Transmission of SCHC-compressed packets over IEEE 802.15.4 networks

draft-ietf-6lo-schc-15dot4-06

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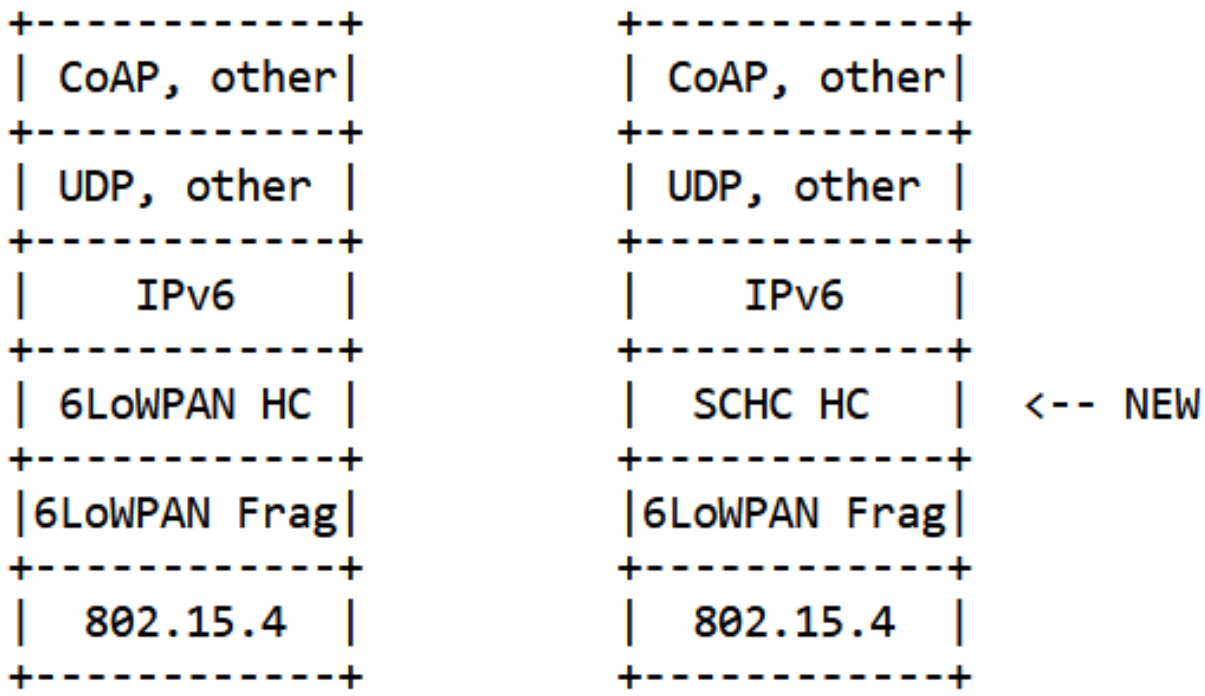
Main goal



Traditional SCHC-based

SCHC (RFC 8724) exploits a priori knowledge of header field values

3.2. SCHC architecture concepts (I/III)

- SCHC Stratum
  - When SCHC is used to compress IPv6 packets over IEEE 802.15.4 networks, the SCHC Stratum is located on top of layer 2 and below layer 3
    - The compressed data of the SCHC Stratum may also comprise upper layer packet headers
    - For example, SCHC may be used to compress IP headers, IP/UDP headers or IP/UDP/CoAP headers (all at once)
- Discriminator
  - 6LoWPAN Dispatch Type set to:
    - SCHC Dispatch
    - SCHC Pointer Dispatch

3.2. SCHC architecture concepts (II/III)

SCHC Packet Instance → SCHC Instance
SCHC Header → SCHC Stratum Header

- Single-instance networks
  - All network nodes have:
    - A single SCHC Instance for C/D
    - A single SoR (there is only one SCHC Instance)
  - SCHC Stratum Header is fully compressed
    - 0 bits sent over the air
  - All network nodes have:
    - A single SCHC Stratum Header
    - A single SoR for SCHC Stratum Header C/D
      - » Comprises a single, implicit Rule for SCHC Stratum Header C/D

