SOCKS Protocol Version 6

draft-olteanu-intarea-socks-6-08
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IETF 106
What’s new

- DNS provided by SOCKS
- Options for Happy Eyeballs at the proxy
Clients need DNS-like features

• A and AAAA
  – LD_PRELOAD for non-SOCKS-aware apps: gedaddrinfo() separate from connect()
  – Happy Eyeballs: need to do queries separately

• TXT
  – ESNI

• MX, Service Binding, etc.
  – <Insert future use case here>
Providing DNS-like features

• Individual SOCKS options (removed in -08)
  - Have to keep up with use cases
  - Duplicate DNS functionality
  - Until -07: A, AAAA, PTR

• Having the client use DNS
  - Hard to convey policies: resolver IPs, plaintext / over TLS / over HTTPS etc., maybe credentials, etc.
  - Provide a DNS proxy
Why not separate DNS from SOCKS?
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- Need context for DNS query
  - Otherwise: privacy leaks, suboptimal CDN use
DNS provided by SOCKS

- Clients make CONNECT request to 0.0.0.0:53
  - Proxy needn’t provide a valid bind address
- Plaintext DNS over SOCKS (opt. over TLS)
  - TCP by default: SOCKS + UDP more cumbersome to use
- Implementation in Sixtysocks
  - Run separate DNS proxy locally
  - Translate 0.0.0.0:53 to 127.0.0.1:53
Happy Eyeballs

- RFC 8305: resolve and connect to a server using both IPv4 and IPv6, keep only one connection
  - Failover from IPv6 to IPv4
  - Better responsiveness if one is faster
- Clients can implement Happy Eyeballs locally
  - Have DNS + CONNECT
Happy Eyeballs: client vs proxy

Resolve somewebsite.org x2: A + AAAA

CONNECT x2: IPv4 + IPv6

SYN x2

SUCCESS

C (High RTT) P S
Happy Eyeballs: client vs proxy

- Sometimes it's a lot better if the proxy does it.
Happy Eyeballs at the proxy

- Request MUST have a Domain Name
- At the minimum: retry using IPv4 if IPv6 fails
- No knobs from RFC8305 (yet)
- Caveat: Happy Eyeballs + TFO

Happy Eyeballs option