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Source(s)	Hyunjeong Kang, Sungjin Lee, Hyoung Kyu Lim, Jungje Son Samsung Electronics	[mail to: hyunjeong.kang@samsung.com]
	Rakesh Taori Samsung Advanced Institute of Technology	[mail to: rakesh.taori@samsung.com]

Re:	Call for technical proposals regarding IEEE project P802.16j
Abstract	This contribution proposes the scheme with which RS supports MS scanning operation.
Purpose	Discussion and Adoption in IEEE 802.16j
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MS scanning in MR network

Hyunjeong Kang, Sungjin Lee, Hyoung Kyu Lim and Jungje Son
Samsung Electronics

Rakesh Taori
Samsung Advanced Institute of Technology

Introduction

In MR network it is needed to define an operation with which a relay station supports MS scanning.

As described in section 6.3.22.1.2 of 802.16e-2005, a serving MR-BS allocates scanning intervals to an MS and scanning negotiation messages are transmitted between the MR-BS and the MS. An access RS relays the scanning negotiation signals of the MS and the serving MR-BS.

Assuming that RS has a capability to schedule MS data transmission, the RS needs to be informed of MS scanning and take MS scanning intervals into account scheduling of MS data transmission. In this case, a serving MR-BS may inform an access RS of MS scanning intervals so that the access RS schedules MS data transmission. In addition, when MS repeats its scanning process with the number of scanning interval and interleaving interval as in figure 1 and the access RS knows the information of each intervals, the RS schedules to transmit MS data during interleaving intervals using the information.

If the access RS does not receive the indication of MS scanning mode, the access RS may transmit MS data to an MS in scanning mode. To keep consistency in MS status among MR-BS, RS and MS, upon receiving indication of MS scanning intervals from the serving MR-BS, the access RS sends its response to the indication.

When an MS terminates any of scanning interval by sending a MAC PDU, the access RS assumes that the MS is no longer in scanning mode based on MAC PDU from the MS. But if the MS sends MOB_SCN-REQ or the serving MR-BS sends MOB_SCN-RSP to terminate the group of scanning intervals, the access RS does not know the termination of group of intervals. So the serving MR-BS shall notify the access RS of the termination of group of intervals using MS_SCN-CLT message.

