











It is important to remember that bgp.he.net uses data from public sources and other places to gather the data presented on the website.

BGP best path selection is used for the one direction. If you want to understand it more please look at the following link

https://tools.ietf.org/html/rfc4271

Also remember this is just one direction you would need to do traceroute or MRT to understand the return paths.

Cuick Links BGP Toolkit Home BGP Prefix Report BGP Peer Report BGP Peer Report BGP Peer Report BGP Deer Report BGP Deer Report	RICANE ELECTRIC ERNET SERVICES Search colkit Home Home Welcome to the Hurricane Electric BGP Toolkit. You are visiting from 220.86.114.11 the second seco	
World Report Multi Origin Routes DNS Report Top. Host Report Internet Statistics Looking Glass Network Tools App Free IPv6 Tunnel IPv6 Certification IPv6 Progress Going Native Contact Us	Announced as 220.80.0.0/13 Your ISP is AS4766 (Korea Telecom) Updated 16 Mar 2017 14.01 PST © 2017 Hurricane Electric	

Visiting from: this is your devices ip address Announced: subnet that your device is on Your ISP AS4766



In the search bar we typed in AS12779

This was used as it is an interesting example and as you can see it shows a summary of the IPS including all the internet exchanges and prefixes



You can see from this slide that there is a probable transit relationship with Cogent. More details will be examined on slide 12 showing the ipv4 graph.

It is key to note that there is no way to tell if there is any commercial relationship between AS12779 and any of the connected ASNs. We can only infer.



This is an interesting page and should be looked at closely.

As we can see there is some growth in both IPv4/v6 peers as we can see the two graphs growing up and to the left.

If we take a look into in both IPv4/v6 graphs we can see a sharp downward spike right around Feb

Route propagation is to the following networks:

Company	ASN	Company	ASN	Company	ASN
Hurricane	6939	TiNet	3257	Sparkle	6762
Qwest	209	Dtag	3320	Cogent	174
UUnet	701	Level3	3356	AT&T	7018
UUnet Europe	702	GBLX	3549	Comcast	7922
Cable and Wireless	1273	Savvis	3561	Telefonica	12956
Sprint	1239	Orange	5511	Abovenet	6461
Telia	1299	TATA	6453	IIJ	2497

Hurricane Electric - Massive Peering!

(HE)



This view shows that there is a ipv4 transit relationship between AS12799 and AS174 as well as AS3257 as they both are propagating routes to the rest of the world.



This view shows that there is a ipv6 transit relationship between AS12799 and AS174, AS3257 as well as AS6939 as they both are propagating routes to the rest of the world.

What is also shown on this page is that AS6939 looks to be preferred for IPv6 transit.

Prefix		Description					
5.104.26.0/23		ALL SRL					
5.104.28.0/22	🔍 ATCA	ALL SRL					
77.74.16.0/21	MOV	IMATICA Srl					
89.31.200.0/21	🔍 IT.Ga	te S.p.A.					
93.191.240.0/21		logon Srl					
176.221.48.0/21	Critic	Critical Case s.r.l					
185.59.80.0/22		IT.Gate S.p.A.					
185.73.136.0/22	FENI	FENICE SRL					
192.88.99.0/24	Interr	net Assigned Numbers Authority					
195.238.235.0/24	🔍 A.D.E	3. Analisi Dati Borsa S.p.A.					
212.110.32.0/19	🔍 IT.Ga	te S.p.A.					
213.212.128.0/18	🔍 IT.Ga	te S.p.A.					
213.254.0.0/19	IT.Ga	ite S.p.A.					

ROA - Route Origin Authorization is a technique which helps in validating a given route against its origin AS. ROA helps to verify whether a given ASN is authorized to announce a prefix or not. It helps in dealing with accidental or intentional route hijacks. Routers can be configured to give priority to routes where ROA check has been successful. HE's BGP tool shows a "green key" next to prefixes where ROA is present and is being validated against the announcement. Incase if a origin AS is not matching origin AS in ROA, tool shows a red key. No key appears incase ROA is not present.

