
The State of the Global IPv6 Tables

– A global view of IPv6 routing readiness

Hurricane Electric

IPv6 Native Backbone – Massive Peering!

PLNOG

Warsaw, Poland – 16th March 2011

Martin J. Levy, Director IPv6 Strategy
Hurricane Electric

IPv6 Global Connectivity – Talk Outline

NATIVE IPv6
EVERYWHERE

- IPv6 at Hurricane Electric *(I'll keep it short and sweet!)*
- ~~Why do we need IPv6?~~ *(Just kidding – I'm assuming that!)*
- Is the IPv6 routing table ready for the real world?
- Can you motivate people to implement IPv6?
- Should we panic or be happy?



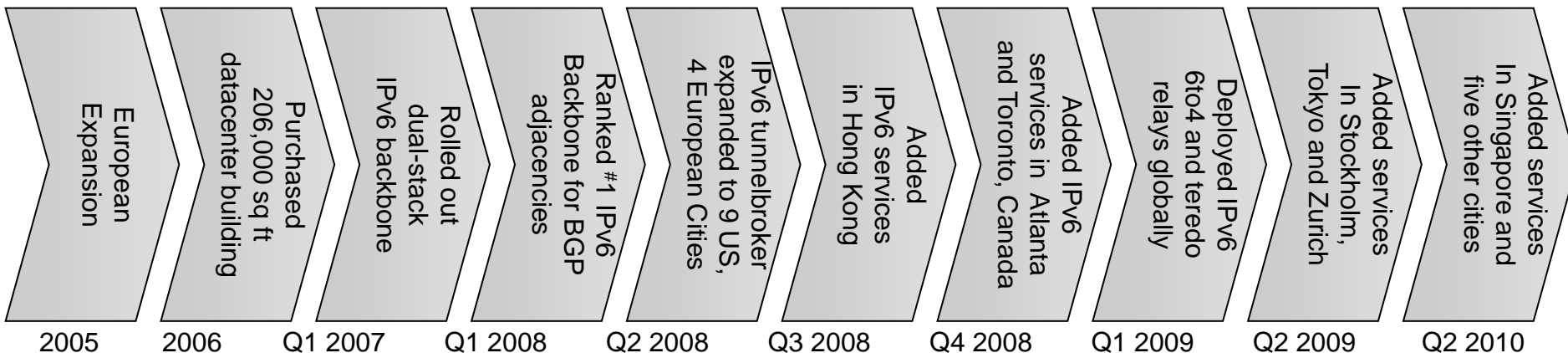
Hurricane Electric



Hurricane Electric – Roots and History

NATIVE IPv6
EVERYWHERE

- Founded 16+ years ago - ISP & datacenter operator
 - Roots within the Silicon Valley high-tech community
 - 1999 – Expanded IPv4 network nationwide
 - 2001 – IPv6 native and tunnel connectivity (<http://tunnelbroker.net>)
 - 2006 – Full “technology refresh” enabled native dual-stack IPv6 backbone
 - 2008 – Became largest IPv6 backbone globally (> 1Gbps IPv6 traffic level)



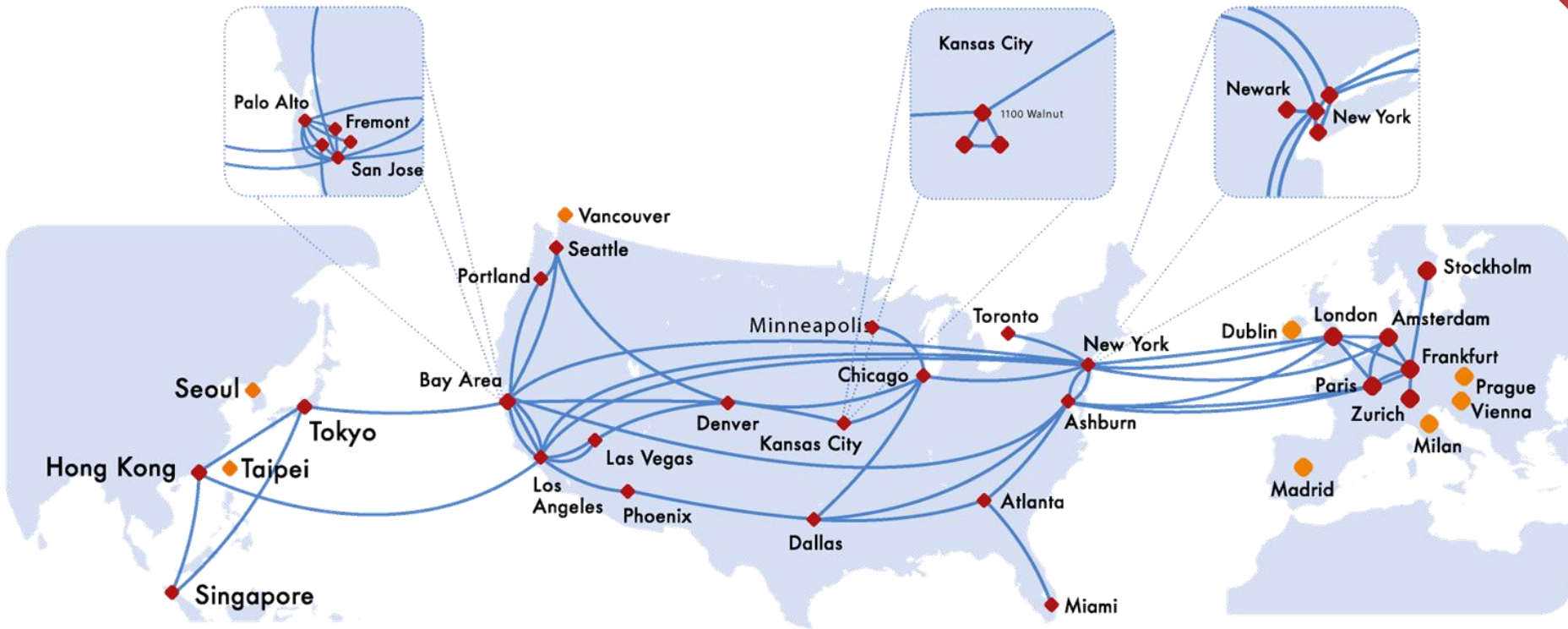
- 2009 – Continued expansion into Asia; enabled IPv6 6to4 & Teredo service
- 2010 – Added more geographic coverage; expanded IPv6 6to4 service
- 2011 – Stop talking about IPv6; just talk about the “Internet”



Hurricane Electric – IPv6 Network Reach

NATIVE IPv6
EVERYWHERE

All Hurricane Electric POPs are full IPv6 Native routing and peering



IPv6 peering at all major peering points in US, Europe & Asia.
Private and public peering capacity at 10Gbps and above.



Hurricane Electric – IPv6 Native Services

NATIVE IPv6
EVERYWHERE

- Four+ years into native IPv6 network deployment
 - Nine+ years of IPv6 on the network
- IPv6 native router platform across all POP's
 - All IPv6 BGP customer connections are native
 - All IPv6 datacenter customer are native
 - Every customer connection is IPv6 enabled by default!
- IPv6 dual-stack & native DNS servers
- IPv6 dual-stack & native NTP servers
- IPv6 & IPv4 public looking glass & route servers
- 24/7 NOC with IPv6 expertise
- IPv6 hosting services

Not just “Joe” on Thursdays



Hurricane Electric – IPv6 Native Services

NATIVE IPv6
EVERYWHERE

- Applied for and got IPv6 address allocation from RIR? ✓
 - Picked hardware & firmware? ✓
 - Enabled IPv6 (dual stack) everywhere? ✓
 - IPv6 peering & global connectivity? ✓
 - Built IPv6 routing for customer interconnections? ✓
 - Reverse-DNS & other backbone IP layer offerings? ✓
 - Evangelized IPv6 excessively? ✓✓✓
 - Saw real use from customers? ✓
-
- We're done!



~~Why do we need IPv6?~~

(Just kidding – I'm assuming that!)

