Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Enhancement of REG-REQ and REG-RSP Messages**
Date Submitted	**2004-08-16**
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Re:	Contribution on comments to IEEE P802.16e/D4
Abstract	Existing REG-REQ and REG-RSP messages can not indicate the current mode of the MSS. For a MSS in IDLE mode, when it changes its paging group, it shall perform ENTRY process first, then, update its paging information. The existing ENTRY process includes a lot of message and information exchanges with BS, and some of the message and information exchanges are unnecessary and even redundant in the current situation. We propose to enhance the REG-REQ and REG-RSP massages to make it possible to simplify the message and information exchanges in the said situation.
Purpose	Adoption
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Enhancement of REG-REQ and REG-RSP Messages

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1. Introduction

Due to the current P802.16e/D4, the MSS in idle mode shall perform the ENTRY process, when it enters the new Paging Group. And in most circumstances, after the ENTRY process, the MSS will reenter IDLE mode by exchanging DREG-CMD and/or DREG-REQ message(s) with BS.

The current ENTRY procedure in section 6.3.9 of P802.16-2004 can be divided into the following phases:

a). Scan for downlink channel and establish synchronization with the BS
b). Obtain transmit parameters (from UCD message)
c). Perform ranging
d). Negotiate basic capabilities
e). Authorize SS and perform key exchange
f). Perform registration
g). Establish IP connectivity
h). Establish time of day
i). Transfer operational parameters
j). Set up connections.

In the current ENTRY process in P802.16-2004, the MSS and BS will exchange a lot of messages and data; especially for a managed MSS, MSS and NETWORK shall exchange their operational parameters.

For a MSS in IDLE mode that enters the new Paging Group, some steps are unnecessary, such as step g), h), i); for a managed MSS, since MSS has exchanged the operational parameters with NETWORK before it enters the new Paging Group, it is redundant to exchange the operational parameters with the NETWORK once more.

Therefore, we propose to enhance the REG-REQ and REG-RSP messages to reduce the redundant message and data exchanges with a minimum signaling overhead. We propose to add the mode indication information in REG-REQ and REG-RSP messages, to indicate which mode that the MSS is in; and the possible mode include POWER-OFF, IDLE, SLEEP, etc. For a MSS in IDLE mode that enters the new Paging Group, the mode indication in REG-REQ indicates IDLE. Thus, the BS can rearrange the message and information exchanges and omit the steps g), h), i) in ENTRY process after it detects the IDLE indication in REG-REQ message.

Additionally, we propose to add some TLV in REG-RSP, to indicate that the paging information about the MSS. Thus, for the MSS in IDLE mode which is changing its paging group, it can update its paging information and direct into IDLE mode after it receives the REG-RSP message including the paging information without the exchange of DREG-CMD and DREG-REQ.

2. Proposed Text Changes

[*Modify the corresponding sections as follows:*]

[Insert the following sentence into the end of Section 6.3.2.3.7]

The REG-REQ shall contain the following TLV:
SS Mode Selection Feedback support (11.7.11)

The REG-REQ may contain the following TLV:
SS Mode Indication (11.7.11.2)

[Insert the following sentence into the end of Section 6.3.2.3.8]

The REG-RSP shall contain the following TLV:
SS Mode Selection Feedback support (11.7.11)

The REG-RSP may contain the following TLV:
SS Mode Indication (11.7.11.2)

When the "SS Mode Indication" indicates IDLE mode, the following TLV may be included:
Paging Information (see 11.14)
The Paging Information TLV defines the Paging Group ID and the PAGING_CYCLE and PAGINGOFFSET parameters to be used by the MSS in IDLE mode

[Insert the following immediately after Section 11.7.11.1]

11.7.11.2 Mode Indication

This field indicates the mode that the MSS belongs to at the time when this information is transmitted..

Type	Length	Value	Scope
X	1	0: POWER-OFF 1: IDLE 2: SLEEP 3-255: RESERVED	REG-REQ REG-RSP