This is the same details for the next slide



Rank	Description		IPv6	Peer
1	Cogent Communications		x	<u>AS174</u>
2	Hurricane Electric, Inc.		x	AS6939
3	RETN Limited		x	AS9002
4	Bharti Airtel Ltd		х	AS9498
5	Closed Joint Stock Company TransTeleCom		x	AS20485
6	PJSC Rostelecom		x	AS12389
7	PJSC "Vimpelcom"		x	AS3216
8	PJSC MegaFon		х	AS31133
9	Reliance Globalcom Limited	2 N N N N N N N N N N N N N N N N N N N	х	AS15412
10	COLT Technology Services Group Limited	2 N N N N N N N N N N N N N N N N N N N	x	AS8220

This shows the ASNs that have a direct connection to AS12779. It does not show if there is any paid peering arrangements.

http://bgp.he.net/AS12779#_peers6

Rank	Description	IPv4	Peer
1	Hurricane Electric, Inc.	x	<u>AS6939</u>
2	Cogent Communications	х	<u>AS174</u>
3	RETN Limited	х	AS9002
4	Bharti Airtel Ltd	х	AS9498
5	Interoute Communications Limited	х	<u>AS8928</u>
6	IP-Only Networks AB	 х	AS12552
7	COLT Technology Services Group Limited	х	AS8220
8	PJSC MegaFon	х	AS31133
9	Eweka Internet Services B.V.	х	AS12989
10	NORDUnet	 x	AS2603

http://	'bgp.he.net/AS12779#_whois
as-block: descr: remarks: region. mnt-by: created: last-modified: source:	AS12557 - AS13223 RIPE NCC ASN block These AS Numbers are assigned to network operators in the RIPE NCC service RIPE-NCC-HM-MNT 2010-05-11T11:45:03Z 2014-02-24T13:15:16Z RIPE
aut-num: as-name:	AS12779 ITGATE
	Hurricane Electric - Massive Peerine!

Whois shows the "who is" data for the given ASN or prefix and it is taken from appropriate RIR which has allocated the ASN. It helps in identifying contact details for the given resource.

incep•/		
RIPE		
aut-num:	AS12779	
as-name:	ITGATE	
remarks:		
remarks:	We do not use RPSL to generate routers configurations and our	
remarks:	complete routing policy would be too much verbose anyway, so	
remarks:	this object does not precisely reflect the actual policy in	
remarks:	use in our network.	
remarks:	The following import and export attributes define only an	
remarks:	upper bound of what we accept or announce from neighbors and	
remarks:	should not be interpreted literally.	
remarks:	We document the ASN and prefixes announced to peers in the	
remarks:	AS12779:AS-CUSTOMERS and AS12779:AS-CUSTOMERS-V6 as-sets	
remarks:	and we generate prefix and/or as-path filters for our peers	
remarks:	and customers using the data published in the RIPE routing	
remarks:	registry as much as feasible.	
remarks:		
import:	from AS-ANY accept ANY;	
export:	{ to AS-ANY announce AS12779:AS-CUSTOMERS: } refine { to AS12779:AS-	
DOWNSTREAMS	announce ANY; }	

IRR or Internet Routing Registry tab shows the data for a given ASN from IRR records. By default HE's BGP tool pulls data for a given ASN from all popular IRRs (RADB, RIPE, and other private registries). It also has direct links to AS sets appearing in the ASN.

nttp://bg	zp.he	e.ne	et/AS1	12779#	≠_ix
1					
AS Info Graph v4	Graph v6	Prefix	kes v4 Prefixes	s v6 Peers v4	Peers v6 Whois IRR IX
Exchange		сс	City	IPv4	IPv6
AMS-IX		NL	Amsterdam	80.249.209.17	2001:7f8:1::a501:2779:1
DE-CIX Frankfurt		DE	Frankfurt	80.81.194.186	2001:7f8::31eb:0:1
France-IX		FR	Paris	37.49.236.177	2001:7f8:54::177
LINX Juniper LAN	<u> N</u>	GB	London	195.66.226.31	2001:7f8:4::31eb:1
Lyonix		FR	Lyon	77.95.71.201	2001:7f8:47:47::c9
MIX-IT		IT	Milan	217.29.66.65	2001:7f8:b:100:1d1:a5d1:2779:65
TOP-IX		IT	Turin	194.116.96.4	2001:7f8:23:ffff::3

This show all the IXs that AS12779 is connected.

However if AS12779 is connected to an IX that is not in the peeringdb.com it will not show up.



This simply shows the growth of the subnets being advertised over time.

It does not show disaggregation of subnets. there is now an active feature request but no release date has been provided.



The areas of unallocated address space are called the bogon space. A network should never advertise bogon space.



