
esa
TC Chain Security - ADCSS Interactive Session
Knut Eckstein
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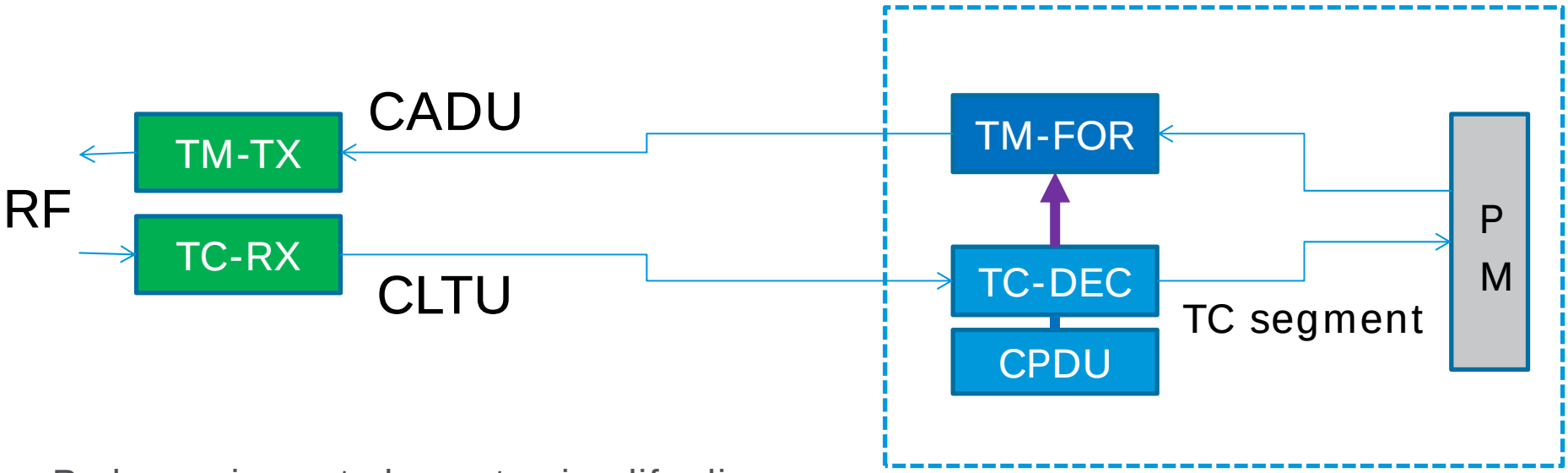
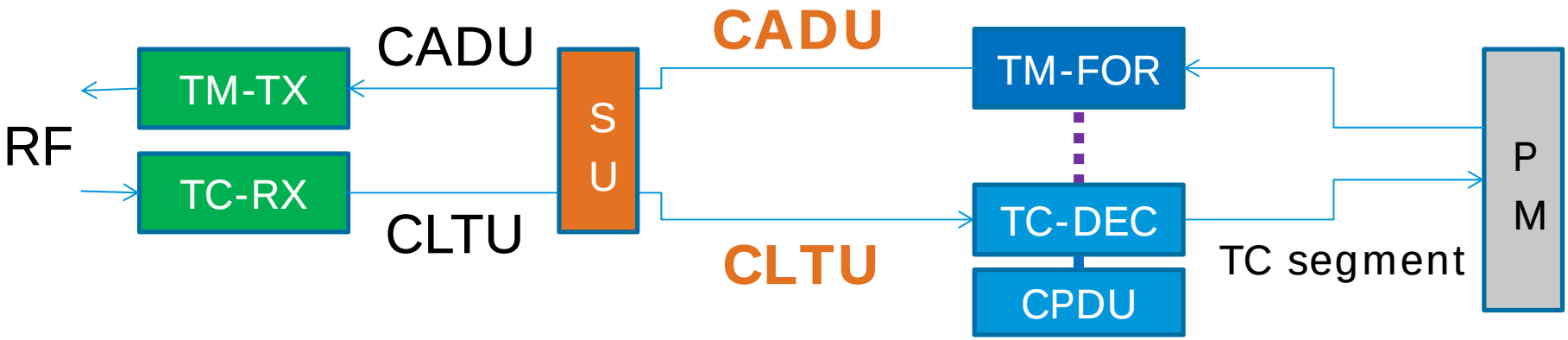
European Space Agency

