

802.17 Frame Structure and Bridging Ad-Hoc Support

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Bridging Ad-Hoc Frame Structure Sub-team

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Outline

- Objective
- Recommendations
- Potential Frame Structure Options

OBJECTIVE

- Provide BAH requirements on 802.17 Frame Format
- Make recommendations to 802.17 Frame Format technical prime(s) for consideration

Terminology

- Ring Local MAC
 - MAC addresses of the actual stations on a Ring
- Remote MAC
 - Global MAC addresses
 - End to end MAC addresses
 - End station MAC addresses
- Original Packet
 - Packet provided by the end station
- DSID: Destination Station Identifier
 - Could be 1 byte value or MAC address (6 bytes)
- SSID: Source Station Identifier
 - Could be 1 byte value or MAC address (6 bytes)

BAH Requirements

- Frame format shall
 - Support explicit delivery of station identifiers (e.g., DSID and SSID)
 - Support a means of indicating that the packet needs to be flooded (on the Ring)
 - Minimize impact to existing Frame Format
 - Minimize impact to MAC

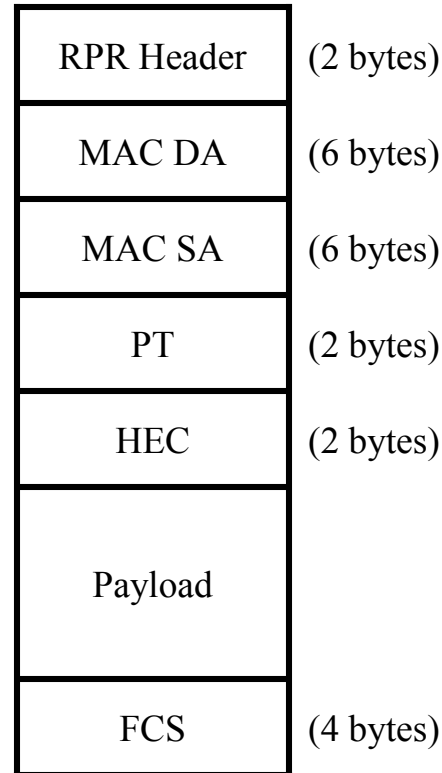
Recommendation

Propose the 802.17 WG create a Frame Format Ad-hoc group to further explore the modifications to the 802.17 Frame Formats to satisfy BAH requirements and other requirements, and make recommendation

Back Up Material: Frame Structure Options

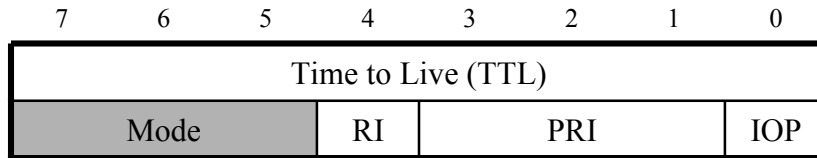
Frame Format

- Basic format as currently defined in 802.17 D0.1



RPR Header Support of Flooding Indicator

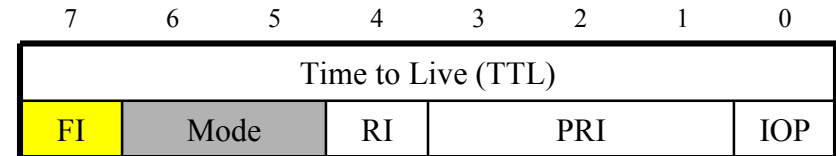
RPR Header Format



Mode Values

Value	Description
0	Reserved
1	Reserved
2	Reserved
3	Steering only data
4	Protection Control packet
5	Control packet
6	Fairness packet
7	Data Packet

Modified RPR Header Format



Mode Values

Value	Description
0	Steering only data
1	Control packet
2	Fairness packet
3	Data Packet

