Proposal for IEEE 802.16m Frame Structure for Relay Support

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Purpose: Adopt the proposal into the IEEE 802.16m System Description Document

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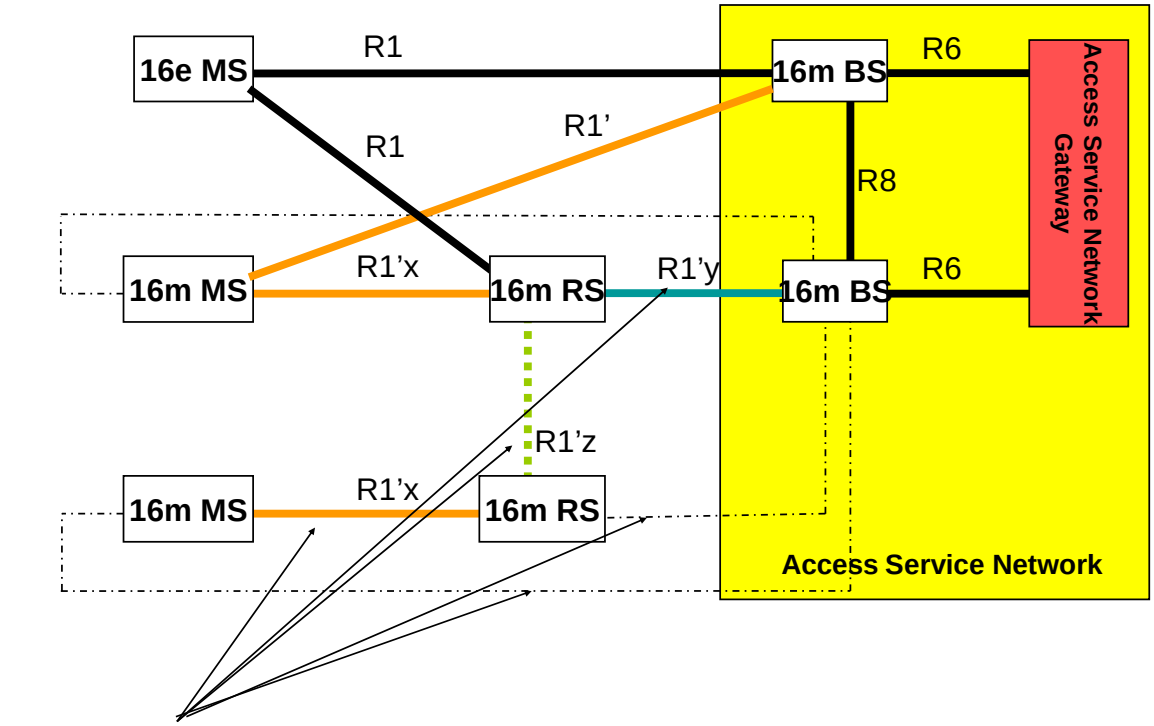
Scope

- This contribution presents the IEEE 802.16m frame structure for relay support
- Basic frame structure without relay for single-band and multi-band operations are presented in separate contributions (C802.16m-08/041, C802.16m-08/042). This contribution presents the frame structure for relay added on to the basic frame structure.

