Command Security via SAs

r1 - revised based on discussions during CAP Security working group

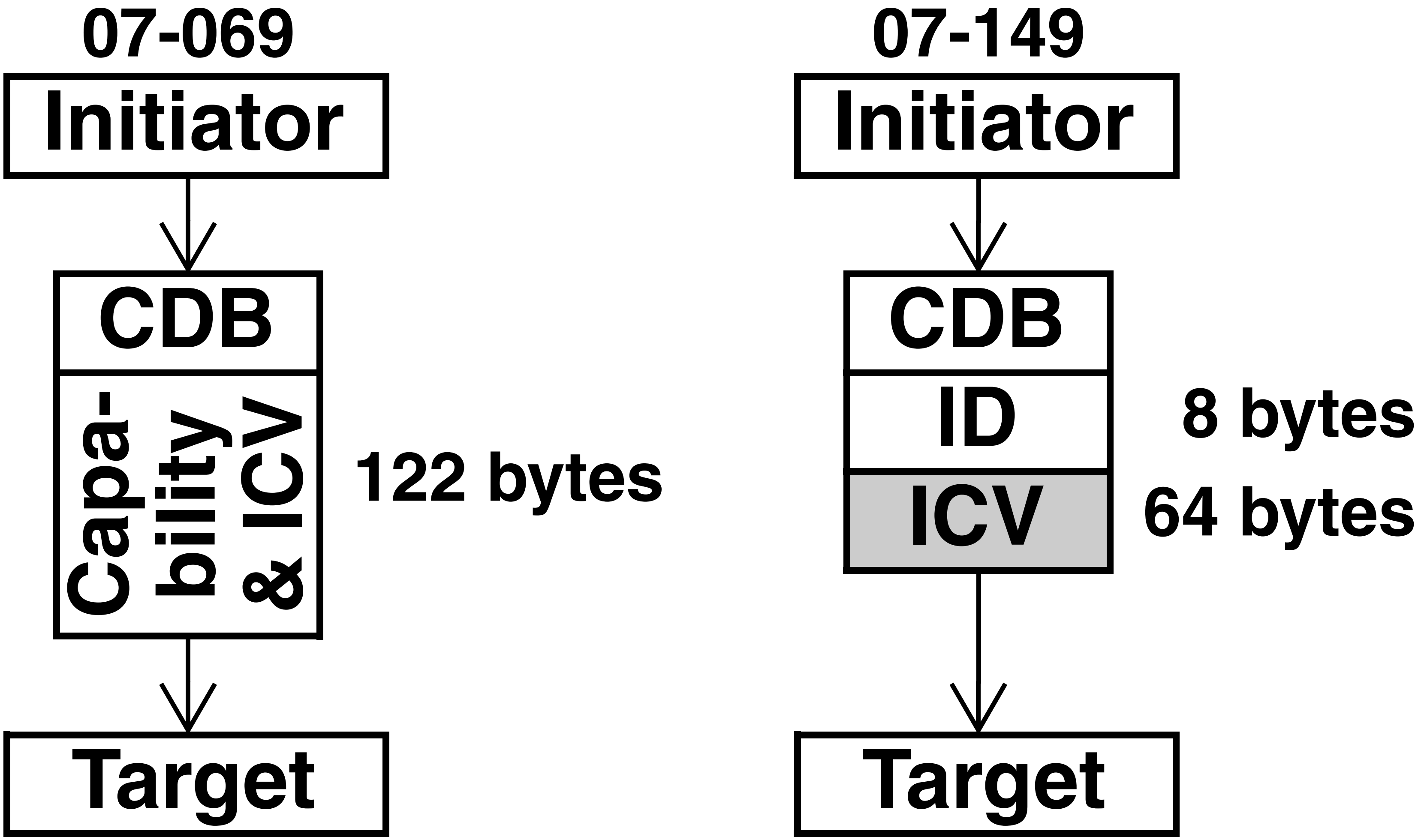
T10/07-149r1

Goals

- ☆ Per-Command Security
- ☆ Fine-grained Reservations and/or Access Controls
  - ✚ Tied to TBD Entities Inside Application Client
  - ✚ Greater Command-Access Flexibility
- ☆ Consideration for OS Performance

Securing Commands

(Comparison of Approaches)



ID Options

(ICV is ICV …)

