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| Title | **Scan Report Operation** |
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| Re: | This contribution is response to call for contribution about IEEE802.16e-D2 |
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| Abstract | This contribution proposes the reporting operation of scan result for the handover process. |
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| Purpose | Propose scan result reporting opeartion for the IEEE802.16e Handoff Ad hoc group |
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# 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, which can be a target BS, for the MSS in serve 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 transmitted by the MSS, the BS can find the proper Target BS for BS initiated handover. However, there is no appropriate message and its corresponding operation that reports the scanning results to the Serving Bs.

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 reporting 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 call flow based on periodic reporting mechanism.
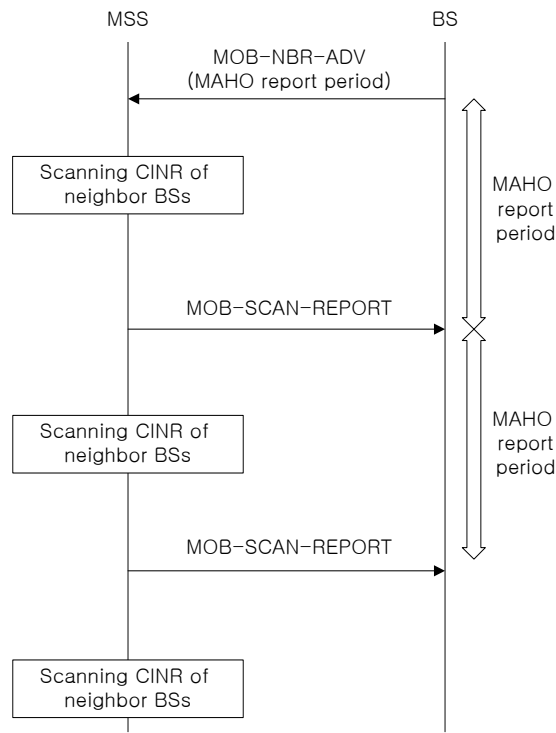
**Figure 1 Example of scan report message using periodic report mechanism**


2) Event triggered report

In this event triggered report mechanism, a MSS reports the scanning results when the specific event has occurred. The event can be something that the rank of received CINR of neighbor BSs has been changed while the CINR of the Serving BS has been remaining 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. In this mechanism, the MSS may report the scanning results, even in the timer for the MAHO report period is has not been expired. And also, two schemed, periodic report and event triggering report, can be activated in hybrid manner.

The figure 2 shows the example of call flow based on event triggering mechanism.
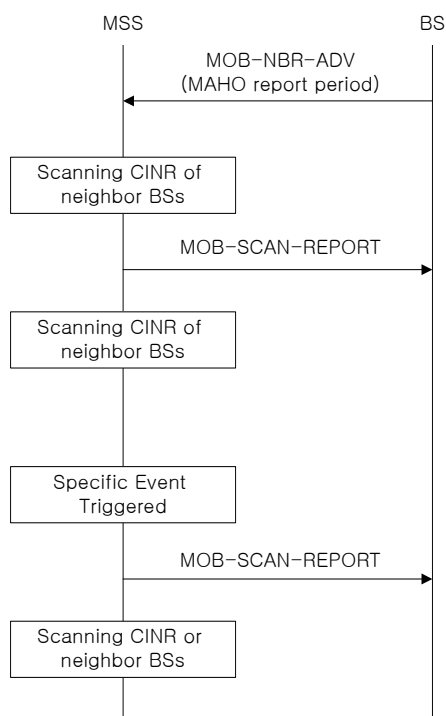
**Figure 2 Example of scan report message using event triggering mechanism**

Therefore we propose the remedies as followings:

■ Create a new message  "Scanning Result Report (MOB-SCAN-REPORT) message' after the section 6.3.2.3.52 page 22

   ■ MOB-SCAN-REPORT message

■ Add the description, "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

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 may transmit a MOB-SCAN-REPORT message to report the scanning results to its Serving BS. The message shall be transmitted on the Basic CID.

Table XXX – MOB-SCAN-REPORT Message Format

| Syntax | Size | Notes |
|---|---|---|
| MOB-SCAN-REPORT_Message_Format(){ | | |
| Management Message Type = ?? | 8bits | |
| Report Mode | 2bits | 00: Periodic<br>01: Event-triggered |

| | | 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-triggered : 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 reporting scheme, the MSS may report the scanning results in case of a specific event which can be 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.