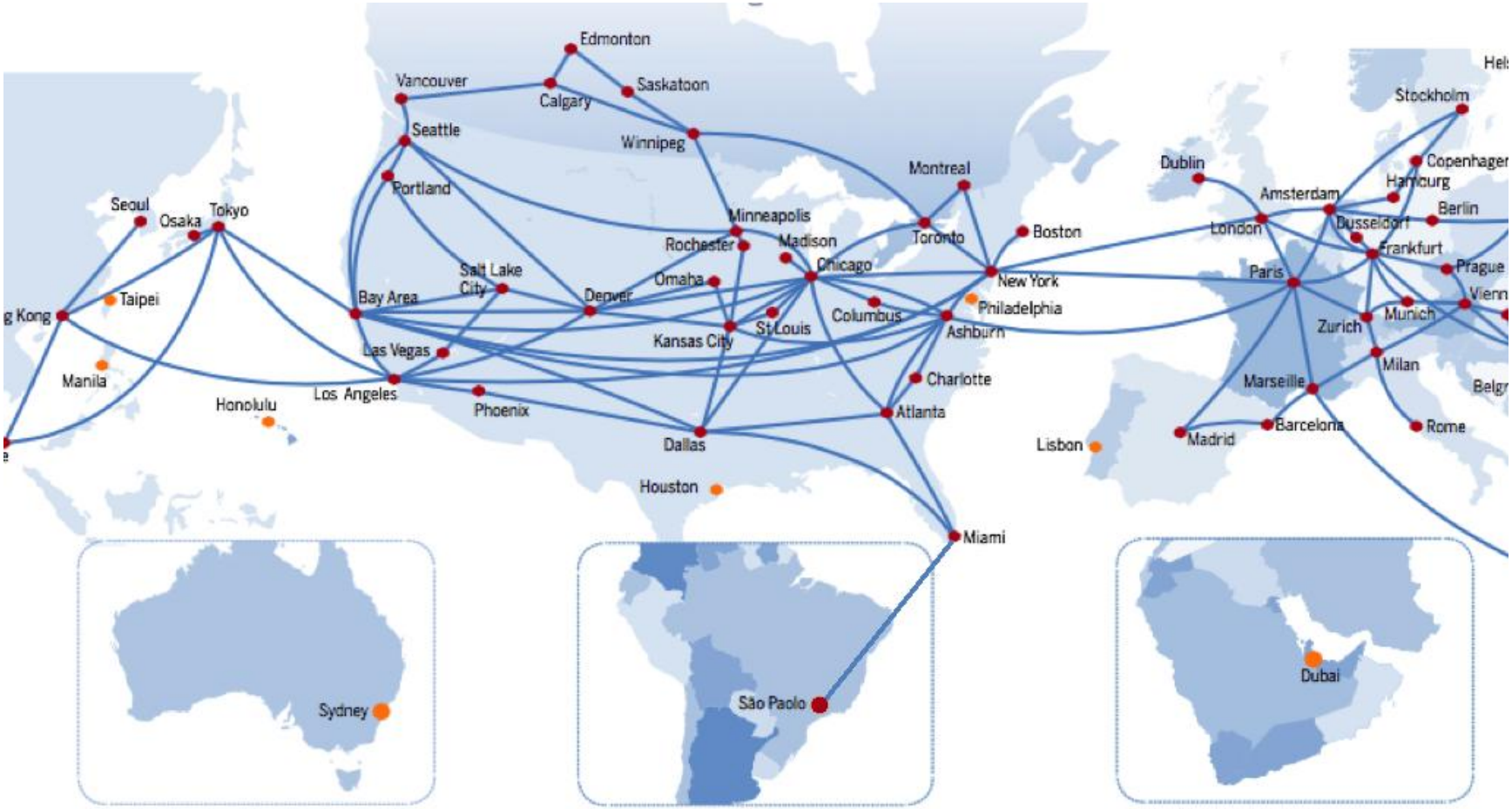
- Hurricane Electric AS6939 – 2 years
  - Director Interconnection Strategy – supporting the network to reach to over 33 counties and over 135 Internet Exchanges. Focus on Global connectivity.
- Amazon AS16509 – 4 years
  - Developed IP Transit and Peering on five continents.
  - Primary focus on Japan,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

