A Whirlwind Tour of DNS in Atlas

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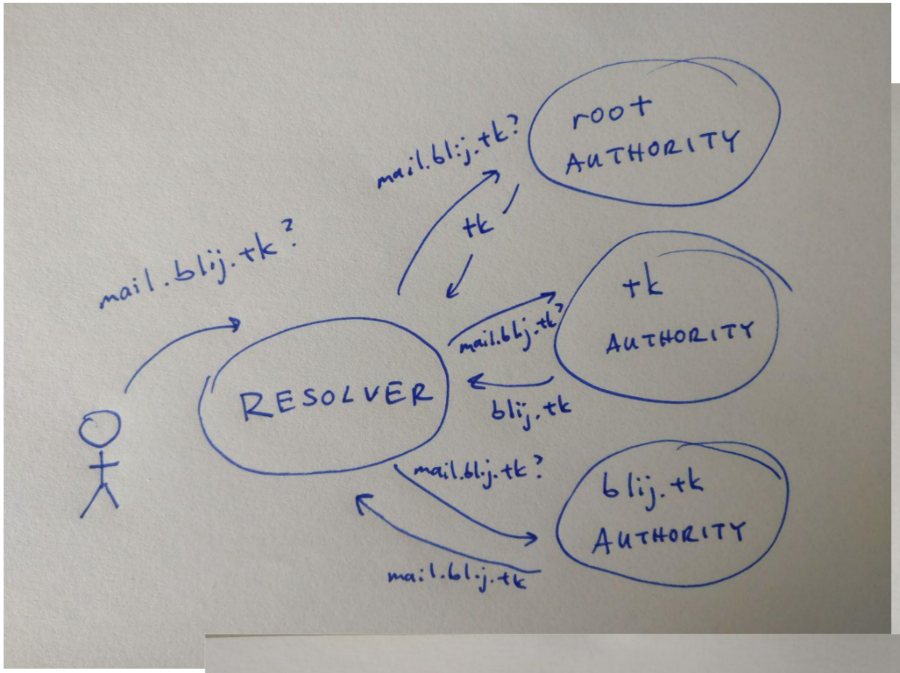
