

## Addressing Scheme in Relay System

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Venue:

Re: TGM SDD: Relay; in response to the TGM Call for Comments and Contributions 802.16m-08/040

Base Contribution:

This is the base contribution.

Purpose:

To be discussed and adopted by TGM for the 802.16m SDD

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# Background

- Addressing scheme in 16j
  - CID based forwarding
    - MAC PDU contains MS CID
    - DL MAP for relay link contains MS CID or RS basic CID
  - Tunnel based forwarding
    - Relay MAC PDU contains tunnel CID
    - DL MAP for relay link contains tunnel CID or RS basic CID
    - CID in each individual MPDU identifies the target MS
- Addressing scheme in 16m
  - MAP contains Station Identifier (to identify MS)
  - MPDU contains Flow Identifier (to identify connection within the MS)

# Motivation

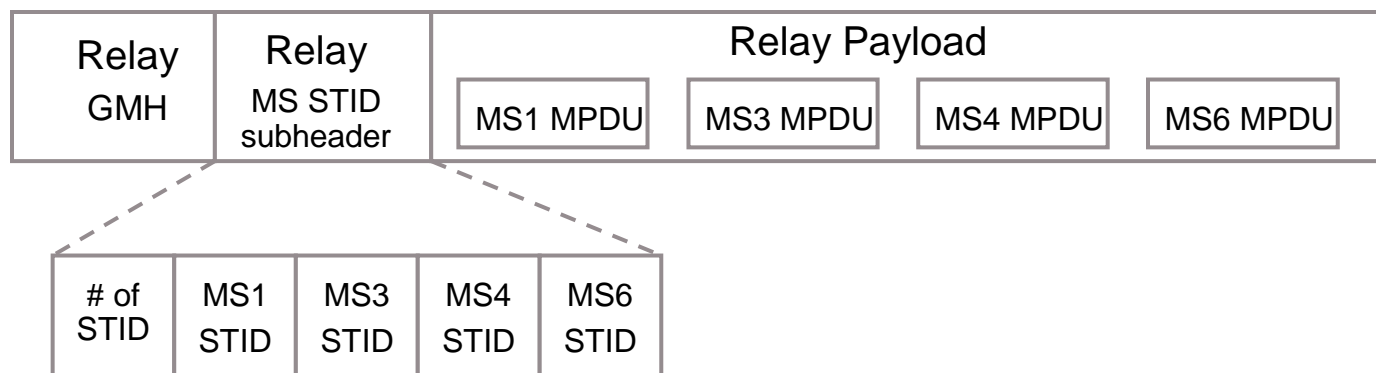
- CID based forwarding
  - If MAP IE on relay link contains Station Identifier for the RS, then the access RS cannot find out which MS to send the MPDU since Station Identifier is not included in the MPDU.
  - Therefore MAP IE should contain Station Identifier of the MS.
- Tunnel based forwarding
  - The tunneling packet contains more than one MPDU for same or different MS.
  - Different Flow identifiers are used to identify different tunnels between BS and an access RS.
  - What to put into the MAP IE in relay link?
    - Station Identifier for access RS.
  - Since Station Identifiers for the MSs are not included in each MPDU in the tunnel packet, how to carry Station Identifier for each MS?

# Proposed Solution

- Station Identifier information for each individual MAC PDU is included in the tunnel packet.
- DL direction
  - BS includes the Station identifier of each MPDU that is mapped into the tunnel in the tunnel packet.
  - Access RS uses it to generate MAP IE over the access link and doesn't include the Station identifier into the individual MAC PDU sent over access link.
- UL direction
  - Access RS includes the Station identifier of each MPDU that is mapped into the tunnel in the tunnel packet.
  - BS uses it to identify which MS the MPDU belongs to.

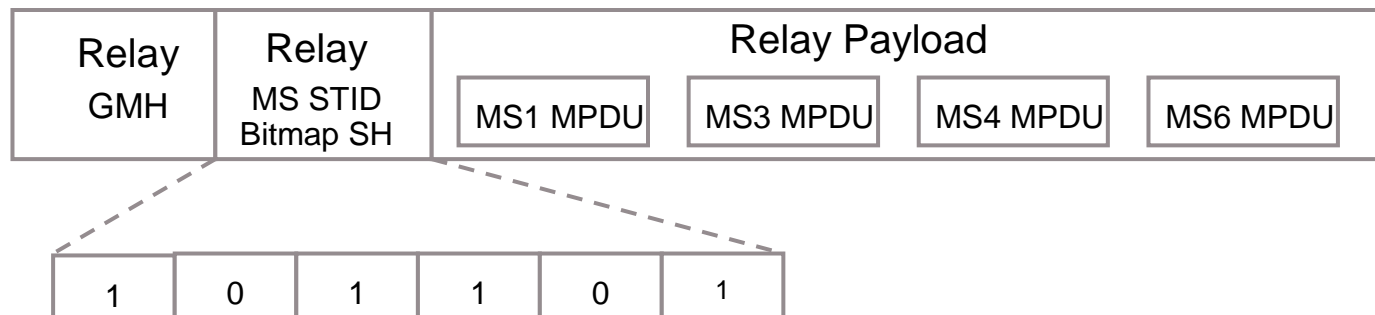
# Scheme 1 – MS STID Subheader

- A new subheader is defined only for relay link - **MS STID subheader**.
- All the SDUs belonging to the same MS are packed into one individual MAC PDU.
- The MS STID subheader included in the relay MAC PDU carries the list of station identifier associated with each MPDU in the tunnel packet
  - A reduced version of station identifier could be used.
- The order of station identifier list follows the order of individual MAC PDUs in the tunnel packet.



## Scheme 2 - MS STID Bitmap Subheader

- A new subheader is defined only for relay link - **MS STID bitmap subheader**.
- The MS STID bitmap subheader **indicates the presence of MPDU that belongs to the corresponding MS**.
- Each MS mapped into the tunnel is assigned with a bit in the bitmap.
- The SDUs belonging to the same MS are packed into one MPDU.
- The MPDUs included in the tunnel packet are sorted by their corresponding station identifiers.
- The bitmap could be **established or modified** (i.e., when MS is added into or removed from the tunnel) **using explicit MAC management signaling**.



## Co-existence of Scheme 1 and Scheme 2

- Scheme 1 introduces less overhead if the number of MSs whose MPDUs are included in the tunnel packet is small.
- Scheme 2 introduces less overhead if the number of MSs mapped into the tunnel is large.
- Both scheme 1 and scheme 2 can be adopted. BS and access RS choose the scheme dynamically based on the size of MS STID subheader and MS STID bitmap subheader if included in the current relay MAC PDU.

# Proposed Text

## Section x: Relay Support

### Section x.1: Addressing

- All the SDUs belonging to the same MS are packed into one individual MAC PDU.
- Station Identifier information for each individual MAP PDU is included in the relay MAC PDU, e.g., in a subheader.
- Such information may be in the format of a list of station identifier associated with each MPDU carried the relay MAC PDU, or in the format of bitmap which indicates the presence of MPDU that belongs to the corresponding MS. The bitmap could be established or modified via MAC management signaling.
- The Access RS uses the station identifier information carried in DL relay MAC PDU to generate MAP IE over the access link.
- The BS uses the station identifier information carried in UL relay MAC PDU to identify which MS the MPDU belongs to.