TCP Authentication Option Master Key Tuple negotiation in IKEv2

draft-mahesh-karp-rkmp-02

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Introduction

- Combines the work of “draft-chunduri-karp-using-ikev2-with-tcp-ao-02”
- Instead of generating an automatic key management for pairwise routing protocols, aims only to secure TCP-based pairwise Routing Protocol (RP) associations using the IKEv2 integrated with TCP-AO
  - Standard IKEv2 IKE_SA_INIT and IKE_AUTH Exchanges
  - Includes extensions to the Security Association payloads to enable its key negotiation to support TCP-AO.
  - Uses standard IKEv2 TS payloads to represent the traffic selectors for the routing protocol that will use the TCP-AO MKT (e.g., BGP or LDP).

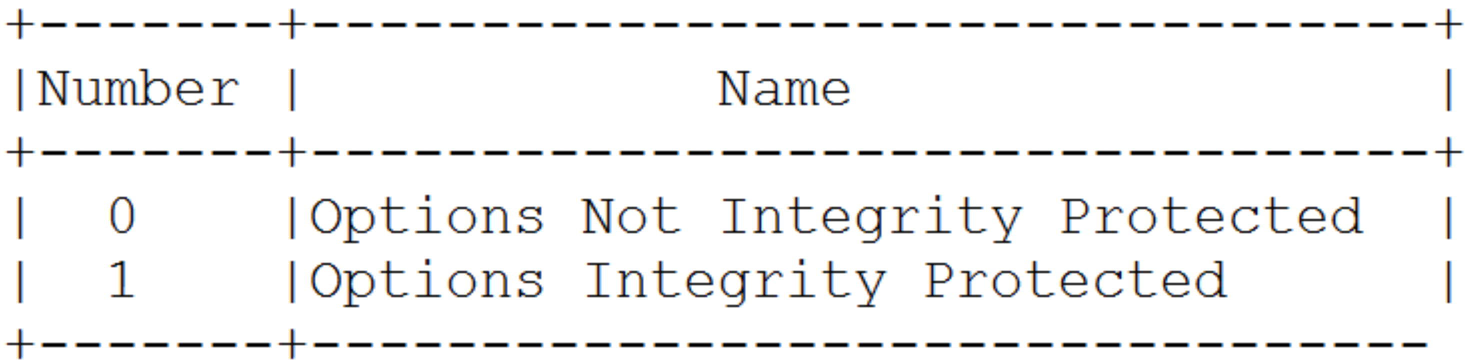
Transforms Substructures (1)

- In order for IKEv2 to negotiate TCP-AO policy, a new Security Protocol Identifier needs to be defined in the IANA registry for "IKEv2 Security Protocol Identifiers".
  - This memo proposes adding a new Protocol Identifier to the table, with a Protocol Name of "TCP_AO" and a value of TBD1.
- Two MAC algorithms are supported in TCP-AO
  - HMAC-SHA- 1-96 and AES-128-CMAC-96
  - Re-use the existing INTEG transform IDs of AUTH_HMAC_SHA1_96 and AUTH_AES_CMAC_96 respectively.

Protocol	Mandatory Types	Optional Types
TCP-AO	INTEG, TCP	D-H

Transforms Substructures (2)

