

draft-stenberg-homenet-dnssdext-hybrid-proxy-ospf-00

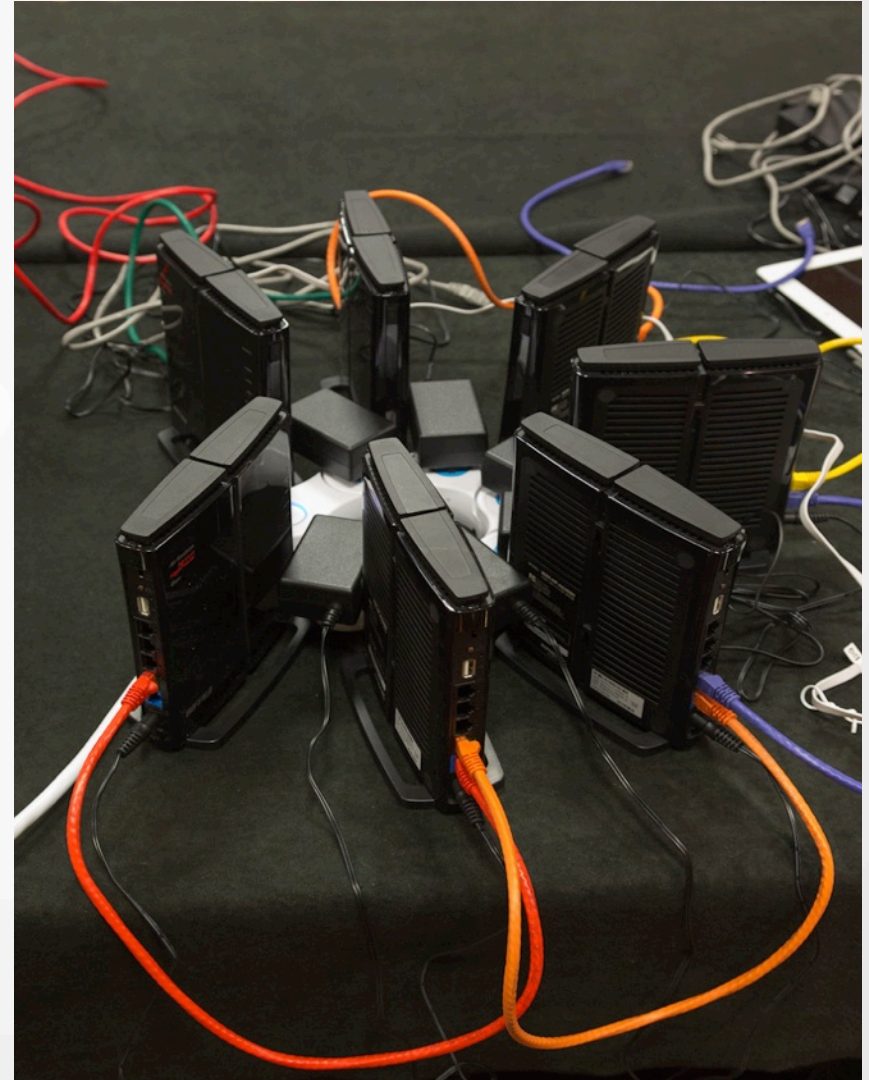
and

implementation status report

Markus Stenberg <fingon@iki.fi>

Agenda

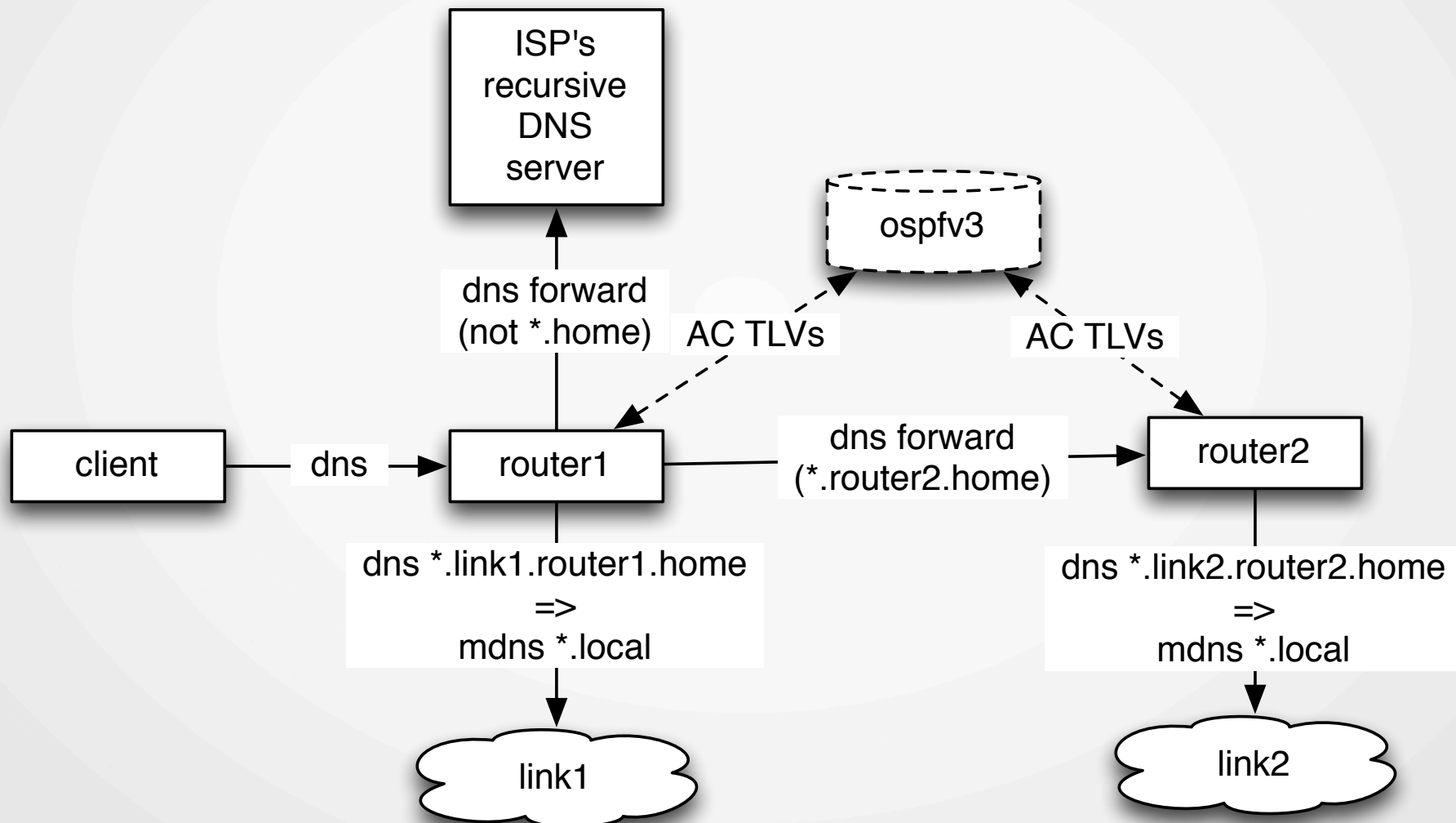
- Service discovery
 - Overview
 - Hybrid proxy
 - Hybrid proxy + OSPFv3 AC
- Implementation report
 - Multicast DNS
 - Hybrid proxy (+ OSPFv3 AC)
 - **BONUS** Follow-up to mailing list discussions
 - hnet advertisement
- Questions?