Simplified TC/TM Architecture Today



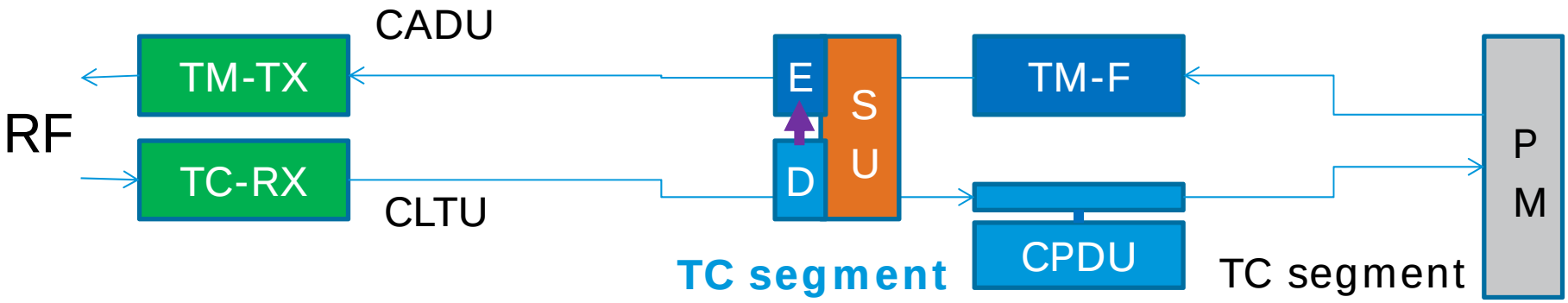
- Redunancies not shown to simplify diagrams
- CLTU decoder is part of OBC, together with other high-rel functions like CPDU
- **COP-1** reports TC status in FM frame trailer

Typical Security “BITW” Today



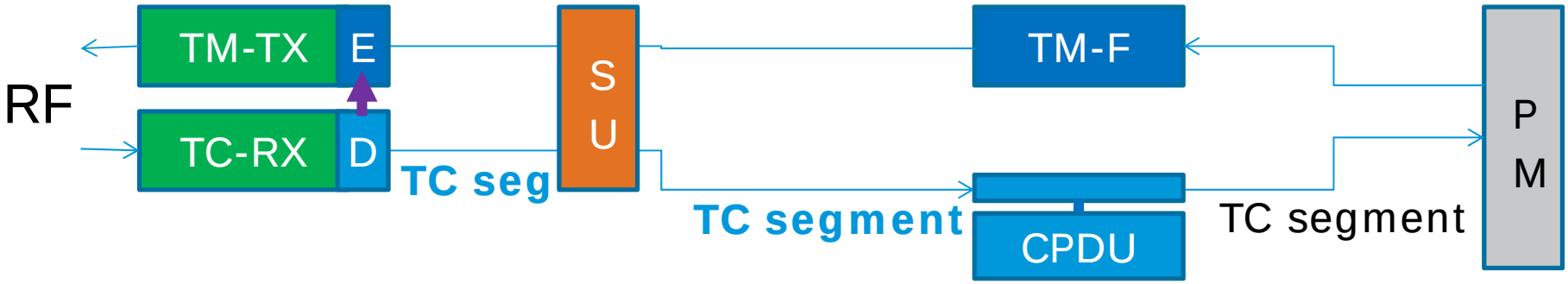
- “Bump in the wire (BITW)” as opposed to “Bump in the stack (BITS)”
- In line with SAVOIR TN-001 chapter 5.7
- Security Unit (SU) has to decode CLTU/CADU and re-encode after crypto function
- Duplication of functions, issues with **COP-1** closure / frame acceptance reporting