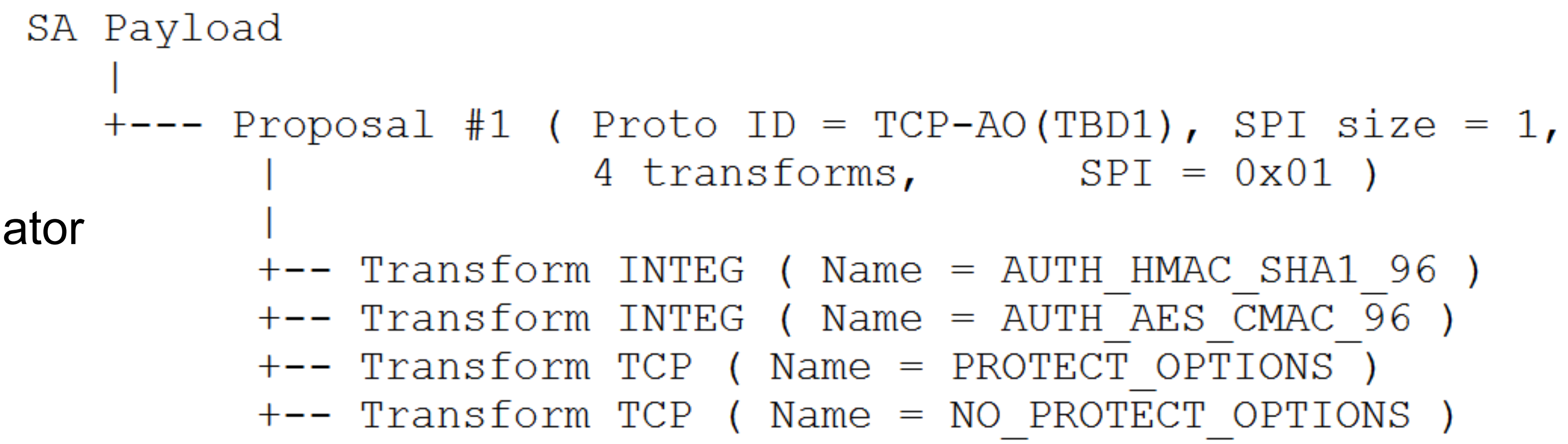
- No KDF algorithm is negotiated
  - •In TCP-AO, the use of each INTEG algorithm implies the use of a specific KDF (deriving session keys from a master key)
- a new type of transform is defined, which describes whether TCP options are to be protected by the integrity algorithm.



Number	Name
0	Options Not Integrity Protected
1	Options Integrity Protected

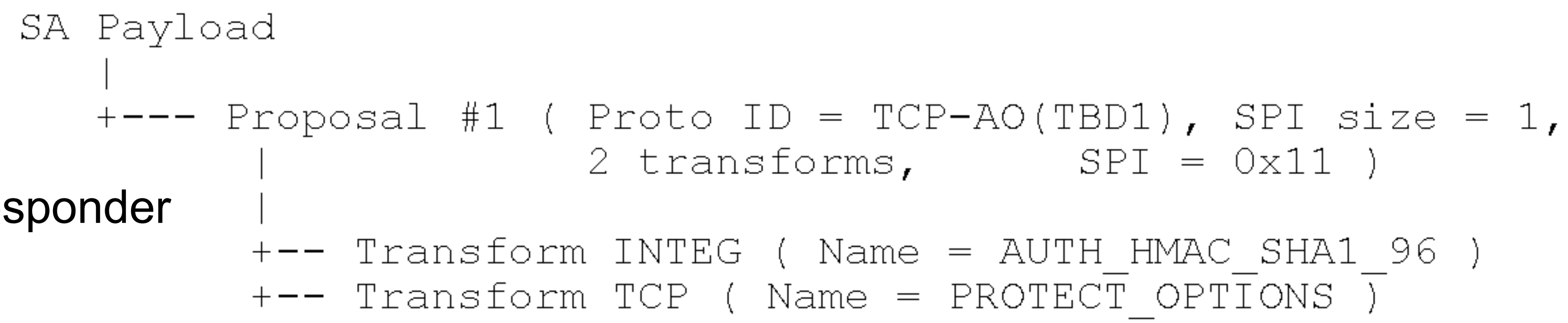
Example of SA Payloads for TCP-AO

Initiator



```
SA Payload
   |
   +--- Proposal #1 ( Proto ID = TCP-AO(TBD1), SPI size = 1,
         |            4 transforms,      SPI = 0x01 )
         |
         +-- Transform INTEG ( Name = AUTH_HMAC_SHA1_96 )
         +-- Transform INTEG ( Name = AUTH_AES_CMAC_96 )
         +-- Transform TCP ( Name = PROTECT_OPTIONS )
         +-- Transform TCP ( Name = NO_PROTECT_OPTIONS )
```

Responder



```
SA Payload
   |
   +--- Proposal #1 ( Proto ID = TCP-AO(TBD1), SPI size = 1,
         |            2 transforms,      SPI = 0x11 )
         |
         +-- Transform INTEG ( Name = AUTH_HMAC_SHA1_96 )
         +-- Transform TCP ( Name = PROTECT_OPTIONS )
```

- The TCP-AO KeyID that is sent in the SPI field of an IKEv2 proposal.

Notify and Delete Payloads

- A Notify Payload or Delete Payload contains a Protocol ID field. The Protocol ID is set to TCP_AO (TBD1) when a notify message is relevant to the TCP-AO KeyID value contained in the SPI field.

Questions?