ICANN held a series of meetings in Bangkok this month:

- May 06-09  Global Domains Division Industry Summit
- May 09  Registry Operations Workshop
- May 10-11  DNS Symposium

DNS OARC 30 was held in the same venue May 12-13.
Each meeting lasted two days and there was a total of

- 47 presentations
- 5 lightning talks
- 2 panel discussions
- No talks duplicated there, or here at RIPE!

There’s a lot to get through!
• **Keynote: 30 Years .TH | Prof. Kanchana**
  » A history of the Internet in Thailand and specifically the .TH TLD

• **Keynote: DNS Stakeholders and Protocol Stability | David Dagon**
  » The implications of the rearrangement of how DNS has traditionally worked.
  » Recursives move from the ISP to the cloud, the stub moves to the application.
  » ECS leaks and breaks anonymity networks. DoH is also going to reveal private information.
  » DoH subverts ability to apply local policy in DNS.
  » Changes to DNS have significant impact on privacy.
• **On the Implementation of the EU NIS Directive | Jim Reid**
  - We've spoken a lot about GDPR, this will likely impact us all too.
  - Aims to improve cybersecurity across the EU.
  - Covered the UK approach to NIS and raised concerns with their threshold based approach and how it applies to DNS.
  - A parked domain hoster is `big` by domain count, but those domains are probably less important than BBC, which has few.

• **Client Side Debugging | Petr Špaček**
  - Lowering DNS resolver support costs
  - Sometimes resolution breaks and users call support.
  - Described automated diagnostics and tools built to ease this burden and help users to perform self-diagnostics. Motivated by the Turris router,
  - but you can use it too!
• **DNS-Magnitude | Alexander Mayrhofer**
  » What is the magnitude of a domain? How popular is it?
  » How often is it queried, by how many resolvers?
  » This is a good input for machine learning algorithms.
  » Discussed how analysis was done and interesting things that came out of it.

• **DNS Resolver Centrality | Joao Damas**
  » Wanted an idea of how centralized resolution is around certain bits of infrastructure
  » Measurements with their ad based network, a small number of resolvers serve most
  » end users on the Internet. Will continue to provide stats on an ongoing basis.

• **New Security Framework for Home Gateways | Jacques Latour**
  » Motivated by the Dyn attack and the threat of IoT botnets
  » Started a project with various participating organizations to build a framework for a
  » secure home gateway. Are working on a prototype, documentation and code are
  » available
• **CrypTech Open Source HSM for DNSSEC | Phil Roberts**
  » Described cryptech, an open source HSM and described how it can be used for DNSSEC

• **DNSSEC in Small Linux Devices | Fernando López**
  » Described the challenges of managing e.g. firmware updates on IoT devices and the role for DNSSEC

• **ICANN Research Projects | Paul Hoffman**
  » An overview of research projects going on at ICANN, e.g.
    † trends in IPv6 deployment
    † looking at conversations between recursives and root servers
    † analysing latencies toward picking good placements for root server
    † looking at how browsers interact with dns
    † how popular is this domain?
    † Identifier Technology Health Indicators!
    † ..and other data collection efforts
• **Session: Future of KSK Rollover | Paul Hoffman**
  » Paul led a mic-line discussion of what future KSK Rolls should look like
  » We can have an even more useful discussion on the mail list:
  » https://mm.icann.org/mailman/listinfo/ksk-rollover

• **Keynote: Lessons Learnt from Avalanche | Stewart Garrick**
  » The work of the Shadowserver Foundation, a not for profit security organization
  » Avalanche was a botnet based malware delivery platform and money muling network.
  » Takedown involved a lot of DNS analysis and domain sinkholes.

• **Domain Reputation Lists as a Tool Against Domain Abuse | Joe Wein**
  » Described how they create URI blocklists and how to use them

• **Building DNS Firewalls With Response Policy Zones | Paul Vixie**
  » How to build a DNS firewall with RPZ, and why you'd want to
• **ICANN’s Domain Abuse Activity Reporting | Samaneh Tajalizadehkhoob**
  » Described ICANN's system for reporting on domain registration and abuse data across TLD registries and registrars. Seeks to understand threat activity to help operators.
  » Consumes data from many sources, does analysis and has APIs to make reporting available.

• **Anomaly Detection in DNS Traffic | Maciej Andziński**
  » Looking for resolvers demonstrating unusual behaviour
  » Doing statistical analysis of queries captured at CZ nameservers
  » Exercising resolvers using RIPE Atlas

• **The Role of Domains and DNS in Large Scale Abuse | Carel Bitter**
  » A look at the types of domains used to send spam, how their reputation is managed and DNS based authentication techniques used and abused.
• **On DoH Dilemma | Vittorio Bertola**
  » The impact of DNS over HTTPS. How DoH is different from traditional resolution.
  » Thoughts on the pros and cons of DoH given various scenarios. It's mostly bad.

• **A UK ISP View on DNS over HTTPS | Andrew Fidler**
  » Concerned by the subversion of local policy re content filtering, customer assistance redirects, on-net content caches, mandated filtering, etc
  » Call for collaboration with DoH implementors to work on these problems

• **Benefits and Hazards of Non-Local DNS Resolution | Paul Vixie**
  » Some history of how name resolution has worked on the Internet.
  » DoH is presented as an end run around local policy and the latest salvo in the war for the resolution path.
• Panel: Applications Performing Their Own DNS Resolution | Paul Hoffman
  » Discussion of various deployment scenarios
  » Paul Vixie spoke of a future RPZ which distributes policy as a bloom filter rather than a catalog
  » Warren Kumari gave an update on how Chrome will DoH

• On the Recent DNS/IMAP Hijacking Campaign | Bill Woodcock
  » A very candid and thorough explanation of a recent state-sponsored attack which PCH fell victim to.

