Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Optimization for the MOB-SCN-RSP message**
Date Submitted	***2004-11-15***

Source(s)		
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Re:	*This is a response to a Call for contribution about IEEE802.16e-D5*
Abstract	*This document contains suggestion to optimize the MOB-SCN-RSP message.*
Purpose	This document is submitted for review by 802.16e Working Group members
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Optimization for the MOB-SCN-RSP message

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1. Background

In the current draft IEEE802.16e-D5, the BS should send the MOB_SCN-RSP message with setting parameters to all zeros when it wants to deny scan request of the MSS. In that case, the BS should include all parameters (e.g. Scan Duration, Start Frame, Interleaving interval, etc) in the MOB_SCN-RSP message.

With Scan Duration to indicate the approval for the scan request, the BS can shorten the MOB_SCN-RSP message and reduce 5 bytes for it in the case of the disapproval for the MSS's scan request.

The revised contribution R2 is written based on the harmonized contribution about Association already accepted at the last session but not reflected at D5.

2. Proposed Remedy

Remedy 1.

[In 6.3.2.3.49 Scanning Interval Allocation Response (MOB-SCN-RSP) message, modify Table106h as]:

Table 106h—MOB_SCN-RSP Message Format

Syntax	Size	Notes
MOB-SCN-RSP_Message_Format() {		
Management Message Type = 51	8 bits	
Scan Duration	8 bits	in frames
if(Scan Duration==0) {		
HMAC Tuple	21 bytes	See 11.1.2
}		
else {		
Start Frame	4 bits	
Scan_type	1 bit	[0] Scanning [1] Association
Reserved	~~7~~ 3 bits	Shall be set to zero.
If (Scan type=0){		
Interleaving interval	8 bits	Duration in frames
Scan iteration	8 bits	
Report mode	2 bits	0b00 : no report 0b01 : periodic report 0b10 : event triggered report

		0b11 : reserved
Reserved	~~2~~6 bits	Shall be set to zero.
Scan report period	8 bits	Available only when the value of Report mode is set to 0b01. Scan report period in frames
}		
else {		
For(j=0; j<N_Recommended_BS; j++) {		N_Recommended_BS can be derived from the length field in the MAC header of the message
Association Test BS ID	48 bits	BS IDs of Available BS for Association
}		
}		
HMAC Tuple	21 bytes	See 11.1.2
}		
}		

Remedy 2.

[In 6.3.20.1.2 MSS Scanning of neighbor BS, replace entire section with]:

6.3.20.1.2 MSS Scanning of Available BS

A BS may allocate time intervals to MSS for the purpose of MSS seeking and monitoring Available BS suitability as targets for HO. The time during which the SS scans for Available BS will be referred to as a Scanning Interval.

An MSS may request an allocation of a Scanning Interval using the MOB-SCN-REQ MAC Management message. The MSS indicates in this message the estimated duration of time it requires for the scan.

The MSS or BS may request group of Scanning Intervals with Interleaving intervals of Normal Operation be allocated through a single exchange of MOB-SCN-REQ/RSP management messages for the purpose of reducing the number of MOB-SCN-REQ and MOB-SCN-RSP messages required to create multiple scanning opportunities when frequent scanning is required. Scanning Interval and Interleaving interval repeat with the number of Scan iteration.

In the MOB-SCN-REQ MAC management message the MSS, and in the MOB-SCN-RSP MAC management message the BS shall indicate either Scanning, Scan type = 0, or Association, Scan type = 1, as the intended MSS activity during the Scanning Interval. If Scan type = 1, Association, then the MSS and BS may include, in their respective messages, one or more Association Test BS ID. The BS may send over the backbone to the Association Test BS request to allocate non-contention based ranging opportunity, at the appropriate timing interval, for MSS to conduct Association ranging with the Association Test BS. When conducting initial ranging to Association Test BS, MSS shall use allocated non-contention based initial ranging opportunity, if available. Regardless of value of Scan type and the presence of one or more Association Test BS ID, MSS may determine and perform any scanning or ranging or Association activities during Scanning Interval at its own discretion.

Upon reception of the MOB-SCN-REQ message, the Serving BS shall respond with a MOB-SCN-RSP MAC Management message. The Serving BS may also send MOB-SCN-RSP MAC management message unsolicited. The MOB-SCN-RSP MAC Management message shall either grant the requesting MSS a Scanning Interval that is at least as long as requested by that MSS, or deny the request. A value of zero for Duration in MOB-SCN-RSP shall indicate the request for an allocation of Scanning Interval is denied, and the BS may omit scan parameters

(e.g. Start frame, Scan type, Interleaving interval, etc) except Scan Duration in the MOB-SCN-RSP MAC Management message.

Following reception of a MOB-SCN-RSP MAC Management message granting the request, beginning at Start frame an MSS shall scan for one or more BS during the time interval allocated in the message. When Available BS are identified through scanning, the MSS may attempt to synchronize with their downlink transmissions, and estimate the quality of the PHY channel. MSS may also perform contention, or non-contention if available, based initial ranging during the Scanning Interval to one or more Available BS to more completely evaluate PHY channel characteristics with Available BS, obtain Service Level Predictions for MSS Service Flows, and assess for Association.

The Serving BS may buffer incoming data addressed to the MSS during the Scanning Interval and transmit that data after the Scanning Interval during any Interleaving interval or after exit of the Scanning Mode and resumption of Normal Operation.

An MSS may terminate scanning and return to Normal Operation anytime by sending a PDU to the Serving BS during any Scanning Interval. If a Serving BS receives a PDU during any Scanning Interval from an MSS that is supposed to be in Scanning Mode, the BS shall assume that the MSS is no longer in Scanning Mode. Any UL message from the MSS to the Serving BS during a Scanning Interval shall interrupt the Scanning Interval, and shall signal the Serving BS that the MSS is still active and has not dropped the connection during the Scanning Interval. The group of intervals is terminated at any time if the MSS sends MOB-SCN-REQ message or Serving BS sends MOB-SCN-RSP message during any Interleaving interval with ~~parameters (Scan duration, Interleaving interval, and Scan iteration) set to all zeros~~ Scan Duration set to zero.