DNS over QUIC

draft-huitema-dprive-dnsoquic-00

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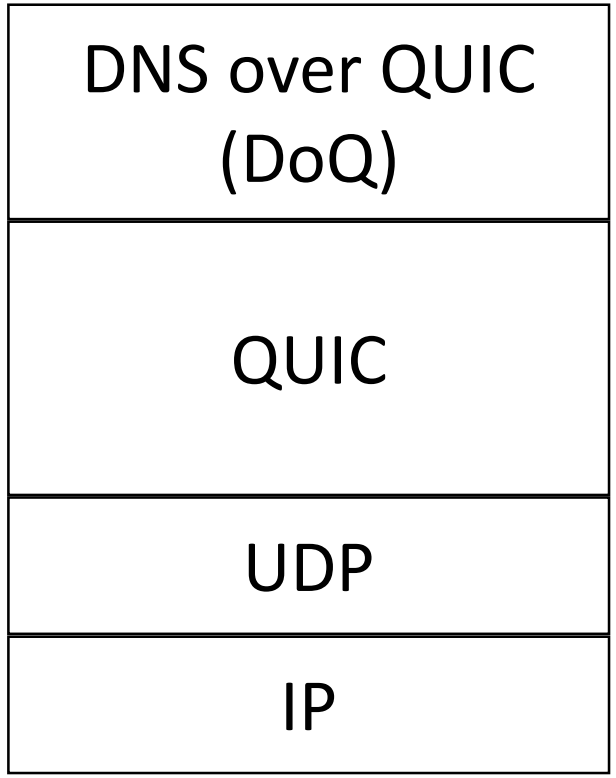
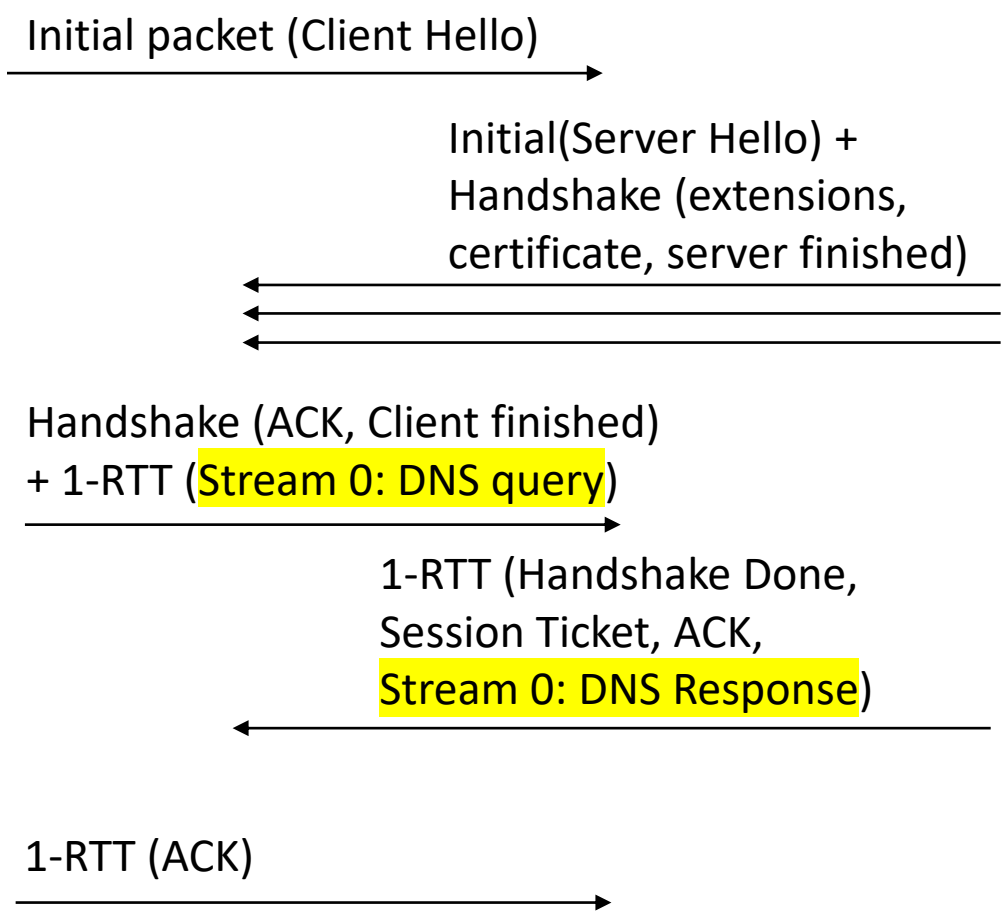
What?



