TCP-use-TLS

Eric Rescorla

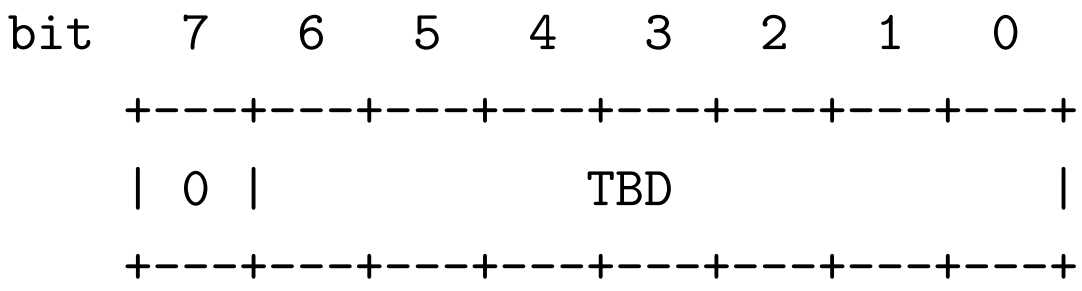
Mozilla

ekr@rtfm.com

Basic idea

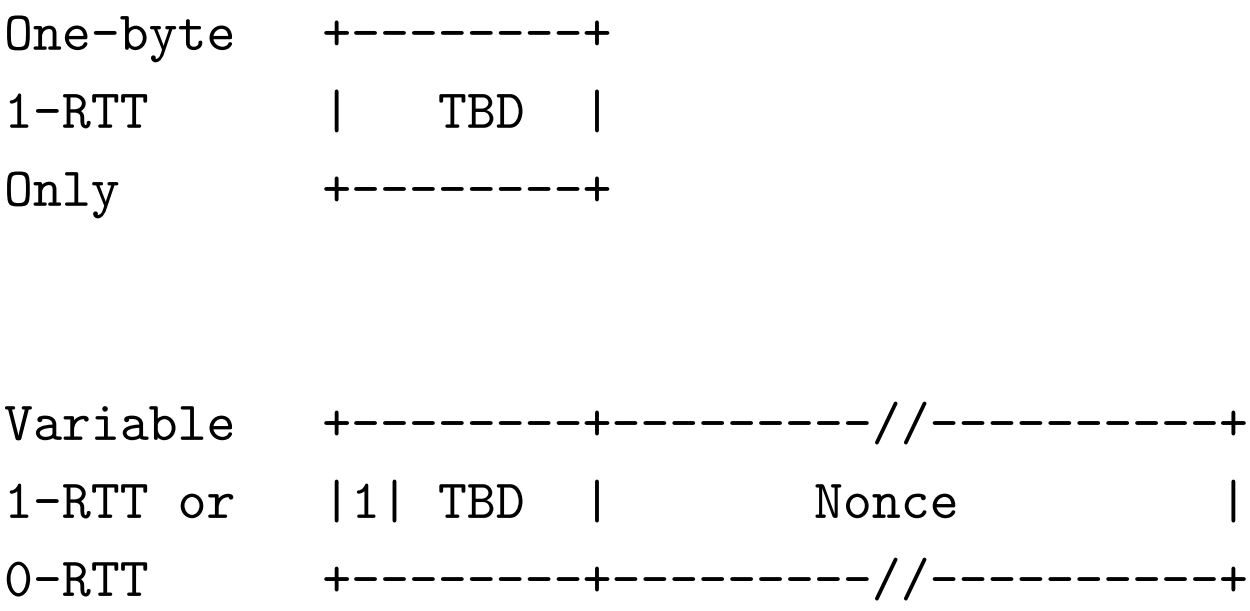
- Use ENO to negotiate use of the _spec_ defined in this draft
- Run TLS as usual over TCP once ENO negotiates it
- Profile TLS down to a small subset of TLS 1.3
  - But also allow TLS 1.2 (see below)
- Intuition: if you ignore ENO extensions this looks just like TLS-over-TCP

