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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | **Usage of Recommended SBS Information TLV** |
| Date Submitted | **2014-08-09** |
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| Re: | Working Group Letter Ballot #39a on IEEE P802.16q/D2 |
| Abstract | This contribution clarifies the usage of Recommended SBS information TLV. |
| Purpose | To discuss and adopt the proposed texts in IEEE P802.16q draft |
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# Usage of Recommended SBS Information TLV

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# Introduction

According to IEEE Std 802.16-2012, a BSID is used to identify a neighbor BS during scanning interval allocation and scanning report, and the BSID of the neighbor BS is included in a MOB\_NBR-ADV message. However, if there are a lot of neighbor SBSs, the system information of the neighbor SBSs may not included in the MOB\_NBR-ADV message to decrease the size of the MOB\_NBR-ADV message. In this case, BSIDs can’t be used to identify the neighbor SBSs. In order to solve this problem, Recommended SBS information TLV has been defined in the current draft. But, it is still unclear and complicate when this TLV is used.

A basic rule is to use a BSID of a neighbor SBS only if the BSID of the neighbor SBS is in the MOB\_NBR-ADV message. However, there is also an exceptional rule as shown in Figure 1. In the first exchange of scanning message, Recommended SBS information TLV is used because the detected neighbor SBS is not in the MOB\_NBR-ADV message. However, the MS uses the BSID of the detected SBS in the second exchange of scanning messages because it has acquired the BSID of the SBS during scanning interval. The serving BS recognizes that the MS has acquired the BSID of the neighbor SBS once it receives from the MS any message that includes the BSID of the neighbor SBS that is not in the MOB\_NBR-ADV message.



Figure 1 – usage of Recommended SBS information TLV

The MS operation and the BS operation for this exceptional case are not clearly defined in the current draft. Moreover, we have to consider whether this exceptional case is a general one or not. The MS shall decode a DCD message transmitted from the neighbor SBS to acquire the BSID of the neighbor SBS. The purpose of receiving the DCD message from a neighbor BS is to acquire the system information of the neighbor BS before HO to decrease HO interruption time. This means that the MS will try to acquire the system information of the neighbor SBS only if it determines the neighbor SBS can be a target BS when HO will occur in the future. In this case, it is better and more general to receive the system information of the neighbor SBS from the serving BS than from the neighbor SBS because the MS shall stop the communication with the serving BS to decode a message from the neighbor SBS. According to current draft, if the MS transmits a MOB\_SCN-REP message that includes Neighbor Request TLV, the serving BS shall transmit a unicast MOB\_NBR-ADV message to provide the system information of the neighbor SBS specified by the Neighbor Request TLV. Therefore, it is more general for the MS acquires the system information through the unicast MOB\_NBR-ADV message. If we consider this mechanism, we can make the usage of Recommended SBS information TLV simpler as shown in Figure 2.

In the first exchange of scanning messages, the MS uses the Recommended SBS information TLV because the BSID of the detected SBS is not in the MOB\_NBR-ADV message. If the MS determines that the detected SBS can become a target SBS for potential HO, then it transmits the MOB\_SCN-REP to request for system information of the detected SBS. After receiving the unicast MOB\_NBR-ADV message from the serving BS as a response to the MOB\_SCN-REP message, the MS will use BSID of the neighbor SBS because the BSID of the neighbor SBS is in the unicast MOB\_NBR-ADV message. As a result, there is only one rule for usage of Recommended SBS information TLV. If a BSID of a neighbor SBS is in MOB\_NBR-ADV message, the BSID is used. Otherwise, Recommended SBS information TLV is used.



Figure 2 – Usage of Recommended SBS information TLV

# Proposed Texts

----------------- Start of the text proposal --------------------------------------------------------------------------------------

[*Remedy 1: Change the texts in subclause 6.3.2.3.43 as follows:*]

**6.3.2.3.43 MOB\_SCN-REQ (scanning interval allocation request) message**

***Insert the following texts at the end of 6.3.2.3.43 as indicated:***

The following TLV may be included in the MOB\_SCN-REQ message to indicated CSGID of BSs to be scanned.

 **CSGID**

 CSGID is a common identifier used to identify the BSs belonging to the same CSG. (see 17.1.3)

~~The following TLVs may be included in the MOB\_SCN-REQ message to indicate neighbor SBSs of which BSIDs are not defined in the MOB\_NBR-ADV message or not shared with the serving BS.~~

If the BSID of a neighbor SBS that the MS plans to scan is not in the MOB\_NBR-ADV message, the following TLV shall be included in the MOB\_SCN-REQ message to identify the neighbor SBS:

 Recommended SBS information

 Information of the recommended SBSs that the MS plans to scan. (see 11.20.4)

[*Remedy 2: Change the texts in subclause 6.3.2.3.44 as follows:*]

**6.3.2.3.44 MOB\_SCN-RSP (scanning interval allocation response) message**

***Insert the following texts at the end of 6.3.2.3.44 as indicated:***

The following TLV may be included in the MOB\_SCN-RSP message to indicated CSGID of BSs to be scanned.

 **CSGID**

 CSGID is a common identifier used to identify the BSs belonging to the same CSG. (see 17.1.3)

~~If the BSID in MOB\_SCN-RSP is (a) not in the MOB\_NBR-ADV message and, (b) not reported by the BS to the MS, then the following TLV shall be in that MOB\_SCN-RSP:~~

If the BSID of a neighbor SBS that the serving BS requests the MS to scan is not in the MOB\_NBR-ADV message, the following TLV shall be included in the MOB\_SCN-RSP message to identify the neighbor SBS:

 Recommended SBS information

 Information of the recommended SBSs to be scanned.~~that the MS plans to scan.~~ (see 11.20.4)

[*Remedy 3: Change the texts in subclause 6.3.2.3.45 as follows:*]

**6.3.2.3.45 MOB\_SCN-REP (scanning result report) message**

***Insert the following texts at the end of 6.3.2.3.45 as indicated:***

The MOB\_SCN-REP message may include the following TLV.

 **Neighbor request**

This TLV is included in the MOB\_SCN-REP to request a serving BS to unicast MOB\_NBR-ADV message that contains system information of the neighbor BSs indicated by this TLV.

~~If the BSID in MOB\_SCN-RSP is (a) not in the MOB\_NBR-ADV message and, (b) not reported by the MS to the BS, then the following TLV shall be in that MOB\_SCN-REP:~~

If the BSID of a neighbor SBS that the MS report to the serving BS is not in the MOB\_NBR-ADV message, the following TLV shall be included in the MOB\_SCN-REP message:

 **Scanning result**

 Measurement report (see 11.19.4)

----------------- End of the text proposal --------------------------------------------------------------------------------------