A Proposal for a DoH Discovery Trial

draft-cook-doh-discovery-trial-00

IETF 108, Virtual

Neil Cook <neil.cook@noware.co.uk>

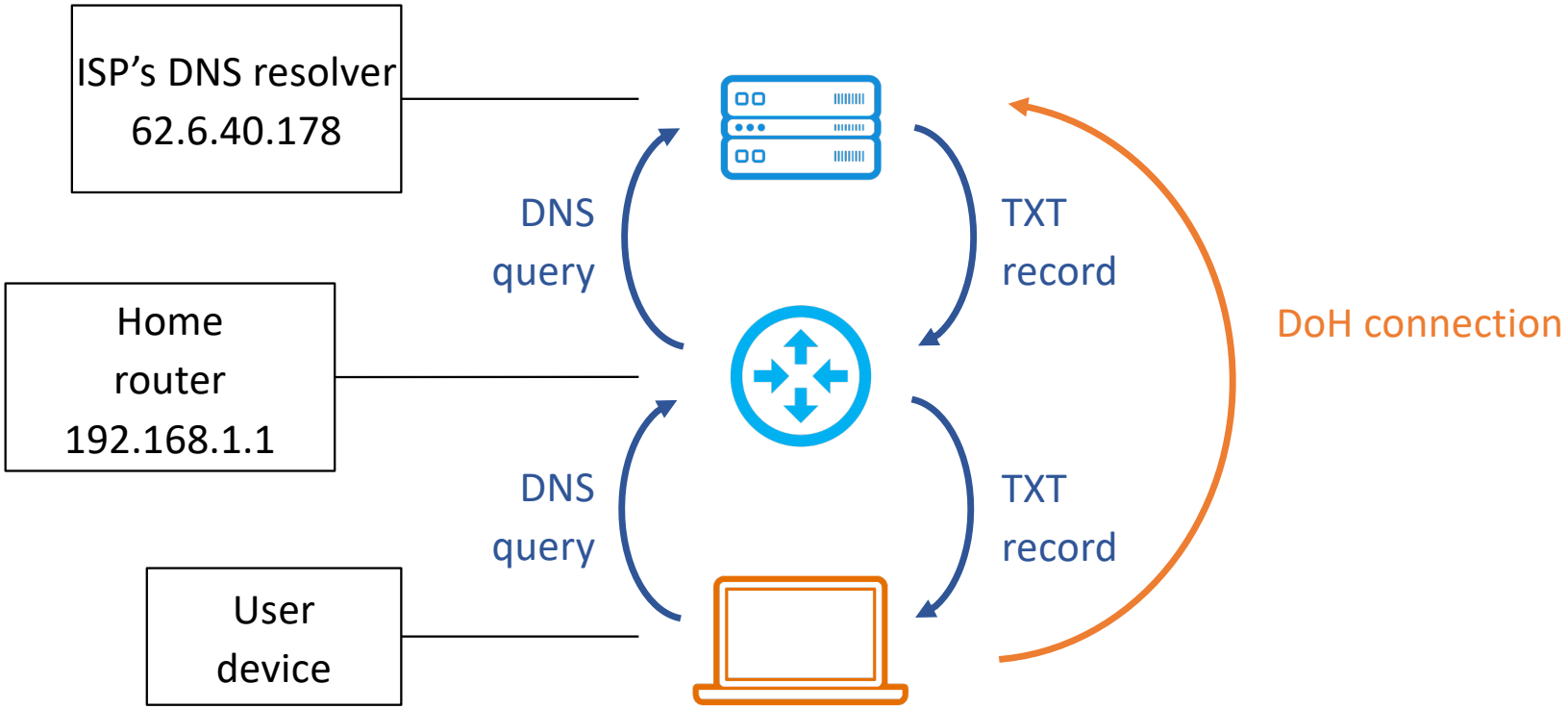
What is this?

- An interim discovery mechanism for quick deployment
- Developed by a group of ISPs and vendors
- Inspired by the Chrome/Windows «same provider auto upgrade» model
- Extends it to a common use case that is currently not supported: CPEs acting as DNS forwarders
  - Most common consumer architecture at major ISPs, at least in Europe
- Complementary, not overlapping
  - The current mechanism is only triggered if the resolver has a public IP
  - This mechanism is only triggered if the resolver has a private IP

How does this work?

- Similar to draft-pp-add-resinfo and draft-rescorla-doh-cdisco
- Does a Do53 query for a special name to ask the system resolver for its DoH URI
  - By using Do53, the query works with forwarders
- Uses a TXT record to convey the DoH URI
- Then (if successful) the client can establish a DoH connection to the discovered URI
  - After the initial query, the CPE is bypassed
  - The client could also ask the user or do other things – this is out of scope

How does this work?



Security assessment

- An attacker on the user's home network or local loop could redirect the user to a malicious DoH server or «downgrade» to Do53
- This can be countered by maintaining a safelist of known legitimate DoH servers
  - Same approach as current Chrome/Windows mechanism
  - Not very scalable, but not less scalable than the current mechanism
- An attacker could still redirect the user to a different safe DoH server
- This can be countered by only safelisting «closed» DoH servers (i.e. accessible only from inside their ISP's network)

Security assessment

- Opportunistic security for users of DNS-forwarding CPEs and of clients following the «same provider auto upgrade» model
- Does not create additional risks
  - An attacker on the user's home network or local loop could already hijack DNS today
- Provides additional security
  - DNS traffic moves from cleartext to encrypted
- Does not prevent implementing better solutions once found