RTP over DTLS

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Basic problem: Key Mgmt

- Currently SRTP uses external key mgmt.
  - Existing proposals all use SIP for key exchange
  - Several proposals at IETF 65 with alternatives
- Current solutions have a number of problems:
  - Early media
  - Forking
  - Rollover counter management
  - Rekeying
  - Dependence on PKI
  - Capabilities discover problems
  - Drafts available to fix some but not all of these
- These problems are architectural
  - Correlation issues between signalling and media channels
  - Can’t be cleanly fixed at signalling level

Target applications

- Anything point-to-point
  - VoIP
    - Solution completely described
  - Streaming
    - Would need some more elaboration
- Not multicast/broadcast
  - This is a fundamentally different problem
    - Less well understood
    - Group keying has very different requirements

Existing approaches

- MIKEY
  - Shared key mode doesn't scale
  - RSA mode requires global PKI
    - And directory
  - DH mode requires PKI
  - Problems with early media
  - Basic problem: not enough round trips
- SDESCRIPTIONS
  - Unrealistic security assumption: full channel confidentiality
  - Problems with early media
  - Forking has security issues

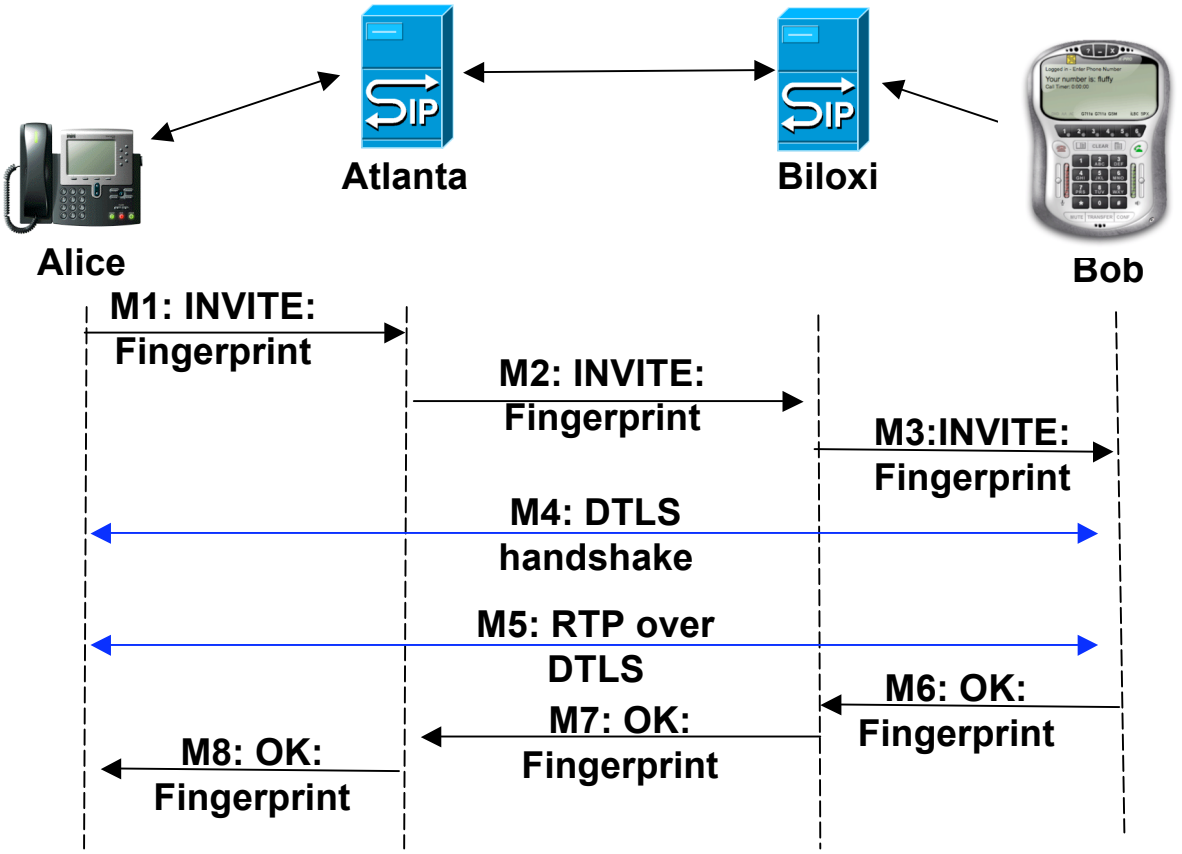
Fixes being discussed

- Modifications to MIKEY handshake
- Rollover counter management
- Public key support for SDESCRIPTIONS
- In-channel key updates
- Key management on media channel

RTP Over DTLS Overview

- Move key management to media channel
  - Carry media over Datagram TLS
  - Well understood technology
- Authenticate with certificate fingerprints
  - Same technique as comedia TLS
  - Could also use Short Authentication String a la ZRTP
  - Integrity protect the fingerprint using sip-identity
- Same packet format as SRTP

Message Flow



Performance Issues

- SRTP is highly tuned for RTP
  - Low overhead
  - Headers in clear
- DTLS is generic
  - Higher overhead
- Meeting in the middle: “SRTP compatibility mode” looks like SRTP
  - New CTR mode cipher suite
  - Partial encryption
  - Implicit headers
    - But can interleave with explicit headers for easy resynchronization
  - On-the wire only changes retain DTLS security arguments

Internet Drafts

- draft-tschofenig-avt-rtp-dtls-00
- draft-fischl-sipping-media-dtls-00
- draft-fischl-mmusic-sdp-dtls-00
- draft-ietf-tls-ctr-00
- draft-rescorla-tls-partial-00
- draft-modadugu-dtls-short-00