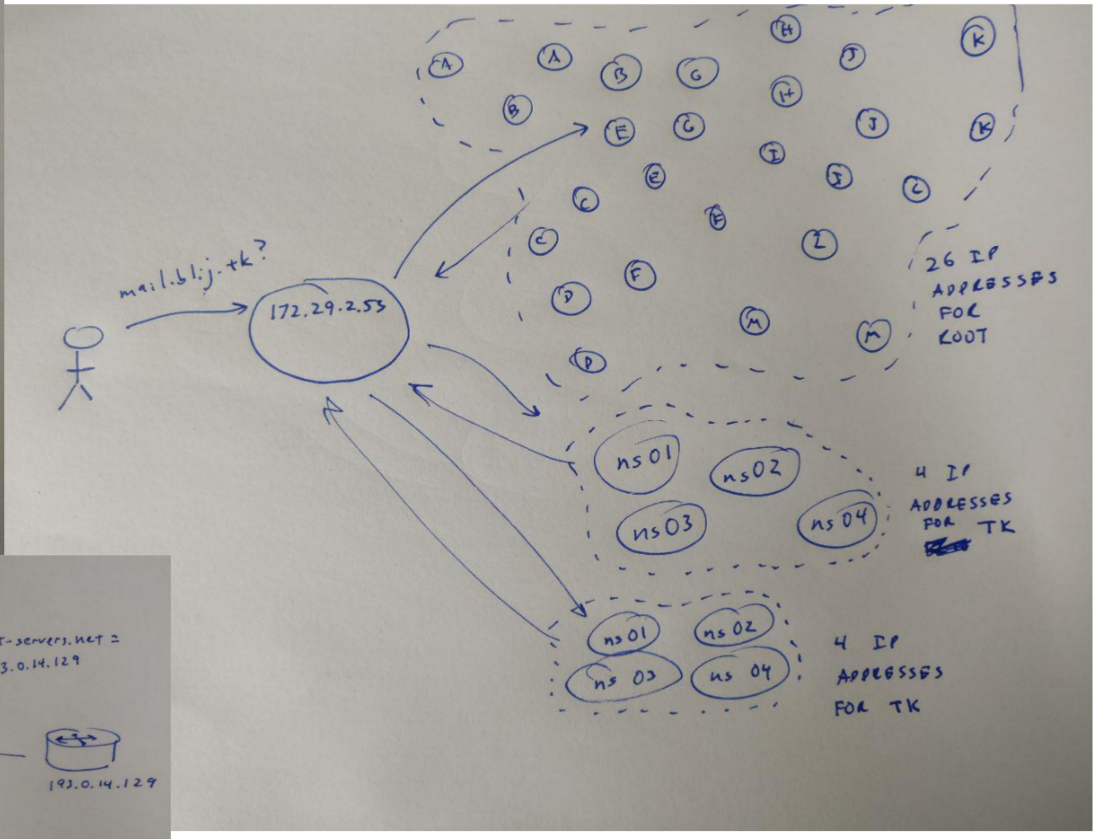
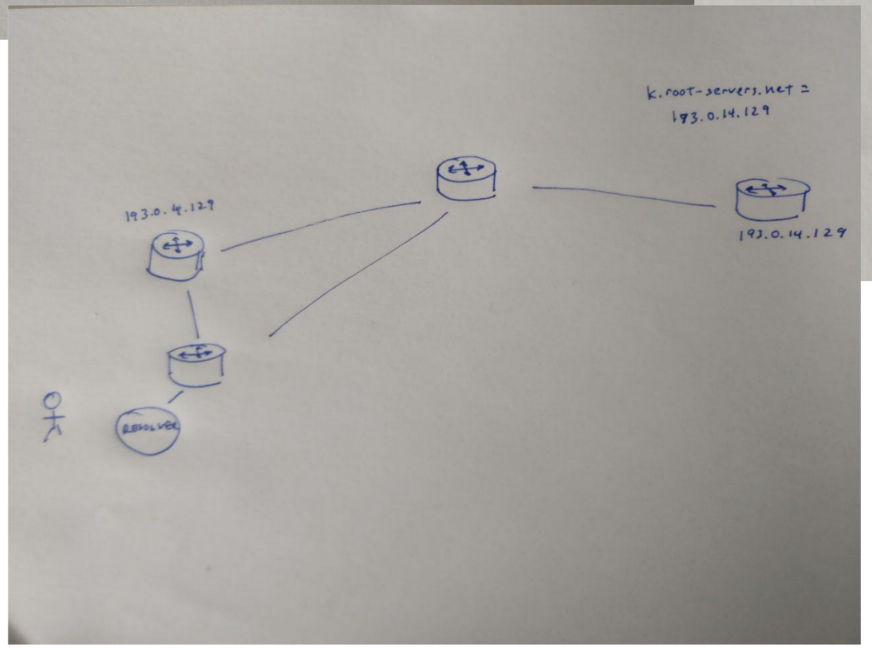
RIPE Atlas and DNS Anycast