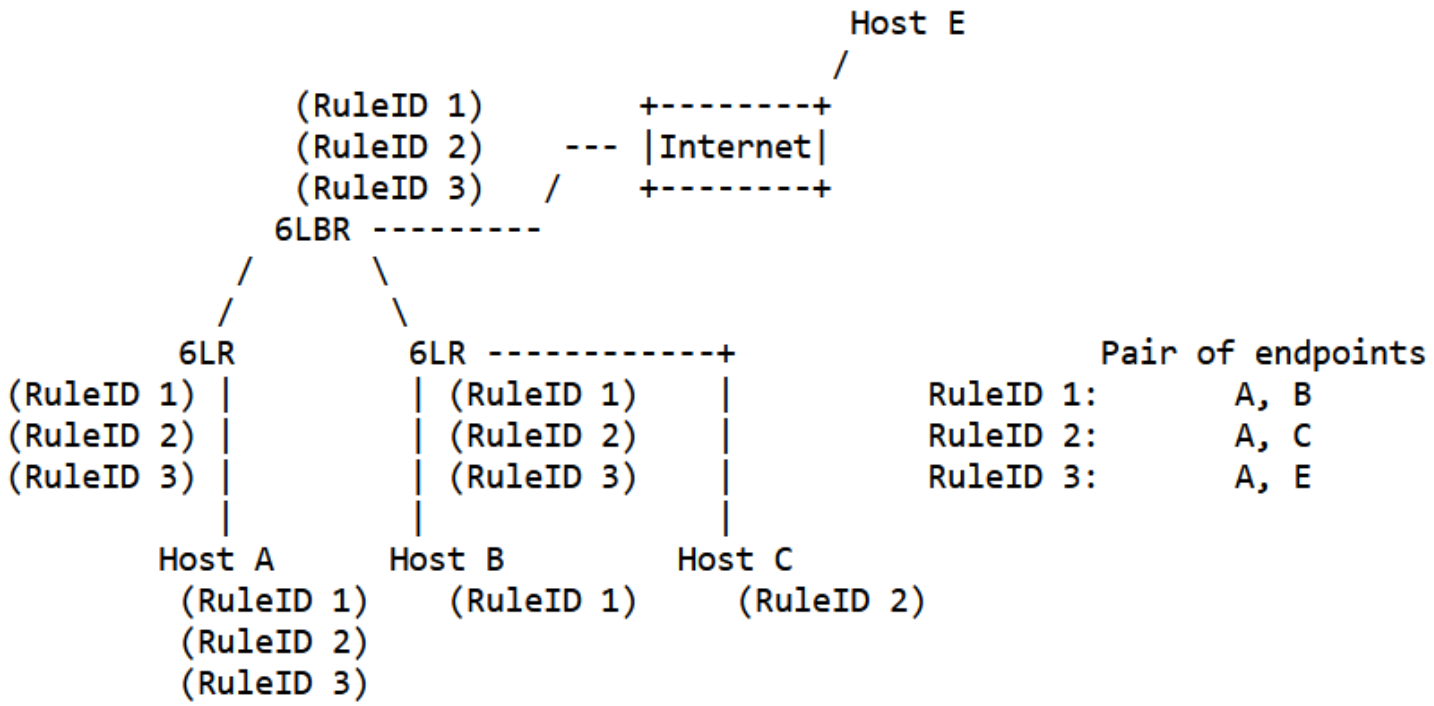
3.2. SCHC architecture concepts (III/III)

SCHC Packet Instance → SCHC Instance
SCHC Header → SCHC Stratum Header

- Multiple-instance networks
  - At least some network nodes have:
    - More than one SCHC Instance for C/D
    - One SoR for each SCHC Instance
  - SCHC Stratum Header cannot (generally) be fully compressed
    - More than 0 bits sent over the air
  - All network nodes have:
    - A single SCHC Stratum Header
    - A single SoR for SCHC Stratum Header C/D
      - » May comprise several Rules for SCHC Strat. Header C/D