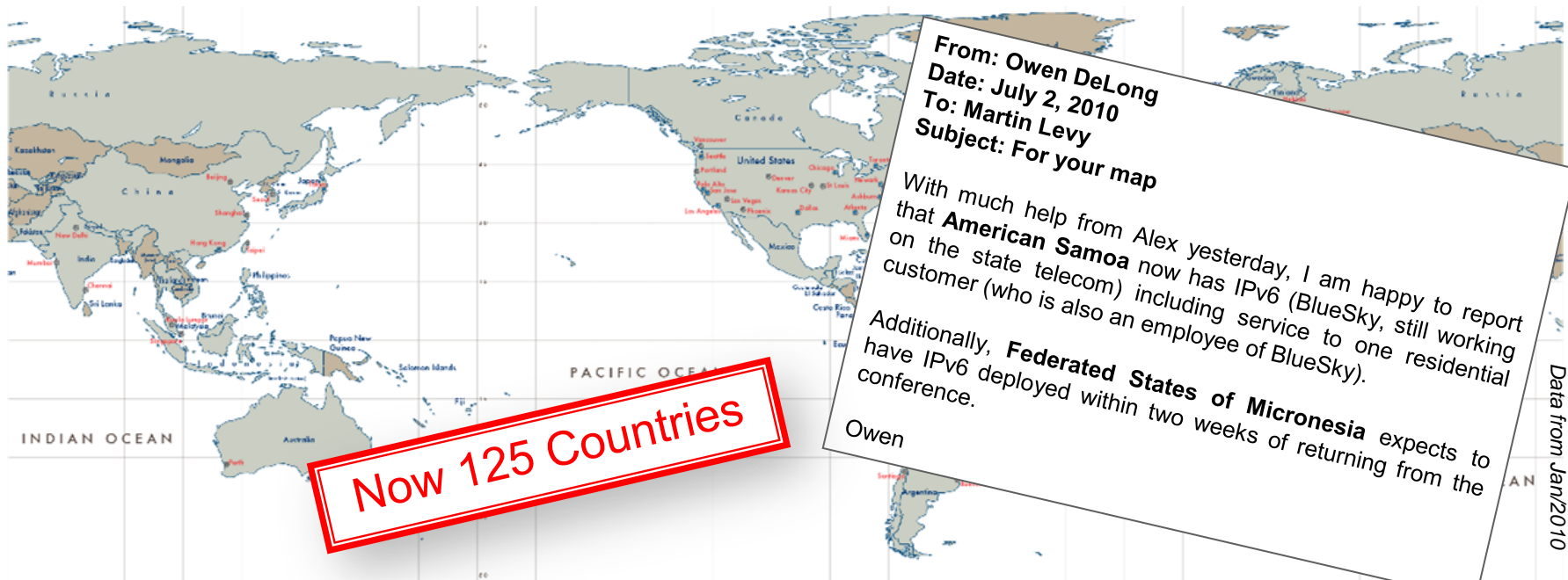
Does IPv6 have
global coverage?



IPv6 and global deployment worldwide

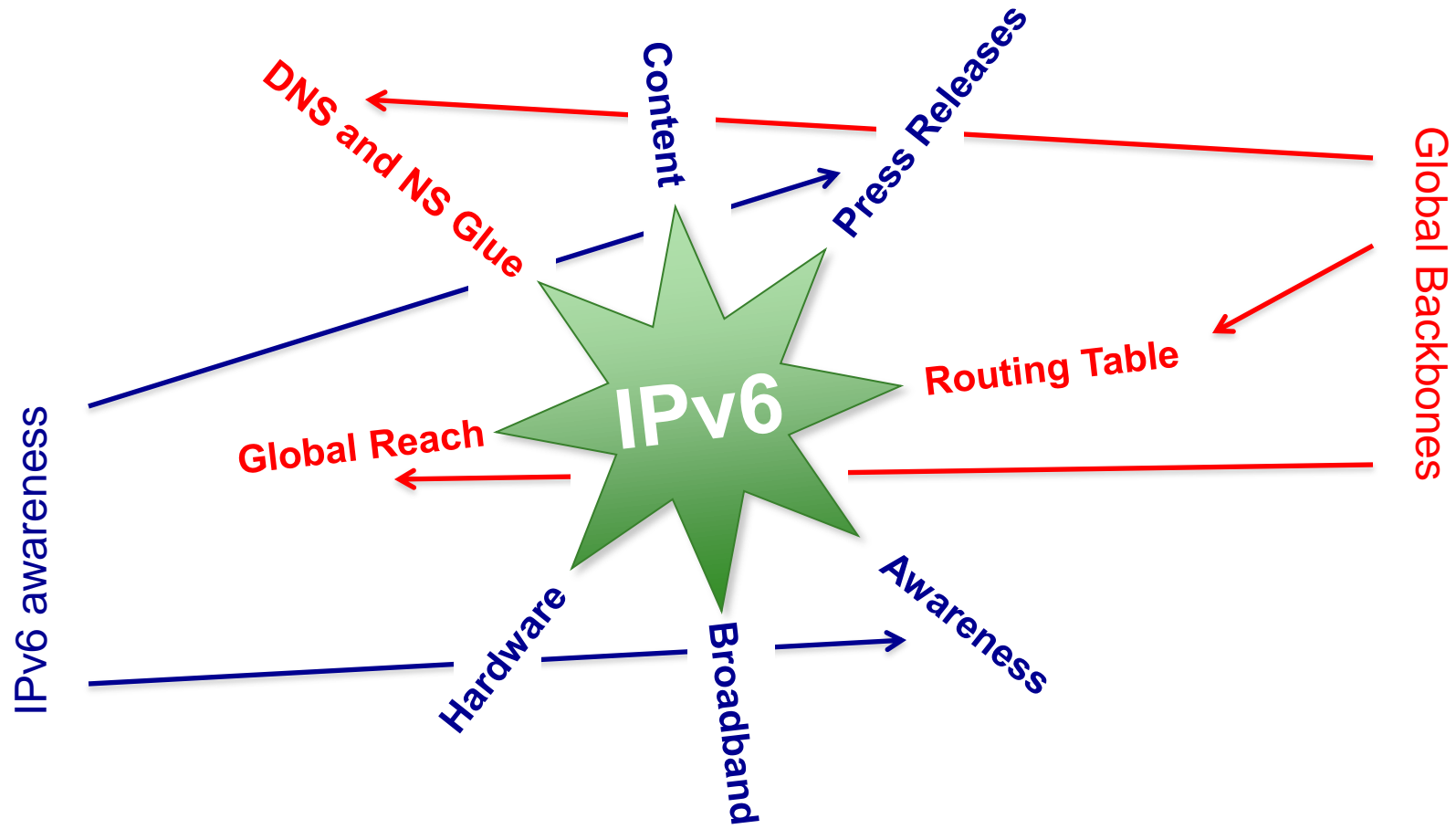
NATIVE IPv6
EVERYWHERE

- IPv6 deployment is everywhere
 - IPv6 active at nearly all global Internet peering points
 - 90+ countries had a “live” IPv6 presence in Jan 2010
 - Now 125 countries



IPv6 and the global backbone story

NATIVE IPv6
EVERYWHERE



IPv6 questions to check on global deployment

NATIVE IPv6
EVERYWHERE

- Is IPv6 supported? (the basic questions)
 - Is IPv6 native on all backbones?
 - Is IPv6 interconnections/peering prevalent?
 - Is IPv6 part of the standard product mix?



Is the IPv6 routing table
ready for real world use?



Basic question: Is IPv6 routing ready?

NATIVE IPv6
EVERYWHERE

- Theory #1: It's been ready for years...
 - Plenty of backbones running v6 routing
 - Plenty of v6 inter-backbone peering
 - Plenty of v6 talks at conferences
- Theory #2: We are not ready yet; but close...
 - Still a few gaps in the routing tables
 - Still some spotty cleanup's here-and-there



Checking global IPv6 routing – graphically!

Showing IPv4/IPv6 route propagation
in a graphical form

<http://bgp.he.net/>

Caveat:

- This tool is only as good as its source data.
- IP information is uploaded from RIPE RIS & Oregon routeviews.
 - Some views are missing; not all routes and paths are visible.
- NOT based on the Hurricane Electric routing tables.

http://bgp.he.net/ - Searching on ASN, IP, etc.

NATIVE IPv6
EVERYWHERE

Search command

ASN	AS6714
IPv4 address	94.42.88.36
IPv4 block	94.42.0.0/16
IPv6 address	2001:6d8:0:1::a:6
IPv6 block	2001:1a68::/32
DNS name	plnog.pl
...etc ...	

The screenshot shows a web browser window titled "Hurricane Electric BGP Toolkit" with the URL "http://bgp.he.net/". The page features the Hurricane Electric logo and a search bar. A red oval highlights the search bar, and a red arrow points from the "Search command" text to it. Below the search bar, the "BGP Toolkit Home" section displays the following information:

- Welcome to the Hurricane Electric BGP Toolkit.
- You are visiting from **94.42.88.36**
- Announced as **94.42.0.0/16** (GTS Poland Sp. z o.o.)
- Your ISP is **AS6714** (ATOM SA)

At the bottom of the page, there is a "Quick Links" sidebar with various navigation options and social media icons for YouTube, Twitter, and Facebook. The footer indicates the page was updated on 15 Mar 2011 at 07:19 PST.