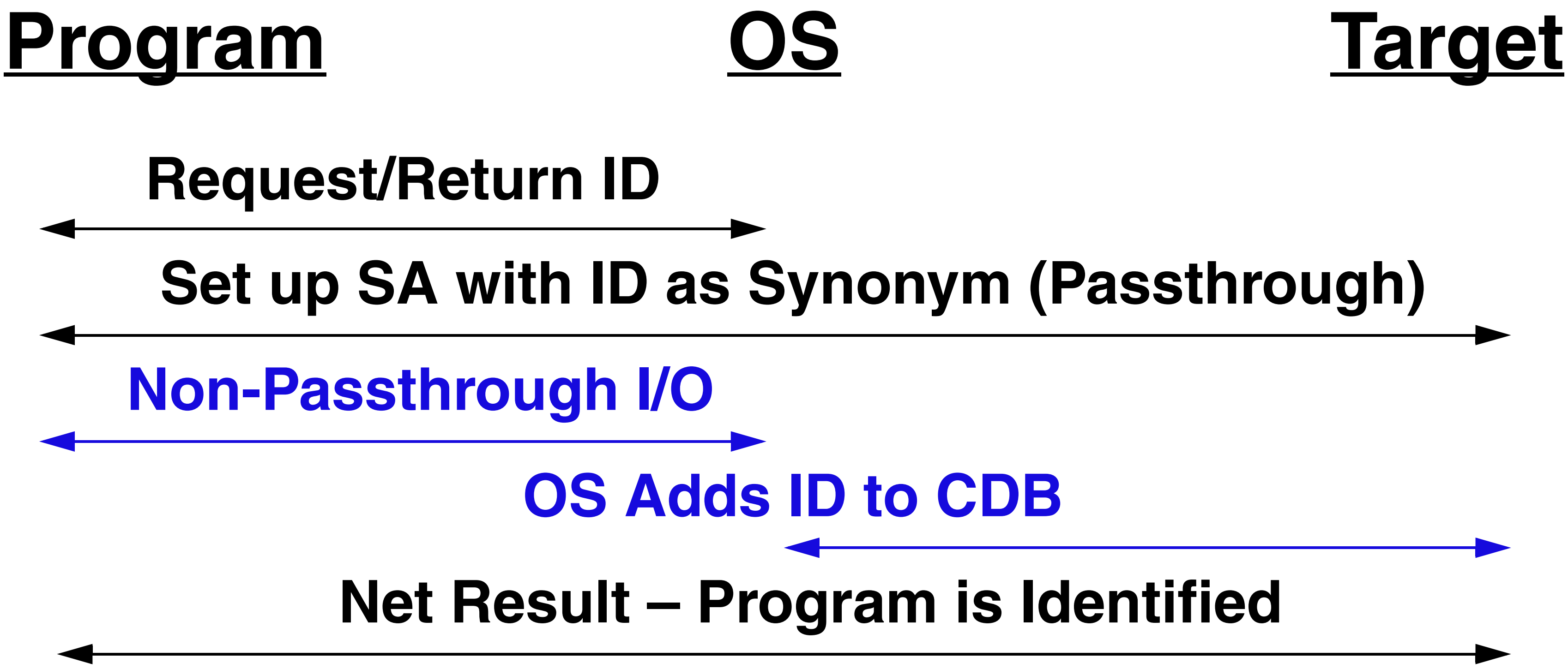
- ✓ **SA Identifier**
  - ✹ **AC_SAI + DS_SAI**
  - ✹ **DS_SAI is actually enough**

    (shrinks ID size to 4 bytes)
- ✓ **OS-Specific**
  - ✓ **Setup as Synonym for SA ID**

    (during SA Creation, i.e., validated**)**
  - ✓ **Tied to Program Running on OS**

OS-Specific ID

(Conceptual Protocol)



Program

OS

Target

Request/Return ID

Set up SA with ID as Synonym (Passthrough)

Non-Passthrough I/O

OS Adds ID to CDB

Net Result – Program is Identified

✓ When the OS stops adding a given ID is the crucial success factor

OS-Specific ID

(What Might Work)

- Process ID
- Image Count

- OS must deliver I/O completion to right image
- This kind of information seems likely to be available in some parts of the driver stack
- Your mileage may vary

SA Extensions

(Extensions to SA Creation)

✺ Authentication Required (usage based)