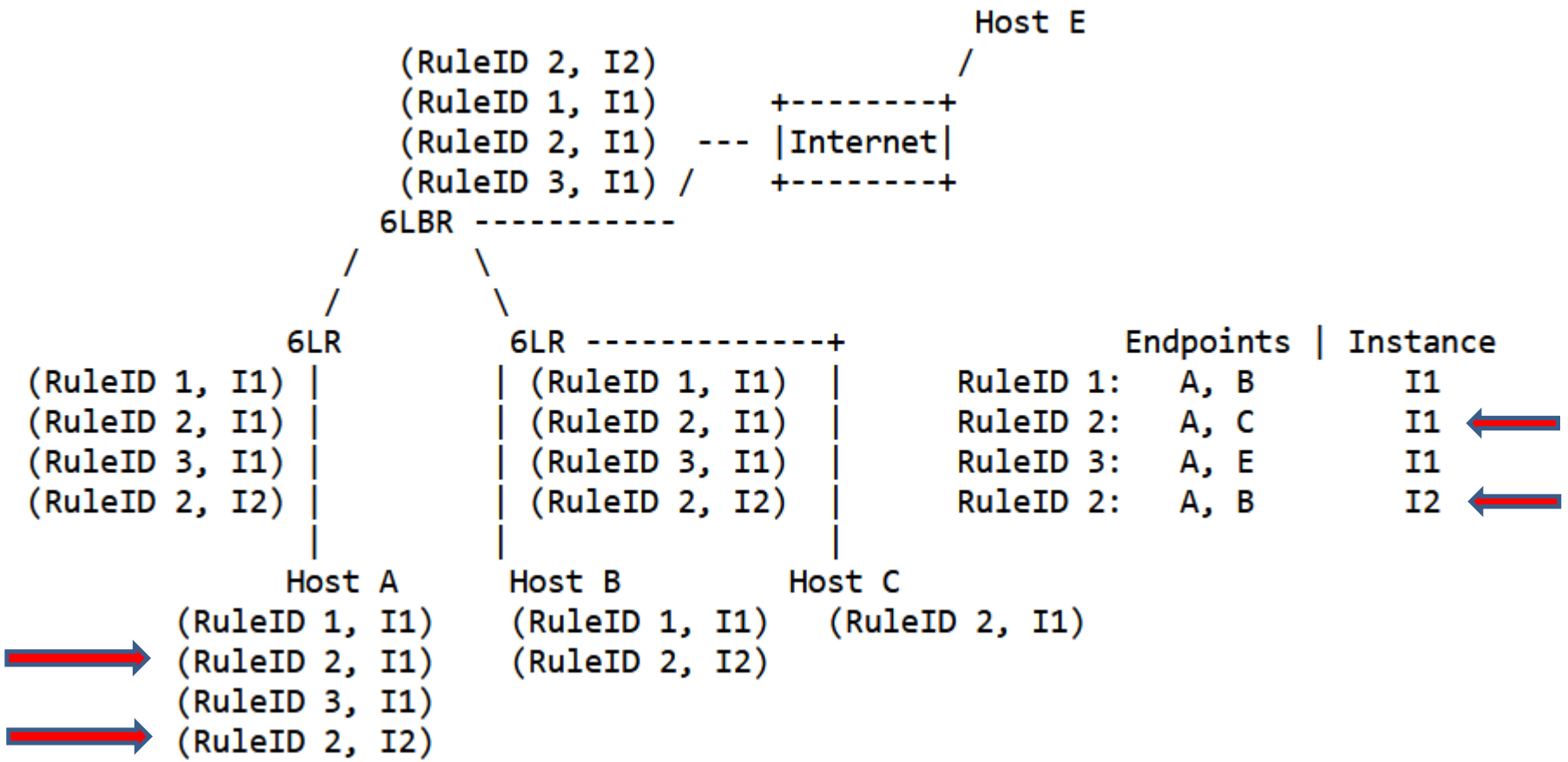
3.5. Multihop communication (I/VIII)

- SRO:
  - Single-instance networks:
    - A Rule and its RuleID MUST be unique network-wide
    - The means to ensure so are out of scope
    - To simplify the management of RuleIDs, in SRO, all nodes in the network MAY share the same SoR



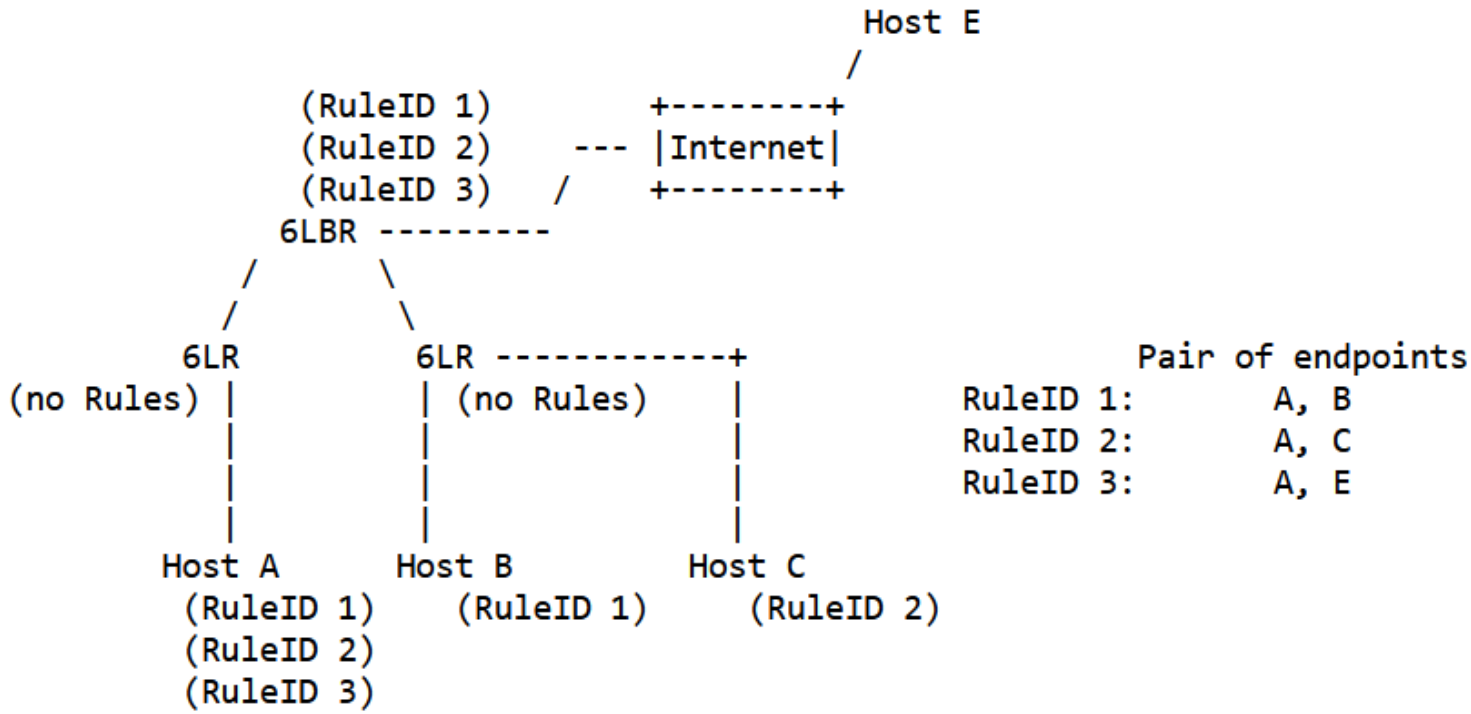
3.5. Multihop communication (II/VIII)