IEEE 802.16m Access Network Architecture with Relay

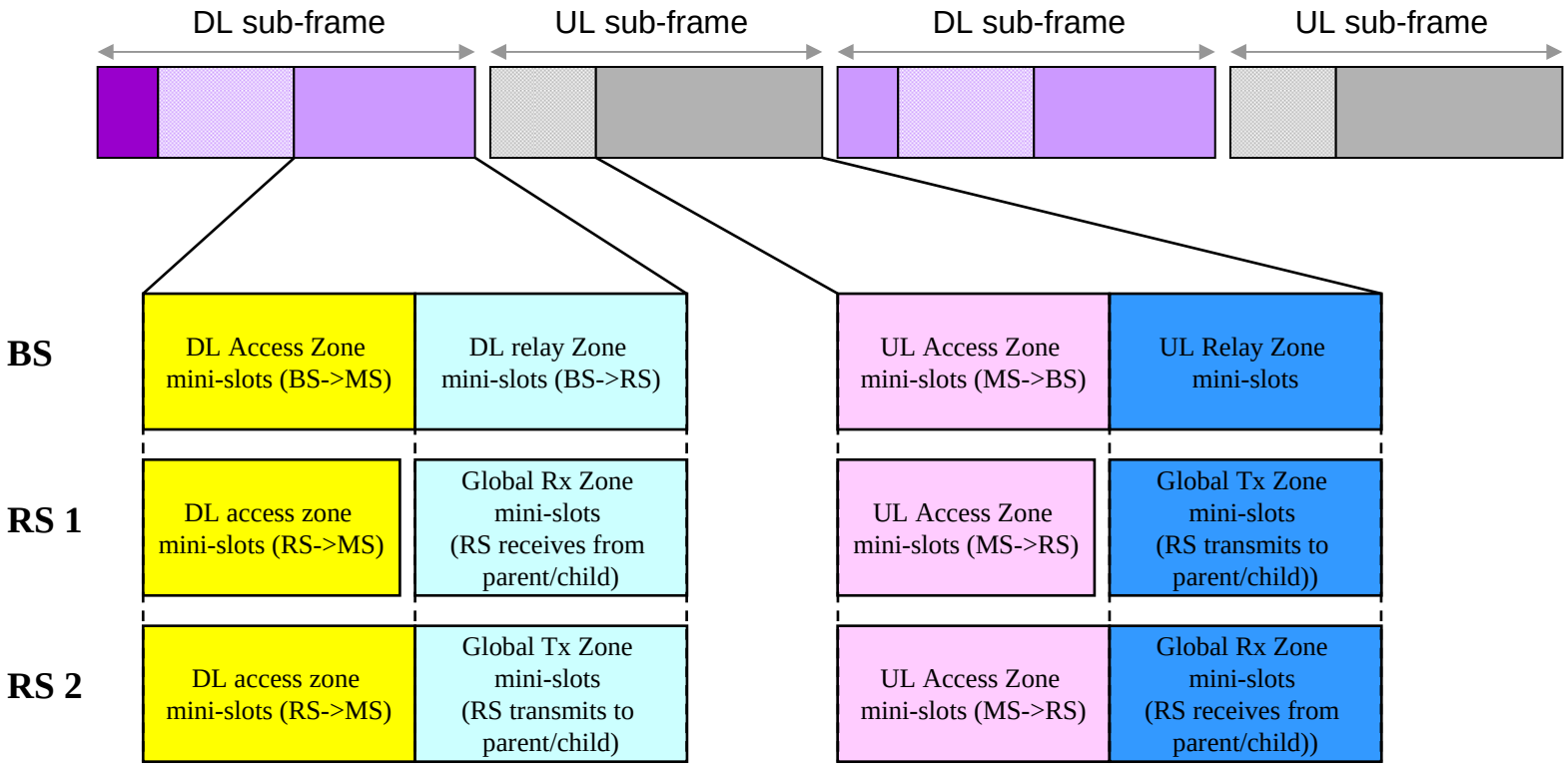


Details given in contribution C802.16m-07/299r3

Consideration for Relay Frame Structure

- The frame structure should support the BS-RS link (R1’y), RS-RS link (R1’z) and RS-MS link (R1’x).
- The RS-MS link should support both legacy MS and 16m MS
- The hop-to-hop latency should be minimized to meet the latency requirements defined in IEEE 802.16m SRD

Relay Frame Structure for Single Band Operation (1/2)



16m preamble mini-slot:: contain 16m synchronization channel, and 16m broadcast control channel

16m DL mini-slots zone: used for relay link and for access link transmission to 16m MS

16m UL mini-slots zone: used for relay link and for access link transmission from MS

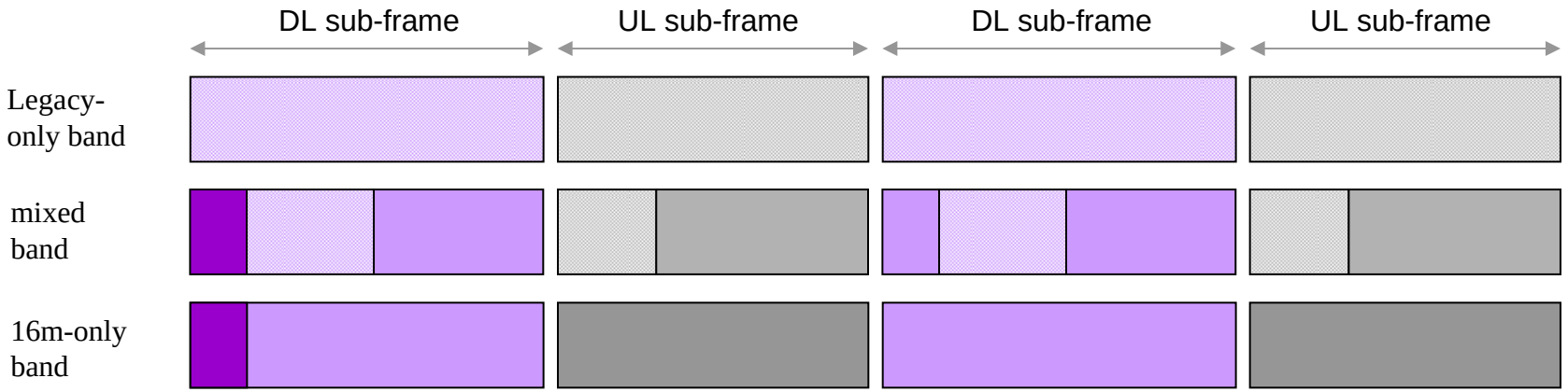
legacy DL mini-slots zone: used for BS/RS to legacy MS transmission

