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

Submission Title: [Questions/Comments on AV-OFDM MAC]

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Re: [In response to TG3c Call for Proposals (IEEE P802.15-07-0586-02-003c)]

Abstract: [Questions/Comments on AV-OFDM MAC]

Purpose: [To be considered in TG3C baseline document.]

Summary

- Identify the "need-to-clarify" items in AV-OFDM

Frames format (based on DF2)

- Comments are shown in the page 5

	SC	AV-OFDM
Preamble types	Long preamble	Long omni LRP preamble
	Medium preamble	Short omni LRP preamble
	Short preamble	Directional LRP preamble
		HRP preamble
Header	- PHY header+MAC header+HCS (+Subheader+HCS)	HRP header+MAC header+HCS
		Omni LRP header+MAC header+HCS
		Directional LRP header+No MAC header
		Short LRP header+No MAC header
Payload	MAC frame body	- MAC frame body - Directional LRP payload

Frames of beacon, association and ACK

frames		SC	AV-OFDM
Beacon frame	Preamble type	Long preamble	Omni LRP preamble (short or long?)
	Data rate for header	27.8 Mbps of base header rate (PHY header + MAC header + HCS)	-2.5Mbps of Omni LRP header rate - One of 4LRPs for MAC header + HCS
	Data rate for payload	50.6Mbps of base (common) rate	One of 4LRPs for payload
Association/ Disassociation frame	Preamble type	The same as beacon frame	The same as beacon frame (?)
	Data rate for header		
	Data rate for payload		
Imm-ACK, Dly-ACK, Imp-ACK, Blk-ACK	Preamble, Header, payload	Same rate as the frame that is being ACKed	- ?
Directional ACK	Preamble		- Directional LRP preamble
	Data rate for header		-3.8Mbps of Directional ACK header with no payload - 3.8Mbps of Short LRP header with payload of 5.1Mbps or 10.2Mbps

Comments for AV-OFDM (related to frame) (1/2)

- Comment 1: How to decide which preamble of short or long is used for omni LRP frame ?
  - Which preamble of short or long is used for beacon?

- Comment 2 : How to decide which LRP in 4LRPs is used for omni LRP frame ?

- Comment 3: Is only omni LRP frame used in CAP?
  - If yes,
    - Is only long preamble used in omni LRP frame?
      - If no (short preamble is used in omni LRP frame), how DEV knows the preamble types of long or short?, and which types of frame are used in each long and short preamble ? (e.g., commands, ack, data, etc)
  - If no (HRP frame is used in CAP),
    - How DEV knows the preamble types of LRP (short and long) and HRP?
    - Which types of frame are used in each omni LRP and HRP? (e.g., commands, data, ack, etc)

Comments for AV-OFDM (related to frame) (2/2)

- Comment 4: Is the data rate of association/disassociation frame the same to that of beacon frame?

- Comment 5: What data rates for ACK frames of Imm-ACK, Dly-ACK, Imp-ACK and Blk-ACK are used in CAP and CTAP?

- Comment 6: For omni LRP frame, the data rates of MAC header, HCS and Payload is defined in LRP mode index of LRP header (DF2). Do MAC header, HCS and Payload have the same data rate?

- Comment 7: What data rate is used for HRP header?

Unification of SC/HSI and AV-OFDM aggregation

- The understanding of the AV-OFDM aggregation and retransmission is presented
  - The ACK policy of AV-OFDM is a kind of Dly-ACK combined Blk-ACK, which is different from SC/HSI
    - Directional ACK frame (SC use MAC subheader for Blk-ACK)
    - Use of ACK group to reduce the overhead of every time ACK after receiving aggregated frame
  - Seems like it doesn't support selective repeat due to the lack of information in directional ACK
  - Directional ACK frame doesn't comply with 802.15.3
- To unify SC/HSI and AV-OFDM aggregation and retransmission
  - To be discussed

Right procedure of AV-OFDM retransmission? (1/2)