- SRO:
  - Multiple-instance networks:
    - A not fully compressed SCHC Stratum Header MUST be used



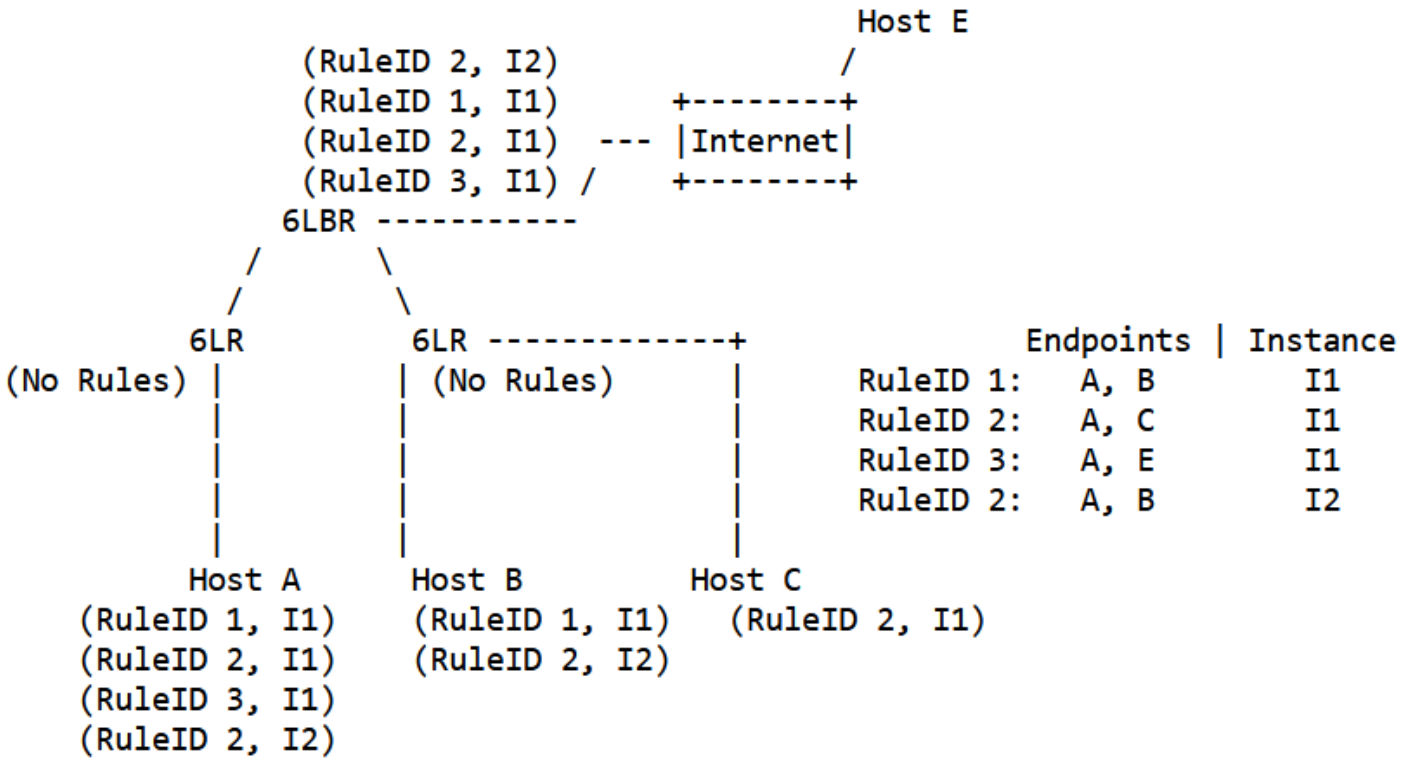
3.5. Multihop communication (III/VIII)

