

ASN*tryst*

A RIPE Atlas Hackathon Project

Project

- ASN Tryst is an ASN to ASN interconnect viewer written during the November/2015 RIPE Atlas Hackathon in Bucharest Romania (just prior to RIPE71)
 - A closer look a RIPE Atlas traceroute data to find relations between networks

2966283	C ⚡ ⁴	pe-lim-as27843.anchors.atla...	Anchoring Measurement: Traceroute IPv4 for anch...	406	2015-11-17 10:39 No Stop Defined	▶
2966279	C ⚡ ⁴	nat64-test.phicoh.nl	Normal traceroute measurement to nat64-test.phi...	1	2015-11-17 10:37 No Stop Defined	▶
2966274	C ⚡ ⁶	nat64-test.phicoh.nl	NAT64 traceroute measurement to nat64-test.phic...	1	2015-11-17 10:32 No Stop Defined	▶
2957512	C ⚡ ⁶	cl-scl-as27678.anchors.atla...	Anchoring Measurement: Traceroute IPv6 for anch...	224	2015-11-16 11:16 No Stop Defined	▶
2957509	C ⚡ ⁴	cl-scl-as27678.anchors.atla...	Anchoring Measurement: Traceroute IPv4 for anch...	408	2015-11-16 11:16 No Stop Defined	▶
2935380	C ⚡ ⁴	www.yelp.com	Traceroute www.yelp.com RoP	50	2015-11-15 05:04 No Stop Defined	▶
2934974	C ⚡ ⁴	www.yelp.co.uk	Traceroute www.yelp.co.uk RoP	50	2015-11-15 04:56 No Stop Defined	▶
2933585	C ⚡ ⁴	199.255.190.20	Traceroute measurement to 199.255.190.20	50	2015-11-15 01:26 No Stop Defined	▶
2929211	C ⚡ ⁴	130.192.9.180	target=130.192.9.180 [1447542000:1448146800]	21	2015-11-14 23:00 2015-11-21 23:00	▶
2929783	C ⚡ ⁶	www.bknix.co.th	campaign:th-mon-run2 type:traceroute host:www.b...	10	2015-11-14 20:25 No Stop Defined	▶

Team

- Team created on-the-fly Saturday morning
 - Alexander Isavnin <isavnin -at- gmail -dot- com>
 - Dmitry Kohmanyuk <dmitry -dot- kohmanyuk -at- gmail -dot- com>
 - Martin Levy <mahtin -at- mahtin -at- com>
 - James Reilly <fun -at- fb -dot- com>
 - Christian Teuschel <cteusche -at- ripe -dot- net>
- Help from
 - Emile Aben <emile -dot- aben -at- ripe -dot- net>
 - plus others ...

Motivation

- Motivation:
 - It would be nice to know where one ASN interconnects with another ASN
 - There's 1,000's of traceroutes running within Atlas every minute
 - They are for many random sources towards many semi-random destinations
 - A trace may pass between one backbone (ASN) and another backbone (a different ASN)

```
aws$ traceroute -f6 -m14 -q1 www.telmex.net
traceroute to www.telmex.net (201.147.20.245), 14 hops max, 60 byte packets
 6  54.239.111.88 (54.239.111.88)  23.961 ms
 7  54.239.109.121 (54.239.109.121)  1.099 ms
 8  dca2-edge-01.inet.qwest.net (67.133.224.205)  0.953 ms
 9  dep-brdr-04.inet.qwest.net (67.14.28.18)  2.094 ms
10  63.146.27.246 (63.146.27.246)  2.231 ms
11  ae-3.r22.asbnva02.us.bb.gin.ntt.net (129.250.6.112)  1.804 ms
12  ae-5.r23.lsanca07.us.bb.gin.ntt.net (129.250.3.189)  72.994 ms
13  ae-2.r00.lsanca07.us.bb.gin.ntt.net (129.250.3.238)  65.201 ms
14  129.250.199.34 (129.250.199.34)  80.190 ms
aws$
```

AS209

AS2914

Methodology

- Spend zero RIPE Atlas credits
- Query RIPE Atlas database (via API) and:
 - Collect a list of measurement IDs (public tests)
 - Collect the many traceroutes run by that one measurement
 - Repeat for all measurement IDs
 - Scan the sequential IP addresses from the traceroute
 - Detect when the next IP address is from a different ASN
 - Place the pair of IP addresses that show an ASN boundary in a database table (the pairs table)
 - Repeat, repeat, repeat
- Match the IP pairs table with a geo-database (OpenIPMap - marmot.ripe.net/openipmap/)
 - Display on a map