legacy UL mini-slots zone: used for legacy MS to BS/RS transmission

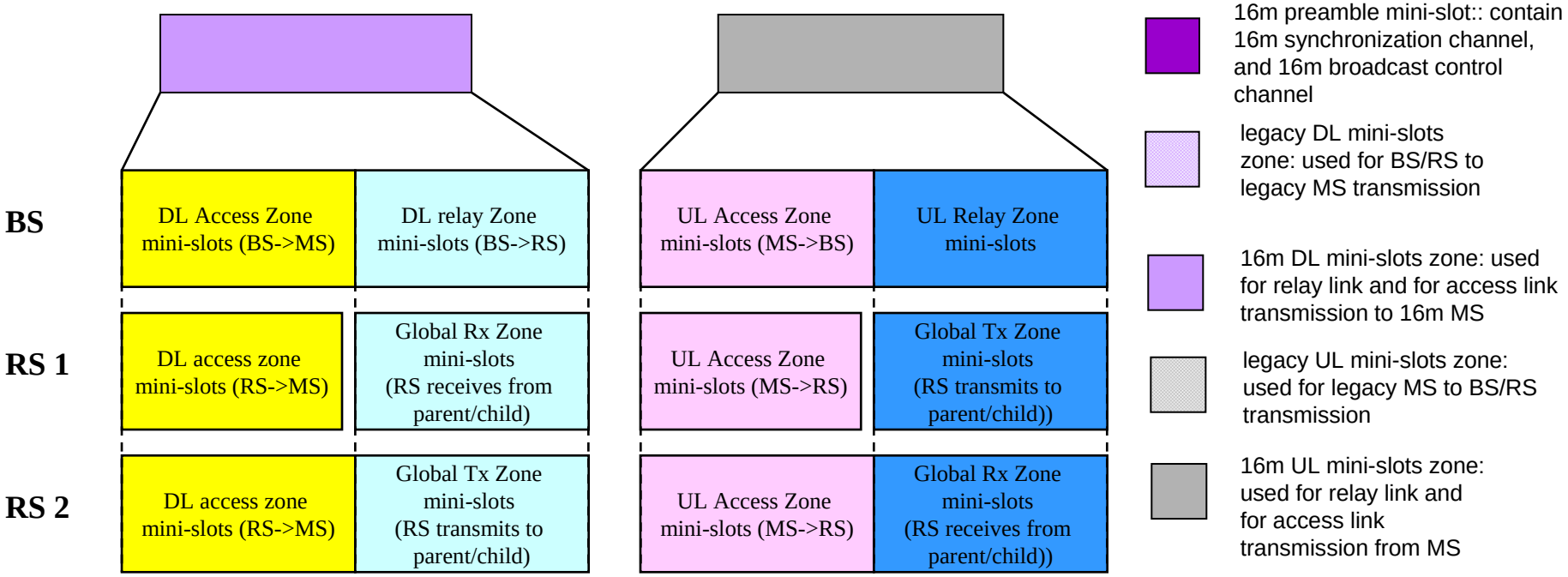
Relay Frame Structure for Single Band Operation (2/2)

- The DL sub-frame and UL sub-frame are each partitioned into mini-slots. A group of mini-slots form the legacy zone and another group of mini-slots form the 16m zone
  - Legacy zones are used for BS/RS transmission/reception to/from the legacy MS
  - 16m zones are used for BS/RS transmission/reception to/from the 16m MS, and also for BS/RS transmission/reception to/from RS.
- Within the 16m zone, one or more mini-slots are defined for the access zone and one or more mini-slots are defined for the global zone
  - Access zone is used for BS/RS transmission/reception to/from the 16m MS
  - Global transmit zone is used for an RS to transmit to its parent and/or child nodes. Global receive zone is used for an RS to receive from its parent and/or child nodes
  - The use of global zones reduces the hop-to-hop latency as well as provides more flexible resource multiplexing between the parent and the child nodes.

