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# Hurricane Electric

## IPv6 Peering

*IPv6 Native Backbone – Massive Peering!*

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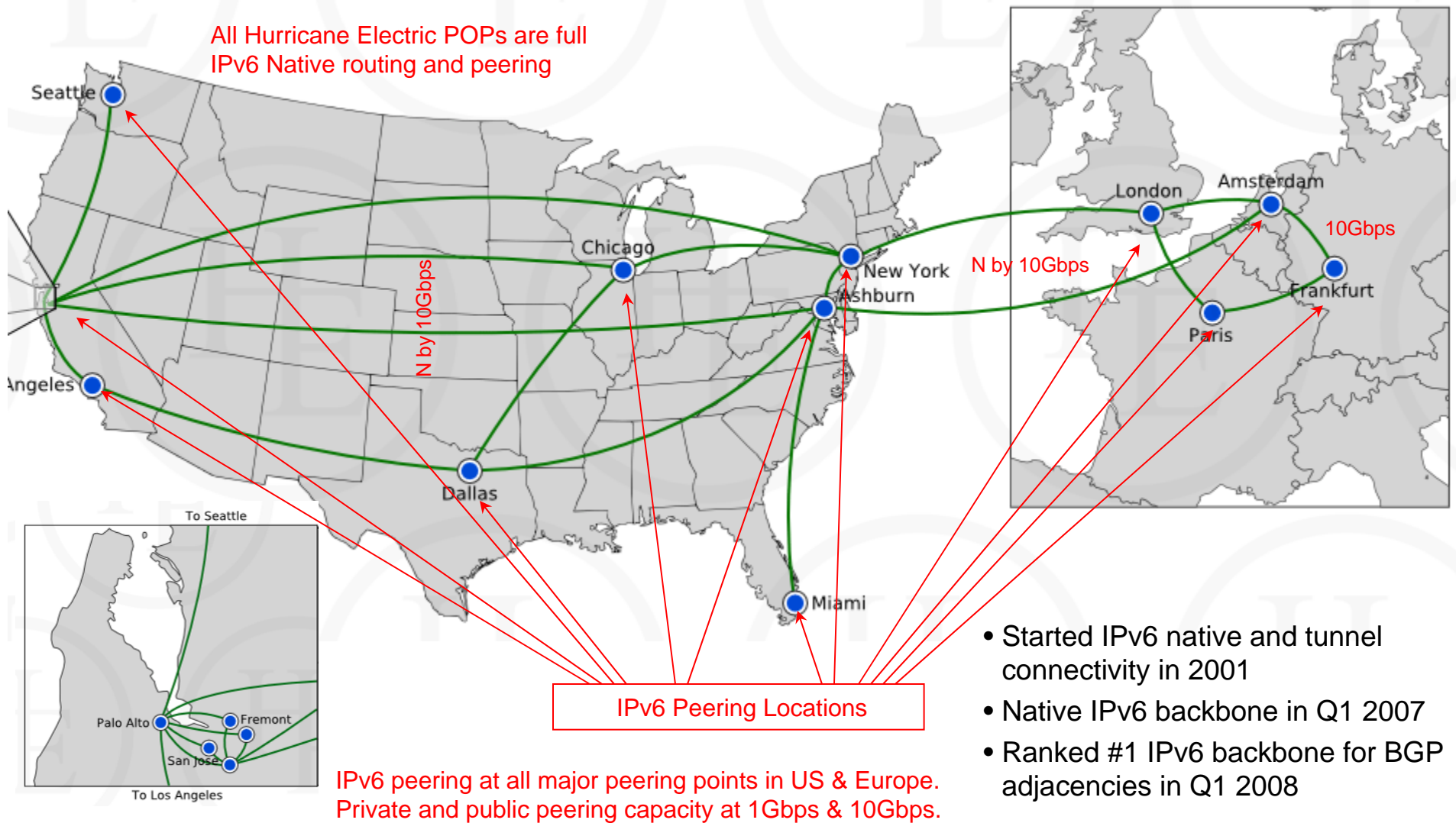
3<sup>rd</sup> June 2008 – NANOG 43

