HURRICANE ELECTRIC
INTERNET SERVICES

150 Internet Exchange Points
And Beyond!

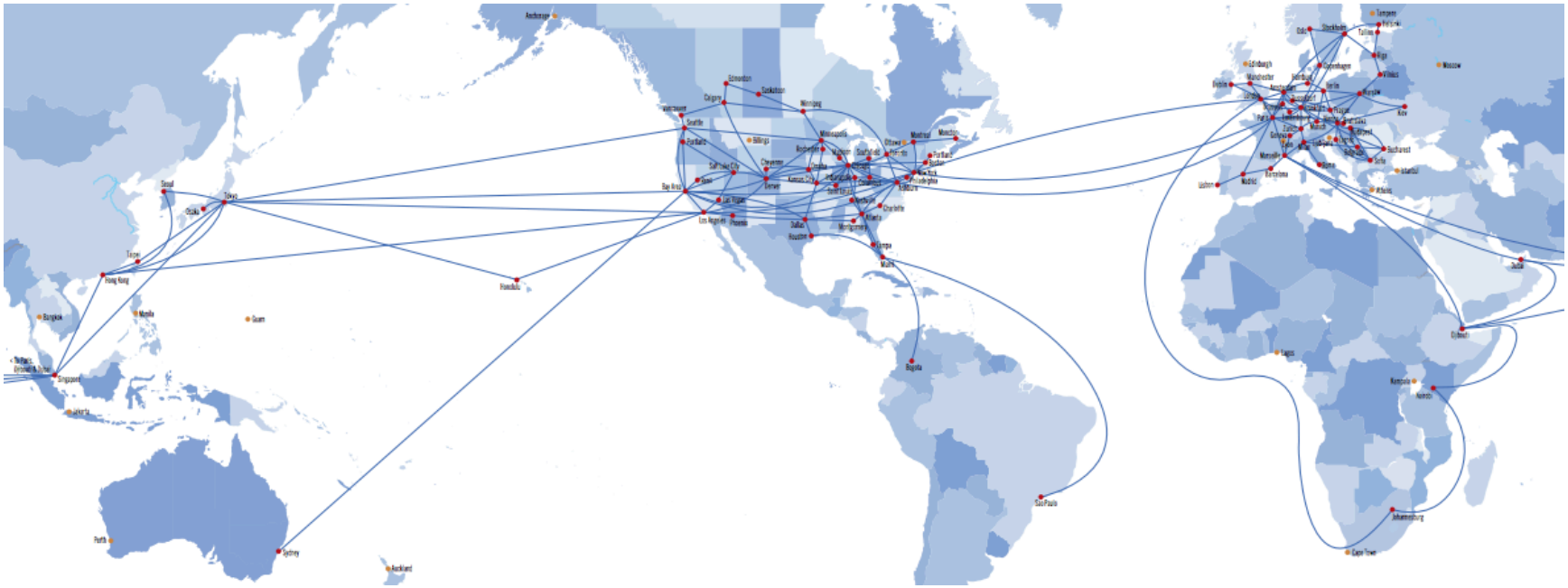
CEE Peering Days
Berlin, Germany

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 44 counties and over 180 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.

Hurricane Electric Network



Why so many Exchanges?

Expansion is the Answer!

