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

Submission Title: [802.15.3c comment resolution on #2, 7, 17, 19, 29, and 36]
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Re: [In response to IEEE P802.15-08-0020-03-003c-df0-comments]

Abstract: [This document provides resolutions for some comments discussed in IEEE Jan'08 meeting at IEEE P802.15-08-0020-03-003c-df0-comments.]

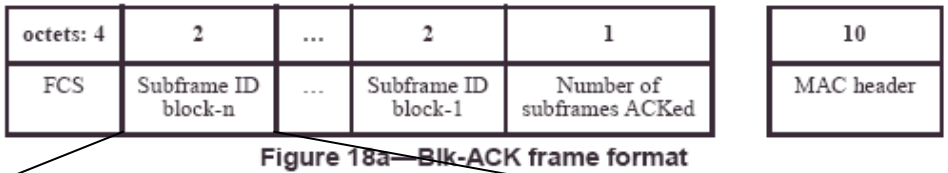
Purpose: [This document provides resolutions for some comments discussed in IEEE Jan'08 meeting IEEE P802.15-08-0020-03-003c-df0-comments]

- Issue Number #2 : Do we need a capability bit that indicates a DEV is MMC PNC capable?
- Resolution : Not necessary. DEV Capability includes AV PHY, HSI PHY, SC PHY, OOK PHY capabilities. DEV w/ more than one enabled will act as MMC. MMC support the SC base rate as mandatory. This means a device supporting more than one PHY mode, but not supporting common mode can not be MMC.

  Suggest to add SC base rate capability in capability IE.

- Issue Number #7 : (1) Will Dly-ACK do what is necessary for Blk-ACK or (2) are there unique things that Blk-ACK needs to do. (3) Also, can this concept be extended to include the AV PHY directional ACK.
- Resolution :
  - (1) Conceptually, Yes,
    - But, Dly-ACK is based on MPDU indication while Blk-ACK is based on subframe indication.
    - Dly-ACK frame format needs to be changed to support aggregation
  - (2) Yes. MSB/LSB indication are included in Blk-ACK.
    - In order for Dly-ACK to keep current functionality of Blk-ACK, Dly-ACK should preserve MSB/LSB indication.
  - (3) Need more discussion.
  - Blk-ACK is suggested to be eliminated from baseline document and use Dly-ACK with suggested changes

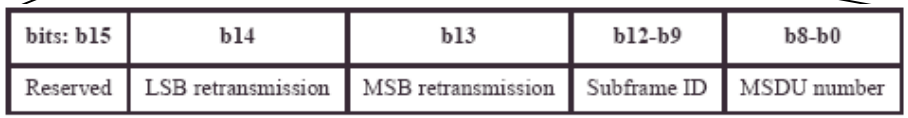
- Blk-ACK frame format in P802-15-3c-DF1



octets: 4	2	…	2	1
FCS	Subframe ID block-n	…	Subframe ID block-1	Number of subframes ACKed

10
MAC header

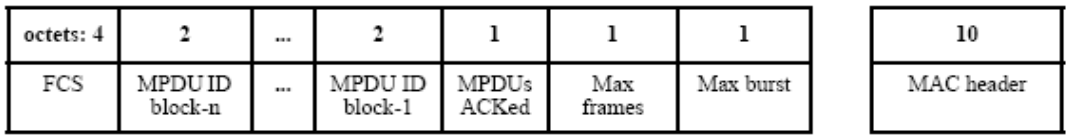
Figure 18a—Blk-ACK frame format



bits: b15	b14	b13	b12-b9	b8-b0
Reserved	LSB retransmission	MSB retransmission	Subframe ID	MSDU number

Figure 18b—Subrame ID block format

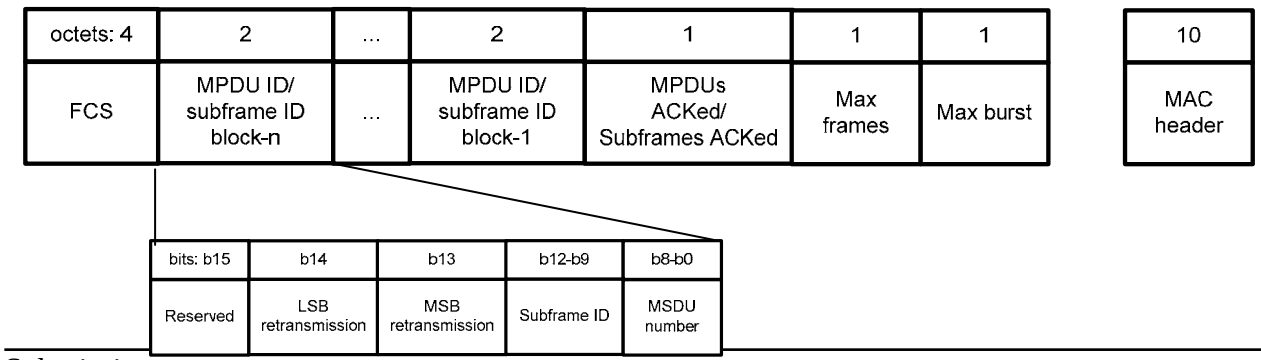
- D-ACK frame format in 802.15.3/3b



octets: 4	2	…	2	1	1	1
FCS	MPDU ID block-n	…	MPDU ID block-1	MPDUs ACKed	Max frames	Max burst