Flooding Indicator (FI) Values

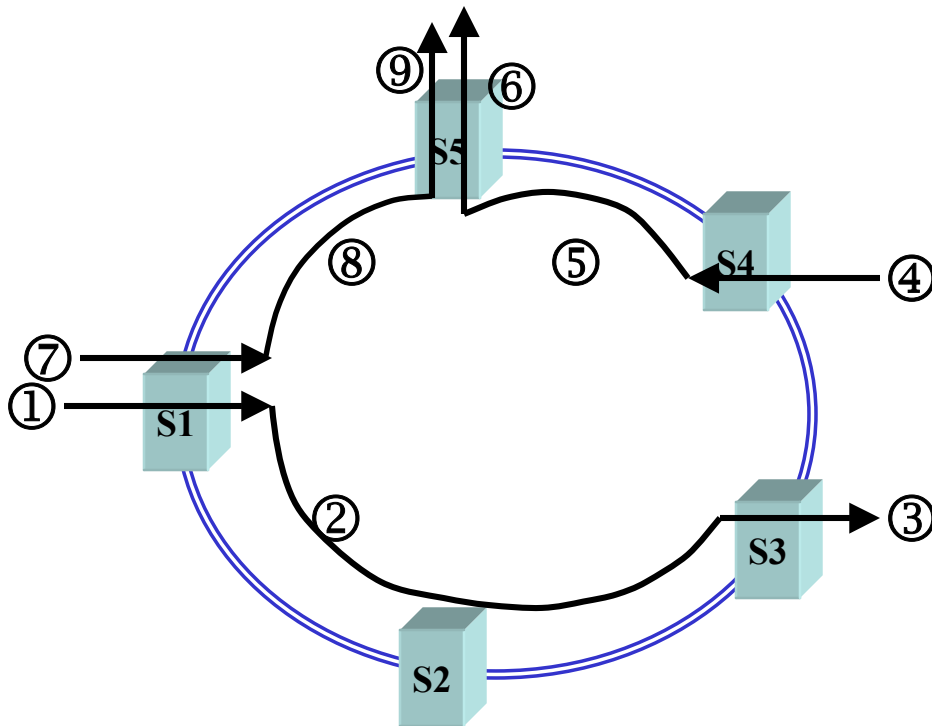
Value	Description
0	No Flooding
1	Flooding

Open Issues

- If two Routers or Hosts on the same Ring are communicating with each other using 802.17 MACs, can the DA and/or SA parameter(s) associated with the Request Primitive be outside the domain of the 802.17 MAC addresses?
 - Can the 802.17 MAC support MAC Clients that have multiple (unique) MAC address?
 - Is this within the scope of 802.17?

Native Packet Format to RPR Frame Format

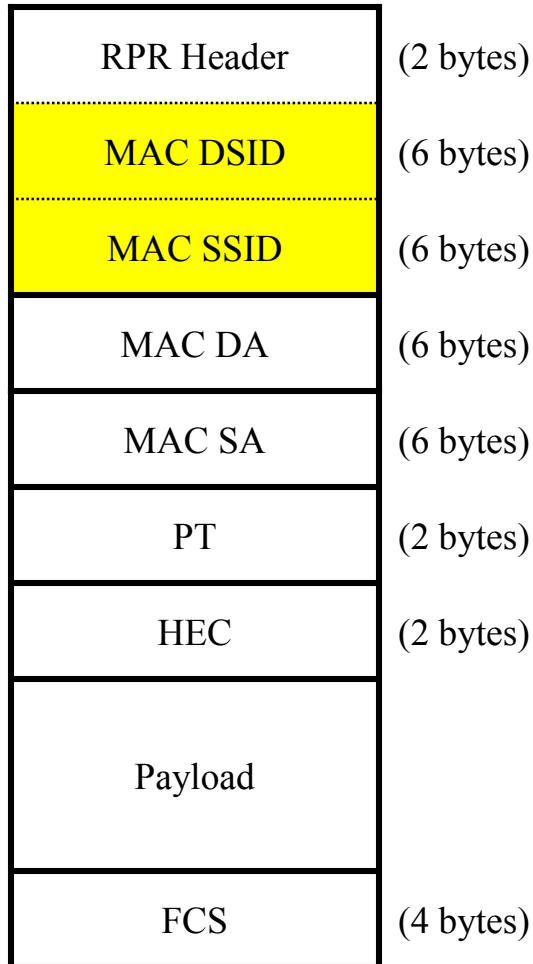
- S1 and S3 are 802.1D/Q Compliant Bridges
- S2, S4, and S5 are Routers/Hosts



