SDP Security Descriptions for Media Streams

<draft-ietf-mmusic-sdescriptions-00.txt>

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Overview

- Rationale & Requirements for replacing k=
  - End-to-end vs Hop-by-hop uses
  - Comparison with existing and nascent standards
- Security descriptions
  - Session descriptors vs. media descriptors
  - Changes from previous, private submission
  - Syntax
- Next steps

Rationale for this Work

1. Overcomes limitations of k=
    - Enables SRTP, TLS,… signaling in SDP
2. Leverages “existing” infrastructure
    - SDP used to signal media sessions
    - TLS or IPsec offers signaling protection
    - Absence of a global PKI

Security descriptions complements the keymgt-extensions for environments where SDP message is secure (e.g. TLS, IPsec).

Comparison with SDP k= Line

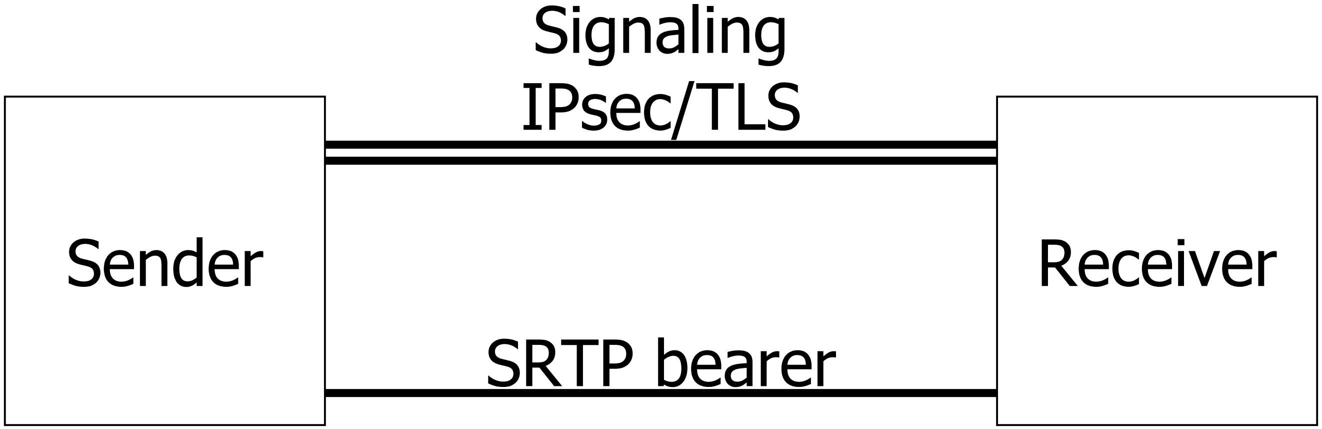
A cryptographic key

1. Has descriptors…
   - Parameters describing the key
   - Parameters describing the crypto session
2. And structure
   - SRTP master salt and master key
3. And session or media-level parameters

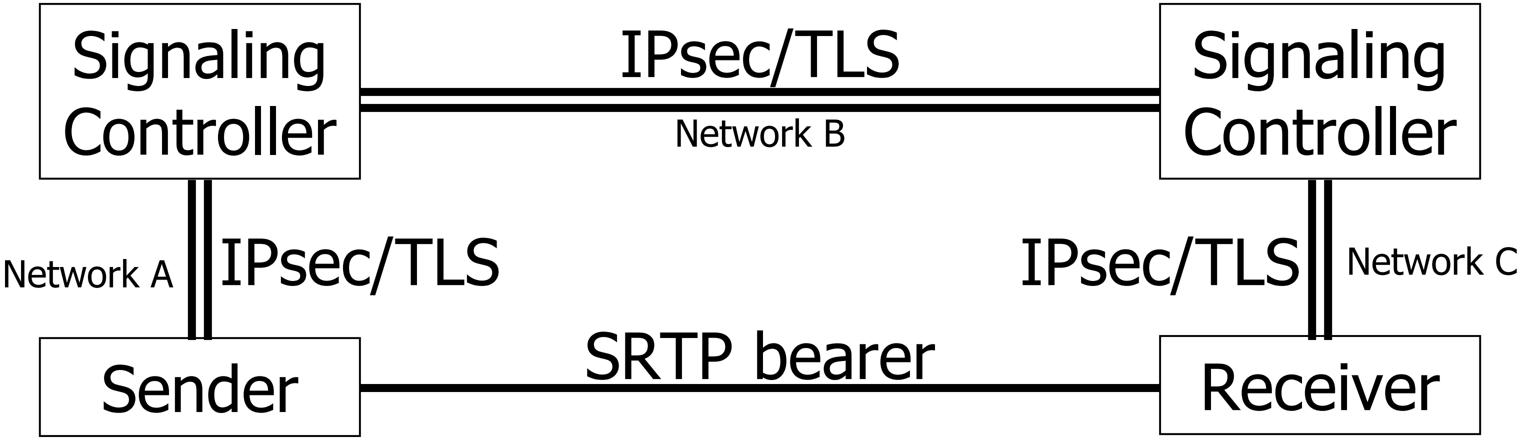
k= defines only structure, not parameters