✺ Synonym Setup

☆ Commands Controls … 3 Lists

- ➔ Allowed When SA ID Present
- ➔ Allowed for Others SAs
- ➔ Allowed for Everything Else

✓ Checked Against Permissions for Authenticated SA Creator

Command Controls

(Preliminary List Format Ideas)

- ☆ **Allowed Bit Mask** (1 bit for each OP code)
- ☆ **Exceptions Descriptors**
  - ➔ Service Actions
  - ➔ Mode Page Codes
  - ➔ Mode Page Changeable
  - ➔ Log Page Codes
  - ➔ Diagnostic Page Codes
  - ➔ Reservations Modes
  - ➔ …

Command Controls

(Preliminary Format Ideas)

- ☆ Prohibit All MAINTENANCE OUT except SET IDENTIFYING INFORMATION
- ☆ Allow All MODE SELECT(10) except Control Mode Page
- ☆ Prohibit All Reservations except All Registrants

Inventive Enough?

Too Much?

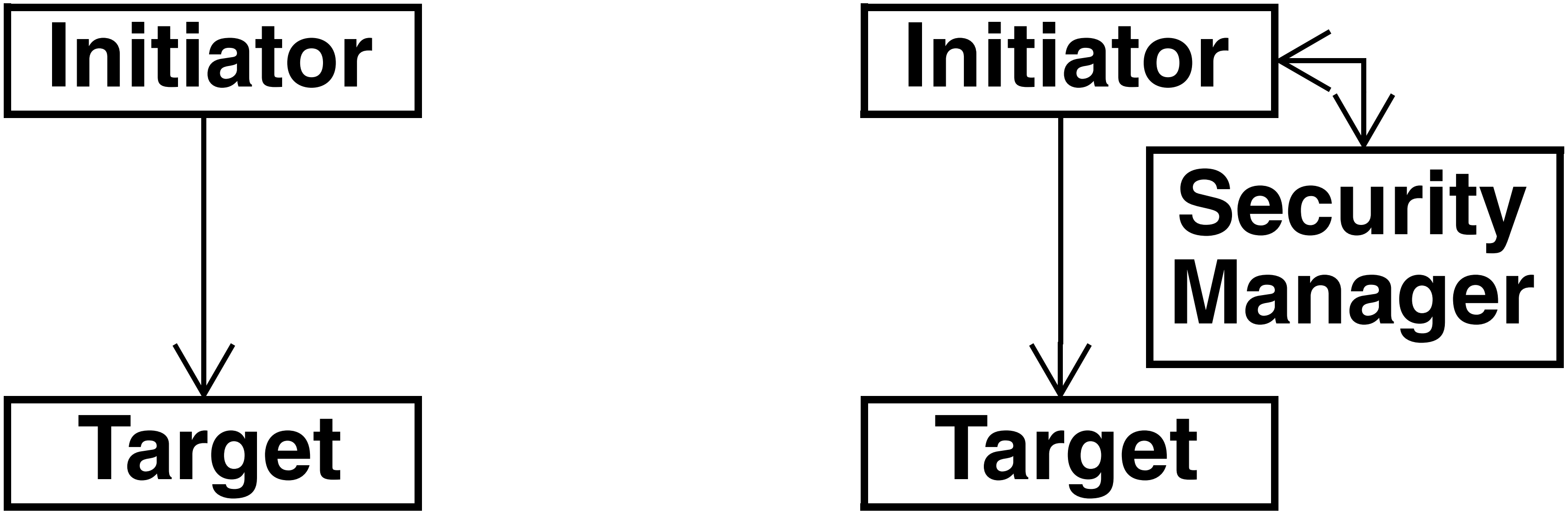
- ➔Is putting the command selection burden on the Initiator right?
- ➔Is the Allow/Prohibit Model Flexible Enough?
- ➔Is there more that can be done for multiple concurrent SAs?
- ➔How do ICVs fit into this picture?

Capabilities Too?

- ☆ Could SA Extension be Capability? (instead of bulky bit/exceptions format)
  - ✺ Somehow push to 1 Authentication (the Security Manager one)
  - ✺ I_T Nexus ID?
  - ✺ ICV?

Two Usage Models

(Good Reasons for Each)



- Usage validation in Target
- Decentralized Security
- More Smarts in Target
- Small Configurations

- Usage validation in SM
- Centralized Security
- Less Smarts in Target
- Large Configurations

Help!