Extended Multicast DNS (xmDNS)

draft-lynn-homenet-site-mdns-00

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Motivation

- Make multicast DNS-Based Service Discovery work on low-power, lossy networks (LLNs)

- Base assumption: ZeroConf

- Fills a gap between existing mDNS and unicast wide-area DNS-SD

Approach

- Leverage draft-cheshire-dnsext-multicastdns to the greatest extent possible => deltas to mDNS
- Issue #1: "link-local" on LLNs means "nearest neighbors" => use site-local multicast
- Issue #1a: assume a viable multicast forwarding solution over LLN, e.g. Trickle multicast
- Issue #2: DNS query to ".local" has defined semantics, namely link-local multicast to port 5353 => define and use ".site" TLD
- Issue #3: Timing parameters in mDNS are adapted to single-hop, (relatively) high b/w subnets

Site-local Multicast

- Administratively defined on a per-group, per-port basis

- FF0x::FB is already registered with IANA for IPv6 multicast DNS; IPv4 is TBD (239.255.0.0/16?)

- Router ports may implement one of three policies:
  – Always forward (e.g. across LLN nodes)
  – May forward (e.g. across LLN border router (LBR))
  – Never forward (e.g. across customer edge)

".site" Top Level Domain name

- draft-cheshire-dnsext-special-names defines a rationale and methodology for reserving "Special Use" TLDs

- RFC 6303 (Locally Served DNS Zones) defines an initial list of names and IANA has created a registry that may suit the purpose

- Means "site-local multicast to port 5353" => all **reachable** nodes in the xmDNS group

Timeouts

- Some increase in timeouts is necessary; how best to scale?

- It might also be desirable to set Hop Limit/TTL

Extend or proxy? It depends…

- There might be very good arguments for a caching proxy (resource directory, etc) at the 6LBR:
  - Traffic shaping between high-speed and LLN links
  - Dual stack, multi-protocol issues
  - Overall reductions in system complexity, or improvement in discovery efficiency
- Rough figure of merit: percentage of b/w used for discovery should remain relatively constant as system scales

"Joining" .local and .site

- Nothing to prevent a service from appearing in multiple registries

- Similar to .local -> example.com RR import

- Even in a proxy or DNS server scenario, (x)mDNS advertisments may provide a useful bootstrapping function