This simply shows the growth of ASNs over time.

A unique ASN is allocated to each AS for use in BGP routing. AS numbers are important because the ASN uniquely identifies each network on the Internet.

https://en.wikipedia.org/wiki/Autonomous_system_(Internet)#Types_

v6 Distribu	ition	
v6 Distribu	ition	
v6 Distribu	ition	
Distribu	luon	
Prefixes	ASNs	Prefixes / ASN
197,599	18,321	10
54,086	501	107
50,280	4,256	11
35,863	1,430	25
28,352	4,799	5
23,783	1,296	18
20,121	1,537	13
19,251	740	26
	I	
	Prefixes 197,599 54,086 50,280 35,863 28,352 23,783 20,121 19,251	Prefixes ASNs 197,599 18,321 54,086 501 50,280 4,256 35,863 1,430 28,352 4,799 23,783 1,296 20,121 1,537 19,251 740

If you want to learn more about each country and what provider and subnets are visible this is a great starting place! Selecting the report will launch more details on the country

Prefixes Bogons Networks Countries v4 Countr	ies v6 Distribu	ution	
IPv6 Announcements by Country Country	Prefixes	ASNs	Prefixes / ASN
United States	14,048	2,804	:
Brazil	4,228	1,776	:
United Kingdom	2,095	706	:
Germany	1,901	894	:
Canada 🔶	1,404	322	
India 🔹	1,360	224	
Netherlands	1,263	489	:
Russian Federation	1,175	722	
Australia	997	345	:
		·	

1 7	/	Dg	5P•	nc	•11			po	91L/	Pr		105	// _C	1150	110	unc	/11
Prefixes	Bog	gons	Ne	etwor	ks	Cou	Intries	s v4	Coun	tries v	/6	istribu	ition				
Pv4 Ann	oun	ced	Prefi	x Co	unt l	by C	IDR a	nd G	rowth	over	1000	Days					
CIDR:	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Count:	20	13	38	103	290	556	1,111	1,963	14,176	9,519	16,021	30,38	1 46,060	52,333	94,124	78,325	415,82
Change:	4	1	8	15	28	59	90	181	689	1,682	3,127	3,42	5 6,939	10,383	30,063	26,247	124,85
Percent:	25%	8%	26%	17%	10%	11%	8%	10%	5%	21%	24%	129	6 17%	24%	46%	50%	429
Due Ann		aad	Drofi	× Co	unt l			nd G	rowth	ovor	1000	Dave					
CIDR:		16	19	20	2	1 2	2 2	3 2	4 2	5	26	27	28	29	30	31	32
Count:		14	2		9	3	4	4	20	5	89	16	78	1,611	136	110	9,208
Change	:	3	0		3	0	0	0	5	1	75	2	19	1,173	57	55	3,091
Percent	:	27%	0%	509	6 0	% (0% 0	% 3	3% 2	5%	535%	14%	32%	267%	72%	100%	50%

Prefix distribution shows distribution of /8s to /24s visible in the routing table (IPv4) and /16 to /32 (IPv6). It shows count of announcement with each of those masks and changes in last 1000 days.



This shows you the top 10 most connected networks.

Internet peering is the relationship whereby two networks reciprocally provide access to each other's customers.



This is a graphical representation of ipv4/6 connectivity over time.

It is important to note that this is for unique networks not all peering sessions.

So for example if you had 6 sessions with AS6939 it would count as one.





This is a graphical representation of ipv4/6 prefixes over time.



This is a graphical representation of ipv4/6 addresses.

nternet Exchanges Exc	hange Participant	S			
Internet Exchange	Members ↓	Data	СС	City	Website
PTT São Paulo	1,016	8	BR	Sao Paulo	ptt.br
AMS-IX	851	٢	NL	Amsterdam	www.ams-ix.net
DE-CIX Frankfurt	730	٢	DE	Frankfurt	www.de-cix.net
LINX Juniper LAN	724	٢	GB	London	www.linx.net
Data IX	461	٢	RU	St.Petersburg	www.dataix.ru
MSK-IX Moscow	422	٢	RU	Moscow	www.msk-ix.ru
NL-IX	382	٢	NL	Amsterdam	www.nl-ix.net
LINX Extreme LAN	336	0	GB	London	www.linx.net
Equinix Paris	336	٢	FR	Paris	www.equinix-ix.fr
Equinix Ashburn	278	8	US	Ashburn	ix.equinix.com

This this of exchanges is generated from peeringdb.com and several other sources.