10
MAC header

- Suggested change for D-ACK frame format



octets: 4	2	…	2	1	1	1
FCS	MPDU ID/ subframe ID block-n	…	MPDU ID/ subframe ID block-1	MPDUs ACKed/ Subframes ACKed	Max frames	Max burst

10
MAC header

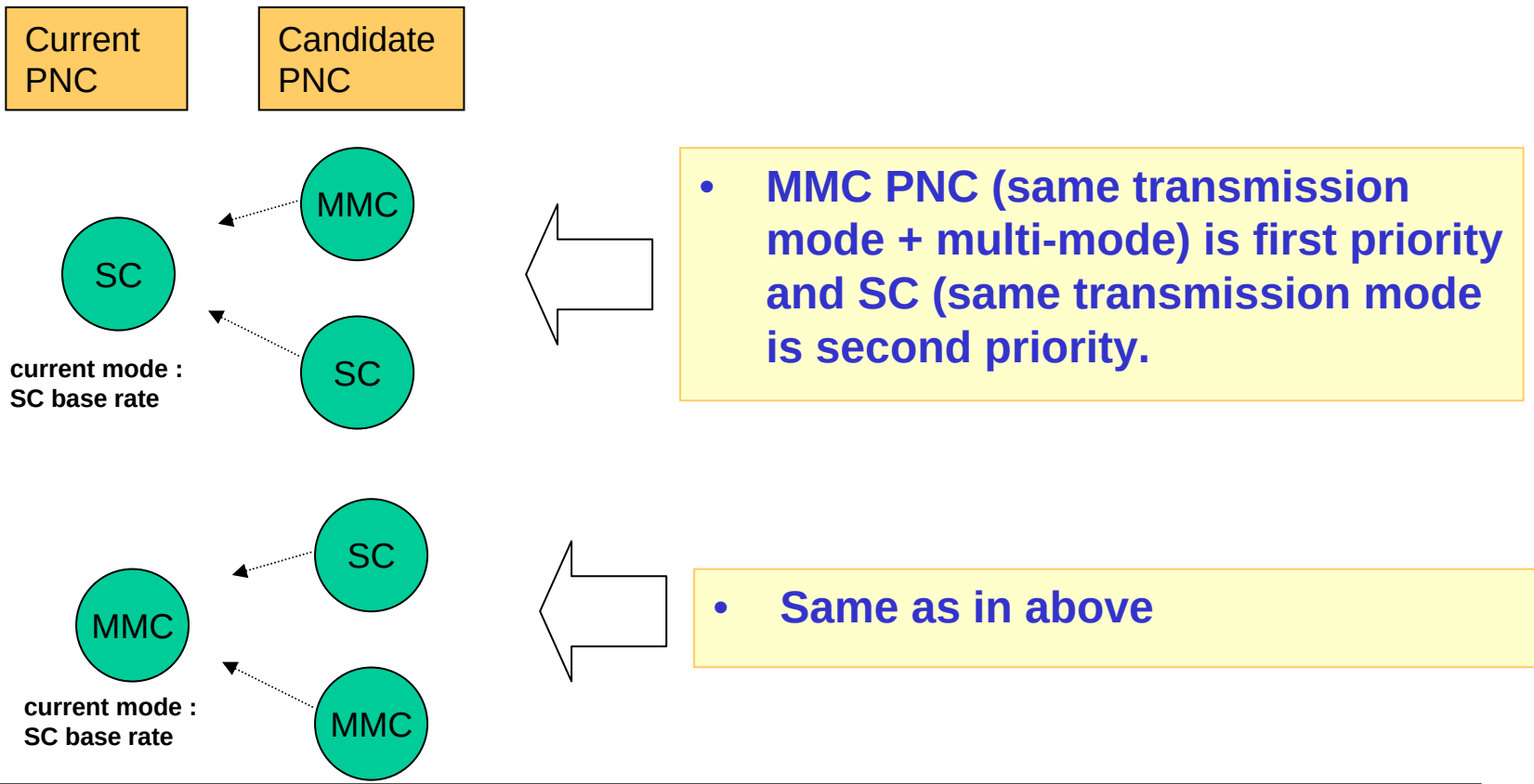
bits: b15	b14	b13	b12-b9	b8-b0
Reserved	LSB retransmission	MSB retransmission	Subframe ID	MSDU number

