MAC Headers Structure for 802.16 MAC

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Base Document:

   This presentation illustrates IEEE 802.16.3c-01/15

Purpose: To figure the proposed changes in MAC header format

MAC Headers Structure for 802.16 MAC

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General MAC Headers Format

	0	1	2	3	4	5	6	7
Constant Part	Type					Length		
	Length-cont.							
	CID							
	CID-cont.							
	HCS							
Data Control	EC	EKS		CSI	CI	FC		PDE
	FSN		Reserved					
CS PDU ID	Retry Number				Sequence Number			
	Sequence Number-cont.							
GM	GM (Short)							
AFB / DA	ARQ Feedback							
	ARQ Feedback							
Last	ARQ Feedback							

Optional, Constant Format

Optional, Constant Format

Optional, Short / Long

Optional, Variable Length
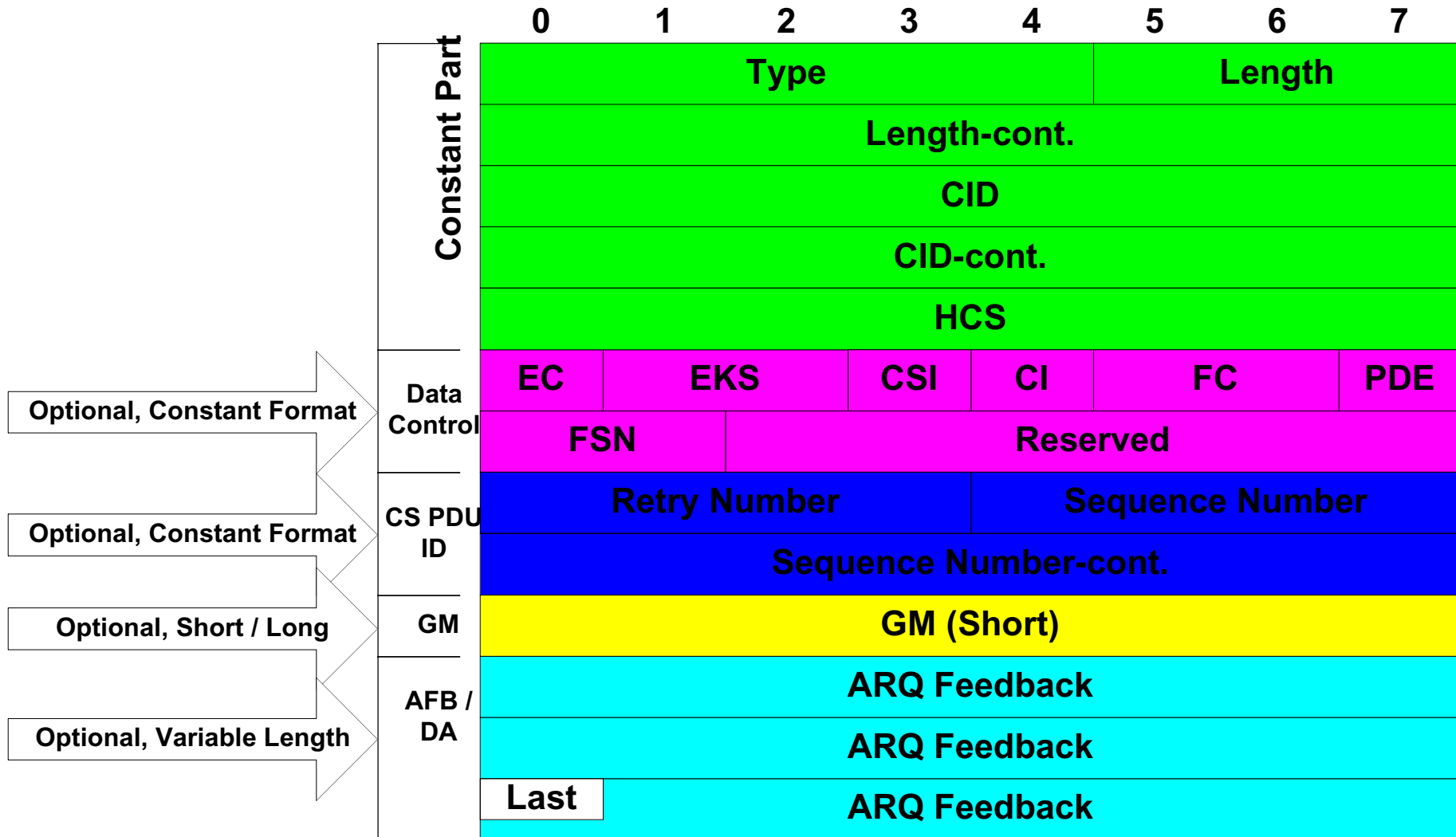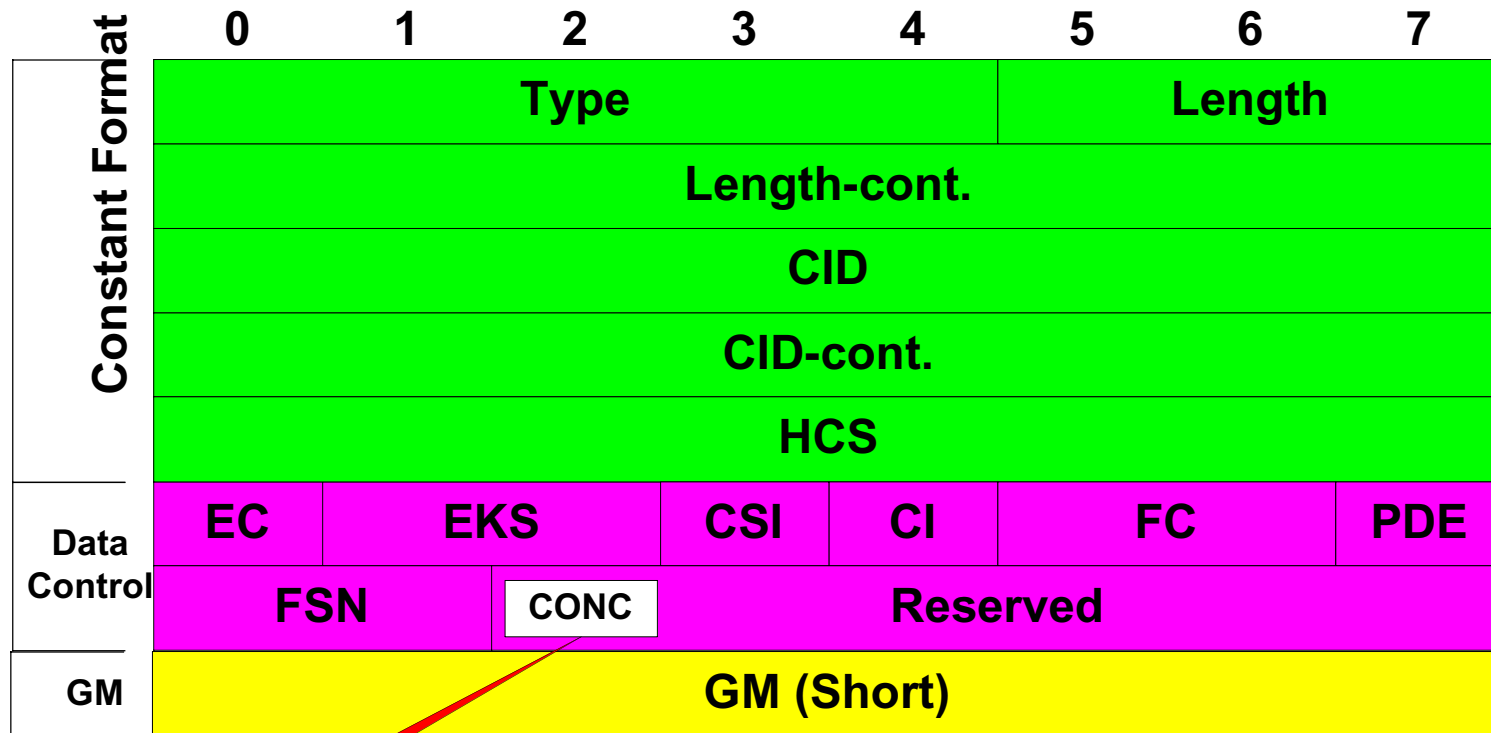
Changes in the Frame Format

