



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Multipath Detection with RIPE Atlas



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**a.k.a. can't we just use
RIPE Atlas for this?**

Paris Traceroute on Atlas



- API docs:

WHICH THE FILE RECEIVES THIS VALUE,
paris (integer): The number of paris
traceroute variations to try. Zero
disables paris traceroute. Value
must be between 0 and 64,
size (integer): size of the data part of

- default: 16

Paris Traceroute on Atlas



- Atlas can cycle through [0 .. 64] distinct flow IDs
- Modifies:
 - destination port field in UDP
 - checksum field in ICMP
- Of course a measurement can define an address family (4/6) and transport (ICMP, UDP, TCP)

Regardless...



- Multipath observations on Atlas?
- Rough comparison:
 - Choosing targets to match Kevin's measurements
 - Using an Atlas probe within a matching ASN as above
 - What do we see?

Apples to Apples part I



- From: probe 6278
- To: 125.155.82.17
- Full cycle of flow IDs
- UDP transport

probe 6278 -> 31.13.64.6



- UDP: 91 IPs in path observed, 165 edges
 - ~80% of the IPs without being smart
 - ~20-25% of edges
- No alias resolution etc
- 4600 traceroute probes sent
- *[ICMP sees fewer of the above]*

Apples to Apples part II



- From: probe 6278
- To: 31.13.64.6
- Full cycle of flow IDs
- UDP transport

probe 6278 -> 125.155.82.17



- UDP: 87 IPs in path observed, 147 edges
 - ~72% of the IPs
 - ~20% of the edges
- 2900 traceroute probes sent
- *[ICMP sees a straight line]*

Shortcomings



- Current implementation is slow to iterate
- Can iterate measurements to get pretty far with the Atlas API, but it's a lot of *work*
- We cycle through a small set of flow IDs, with no configuration for other fields to modify

Shortcomings



- No smarts built-in to avoid repeatedly measuring hops with only one link
- You can throw away your statistical guarantees
- Finally, 70% of Atlas platform is behind a NAT

Ongoing



- Investigating more structured approaches to performing multipath detection with Atlas
- Expand the set of paris IDs available
- ... up to a smarter MDA measurement type?



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