Brooklyn, New York

Martin J. Levy, Director IPv6 Strategy

Hurricane Electric

# Hurricane Electric – IPv6 Peering Points



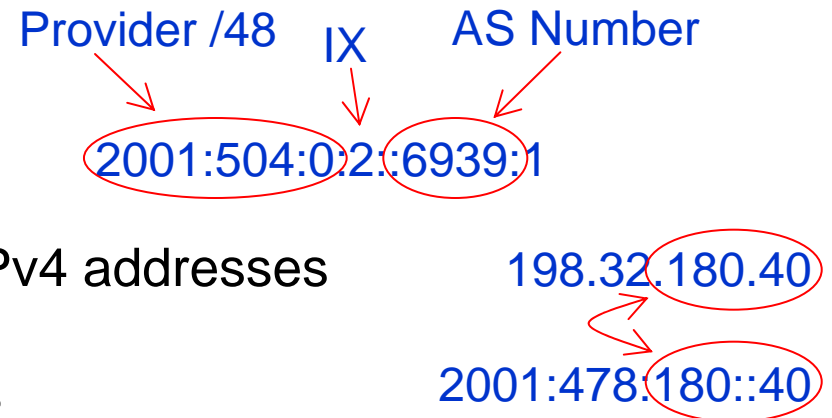
# Hurricane Electric – IPv6 Peering Points

Location	Exchange	100FE	GigE	10GigE	IPv4 Address	IPv6 Address
Seattle, Washington	SIX			10GigE	198.32.180.40	2001:478:180::40
San Francisco Bay Area	PAIX Palo Alto			10GigE	198.32.176.20	2001:504:d::10
	EQUINIX-SJC			10GigE	206.223.116.37	2001:504:0:1::6939:1
Los Angeles, CA	Any2-LAX			10GigE	206.223.143.122	2001:504:13:0:0:0:0:1A
	LAIIX		GigE		198.32.146.50	2001:504:a::a500:6939:1
	EQUINIX-LAX			10GigE	206.223.123.37	2001:504:0:3::6939:1
Chicago, Illinois	EQUINIX-CHI			10GigE	206.223.119.37	2001:504:0:4::6939:1
Dallas, Texas	EQUINIX-DAL			10GigE	206.223.118.37	2001:504:0:5::6939:1
New York	PAIX New York			10GigE	198.32.118.57	2001:504:f::39
	NYIIX			10GigE	198.32.160.61	2001:504:1::a500:6939:1
	NYCX		GigE		198.32.229.22	
	BIGEAPE	100FE				2001:458:26:2::500
Washington, DC	EQUINIX-ASH			10GigE	206.223.115.37	2001:504:0:2::6939:1
Miami, Florida	NOTA			10GigE	198.32.124.176	2001:478:124::176
London, England	LINX			10GigE	195.66.224.21	2001:7f8:4:0::1b1b:1
	LoNAP		GigE		193.203.5.128	2001:7f8:17::1b1b:1
Amsterdam, Netherlands	AMS-IX			10GigE	195.69.145.150	2001:7f8:1::a500:6939:1
	NL-IX		GigE		193.239.116.14	2001:7f8:13::a500:6939:1
Paris, France	PaNAP			10GigE	62.35.254.111	2001:860:0:6::6939:1
Frankfurt, Germany	DE-CIX			10GigE	80.81.192.172	2001:7f8::1b1b:0:1



# Hurricane Electric – IPv6 Peering Issues

- IPv6 addressing at NAP/IX's
  - Sometimes using BCD encoding
  - Sometimes by “duplicating” the IPv4 addresses
- Where next? Which peering point?
  - We only expand the network into IPv6 enabled NAP/IX's!
    - AtlantIX (Atlanta, Georgia), TorIX (Toronto, Canada), etc.
- Other issues...
  - 24/7 NOC with IPv6 expertise (not just “joe” on Mondays\*)
  - IPv6 dual-stack & native DNS servers
  - IPv6 dual-stack & native NTP servers
  - IPv6 & IPv4 public looking glass & route servers