Example of BGP tools – IPv4/IPv6 statistics

NATIVE IPv6 EVERYWHERE

IPv6 and IP4 BGP and routing information

HURRICANE ELECTRIC INTERNET SERVICES
BGP Peer Report

Quick Links
[BGP Toolkit Home](#)
[BGP Prefix Report](#)
[BGP Peer Report](#)
[Top Host Report](#)
[Internet Statistics](#)
[Looking Glass](#)
[Free IPv6 Tunnel](#)
[IPv6 Certification](#)
[IPv6 Progress](#)
[Going Native](#)
[Contact Us](#)

Adjacencies | **Adjacency History** | **Prefixes** | **Prefix History** | **IPv4 Addresses Originated**

IPv4 Adjacencies

ASN	Name
AS174	Cogent Communications
AS3356	Level 3 Communications, LLC
AS7018	AT&T WorldNet Services
AS701	MCI Communications Services, Inc. d/b/a Verizon Business
AS9002	ReTN.net Autonomous System
AS6939	Hurricane Electric, Inc.
AS3549	Global Crossing
AS209	Qwest Communications Company, LL
AS4323	tw telecom holdings, inc.
AS1239	Sprint

IPv6 Adjacencies

ASN	Name
AS6939	Hurricane Electric, Inc.
AS9002	ReTN.net Autonomous System
AS3257	Tinet SpA
AS13030	Init Seven AG, Zurich, Switzerland
AS12859	BIT BV
AS19151	WV FIBER
AS34309	Link11 GmbH
AS34695	E4A s.r.l.
AS2914	NTT America, Inc.
AS29208	descr: Dial Telecom, a.s.

IPv4 Prefixes Announced

ASN	Name	Count
AS3356	Level 3 Communications, LLC	79110
AS3549	Global Crossing	65064
AS7018	AT&T WorldNet Services	37833
AS1299	TeliaNet Global Network	25724
AS701	MCI Communications Services, Inc. d/b/a Verizon Business	25377
AS2914	NTT America, Inc.	23657
AS174	Coigent Communications	22743
AS3257	Tinet SpA	22226
AS6453	Tata Communications	21374
AS3491	Beyond The Network America, Inc.	19065

IPv6 Prefixes Announced

ASN	Name	Count
AS6939	Hurricane Electric, Inc.	1479
AS3257	Tinet SpA	632
AS2914	NTT America, Inc.	627
AS3549	Global Crossing	618
AS1299	TeliaNet Global Network	419
AS20965	The GEANT IP Service	349
AS6453	Tata Communications	244
AS3356	Level 3 Communications, LLC	215
AS1273	Cable and Wireless plc	203
AS2497	Internet Initiative Japan Inc.	150

IPv4 Prefixes Originated

ASN	Name	Count
AS4538	China Education and Research Network Center	5418
AS4323	tw telecom holdings, inc.	4481
AS6389	BellSouth.net Inc.	3913

Updated 04/07/2011 | Display a menu for "http://bgp.he.net/report/adjacencies"

http://bgp.he.net/

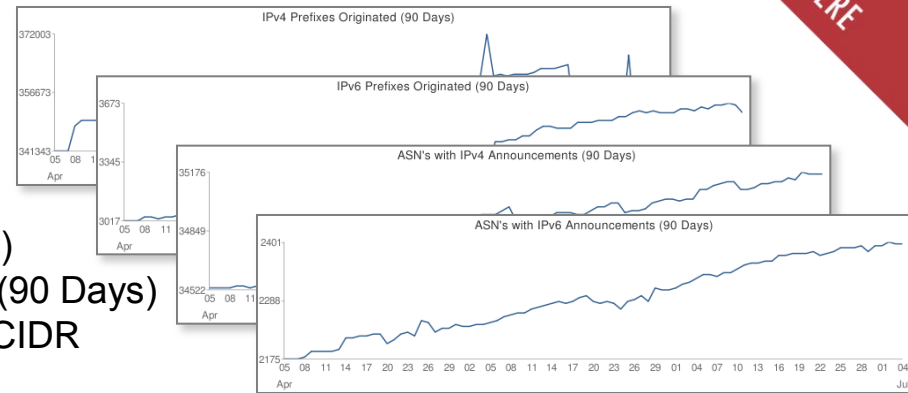


<http://bgp.he.net/> – Available information

NATIVE IPv6
EVERYWHERE

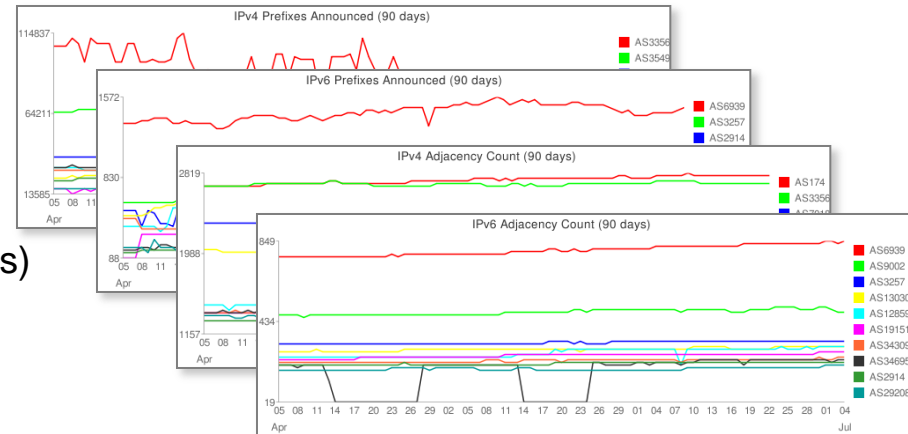
■ BGP Prefix Report

- Prefixes, Networks, Distribution
 - IPv4/IPv6 Prefixes Originated (90 Days)
 - ASN's with IPv4/IPv6 Announcements (90 Days)
 - IPv4/IPv6 Announced Prefix Count by CIDR



■ BGP Peer Report

- Adjacencies, Adjacency History
 - IPv4/IPv6 Adjacencies
 - IPv4/IPv6 Adjacency Count (90 Days)
- Prefixes, Prefix History
 - IPv4/IPv6 Prefixes Announced
 - IPv4/IPv6 Prefixes Announced (90 Days)
- IPv4 Addresses Originated
 - IPv4 Addresses Originated



