



# Spatially aware sublayer DB operations

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# Agenda

- Objectives
- Terminology and terms
- Spatially aware sublayer DB overview
- Spatially aware sublayer DB operations
- Spatially aware sublayer DB models

# Objectives

- Outline the operations of the address learning process used by the spatially aware sublayer (SAS)



# Terminology and terms (1)

- SAS – Spatially aware sublayer
- Directed transmissions – Refers to a RPR source station transmitting to a designated (unicast) destination address on the ring
- Undirected transmission – Refers to a RPR source station flooding a frame over the ring



# Terminology and terms (2)

- Local - implies ring local addresses of RPR station address and/or secondary MAC address associated with local RPR stations
- Remote address – A unicast address not found in the RPR topology DB
- targetAddress - denotes the destination RPR station MAC address associated with the client *da*.

# Spatially aware sublayer

- SAS is below MAC service interface (and within data link layer)
- An optional sublayer of RPR MAC

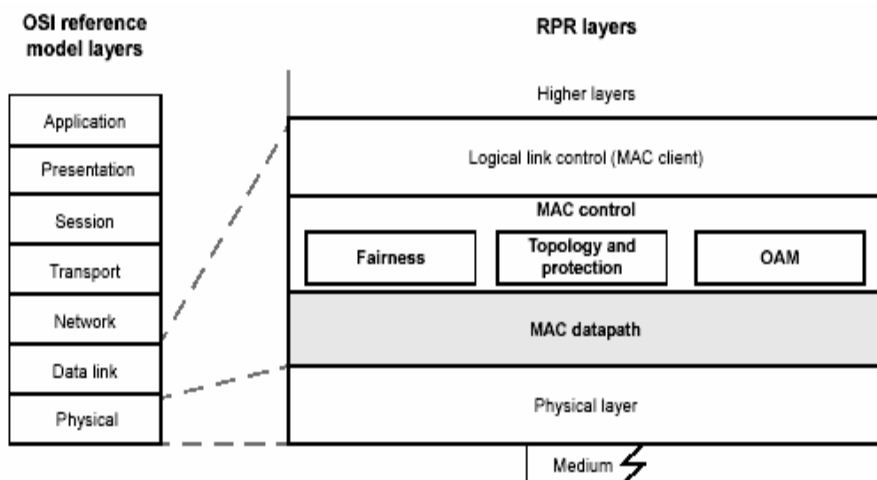
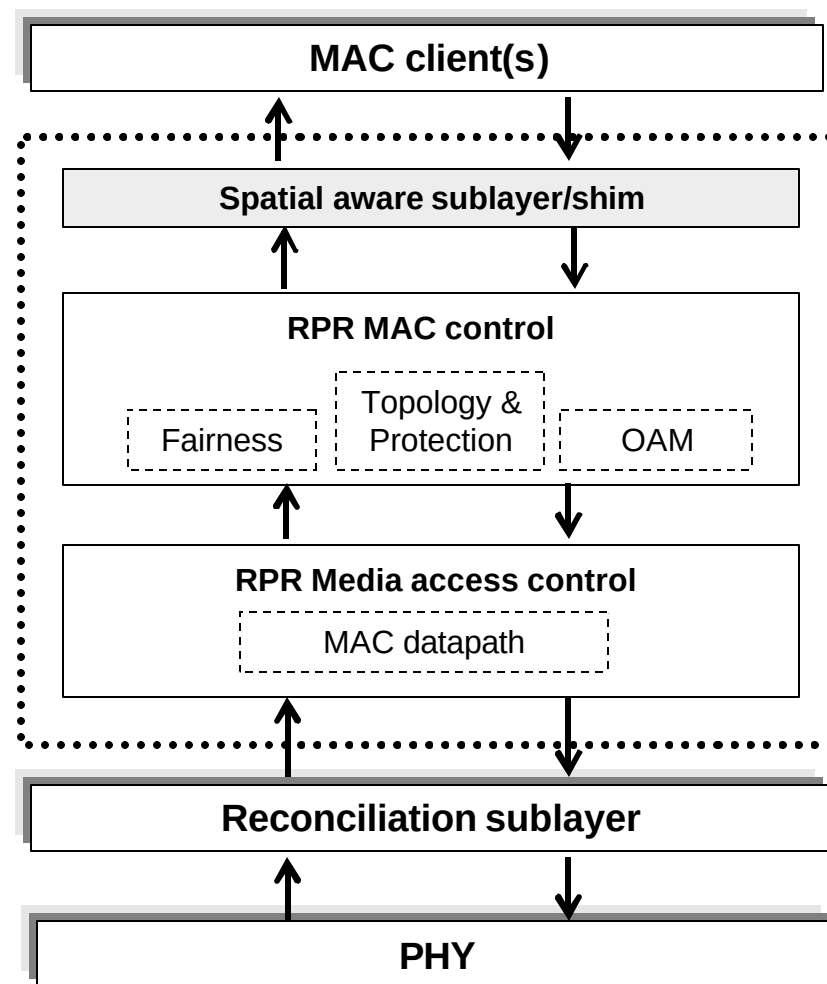


