RPR Ringlet Selection

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Position Of Ringlet Selection

- A unit of the MAC Control Sublayer
- Ringlet selection is performed for client add traffic only
- Positioned as shown in ag_ref_model_01.pdf
  - Ringlet selection occurs prior to any other action on the add traffic inside the MAC

Ringlet Selection Actions

- Choice of ringlet
- Re-steering of packet during protection for steering rings or for local attachment failure in wrapping rings
- Multicast packet replication for steering rings in state other than IDLE state
- Setting of TTL based on destination's location on chosen ringlet
- Setting of wrap eligible bit

Use Of RPR MAC Database

- Ringlet selection makes use of the RPR MAC database which contains the topology and protection information for each ringlet

- Protection Control Unit provides ringlet protection summary for Ringlet Selection Control Unit

Client Control

- Ringlet selection is specified via the optional ringlet_id and MAC_protection parameters of the MA_DATA.request primitive for each packet supplied by the client

- The values for ringlet_id are
  - left
  - right
  - default_ringlet
  - ➢ If unspecified, the value for ringlet_id shall default to default_ringlet

- The values for MAC_protection are
  - MAC_protected
  - MAC_unprotected
  - ➢ If unspecified, the value for MAC_protection shall default to MAC_protected

left, MAC_protected

- Packet will be sent on the left ringlet, if destination address is reachable

- If destination address is not reachable to the left, and is reachable to the right, the packet will be sent to the right

- If destination address is multicast address, the packet may be sent either or both directions as necessary to reach all of the destination addresses

- The Wrap Eligible (WE) bit is set for wrapping rings

left, MAC_unprotected

- Packet will be sent to the left ringlet, regardless of state of left ringlet
- No allowance will be made for unicast or multicast addresses beyond any non usable links
  - For unicast addresses, the packet will make it to the destination address only if the destination is closer than any non usable link
  - For multicast addresses, the packet may make it to all of the destination addresses, some of the destination addresses, or none of the destination addresses
- The Wrap Eligible (WE) bit is not set

right, MAC_protected

- Packet will be sent on the right ringlet, if destination address is reachable

- If destination address is not reachable to the right, and is reachable to the left, the packet will be sent to the left

- If destination address is multicast address, the packet may be sent either or both directions as necessary to reach all of the destination addresses

- The Wrap Eligible (WE) bit is set for wrapping rings

right, MAC_unprotected

- Packet will be sent to the right ringlet, regardless of state of right ringlet
- No allowance will be made for unicast or multicast addresses beyond any non usable links
    - For unicast addresses, the packet will make it to the destination address only if the destination is closer than any non usable link
    - For multicast addresses, the packet may make it to all of the destination addresses, some of the destination addresses, or none of the destination addresses
- The Wrap Eligible (WE) bit is not set

default_ringlet, MAC_protected

- Packet will be sent on either or both ringlets, as chosen by the MAC

- The algorithm used to choose ringlets is implementation specific
  - The only constraint on the algorithm is that it chooses the same direction for all packets addressed with the same destination address, until protection or topology changes

- The Wrap Eligible (WE) bit is not set if the packet is replicated, otherwise it is set for wrapping rings

default_ringlet, MAC_unprotected

- Packet will be sent on either ringlet, as chosen by the MAC, with no allowance for unicast or multicast addresses beyond any non usable links
  - For unicast addresses, the packet will make it to the destination address only if the destination is closer than any non usable link
  - For multicast addresses, the packet may make it to all of the destination addresses, some of the destination addresses, or none of the destination addresses
- The algorithm used to choose ringlets is implementation specific
  - The only constraint on the algorithm is that it chooses the same direction for all packets addressed with the same destination address, without regard to protection, until topology changes
- The Wrap Eligible (WE) bit is not set

Setting Of TTL

- ## Unicast packets
  - ### Uniform provisioning stations
    - TTL set to no more than Max_Ring_Size (e.g. a likely value would be rprIfNodesOnRing)
  - ### Spatial provisioning stations
    - TTL set to distance on chosen direction to destination
- ## Multicast packets
  - ### Non-replicated packets
    - TTL set to no more than Max_Ring_Size (e.g. a likely value would be rprIfNodesOnRing)
  - ### Replicated packets
    - TTL for each direction set to no more than distance on each direction to point of protection