\* “joe” is not his real name



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# Hurricane Electric

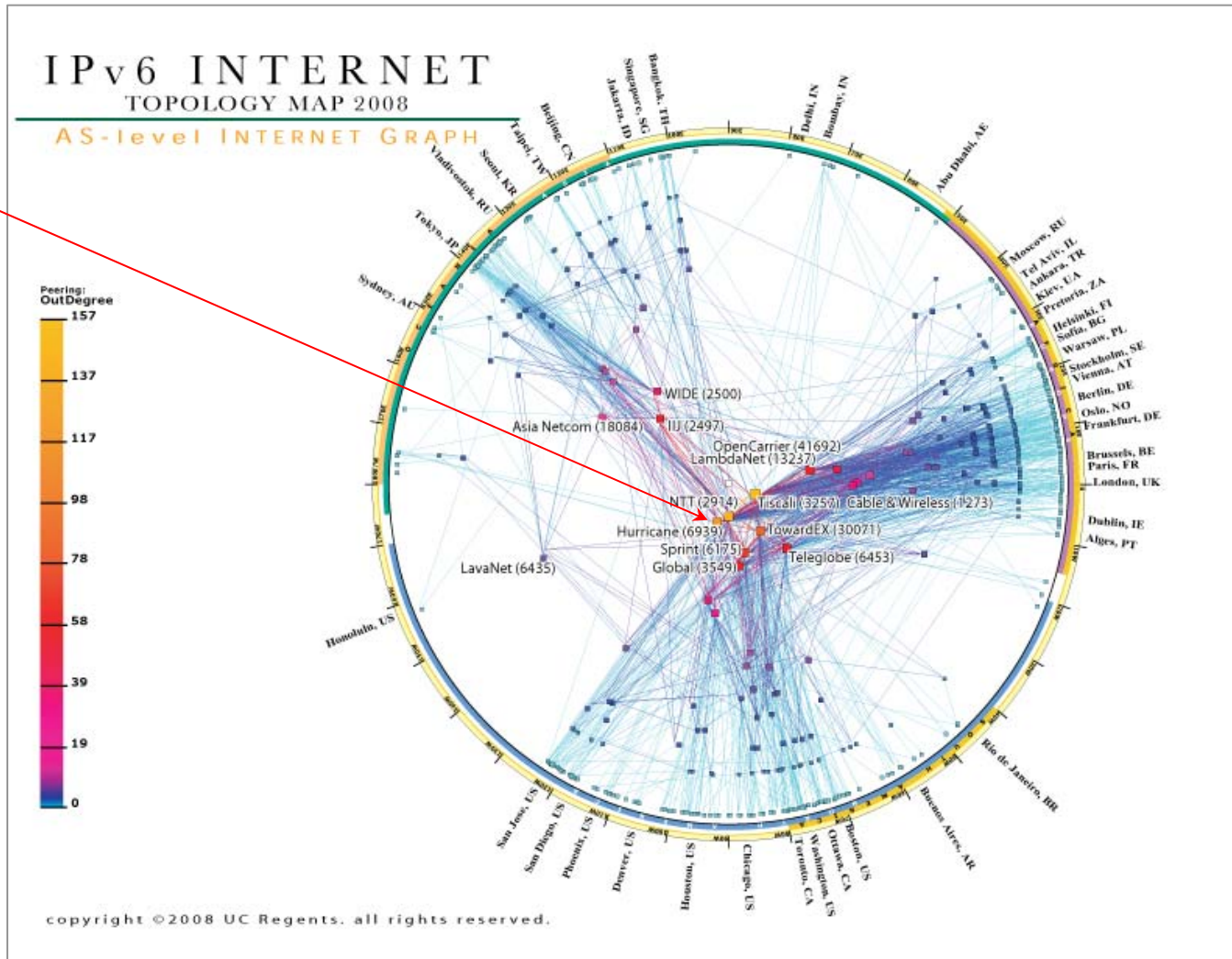
Where did all this lead us?

