IEEE 802.16m HARQ Feedback Design Details

Document Number:

    IEEE S802.16m-08/920

Date Submitted:

    2008-09-05

Source:

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Venue:

    SDD Session 56 Cleanup, Call for PHY Details

Base Contribution:

    IEEE C802.16m-08/920

Abstract:

    Proposal for 16m HARQ feedback design.

Purpose:

    Adoption of proposed text/content for 802.16m System Description Document

LTE ACK/NACK Review (internal)

- ❑ ACK/NACK allocation size (minimum unit)
  - ▪ 12 subcarriers by 14 symbols (1ms)
- ❑ ACK/NACK load
  - ▪ 18 ACK/NACK channels by CDM
- ❑ ACK/NACK overhead: 9.3 tones/ACK/NACK channel
- ❑ SCW ACK/NACK: BPSK
- ❑ MCW ACK/NACK: QPSK (2 steams per user)
- ❑ ACK/NACK can also be transmitted with data

16m ACK/NACK Design

- ❑ 1 PRU (3 distributed tiles) shared by 12 ACK/NACK
  - ▪ Pilot subcarriers are shared using CDM
  - ▪ Data subcarriers are shared using CDM
    - • CDM has link budget advantage over TDM/FDM
  - ▪ ACK/NACK overhead: 9 tones/ACK/NACK channel
- ❑ To improve coverage, the tiles are allocated "time first"
  - ▪ Tile hopping in different subframes
  - ▪ Details in the next slides
- ❑ Support MCW ACK/NACK feedback
  - ▪ SCW: BPSK
  - ▪ MCW: QPSK
- ❑ ACK/NACK can also be transmitted with data

16m ACK/NACK PHY Design

4
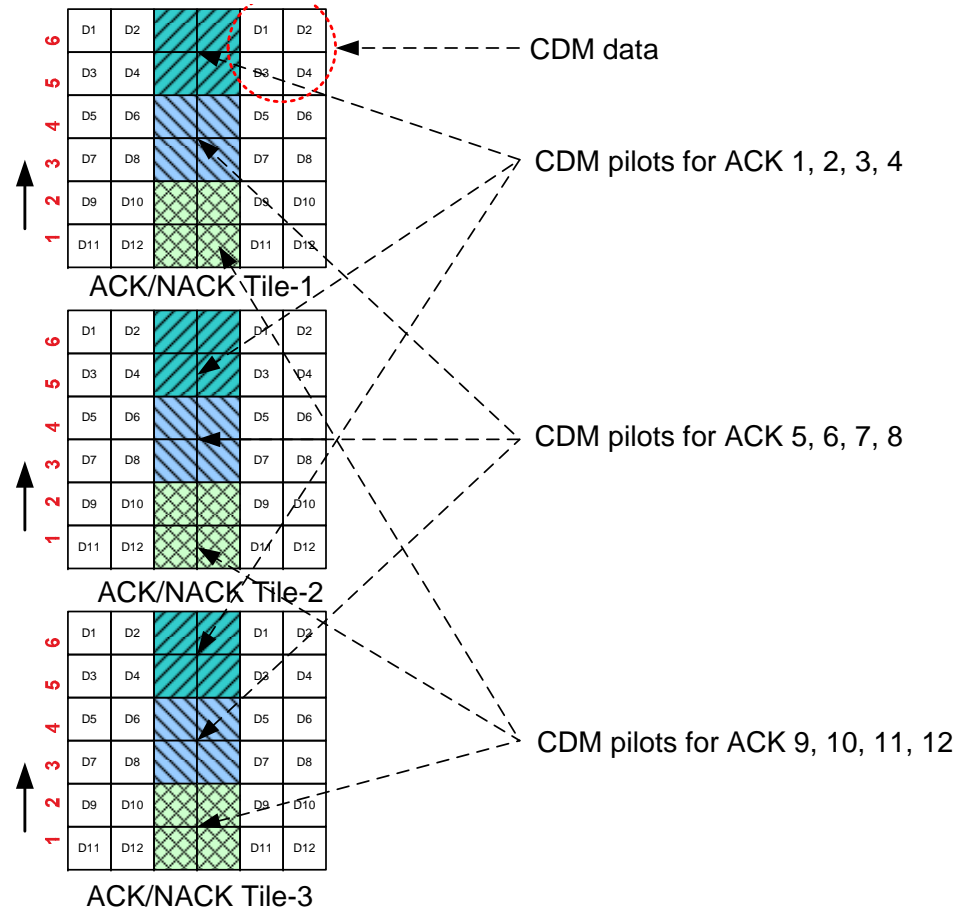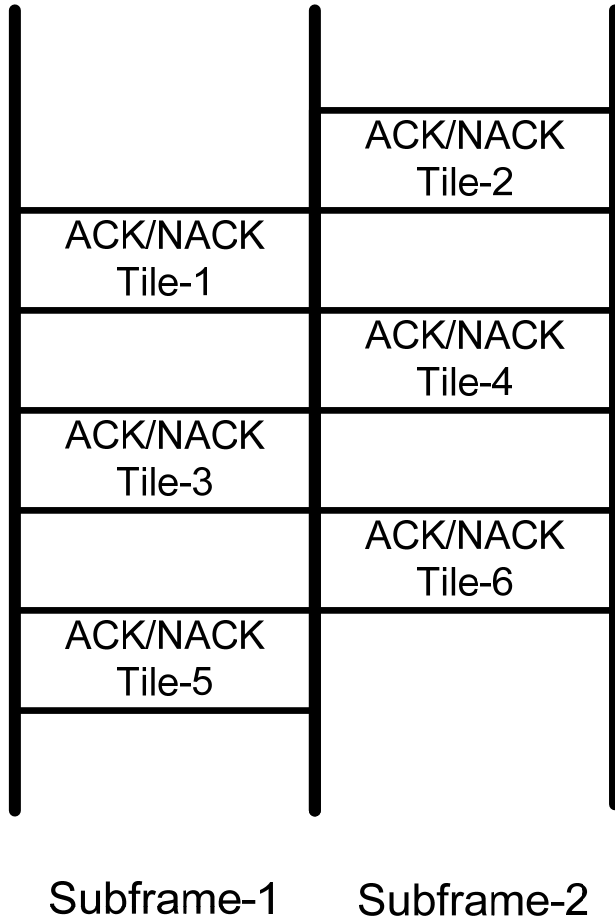
16m ACK/NACK Detection

- ❑ ACK: packet has been received correctly
- ❑ NACK: packet has been received, but incorrectly
- ❑ DTX: DL allocation signal might be missed by MS, or MS ACK/NACK signal is missed

Support Subframe Bundling

❑ Multiple DL subframes can be bundled together

❑ One ACK/NACK is assigned for each DL allocation across the bundled subframes

  ▪ One allocation corresponds to one DL allocation message

  ▪ 1-bit for SCW

❑ Location of ACK/NACK is indicated in DL resource allocation → DL allocation index

  ▪ ACK/NACK for persistent allocation should be allocated before regular allocations

  ▪ DL allocation index should include number of persistent allocations