Innovation potential: CCSDS SDLS standard



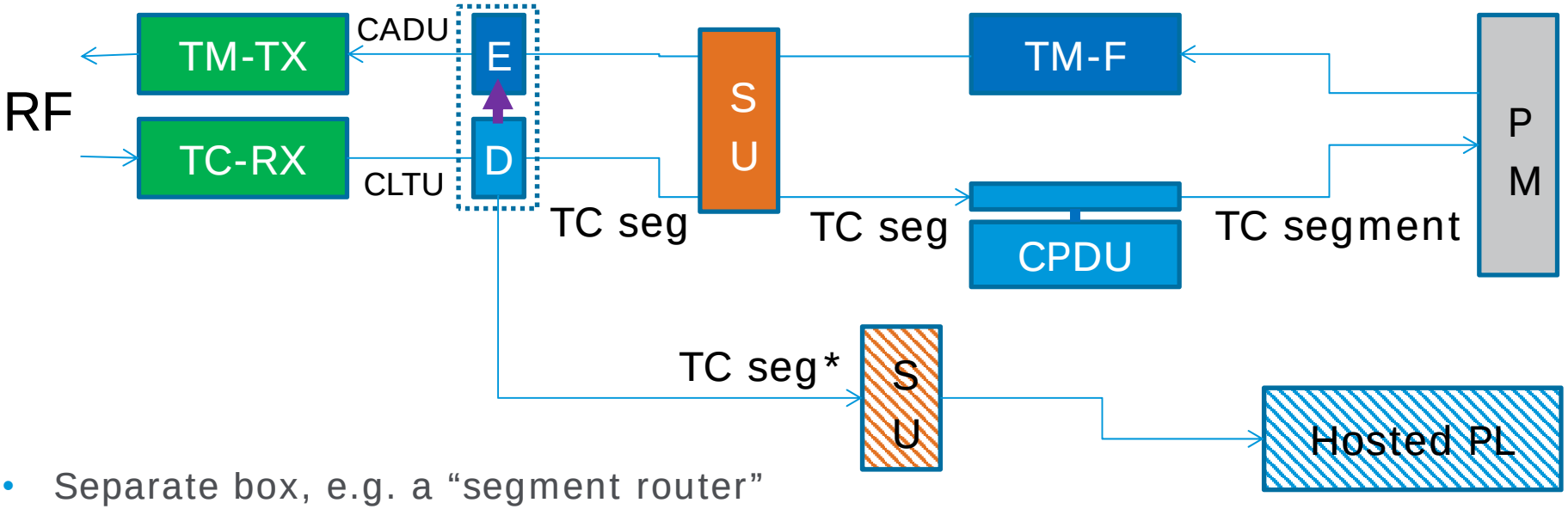
- SDLS designed to implement security at segment level
- SDLS introduction motivates reconsideration of placement of protocol functions
- Major potential impact in terms of change of OBC TC input protocol level
- Objective: Robust, affordable security unit (SU) for many missions
- SU should be as simple as possible, and still removable e.g. during AIT (not here!)

Backup Slide: Variant A



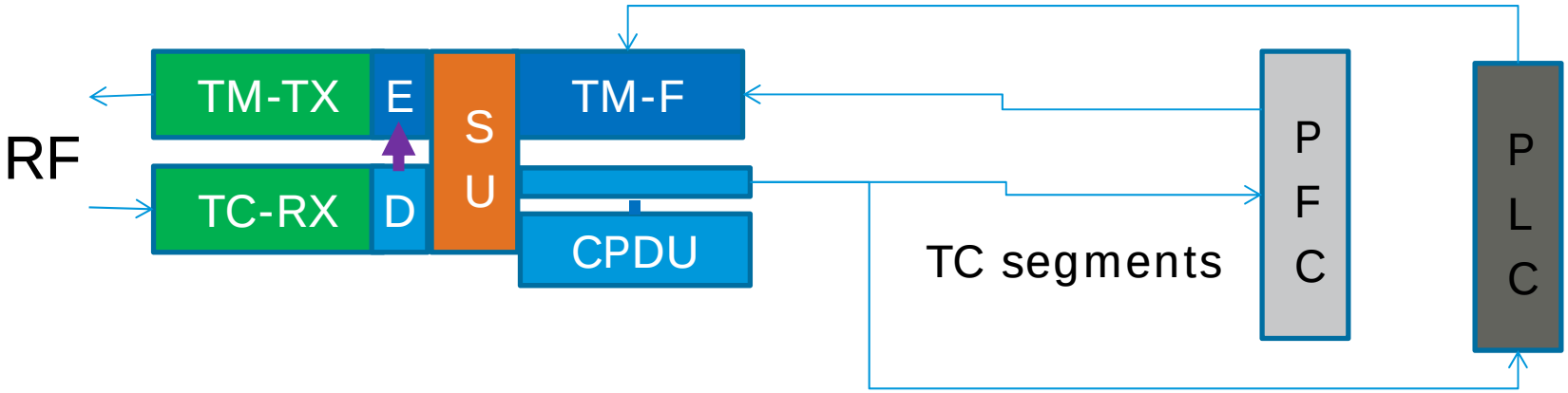
- Placement inside transponder could be one option
- SU simplicity and removability appear achievable
- Again, redundancy not shown here, TC decoding cross strapping clearly needed
- Could be interesting as well from advanced/soft decoding perspective

Backup Slide: Variant B



- Separate box, e.g. a “segment router”
- Could be interesting for hosted payload with independent physical SUs

Backup Slide: Variant C



- Transponder evolves into communications processor
- Performs TC decoding, decryption and segment level routing to possibly multiple computers