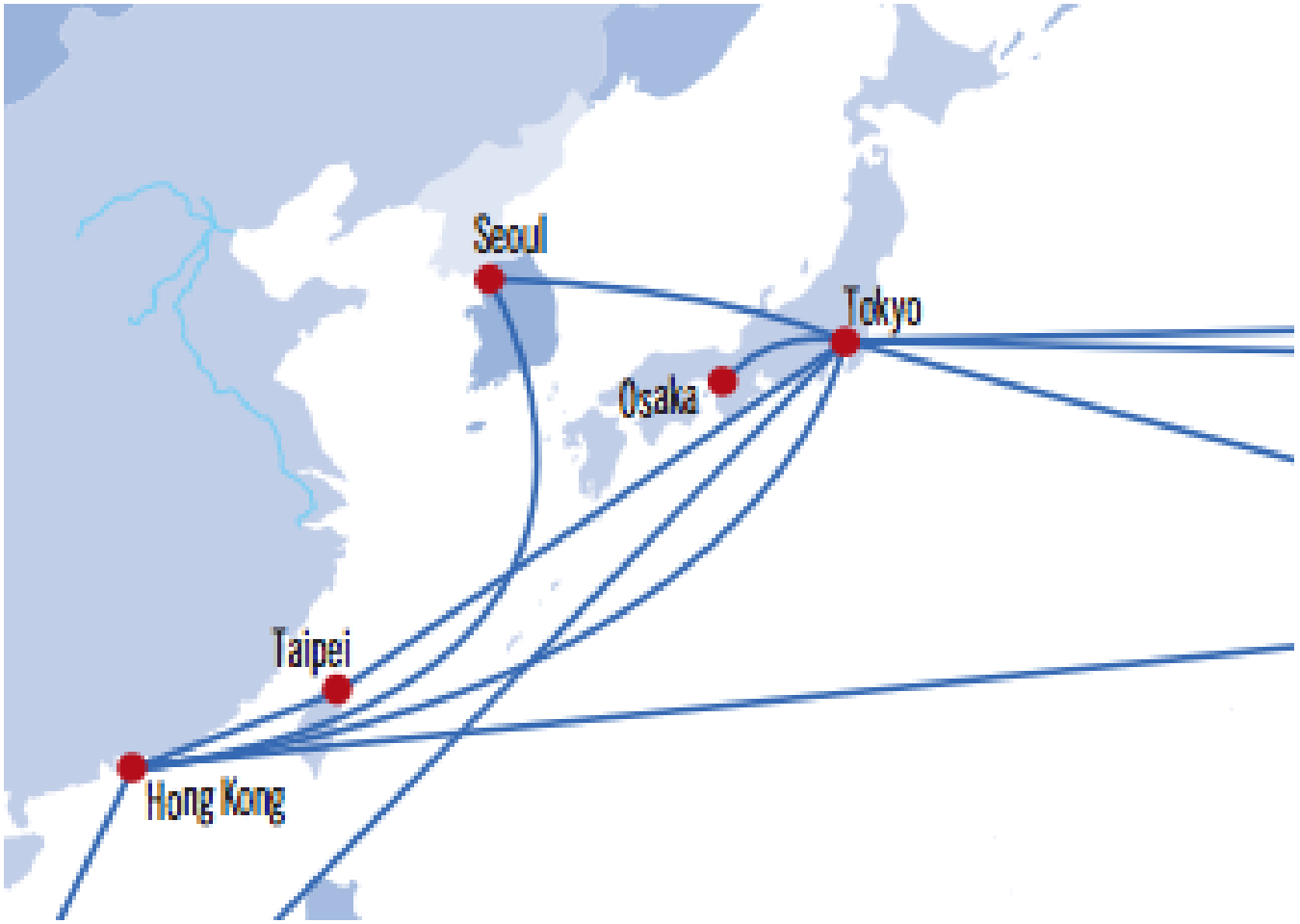
Agenda

- 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.