Database

- Tables:
 - measurements (measurement_id, af, description, start, stop, interval)
 - ipv4/ipv6 IP's found (ip, asn)
 - ipv4pairs/ipv6pairs (ip1, ip2)
 - locations (ip, lat, long, city, hostname)
 - mids (measurement_id, af, timestamp, pair_id)

Database

- Results (so far):

175415 measurement_id's found
79730 traceroutes

41334 IPv4's found at an ASN boundary
27354 IPv6's found at an ASN boundary

53729 IPv4's in geoloc (from Emile)
24023 IPv6's in geoloc (from Emile)

11658 IP pairs found
3342 asns found
3236 dots
2610 unique dots
626 coincident dots (ie. more than one pair in a location)
2290 IP1,IP2 pairs with only one geoloc

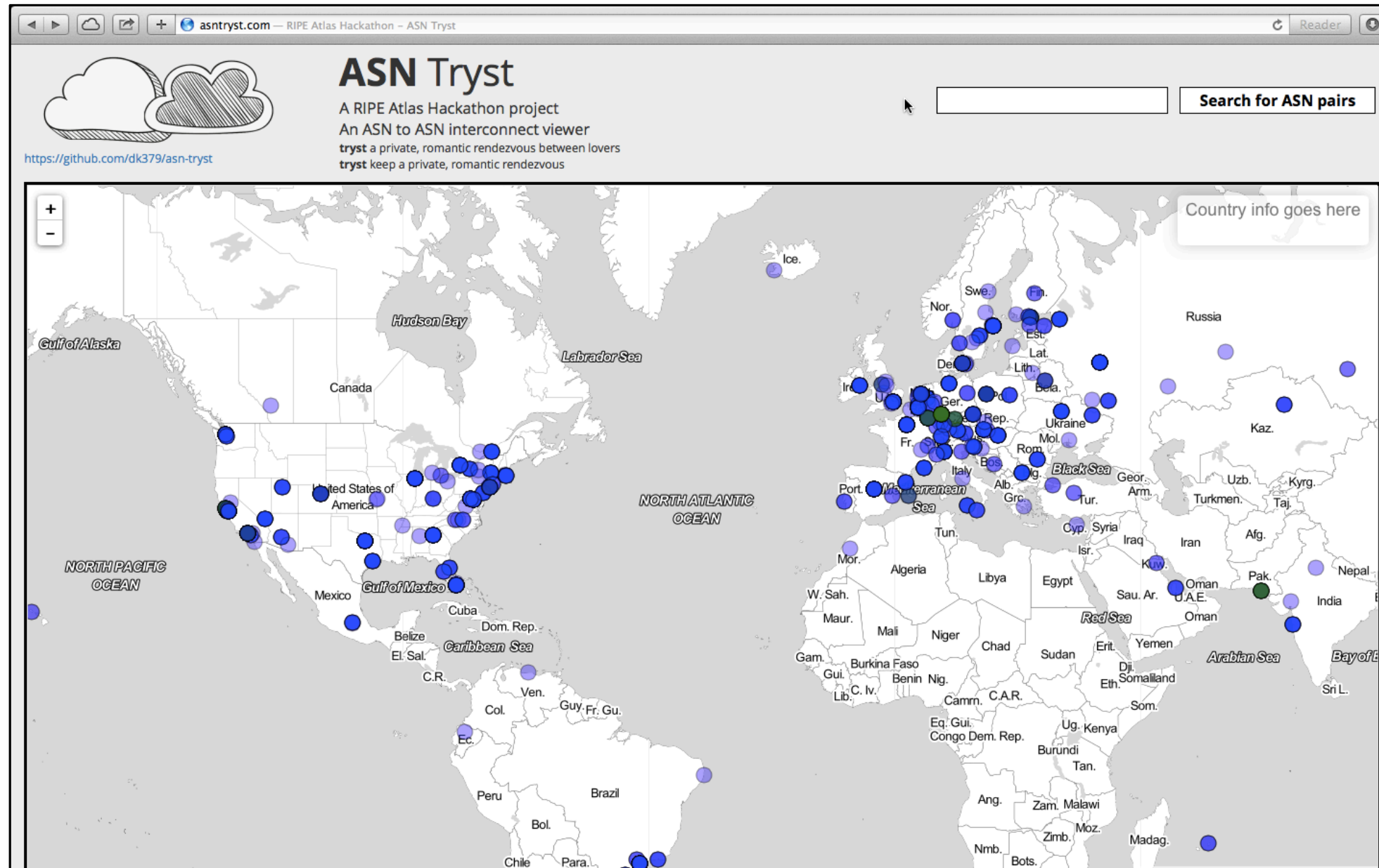
Database

- Results (so far):

