The \texttt{qpack\_static\_table\_version} TLS extension

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Overview

• What is the QPACK static table?

• What's wrong with the QPACK static table?

• What is the "qpack_static_table_version" TLS extension

• Discussion
What is the QPACK static table?

- QPACK is the HTTP/3 compression system for headers/trailers
- Comprises static and dynamic tables
  - Static table - encodes common header field or field/value combinations
    - :method
    - strict-transport-security max-age=31536000; includesubdomains
    - If-Modified-Since
  - Dynamic table - encodes less-common combinations
    - May be request-specific or simply 'less-common'
- Static table allows for excellent compression (e.g. 61 bytes -> 2 bytes)
- Common static table is referenced by client and server
Limitations of QPACK static table

• A single QPACK static table is defined in RFC 9204 as Appendix A
• Created in 2018, based on a representative sampling of web traffic
• Includes some invalid values
  • May still be worthwhile to include if they are frequently passed
• Doesn't allow for 'upgrades'
  • Additions to table for new common headers e.g. Accept-CH
  • Reordered table to ensure most common elements are near the beginning
• Over time, static table will become 'stale'
  • Other vendors may choose to create their own copies
The "qpack_static_table_version" TLS extension

• A proposed TLS extension that clients and servers can use to negotiate on a version of the static table to use
• Runs 'before' HTTP, so table is known before request/response begins
• Relies on static table(s) being published in an IANA registry
  • Additions to existing table can be added to existing registry
  • New versions of the table (reordered etc.) have their own registry

• Future-proofing - defines a standard for all vendors to use
• Avoids interoperability chaos if vendors choose their own static table
Problems?

• Should it be a TLS extension?
  • Boundary crossing - this is an HTTP I-D
  • Maybe use ALPS/ALPN?

• Could it run early in HTTP (perhaps controlled via a header?)

• How big of a deal is table interoperability/staleness?
Discussion