¥ Employ Type field

¥ Make presence of certain fields dependent on the Type value

¥ The first part of the header is of constant format, protected by HCS

¥ Optional fields are placed after the HCS

¥ ARQ related records occupy the zone of variable size

UL Data MAC Header = 8 bytes

MAC Header Zones

Zone	Contains the Fields (If not specified, the size of a field the same as in the existing draft)	Fixed / Variable Size
Generic	Type = 5 bits, Length, CID	Fixed
Data Control	EC, EKS, FC, FSN, PDE, CI, CSI	Fixed
CS PDU Identification	CS PDU Sequence Number and Retry Number	Fixed
GM	GM field, like in the existing draft, but with an additional option of the request field enlarged to 16 bits. Two options exist, short = 8 bits (like in [1]) and long = 16 bits	Fixed
AFB (ARQ Feedback)	One or several ARQ Feedback records and/or ARQ Discard Records	Variable

MAC Message Types

¥ Data DL (with the option of piggybacked AFB/DA info)

¥ Data UL (with the option of piggybacked GM and AFB/DA info)

¥ BW Request (with the option of piggybacked AFB/DA info)

¥ Management

Types of Messages

Message function	Type	Data Control	GM Short	GM Long	AFB / DA
Management DL	0	-	-	-	X
Management UL	1	-	-	-	X
Management UL	2	-	-	X	X
Data DL	3	X	-	-	-
Data DL	4	X	-	-	X
Data UL	5	X	-	-	-
Data UL	6	X	-	-	X
Data UL	7	X	X	-	-
Data UL	8	X	X	-	X
Data UL	9	X	-	-	-
Data UL	10	X	-	-	X
Data UL	11	X	-	X	-
Data UL	12	X	-	X	X
BW Request	13	-	-	X	-
BW Request	14	-	-	-	X
Reserved	15-31				

ARQ Feedback / Discard Info

AFB Short Format = 8 bits

Last	Mode	Reserved
1	3	4

AFB Medium Format = 32 bits

CID	Last	Mode	SeqNo
16	1	3	12

AFB Long Format = 48 bits

CID	Last	Mode	SeqNo	Mask
16	1	3	12	16

Discard Info = 32 bits

CID	Last	Mode = 101	SeqNo
16	1	3	12

ARQ Feedback / Discard Info

- ¥ Mode = 0: Acknowledges all MAC messages received from the beginning of the previous frame up to this moment
- ¥ Mode = 1: all messages with the Ser.No. < the given one were successfully received
- ¥ Mode = 2: the Mask provides the ACK bits for the messages from the given Ser.No. to Ser.No. + 15

ARQ Feedback / Discard Info

¥ Mode = 3: the Mask provides the ACK bits for the *fragments* of the message with the given Ser.No.

¥ Mode = 4: same as above + indication that all the sequence numbers < Ser.No. were successfully received.