

## Proposed structure to harmonize the CMI and CSI timing in control channel

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802.16h-06/021: Third Working Group Review: P802.16h Working Document (2006-08-10)

Abstract:

We need to figure out a common frame structure for the CMI and CSI, so that it can be unified as a whole to form a so called control channel.

Purpose:

To consolidate the working document.

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# Proposed structure to harmonize the CMI and CSI timing in control channel

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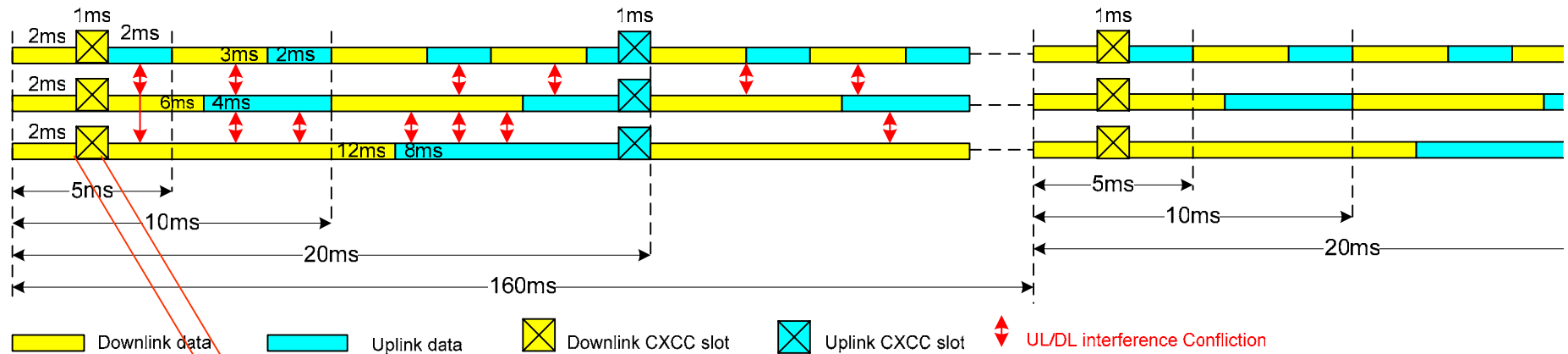
# Outline

- Candidate Scheme\_ Frame Structure
- Conclusion
- Discussion
- CXCC Superframe Scheme



# Candidate Scheme\_ Frame Structure

- Scheme 1: flexible frame duration with:
- 1) flexible CXCC slots
  - 2) 3 kind of frame structure timing for each system
  - 3) but problematic UL/DL interference confliction



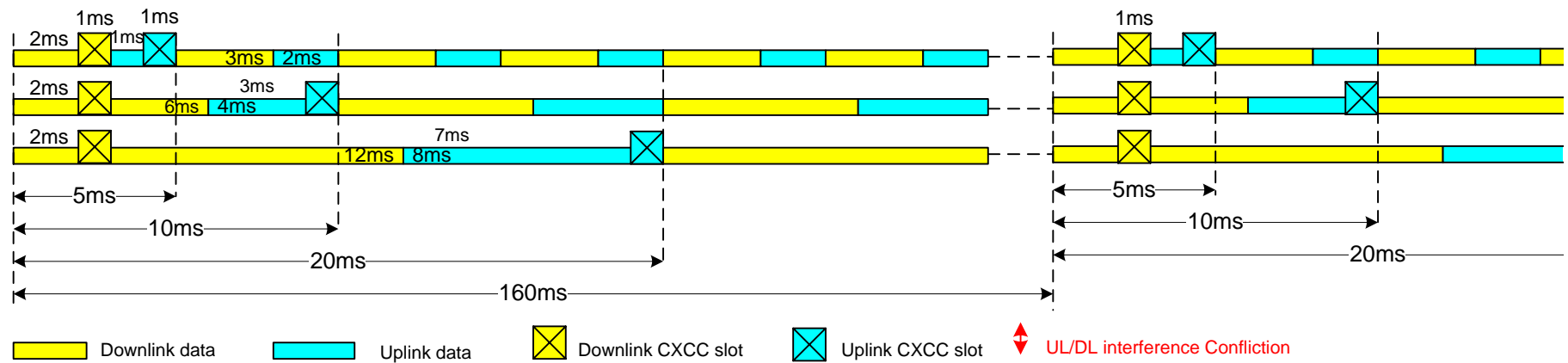
**2 gaps needed!!!**



# Candidate Scheme\_ Frame Structure

Scheme 2: fix frame duration with:

- 1) fix CXCC slots
- 2) 2 kind of frame structure timing for each system
- 3) no UL/DL interference conflict because of synchronization



