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# 100 Internet Exchange Points And Beyond!

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May 2016 – BKNIX  
Bangkok Thailand

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# Who is Douglas Wilson?

- ❑ Hurricane Electric AS6939 – the new guy
  - ❑ High Tech Plumber – ~100 routers , ~23 countries , ~132 Internet Exchanges.
- ❑ Layer42 Networks AS8121 – 3 years
  - ❑ Director Network Operations.
  - ❑ Primary focus on USA.
  - ❑ Helped build & run & plan the network.
- ❑ Microsoft AS8075 – 9 years
  - ❑ Sr. Network Architect
  - ❑ Helped build & run & plan the network.
  - ❑ Approx 10 AS#s
- ❑ XO AS2828 - 5 years
  - ❑ High Tech Plumber – approx 10 AS#s



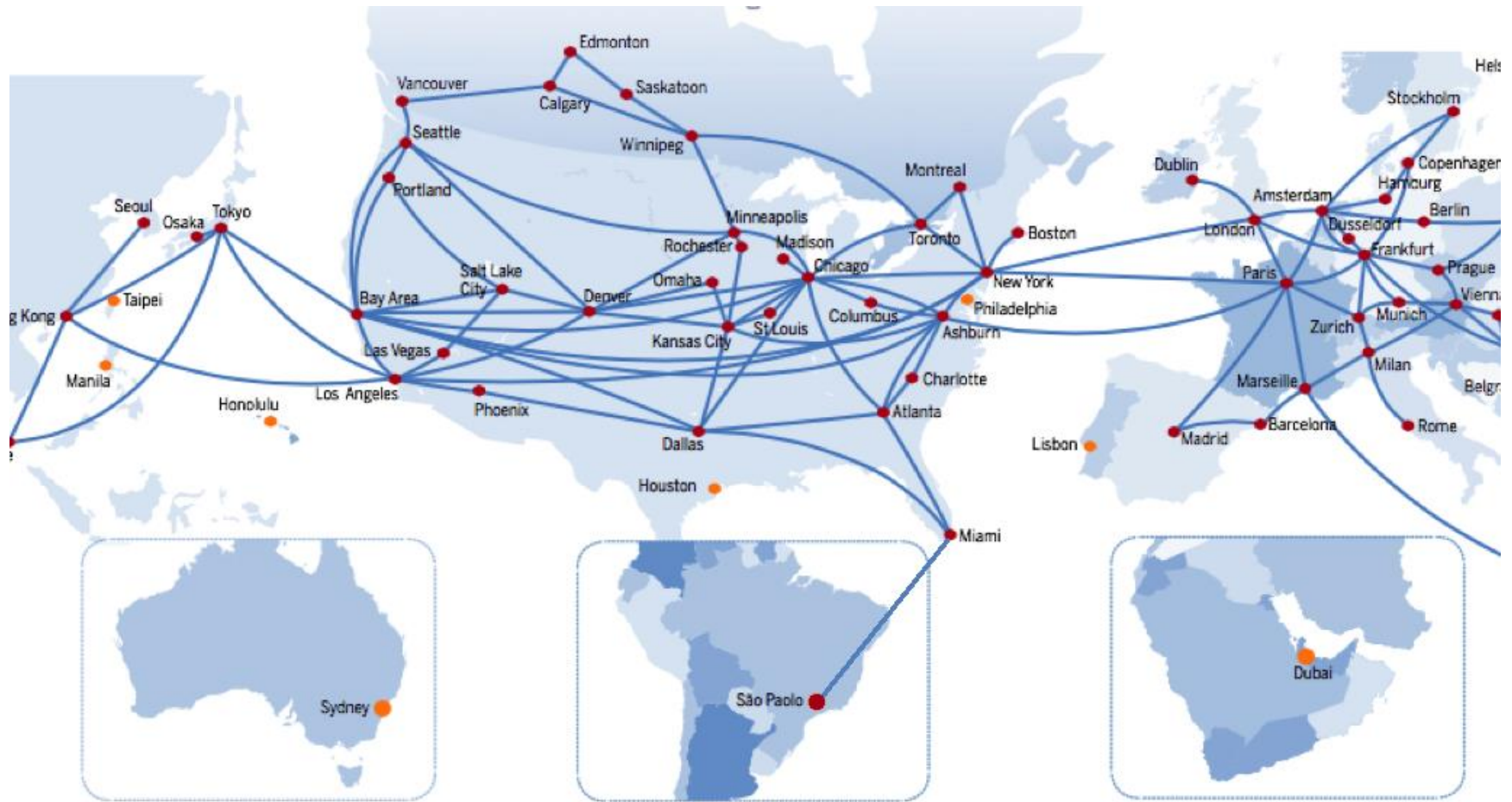
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# Hurricane Electric – Network History

- Founded 22 years ago - ISP & Datacenter operator
  - 1999 - Nationwide network
  - 2005 - European network expansion
  - 2007 - Native IPv6 backbone
  - 2008 - Ranked #1 IPv6 backbone for BGP adjacencies
  - 2008 - Expanded network into APAC
  - 2015 - Expanded network into Osaka and Seoul
  - 2016 - Expanded network into Honolulu and San Paulo



# Hurricane Electric Network



Hurricane Electric - Massive Peering!



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# Why so many Exchanges?



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# Expansion is the Answer!

## January 2015

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

## April 2016

132	Internet exchanges	46.6% increase
IPv4	5,303 unique adjacencies	45.5% increase
IPv6	3,318 unique adjacencies	34.0% increase

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# 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



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# 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...



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# New exchanges in the next 60 days

- TPIX-TW                      14 unique adjacencies
- NAPAfrica IX                86 unique adjacencies
- TPIX Warsaw                85 unique adjacencies
  
- Total new 185 unique adjacencies

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# Possible new locations 2016 - 2017

- Bangkok
- Manila
- Guam
- Houston
- Philadelphia
- Nairobi
- Athens
- Istanbul
- Dubai
- Mumbai

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# And several others

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

This is updated frequently with locations of interest

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# How IX operators can attract more members

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



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# 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.
- ❑ Catalyze ongoing communication between your participants.

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

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# Tell the world about your exchange!

- ❑ [www.peeringdb.com](http://www.peeringdb.com)
- ❑ <http://www.datacentermap.com/ixps.html>
- ❑ <http://www.internetexchangemap.com/>
- ❑ <https://www.telegeography.com>
- ❑ internet exchange wikipedia

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# Your IX members page

List participants on your website including:

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

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# 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	<a href="mailto:noc@zillow.com">noc@zillow.com</a>
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



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# Conclusions

It is Hurricane Electric goal to continue our expansion globally to as many locations as possible.

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 150 Internet Exchanges

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# Questions?

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