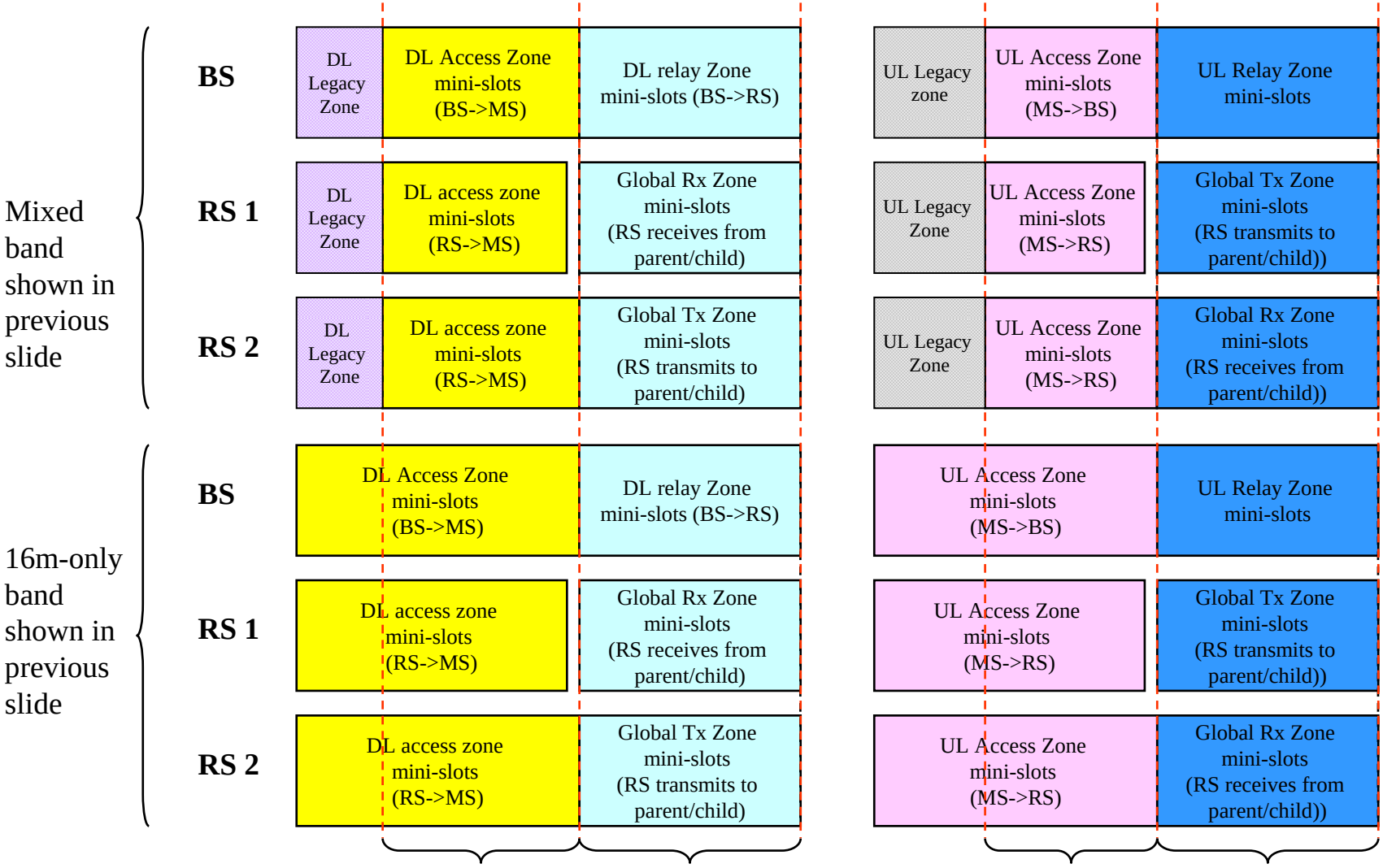
Relay Frame Structure for Multi-Band Operation (1/2)



In each band, access zone and relay/global zone are defined within the 16m mini-slots zone



Relay Frame Structure for Multi-Band Operation (2/2)



The boundary between the access zone and the relay/global zone is aligned across bands to ensure transmit-receive switch time is aligned across bands. In overlapping region across bands, the burst transmission to/from wideband MS can span across multiple bands.