① ③ ④ ⑥ ⑦ ⑨ 802.3 Frame

② ⑤ ⑧ RPR Frame

Frame Structure with Station Identifiers: Option #1a

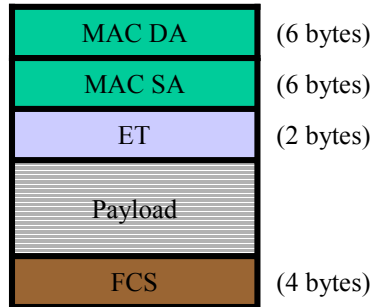


- Frame syntax changed due to DSID and SSID fields.
- MAC SA & DA fields can either be Ring local or Remote (I.e., end-to-end MAC addresses or end station MAC addresses)

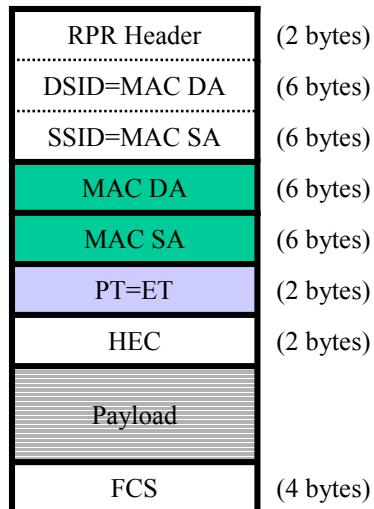
Option #1a: Example

Locally Originated and Terminated Packet Flow

Router/Host/Server Client Data Frame

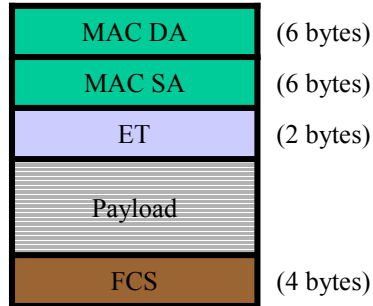


Resulting RPR Frame

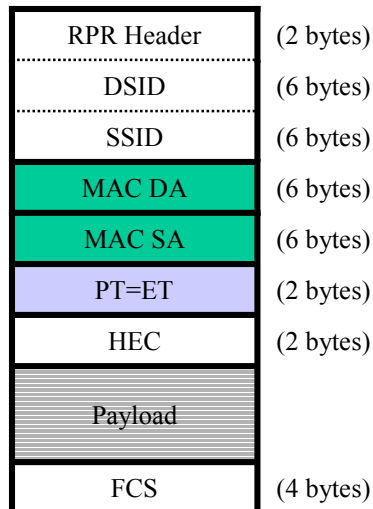


Packet Flow Involving Bridges

