The SA Creation protocol in 06-449r5

T10/07-226r1

ENDL
TEXAS

The Basics

- ☆ **Three steps**
  - ✚ **Get Capabilities** (boring)
  - ✚ **Key Exchange**
  - ✚ **Authentication**

- ☆ **Steps are identified in CDB**
  - ✓ **SECURITY PROTOCOL field**
  - ✓ **SECURITY PROTOCOL SPECIFIC field**

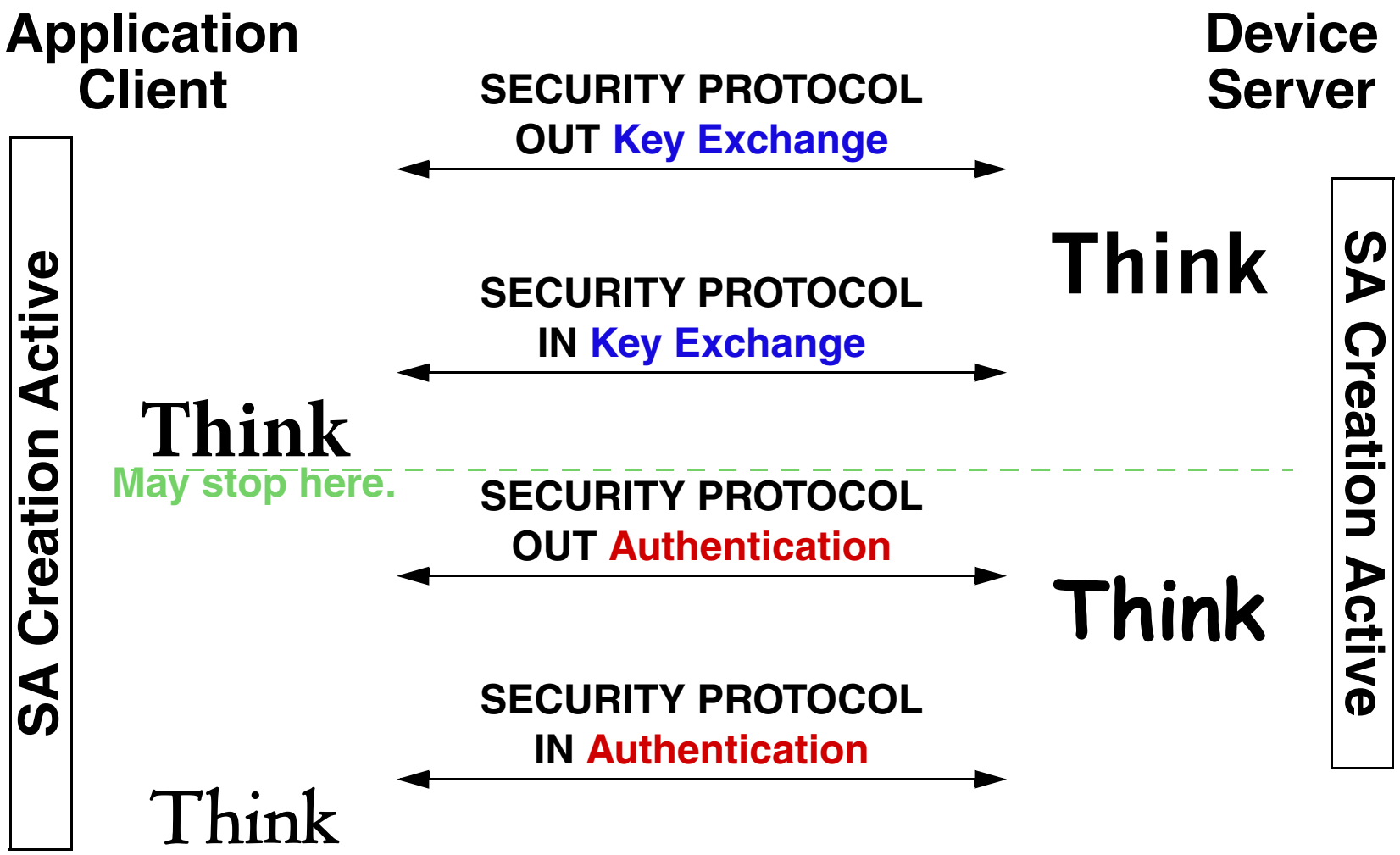
The Basics

(continued)

- **Four commands** (in Key Ex. & Auth.)
  - **SECURITY PROTOCOL OUT** **Key**
  - **SECURITY PROTOCOL IN** **Key**
  - **SECURITY PROTOCOL OUT** **Auth**
  - **SECURITY PROTOCOL IN** **Auth**
- **Always start at:**
  - **SECURITY PROTOCOL OUT** **Key**
- **End after:**
  - **SECURITY PROTOCOL IN** **Key**
  - **SECURITY PROTOCOL IN** **Auth**

The Basics

(Ladder Diagram)



Limit: 1 SA Creation per I_T_L Nexus

(Reflect this in the command protocol)

- ☆ **Lock-step protocol**
  - ➔ **Initiator waits for status on command *n* before sending *n*+1**
  - ➔ **Target processes each command all the way to completion before sending status**
- ☆ **Use REQUEST SENSE for progress indication**

Limit: 1 SA Creation per I_T_L Nexus

- ☆ Check multiple attempts only on SECURITY PROTOCOL OUT Key
- ☆ Other *Kindness* Features
  - ✚ Allow repeats on any SECURITY PROTOCOL IN
  - ✚ SECURITY PROTOCOL OUT Auth returns a 'retryable' error if decryption/integrity check fails
- ✗ All other errors abort SA creation

Abandoning SA Creation

Initiator needs a way to tell target it does not want to continue SA Creation

- ✗ **Delete created SA**
- ✗ **Delete *Creation Active* SA**
  - ✚ **Valid in place of SECURITY PROTOCOL OUT Auth**
  - ✚ **Requires minor changes to r4 Delete rules**

SA Type/Usage too Public

(Hugo Krawczyk issue #1)

It is not hard to concoct scenarios where the SA Type or Usage information can help an attacker. For example, the attacker may learn, from the Usage information, which of the connections is for higher-security communications (say, labeled "top secret") and hence use this information to concentrate an attack or disrupt the connection, etc. It could also help in some forms of traffic analysis. Whether such scenarios are of concern for SCSI I cannot say.

- ✓ These SAs do not associate easily to connections
- ✓ Encrypting sensitive usage info using the SA is a way to hide it

- ☆ No Changes Needed

SA Type/Usage too Public

(Hugo Krawczyk issue #4)

I would change the name of the flag AUTH_NONE to signal the use of a combined encryption/integrity to AUTH_COMBINED. The existence of a AUTH_NONE flag may lead people to think that they can skip authentication all together.

- ☆ **Outstanding idea**
- ☆ **Do it & assign it a non-zero codepoint to avoid IKEv2 entanglements**