
Peering 101

October 2017 – MyIX MyNOG 2017
Kuala Lumpur, Malaysia

Douglas Wilson, Sr. Network Engineer
Hurricane Electric AS6939

Who is Douglas Wilson?

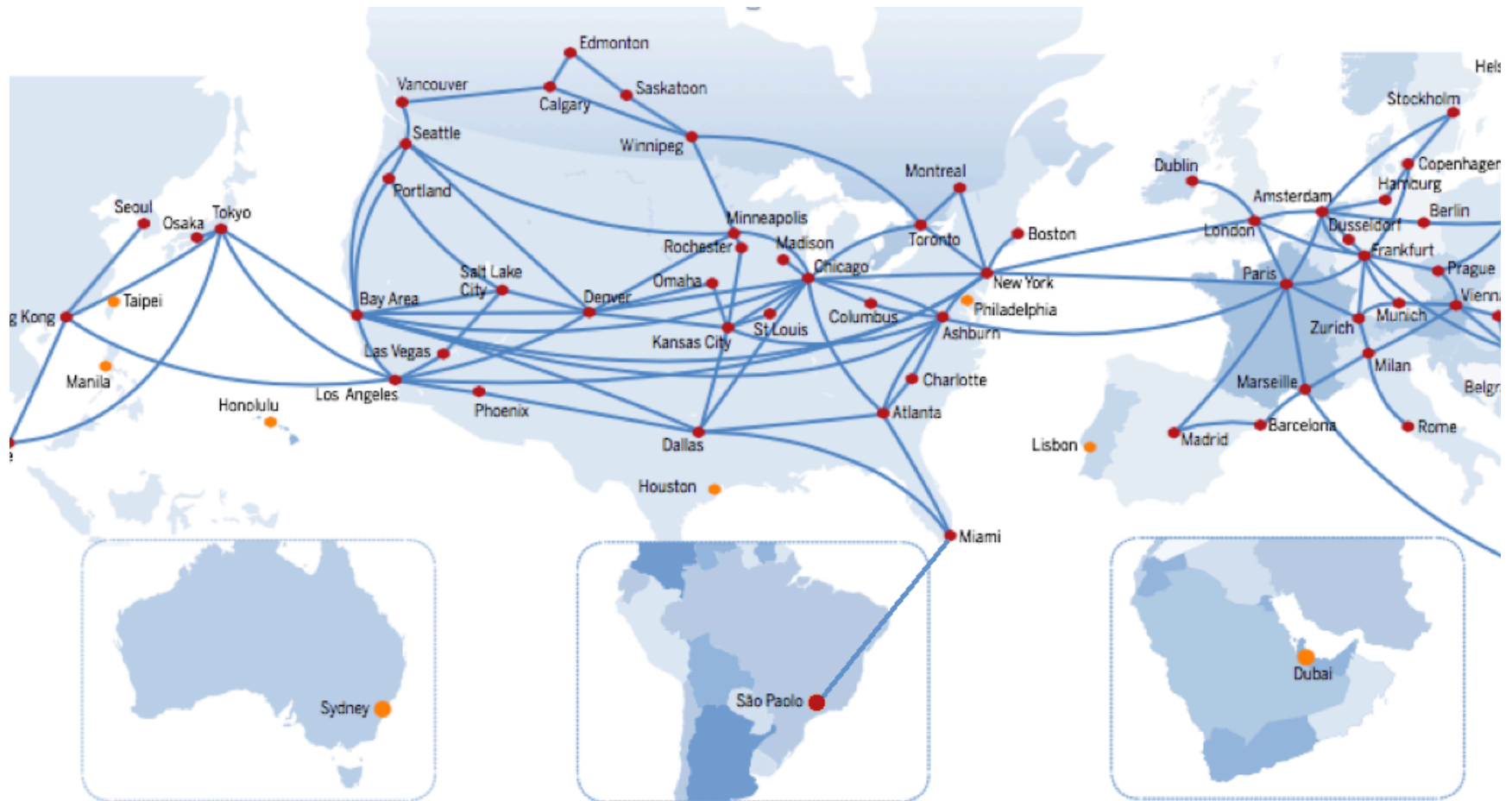
- ❑ Hurricane Electric AS6939 – 1.5 years
 - ❑ – supporting the network to reach to over 34 counties and over 168 Internet Exchanges. Focus on making it better.
- ❑ Nexusguard AS6500 – 1 year
 - ❑ DDOS mitigation USA startup.
- ❑ Layer42 AS8121 – 3 years
- ❑ Yahoo AS10310 – 2 years (10 different AS#)
- ❑ Microsoft AS8075 – 10 years (10 different AS#)
- ❑ XO AS2828 – 3 years (8 different AS#)

20+ years of internet experience

Agenda

- ❑ Hurricane Electric network update.
- ❑ What is the goal?
- ❑ 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



Hurricane Electric - Massive Peering!



