A proposal for synchronous MBS transmission in MR

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Venue:

IEEE 802.16 Session #46, Dallas, Texas, USA

Base Document:

C802.16j-06/129r3

Purpose:

Discuss and adopt proposed text and message format

A Proposal for Synchronous MBS in MR

1. Problem Description

-- Transmission of broadcast data from MR-BS and RS should be synchronized

 ** Specified in IEEE802.16e 6.3.23.2.2

-- Processing delay in RS may impact the synchronous MBS

MR-BS   (2-1)Wait

(1)MBS Pre-transmission

(3)MBS transmission
(synchronized)

MS1

(3)

RS   (2-2)Relay
processing

MS2
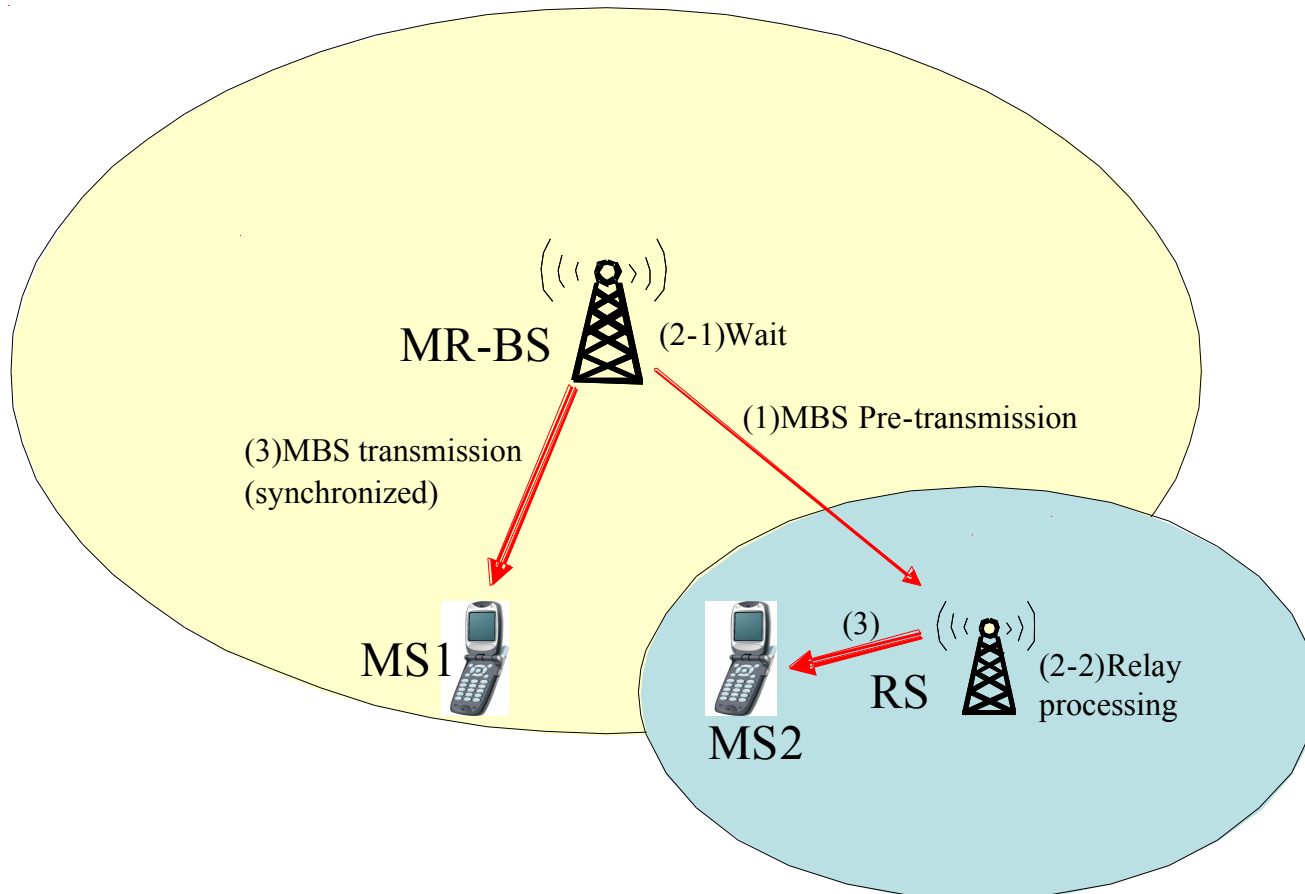
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2. Proposed Method

-- Assume that frame synchronization among MR-BS and RS is established in a same MBS zone