# Conclusion

## 1) Inter-system UL/DL interference confliction

- Scheme1: If the frame duration is not fixed in some region ,and we use flexible frame duration(eg.5/10/20ms), it will be problematic on inter-system UL/DL interference confliction, even we can figure out flexible CXCC slots timing suitable for each duration.
- Scheme2: If the frame duration is fixed in some region by regulatory, it will have no issue on inter-system UL/DL interference confliction and easy synchronized;

## 2) Number of types of the frame structure

- Scheme1: 3 kinds of frame structure: 1)with UL CXCC slot only, 2)with DL CXCC slot only, and 3)normal frame without CXCC slot
- Scheme2: 2 kinds of frame structures only: 1) with DL and UL CXCC slots; 2) normal frame without any CXCC slot

## 3) Gaps overhead

- Scheme1: 2 additional GAPS needed for each DL slots in case of 10ms /20ms frame duration
- Scheme2: 1 additional GAPS needed for each DL slots in case of 10ms /20ms frame duration

**Preference: Scheme 2**

# Discussion

- Regulatory: Is it a Regulatory issue to limit the frame duration in one region? Anyway, to limit the frame duration into 5/10/20ms is more or less the same with to have only one considering the regulatory limitation. (10ms or one of them chosen by region regulatory entity?) Why not just *limit to only one duration?*
- QOS: CXCC Slots should be *no more than 1ms* so that to allow 50% duration in the frame (*which have the CXCC slots inside*) to carry normal data transfer. (*also see resolution of C80216h-06\_055 PLS*)

# Discussion ☹️

- From minutes for 44# meeting:

*Comment: 1066*

## Discussion on the CTS duration

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Contribution: IEEE C802.16h-06/055

This contribution discussed the CTS duration, regarding QoS and fairness, and consolidated the WirelessMAN-CX mechanisms.

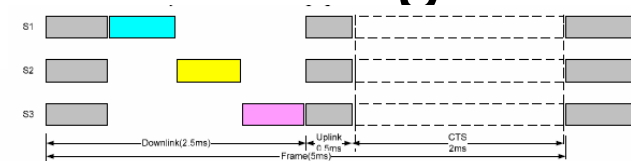
The contribution IEEE C802.16h-06/055 was accepted with no objection.

- From C802.16h-06/055 in 44# meeting:

## Conclusion and further discussion needed:

To lower down the QOS and fairness affection, we may:

- 1) Make the coexistence interval shorter,
- 2) Better to evenly decrease the duration of each subframe within the frames containing coexistence interval.





# CXCC Superframe Scheme

Index for CXCC composition	Function Of Control Channel*	Name& reference **	CXCC Mac frame number ***		
			5ms (Index-1)/2*32	10ms (Index-1)/2*16	20ms (Index-1)/2*8
1	GPS timing recovery DL	CX_CC_GPS_D1 (15.2.1.1)	0	0	0
2	GPS timing recovery UL	CX_CC_GPS_U1 (15.2.1.1)	0	0	0
3	GPS timing recovery DL	CX_CC_Sync_D1 (15.2.1.1)	32	16	8
4	GPS timing recovery UL	CX_CC_Sync_U1 (15.2.1.1)	32	16	8
5-61 (mod4=1)	CSI DL (15 slots)	CX_DCSI [(index-5)/4] (15.3.1.1)****	(Index-1)/2*32	(Index-1)/2*16	(Index-1)/2*8
6-62 (mod4=2)	CSI UL (15 slots)	CX_UCSI [(index-6)/4] (15.3.1.1)****	(Index-2)/2*32	(Index-2)/2*16	(Index-2)/2*8
7	No & Interference (No+Io)	CX_CC_No1	96	48	24
8	AT1	CX_AT1 (15.4.3.2)	96	48	24
11-31 (mod4=3)	CMI DL (6 slots)	CX_DCMI [(index-7)/4] (15.1.4.1)	(Index-1)/2*32	(Index-1)/2*16	(Index-1)/2*8
12-32 (mod4=0)	CMI UL (6 slots)	CX_DCMI [(index-8)/4] (15.1.4.1)	(Index-2)/2*32	(Index-2)/2*16	(Index-2)/2*8
35	No & Interference (No+Io)	CX_CC_No2	544	272	136
36	AT2	CX_AT2 (15.4.3.2)	544	272	136
39-64 (mod4=3) 9/27/2006	Reserved (14 slots)	Reserved C802.16h-06/085r1	(Index-2)/2*32	(Index-2)/2*16	(Index-2)/2*8 9

# Notice

**\*Control Channel duration  $T_{cc\_s}$  is 1 ms (C80216h-06\_055 )**

**\*\* CXCC Mac frame number start counting at 0 at absolute time 0030:000 sec and repeats every  $T_{cogn}$ .**

**\*\*\*  $T_{cogn}$  =5.12 seconds, with MAX CXCC MAC frame number equaling respectively 1024, 512 and 256 for Frame durations of 5,10,and 20 msec.**

**\*\*\*\* the CSI scheduling in 15.3.1.1 should change the first ICSI to be GPS usage**

# Discussion