- TRO:
  - Single-instance networks:
    - A Rule and its RuleID MUST be unique network-wide
    - The means to ensure so are out of scope



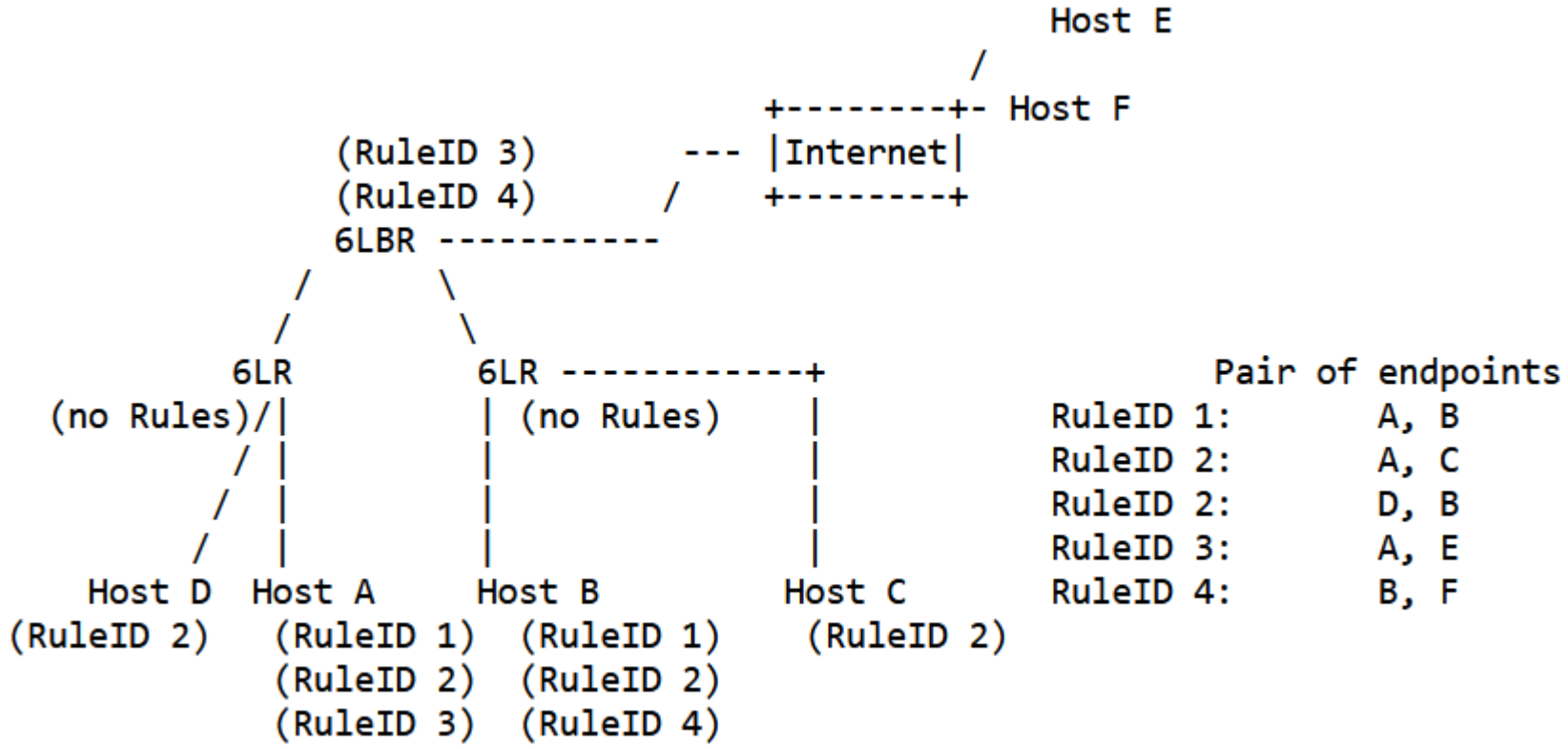
3.5. Multihop communication (IV/VIII)

- TRO:
  - Multiple-instance networks:
    - A not fully compressed SCHC Stratum Header MUST be used