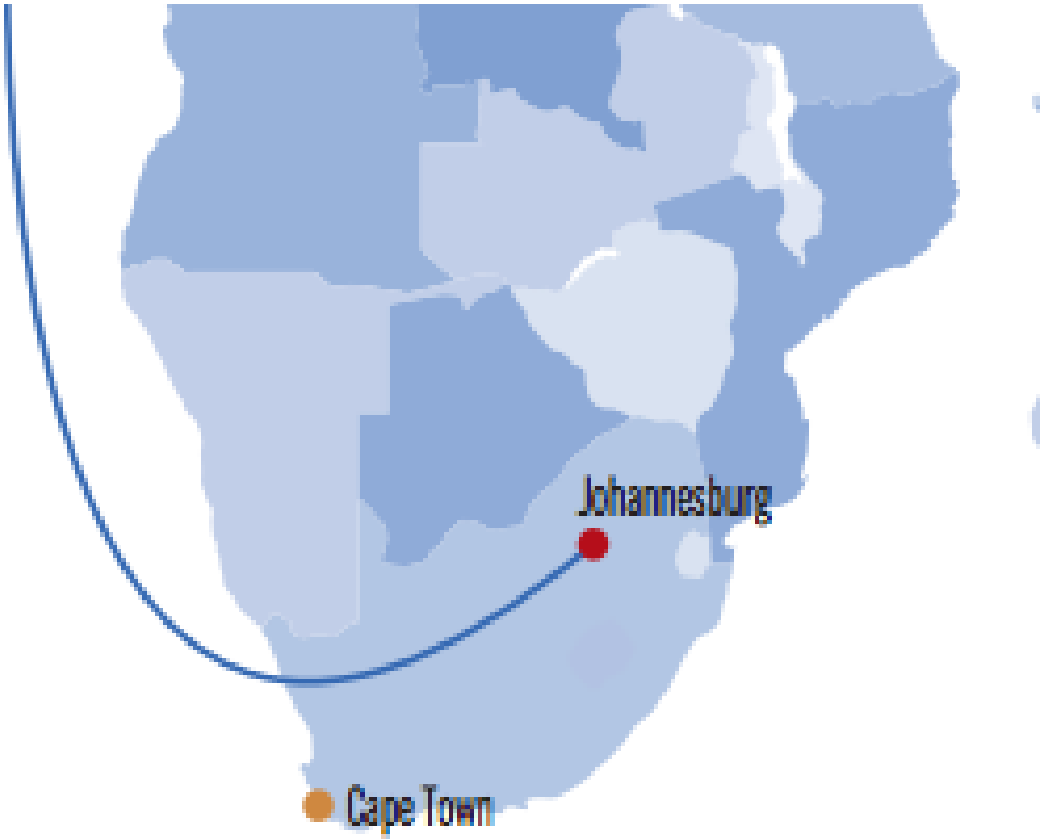
Hurricane Electric Network



Network updates APAC



Network updates Africa



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

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

Interconnection Manager job description

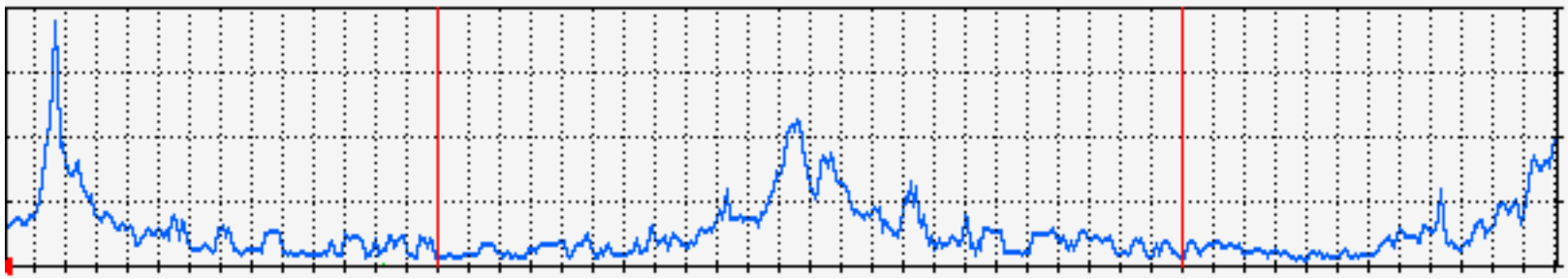
- http://www.verizon.com/about/work/jobs/4103246-interconnections-strategy-manager-asia

Typical Day for an Interconnection Manager

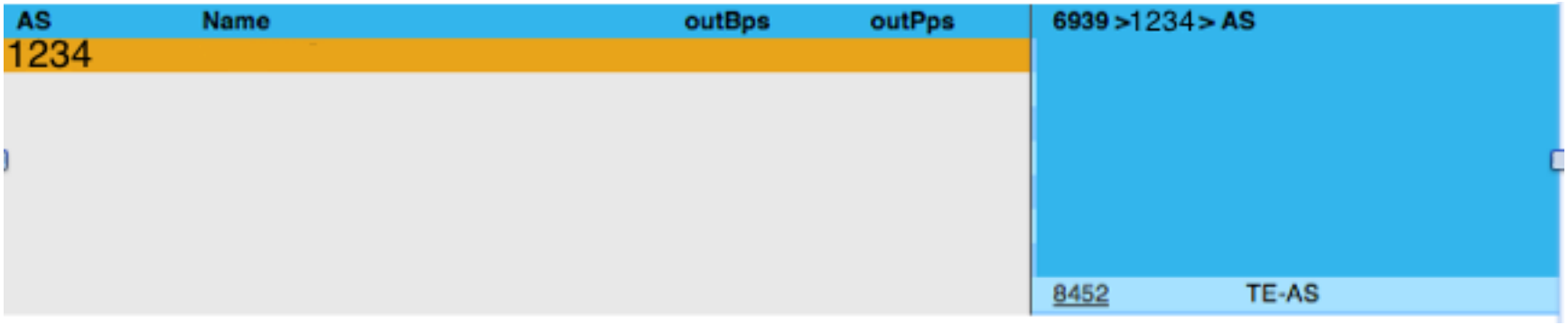
- Reviewing peers and performance
  - Know your network
  - Performance Tuning
  - New peering on existing exchanges
- New market research
- Contract reviews
- New peering opportunities

