New Developments in DNS Service Discovery

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What is DNS Service Discovery?

- ## Normal DNS:
  - www.ietf.org IN AAAA 2606:4700:10::6814:155
- ## Mail:
  - ietf.org in MX mail.ietf.org.
- ## Printer:
  - printer-1._ipp._tcp.meeting.ietf.org IN SRV 0 0 631 printer-1.meeting.ietf.org
  - printer-1.meeting.ietf.org IN AAAA 2001:67c:370:160::18
- ## Printers:
  - _ipp._tcp.meeting.ietf.org. 3600 IN PTR printer-1._ipp._tcp.meeting.ietf.org.
  -                                     IN PTR printer-2._ipp._tcp.meeting.ietf.org.

How are services discovered?

- Multicast DNS on the local link
- Unicast (normal) DNS in a local or configured domain

How are services advertised

- Multicast DNS
  - Service listens for queries for provided service
  - Client multicasts request
  - Service multicasts response
  - All listeners cache answers for later use
  - Completely automatic, no operator intervention
- DNS
  - Administrator hacks the zone file
  - Completely manual, operator intervention required

Automating DNSSD with DNS

- Two approaches:
  - Authoritative DNS server satisfies DNS queries using mDNS backend
  - Authoritative DNS server is automatically updated using special DNS update profile (Service Registration Protocol)

DNS-to-mDNS

- Discovery Proxy (draft-ietf-dnssd-hybrid)
  - Listens for DNS queries on port 53
  - When a DNS query arrives, satisfy it from cache populated by mDNS, or by issuing mDNS queries
- Discovery Relay (draft-ietf-dnssd-mdns-relay)
  - Provides a way for a Discovery Proxy to issue queries on links to which it is not attached
  - Allows a centralized, frequently updated DNS Proxy that can use edge router relays that need not be updated frequently

DNS Update

- Service Registration Protocol (draft-ietf-dnssd-srp)
- Lightweight mode is a single packet exchange
- Signed with ECCDSA, a single registration is 415 bytes including headers
- Lease is used to gc stale registrations
- The name persists for longer than the advertisement

DNS Push Notifications

- draft-ietf-dnssd-push
- allows a DNS (not mDNS) client to receive timely updates when services appear and disappear
- works with Discovery Proxy or SRP