• Trends in TLD Abuse | Ralf Weber
  » Description of how they gather DNS data from recursives and do analysis
  » Looking at that data for evidence of malicious domains across TLDs

• DNS – A Phishing Chokepoint | Carel Bitter
  » The domain is a good place to break phishing attacks
  » Looking at patterns in domain names and other metadata indicators to predict which will be used for phishing before we see a phish
• DNS Recursive Resolver Delegation Selection in the Wild | Dr. Kyle Schomp
  » Want to know how resolvers choose an authority to aid decision making around server deployments, etc
  » Capture data at authority servers, measure rtt to querying resolvers, did analysis
  » Most resolvers prefer low latency authority, some query every ns, some query only one

• Developing a Testbed For Interactions Between Resolvers and the Root | Paul Hoffman
  » Building A test framework made out of lots of virtualbox VMs filled with nameservers to simulate behaviour of resolution at the root - code available

• The Modality of Mortality in Domain Names | Paul Vixie
  » Set out to determine the quality of DNS content, are new domains mostly bad?
  » Used passive dns infrastructure to look at domains from creation to death, how long, types of death.
  » Some TLDs see significantly higher early death rates than others
• **DNS Security: Past, Present, and Future (It’s Not Easy) | Ralf Weber**
  » A history of security issues in and around the DNS

• **Who Is Answering My Queries: Understanding and Characterizing Interception of the DNS Resolution Path | Chaoyi Liu**
  » Investigated interception of dns queries in a numer of networks
  » Sending queries to public resolvers and checking to see who actually performs the query
  » Looked into what's going on when queries are intercepted

• **Multi-signer DNSSEC Models | Shumon Huque et al**
  » The traditional multi-provider model doesn't work well with widely used, but non-standard DNS features
  » DNSSEC with multiple providers where these features are used requires multiple signers
  » Approaches for this were described. There is a draft.
• **A Story on Unsupported DNSSEC Algorithms | Matthijs Mekking**
  » We remove no longer supported DNSSEC algorithms from the nameserver, what goes wrong?
  » Tested many implementations of authority, resolver and signer.
  » Overall things look good, but some quirkiness and crashes were found.

• **Signing with offline KSK in Knot DNS 2.8 | Jaromír Talíř**
  » Some history on how CZ was signed and the challenges with the method
  » Described new improved process using Knot DNS signer

• **Seeing the effects of DNS Flag Day in action | Willem Toorop**
  » Presented some measurement taken around DNS Flag day to determine resolver uptake
• **DNS flag day 2019 panel discussion | Petr Špaček et al.**  
  » Some background presented on Flag Day and measurements taken  
  » The panel discussed how they perceived Flag Day, lessons learned, and should we have another one?

• **The road to the Ultimate Stub-resolver | Ólafur Guðmundsson**  
  » Some history of stub resolvers, concluding in the observation that they still give you very little  
  » Want to make CDN services faster, need faster resolution  
  » Described a new approach using dnsdist in front of a resolver farm which is faster and works better

• **OpenINTEL - Creating a "long-term memory" for the global DNS | Willem Toorop**  
  » Wanted to measure lots of the global DNS, Unlike passiveDNS this uses active measurement  
  » Some examples of using this to learn about DNSSEC deployment, DNS resilience, weird things seen in TXT records
• **DNSKEY Flood what does that tell us about resolvers | Ray Bellis**
  » Work motivated by the KSK roll, will resolvers do 5011 correctly?
  » Looked at root server data for 8145 signalling and DNSKEY query behaviour

• **What part of “NO” is so hard to understand? | Geoff Huston**
  » Investigated surprising repeated queries seen during a different experiment
  » Using ads to query for things which don't exist, see more than half of tests generating more than one query
  » Described the various reasons why this is happening

• **Incentivizing the adoption of (new) standards | Maarten Wullink**
  » Motivated by the success of incentivized DNSSEC adoption in .nl
  » Want to repeat for IPv6, etc
  » Described how incentives for things are made in .nl domain pricing, and how adoption is measured
• **Measures against cache poisoning attacks using IP fragmentation in DNS | Kazunori Fujiwara**
  
  » Described how IP fragmentation is used to attack pMTUd and the resolver cache  
  » Proposed some methods to protect against this  

• **Flamethrower: A flexible tool for DNS load and functional testing | Jan Včelák**
  
  » An alternative to dnsperf, TCP support! realistic query patterns!  
  » Easily built into CI/CD  
  » Code is available  

• **Hyper-hyper-local root serving | Ray Bellis**
  
  » Ray built the tiniest, but very high performance nameserver for locally serving just the root zone
• **respdiff: Regression and interoperability testing for the Internet | Petr Špaček**
  » Describes the challenge of closing the gap between RFC compliance and making things work on the real Internet
  » respdif! tool to generate and send queries to many nameservers than gather and compare responses
  » Code is available

• **Lightning Talks**
  » Identifier Technology Health Indicators | Paul Hoffman
  » Oh, another DoH | Jaromír Talíř
  » DNSCrypt | Brian Hartvigsen
  » DNS Flag Day: kiwi flavour | Sebastian Castro
  » Whither DANE? | Shumon Huque
Agendas, slide decks and webcast archives at…

DNS OARC 30
https://indico.dns-oarc.net/event/31/timetable/

ICANN DNS Symposium
https://www.icann.org/ids
Notes from Bangkok

UPCOMING OARC WORKSHOPS

• DNS OARC 31
  » Austin, TX  10/31 - 11/01
  » https://indico.dns-oarc.net/event/32/

• Moving to 3 meetings annually in 2020
  » Adding a 1 day meeting in February
  » Meetings held ~ Feb / May / Oct
  » Co-locating with e.g. NANOG / RIPE / ICANN IDS