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Re:	IEEE 802.16j- 07/043:"IEEE 802.16 Working Group Letter Ballet #28"

Abstract	The document contains technical proposals for IEEE P802.16j that provides TLV for simultaneous reception and transmission support

Purpose	Text proposal for C802 16j-D1 (August 2007),"Draft Standard for Local and Metropolitan Area Networks

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Direct MAP Relay Support for centralized scheduling

1. Introduction.

  The RSs with centralized scheduling such as virtual group has been introduced to support to share preamble, FCH and MAP. When the virtual RS group includes MR-BS, each member RS of the group shall either transmit the same preamble, FCH and MAP as the MR-BS or they all do not transmit any preamble, FCH or MAP. When the virtual RS group doesn't include MR-BS, one of the RSs in virtual group is non-transparent RS and all the others shall either transmit the preamble, FCH and MAP of the said non-transparent RS or they all do not transmit preamble, FCH and MAP. If a member RS of group wants to transmit preamble, FCH and MAP, those information should be received in relay zone of previous frame. This causes a little overhead in radio resource in relay zone of previous frame. In this contribution, we propose a method to reduce the overhead by relaying FCH and MAP to subordinate terminals directly

2. Direct MAP Relay

  Direct MAP Relay function works like a repeater for MAP period.
  There are many types of IEs in MAP. Some are about burst allocation and others are about control. When RS relay full MAP through relay zone, all those information is delivered to subordinate RS. This scheme is shown in Figure 1.
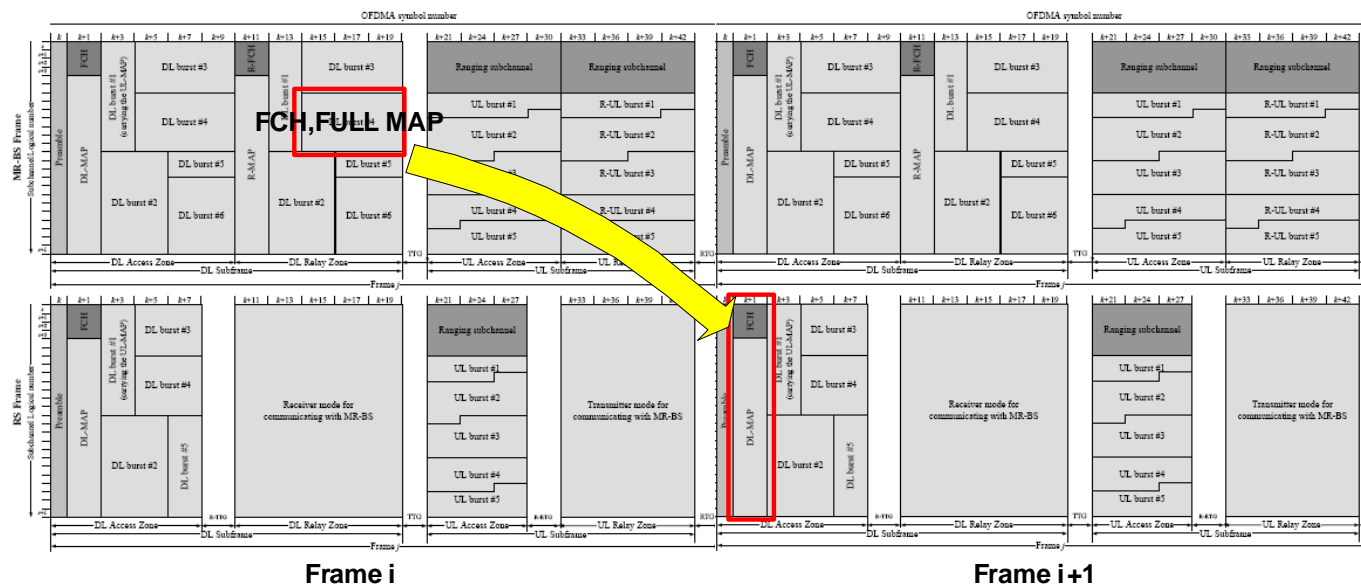