(or – was it worth it?)



# Hurricane Electric – IPv6 Status (CAIDA)

Hurricane Electric

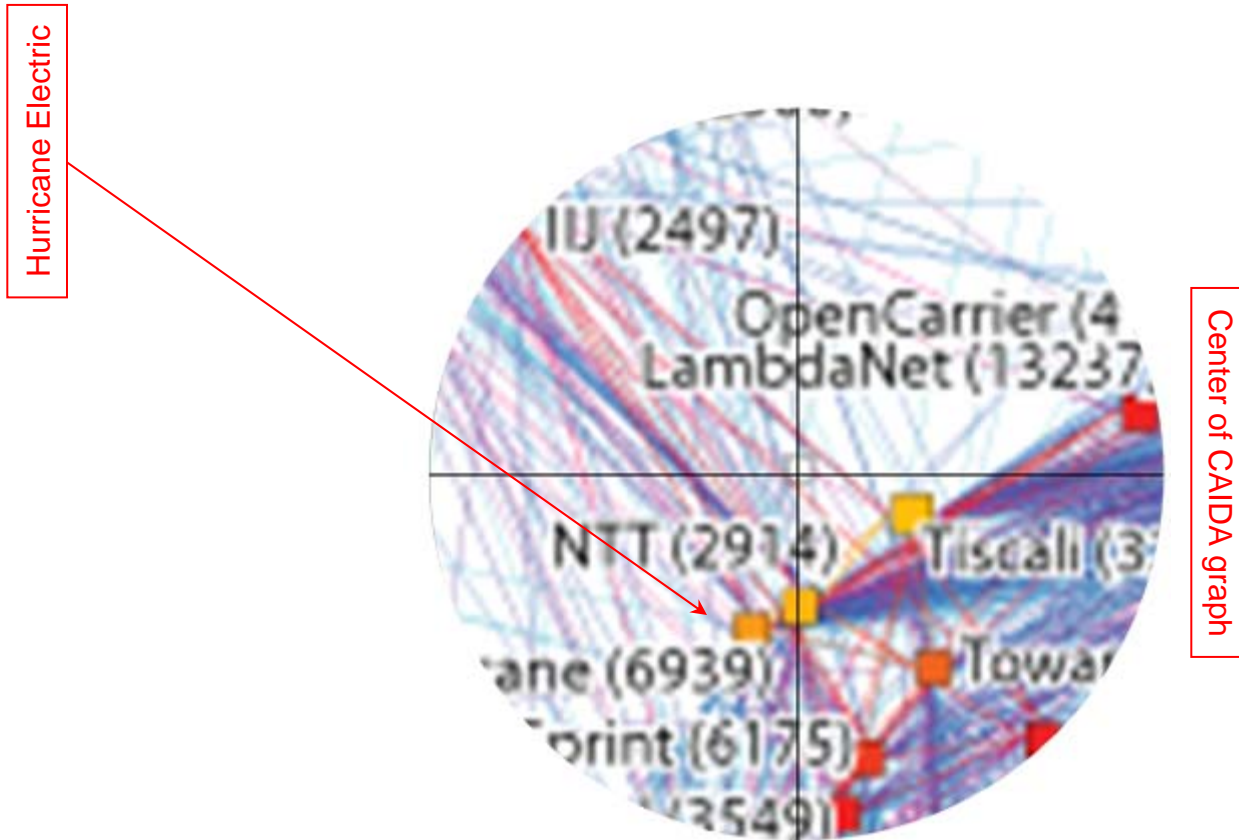


CAIDA status as of January 2008 – Further improved since

See: [http://www.caida.org/research/topology/as\\_core\\_network/ipv6.xml](http://www.caida.org/research/topology/as_core_network/ipv6.xml) for full description and explanation.



