

An Overview of Some DNS Research

With A Request for Participation

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A Word From Our Sponsors

- **DNS OARC** (Operations, Analysis, and Research Center)
 - Organizational home at ISC for research, sharing wisdom from the field, and outreach such as BCPs
 - Root server operators, TLD operators, and others with mission-critical reliance on DNS
 - See oarc.isc.org for more
- **CAIDA**
 - “We can’t tell you in detail how it breaks because we don’t know enough about how it works.”
 - US National Science Foundation grant

State of DNS Research

- Very little quality academic research
- Some very....impractical academic research
- Lots of good engineering
- Lots of....other engineering
- *Good research can inform good engineering.*

Topics of interest

- Anycast metrics
 - How much does anycast actually help?
 - How does doing anycast add complexity and overhead to your nameserver operation?
- Trust networks
- Attack response and mitigation
- DNS misconfiguration and abuse

So far....

- Gearing up for serious anycast work
 - Improved instrumentation so we can watch changes in traffic based on changes in anycast configuration
 - Expecting preliminary results this summer
 - Technotes/white papers on background issues ready for review soon
- Significant work on DNS Stats Collector
 - background and demo: dns.measurement-factory.com/tools/dsc
 - Tarball: [//tools.dns-oarc.org/](https://tools.dns-oarc.org/)
 - Case study at dns.measurement-factory.com/writings/207.244.64.0-casestudy/

In the wings....

- Trust networks
 - We all have a set of contracts or SLAs
 - We all have a virtual rolodex
 - How do we scale “I know who to call when I see something weird because I met him at a RIPE Dinner” without destroying flexibility?
- BCPs for nameserver operators
 - IPv6 will act a little different....
 - DNSSEC will act a lot different....
 - Operational threats, e.g. cache poisoning

What We Need

- Try out DNS Stats Collector
 - We're trying to make it usable for anyone who wants it and sees value in it
 - Contribute whatever data you can to the research effort. The vehicle for this is to join OARC.
- Review the research as it proceeds, suggest extensions, tell us what anomalous behavior or strange traffic your nameservers see....