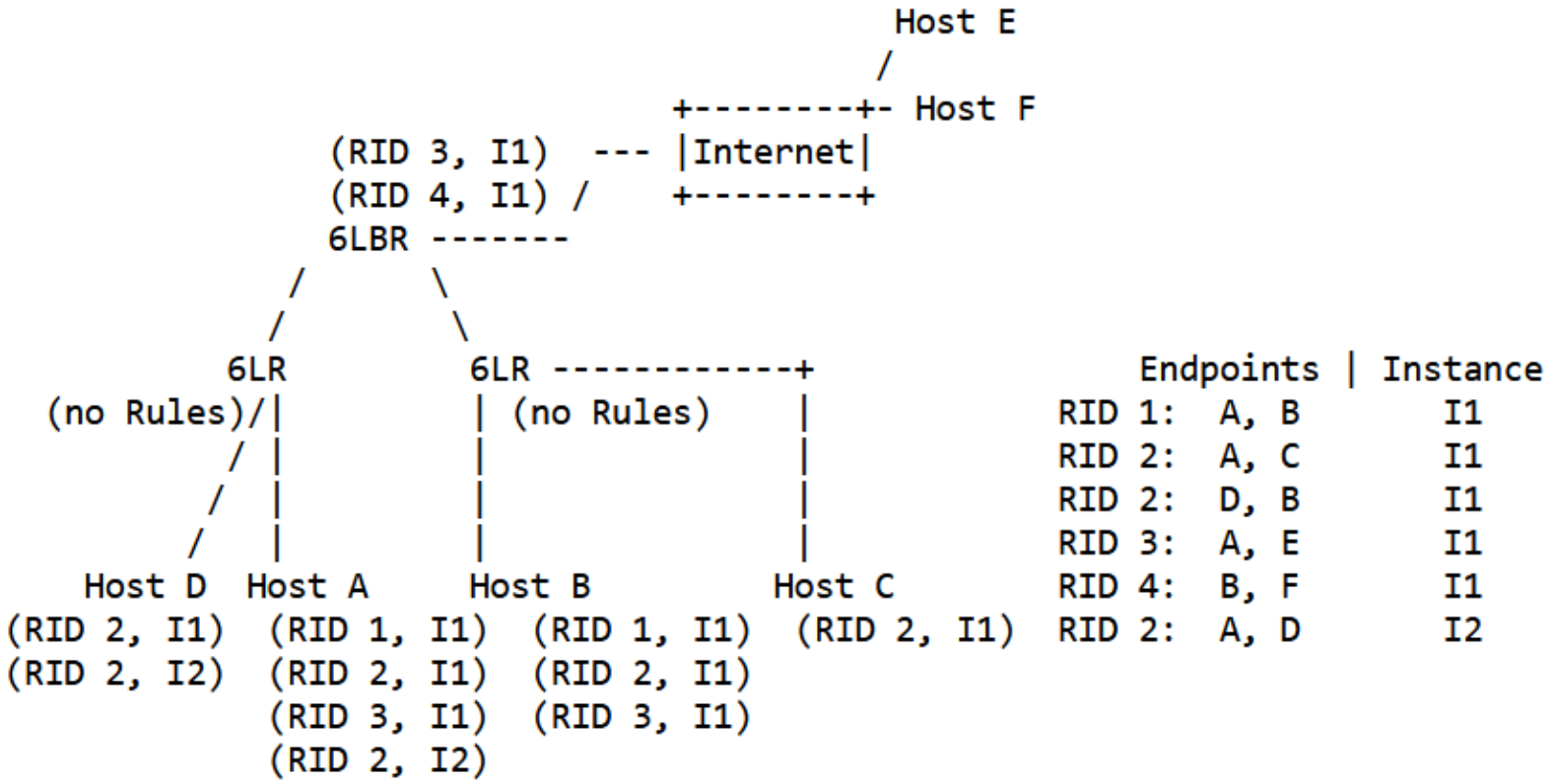
3.5. Multihop communication (V/VIII)

- PRO:
  - Single-instance networks:
    - A RuleID MAY be used to identify different Rules used by different pairs of endpoints



