DNS operators are faced with different challenges:
- How many servers should they operate?
- How many should use anycast?
- How many sites should each anycast service employ?

To minimize latency and balancing load across NSes (name servers) and anycast, operators need to know how recursive resolvers select an NS, and how that interacts with their NS deployments.

**Motivation for .nl**

24% of the traffic to Dutch name servers is from the U.S. - why does it cross the Atlantic even though there are NSes in the U.S.?

**Q1: How do recursive resolvers select authoritative name servers?**

**Setup:**
- One test domain with up to 4 different global NSes
- Measurement from 9000 RIPE Atlas probes
- Continuous DNS queries every 2 minutes for 1 hour using the probe’s resolver

**Main Results:**
- Up to 69% of recursive resolvers favor NSes with shorter RTT
- Up to 41% of the recursive resolvers send the majority of queries to the slower responding NS
- Their preference is stronger when the RTT of the NSes is shorter

**Q2: How can DNS operators optimize their service to reduce latency?**

- Worst-case latency will be limited by the least anycast authoritative
- If some authoritatives are anycast all should be
- All anycast authoritatives need to be equally strong provisioned (sites, connectivity, peering)

**Discussion and further research**

- How many authoritative name servers are necessary?
- What are the critical recursive resolvers?
- How can we make them more resilient?