Minimal SYN Suboption



- As usual, application-aware bit avoids TLS-in-TLS

SYN/ACK Suboptions

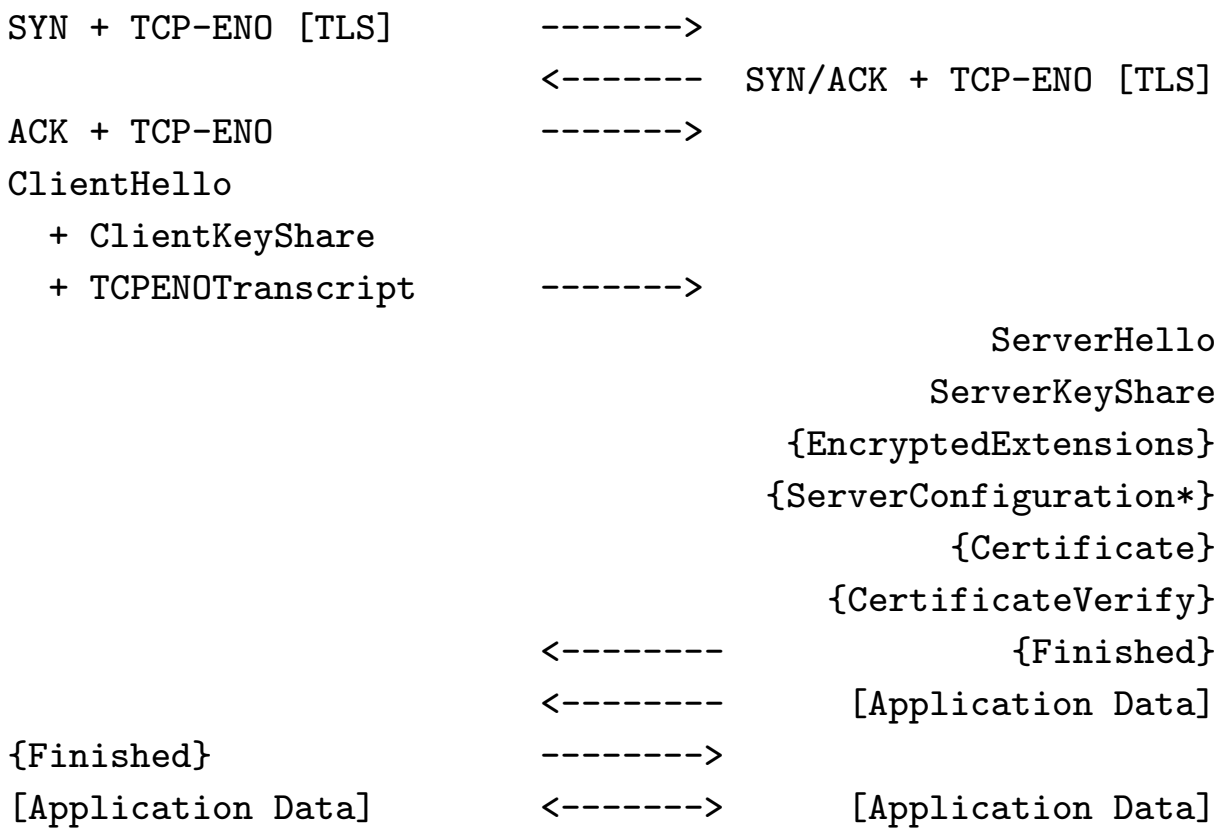


- Warning: nonce thing may be half-baked; more on this later

TLS 1.3 Profile Overview

- ECDHE only (MUST P256, SHOULD X25519)
- Limited set of symmetric ciphers
- Support for raw public keys (avoid need for X.509 certs)
- Server "authentication" mandatory for protocol reasons
- No client authentication
- No resumption

