Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

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]

Considerations on 15.3MAC modifications to support 15.3cPHY

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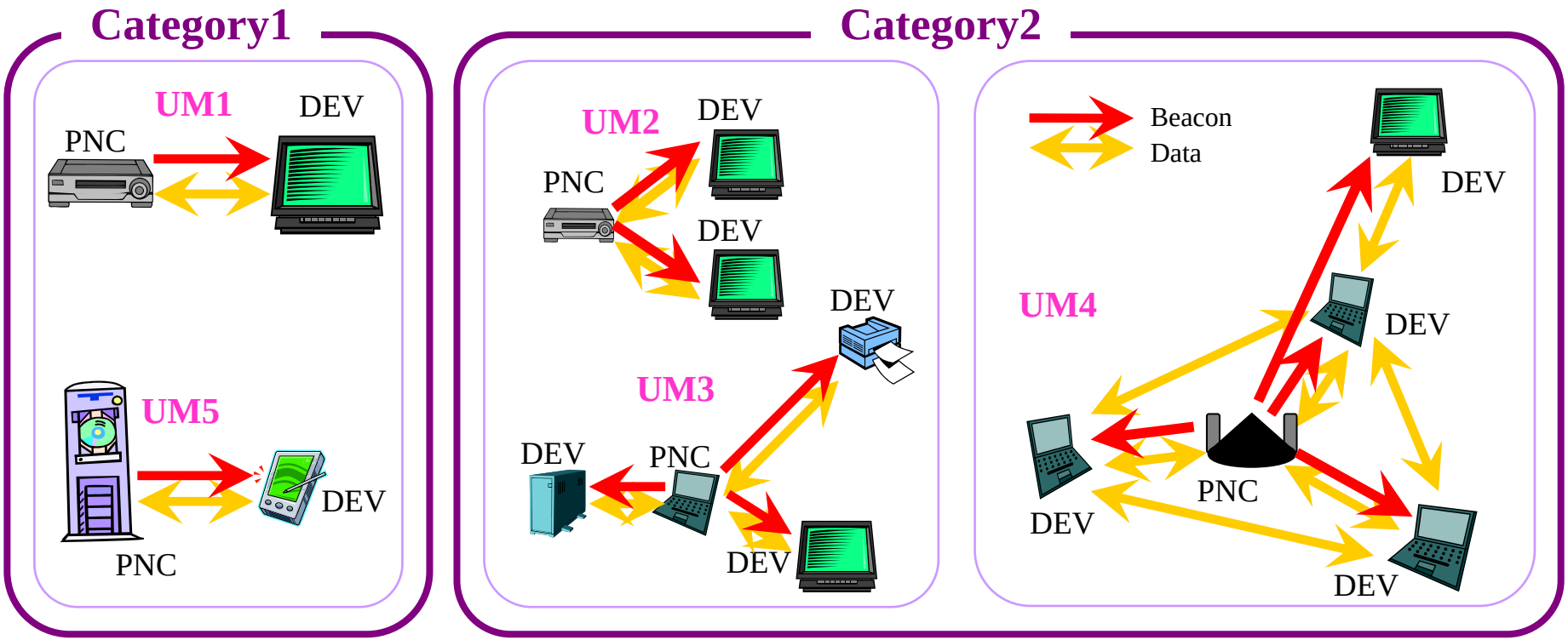
Summary

- 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



Action items detected and prioritized

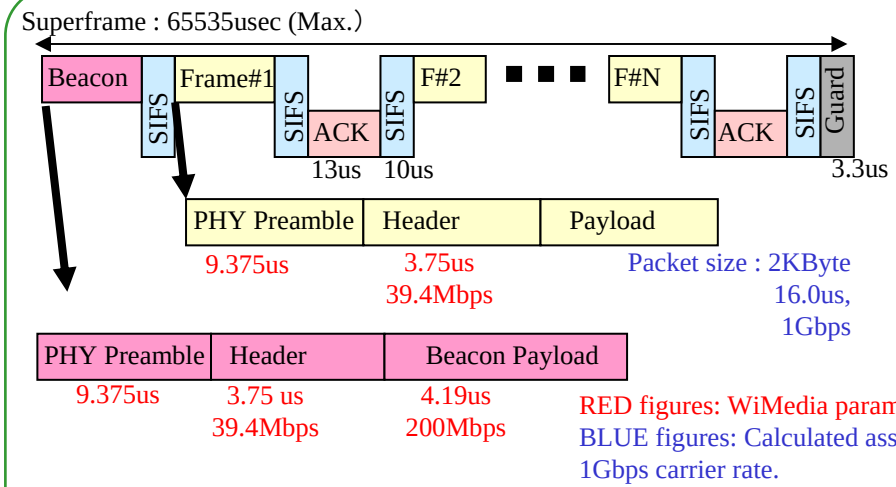
I. Essential items for category 1
   A) MAC parameters optimization
   B) PHY parameters requirement
   C) ACK/ARQ improvement
II. Basic expandability in category 1
   A) Hidden terminal treatment (, for example)
III. Expandability to category 2
   A) UM 2 and 3: Point-to-Multipoint
   B) UM 4: Mesh

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.



Frame format in the case of Imm-ACK

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

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.