-- MR-BS needs to know the RS delay D_R. The value of D_R will be given to the MR-BS as a capability parameter of SBC-REQ message

-- Then, MR-BS sends MBS data to RS as pre-transmission earlier than normal MBS transmission time. For this pre-transmission, MR-BS use a multicast connection corresponded to RS multicast CID over the R-DL

-- At last, after D_R frames, MR-BS also send same MBS data. At the same time, RS sends MBS data over access link synchronously. For these transmissions, MR-BS and RS use broadcast connection for MBS over the access link.

| MS2 | RS | MS1 | MR-BS |

(1)MBS Traffic (pre-transmission)

(3)MBS Traffic   (2-1)Relay D_R (3)MBS Traffic
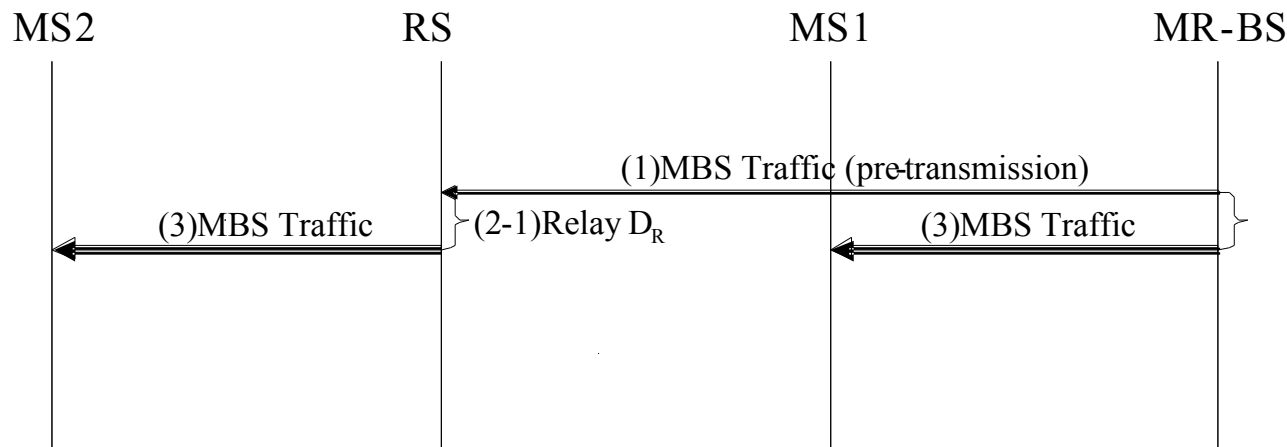
D_R : Relay processing delay of RS

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3. Benefits
- MBS data which is received at MS under MR-BS or RS is synchronized exactly
- Support MS roaming
  ** If MS moves between MR-BS and RS, MS can receive MBS data without

any discontinuance.

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4. Other Consideration

- Multiple RSs with different delay

   ** MR-BS examines the maximum delay, D_M, of all RS

   ** MR-BS will inform this maximum delay to all RS by SBC-RSP message

   ** MR-BS broadcasts the MBS data earlier by D_M.

   ** All RSs relay the MBS with this maximum delay.

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Specific text changes

6.3.23.2.2 Performance enhancement with macro diversity

Insert the following text at the end of 6.3.23.2.2:

For MR, MBS transmission in a group of MR-BS and RS shall also be synchronized. The RS delay, D_R, is given to MR-BS as a capability parameter of SBC-REQ message. MR-BS sends MBS data over the R-DL as a pre-transmission D_R frame earlier than normal MBS transmission time. MR-BS may wait for D_R frames, and then send MBS data again over the access link.

If multiple RSs with different delay performance existing, MR-BS shall firstly examine the maximum delay of RSs, which is D_M, and notify it to all RSs by SBC-RSP message. MR-BS sends MBS data over the R-DL as a pre-transmission D_M frame earlier than the normal MBS transmission over access link. MR-BS may wait for D_R frames, and then send MBS data again over the access link. All RSs shall use D_M as the delay to transmit MBS data over access link. If the MR-BS detects that the delay of a RS is greater than the examined maximum delay, it shall update the current maximum RS delay parameter by this greater value. Also, MR-BS needs to send an unsolicited SBC-RSP message to all RSs to notify the change of the maximum RS delay.

Insert new subclause 11.8.3.7:

11.8.3.7.X Maximum RS Downlink Delay for MBS Zone

Type	Length	Value	Scope
TBA	1	Maximum RS Downlink Delay for MBS Zone (unit: frame)	SBC-RSP