■ Top Host Report

- Top Hosts

■ Internet Statistics

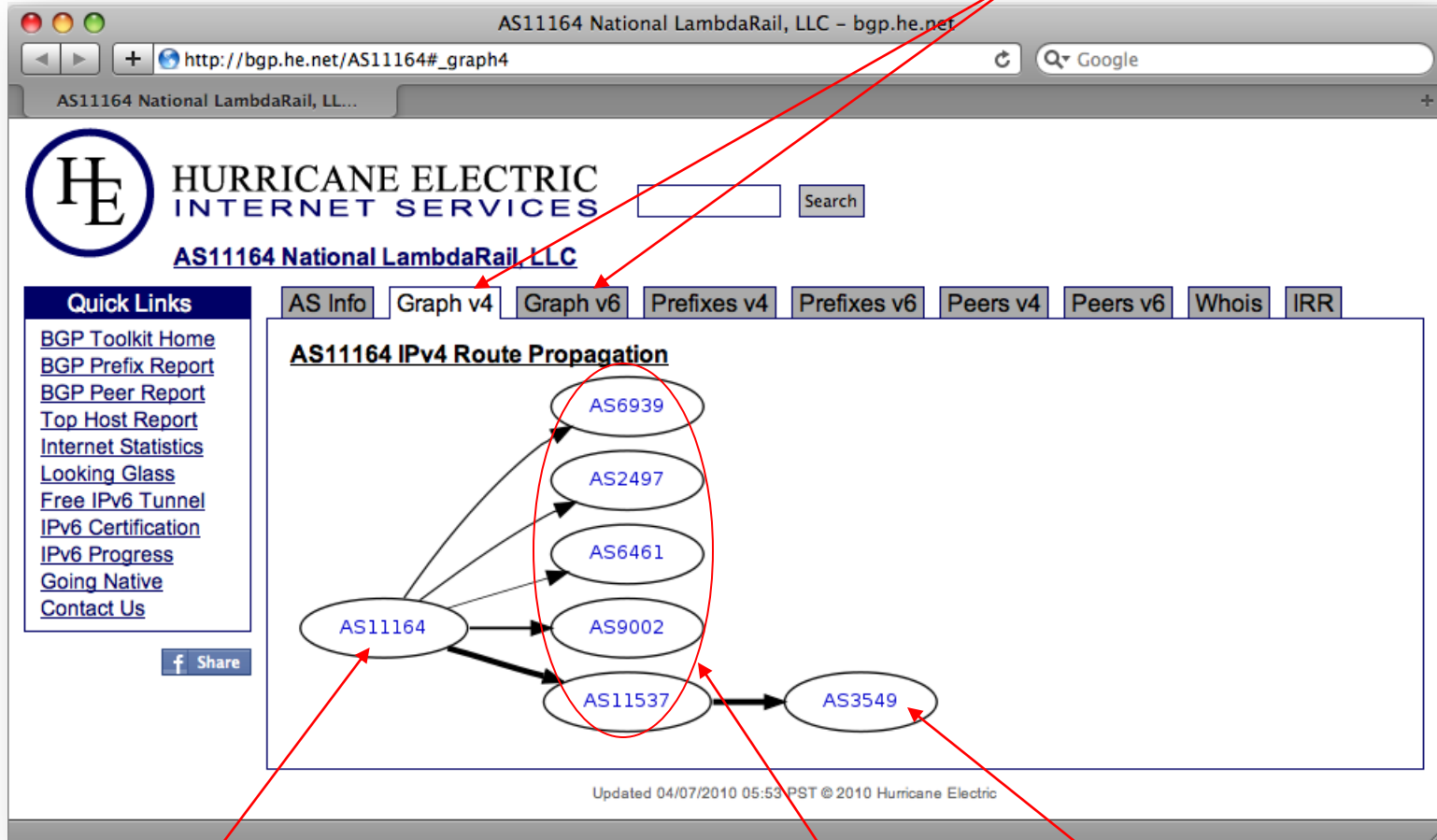
- Internet Statistics



http://bgp.he.net/ – Route propagation graphs

NATIVE IPv6
EVERYWHERE

Select tab for v4 or v6 graphs



ASN originating routes

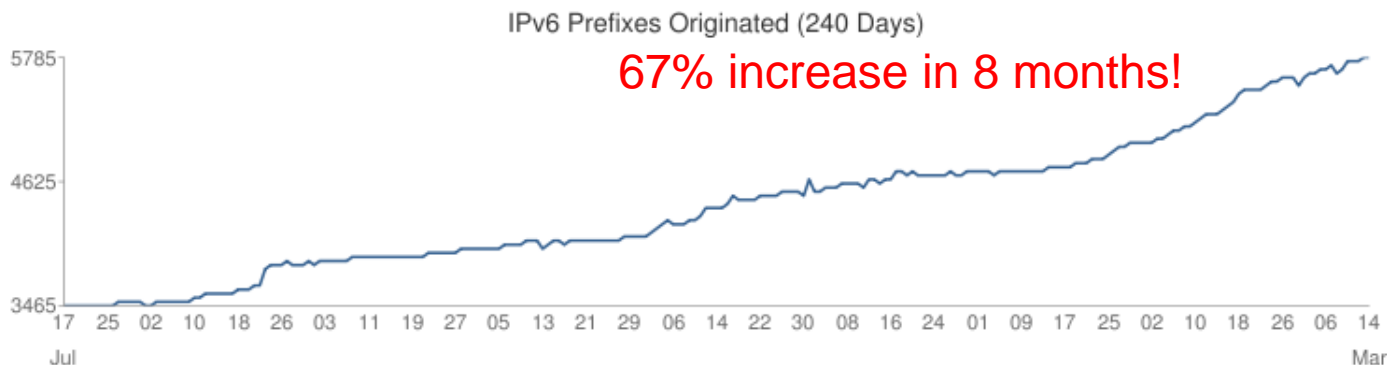
Peers that see routes

Routes see downstream of peers

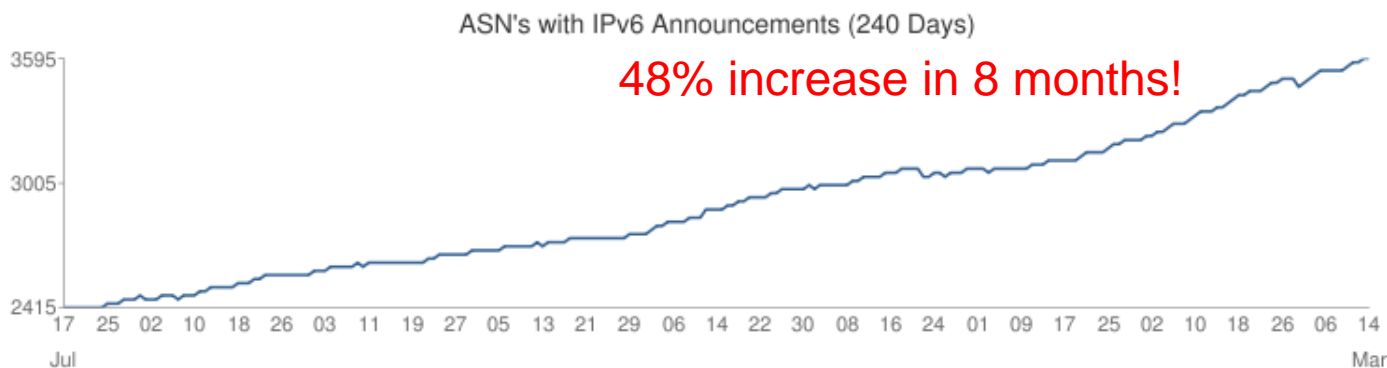


Is IPv6 routing/interconnections/peering prevalent?

NATIVE IPv6
EVERYWHERE



http://bgp.he.net/report/prefixes#_prefixes



http://bgp.he.net/report/prefixes#_networks

Simple conclusion #1 – “up and to the right”



Is IPv6 alive and kicking in Poland?

NATIVE IPv6 EVERYWHERE

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

Networks of Poland - bgp.he.net

Country Info

ASN	Name	Adjacencies v4	Routes v4	Adjacencies v6	Routes v6
AS24724	ATM S.A.	139	666	46	22
AS8308	NASK Research and Academic Computer Networks	106	131	25	3
AS12968	Crowley Data Poland, sp. z o.o.	142	203	25	6
AS30975	Telewizja Kablowa Koszalin	28	4	23	2
AS31242	TKP S.A. is 3S.pl network operator.	56	68	19	1
AS198844	PIONIER	46	317	19	10
AS30851	Slaska Grupa Multimedialna - Infrastruktura sp. z o.o.	19	14	17	1
AS15857	Telefonia Dialog S.A.	59	47	16	1
AS8501	PIONIER, National Research and Education Network in Poland	36	150	15	13
AS8246	GTS Poland Sp. z o.o.	230	1	8	1
AS5617	Telekomunikacja Polska S.A.	255	535	8	6
AS43679	PETRUS POLSKA SP. Z O.O. S.K.A.	7	1	6	2
AS8664	University of Warsaw, ICM	7	13	6	2
AS12476	ASTER Sp. z.o.o.	14	27	6	3
AS12831	Technical University of Gdansk	30	99	6	3
AS20960	TK Telekom sp. z o.o.	74	135	6	3
AS13293	PIONIER	21	424	6	10
AS12824	home.pl	4	7	5	1
AS44514	INOTEL S.A.	6	8	5	1
AS49102	Connected sp. z o.o.	17	17	5	1
AS33923	ART-COM Sp. z o.o.	4	4	5	2
AS43333	CIS NEPHAX	9	11	5	2
AS15744	Silesian University of Technology, Computer Centre	15	85	5	3
AS39439	AC Systemy Komputerowe Stanislaw Bor spolka jawna	3	4	4	1
AS41079	SuperHost.pl s.c.	3	12	4	1
AS8535	Agora TC Sp.z.o.o.	3	3	4	1

Poland #8

World Report - bgp.he.net

Countries with ASNs: 219

Description	CC	ASNs	Report
United States	US	19,828	Report
Russian Federation	RU	3,380	Report
European Union	EU	2,344	Report
United Kingdom	GB	1,883	Report
Ukraine	UA	1,767	Report
Canada	CA	1,390	Report
Germany	DE	1,350	Report
Poland	PL	1,288	Report
Australia	AU	1,147	Report
Brazil	BR	1,043	Report
Korea, Republic of	KR	866	Report
Japan	JP	777	Report
Czech Republic	CZ	715	Report
France	FR	688	Report
Romania	RO	633	Report
Italy	IT	623	Report
Switzerland	CH	557	Report
China	CN	535	Report
Netherlands	NL	517	Report
Bulgaria	BG	485	Report
Sweden	SE	469	Report
Indonesia	ID	433	Report
India	IN	411	Report
Turkey	TR	376	Report
Austria	AT	374	Report