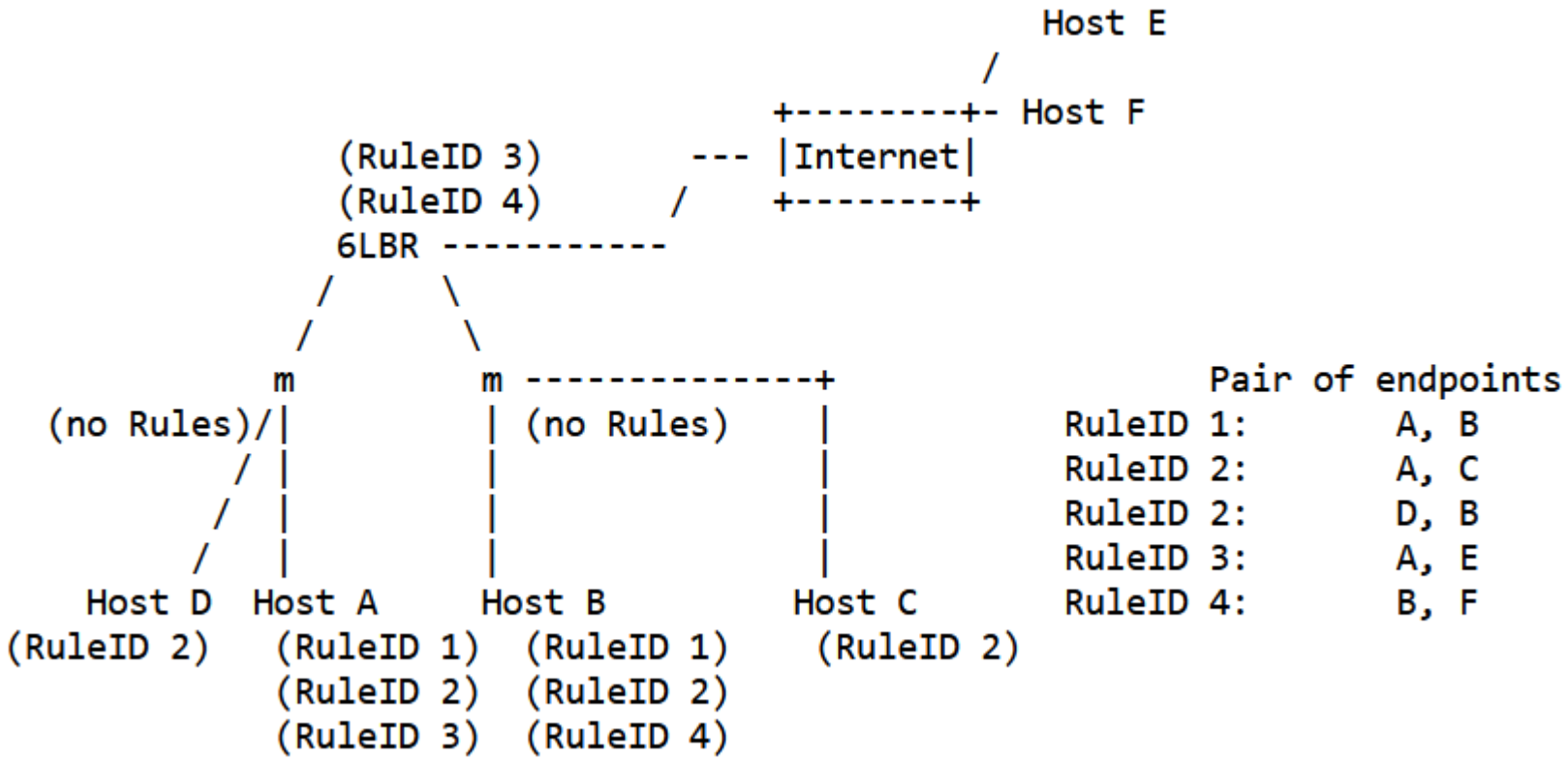
3.5. Multihop communication (VI/VIII)

- PRO:
  - Multiple-instance networks:
    - A not fully compressed SCHC Stratum Header MUST be used