Know Your Network

- Reviewing peering and performance ….



Performance Tuning



It is important to review netflow data to know your network

Performance Tuning

HURRICANE ELECTRIC INTERNET SERVICES
Peering Monitor

AS8452: TE-AS

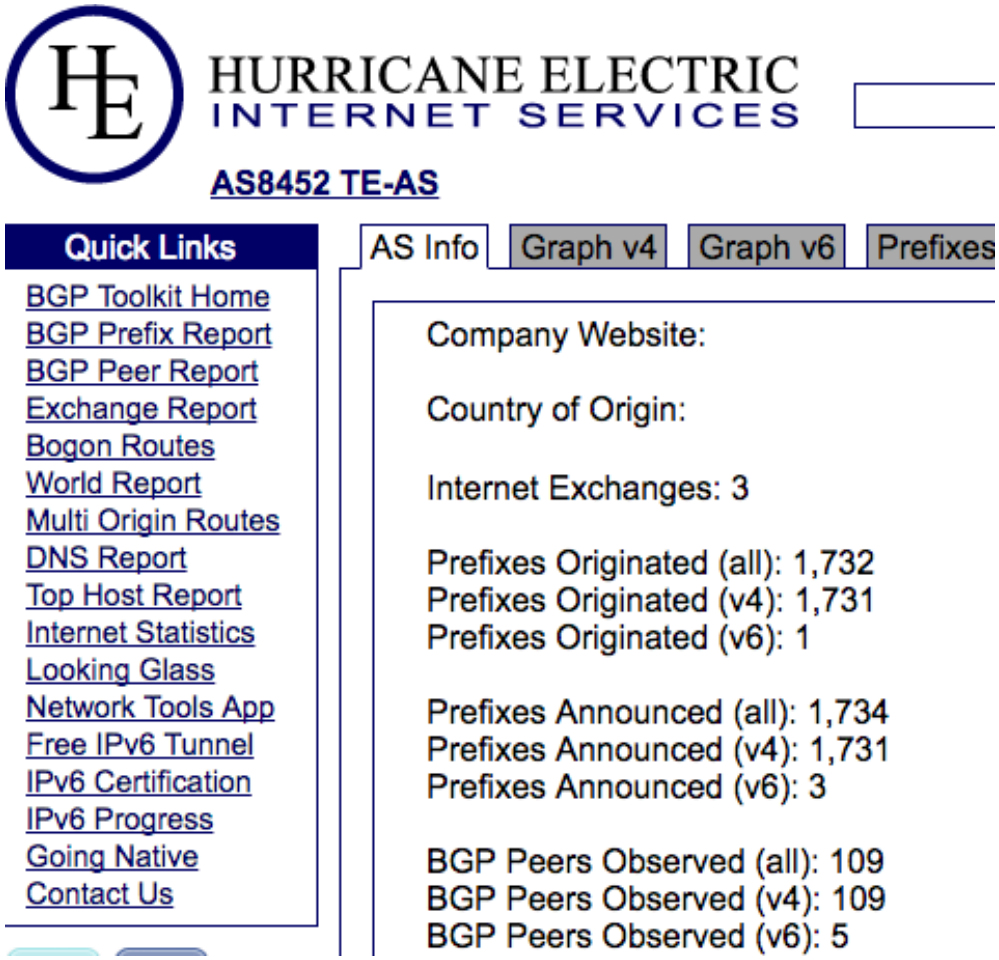
TE-AS

6 Possible Sessions for 2016/6/28

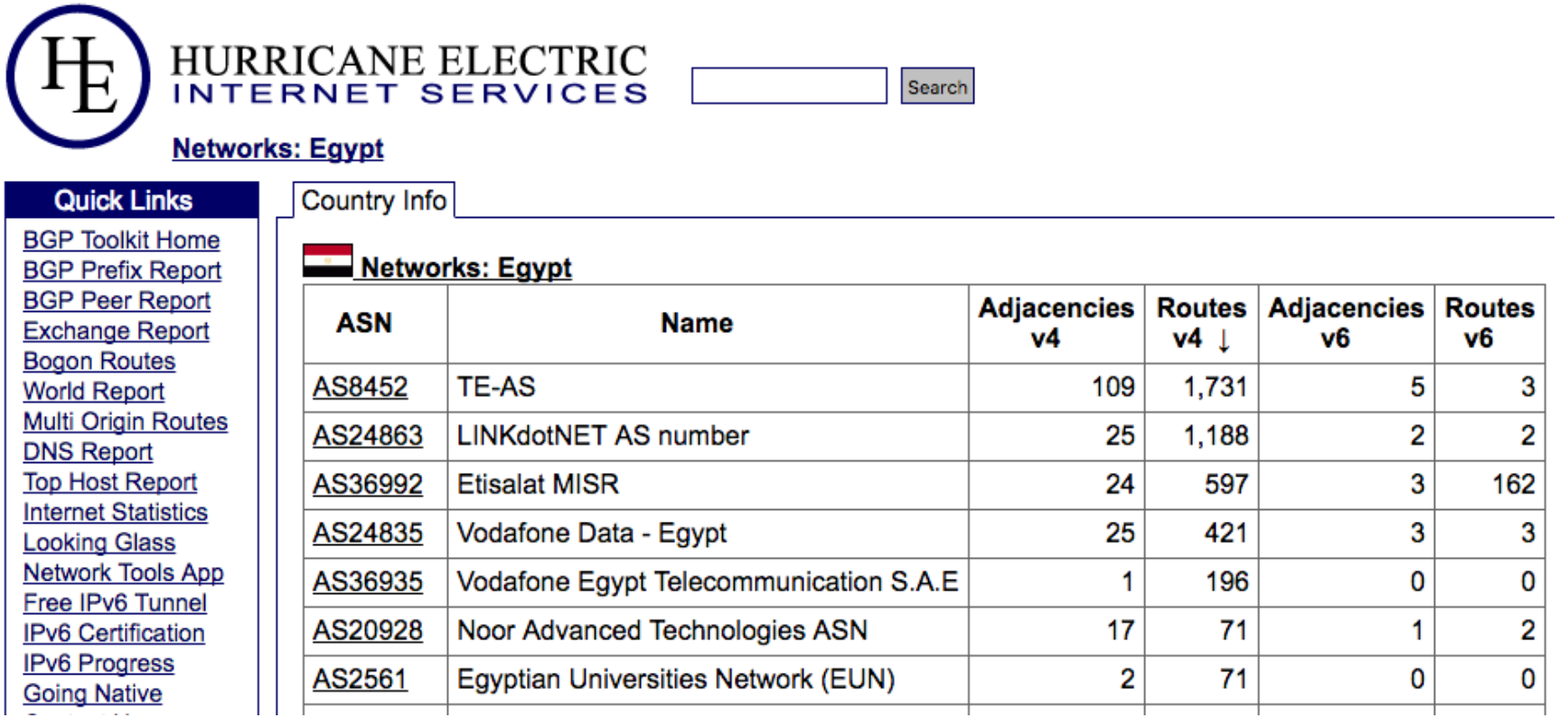
AS	Status	Neighbor	Exchange	Name	Up/Down	State	Group	RcvdRts	SentRts
8452	AT_EXCHANGE	2001:7f8::2104:0:1	DE-CIX Frankfurt	**TE-AS**	14w1d	-	-	-	-
8452	AT_EXCHANGE	2001:7f8::2104:0:2	DE-CIX Frankfurt	**TE-AS**	14w1d	-	-	-	-
8452	AT_EXCHANGE	80.81.193.140	DE-CIX Frankfurt	**TE-AS**	264w2d	-	-	-	-
8452	AT_EXCHANGE	80.81.193.245	DE-CIX Frankfurt	**TE-AS**	77w15h	-	-	-	-
8452	AT_EXCHANGE	195.66.226.105	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