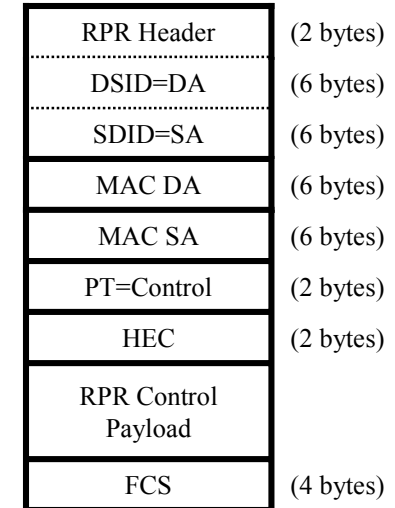
Bridge Client Data Frame



Resulting RPR Frame



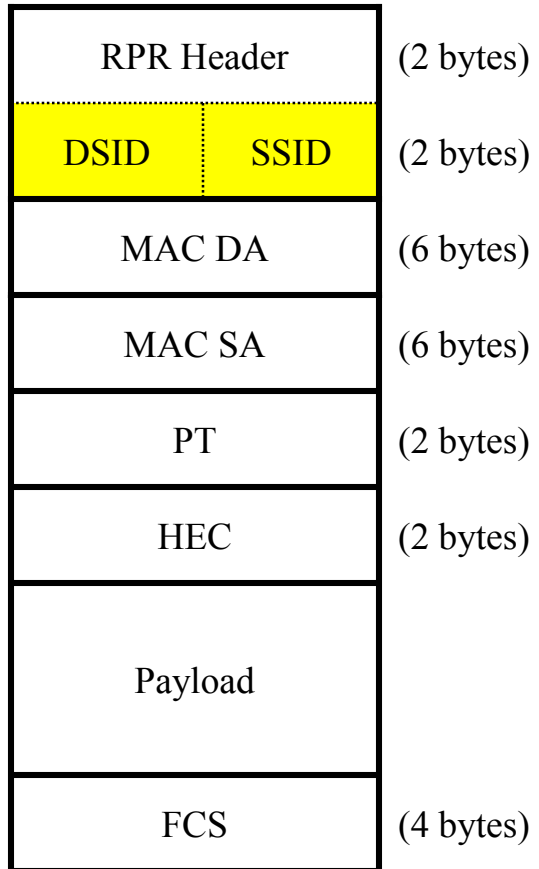
RPR Control Packet



Values of DSID/SSID

- May, but need not, be MAC DA/SA
- Must be a member of the Ring Topology Image

Frame Structure with Station Identifiers: Option #1b

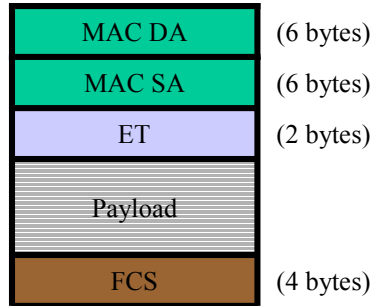


- Frame syntax changed due to DSID and SSID fields
- MAC reception rules changed to accommodate DSID and SSID
- MAC SA & DA fields can be either Ring local or Remote (I.e., end-to-end MAC addresses or end station MAC addresses)