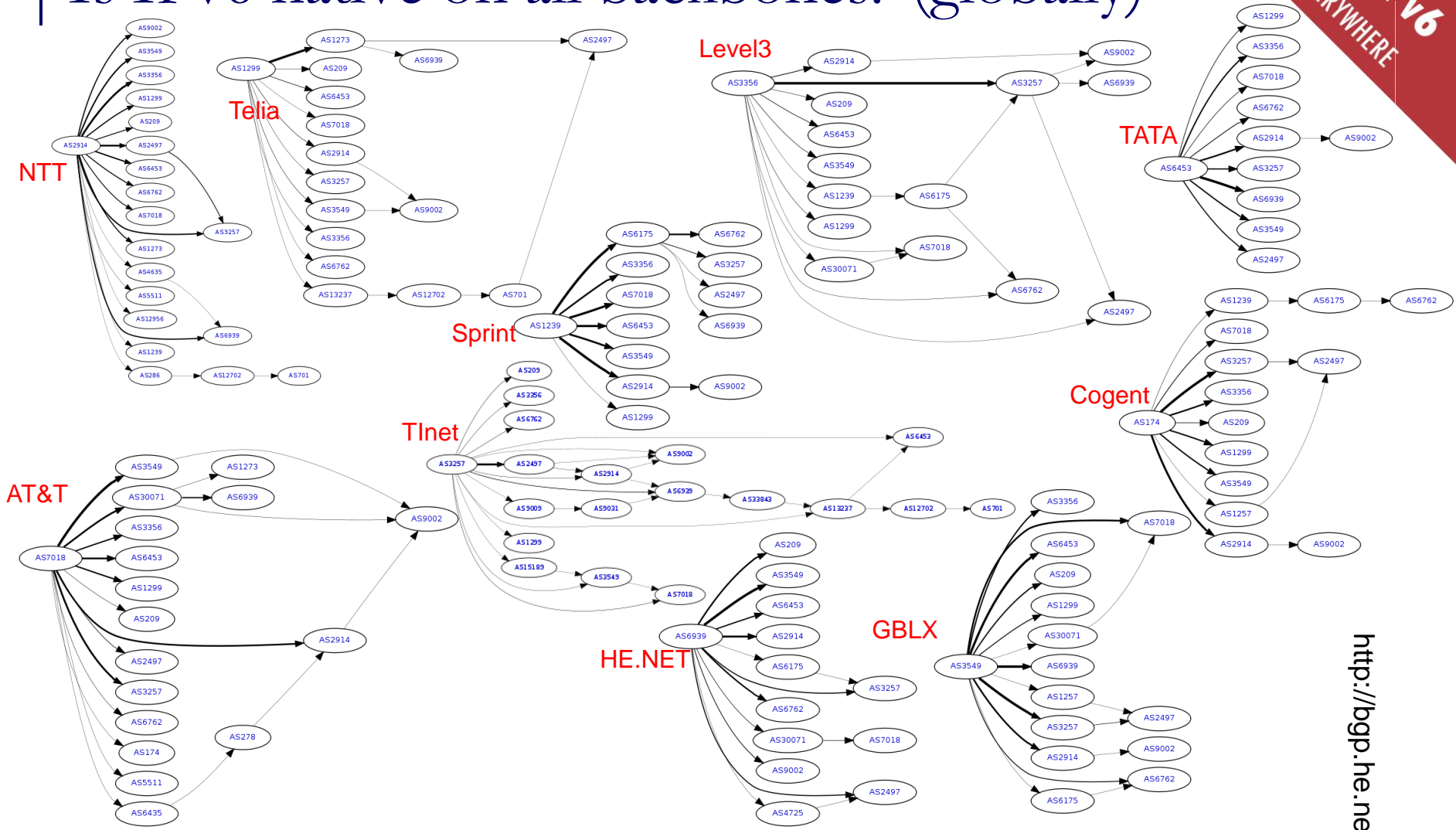
http://bgp.he.net/report/prefixes#_countriesv6

However only 90 ASNs have IPv6 enabled (out of 1,288)



Is IPv6 native on all backbones? (globally)

NATIVE IPv6 EVERYWHERE



<http://bgp.he.net>

Simple conclusion #2 – global routing seems to exist on nearly every tier1 backbone



IPv6 routing on backbones (the summary)

NATIVE IPv6
EVERYWHERE

- Classic backbones have (finally) got IPv6
 - This is not news to a savvy IPv6 crowd!
 - The last “*tier1 backbone*” only-recently enabled IPv6
- Some backbones still missing some routes
 - Uninteresting to multi-homed networks
- Expect the trickle-down effect to other networks

Simple conclusion #3 – it took till 2010 for some Tier1 backbones to get v6 ready!



Hurricane Electric's IPv6 Tunnelbroker

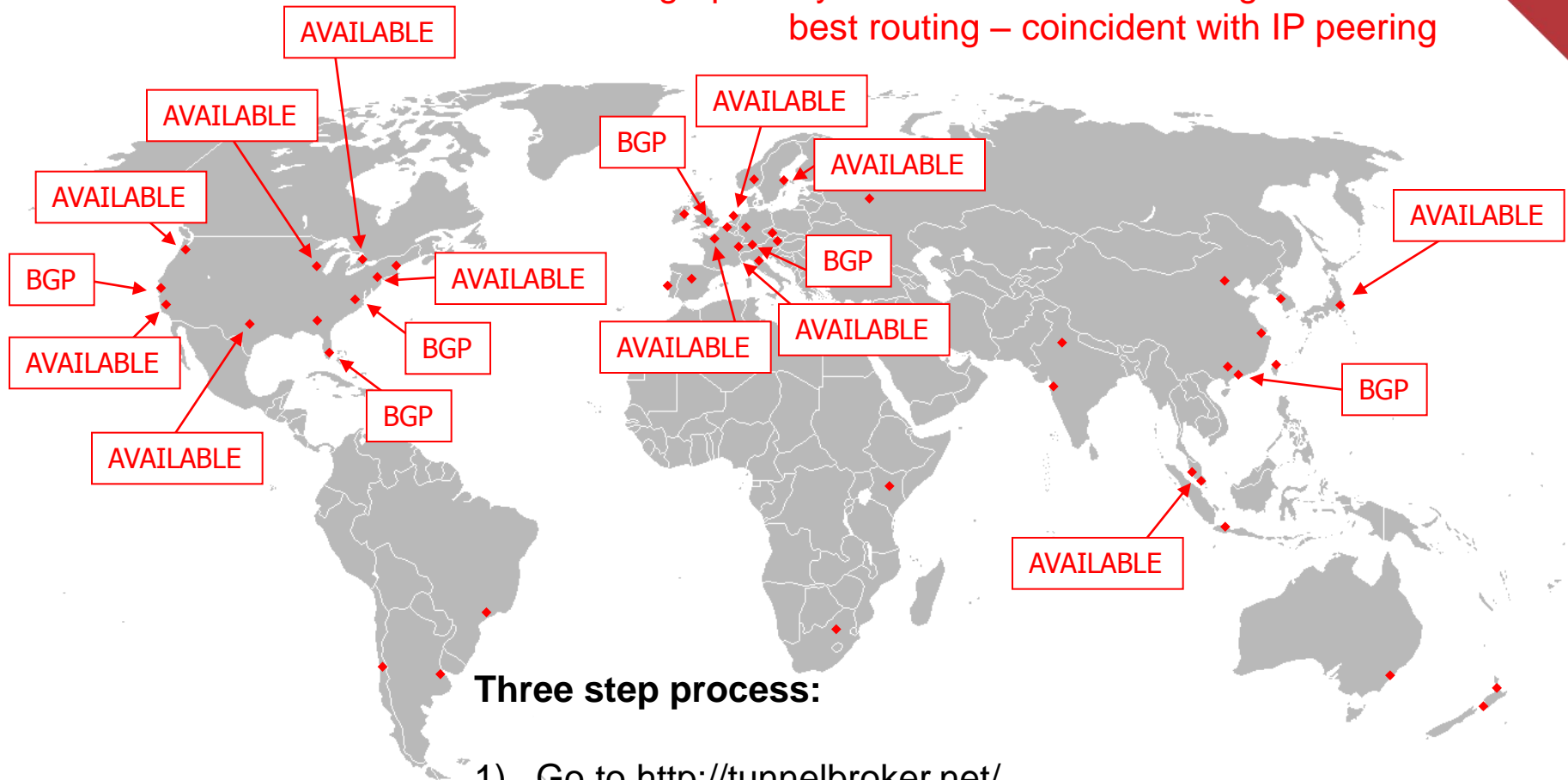
<http://tunnelbroker.net/>

(IPv6 Tunnels Exist! – sometimes it's the only way)

Hurricane Electric – IPv6 tunnelbroker.net

NATIVE IPv6
EVERYWHERE

Geographically diverse locations allowing customers
best routing – coincident with IP peering



Three step process:

- 1) Go to <http://tunnelbroker.net/>
- 2) Setup an account – choose a location
- 3) Setup your own host or router to allow tunnels



Hurricane Electric – IPv6 tunnelbroker.net setup

NATIVE IPv6
EVERYWHERE

Setup Regular IPv6 Tunnel

You currently have 1 of 4 allowed tunnels configured.