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 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>



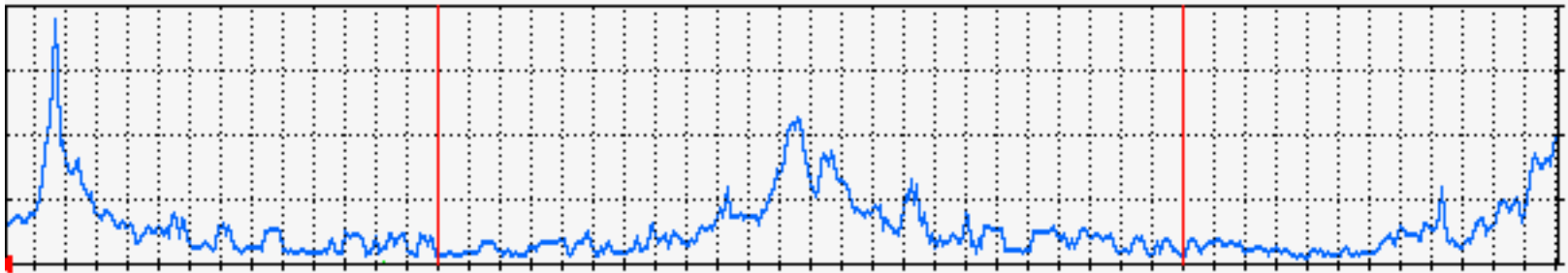
Typical Day for an Interconnection Manager

- 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

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	2001:7f8::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	195.68.226.105	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 AS8462
* This is an example only and not a reflection of an actual peer



Performance Tuning – Digging deeper



HURRICANE ELECTRIC
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](#)
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[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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INTERNET SERVICES

Search

Networks: Egypt

Quick Links

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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 - Equinix Singapore



Search Options

Search Entire Network

Sessions by Exchange

Sessions by Router

Sessions

Equinix Singapore

410 Possible Sessions for 2016/8/8

Status	Exchange	Up/Down	State	RcvdRts	SentRts	DndRts	Neighbor	Group
AT_EXCHANGE	Equinix Singapore	141w5d	-	-	-	-	2001:de8:4::109:1	-
AT_EXCHANGE	Equinix Singapore	268w2d	-	-	-	-	2001:de8:4::703:1	-
AT_EXCHANGE	Equinix Singapore	38w6d	-	-	-	-	2001:de8:4::1273:1	-
AT_EXCHANGE	Equinix Singapore	36w6d	-	-	-	-	2001:de8:4::2906:1	-
AT_EXCHANGE	Equinix Singapore	36w6d	-	-	-	-	2001:de8:4::2906:2	-
AT_EXCHANGE	Equinix Singapore	209w3d	-	-	-	-	2001:de8:4::3491:1	-
AT_EXCHANGE	Equinix Singapore	24w6d	-	-	-	-	27.111.228.28	-
AT_EXCHANGE	Equinix Singapore	-	-	-	-	-	27.111.228.47	-



New Market Research (Philippines)



Who are the top ISPs?



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BGP Toolkit Home

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Home

Welcome to the Hurricane Electric

You are visiting from **184.105.13**


Announced as **184.104.0.0/15** (f

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
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



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

[Sugamet](#) (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



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 difficulty for anyone looking to peer with you.

What is peeringdb.com?

The screenshot displays the PeeringDB interface for Hurricane Electric. The top navigation bar includes the PeeringDB logo, a search bar with the text "Search here for a network, IX, or facility.", and a user profile for "daddywalt". Below the navigation bar, the organization name "Hurricane Electric" is prominently displayed with an "Edit" button. The main content is divided into two sections: organization details on the left and a list of public peering exchange points on the right.

Organization Details:

Organization	Hurricane Electric
Also Known As	
Company Website	http://he.net
Primary ASN	6939
IRR Record	AS-HURRICANE / AS-HURRICANEv6
Route Server URL	telnet://route-server.he.net
Looking Glass URL	http://lg.he.net
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	http://he.net/peering.html
General Policy	Open
Multiple Locations	Preferred
Ratio Requirement	No
Contract Requirement	Not Required

Public Peering Exchange Points:

Exchange ASN	IPv4 IPv6	Speed RS Peer
AMS-IX 6939	80.249.209.150 2001:7f8:1::a500:6939:1	100G ○
AMS-IX BA 6939	206.41.106.27 2001:504:3d:1:0:a500:6939:1	10G ○
AMS-IX Chicago 6939	206.108.115.13 2001:504:38:1:0:a500:6939:1	100G ○
AMS-IX Hong Kong 6939	103.247.139.6 2001:df0:296::a500:6939:1	10G ○
AMS-IX NY 6939	206.126.240.27 2001:504:34:1:0:a500:6939:1	10G ○
B-IX 6939	217.174.157.31 2001:7f8:8e::31	10G ○
BBIX Hong Kong / Singapore 6939	103.231.152.51 2001:df5:b800:bb00::6939:2	10G ○
BBIX Hong Kong / Singapore 6939	103.231.152.47 2001:df5:b800:bb00::6939:1	10G ○
BBIX Osaka 6939	218.100.7.26 2001:de8:c:2::6939:1	10G ○
BBIX Tokyo 6939	218.100.6.74 2001:de8:c::6939:1	10G ○
BCIX 6939	193.178.185.34 2001:7f8:19:1::1b1b:1	10G ○
BIX.BG 6939	193.169.198.70 2001:7f8:58::1b1b:0:1	10G ○
BREM-IX 6939	185.1.35.13 2001:7f8:92::6939:0:1	10G ○
BIX 6939	193.188.137.175 2001:7f8:35::6939:1	10G ○
BIX-ATL 6939	193.22.228.16 2001:7f8:35::6939:1	10G ○

Private Peering Facilities:

Facility	Filter
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Hurricane Electric - Massive Peering!



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 .

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 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 Exchange Point 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

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:

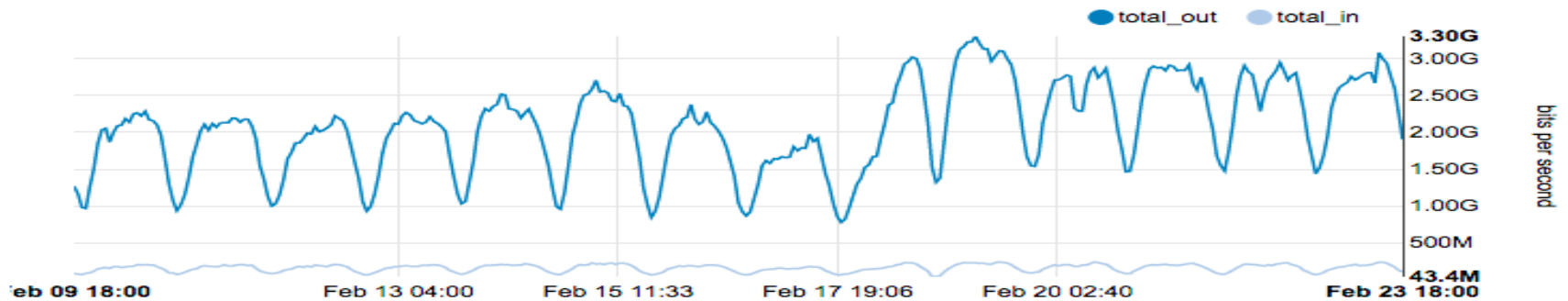
AS13335

210.171.224.134

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

With Thanks

Tom Paseka



Subject: AS13335 – AS6939 peering request <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を見て、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。

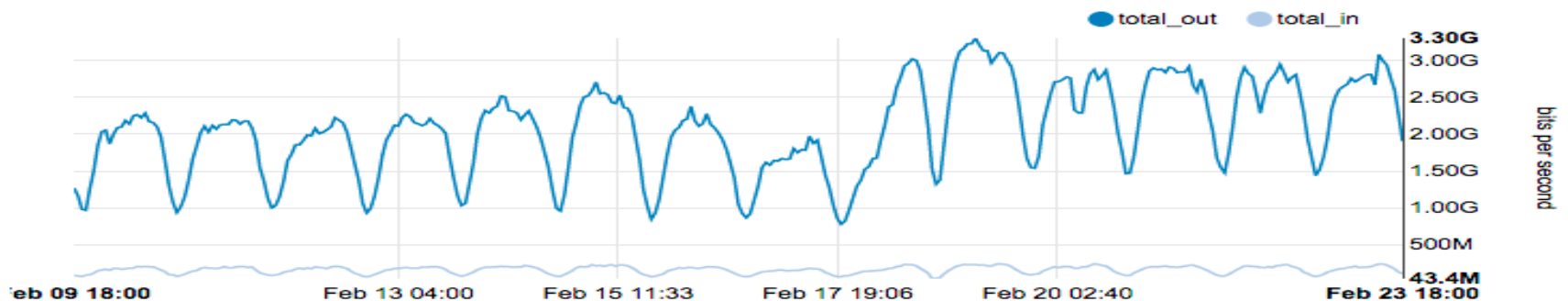
AS13335

210.171.224.134

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

おかげ付き

Tom Doolan



<https://translate.google.com>

- Translating sites do not work well.
- Have a friend or the IX operator draft an email on your behalf.

Key Meetings

- JANOG ([JApn 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.

References

- <http://www.cu.ipv6tf.org/lacnic12/PeeringCoordinator-lacnic-3.pdf>

Questions?

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