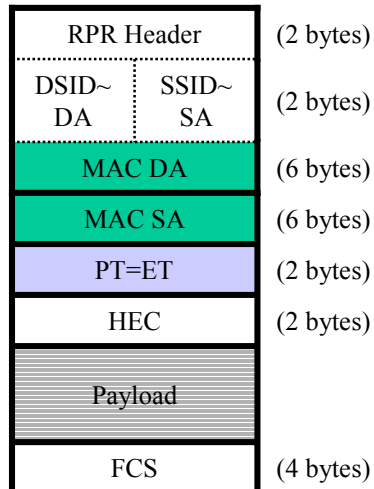
Option #1b: Example

Locally Originated and Terminated Packet Flow

Router/Host/Server Client Data Frame

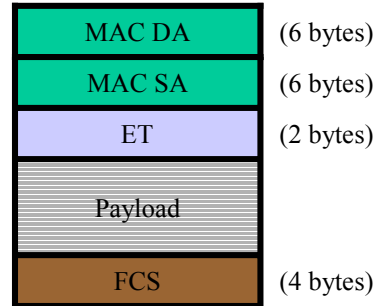


Resulting RPR Frame

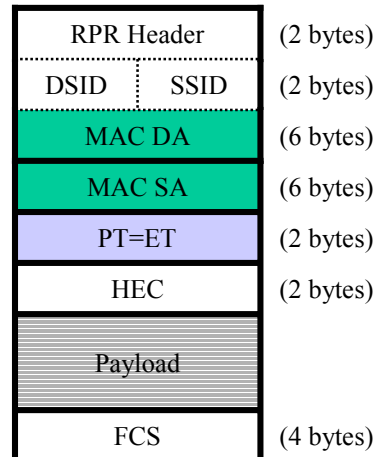


Packet Flow Involving Bridges

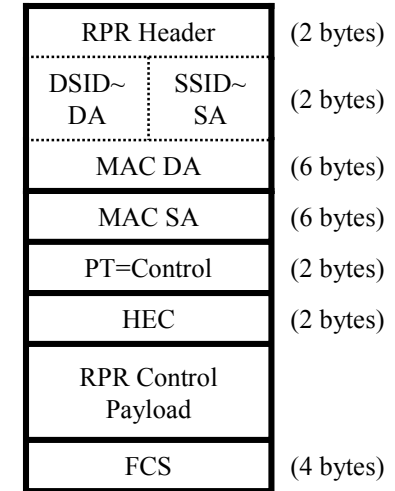
Bridge Client Data Frame



Resulting RPR Frame



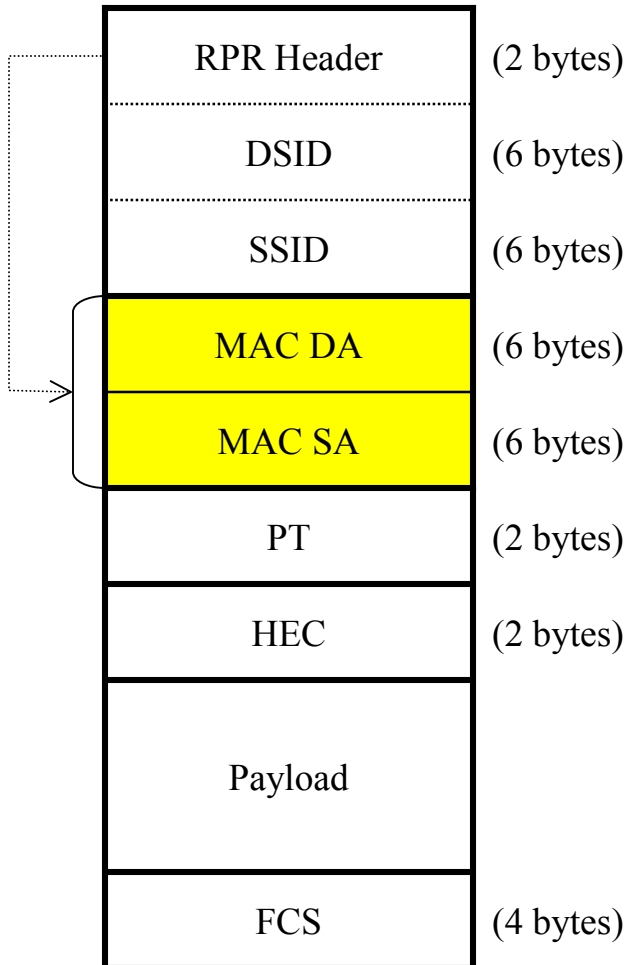
RPR Control Packet



Values of DSID/SSID

- May, but need not, be derived from MAC DA/SA (e.g., using SID DB)
- Must be a member of the Ring Topology Image

Frame Structure with Station Identifiers: Option #1c

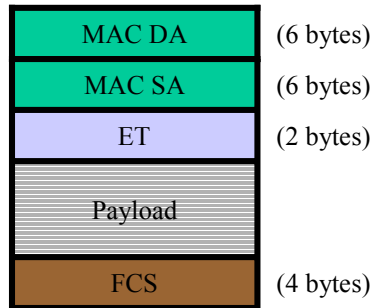


- Bit in RPR Header indicates presence of Remote MAC addresses in frame format
- Frame syntax changed when Remote MACs are present