The exchange most connected networks



This is a graphical representation of ipv4/6 bogons over time.

ogons IPv4 by Origin IPv6 by Origin IPv4 by Prefix IPv6 by Prefix				
ASN	Name	Prefixes		
AS81	MCNC	<u>192.154.32.0/19</u> -> unallocated <u>192.154.64.0/19</u> -> unallocated		
AS112	DNS-OARC	192.31.196.0/24 -> unallocated		
AS209	Qwest Communications Company, LLC	209.193.112.0/20 -> unallocated		
AS680	Verein zur Foerderung eines Deutschen Forschungsnetzes e.V.	192.124.252.0/22 -> unallocated		
AS701	Verizon Business/UUnet	<u>198.168.0.0/16</u> -> unallocated 208.67.132.0/22 -> unallocated 209.135.171.0/24 -> unallocated 209.135.175.0/24 -> unallocated		
AS702	Verizon Business/UUnet Europe	192.101.72.0/24 -> unallocated		
<u>AS721</u>	DoD Network Information Center	192.188.208.0/20 -> unallocated 198.97.72.0/21 -> unallocated 198.97.98.0/19 -> unallocated 198.97.240.0/20 -> unallocated 199.121.0.0/16 -> unallocated 199.123.16.0/20 -> unallocated		
AS812	Rogers Communications Canada Inc.	198.62.196.0/24 -> unallocated		

You do not want to be announcing bogons



When AS81 removes the bogon announces red bar will no longer be there.

	I					
Countries	95					
Countries with ASNs: 240						
Descr	iption	СС	ASNs	Report		
United States		US	26,270	Report		
Russian Federation		RU	6,267	Report		
Brazil	•	BR	4,668	Report		
United Kingdom		GB	2,661	Report		
Poland		PL	2,406	Report		
Germany		DE	2,295	Report		
Australia	×	AU	2,267	Report		
Ukraine		UA	2,244	Report		
Canada	+	CA	1,973	Report		

ountry Info	try Info				
Netwo	orks: Philippines				
ASN	Name	Adjacencies v4	Routes v4 ↓	Adjacencies v6	Routes v6
AS9299	Philippine Long Distance Telephone Company	154	1,042	12	5
AS4775	Globe Telecoms	154	503	29	3
AS9658	Eastern Telecoms Phils., Inc.	71	493	10	3
AS6648	Bayan Telecommunications, Inc.	111	290	8	5
AS55303	60 Market Square, P.O. Box 364	17	274	1	10
AS23930	IP-Converge Data Center, Inc.	41	224	7	1
AS132199	Globe Telecom Inc.	1	210	0	0
AS17639	ComClark Network & Technology Corp.	40	202	8	4
AS23944	SKYBroadband SKYCable Corporation	26	153	0	0
AS10139	Smart Broadband, Inc.	1	147	1	1

What you can see here is the report of the Philippines

Take the time to click on AS132199 and you can see that that ASN is connected to AS4775.

Question. What ASN on this page is single attached to AS9299?

)utes#_ipv4multioriginroutes IPv4 Multi Origin Routes IPv6 Multi Origin Routes				
Prefix	Description	Origin ASNs		
69.36.157.0/24	VeriSign Infrastructure & Operations	AS36616, AS36617, AS36618, AS36619, AS36620, AS36621, AS36622, AS36623, AS36624, AS36625, AS36626, AS36626, AS36620, AS366631, AS36632		
192.42.176.0/24	VeriSign Global Registry Services	AS36616, AS36617, AS36618, AS36619, AS36620, AS36621, AS36622, AS36623, AS36624, AS36625, AS36626, AS36626, AS36620, AS36631, AS36632		
192.82.134.0/24	VeriSign Global Registry Services	AS36616. AS36617. AS36618. AS36619. AS36620. AS36621. AS36622. AS36623. AS36624. AS36625. AS36626. AS36626. AS36626. AS36632. AS36630.		

Multi-origin routes are the cases where a given prefix is being announced by different ASNs. This can be done for various administrative reasons. First column shows prefix and third column shows the ASNs which are originating that prefix. Table is a formed by aggregated data and it may be reflecting case where an AS is announcing pool in one region & other ASN is announcing it in other region.