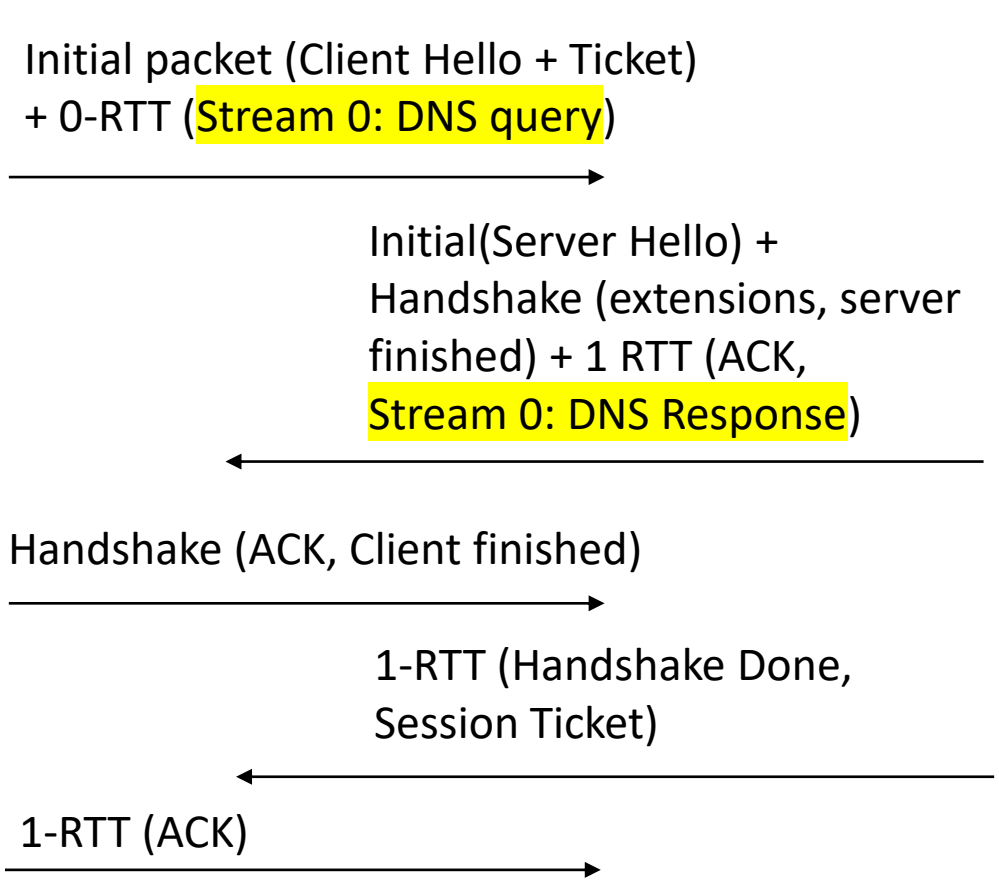
- Simple mapping of DNS over dedicated QUIC connections
  - One QUIC Stream per DNS Query/Response
  - Query and Response size up to 64K (65536)
  - Parallel processing, no head of queue blocking
  - QUIC handles timers, retransmissions, connection management
- Draft-00 targets the stub-recursive scenario
  - Recursive-authoritative requires discovery
- Operates on dedicated port (TBD-IANA)

Example flow, First connection, 1-RTT



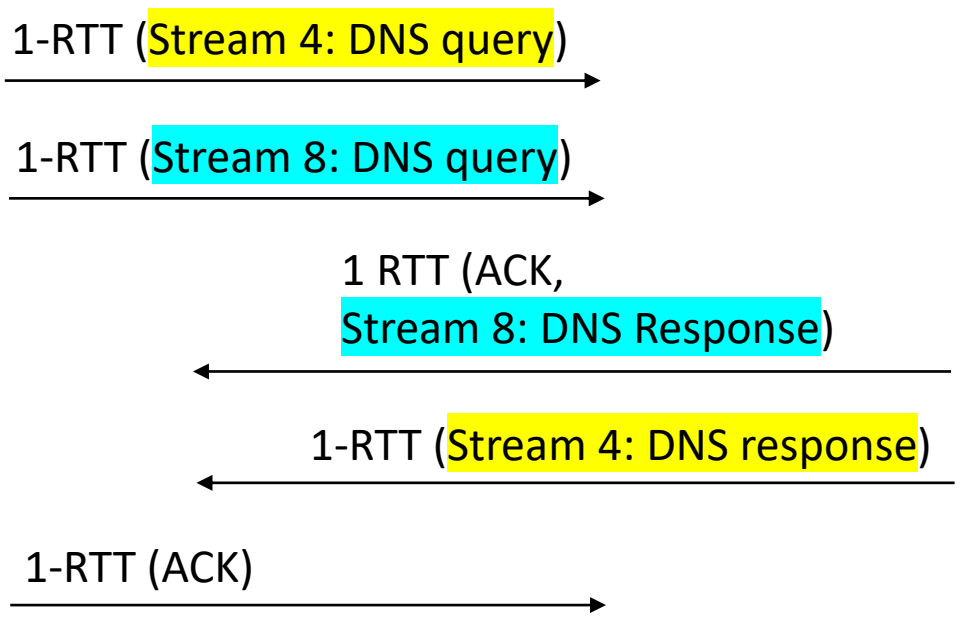
- QUIC handshake embeds TLS handshake
  - Size of server responses depends on size of server certificate, signature
- DNS Query can be sent as soon as server first flight is received
- Response arrives after 2-RTT plus service time.