- If you are trying to reclaim a tunnel simply enter your last IPv4 address here. If you have any issues please email ipv6@he.net.
- If you have an official ASN and wish to setup a full BGP feed, please use [this form](#) instead.

IPv4 endpoint:
(your side of the tunnel)

You are viewing from IP: 216.218.214.2

We recommend you use: Fremont, CA, US [72.52.104.74]

Which Server Is Closest to you?:

Asia

- Tokyo, JP [74.82.46.6]
- Hong Kong, HK [216.218.221.6]

Europe

- Amsterdam, NL [216.66.84.46]
- Stockholm, SE [216.66.80.90]
- Paris, FR [216.66.84.42]
- Zurich, CH [216.66.80.98]
- London, UK [216.66.80.26]
- Frankfurt, DE [216.66.80.30]

North America

- Seattle, WA, US [216.218.226.238]
- Fremont, CA, US [72.52.104.74]
- Ashburn, VA, US [216.66.22.2]
- Miami, FL, US [209.51.161.58]
- Chicago, IL, US [209.51.181.2]
- Dallas, TX, US [216.218.224.42]
- Toronto, ON, CA [216.66.38.58]
- Los Angeles, CA, US [66.220.18.42]
- New York, NY, US [209.51.161.14]

Select Global Location



Hurricane Electric – IPv6 tunnelbroker.net setup

NATIVE IPv6
EVERYWHERE

Tunnel Details - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Tunnel Details

HURRICANE ELECTRIC
INTERNET SERVICES

Account Menu
Click For Main Page
[Update Info](#)
[Logout](#)

User Functions
Combine Tunnels
Create Regular Tunnel
Create BGP Tunnel

Tunnel Details

Account: **mahtin** [Delete Tunnel](#)

Claim Code: [REDACTED]
Global Tunnel ID: [REDACTED] Local Tunnel ID: 970
Description: [REDACTED]

Server IPv4 address: 72.52.236.100
Server IPv6 address: 2001:470:1:1::164
Client IPv4 address: [REDACTED]
Client IPv6 address: 2001:470:1:1::164

Routed /48: [Allocate](#)
Routed /64: 2001:470:1:1::164
RDNS Delegation NS1: ns1.[REDACTED].com
RDNS Delegation NS2: ns2.[REDACTED].com
RDNS Delegation NS3: ns3.[REDACTED].com

ASN: none
Registration Date: Sat, Apr 5, 2008

Example OS Configurations (Windows, Linux, etc.):

Linux-net-tools

The configurations provided are only example configurations and may be different depending on the version OS or tools you are using. If you have any issues getting your tunnel to work please contact us at ipv6@he.net and we will be happy to assist you.

Quick Links
[Certification](#)
[Tunnelbroker](#)
[Forums](#)
[IPv6 Blog Posts](#)
[Usage Statistics](#)
[Network Map](#)
[Looking Glass \(v4/v6\)](#)
[Route Server \(telnet\)](#)
[Global IPv6 Report](#)
[IPv6 BGP View](#)

Services
[Transit](#)
[Colocation](#)
[Dedicated Servers](#)

Done

BGP

Configuration information



Hurricane Electric – IPv6 tunnelbroker.net setup

NATIVE IPv6
EVERYWHERE

Windows XP



```
ipv6 install
ipv6 rtu ::/0 2/::72.52.##.## pub
ipv6 adu 2/2001:470:##:##::2
```

Linux



```
modprobe ipv6
ip tunnel add he-ipv6 mode sit \
  remote 72.52.##.## local ##.##.##.## ttl 255
ip link set he-ipv6 up
ip addr add 2001:470:##:##::2/64 dev he-ipv6
ip route add ::/0 dev he-ipv6
ip -f inet6 addr
```

MacOS X



```
ifconfig gif0 tunnel ##.##.##.## 72.52.##.##
ifconfig gif0 inet6 2001:470:##:##::2 2001:470:##:##::1 prefixlen 128
route -n add -inet6 default 2001:470:##:##::1
```

Windows Vista & Windows 7



```
netsh interface ipv6 add v6v4tunnel IP6Tunnel ##.##.##.## 72.52.##.##
netsh interface ipv6 add address IP6Tunnel 2001:470:##:##::2
netsh interface ipv6 add route ::/0 IP6Tunnel 2001:470:##:##::1
```

Juniper JunOS



```
interfaces {
  ip-0/1/0 {
    unit 0 {
      tunnel {
        source ##.##.##.##;
        destination 72.52.##.##;
      }
      family inet6 {
        address 2001:470:##:##::2/64;
      }
    }
  }
}
```

Cisco IOS



```
configure terminal
interface Tunnel0
description Hurricane Electric IPv6 Tunnel Broker
no ip address
ipv6 enable
ipv6 address 2001:470:##:##::2
tunnel source ##.##.##.##
tunnel destination 72.52.##.##
tunnel mode ipv6ip
ipv6 route ::/0 Tunnel0
end
write
```

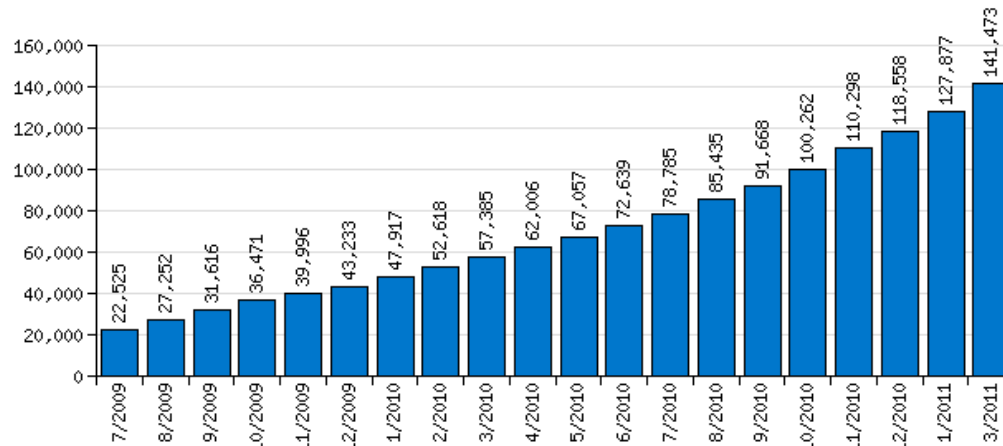


Hurricane Electric – IPv6 tunnelbroker.net stats

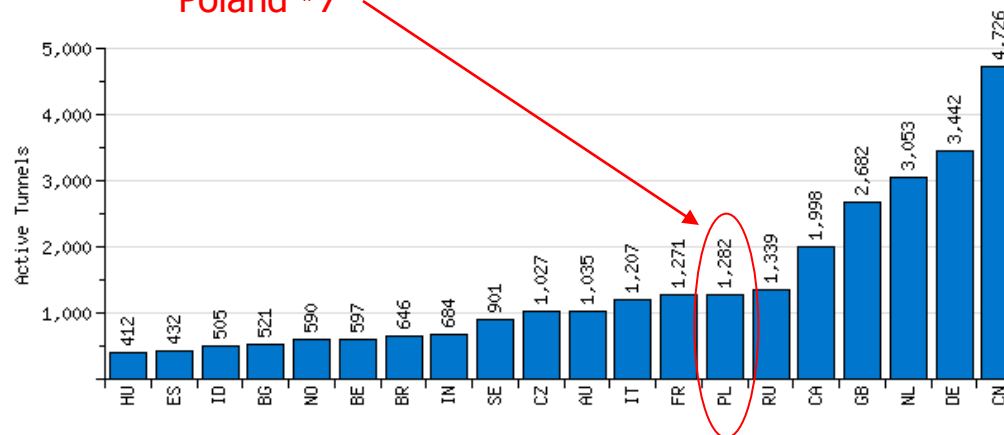
NATIVE IPv6 EVERYWHERE

Country	Users	%
 United States	21,887	38.00 %
 China	4,726	8.20 %
 Germany	3,442	6.00 %
 Netherlands	3,053	5.30 %
 United Kingdom	2,682	4.60 %
 Canada	1,998	3.50 %
 Russian Federation	1,339	2.30 %
 Poland	1,282	2.20 %
 France	1,271	2.20 %
 Italy	1,207	2.10 %
 Australia	1,035	1.80 %
 Czech Republic	1,027	1.80 %
 Sweden	901	1.60 %
 India	684	1.20 %
 Brazil	646	1.10 %
 Belgium	597	1.00 %
 Norway	590	1.00 %
 Bulgaria	521	0.90 %
 Indonesia	505	0.87 %
 Spain	432	0.75 %
 Hungary	412	0.71 %
 Ukraine	403	0.70 %
 Slovenia	388	0.67 %
 Switzerland	360	0.62 %
 Romania	337	0.58 %
 Austria	298	0.52 %
 Japan	283	0.49 %
 Hong Kong	282	0.49 %