- ACK group bit setting of MAC extension header (Annex 1)
  - 0 if the subframe is the first subframe in the ACK group
  - 1 if the sbuframe is in the same ACK group with the previous subframe
- ACK group bit setting of directional ACK (Annex 2)
  - 0 if there is error in the corresponding ACK group
  - 1 if all the subframes in the ACK group are correctly received
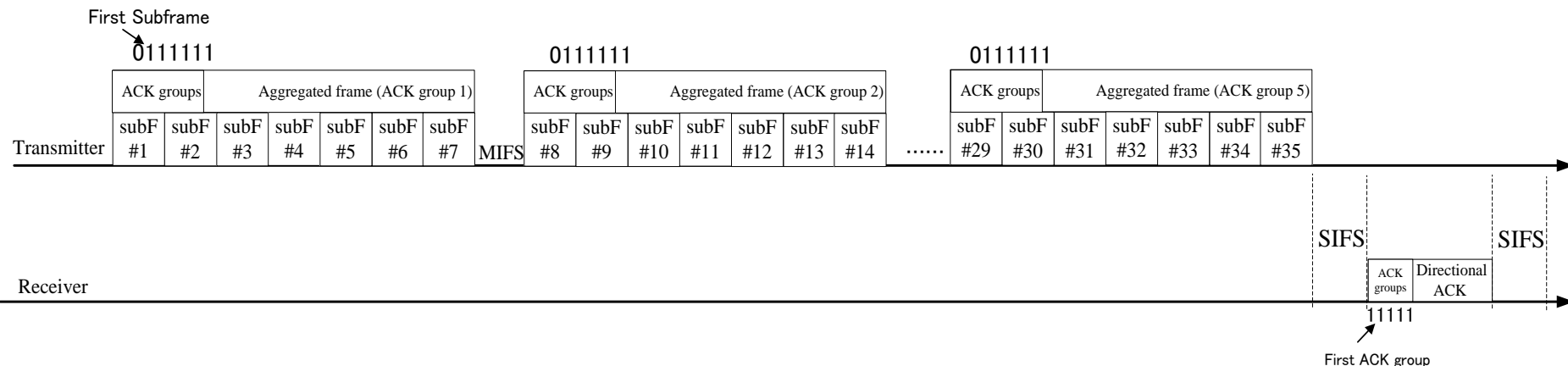
Right procedure of AV-OFDM retransmission? (2/2)

Potential issues and suggested modification

- Selective repeat is not supported due to the lack of information in directional ACK frame
  - Extend directional ACK frame to include indication of individual erroneous subframe
  - Or retransmission is just performed in ACK group level (Imm-ACK) ACK groups in MAC extension header is not needed anymore

Unify SC/HSI and AV_OFDM aggregation

- To be discussed

Annex 1 MAC extension header

HRP MAC header

Octets: 16	24	5	12(5?)	10
Reserved	Video header	Security header	MAC extension header	MAC header

LRP MAC header

Octets: 5	12(5?)	10
Security header	MAC extension header	MAC header

MAC extension header

Bits: 8	4	4	...	4
ACK group (1: same group as previous, 0: new group)	Reserved	Type7	...	Type1

Annex 2 directional ACK

Directional LRPDU frame

(Directional LRP payload)	Directional LRP header	Directional LRP preamble
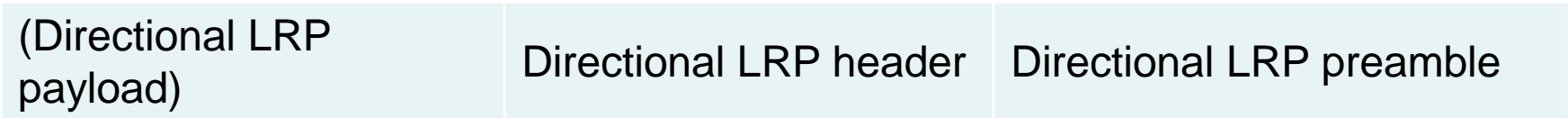
Directional ACK header format (without payload)

Bits: 8	5	1(2?)	1
SCS	ACK group (1: correct, 0: not correct or not existent)	Reserved	0 (w/o payload)

Short LRP header (with payload)

Bits: 8	4	2	1	1
SCS	Length-1	Reserved	Mode (0: LRP2, 1: LRP3)	1 (w/ payload)