k= can be extended with a *method* but no provision is made for descriptors and complicated session and media-level semantics.

SDP Signaling: Secure End-End Channel



SDP Signaling: Hop-by-Hop Channels



SDP message (e.g. SIP/SDP) travels multiple hops

e.g. networks a, b, and c encrypted/authenticated

Not end-end, security as good as weakest link

MMUSIC key-mgt approach does not suffer from this

Comparison with key-mgt Line

- Key mgt extensions
  - Supports AKE
  - Uses encrypted blob
    - New key-mgt stmt
    - Conveys a key mgt protocol message
  - Provides end-to-end security
  - As secure as the key management protocol
  - Additional latency

- Security descriptions
  - No AKE
  - Textual SDP parms
    - Extends k= statement
    - SDP secured with TLS, IPsec, …
  - May not provide end-to-end security
  - As secure as hop-by-hop security
  - No additional latency

Transport-Specific vs. Generic

- “K=” & key-mgt are transport-generic
- sdescriptions seeks to be as generic
  - A framework for security transports
  - Parameters are generic to the transports
  - Parameter values are transport specific
- But do not operate at SDP session level
  - There are omplicated interactions with transport-session parameters

SDP Security Descriptions

`a=crypto:<crypto-suite> <application> <key> [<session>]`

An SDP attribute with 4 parameters

- *Crypto-suite*=value (e.g. SRTP: AES-CTR-HMAC-SHA1-80)
- *application*=sub-protocol (e.g. SRTP or SRTCP)
- *Key* has two incarnations
  - uri: absolute-uri
  - inline: transport-specific-key-descriptor
- *Session* is transport-specific session parameters (e.g. SRTP: unencrypted srtp, FEC order, etc.)

Changes from Previous Draft

- Applies to media streams not codecs
  - Led to substantial change in the syntax
- Applies to SDP media level only
  - As a result of improving Offer/Answer
- Added “Application” Parameter
  - Allows separate descriptions for SRTP and SRTCP
- Defines sdescriptions Offer/Answer
  - Not yet generalized beyond SRTP
- Added Augmented BNF Grammar

An SRTP Example

```
v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
u=http://www.example.com/seminars/sdp.pdf
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=video 51372 RTP/SAVP 31
a=crypto:AES_CM_128_HMAC_SHA1_80 both
    inline:16/14/d0RmdmcmVCspeEc3QGZiNWpVLFJhQX1cfHAwJSoj/2^20/1:32
m=audio 49170 RTP/SAVP 0
a=crypto:AES_CM_128_HMAC_SHA1_32 srtp
    inline:16/14/NzB4d1BINUAvLEw6UzF3WSJ+PSdFcGdUJShpX1Zj/2^20/1:32
a=crypto:AES_CM_128_HMAC_SHA1_80 srtcp
    inline:16/14/eZkBkQythOTg3NjU0MSEzMDMyMT01NDg5N2RlRkF/2^20/1:32
m=application 32416 udp wb
a=orient:portrait
```

Next Steps

- Fix known errors
  - SDP direction attribute ambiguities
- Add missing pieces
  - Generalize Offer/Answer
  - Generalize to transports beyond RTP/SAVP
- Get implementation experience
- Report back to next mmusic meeting