January 2015

90	Internet exchanges	
IPv4	3,644 unique adjacencies	
IPv6	2,475 unique adjacencies	

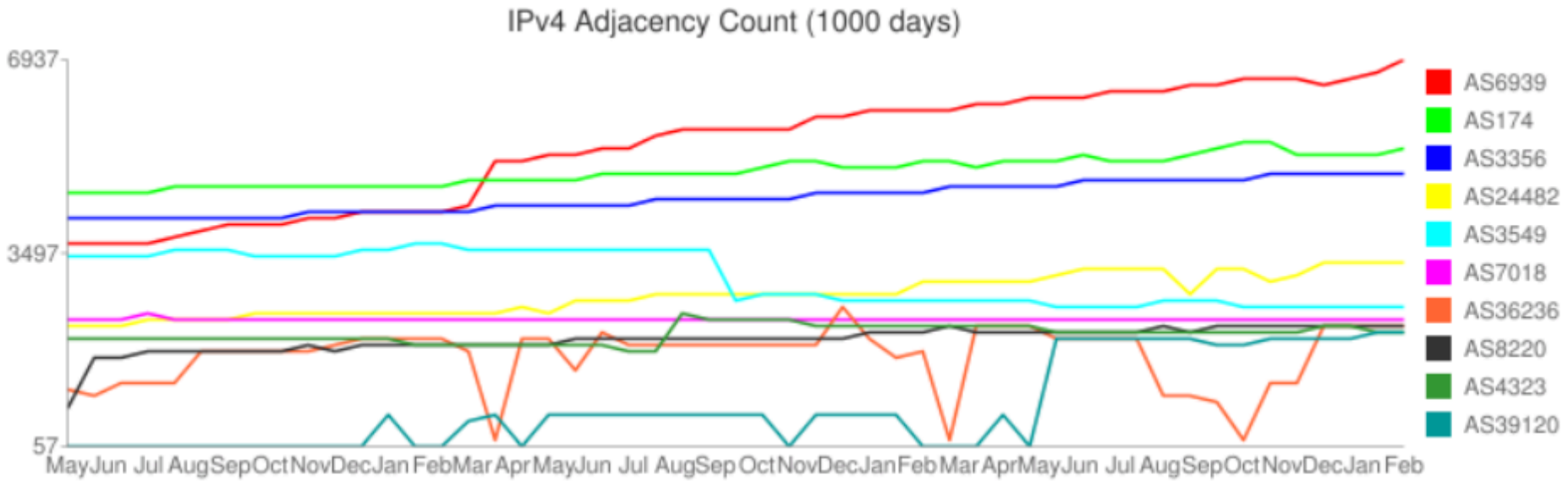
January 2018

179	Internet exchanges	99% increase
IPv4	6,896 unique adjacencies	89% increase
IPv6	4,183 unique adjacencies	69% increase

https://bgp.he.net/report/peers

IPv4 Adjacencies		
ASN	**Name**	**Count**
AS6939	Hurricane Electric, Inc.	6,893
AS174	Cogent Communications	5,367
AS3356	Level 3 Communications, Inc.	4,961
AS24482	SG.GS	3,369
AS3549	Level 3 Communications, Inc. (GBLX)	2,545
AS7018	AT&T Services, Inc.	2,370
AS36236	NetActuate, Inc	2,274
AS8220	COLT Technology Services Group Limited	2,240
AS4323	tw telecom holdings, inc.	2,175
AS39120	Convergenze S.p.A.	2,144

https://bgp.he.net/report/peers#_adjacencyhistory



Hurricane Electric

I’m here to share with you the following:

- What Hurricane Electric looks for in a new IX
- How IX operators can attract more members

What we look for in a new IX

- Unique ASN adjacencies opportunities
- New countries
- Customer request

- Does it make financial business sense?
- Cost of long-haul circuits
- Datacenter cost
- Dark fiber/metro and cross connect cost
- Local import issues, taxes, ETC…
- Internet exchange cost

Benefits

- When Hurricane Electric connects to a new exchange, we are trying to achieve these goals:
  - Reduce average per-bit delivery cost
  - Increase supply of bandwidth to keep up with growing demand
  - Improve quality: reduce loss, latency, out-of-order delivery and jitter
  - Meet and connect new potential customers

New exchanges in the next 90 days

- MSK-IX Moscow 303 unique adjacencies
- MyIX Kuala Lumpur 95 unique adjacencies
- RVA-IX Richmond VA 3 unique adjacencies

- Total new 401 unique adjacencies

Possible new locations 2018 - 2019

- Bangkok
- Manila
- Guam
- Athens
- Istanbul
- Mumbai
- Perth
- Kuala Lumpur

And several others

http://www.he.net/HurricaneElectricNetworkMap.pdf

This is updated frequently with locations of interest

How IX operators can attract more members

If we don’t know about you, how can we connect!

Tell the world about your exchange!

PeeringDB

PCH

TeleGeography

WIKIPEDIA
The Free Encyclopedia

IXPDB

Tell the world about your exchange!

- pch.net/ixp/dir
- peeringdb.com
- en.wikipedia.org/wiki/List_of_Internet_exchange_points
- www.internetexchangemap.com
- www.ixpdb.net (www.euro-ix.net/ixpdb)

Get Your Exchange Listed Publicly

You put extensive effort into starting and running your exchange:

- Talk to network operators and recruit the members.
- Negotiate with data center operators for space to install exchange.
- Obtain, deploy and maintain hardware for the exchange.
- Prompt ongoing communication between your participants.

Taking the last step, publicizing your exchange, maximizes its value both to current participants and future members.

Your IX members page

List participants on your website including:

- ASN
- IPv4 and IPv6 addresses
- Peering and NOC contact details
- Peering policy

Why List Participants?

Current and prospective participants need this information to add peering sessions, increase peered traffic, and for the IX to grow revenue.

Network operators continuously evaluate additional IXPs for potential expansion opportunities. To make this determination they need participant AS numbers and, ideally, to see what prefixes those peers advertise to a route-server at the exchange.