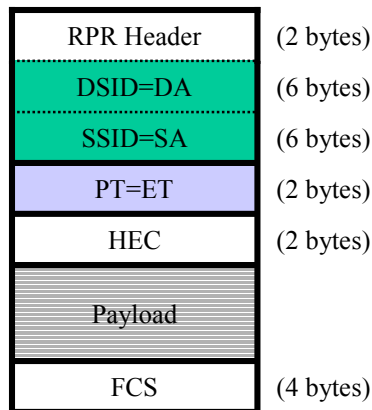
Option #1c: Example

Locally Originated and Terminated Packet Flow

Router/Host/Server Client Data Frame

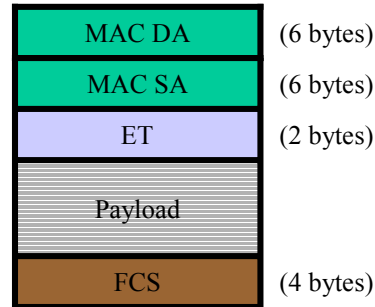


Resulting RPR Frame

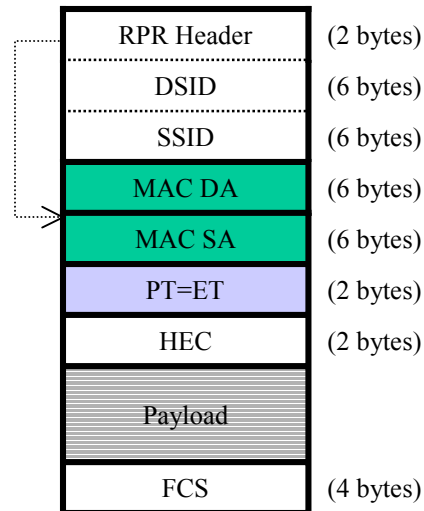


Packet Flow Involving Bridges

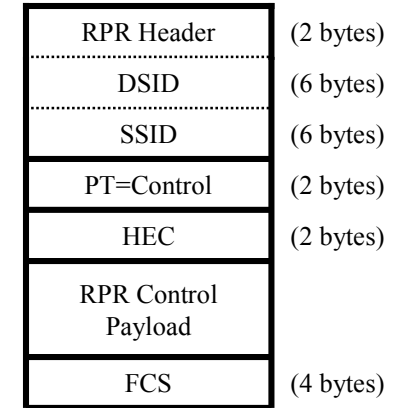
Bridge Client Data Frame



Resulting RPR Frame



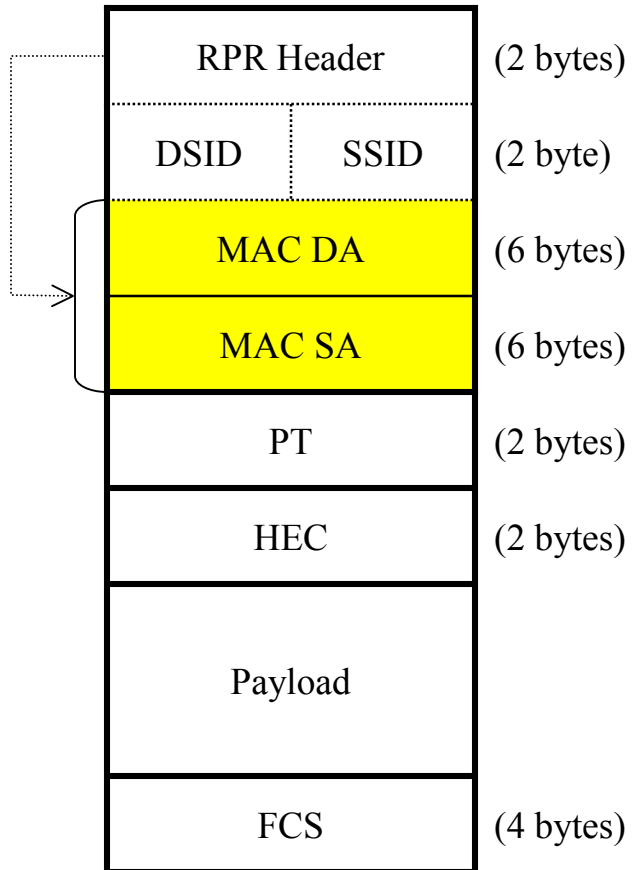
RPR Control Packet



Values of DSID/SSID

- May, but need not, be derived from MAC DA/SA (e.g., using SID DB)
- Must be a member of the Ring Topology Image

Frame Structure with Station Identifiers: Option #1d

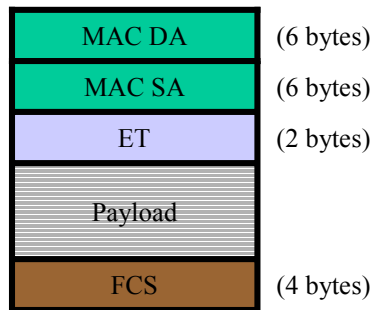


- Bit in RPR Header indicates presence of Remote MAC addresses in frame format
- Frame syntax changed when Remote MACs are present
- MAC reception rules changed to accommodate DSID and SSID (labels)