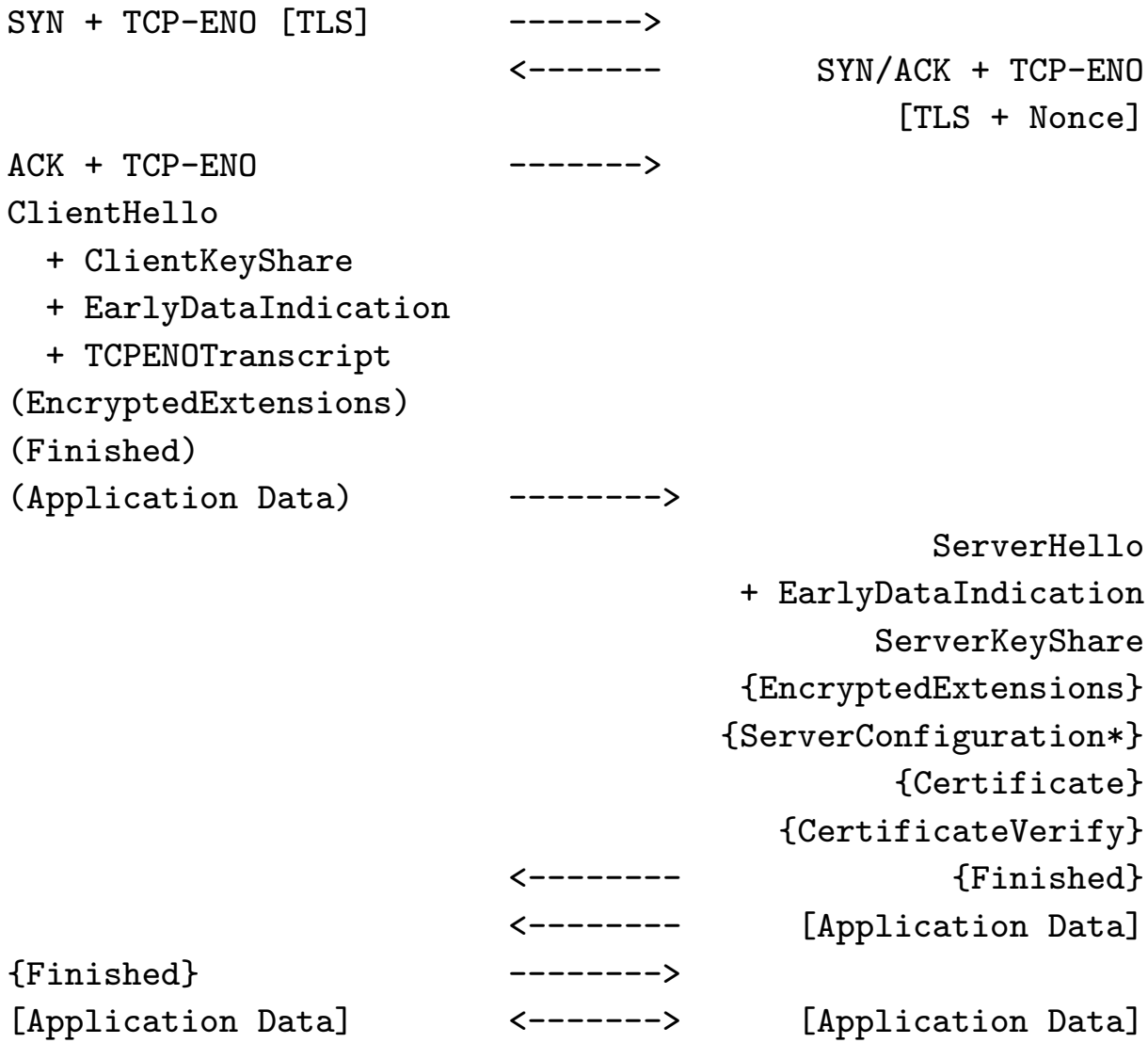
TLS 1.3 Handshake in TCPINC (1-RTT)



0-RTT

- In initial handshake, server provides long-term ECDHE key in ServerConfiguration
- In subsequent handshake, client can encrypt using that key
  - Obviously this doesn't provide PFS
  - There are replay issues in stock TLS 1.3
  - ... but here we have a nonce
- 0-RTT currently required to be manually configured

TLS 1.3 Handshake in TCPINC (0-RTT)



Session IDs

- Computed as TLS Exporter [RFC 5705]
- Label to exporter is TBD
- TCP-ENO transcript bound in via TCPENOTranscript extension

Open issues

- Ability to negotiate TLS 1.2 as well
  - This is useful, though perhaps not for TCPINC use case
  - Some suggestions to define two code points
- Should the client be able to say it wants 0-RTT?
  - How would this help?
- Interaction with TFO

Questions?