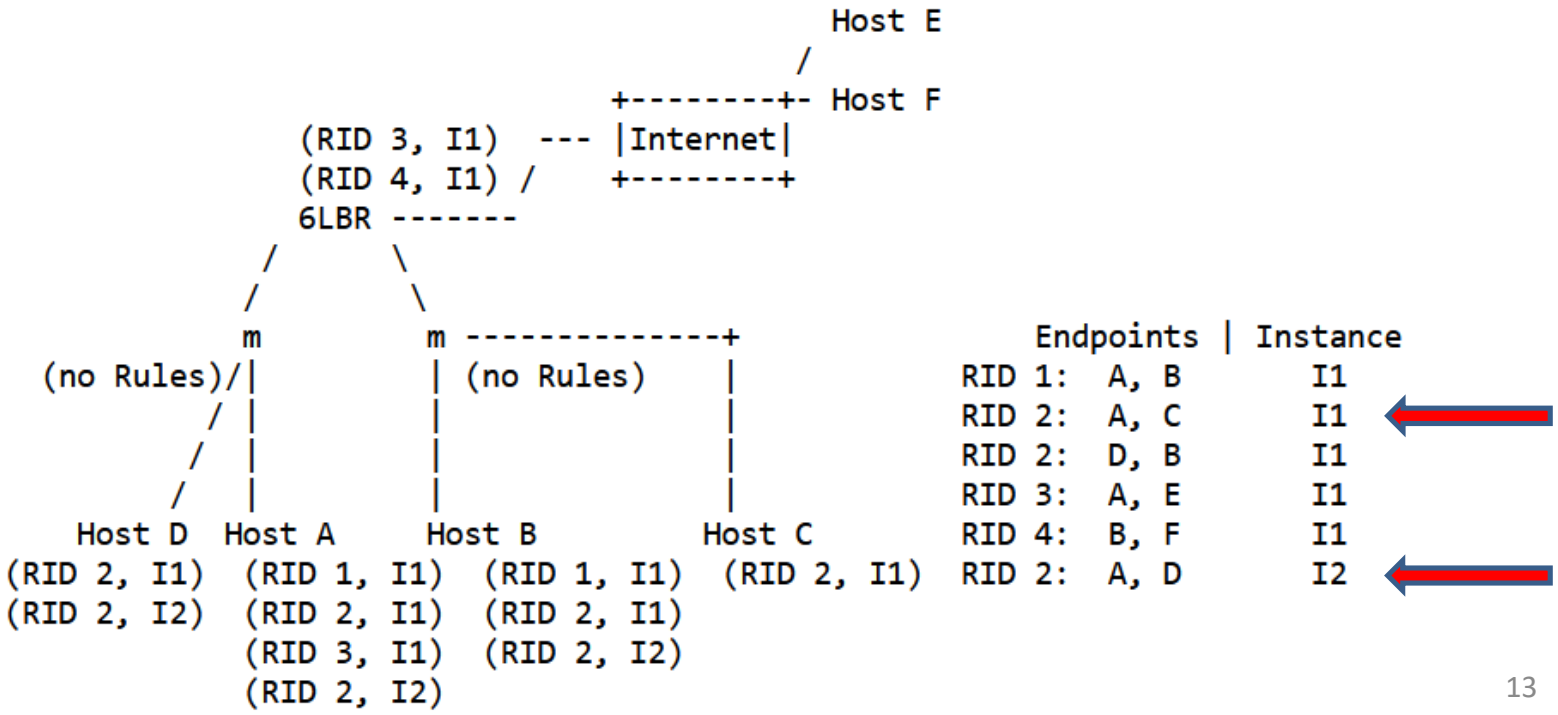
3.5. Multihop communication (VII/VIII)

- Mesh-Under:
  - Single-instance networks:
    - A RuleID MAY be used to identify different Rules used by different pairs of endpoints



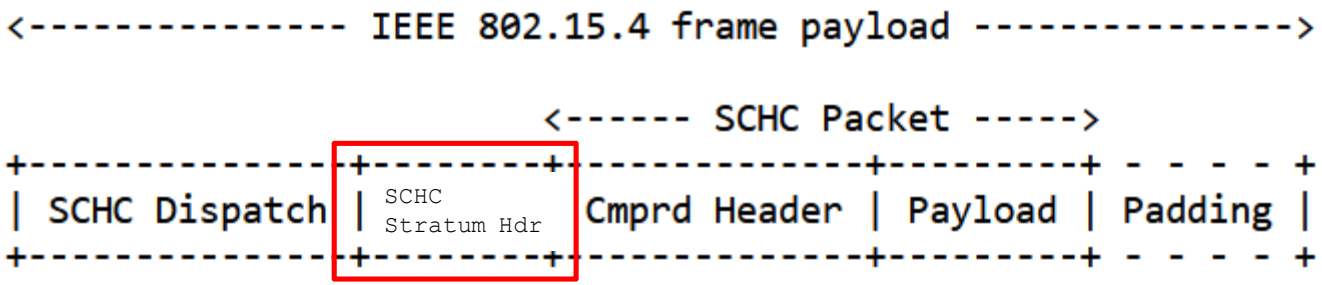
3.5. Multihop communication (VIII/VIII)

- Mesh-Under:
  - Multiple-instance networks:
    - A fully compressed SCHC Stratum Header MAY be used
      - » Only if it is possible to determine the SCHC Packet Instance needed to decompress a SCHC-compressed packet based on the packet source identifier (Mesh-Under header [RFC 4944])



4.1. Single-hop or SRO frame format

- Frame format:



  - SCHC Stratum Header
    - Determines the SCHC Instance to be used to decompress the next field
    - In compressed form: a RuleID and a compression residue
    - Single-instance networks: fully compressed (0 bits)
    - Multiple-instance networks: (generally) not fully compressed
      - » RuleID size RECOMMENDED between 1 and 8 bits

Next Steps

- Define the SCHC Stratum Header format

- Define the number of strata for the transition protocol stack (section 5)
  - Traditional 6LoWPAN to compress IPv6 header
    - RFC 6282
  - Two SCHC Strata may be needed:
    - One for UDP and another for CoAP

Comments/Questions?

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