Figure 7.1—MAC datapath sublayer relationship to the ISO/IEC OSI reference model



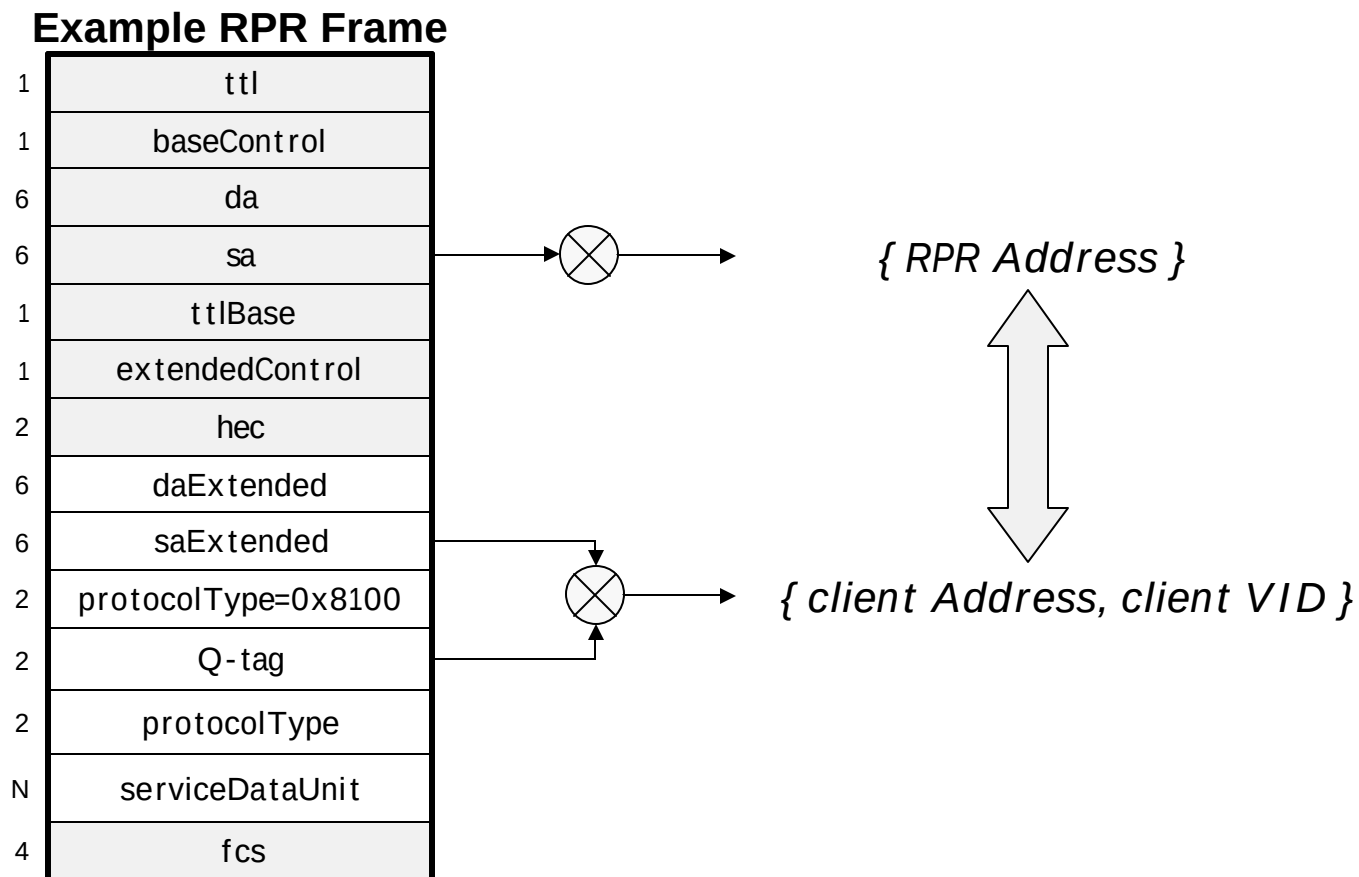
# Operations overview

|                                   | SAS Rx operations                                                                                                                                                                                                                        | SAS Tx operations                                                                                                                                                                                                                |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reserved group address</b>     | 1. SDB update ( $\{saExtended, [vid]\} \leftrightarrow sa$ ), if<br>$(da == RPRGroupAddress) \parallel$<br>$(ef == 1 \ \&\& \ fi == fi\_none)$                                                                                           | 1. If ( $sa == myAddress$ ) && local( $da$ )<br>Pass to RPR MAC for Tx<br>2. Otherwise,<br>Set $ef$ bit<br>If $da$ [ $\& \ vid$ ] found, RPR header $da$ = target RPR MAC<br>Else RPR header $da$ = RPRGroupAddress              |
