

DNS Discovery: Problem Statement Review

- host plug-n-play / auto-config / zero-config is an important goal for IPv6 — essential for, e.g., home networks, small offices, mobile devices
- we currently have IP-layer auto-config
 - stateless address auto-conf + neighbor discovery
 - but for full plug-n-play, also need auto-config of higher-layer services, e.g., DNS, NTP, web caches, etc.
- we currently have override mechanisms for hosts or environments where auto-conf undesired:
 - ability to manually configure individual hosts
 - RA flags to cause hosts to use DHCP service

Why Just DNS Discovery and Not the Whole Zeroconf Solution?

- the more general problem is a big one (includes getting names into DNS, home vs. roaming config, etc.)
- there have been attempts at solving “the big problem” before in the IETF, with less-than-stellar success so far
 - SLP, zeroconf
- perhaps will have better chance of success if we take one step at a time
- config of DNS access is the other “fundamental” piece (beyond IP-layer config) needed to get a client-only host up and using most Internet services

Why Not Just Use DHCP?

requiring that hosts get configuration from a DHCP server introduces undesirable potential failure modes:

- can't find and use target servers if DHCP service is down or unreachable
- DHCP database may become inconsistent with the currently-reachable services, e.g.:
 - may supply addresses for servers that are down/unreachable
 - may fail to provide addresses for services that are up/available
- when installing/removing a server, easy to forget to update DHCP database
- replicating DHCP servers to improve robustness increases opportunities for inconsistent DHCP databases, and adds more complexity and failure modes
- same applies to any other “third-party” configuration service

Alternatives to DHCP Servers

- Can avoid failure modes of DHCP servers by communicating directly with target servers (i.e., eliminating the DHCP “middleman”), reached by techniques that have “perfect fate-sharing”:
 - admin-scoped multicast queries
 - admin-scoped multicast advertisements
 - well-known, per-service, anycast address
 - multiple well-known, per-service, unicast addresses
- These techniques depend only on the resources (links, interfaces, routers) needed anyway to communicate use the target servers

Terminology Confusion

- it would be possible to have each target server accept and respond to DHCP messages sent using any of the fate-sharing techniques
 - let's call this “per-server DHCP” to distinguish from traditional use of DHCP to config multiple services from a single DHCP server (possibly replicated)
- I think “stateless autoconfig” would have been better named “third-party-serverless autoconfig”
 - well, perhaps not from a easy-of-saying perspective :-)
 - the third-party-serverless-ness is its key feature, not it's “statelessness”

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