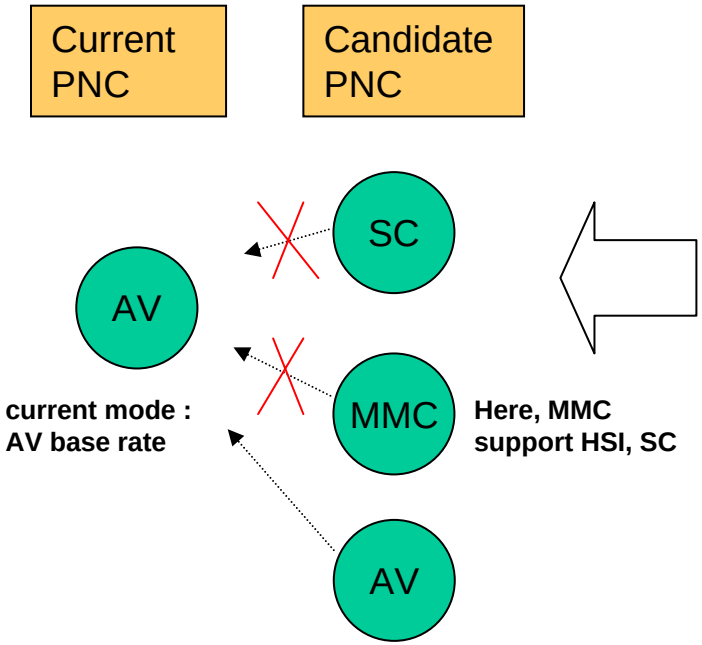
- Issue Number #17 : Can this be done with an information element? Also, there are some updates to the frame format that need to be reviewed.
- Resolution : Yes. It would be possible to use an information element, instead of commands. We can use either capability IE or create UEP IE.

- Issue Number #36 : Rather than using commands, if the UEP capabilities are exchanged as part of the normal capabilities exchange, then the commands are not needed.
- Resolution : Yes. Same as in #17

- Issue Number #19 : Need rules to describe that the beacon PHY mode shall not change while in operation. Also, that on handover, the new PNC uses the same PHY mode for the beacon as the old PNC. If so, we may be able to leave PNC Des-Mode as the top criteria for handover.
- Resolution : MMC (a PNC capable device supporting multiple PHYs) would be more desirable to be PNC since it supports SC base rate. But we need a restriction that device being handed over should maintain current transmission mode after handover. For example, current device is SC and candidate device is HSI/AV OFDM capable. After handover, it shall maintain SC base rate.

- Devices between different PHYs can not communicate with each other. Only way to communicate between devices thru either.
  - Same PHY
  - SC base rate





- **Since AV PNC only support AV PHY, it can't talk with SC or MMC**
- **So SC/MMC can't be heard and can't be candidate PNC**
- **Only device supporting AV can be candidate.**

- Suggest Priority order (on the table 55 in P802.15-3c-DF1)
  - 1. PNC desire mode
  - 2. Same transmission mode
  - 3. MMC

- Issue Number #29 : Can we unify the aggregation?
- Resolution : All CoMPA, HSI OFDM, and AV OFDM support aggregation, but there are differences

	CoMPA/HSI OFDM	AV OFDM
Number of sub-frames	Variable Maximal 16	fixed to 7
Position of MCS and sub-frame length	At Subframe header (MAC header extension) part.	At PHY header part
Sequence number and sub-frame ID information	MSDU number and sub-frame ID (or fragment information) placed at each sub-frame header	No such information
Sub-frame type information	Sub-frame information type means whether the sub-frame is MSB/LSB/Combination of MSB/LSB	No such information
ACK & Re-Transmission	ACK is done at MAC layer, each sub-frame can have its own ACK and Re-transmission policy	ACK is done at PHY layer, maximal 7 sub-frames need to be grouped and mapped to 5 ACK bits

- AV OFDM, CoMPA/HSI use quite different PHY technologies which need to be reflected in the PHY header.
- It is difficult to have a unified frame format

- New Issue : When a MMC device turns on, is it up to implementation which mode it starts with? (SC base rate or other)

- Resolution : It is up to implementation. It is OK to let implementation decide which mode to start with.

- New Issue (Editorial): The following text is included in the confirmation and baseline doc. But, frame format is missing.
- “When subframe information in subheader indicates the subframe contains MSB and LSB together, the corresponding subframe shall have two FCSs (MSB FCS and LSB FCS) attached to it. FCS information shall be set to 1 in this case (refer to p.35 in IEEE 802.15-07-0934-01-003c in altanta meeting, also p27 in P802-15-3c-DF1)

- Resolution : Frame format and related text will be provided to Technical editor before March IEEE meeting.

Thanks!