Token Binding in TLS 1.3

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Token Binding for 1-RTT TLS 1.3

TBNEGO is limited to TLS 1.2 and earlier, but changes to support TLS 1.3 are minimal. Proposed changes for a new draft:

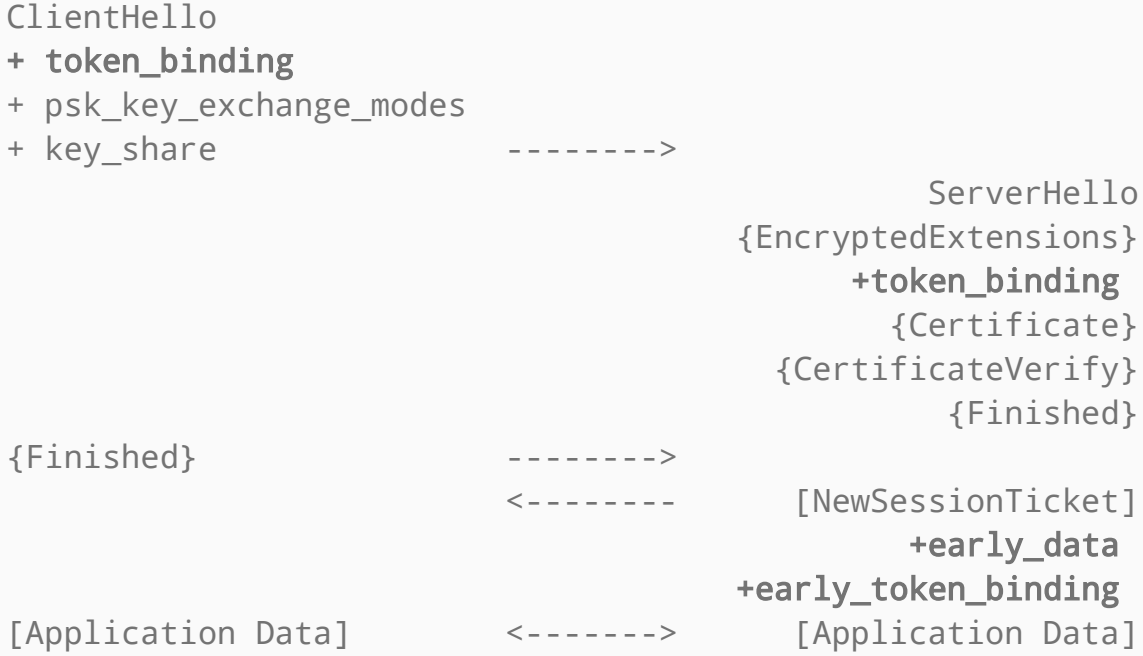
- Server puts token_binding extension in EncryptedExtensions
- Define signed value in terms of TLS 1.3 section 7.5 (Exporters) instead of RFC 5705
- Define an interaction with 0-RTT that a server MUST NOT negotiate token_binding and early_data on the same connection (unless updated by another draft)

draft-ietf-tokbind-tls13-0rtt: Changes in -02 from -01

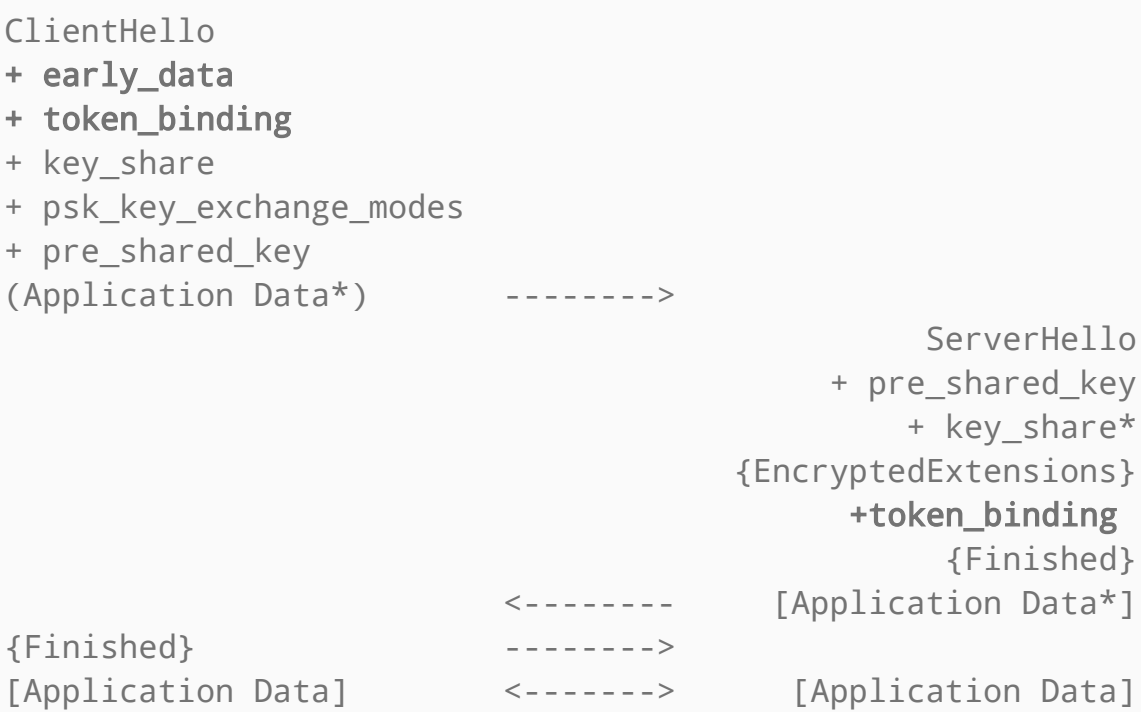
- Use one exporter value for entire connection*
- Restrict to using PSKs issued from NewSessionTicket and used with (EC)DHE key exchange mode
- Added new TLS extension to negotiate and indicate use of 0-RTT TB
- Removed replay indication TLS extension

*Needs further discussion

0-RTT TB negotiation: initial handshake



0-RTT or TB negotiation (client does not support 0-RTT TB)



0-RTT TB negotiation: resumption handshake (early data accepted)

Switching Exporters: Background

Current design (no switching exporters) is convenient for HTTP

Other application protocols might send a message in early data without any tokens, and want to send bound tokens after TLS handshake

Do we need application profiles on how to use protocols with 0-RTT TB?

Switching Exporters: Options

- Always use early exporter: security roughly equivalent to client certs used with resumption
- Require normal exporter used for all TokenBindingMessage structs sent after handshake completes: security is as close to TBPROTO as possible
- Some sort of middle ground
  - Previously suggested: client switches ASAP; server has no way of enforcing switch
  - Another option: client SHOULD switch post handshake; server soft fails (e.g. sends 4NN Too Early HTTP status code) if wrong exporter used
  - Other options?