Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Scan Report Operation**
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Re:	This contribution is for call for contribution IEEEP802.16e/D2-2004

Abstract	This contribution proposes the reporting operation of scan result for the handover process.

Purpose	Propose scan result reporting opeartion for the IEEE802.16e Handoff Ad hoc group

Scan Report Operation

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Introduction

Except CINR field in MOB-MSSHO-REQ, there is no mechanism that informs the MSS's scanning operation results. With using only handover mechanism in current draft document, the Serving BS cannot know the exact status of neighbor BSs such as signal power for the MSS and recommend the best neighbor BS in case of BS initiated handover.

Therefore it is necessary to provide mechanisms to report neighbor BSs' CINR status, and if the Serving BS knows the received CINR of neighbor BS by transmitted by the MSS, the BS can find the proper Target BS for BS initiated handover.

For the purpose, we propose the mechanism for reporting the scanning results to the Serving BS.
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Proposed Mechanism

For efficient handover and MSS operation, we propose the following reporting mechanisms for the BS initiated handover case.

- ■ Periodic report
- ■ Event triggering report

1) Periodic report

With this periodic report mechanism, a MSS scans CINR of neighbor BSs and periodically reports the scanning results to its Serving BS based on the MAHO report period defined in MOB-NBR-ADV. The Serving BS, through this report mechanism, can know the status of neighbor BSs and indicate the suitable neighbor BS to the MSS when the Serving BS initiates handover operation.

Figure 1 shows the example of scan report message using periodic reporting mechanism.
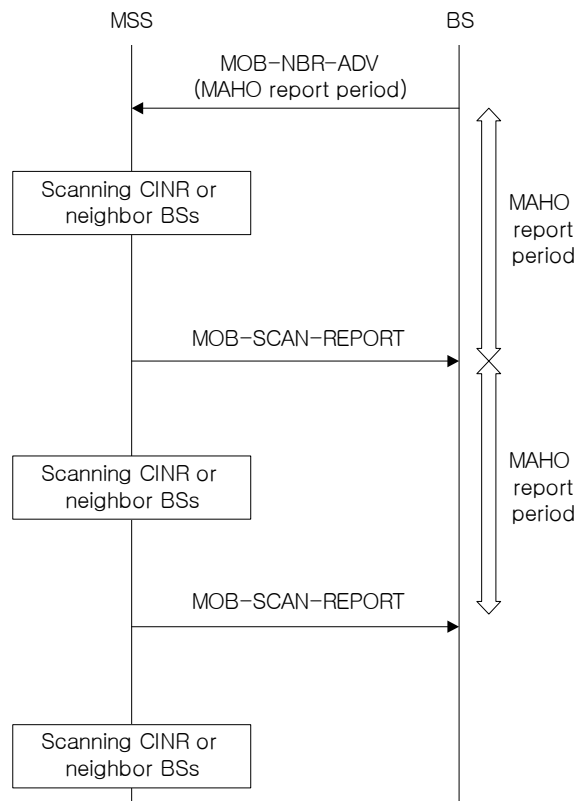
Figure 1 Example of scan report message using periodic report mechanism

2) Event triggering report
In this event triggering report mechanism, a MSS reports the scanning results when the specific event is triggered. The event can be something that the rank of received CINR of neighbor BSs is changed while the CINR of the Serving BS still remains the highest value. Similar to the periodic report mechanism, with this scanning report, the Serving BS can know the ranking changes of received CINR of neighbor BSs.
The figure 2 shows the example of scan report message using event triggering mechanism.

Figure 2 Example of scan report message using event triggering mechanism

Therefore we propose the remedies as followings:

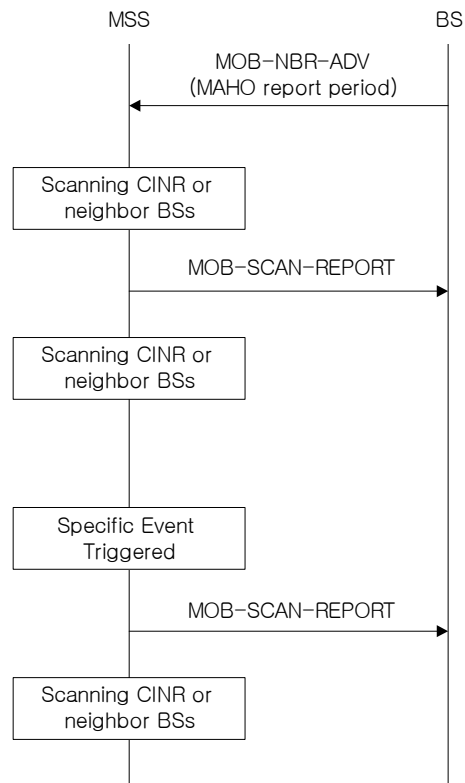- Add "the operation that the MSS reports scanning results to the Serving BS by sending MOB-SCAN-REPORT message" to section 6.3.20.1.2, page 41
- Add a new section "Scanning Result Report (MOB-SCAN-REPORT) message' after section 6.3.2.3.52 page 22
    - MOB-SCAN-REPORT message

Proposed Text Changes

We propose the following remedies in IEEE P802.16e/D2 to provide the scan result reporting mechanism.

[Insert this section after the section 6.3.2.3.52 in page 22]

6.3.2.3.xx Scanning Result Report (MOB-SCAN-REPORT) message
The MSS transmits a MOB-SCAN-REPORT message to report the result of the scan operation to its Serving BS. The message includes the scanning result same as CINR of neighbor BS.

Table XXX – MOB-SCAN-REPORT Message Format

Syntax	Size	Notes
MOB-SCAN-REPORT_Message_Format(){		
Management Message Type = ??	8bits	
Report Mode	2bits	00: Periodic 01: Event-triggering 10-11: reserved
N_NEIGHBORS	8bits	
For(j=0; j<N_NEIGHBORS; j++){		
Neighbor BS-ID	48bits	
BS CINR mean	8bits	
}		
}		

A MSS shall generate MOB-SCAN-REPORT messages in the format shown in Table XXX. The following parameters shall be included in the MOB-SCAN-REPORT message,

Report Mode
        This parameter indicates the report mode:
           Periodic – the MSS reports the scan result to the Serving BS periodically
           Event-triggering – the MSS reports the scan result in the case that specific event has been triggered

For each neighbor BS, the following parameter shall be included:

Neighbor BS-ID
        Same as the Base Station ID parameter in the DL-MAP message of neighbor BS.

BS CINR mean
        This parameter indicates the signal to noise and interference ratio measured by the MSS from the particular BS. The value shall be interpreted as an unsigned byte with units of 0.25dB.

[Add the followings after line 61 page 41]

After scanning for neighbor BSs using the allocated scanning interval, the MSS shall report the scanning result to the Serving BS through MOB-SCAN-REPORT message periodically based on MAHO report period in MOB-NBR-ADV. Addition to the periodic report, the MSS may report the scanning result in case of a specific event such that the rank of the received CINR of neighbor BSs is changed. This scanning report may assist Serving BS to recommend suitable BSs for BS initiated handover operation.