Example flow, Second connection, 0-RTT



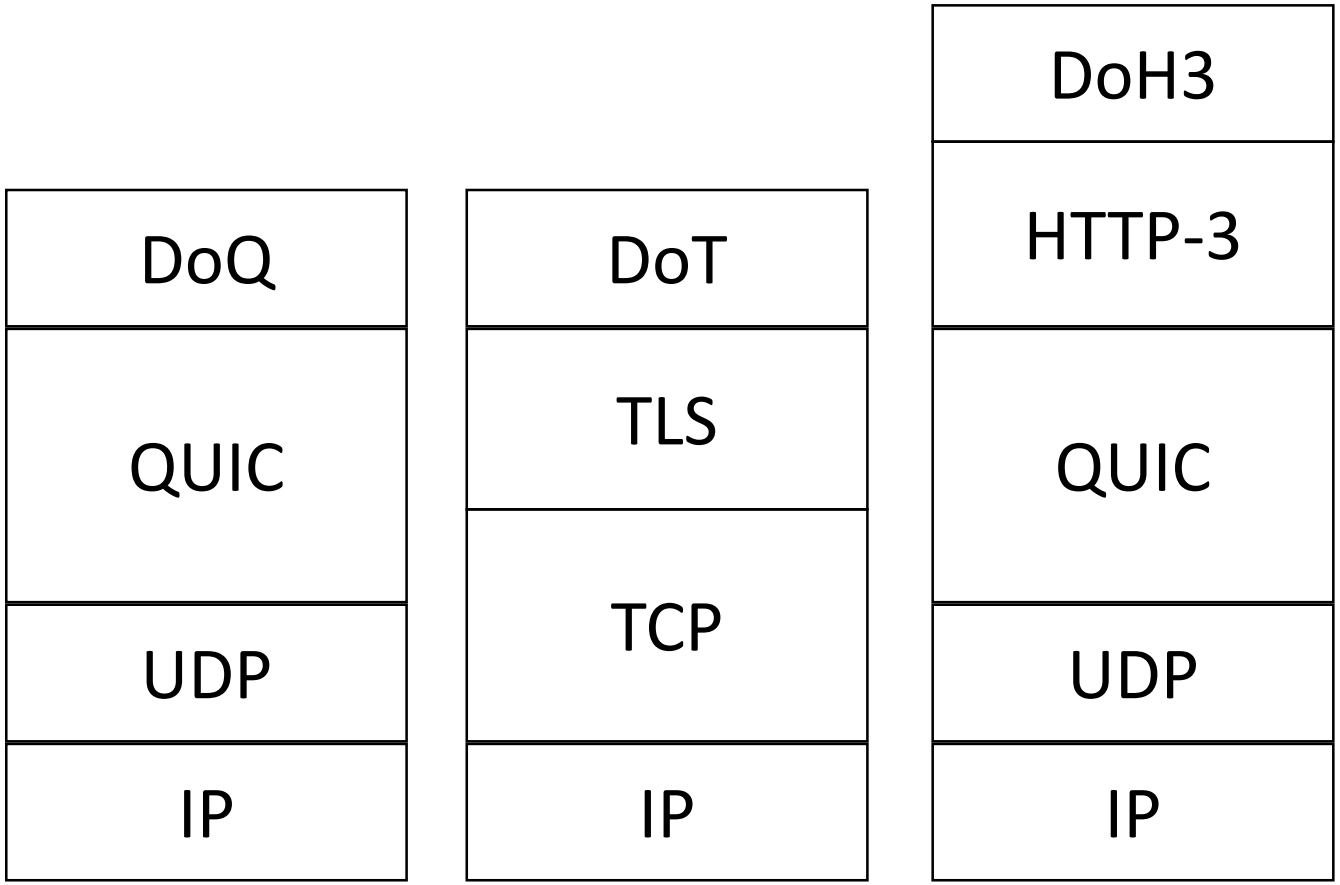
- Session Ticket obtained during previous connection
- DNS Query sent immediately as 0-RTT data
- DNS Response sent with first server flight
- Response arrives after 1-RTT plus service time.

Example flow, Additional Queries



- Each Query uses a new QUIC stream (Query-ID is always 0)
- Responses can arrive in any order

Why?



- Differences with DoT
  - QUIC instead of TLS + TCP
- Difference with DoH3
  - DoH3 has integration with the Web
  - DoQ does not need to use the HTTP-3 layer
  - DoQ has no dependency on HTTP platforms
- With ESNI/ECHO, all 3 solutions can cross firewalls

Why Now?

- QUIC Transport is (almost) ready
  - Spec is largely frozen, very high bar for changes
  - More than 16 interoperating implementations
- DNS over QUIC does not require changes in QUIC
  - DNS over QUIC use case taken into account during development
- Work to do in DPRIVE
  - Connection Management
  - Details of DNS mapping
  - Policy for using 0-RTT

ADOPT?