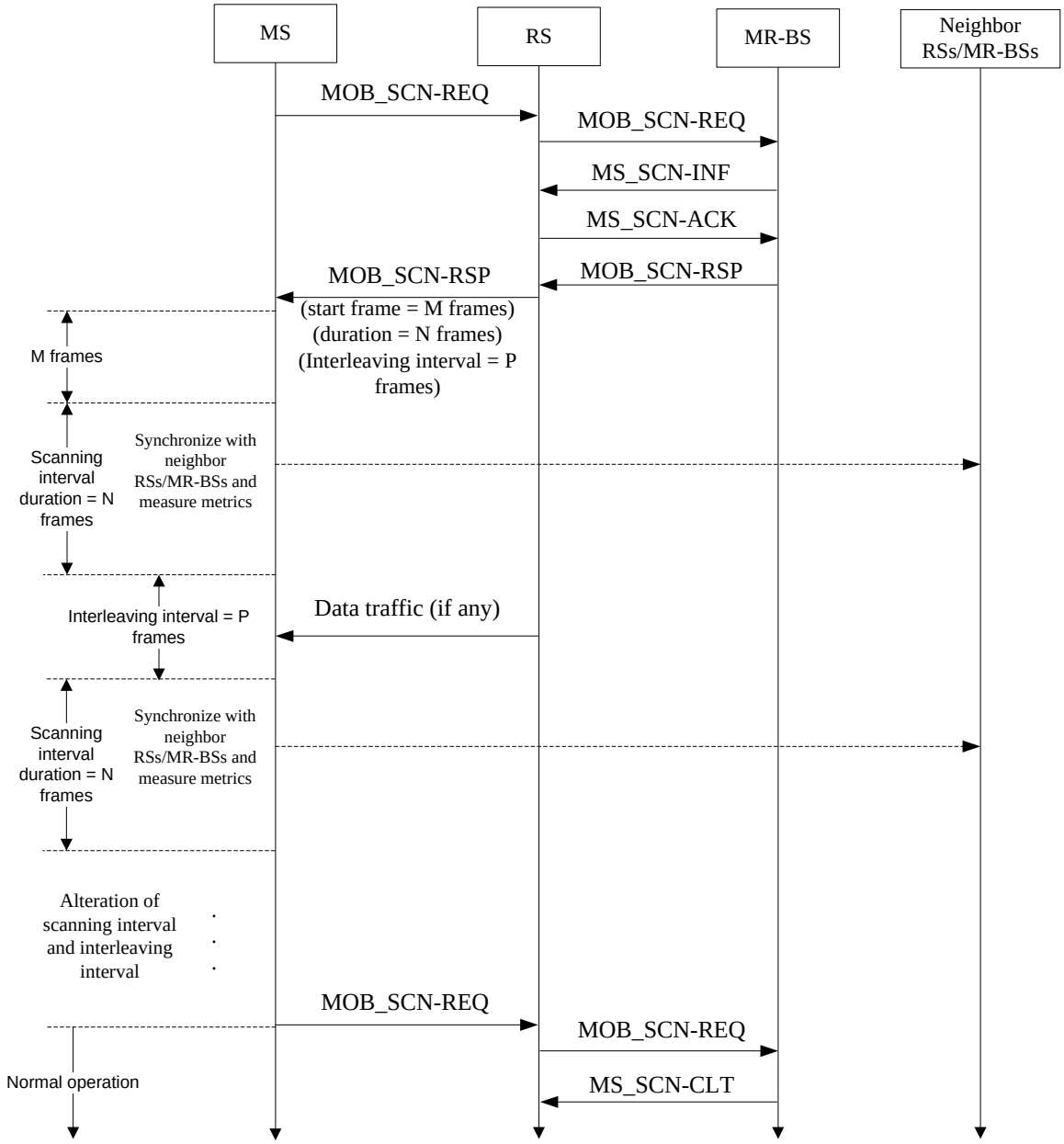

Figure 1 Example of periodic scanning by MS request in distributed scheduling case

Proposed Text Change

[Insert the followings at the end of section 6.3.22.1.2:]

In MR network MR-BS shall control MS scanning. An access RS relays MOB_SCN-REQ, MOB_SCN-RSP and MOB_SCN-REP messages between an MS and the MR-BS in centralized scheduling or distributed scheduling.

In the case of distributed scheduling, the MR-BS sends MS_SCN-INF message to inform the access RS of MS scanning related information after the MR-BS determines the scanning intervals of MS. The access RS

transmits MS_SCN-ACK message as an acknowledgement of MS_SCN-INF. Based on MS_SCN-INF message, the access RS schedules MS data transmission. The MR-BS shall transmit MS_SCN-CLT message to inform an access RS that the group of intervals of MS is terminated. The access RS shall assume that the MS is no longer in scanning mode when the access RS receives MS_SCN-CLT message or a MAC PDU of MS.

[Insert new subclause 6.3.2.3.xx after section 6.3.2.3.64:]

6.3.2.3.xx MS Scanning Inform (MS_SCN-INF) message

A MS_SCN-INF message may be transmitted by an MR-BS to inform an access RS of MS scanning operation. An MR-BS includes the information of scanning intervals of MS(s) in a MS_SCN-INF message.
An MR-BS shall generate MS_SCN-INF messages in the format shown in Table x.

Table x – MS_SCN-INF message format

Syntax	Size	Notes
MS_SCN-INF_Message_format() {	-	
Management Message Type=TBD	8 bits	-
Transaction ID	8 bits	-
N_MS	8 bits	Number of MSs
For(i=0; i<N_MS; i++) {		
MS CID	16 bits	Basic CID of MS
Start frame	4 bits	Measured from the frame in which this message was received. A value of zero means that first scanning interval starts in the next frame.
Scan duration	8 bits	Duration (in units of frames) where the MS may perform scanning.
Interleaving interval	8 bits	Duration in frames. The period interleaved between scanning intervals when MS shall perform normal operation.
Scan iteration	8 bits	The number of iterating scanning interval.

Padding	4 bits	Shall be set to zero
}		
}		

[Insert new subclause 6.3.2.3.yy after section 6.3.2.3.64:]

6.3.2.3.yy MS Scanning Acknowledgement (MS_SCN-ACK) message

An RS sends MS_SCN-ACK as a response of MS_SCN-INF message to an MR-BS.
An RS shall generate MS_SCN-ACK messages in the format shown in Table y.

Table y – MS_SCN-ACK message format

Syntax	Size	Notes
MS_SCN-ACK_Message_format() {	-	
Management Message Type=TBD	8 bits	-
Transaction ID	8 bits	Transaction ID in corresponding MS_SCN-INF message
}		

[Insert new subclause 6.3.2.3.zz after section 6.3.2.3.64:]

6.3.2.3.zz MS Scanning Completion (MS_SCN-CLT) message

A MS_SCN-CLT message may be transmitted by an MR-BS to inform an access RS that the group of intervals of MS is terminated.
An MR-BS shall generate MS_SCN-CLT messages in the format shown in Table z.

Table z – MS_SCN-CLT message format

Syntax	Size	Notes
MS_SCN-CLT_Message_format() {	-	
Management Message Type=TBD	8 bits	-
N_MS	8 bits	Number of MSs

For(i=0; i<N_MS; i++) {		
MS CID	16 bits	Basic CID of MS
}		
}		