Account Growth Last 20 Months



Tunnels by Country



Stats available at: <http://tunnelbroker.net/>



Hurricane Electric's Free IPv6 Certification Program

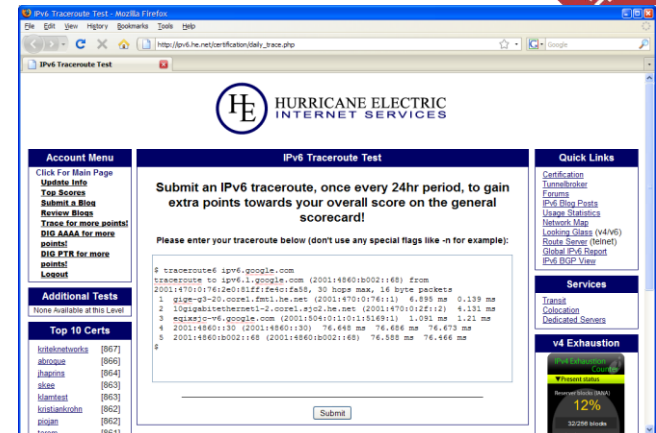
<http://ipv6.he.net/certification/>



Hurricane Electric – IPv6 Certification (and learning)

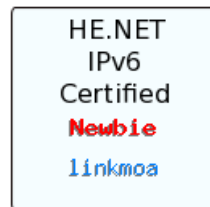
NATIVE IPv6 EVERYWHERE

- Prove that you have IPv6 connectivity
- Prove that you have a working IPv6 web server
- Prove that you have a working IPv6 email address
- Prove that you have working forward IPv6 DNS
- Prove that you have working reverse IPv6 DNS for your mail server
- Prove that you have name servers with IPv6 addresses that can respond to queries via IPv6
- Prove your knowledge of IPv6 technologies through quick and easy testing



- the format of IPv6 addresses
- AAAA records
- reverse DNS for IPv6
- the IPv6 localhost address
- the IPv6 default route
- the IPv6 documentation prefix
- the IPv6 link local prefix
- the IPv6 multicast prefix
- do an IPv6 ping
- do an IPv6 traceroute
- common IPv6 prefix
- and more!

<http://ipv6.he.net/certification/>



28,500++ Certifications!



Hurricane Electric – IPv6 Certification (sample test)

NATIVE IPv6
EVERYWHERE

<http://ipv6.he.net/certification/>

The test – to send and receive IPv6 emails

Administrator

Congratulations, you are an IPv6 Enthusiast! The next step after getting your website online is to make it so you can receive email via IPv6. What you will need is:

- An IPv6 enabled mail system
- Note: If you have "Greylisting" enabled, either whitelist `ipv6@he.net` or: send, wait for your greylist timer to expire and then reset and send again. We are working on a better solution to this issue.

[\[Reset Test\]](#)

Step	Description	Data
1	Generate a New User Code	Generated
2	Tell us what your IPv6 capable email address is (Including the domain):	<input type="text"/>
3	Schedule a test, and we will email you your new User Code	<input type="button" value="Send It!"/>
4	Tell us what the code was:	<input type="text"/> <input type="button" value="->"/>



Hurricane Electric – IPv6 Certification Levels

NATIVE IPv6
EVERYWHERE

Newbie Test

This is a basic level test of the information here. With this primer at hand these questions should be a snap for you.

Enthusiast Test

This test validates that you have an IPv6 capable machine setup that can browse the web via IPv6, as well as the fact that you have a web server setup that can serve files via IPv6.

Administrator Test

This test validates that your SMTP server is able to accept mail over IPv6

Professional Test

This test validates that Reverse DNS for the IPv6 address of your SMTP server is properly configured.

Guru Test

This test validates that your nameservers have AAAA records for themselves and that these nameservers can be queried over IPv6 for your domain.

Enthusiast Questionnaire

These are a few questions to gauge interest and usage level for IPv6 and gather data as to your experiences with IPv6 deployments.

Administrator Questionnaire

These are a few questions to gauge interest and usage level for IPv6 and gather data as to your experiences with IPv6 deployments.

Professional Questionnaire

These are a few questions to gauge interest and usage level for IPv6 and gather data as to your experiences with IPv6 deployments.

Guru Questionnaire

These are a few questions to try to gauge interest and usage level for IPv6 and gather data as to your experiences with IPv6 deployments.

Enthusiast Technical Test

This test covers technical knowledge of ping and traceroute commands on Linux and Windows.

Administrator Technical Test

This test covers technical knowledge of DNS and general IPv6 topics.

Professional Technical Test

This test covers technical knowledge of well known IPv6 prefixes and expands on your understanding of IPv6 related Linux and Windows commands.

Guru Technical Test

This test covers technical knowledge of IPv6 routing and IPv6 related protocols.

Explorer Test

This test validates that you have Native or Tunneled IPv6.

Sage Test

This test validates that you have IPv6 Glue at your registrar



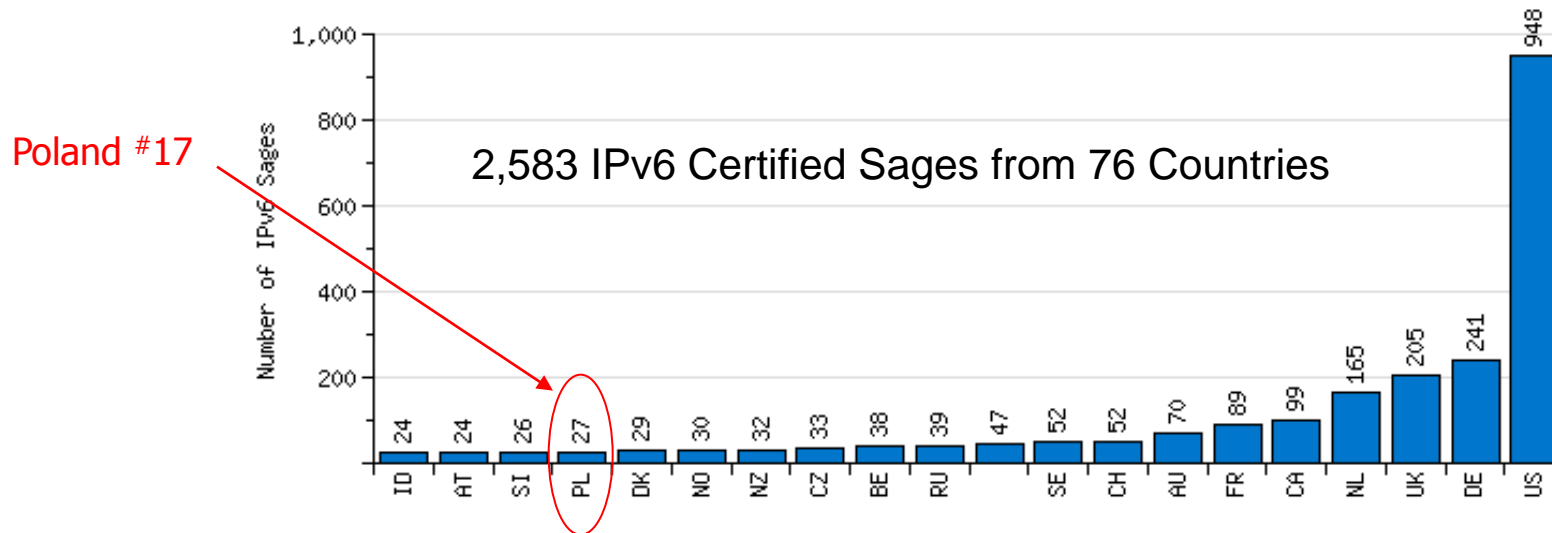
Hurricane Electric – IPv6 Certification – Sages

NATIVE IPv6
EVERYWHERE

EU (European Union)	1,051
United States	948

Europe	1,202
North America	1,057
South America	39
Asia	125
Africa	8
Oceania	105
Unknown	47
TOTAL	2,583

Top 20 IPv6 Sages by Country



Sage level is the highest level obtainable.

http://tunnelbroker.net/usage/sages_by_country_and_state.php



IPv6 certification (on a lighter note) ...