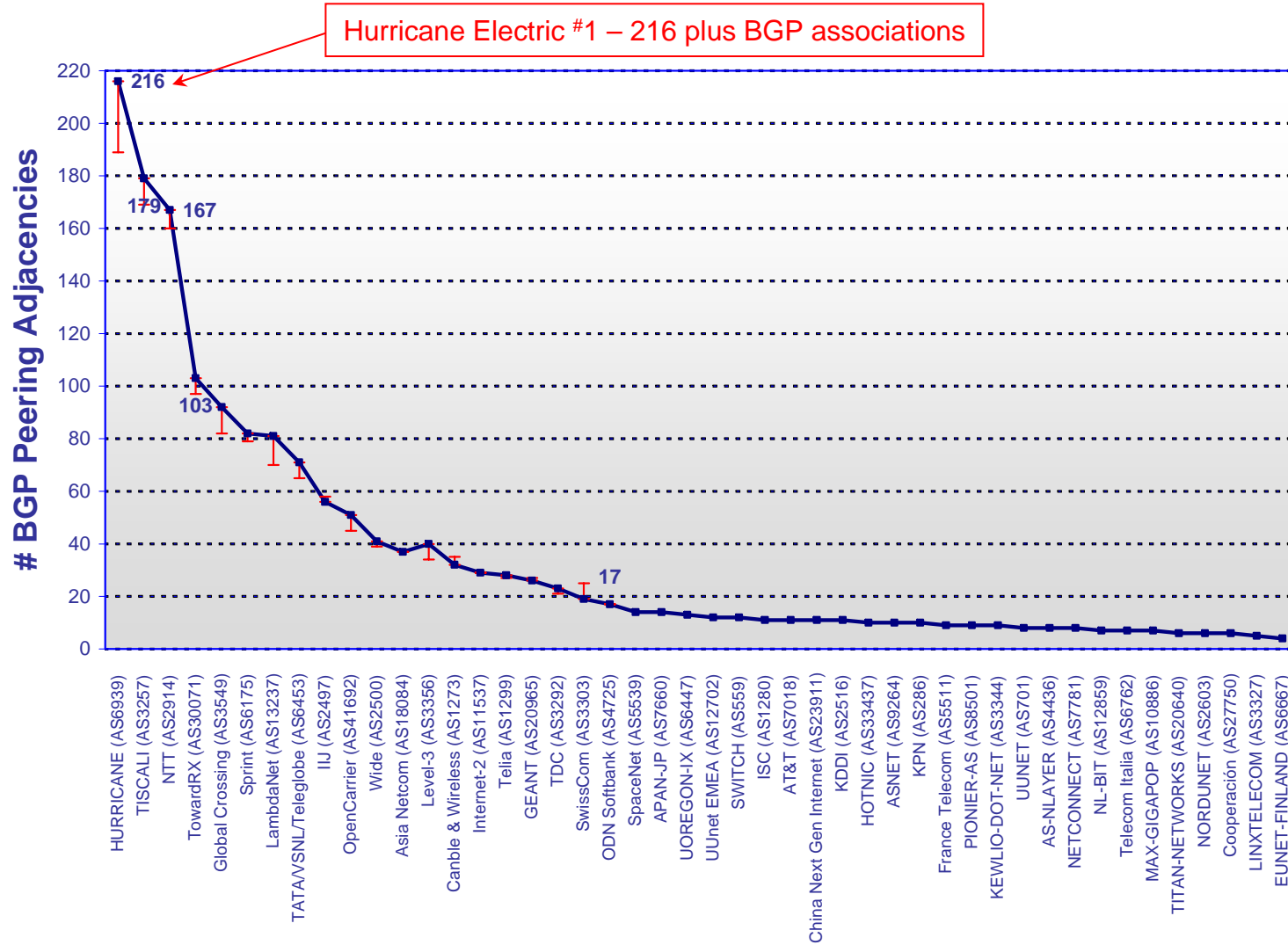
# Hurricane Electric – IPv6 Status (CAIDA)



Yes!



# Hurricane Electric – IPv6 Status (Oregon)



Data extracted from <http://bgp.potaroo.net/v6/as6447/bgp-as-adj.txt>.





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# Q&A



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