TLS Extractors

Eric Rescorla

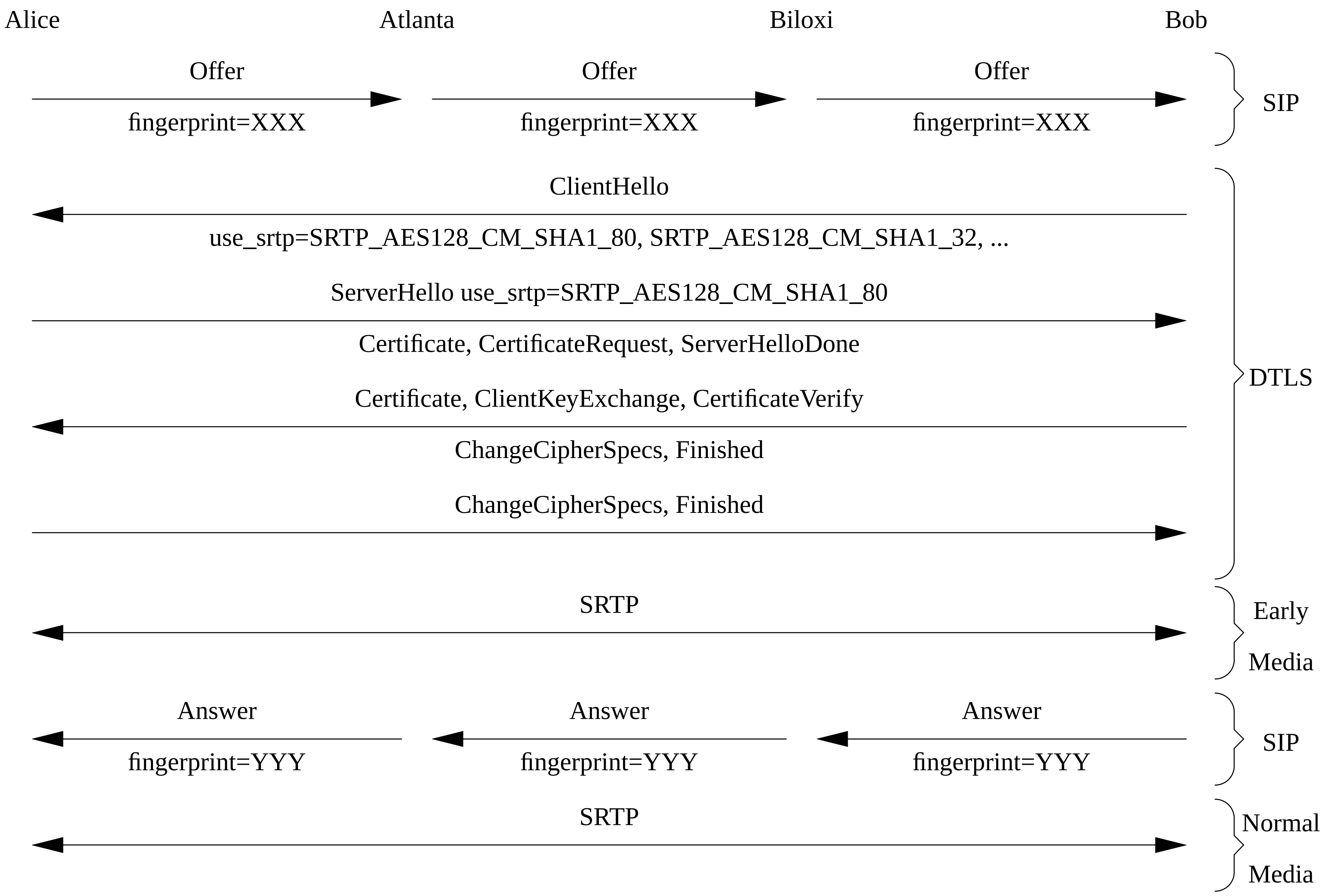
Network Resonance

ekr@networkresonance.com

General Idea

- Other protocols want to use TLS negotiation
  - But for some reason access keying material
- Examples
  - SCTP Auth
  - DTLS-SRTP
  - TCP Auth
  - EAP

Example: DTLS-SRTP



Alice Atlanta Biloxi Bob

Offer / fingerprint=XXX (Alice → Atlanta)

Offer / fingerprint=XXX (Atlanta → Biloxi)

Offer / fingerprint=XXX (Biloxi → Bob)

SIP

ClientHello
use_srtp=SRTP_AES128_CM_SHA1_80, SRTP_AES128_CM_SHA1_32, ...

ServerHello use_srtp=SRTP_AES128_CM_SHA1_80
Certificate, CertificateRequest, ServerHelloDone

Certificate, ClientKeyExchange, CertificateVerify
ChangeCipherSpecs, Finished

ChangeCipherSpecs, Finished

DTLS

SRTP

Early Media

Answer / fingerprint=YYY (Atlanta → Alice)

Answer / fingerprint=YYY (Biloxi → Atlanta)

Answer / fingerprint=YYY (Bob → Biloxi)

SIP

SRTP

Normal Media

Simple Idea

- General technique for generating keys from TLS handshake (*Extractor*)
- Requirements
  - Each *exported keying material* (EKM) is unique
  - Infeasible to go from EKM_1 to EKM_2
  - Infeasible to go from EKM to MS
- Algorithm is: $EKM = PRF(master\_secret, label, SecurityParameters.client\_random + SecurityParameters.server\_random)[length])$
- labels MUST be registered

Changes From Last Version

- Labels no longer MUST have a fixed prefix
- Text that you should somehow indicate you're doing this
  - Like with an extension

Where to from here?

- Comments?
- Should we accept this as a WG item?
- draft-rescorla-tls-extractor-01.txt