Project	IEEE 802.16 Broadband Wireless Access Working Group <**http://ieee802.org/16**>
Title	RS Sleep Mode
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Re:	IEEE 802.16j-07/043: "IEEE 802.16j working group letter ballot #28"
Abstract	This contribution proposes sleep mode procedure for the transparent RS.
Purpose	To incorporate the proposed text into the P802.16j/D1
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RS Sleep Mode

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1 Introduction

A transparent RS only transfers the traffic between its subordinate MSs and the serving MR-BS. It's not necessary for the transparent RS to transmit preamble, FCH, and broadcast messages, such as MAPs, DCD and UCD. The sleep mode feature of a transparent RS is useful for providing power efficiency, especially for the mobile RS with battery power source or low-power fixed/nomadic RS powered by the solar power or battery. As a transparent RS enters the sleep mode, its power consumption can be reduced by turning off the transceiver and keeping CPU running at the lowest speed.

2 Spec Changes

This section contains the suggested text for the 802.16 specification changes.

6.3.21.7 Relay support for MS sleep mode

6.3.21.7.3 RS Sleep mode

The RS sleep mode is only for the transparent RS. Under centralized scheduling, MR-BS may activate an RS getting into sleep mode after switching the MSs, which are attached to the RS and are in normal mode, to either itself or another transparent RS. The mechanism of RS sleep mode shall be the same as MS sleep mode. The MR-BS should send an MOB_SLP-RSP message to inform the transparent RS of the sleeping pattern which consists of listening and sleep windows. The sleeping patterns of an RS in sleep mode and its subordinate MSs in sleep mode shall be consistent.
Alternatively, a transparent RS can request the activation of RS sleep mode by sending an MOB_SLP-REQ message to the serving MR-BS. Upon receiving the MOB_SLP-REQ message, the MR-BS shall respond by sending an MOB_SLP-RSP message to the RS to activate the RS sleep mode. When an RS is in sleep mode, the MR-BS can send an MOB_TRF-IND to awake the sleeping RS. Alternatively, when an RS in sleep mode needs to transmit data, it should perform bandwidth request process with its serving MR-BS, and awake from sleep mode.

Change the subclause 6.3.2.3.46 MOB_TRF-IND (traffic indication) message

6.3.2.3.46 MOB_TRF-IND (traffic indication) message
[Insert the following text after the third paragraph of 6.3.2.3.46:]
For MR system, when a transparent RS enters sleep mode, the MR-BS shall assign a SLPID for the RS.

Change Table 342 as indicated:

10.1 Global values

Table 342—Parameters and constants

System	Name	Time reference	Minmum value	Default value	Maximum value
RS/MS	Listening_ Interval	The time duration during which the RS/MS, after waking up and synchronizing with the DL transmissions, can demodulate downlink transmissions and decide whether to stay awake or go back to sleep.	=	=	64 frames

Change the subclause 11.1.8.2 SLPID_Update

11.1.8.2 SLPID_Update

The SLPID_Update TLV specifies a new SLPID that replaces an old SLPID. This TLV may include multiple Old_New_SLPID values for the MSs or RSs negatively indicated in MOB_TRF-IND message.

***Change the subclause 11.7.15*:**

11.7.15 Sleep mode recovery time

The 'Sleep mode recovery time' field indicates the time required for an MS or an RS that is in a sleep mode to return to awake-mode. This parameter is optional and may be used by the MR-BS or BS to determine sleep interval window sizes when initiating sleep mode with an MS or an RS.

Type	Length	Value	Scope
32	1	Number of frames required for the MS or the RS to switch from sleep mode to awake-mode	REG-REQ