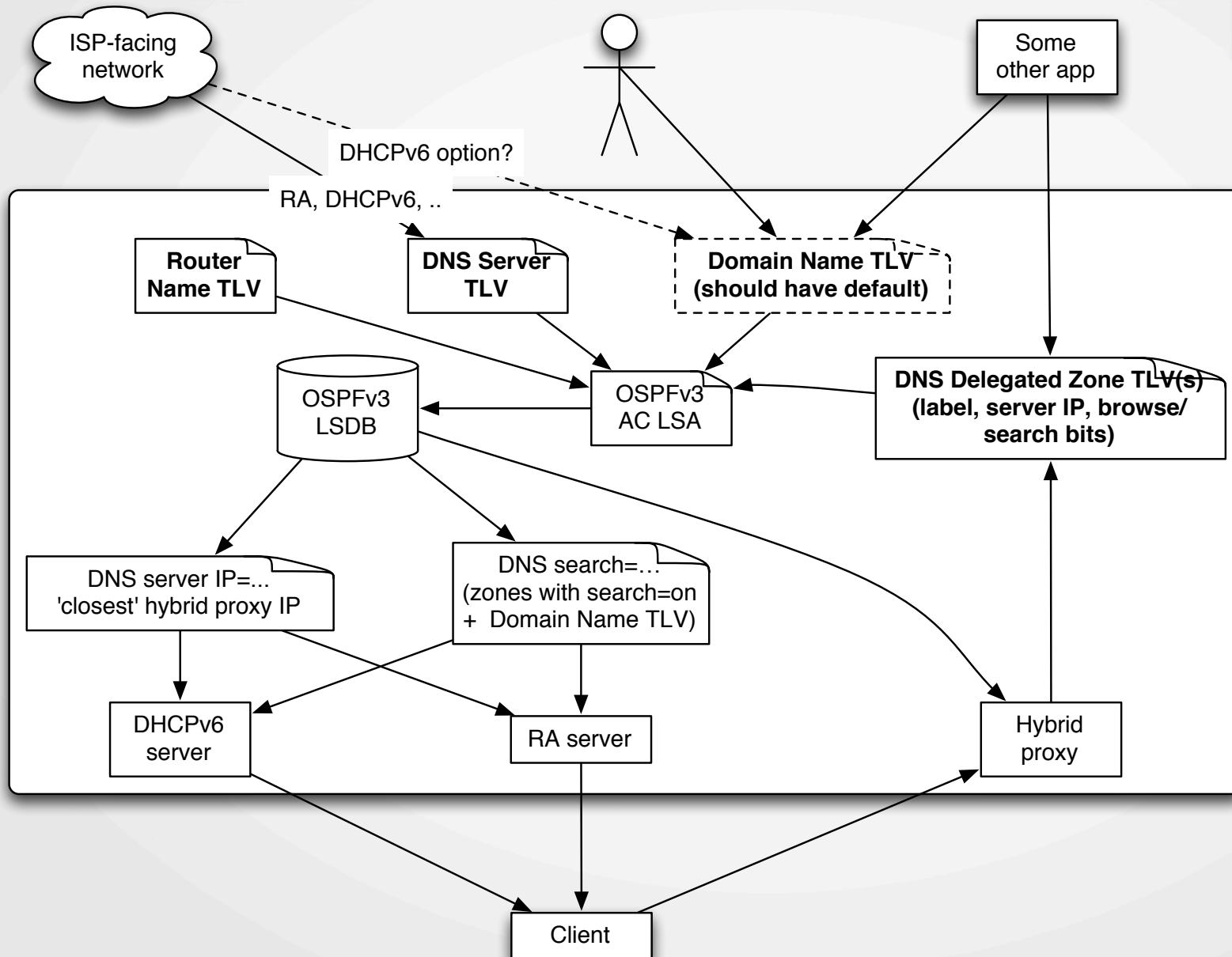
SD 1/3: An overview

- A number of different protocols for it
 - SLP, UPnP, multicast DNS, DNS-SD
 - Architecture draft seems to assume something DNS-based
 - Multicast DNS is the most widely deployed and used one
 - Apple devices (IOS, OS X), Linux devices (Android, some desktop distros)
 - Link-local, moderately chatty, device-to-device
 - Challenging to proxy
 - As long as you don't alter payload contents it's fine
- What about link-local addresses within payload? ...
- DNS-SD is also deployed, but has some warts
 - Update mechanisms not much used
 - Typically single query = single response