Example: Seattle IX (SIX) Members Page https://www.seattleix.net/participants.htm

206.81.80.10/23	Altopia Corporation	6456	noc@alt.net
206.81.80.11/23	RealNetworks, Inc.	11922	nso@real.com
206.81.80.12/23	NuclearFallout Enterprises, Inc.	32751	noc@nfoe.net
206.81.80.13/23	Beyond the Network (PCCW)	3491	peering@pccwglobal.com
206.81.80.14/23	Mouat's Technology Services, Inc.	3601	peering@mouats.com
206.81.80.16/23	Semaphore Corporation	3742	noc@semaphore.com
206.81.80.17/23	Google	15169	peering@google.com
206.81.80.18/23	Cortland Electronics Corporation	4319	peering@cortland.com
206.81.80.19/23	Zayo (was AboveNet)	6461	peering@zayo.com
206.81.80.20/23	TierPoint Spokane	30340	peering@tierpoint.com
206.81.80.21/23	Metapeer, Inc.	13331	noc@metapeer.com
206.81.80.23/23	RGnet/PSGnet	3130	peering@rg.net
206.81.80.27/23	In2net Network	26753	noc@in2net.com
206.81.80.28/23	Threshold Communications, Inc.	7752	noc@thresholdcommunications.com
206.81.80.29/23	Zillow.com	18888	noc@zillow.com
206.81.80.34/23	Connect Northwest Internet Services	10557	noc@cnw.com
206.81.80.37/23	Wowrack.com	23033	noc@wowrack.com
206.81.80.38/23	Peer 1 Network	13768	peering@peer1.net
206.81.80.40/23	Hurricane Electric	6939	peering@he.net

JSON API

Many exchanges are starting to publish a list of their members in JSON format at a URL. This API allows anyone to automate collection of a current member list and thus automate peering

https://ripe70.ripe.net/presentations/96-inex-ripe-connectwg-amsterdam-2015-05-13.pdf

https://github.com/euro-ix/json-schemas

Open-source tools, like IXP-Manager, do it for you:

https://github.com/inex/IXP-Manager

The IX-F (Internet eXchange Federation) are behind this initiative contact secretariat@ix-f.net for more information or support.

JSON Data Feed Health

HKIX		281		HK	Hong Kong	www.hkix.net
Equinix Hong Kong		138		HK	Hong Kong	ix.equinix.com
iAIX		13		HK	Hong Kong	www.iadvantage.net
MegaIX Hong Kong		5		HK	Hong Kong	www.megaport.com
BBIX Hong Kong		26		HK	Hong Kong	www.bbix.net
AMS-IX Hong Kong		40		HK	Hong Kong	www.ams-ix.hk

https://lg.megaport.com/megaport.json


```
{
   "ixp_list" : [
      {
         "shortname" : "IX-SYD",
         "name" : "Sydney IX",
         "ixp_id" : 1,
         "vlan" : [
            {
               "ipv6" : {
                  "mask_length" : 64,
                  "prefix" : "2001:DEA:0:10:0:0:0:0"
               },
               "ipv4" : {
                  "mask_length" : 23,
                  "prefix" : "103.26.68.0"
               },
               "name" : "IX-SYD",
               "id" : 0
            }
         ],
         "support_email" : "support@megaport.com",
         "url" : "http://www.megaport.com",
         "support_phone" : "+61 7 3088 5996",
         "support_contact_hours" : "24/7"
      },
      {
         "shortname" : "IX-BNE",
         "name" : "Brisbane IX",
         "ixp_id" : 2,
         "vlan" : [
            {
               "ipv6" : {
                  "mask_length" : 64,
                  "prefix" : "2001:DEA:0:20:0:0:0:0"
               },
               "ipv4" : {
                  "mask_length" : 24,
                  "prefix" : "103.26.70.0"
               },
               "name" : "IX-BNE",
               "id" : 0
            }
         ],
         "support_email" : "support@megaport.com",
         "url" : "http://www.megaport.com",
```

Why Use JSON

- Peeringdb.com data may not be accurate as it relies on each network to update their records
- You're in control of your JSON data!
- IXPDB will publish the full JSON schema
- Automation!

Conclusions

It is Hurricane Electric's vision to continue our expansion globally to as many locations as possible and help overcome illiteracy globally.

I need your help! So please make your IX information public, as membership information is key when making decisions about where to invest next.

Next milestone 200 Internet Exchanges

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Questions?

Walt Wollny, Director Interconnection Strategy
Hurricane Electric AS6939
walt@he.net