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Title	**Macro IEs in MAP messages for 802.16 OFDM**
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Re:	Supporting document for Letter Ballot #13a
Abstract	The document suggests macro definitions for MAP messages
Purpose	The document is intended for consideration within comments resolution process
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Macro IEs in MAP messages for 802.16 OFDM

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1. <u>Rationale</u>

UL map size depends on amount of UL bursts scheduled. UL map element is 6 bytes; the efficiency depends on average UL payload size and its data rate. For 40 byte payload transmitted at QAM16, R= ½ (equivalent to 35 bytes at QPSK R= ½) the UL map element size is 15% of the payload size. Such small packets are common for transferring e.g. VoIP payloads of or payloads of legacy voice. This overhead appears in DL Subframe (where UL-MAP is transmitted), but indirectly it is propagated also to UL because all SSs have to listen to the (whole) burst #1 that contains DL-MAP and UL-MAP and only then they can switch to Tx.

As voice payloads from the SS appear with certain periodicity (each air frame or each two frames), the overhead may be significantly decreased by using a single "macro" IE that provides UL allocations to many SSs.

2. <u>Specific Changes in 802.16-REVd/D2-2003</u>

[Insert before 8.3.5.2.6]
8.3.5.2.6. DL-MAP Macro IEs
The DL Macro Start/End Information Elements indicate correspondingly start (Extended UIUC = 3) or end (Extended UIUC = 4) of sequence of IEs. If the sequence contains CIDs associated with an SS, the SS shall respond, as usual, to that allocation and store the whole sequence together with Group CID and Change_Count value. Then the SS associates itself with the group.

Table NNN – DL Macro Start/End IE Format

Syntax	Size	Notes
DL_Macro_ IE() {		
Extended DIUC	4 bits	Macro start (= 4) or end (= 5)
Length	4 bits	= 3
CID	16 bits	Group CID value allocated by the BS to identify the macro
Change_Count	8 bits	The counter should be increased each time when an essentially new macro is associated with the CID value
}		

If then an SS receives DL-MAP IE with Group CID it is associated with, then it shall compare Change_Count value with the stored one to determine whether the macro definition it up to date. If yes, the SS considers the DL-MAP IE as a macro invocation meaning that before interpretation, the DL-MAP IE shall be replaced with the stored macro definition with additional time offset specified by Start Time field in the DL-MAP IE.

[Insert before 8.3.5.3.8]
8.3.5.3.8. UL-MAP Macro IEs
The UL Macro Start/End Information Elements indicate correspondingly start (Extended UIUC = 4) or end (Extended UIUC = 5) of sequence of IEs. If the sequence contains CIDs associated with an SS, the SS shall respond, as usual, to that allocation and store the whole sequence together with Group CID and Change_Count value. Then the SS associates itself with the group.

Table NNN – UL Macro Start/End IE Format

Syntax	Size	Notes
UL_Macro_ IE() {		
Extended UIUC	4 bits	Macro start (= 4) or end (= 5)
Length	4 bits	= 3
CID	16 bits	Group CID value allocated by the BS to identify the macro
Change_Count	8 bits	The counter should be increased each time when an essentially new macro is associated with the CID value
}		

If then an SS receives UL-MAP IE with Group CID it is associated with, then it shall compare Change_Count value with the stored one to determine whether the macro definition it up to date. If yes, the SS considers the UL-MAP IE as a macro invocation meaning that before interpretation, the UL-MAP IE shall be replaced with the stored macro definition with additional time offset specified by Start Time field in the UL-MAP IE.

3. **References**

[1] IEEE P802.16-REVd/D2-2003 Draft IEEE Standard for local and metropolitan area networks Part 16: Air Interface for Fixed Broadband Wireless Access Systems