| <b>Topology DB and ATD</b>        | 1. SDB update ( $\{saExtended, [vid]\} \leftrightarrow sa$ ), if<br>(TopoDB( $sa$ ) indicates SAS) &&<br>( $ef == 1$ )<br>2. SDB update ( $\{sa, [vid]\} \leftrightarrow sa$ ), if<br>(TopoDB( $sa$ ) indicates SAS) &&<br>( $ef == 0$ ) | 1. If ( $sa == myAddress$ ) && local( $da$ )<br>Pass to RPR MAC for Tx<br>2. Lookup $da$ [ $\& \ vid$ ] in SAS DB<br>If found, RPR header $da$ = target RPR MAC<br>Else pass to RPR MAC for Tx                                   |
| <b>Explicit bit in RPR header</b> | 1. SDB update ( $\{saExtended, [vid]\} \leftrightarrow sa$ ), if<br>( $sas == 1 \ \&\& \ ef == 1$ )<br>2. SDB update ( $\{sa, [vid]\} \leftrightarrow sa$ ), if<br>( $sas == 1 \ \&\& \ ef == 0$ )                                       | 1. Set $sas$ bit in RPR header<br>2. If ( $sa == myAddress$ ) && local( $da$ )<br>Pass to RPR MAC for Tx<br>3. Lookup $da$ [ $\& \ vid$ ] in SAS DB<br>If found, RPR header $da$ = target RPR MAC<br>Else pass to RPR MAC for Tx |

**NOTE:** The remainder of this package will focus on the “reserved group address” method DB operations.

# SAS DB learning (Rx side)

- Observes source MAC address and VLAN of client and associates with local RPR source MAC address







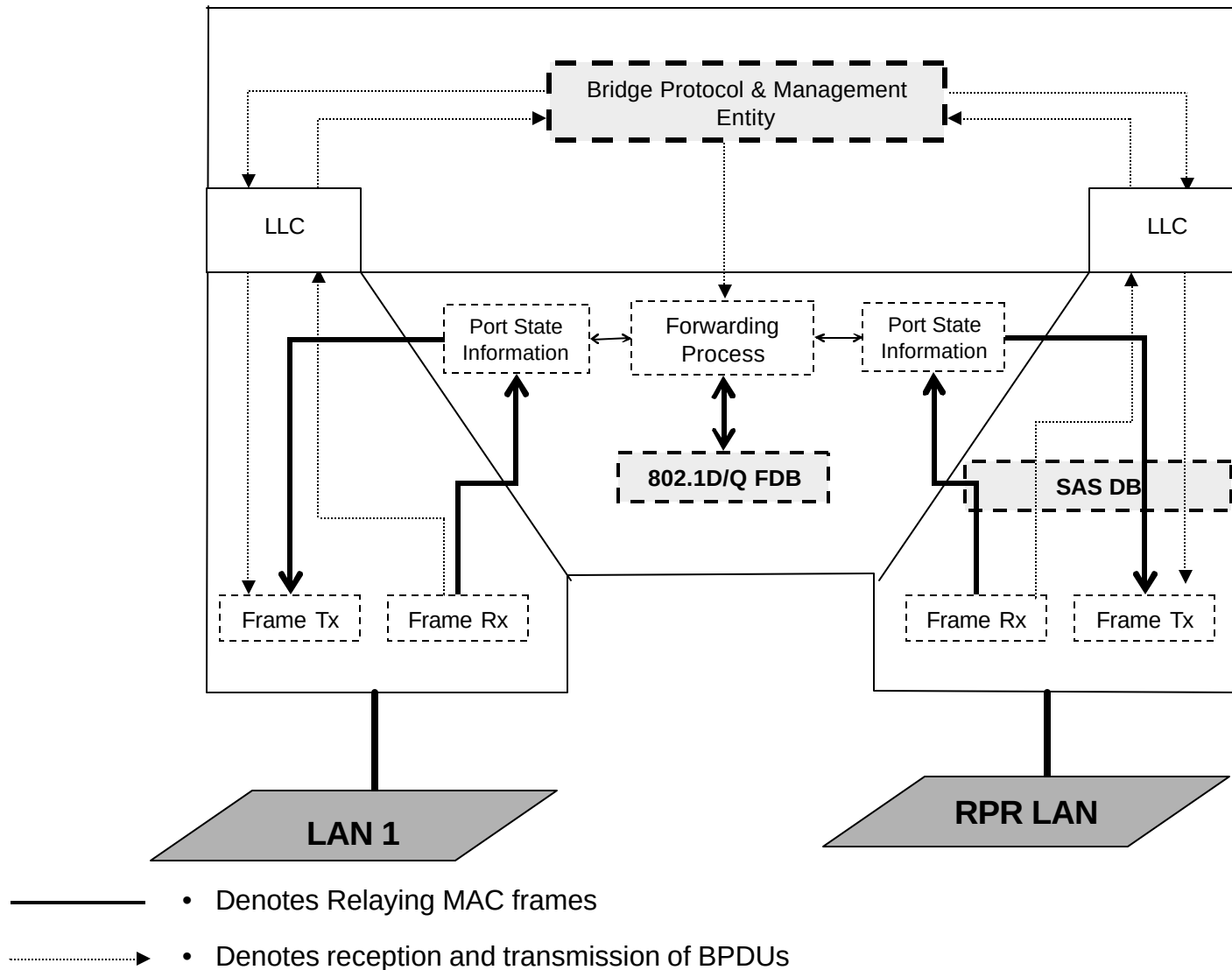
# SAS DB lookup (Tx side)