Performance Tuning – Digging deeper



HURRICANE ELECTRIC INTERNET SERVICES

Search

Networks: Egypt

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

Country Info

Networks: Egypt

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

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

HURRICANE ELECTRIC
INTERNET SERVICES
Peering Monitor

Search Options

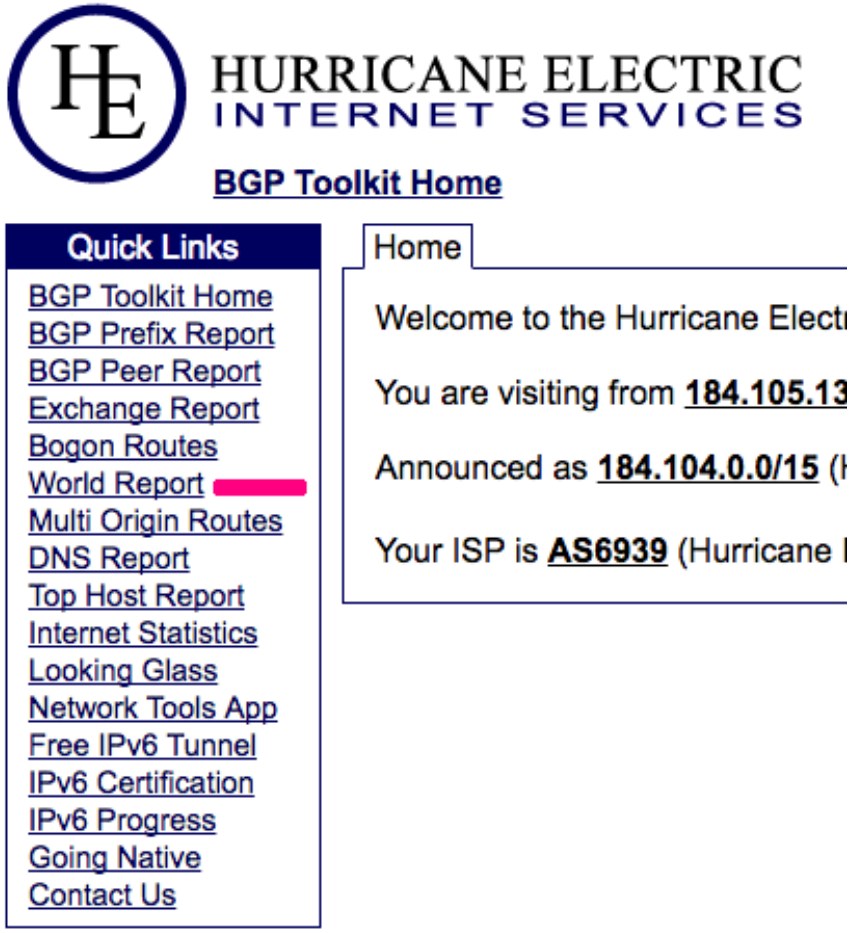
Search Entire Network	Sessions by Exchange	Sessions by Router	Sessions
	JPIX Tokyo		

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?