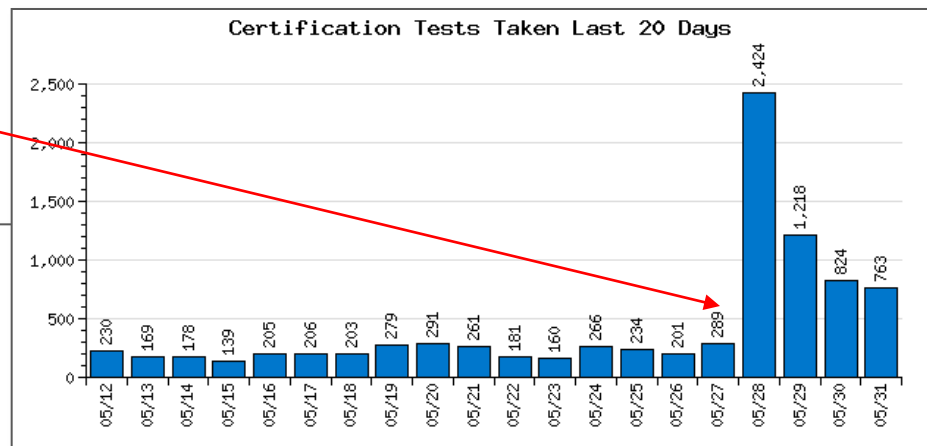
Motivating people to
think about IPv6

... maybe t-shirts will help?

Summary – IPv6 certifications and t-shirts

NATIVE IPv6
EVERYWHERE

Hurricane Electric sends email
saying "free IPv6 t-shirt"
for sage-level users



From: <ipv6@he.net>
Date: Thu, May 27, 2010 at 11:32 PM
Subject: Hurricane Electric IPv6 Update

...
* Attention Sages!

Hurricane Electric would like to send you an "IPv6" T-shirt!

Please log into <http://ipv6.he.net/certification/>, and verify your address information which will only be used for shipping out this T-shirt.

After making certain it is correct (remember to click "Update Info" if you made changes, before validating), you will see T-shirt size selections for S/M/L/XL/XXL, and a button that will submit your preferred shirt size and log that you have validated your address.

This is optional, and will only be sent to validated addresses.

We'll be adding on some points to your score for Sages that want to get a T-shirt!

We are looking to get the t-shirts out around the end of June. We need make sure to get enough of each size before sending them out to all of you. ...



Hurricane Electric - Exhaustion Counters

NATIVE IPv6
EVERYWHERE

*Finally. Maybe this will help convince
someone important...*

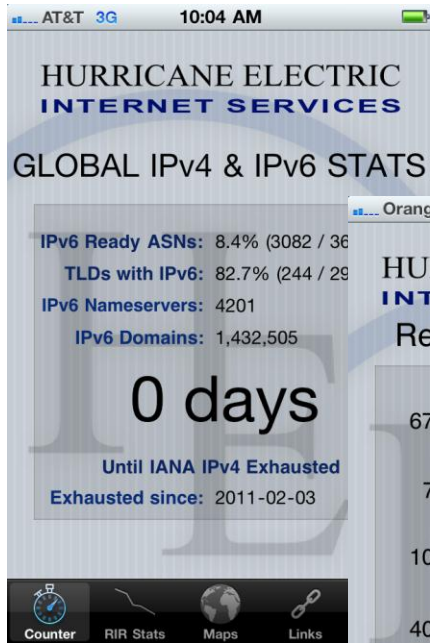
Exhaustion Counters

<http://ipv6.he.net/statistics/>



Hurricane Electric IPv4 Exhaustion Counters

NATIVE IPv6 EVERYWHERE



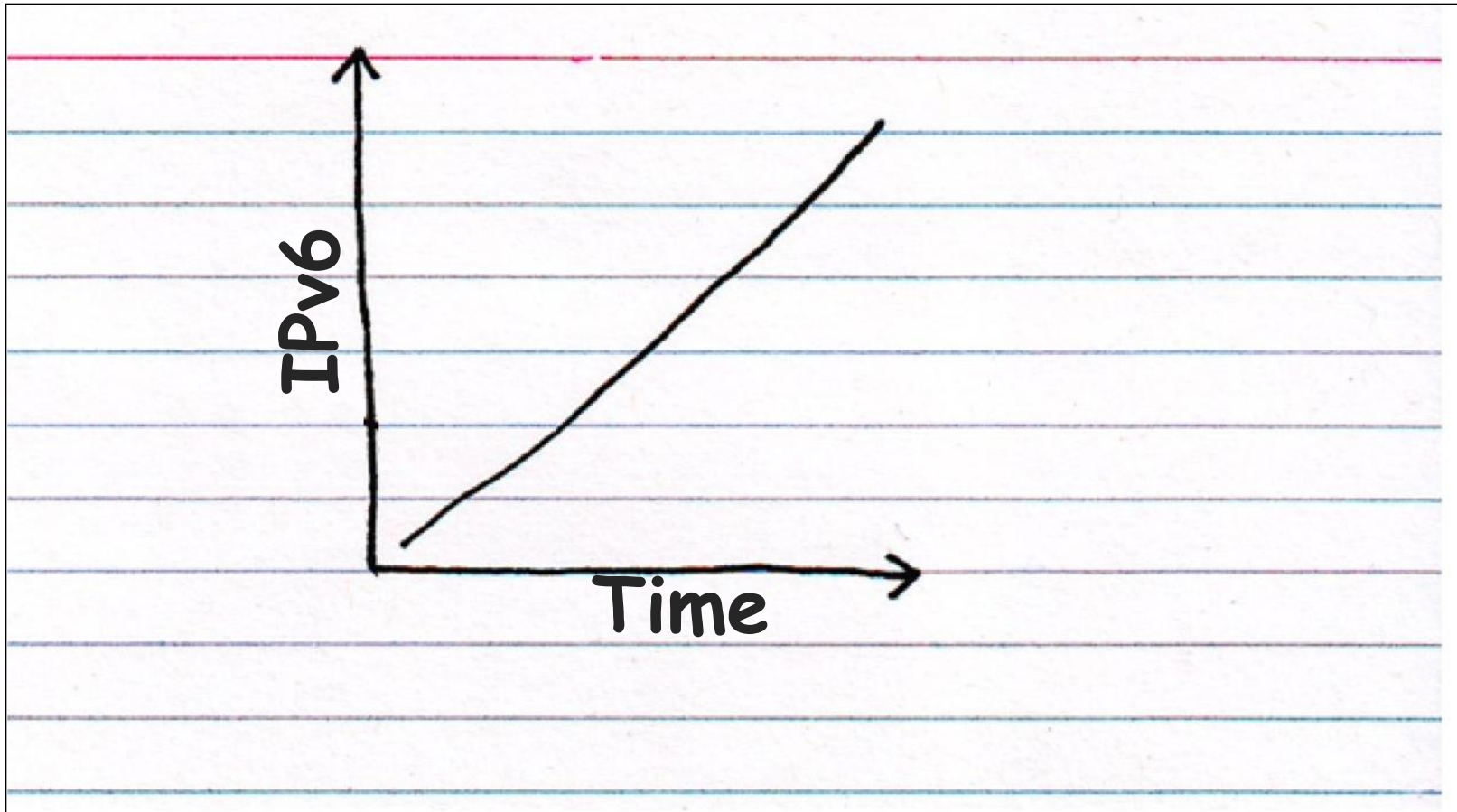
<http://ipv6.he.net/statistics/>

<http://bgp.he.net/ipv6-progress-report.cgi>



Summary – Have a positive IPv6 mindset

NATIVE IPv6
EVERYWHERE





Contact:

Martin J. Levy
Director, IPv6 Strategy
Hurricane Electric
760 Mission Court
Fremont, CA 94539, USA
<http://he.net/>

martin at he dot net
+1 (510) 580 4167