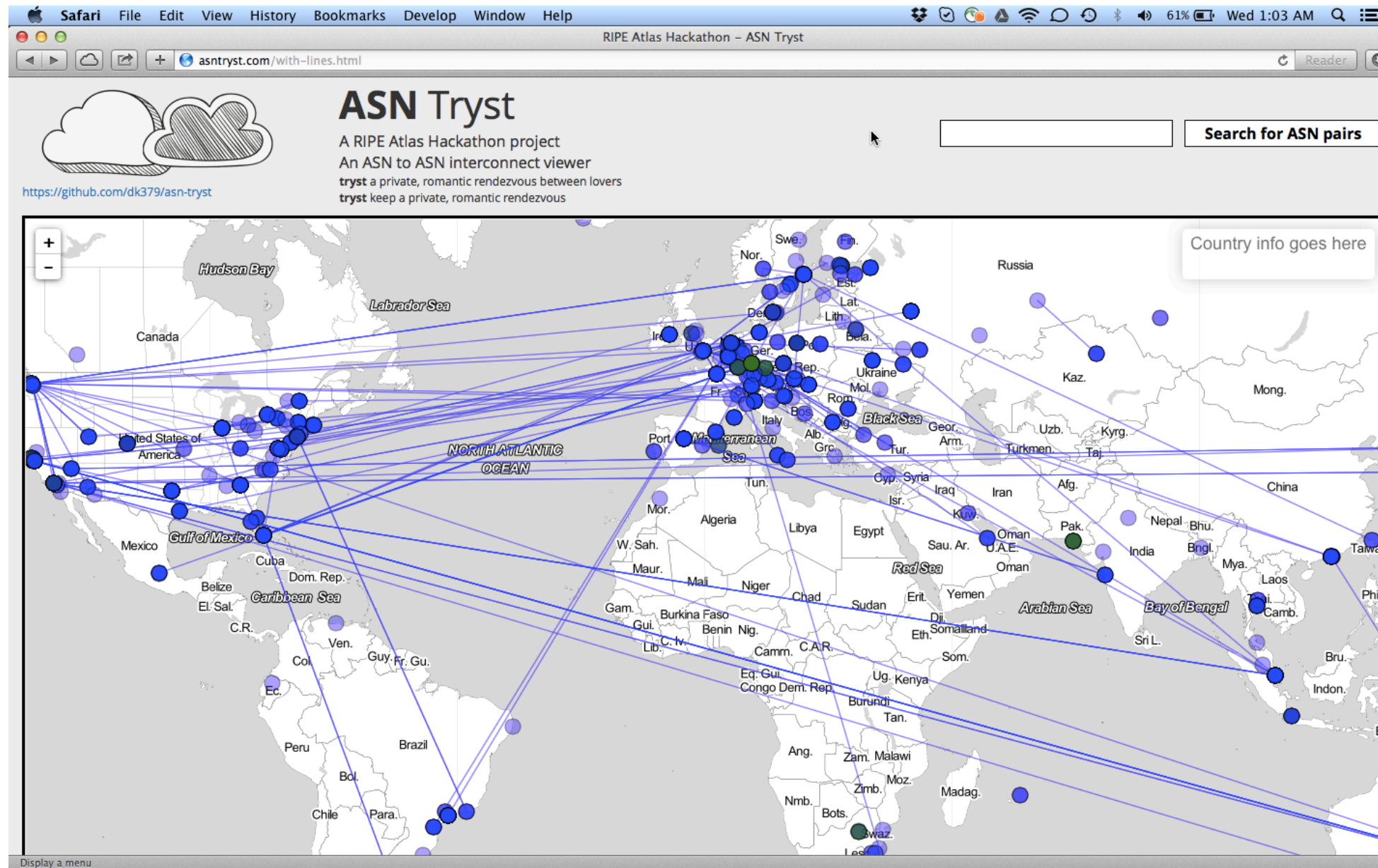
#	City
176	London, England, GB
133	Frankfurt am Main, Hesse, DE
114	Amsterdam, North Holland, NL
97	Los Angeles, California, US
91	New York, New York, US
82	Paris, Île-de-France, FR
69	San Jose, California, US
63	Miami, Florida, US
55	Stockholm, Stockholm, SE
48	Singapore, , SG

