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Submission Title: [Considerations on 15.3cMAC modifications to support 15.3cPHY]

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Abstract: [Considerations on 15.3cMAC modifications to support 15.3cPHY]

Purpose: [To be considered in 15.3c Usage Model Document]

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Considerations on 15.3MAC modifications to support 15.3cPHY

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Hiroyuki Nakase(Tohoku University),
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Summary

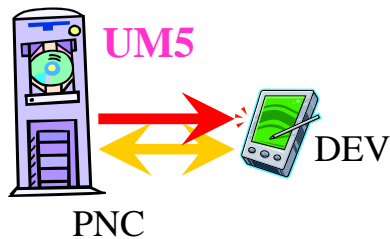
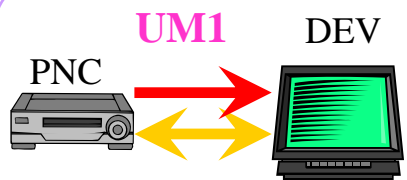
- Action items are detected and prioritized for 15.3MAC modifications according to UM categorization.
- An example of throughput analysis shows that suitable PHY and MAC parameters modification is mandatory for real applications.

UM categorization from MAC design perspective

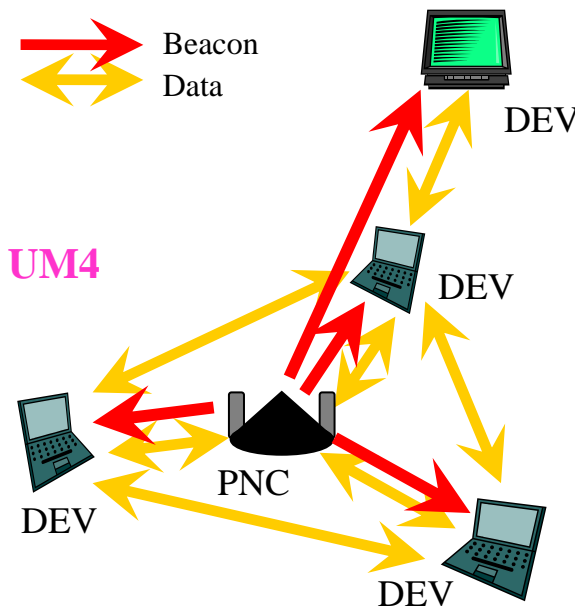
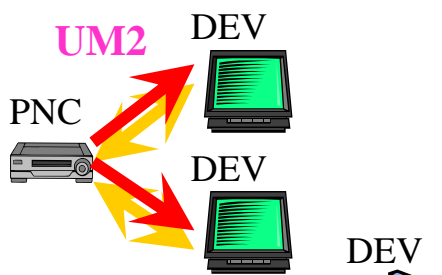
■ From MAC design perspective, UMs are categorized as follows.

- Category 1: Point-to-Point
 - UM 1 and 5
- Category 2: Point-to-Multipoint, or Mesh
 - UM 2, 3, and 4

Category1



Category2



Action items detected and prioritized

- I. Essential items for category 1
 - A) MAC parameters optimization
 - B) PHY parameters requirement
 - C) ACK/ARQ improvement
- II. Basic expandability in category 1
 - A) Hidden terminal treatment (, for example)
- III. Expandability to category 2
 - A) UM 2 and 3: Point-to-Multipoint
 - B) UM 4: Mesh

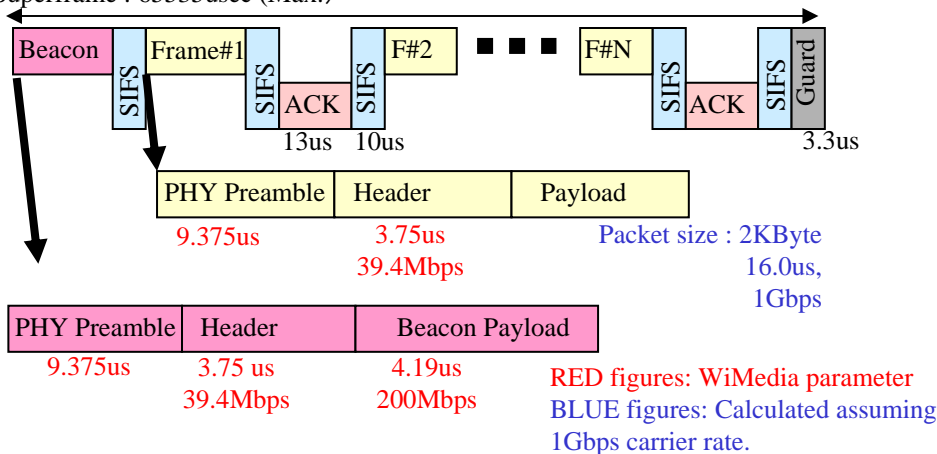
Throughput analysis example

■ 25.7% efficiency on Imm-ACK

(256.6Mbps throughput at 1Gbps modem rate) is due to

- Large PHY/MAC overhead,
- Short payload size against header size,
- Inefficient ACK/ARQ,
- Others.

Superframe : 65535usec (Max.)



■ Assumption

- PHY
 - WiMedia PHY parameters
 - Modem rate 1Gbps
- MAC
 - 15.3MAC parameters

Frame format in the case of Imm-ACK

Conclusions

- Action items are detected and prioritized for 15.3MAC modifications according to UM categorization.
- An example of throughput analysis shows that suitable PHY and MAC parameters modification is mandatory for real applications.