Figure 1 Example of FCH, MAP relaying without Direct Relaying

  But RS doesn't need all the information in MAP to function properly. Some information is necessary only for MS. Some information may not necessary for RS. For those information, RS just need to deliver them to subordinate terminal. With Direct Relaying, RS may receive only necessary MAP data. Because member RS repeats the whole FCH and MAP from MR-BS or super-ordinate RS with Direct Relaying function, subordinate terminal can receive the original FCH and MAP. Thus we can save some radio resource which could be allocated to relay some MAP information unnecessary for RS without Direct MAP Relay function. This scheme is shown in Figure 2.
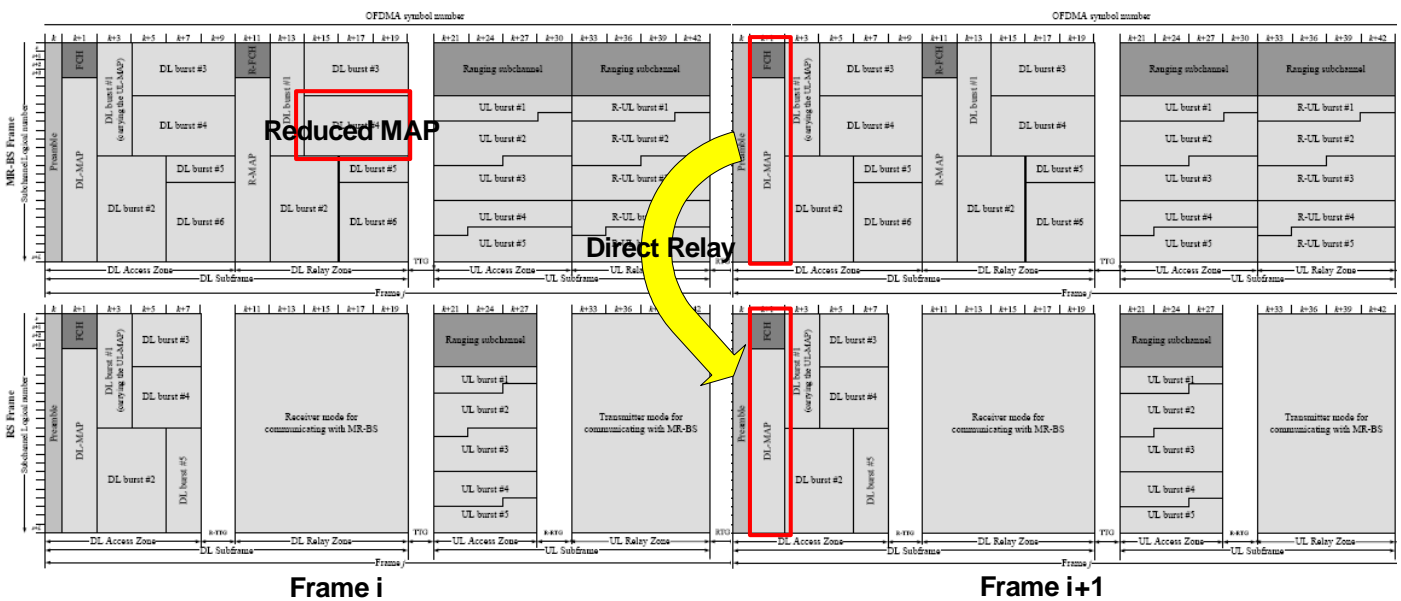
Figure 2 Example of FCH, MAP relaying with Direct Relaying

3. Proposed Text change.

Insert followings at the end of section 6.3.2.3.23

Direct MAP Relay
 - This parameter is sent by RS to indicate its capability of Direct MAP Relay .

 In Direct MAP Relay, RS performs amplify-and-forward during MAP period. While RS is repeating FCH and MAP, RS may receive the MAP. If MAP does not occupy all the subchannels in a symbol pair, rest subchannels shall not be allocated to RS.

Add followings after the third characteristics in 6.3.9.16.3.1

 If a RS member of virtual group is to transmit preamble, FCH and MAP, in Direct MAP Relay , only burst allocation information of MAP shall be received in previous frame and other IEs are relayed directly by RS.

Insert the followings at section 11.8.3.7.xx

This field indicates the availability of RS for Direct MAP Relay

Type	Length	Value	Scope
TBA	1	Bit #0: Direct MAP Relay support Bit #1-7 : reserved	SBC-REQ SBC-RSP

 During the network entry process, RS sends SBC-REQ with Direct MAP Relay support capability(set bit #0 to 1, if capable) to MR-BS or super-ordinate RS and MR-BS or super-ordinate RS responds with SBC-RSP to notify whether to use Direct MAP Relay function or not.

Change Table 496c of section 8.4.5.9.1 as indicated:

Table 496c-R-link specific IE format

Extended DIUC (hexadecimal)	Usage
00	RS_UL_DCH assignment IE
01	Map_End_Location_IE
0x0~~1~~2-1F	*Reserved*

Insert section 8.4.5.3.29 as indicated:

8.4.5.9.2 Map_End_Location_IE

This IE is issued by the MR-BS or super-ordinate RS to member RS for Direct Relay of MAP. To relay them directly, RS should know the end point of MAP in unit of OFDMA symbol

Table xxx – Map End Location IE

Syntax	Size (bits)	Notes
Map_End_Location_IE(){		
Type	5 bits	Map_End_Location_IE=01
Length	4 bits	Length = 0x2
Map End Indication	8 bits	This field indicates the last OFDMA symbol index of MAP of next frame
Reserved	8bits	Shall be set to zero
}		