- Requests by MAC clients to dispatch a frame over the RPR media are processed by the SAS
- If the client destination address is a remote address, then client destination address (and optional VID) is indexed into the SAS DB to determine if a RPR MAC address is associated
  - If RPR MAC address association found, then da field of RPR header is populated with associated value and directed transmission of frame is used,
  - Else, an undirected transmission of frame is used (i.e., the frame is flooded over the ring)

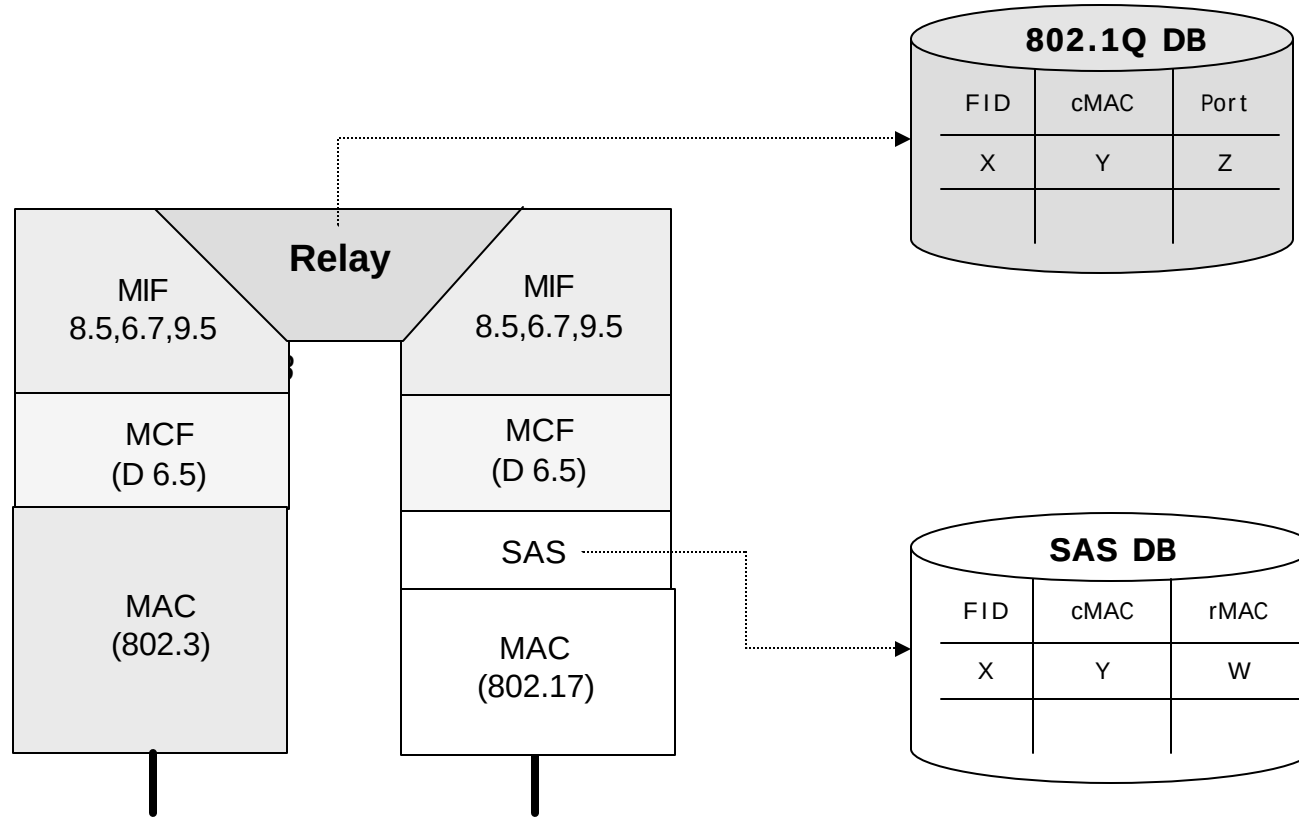
# SAS DB operations

- Operation of SAS DB is similar to operation (e.g., learning, aging, etc.) of 802.1D/Q specified FDB
  - Support of static and dynamic entries
  - Dynamic entries aged out
  - DB can be queried by management entity
  - Etc.