#	AUTNUM	name
1020	1299	TeliaSonera International Carrier
732	2914	NTT America, Inc.
708	174	Cogent Communications
545	3257	Tinet SpA
483	3356	Level 3 Communications, Inc.
372	6453	TATA COMMUNICATIONS (AMERICA) INC
296	6939	Hurricane Electric, Inc.
275	3549	Level 3 Communications, Inc. (GBLX)
257	6762	TELECOM ITALIA SPARKLE S.p.A.
162	6461	Abovenet Communications, Inc
157	3320	Deutsche Telekom AG
137	7018	AT&T Services, Inc.
135	2828	XO Communications
88	1239	Sprint
85	701	Verizon Business/UUnet
13	702	Verizon Business/UUnet Europe
6	5511	Orange S.A.
5	703	Verizon Business/UUnet ASPAC

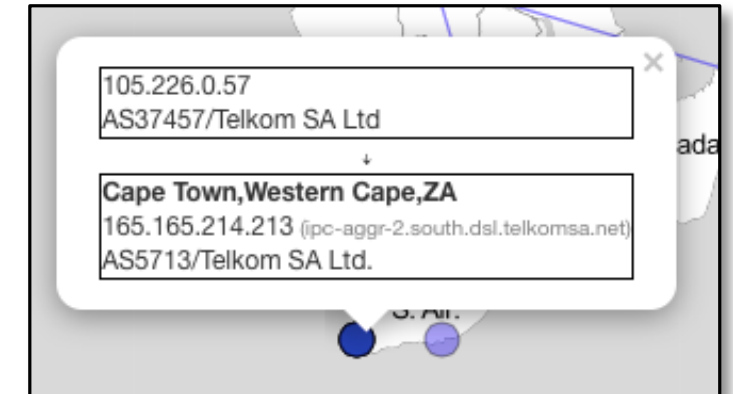
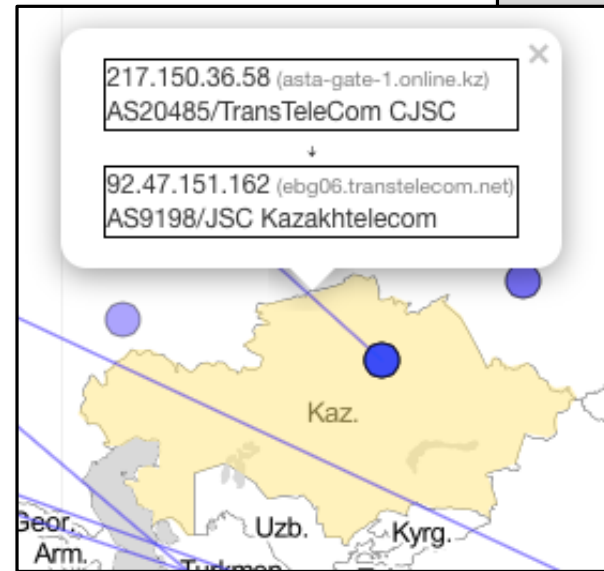
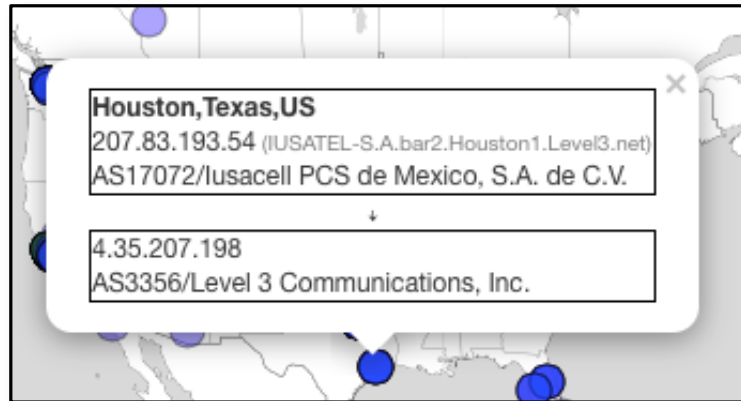
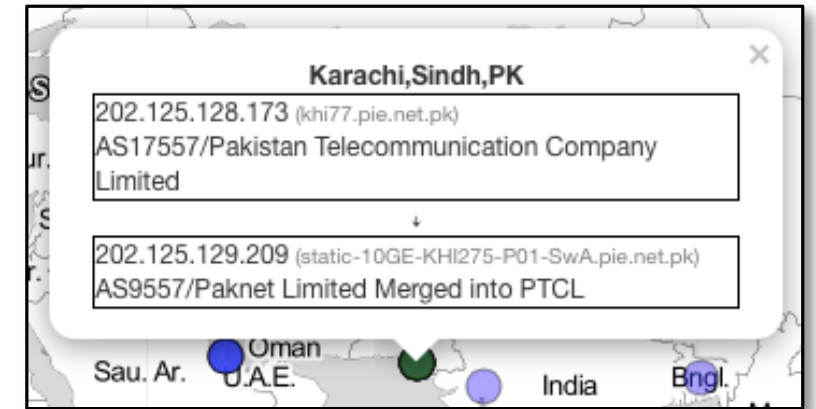
Results



