ALTO Server Discovery

IETF#86, Orlando, 2013-03-15
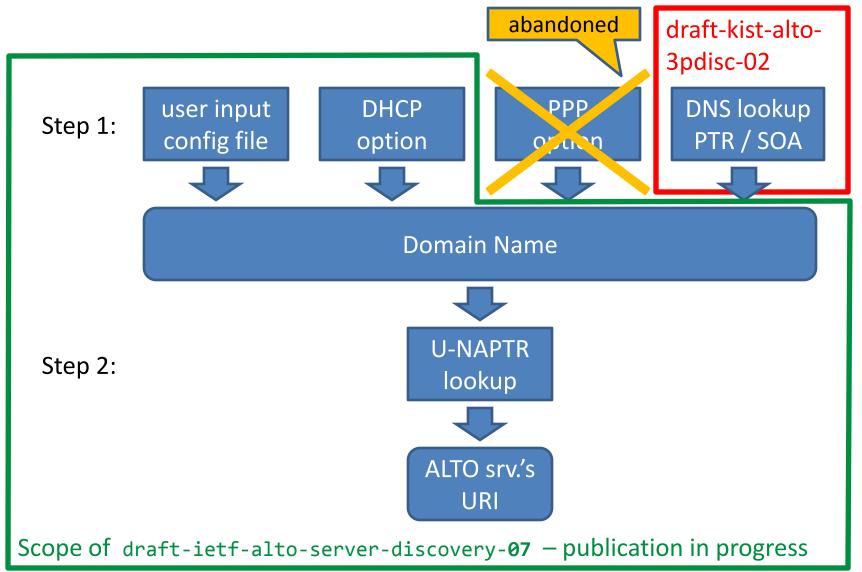
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Recap

ALTO server discovery needs to support two scenarios:

- Resource consumer initiated discovery (ALTO Req. AR-32)
    - Used if ALTO client is embedded into resource consumer
    - May query user, read local configuration file, or use mechanisms specific to the access network (e.g., DHCP)
    - `draft-ietf-alto-server-discovery-07 passed WGLC`, IPR discl, 2nd WGLC
- Third-party discovery (ALTO Req. AR-33)
    - Used if ALTO client is embedded into 3rd party, e.g., P2P tracker
    - In tracker-based systems, ALTO should be done in the tracker, not in the client for good optimization results (see draft-ietf-alto-deployments,Sec 4.1)
    - Client's IP address is only input parameter
    - Spec moved to `draft-kist-alto-3pdisc` to allow different pace. Significant changes in -02 reflect feedback from DNS experts

one architecture – two drafts

abandoned

draft-kist-alto-3pdisc-02

Step 1:

| user input config file | DHCP option | PPP option | DNS lookup PTR / SOA |

Domain Name

Step 2:

U-NAPTR lookup

ALTO srv.'s URI

Scope of `draft-ietf-alto-server-discovery-07` – publication in progress
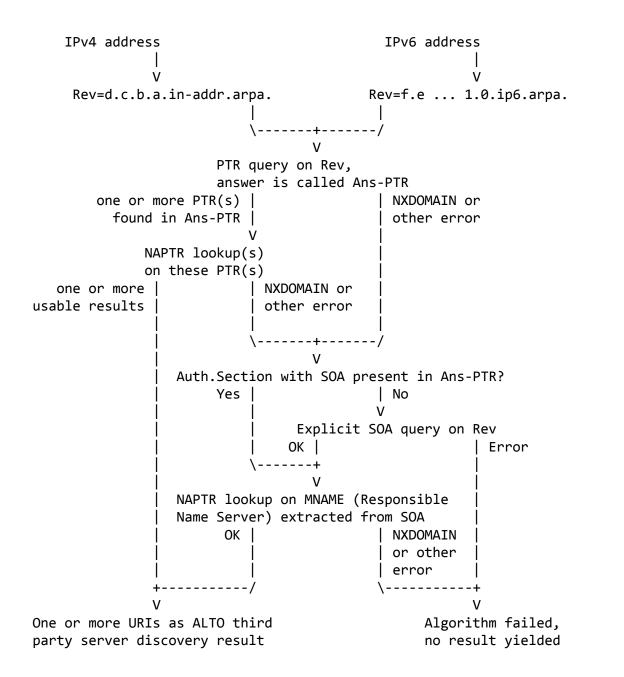
draft-kist-alto-3pdisc-02
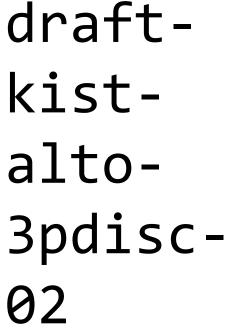
Discovery algorithm's interface:

- In: IP address (IPv4 or IPv6)

- Out: ALTO server's inform. resource directory URI, for an ALTO server that can give guidance for this IP addr.

Basic Idea

1. PTR lookup on IP address ("reverse DNS"): hostname.domain

2. U-NAPTR lookup on hostname.domain
   ```
   IN NAPTR 20 10 "u" "ALTO:http" "!.*!http://altosrv.example.com/directory!" ""
   ```

3. If either 1) or 2) yield NXDOMAIN or other failure
   a. get SOA record for reverse zone (…in-addr.arpa /…ip6.arpa)
   b. extract MNAME (responsible master name server)
   c. U-NAPTR lookup on MNAME

```
   IPv4 address                          IPv6 address
       |                                     |
       V                                     V
  Rev=d.c.b.a.in-addr.arpa.        Rev=f.e ... 1.0.ip6.arpa.
                    |                 |
                    \-------+-------/
                            V
                    PTR query on Rev,
                    answer is called Ans-PTR
     one or more PTR(s) |                 | NXDOMAIN or
        found in Ans-PTR |               | other error
                         V               |
            NAPTR lookup(s)              |
            on these PTR(s)              |
   one or more |         | NXDOMAIN or   |
   usable results |      | other error   |
             |   |       |               |
             |   \-------+-------/
             |           V
             | Auth.Section with SOA present in Ans-PTR?
             |    Yes |             | No
             |        |             V
             |        |    Explicit SOA query on Rev
             |     OK |             |        | Error
             |   \-------+          |
             |           V          |
             | NAPTR lookup on MNAME (Responsible   |
             | Name Server) extracted from SOA      |
             |     OK |             | NXDOMAIN |
             |        |             | or other |
             |        |             | error    |
       +-----------/          \-----------+
       V                                   V
 One or more URIs as ALTO third      Algorithm failed,
 party server discovery result       no result yielded
```

draft-kist-alto-3pdisc-02

Significant changes since older versions

- No more DNS "tree climbing"

- No more unpredictable truncating of domain names

- Works also without PTR records ("reverse DNS")
  - Not deployed everywhere
  - Difficulties with PTRs + IPv6 privacy extensions

- Assumes that, if two organizations agreed to (or have to) share one name server (SOA/MNAME) for their reverse zone, they may also use one ALTO server as an entry point – redirection within the ALTO protocol is still possible!

draft-kiesel-alto-3pdisc-impl-00

- Proof-of-concept implementation of
  `draft-kist-alto-3pdisc-02`
  Perl, NET::DNS module, tested with Linux
- Self-contained testbed
  - May be installed on a single Linux host with bind9
  - Exemplary delegation hierarchy of DNS servers (".", example., isp.example., in-addr.arpa., ip6.arpa., …) but all name servers' A records point to 127.0.0.1
  - DNS entries for various hosts (IPv4/v6)
  - Proof-of-concept algorithm shows various test cases in this environment

Conclusion

`draft-ietf-alto-server-discovery-07`

- WGLC passed, publication in progress
- This DHCP-based algorithm seems to be straightforward and obvious, but has limited scope of applicability
- Please check, does this fit your intended ALTO scenario?

`draft-kist-alto-3pdisc-02`

- Changes to spec reflect feedback from DNS operators: no more tree climbing, works with or without PTR records
- Much wider applicability than DHCP-based solution
- Running proof-of-concept code
- Requirement has been documented in RFC 6708, AR-33
- Adopt as a WG item?

Acknowledgments