# RPR bridging model

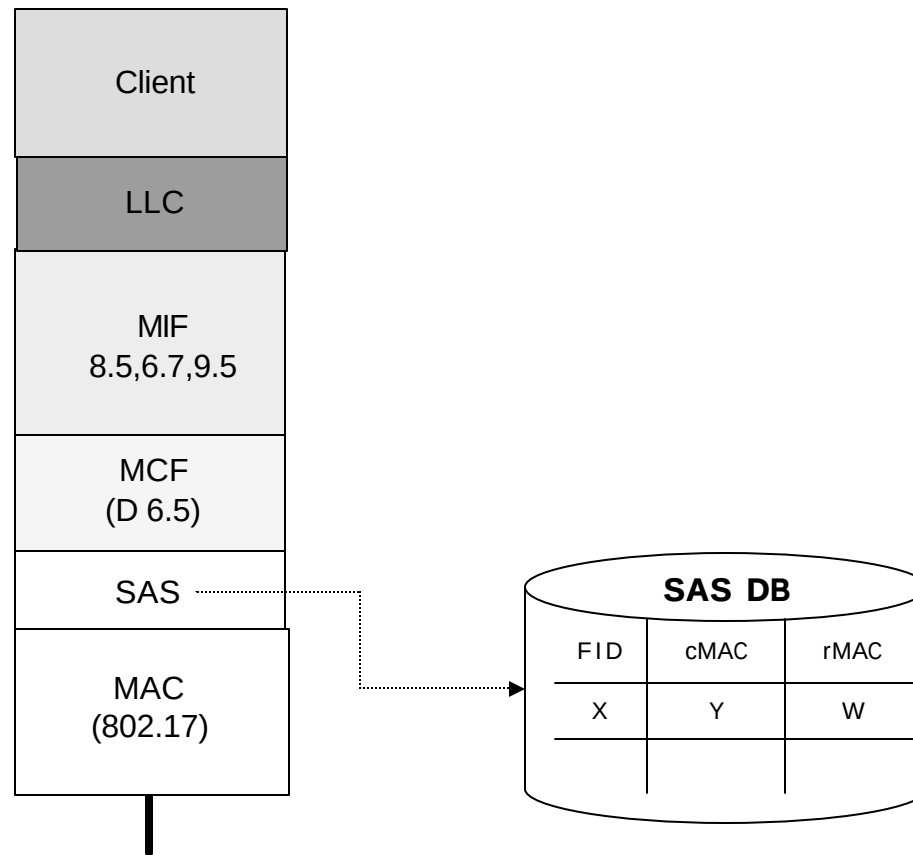


# RPR bridging DB model



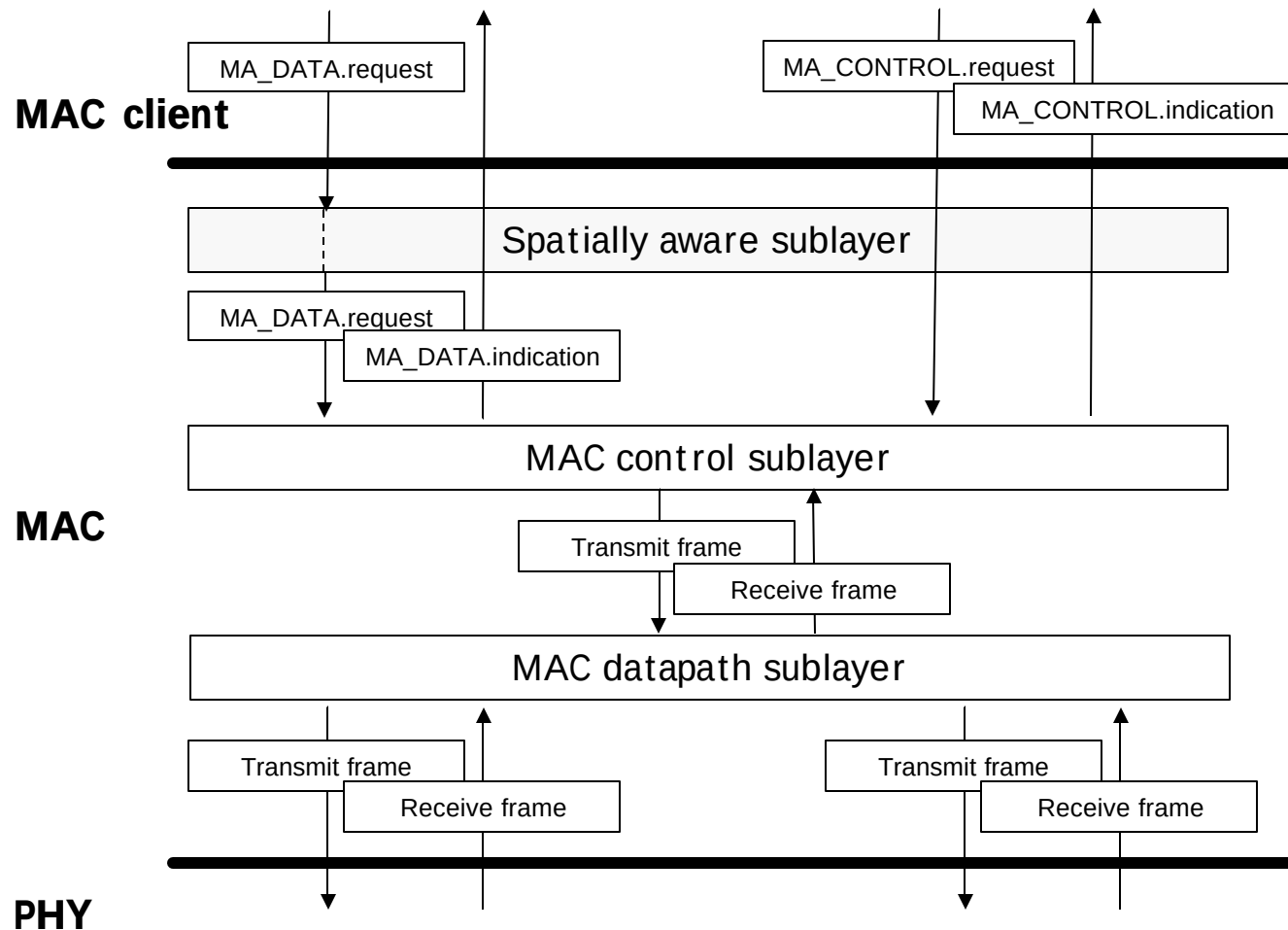
**Note:** cMAC denotes the client MAC address and rMAC denotes the RPR MAC address.