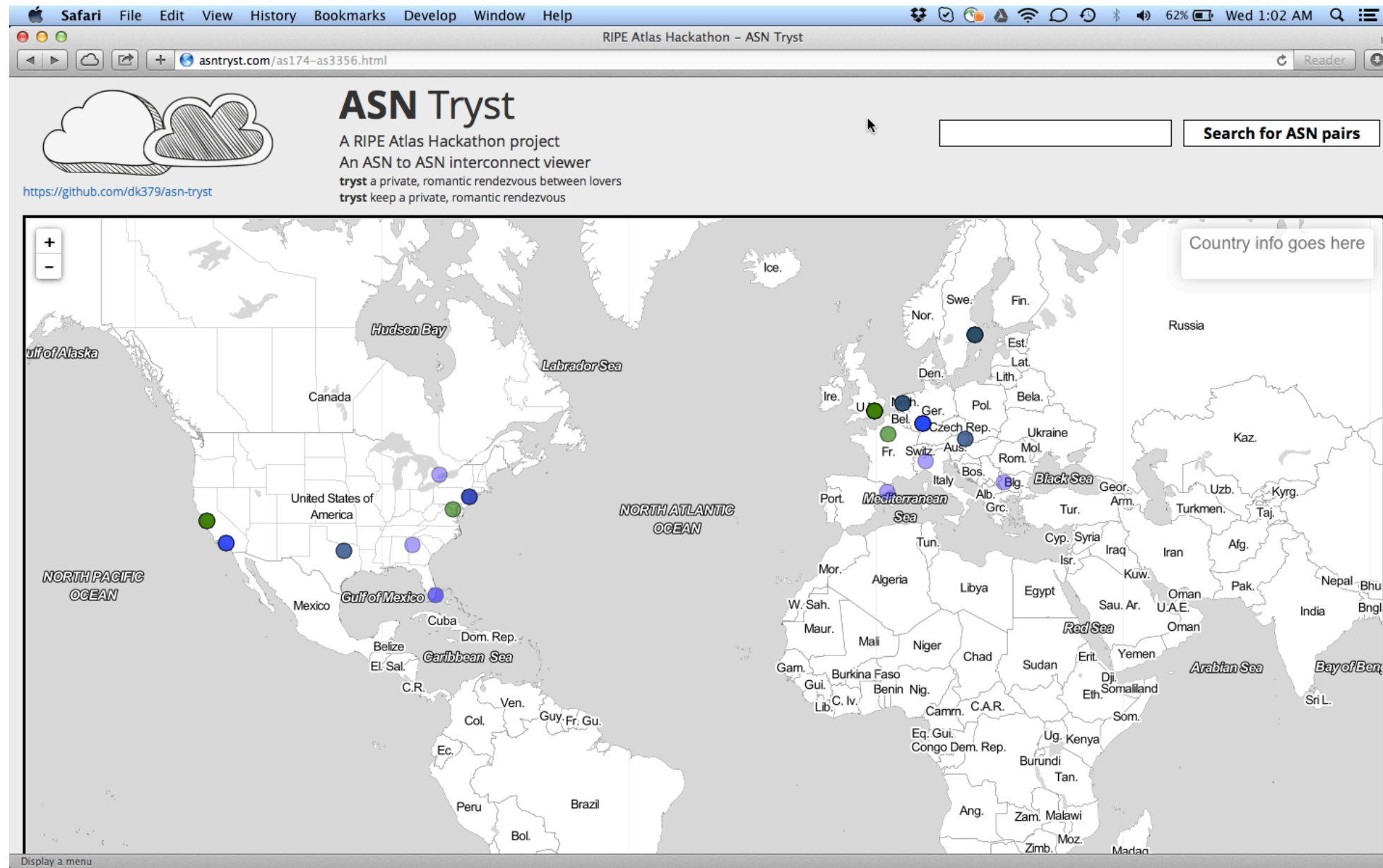
Results (lines between ASNs)