http://bgp.he.net/country/PH

Country Info

Networks: Philippines

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

Exchange Points & Facilities

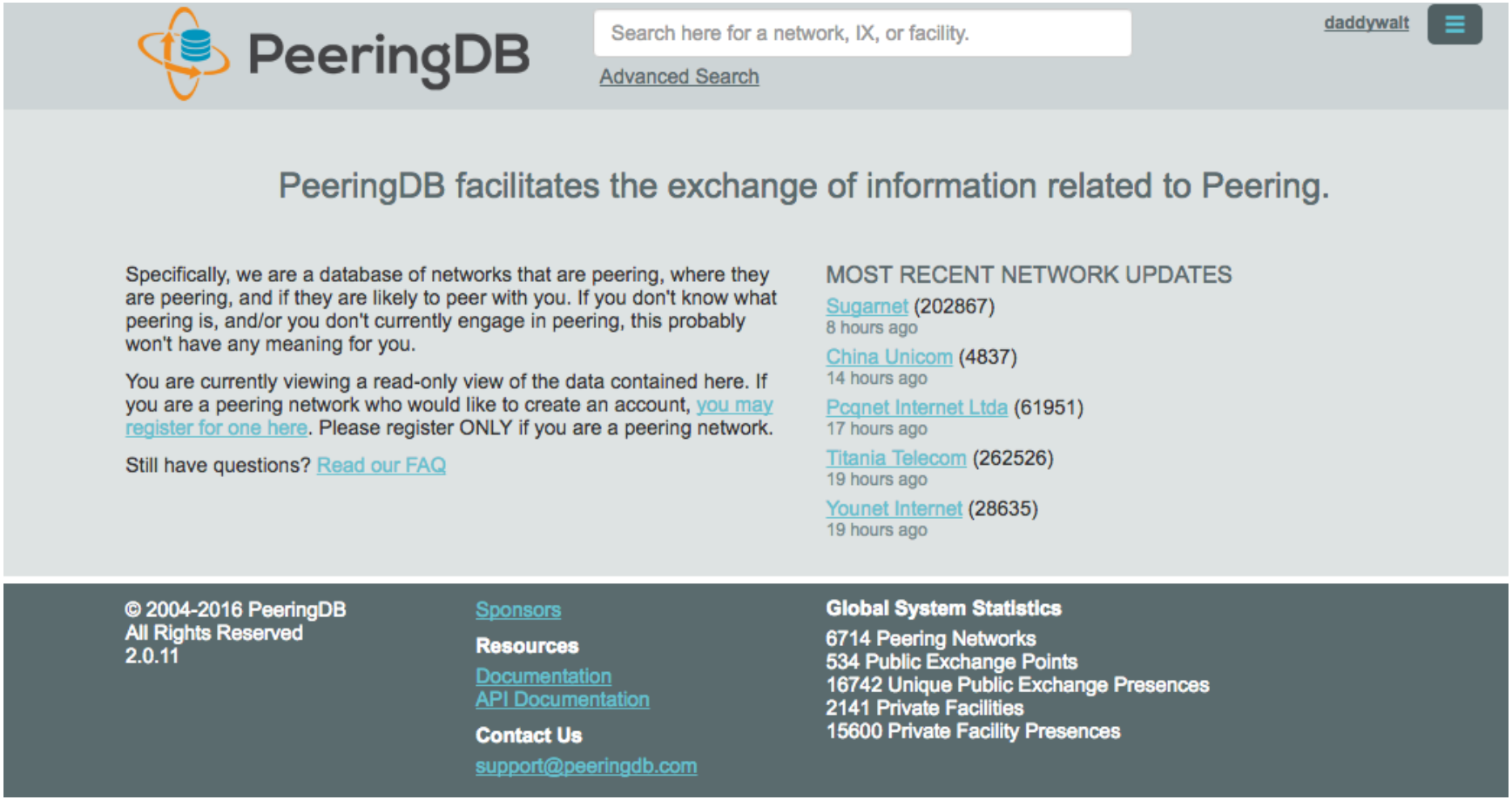
List of Public Exchange Points

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

List of Interconnection Facilities

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

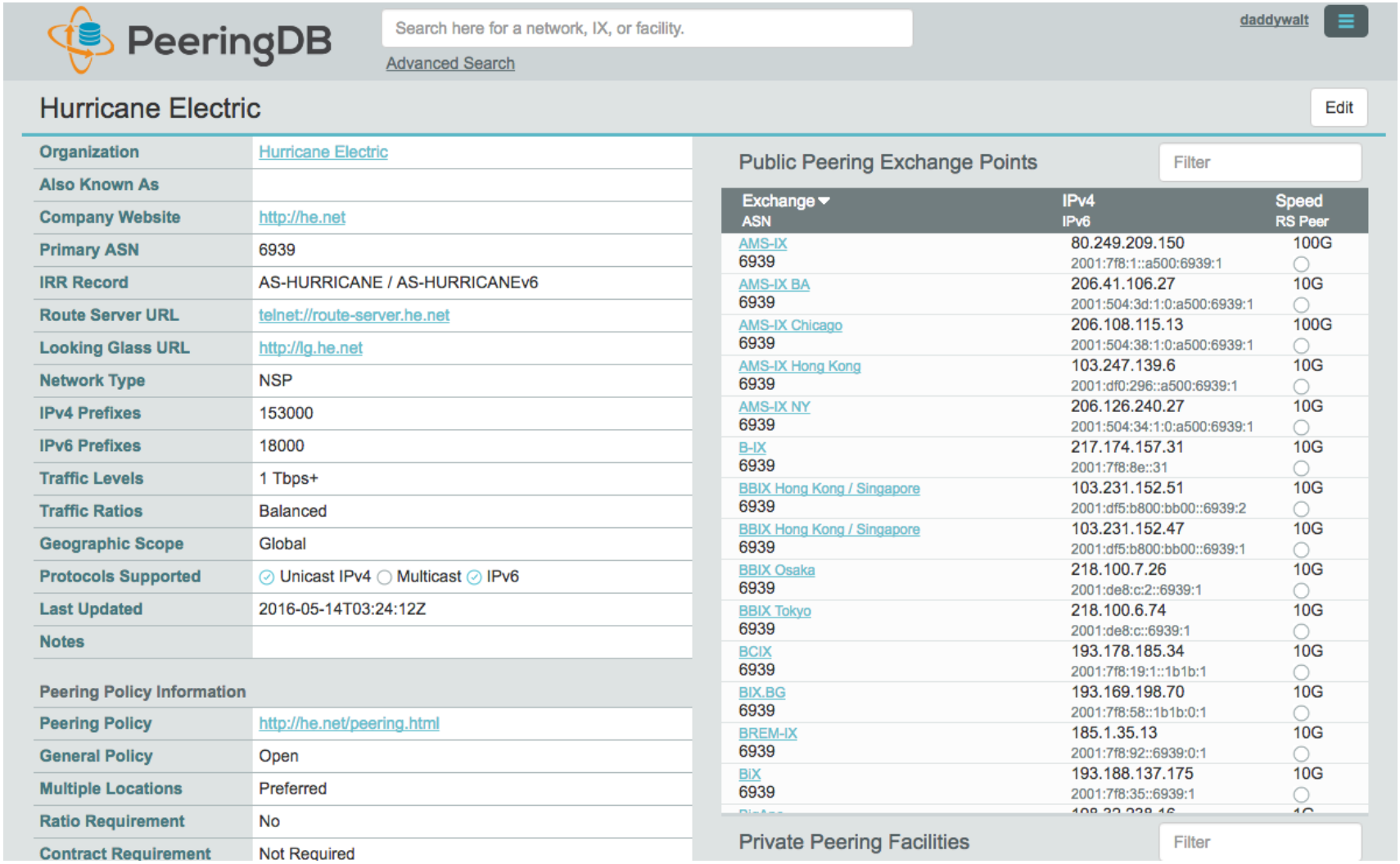
peeringdb.com



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?



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 an 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 .

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 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 networks 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