# RPR host DB model

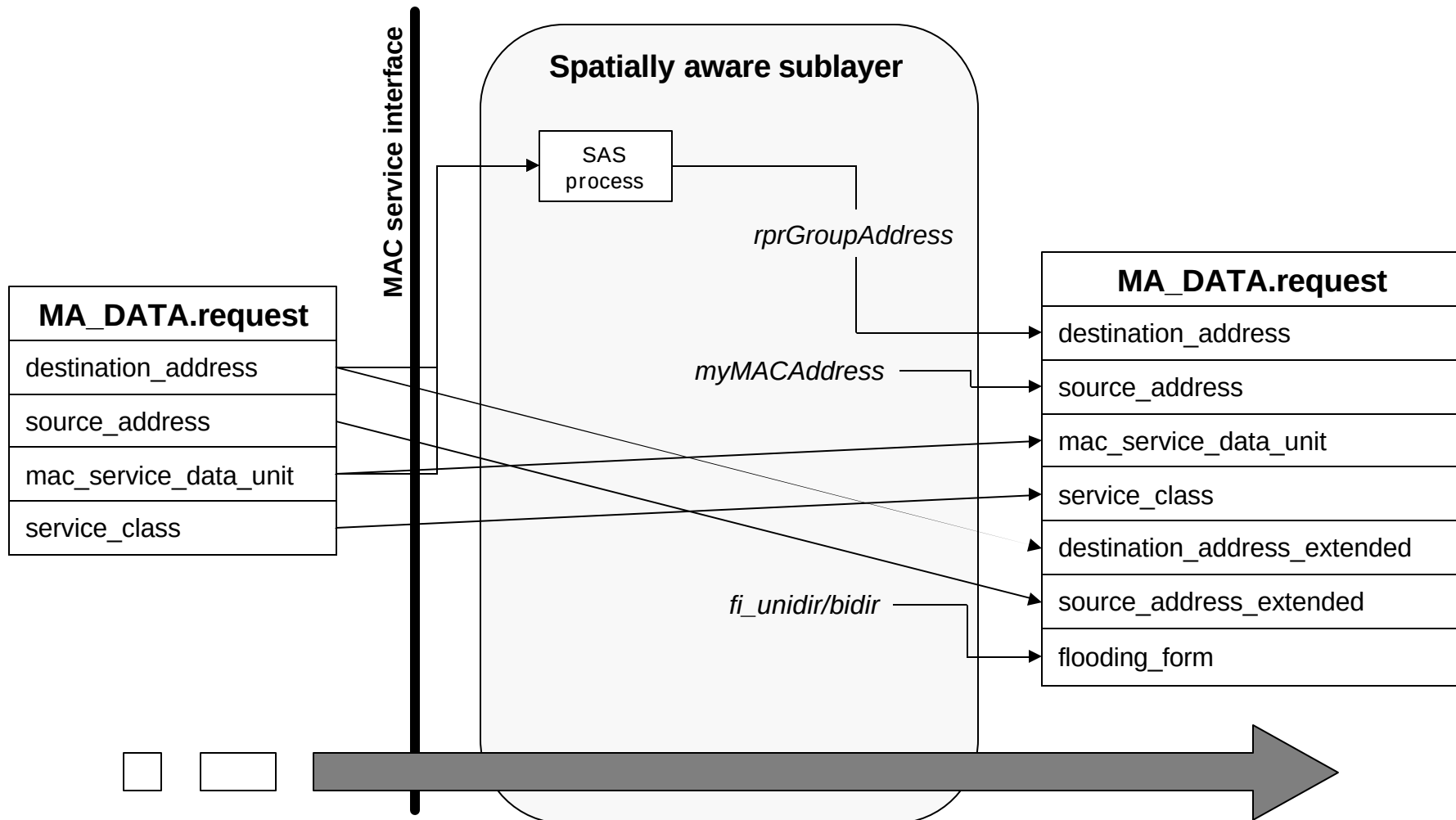


**Note:** cMAC denotes the client MAC address and rMAC denotes the RPR MAC address.

# Service primitives

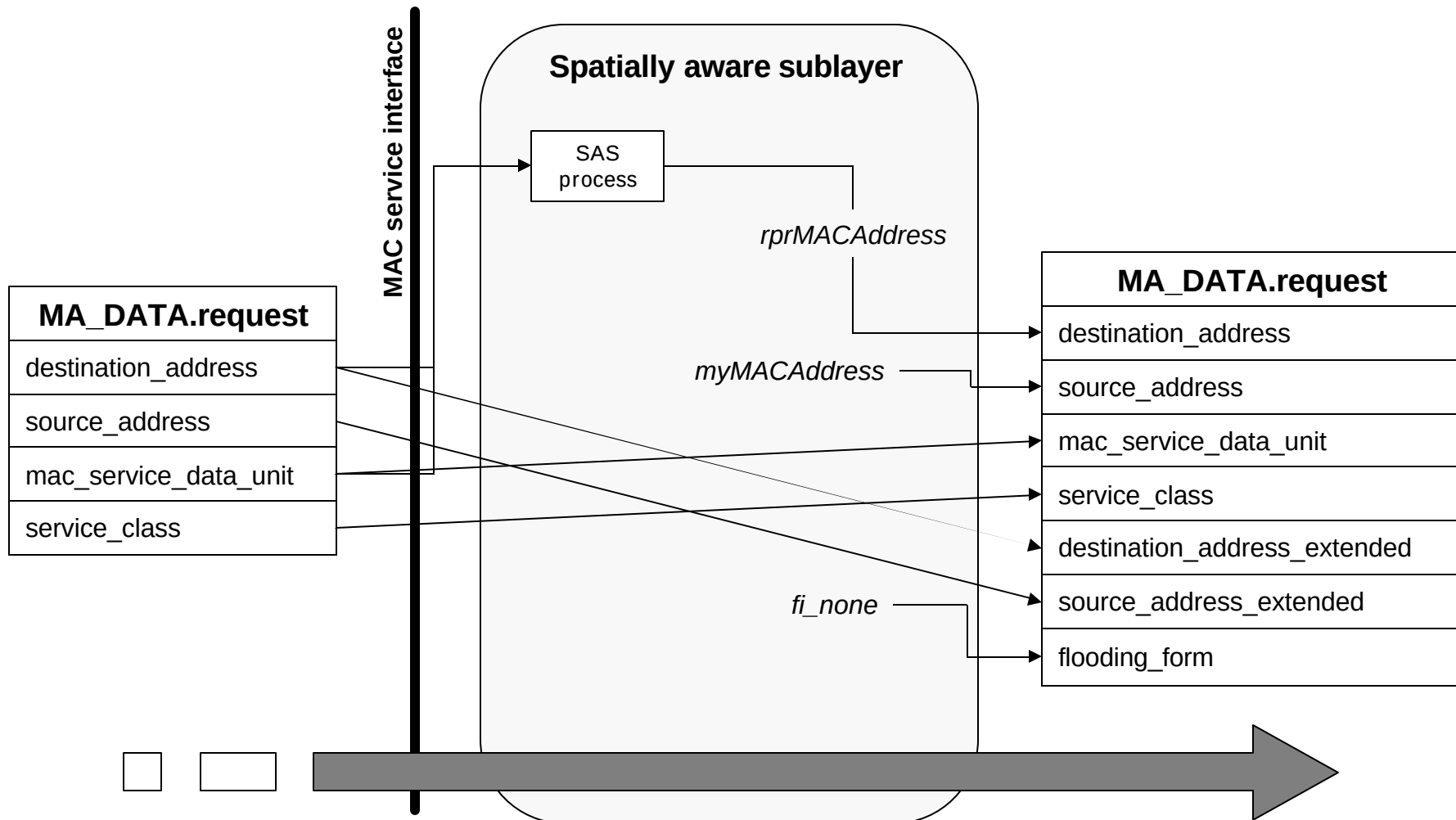