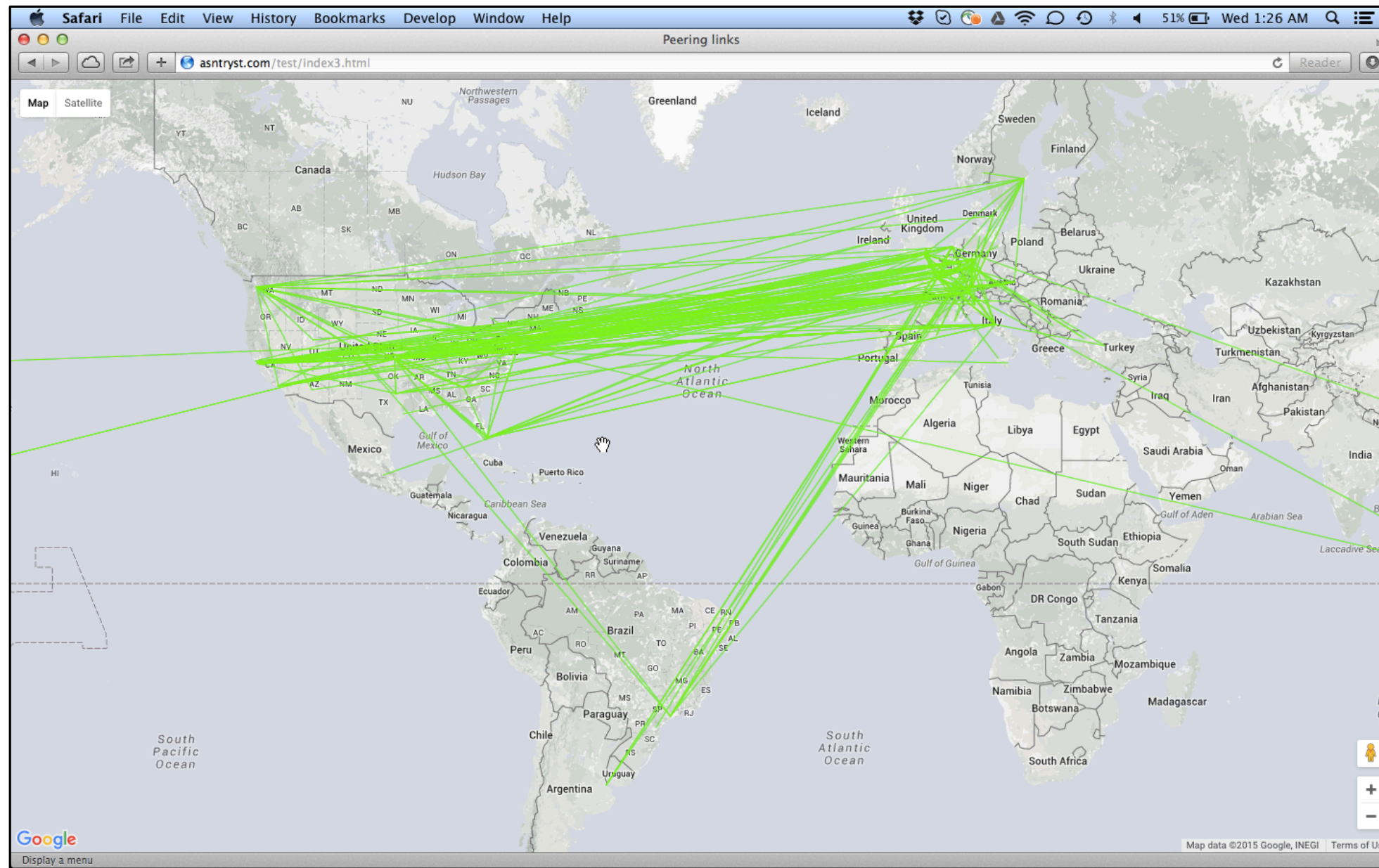
Results



Results (filter on two ASNs)



Results (Tier1's)



Further work ...

- Current state
 - Nearly all on GitHub - <https://github.com/dk379/asn-tryst>
 - Live website - <http://asntryst.com/>
 - Missing ASN search on live site
- LOTS MORE WORK TO DO!
 - It was a hackathon after-all