Enhancements for Persistent allocation

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This is a base contribution

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Discuss and adopt

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Persistent Allocation mechanism in 802.16-REV2/D9

- Persistent Allocation saves lot of MAP overhead.
- Persistent HARQ DL/UL MAP IEs are used for persistent allocation.
- ACK Channel is used to acknowledgement the reception of Persistent HARQ DL/UL MAP IE.
- MAP NACK Channel is used to indicate the MAP decoding Error.
  - It helps BS to re-transmit Persistent Deallocation IE in case NAK signal is received on MAP NACK Channel if such IE are transmitted in previous MAP.

Changes in 16m

- In 16m, MAPs are separately encoded. So MS does not know if MAP decoding error happens or not
  - Because there may be no A-MAP IEs are transmitted to MS.
  - MAP NAK channel can not be used otherwise, it require MS to transmit NAK signal on MAP NACK Channel every time if there is no IE received in A-MAP.
  - It can be solved by having explicit ACK channel in Persistent IE for both allocation, de-allocation and re-allocation. - Increased overhead
- Verification of system configuration information - power consuming operation

MS operation during Persistent Allocation

- Persistent allocation is mainly targeted for VoIP traffic.
- Following are the major task performed by MS during Persistent allocation
- On uplink:
  - Transmission of VoIP packet
  - Transmission of DL HARQ ACK/NAK
- On Downlink:
  - Reception of VoIP packet
  - Reception of UL HARQ ACK/NAK
  - Decoding of A-MAP (PA de-allocation or re-allocation may come)
  - Verification of system configuration information.
- We propose that operation mentioned in blue text can be done inside the PA resources using extended header.

Persistent Allocation Enhancements

- Allocation of PA is done in the same way as defined in 16e. (adopted to 16m signalling)
- Communication between BS and MS may happen in PA resources.
- The following exchanges may be allowed (this can be achieved without bandwidth stealing from VoIP traffic):
  - De-allocation PA Resources
    - Separate IE is not required to be transmitted in A-MAP for de-allocation of PA. - Saves overhead
  - Indication of change in system information or Transmission of SFH ChangeCount
    - For VoIP call, MS is only communicated in 1 DL sub-frame and 1 UL sub-frame. However, verification of system information require either MS to wake up at super-frame boundary or require SFH change count in Non-User specfic part of A-MAP.
    - Basically Either process is not efficient. Wake up at SFH boundary is power inefficient while transmit change count is additional overhead.
    - If BS can transmit indication of SFH change in the PA resources, MS is not required to wake up at every SFH boundary.

Persistent Allocation Enhancements (2)

- 1 byte extended Header in the PA resource should be enough for transmitting signalling in the PA resources.
- It is expected that VoIP packet is of variable size and may not fit exactly in the N number of PRUs. Therefore, 1 byte room in the PA resource is expected to be available for transmitting signalling in the PA.
- Embedded Signalling message can be implicitly acked by PA HARQ ACK/NAK or can be ACKed separately using Generic ACK message.

AWD Text Proposal

[Insert following sections and text as indicated]

15.2.x HARQ

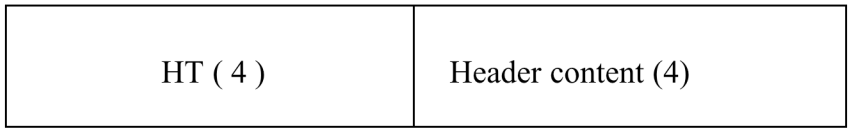
15.2.x.y HARQ for Persistent allocation

15.2.x.y.z Signalling in Persistent allocation resources

BS may transmit the following signalling indication in persistent allocation resources.

- De-allocation of Persistent allocation resources
  - When MS receives the extended header in PA with HT = 0000, It will assume PA resources are de-allocated.
- System information change indication or change count
  - When MS receives the extended header in PA with HT = 0001, MS will verify the received change count with the stored change count and if value does not match, then MS will acquire the new system configuration information.

- 15.2.x1 MAC PDU Formats
- 15.2.x1.y Extended Header in Persistent allocation



HT = 0b0000: De-allocation of Persistent allocation

0b0001: System information change, Content = LSB of SFHChangeCount