SD 2/3: Hybrid proxy in a home



SD 3/3: Hybrid proxy + OSPFv3 AC



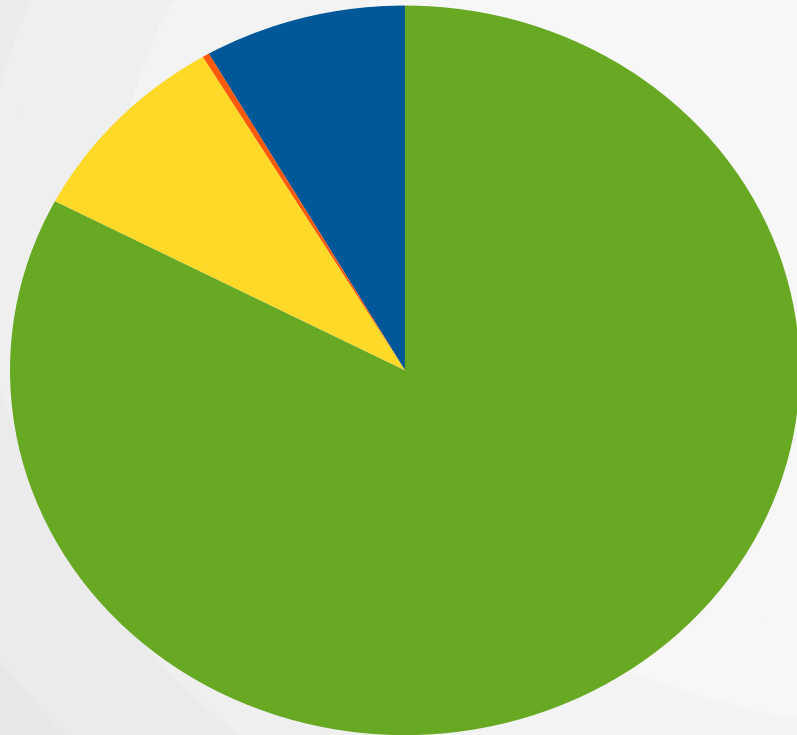
Impl 1/4: Multicast DNS

- Sensible choice would be to use Apple implementation (mDNSResponder, open source)
- avahi is not that good
 - A number of bugs/misfeatures, most amusing one:
 - Forcing use of non-linklocal addresses for a link-local protocol
 - Does not really support DNS-SD browse domain lists, legacy browse domain, etc.
- Somewhat painful to implement – minimal, incomplete implementation in ~2k LoC lua

Impl 2/4: Hybrid proxy + OSPFv3 AC

- Hybrid proxy draft somewhat vague on details
 - Needed to think about some things such as TTL handling, zones to handle (forward+reverse)
- Hybrid proxy draft questionable on some details
 - If no LLQ => Sensible thing to do is wait a bit before responding. Otherwise NXDOMAIN, which may be bad for non-DNS-SD DNS clients
 - Legacy browsing is not included – but I think it should be, most apps are not browsing domain-aware (lb._dns-sd._udp)
- Hybrid proxy needed few weeks of tinkering, main effort spent on DNS library
 - (Almost) never saw LLQ starting from client, so didn't bother to look at that
 - Based on experimentation, it requires non-RFC1918 IPv4 address or NAT-PMP
 - Unfortunately, my lab is IPv6 (and backup RFC1918 IPv4, and no NAT-PMP)
- Hybrid proxy easy to implement if you have MDNS and DNS libraries - ~500 LoC Lua
- After hybrid proxy was done, my draft took just few days to implement, unit test, and (to some degree) system test
- Not too bad to implement given hybrid proxy implementation (and OSPFv3 AC implementation you can plug into) - <1k LoC Lua

Impl 3/4: *BONUS* Guessing game



- hnet Buffalo memory usage
- Contents
 - Free memory
 - Linux kernel + OpenWRT
 - bird OSPF
 - 3 Lua daemons
- Which is which?

Impl 4/4: hnet

- Cisco-funded GPLv2 implementation at <https://github.com/fingon/hnet>
 - Mostly implemented in Lua
 - MDNS/DNS implementations
 - Hybrid proxy
 - Both stand-alone, and
 - OSPFv3 AC-integrated auto-configured one (integrated with hnet infra)
- It does some other stuff too
 - OSPFv3 AC (within Bird OSPFv3)
 - source specific routing (based on Linux rule/route tables, TBD draft?)
 - prefix assignment (also with IPv4 portion for which no draft exists)
 - zero configuration (no specific WAN/LAN ports)
 - It assumes you have real ISP that runs DHCPv6 PD (TBD something better)



Questions?