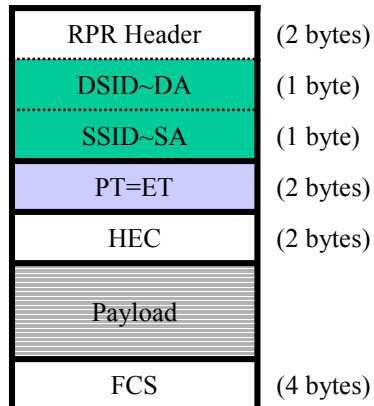
Option #1d: Example

Locally Originated and Terminated Packet Flow

Router/Host/Server Client Data Frame

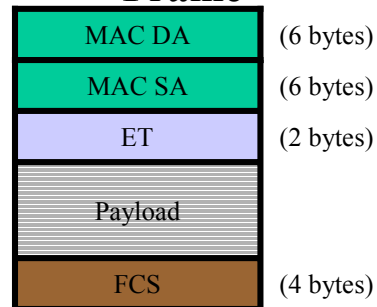


Resulting RPR Frame

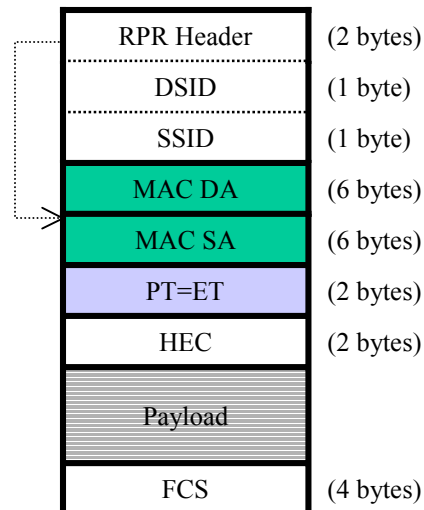


Packet Flow Involving Bridges

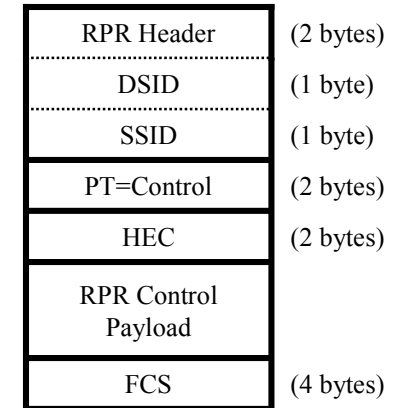
Bridge Client Data Frame



Resulting RPR Frame



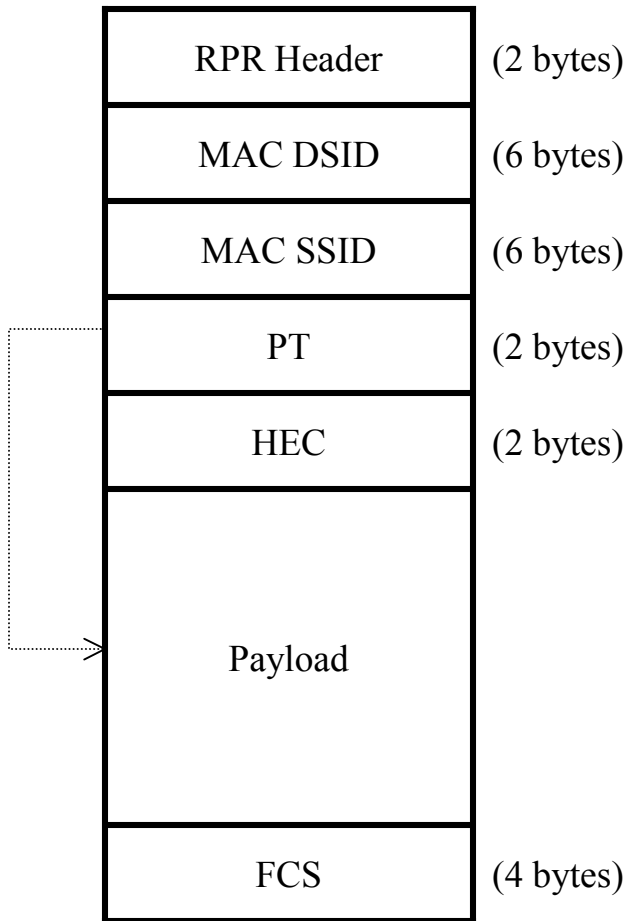
RPR Control Packet



Values of DSID/SSID

- May, but need not, be derived from MAC DA/SA (e.g., using SID DB)
- Must be a member of the Ring Topology Image

Frame Structure with Station Identifiers: Option #2a

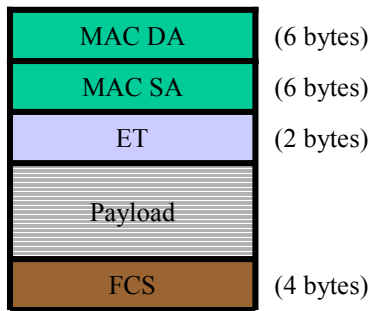


- Frame syntax unchanged
- Frame semantics changed ?
- MAC SA and DA (prior to HEC) *always* in the Ring local address domain
 - All fields prior to HEC are specific to managing packet flow on the RPR LAN
- Packets with Remote MAC address are carried in the RPR frame Payload
 - PT field indicates RPR addressing hierarchy
- Local traffic (with local MAC addressing) use the Payload to carry Client data.

