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Title	<b>DL and UL loading parameters information</b>	
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Re:	IEEE 802.16 Session #48	
Abstract	This contribution proposes the updates of IEEE 802.16g D8 document in order to obtain loading information from the Base Station	
Purpose	Update 802.16g draft to obtain uplink and downlink loading information (harmonized version)	
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## **DL and UL loading parameters information**

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### **1. Introduction**

In order for MS to enter 802.16 network for the first time, MS shall obtain DCD and UCD then will commence network entry procedure by initiating the initial ranging procedure. Before ranging with a particular BS, the MS shall obtain the available DL and UL loading information from the DCD and UCD broadcast messages and take the loading report into consideration when selecting a particular BS. The loading condition is not the only factor for BS selection; however it is important information when load balancing is required prior to network entry.

## 2. Proposed Text Change

### *Remedy 1:*

Factor the loading information in the Down Link as part synchronization.

*[In 6.3.9.2 Obtain downlink parameters, Modify the text]:*

### 6.3.9.2 Obtain downlink parameters

The MAC shall search for the DL-MAP MAC management messages. The SS achieves MAC synchronization once it has received at least one DL-MAP message and is able to decode the DL-Burst Profiles contained therein. An SS MAC remains in synchronization as long as it continues to successfully receive the DL-MAP and DCD messages for its channel. The MS may use information received in the DCD or MOB\_NBR-ADV messages, such as the Available DL Radio Resources and Cell Type (11.4.1), to determine whether the channel is suitable for its intended use and whether it should continue scanning for other channels. During network entry or re-entry the SS will synchronize to a channel if the Available DL Radio Resources in the DCD message are sufficient for its intended requirements. If the reported Available DL Radio Resources are not adequate for the SS, it should continue scanning and find another channel until all channels are scanned. If all channels are scanned, the SS should choose the most appropriate channel to perform initial ranging according to section 6.3.9.5 based on conditions that include RSSI, CINR and the available radio resources of all channels. If the Lost DL-MAP Interval (Table 342) has elapsed without a valid DL-MAP message or the T1 interval (Table 342) has elapsed without a valid DCD message, an SS shall try to reestablish synchronization. The process of acquiring synchronization is illustrated in Figure 56. The process of maintaining synchronization is illustrated in Figure 57.

### *Remedy 2:*

Factor the loading information in the Uplink Link after DL synchronizaton.

*[In 6.3.9.3 Obtain uplink parameters, Modify the text]:*

### 6.3.9.3 Obtain uplink parameters

After synchronization, the SS/MS shall wait for a UCD message from the BS in order to retrieve a set of transmission parameters for a possible uplink channel. These messages are transmitted periodically from the BS for all available uplink channels and are addressed to the MAC broadcast address.

If no uplink can be found after a suitable timeout period, ~~or if the Available UL Radio Resources in the UCD message are not sufficient for the SS requirements,~~ then the SS shall continue scanning to find another downlink channel. The SS may use information received in the UCD or MOB\_NBR-ADV messages, such as the Available UL Radio Resources or Cell Type (11.4.1), to determine whether the channel is suitable for its intended use and whether it should continue scanning for other channels. The process of obtaining uplink parameters is illustrated in Figure 58.

The SS shall determine from the channel description parameters whether it may use the uplink channel. If the channel is not suitable ~~or the Available UL Radio Resources are not sufficient for the SS requirements~~, then the SS shall continue scanning to find another downlink channel until all channels are exhausted. If the channel is suitable, the SS shall extract the parameters for this uplink from the UCD. Then, the SS shall wait for a bandwidth allocation map for the selected channel. It may begin transmitting uplink in accordance with the MAC operation and the bandwidth allocation mechanism.

~~If, after scanning all channels, the SS does not find a suitable channel of which the available radio resources are sufficient, the SS should may choose the most appropriate channel based on conditions that include RSSI, CINR, cell type and the available radio resources of all channels to perform initial ranging according to section 6.3.9.5 based on conditions that include RSSI, CINR and the available radio resources of all channels.~~

The SS shall perform initial ranging at least once, per Figure 60 and Figure 61. If initial ranging is not successful, the procedure is restarted from scanning to find another downlink channel.

The SS MAC is considered to have valid uplink parameters as long as it continues to successfully receive the UL-MAP and UCD messages. If at least one of the messages is not received within the time intervals specified in Table 342 the SS shall not use the uplink. This is illustrated in Figure 59.

**Remedy 3:**

Revise the description of DCD configuration change count to ensure it does not change even when loading condition does.

*[In section 6.3.2.3.1 Downlink Channel Descriptor (DCD) message under Table 15, modify the text]:*

A BS shall generate DCDs in the format shown in Table 15, including all of the following parameters:

**Configuration Change Count**

Incremented by one (modulo 256) by the BS whenever any of the values of this channel descriptor change, except for the Frame Number for the OFDM PHY ~~and the Available DL Radio Resources.~~

If the value of this count in a subsequent DCD remains the same, the SS can quickly decide that the remaining fields have not changed and may be able to disregard the remainder of the message. ~~unless the An SS is performing initial network entry. At the initial network entry, the SS will should decode the Available DL Radio Resources even if the DCD eConfiguration eChange eCount remains the same unchanged.~~

**Remedy 4:**

Revise the description of UCD configuration change count to ensure it does not change even when the loading condition does.

*[In section 6.3.2.3.3 Uplink Channel Descriptor (UCD) message, modify the text]:*

A BS shall generate UCDs in the format shown in Table 17, including all of the following parameters:

**Configuration Change Count**

Incremented by one (modulo 256) by the BS whenever any of the values of this channel descriptor change, ~~except for the Available UL Radio Resources.~~ If the value of this count in a subsequent UCD remains the same, the SS can quickly decide that the remaining fields have not changed and may be able to disregard the remainder of the message. ~~unless the An SS is performing initial network entry. At the initial network entry, the SS will should decode the Available UL Radio Resources even if the~~

~~UCD eConfiguration eChange eCount remains the same unchanged.~~ This value is also referenced from the UL-MAP messages.

**Remedy 5:**

Revise the description of cell selection during idle mode.

*[In section 6.3.24.2 Cell Selection, modify the text]:*

**6.3.24.2 Cell selection**

At MS Idle Mode Initiation, an MS may engage in cell selection to obtain a new Preferred BS. A Preferred BS is a Neighbor BS that the MS evaluates and selects as the BS with the best air interface DL properties, ~~which may include the RSSI, CINR, and cell type, the available radio resources, etc.~~ The Preferred BS may be the MS's previous Serving BS. In all other respects, cell selection is similar to 6.3.22.2.1.