# Service data request primitive



**Assumptions:** The destination\_address parameter is remote. Undirected transmission is used since RPR destination address not found in SAS FDB.

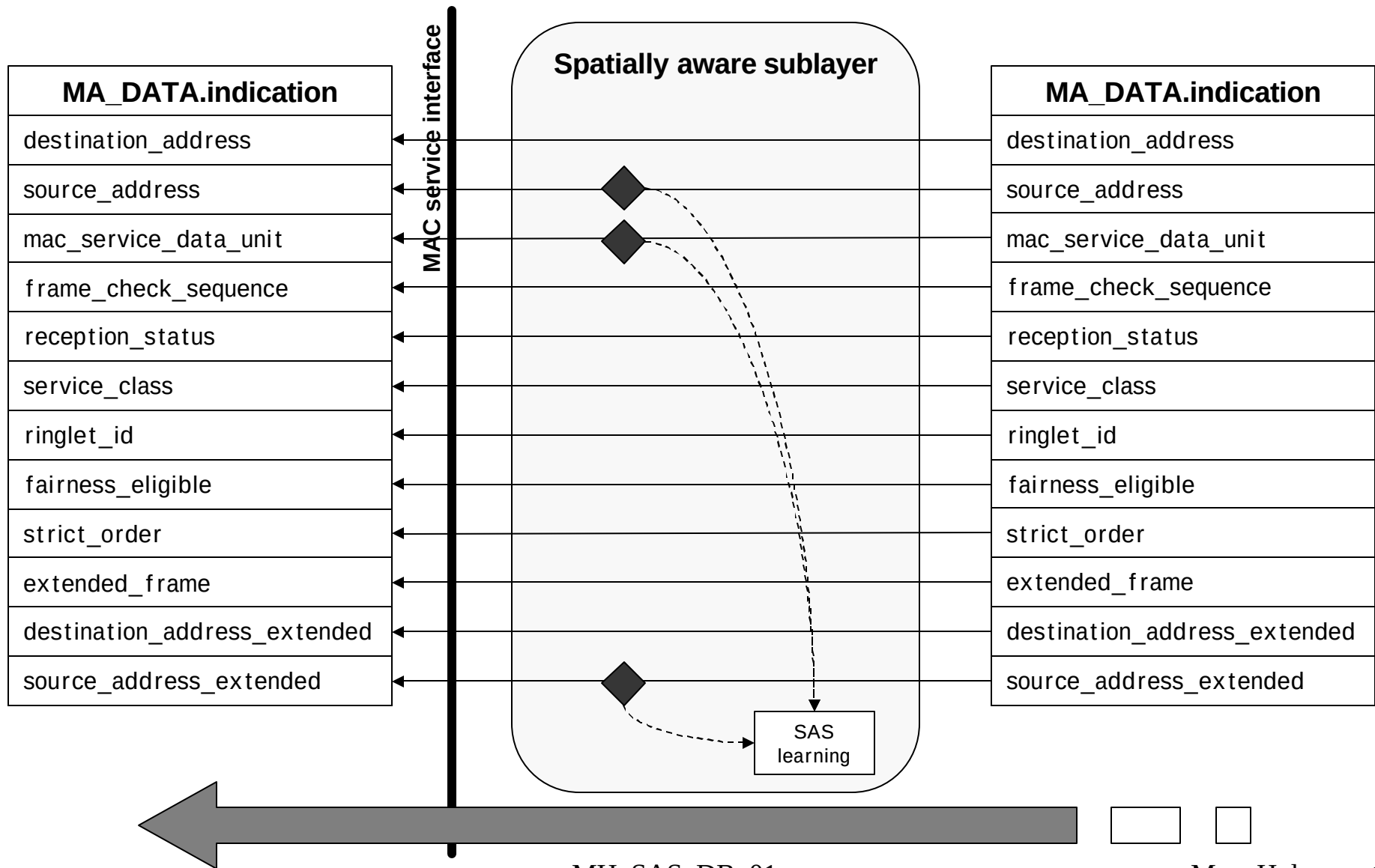
# Service data request primitive



**Assumptions:** The destination\_address parameter is remote. Directed transmission is used since RPR destination address found in SAS FDB.



# Service data indication primitive





# Back Up