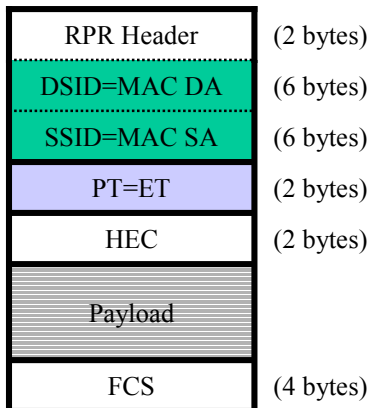
Option #2a: Example

Locally Originated and Terminated Packet Flow

Router/Host/Server Client Data Frame

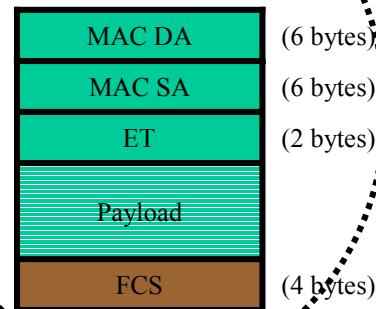


Resulting RPR Frame

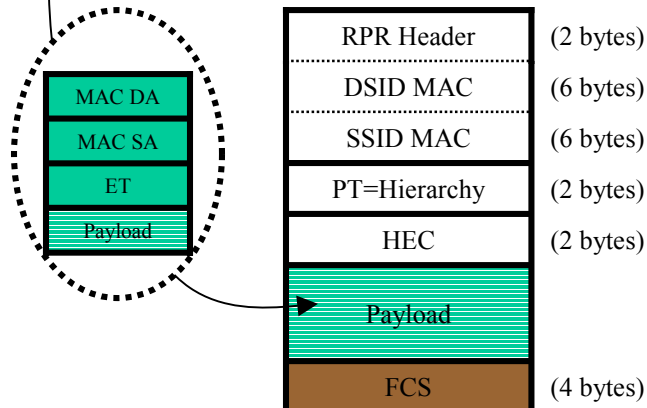


Packet Flow Involving Bridges

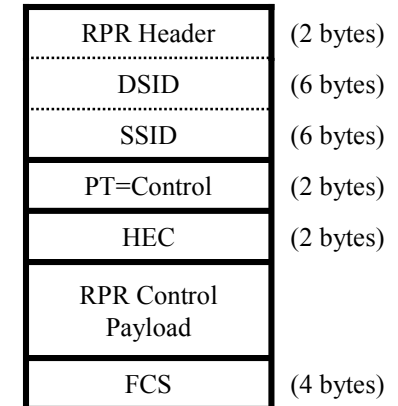
Bridge Client Data Frame



Resulting RPR Frame



RPR Control Packet



Values of DSID/SSID

- May, but need not, be derived from MAC DA/SA (e.g., using SID DB)
- Must be a member of the Ring Topology Image

Open Issues

- Certain members of BAH believe that this option results in a different format for local addresses versus remote addresses

Option Comparison

Category	Option #2a	Option #1a	Option #1b	Option #1c	Option #1d
No change to frame format					
No impact to existing MAC reception rules					
Avoids introduction of distribution and uniqueness algorithm need to manage Station label identifiers.					
Can support Bridging with Flooding proposals.					
Can support Bridging with Spatial Re-Use proposals.					
Can support multiple flooding techniques (e.g., source stripping, TTL scoping, etc.)					
No impact to currently defined Service interface between 802.17 MAC and MAC Clients.					
Maximum Frame Tax (Ring Configuration dependent – Ring has at least 1 Bridge operating with Spatial Reuse)					
Minimum Frame Tax (Ring Configuration dependent – Ring does not have any Bridges resident, or has at least 1 Bridge but does not operates a Broadcast media)					

Option Comparison

Category	Option #2a	Option #1a	Option #1b	Option #1c	
				Label SID	MAC SID
Fixed pre-HEC fields					
Bridge support for source stripping					
Same frame format for Bridge and non-Bridge devices					
Is Format in the domain of 802.17?					