DNS: Lots of Servers

- DNS is how we look up names on the Internet
- DNS recursive resolvers talk to authoritative servers to lookup information
- Each authoritative server may have many IP addresses
  - Provides redundancy
  - Resolvers use "round trip time" (RTT) to pick the fastest
- But...
  - To deliver service worldwide we need *MANY* servers
  - Having too many servers breaks RTT

DNS: We Love Anycast

- In DNS we use ANYCAST, where we have the same IP address in many locations
- The BGP routing system tries to get a "close" server for an IP address
- First used for the root servers, which had a limited number of IP addresses and was under attack

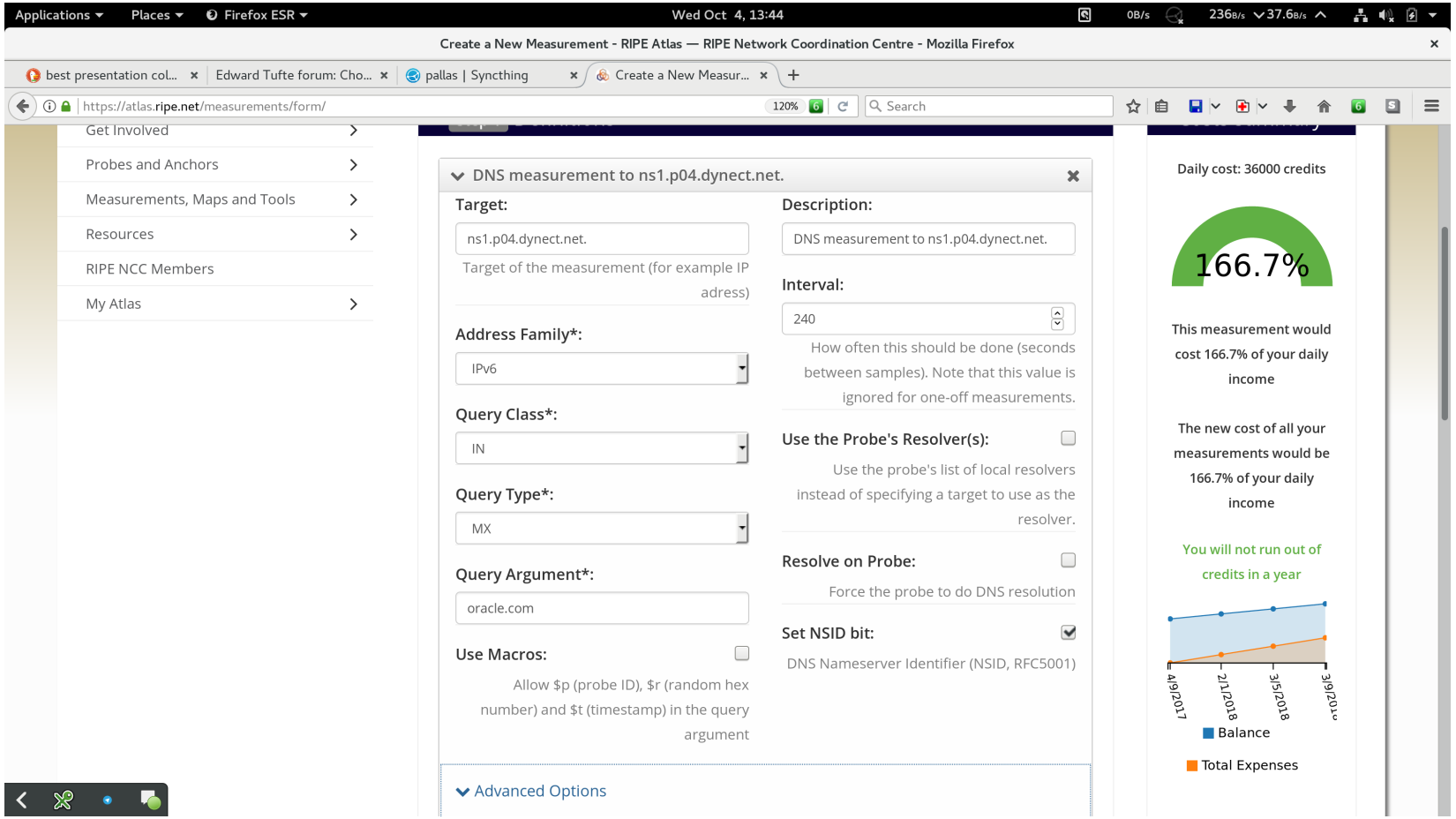
DNS: We Hate Anycast

- Many Different anycast servers look the same
  - By design!
- Difficult to know which server you are using
- Difficult for operators to debug problems
  - Which server is a user actually using?
  - How can I be sure that my service is working?

Anycast DNS: Atlas to the Rescue

- RIPE Atlas has a large number of dedicated probes that can make DNS measurements
- RIPE Atlas has many options that you can use when performing DNS measurements
- RIPE Atlas has a number of ongoing DNS measurements that researchers can use

RIPE Atlas DNS Knobs



DNS Problem? There's a Knob for That!

- RIPE Atlas can craft packets and send them from and too almost anywhere
- IPv4/IPv6 – spot problems with IP transit
- UDP/TCP – check different transport protocols
- NSID – ask for server name information
- ENDS buffer size – tweak maximum reply packet size
- DNSSEC – get DNS security information

Reduce, Reuse, Recycle

- RIPE Atlas has many pre-existing measurements
  - Most of them for DNS!
- In the Web UI you can get a list:
  https://atlas.ripe.net/measurements/?page=1#tab-builtin
- You can also see many of them in the dnsmon page:
  https://atlas.ripe.net/dnsmon/
- If you want to do serious analysis, consider using the API to get the data in JSON format
- The ICMP PING and traceroute measurements are also useful!

DomainMON for Fun and Profit

- Provides visualization similar to DNSMON
- Use on your own domains
- Wizard guides you through the process
  - Results in "normal" RIPE Atlas measurements
- Useful for:
  - Your NOC
  - Presentations to Customers and Management

On-Going Monitoring a.k.a. "The Credit Crisis"

- Users gain Credits by hosting probes, anchors, or helping RIPE in other ways
- However, a large-scale deployment will never have enough credits to use RIPE Atlas for full monitoring
- RIPE Atlas is excellent for research, monitoring small deployments, as an extra source of information, and as an independent resource
- Be prepared to also use other tools for DNS monitoring