  - 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

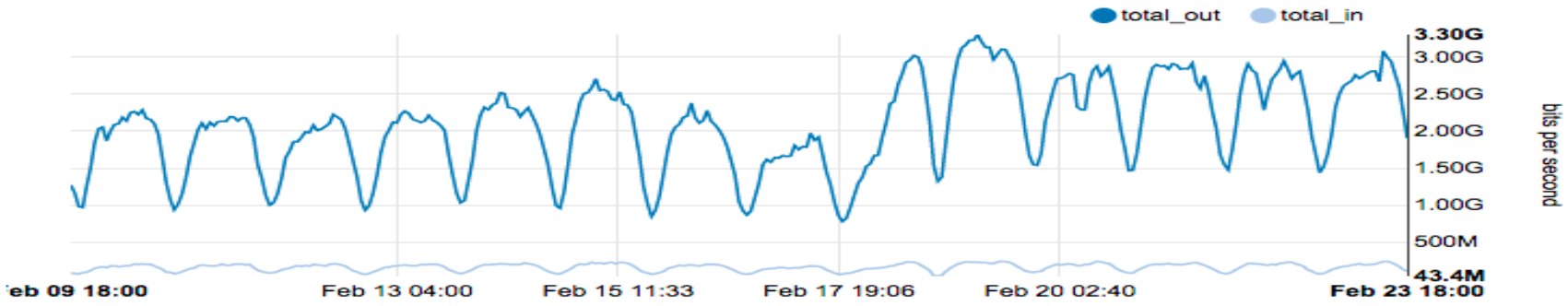
Subject: AS13335 – AS6939 peering request @ JPIX

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



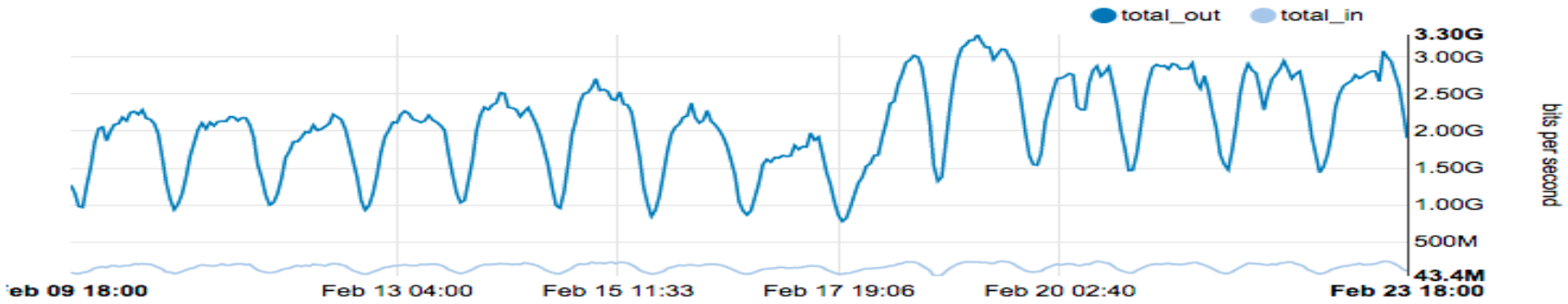
Subject: AS13335 – AS6939 peering request @ JPIX https://translate.google.com

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

Summary

- Dedicate a person(s) to interconnection strategy.
- Create a peering strategy that fits your network.
- Attend local and regional meetings.
- Join 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

HURRICANE ELECTRIC
INTERNET SERVICES

Questions?

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