Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Secondary Management Connection usage clarification**
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Abstract	This contribution clarifies the usage of the secondary management connection, and proposes the following changes to the 802.16REVd standard.
Purpose	Adoption
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1. Introduction

Section 6.3.1.1 in IEEE 802.16REVd/D4 states that

> "Connections are identified by a 16-bit CID. At SS initialization, two pairs of management connections (uplink and downlink) shall be established between the SS and the BS and a third pair of management connections may be optionally generated. The three pairs of connections reflect the fact that there are inherently three different levels of QoS for management traffic between an SS and the BS. ***The basic connection is used by the BS MAC and SS MAC to exchange short, time-urgent MAC management messages. The primary management connection is used by the BS MAC and SS MAC to exchange longer, more delay-tolerant MAC management messages.*** Table 14 specifies which MAC Management messages are transferred on which of these two connections. ***Finally, the Secondary Management Connection is used by the BS and SS to transfer delay tolerant, standards-based [Dynamic Host Configuration Protocol (DHCP), Trivial File Transfer Protocol (TFTP), SNMP, etc.] messages. These messages are carried in IP datagrams, as specified in 5.2.7.*** Messages carried on the Secondary Management Connection may be packed and/or fragmented."

Clearly, secondary management connection is intended to transfer standard-based IP datagrams, including DHCP, TFTP, SNMP, and have the flexibility to transfer other IP based protocols, such as mobile IP for 802.16e. However, the presence of secondary management connection is limited to managed SS and three additional steps in the network entry and initialization procedures, as shown in the following.

> **6.3.2.3.8 Registration Response (REG-RSP) message**
>
> **Secondary Management CID (11.7.5)**
> Present only if the SS has indicated in the REG-REQ that it is a managed SS.
>
> **6.3.9 Network entry and initialization**
>
> g) Establish IP connectivity
> h) Establish time of day
> i) Transfer operational parameters
> Implementation of phases (g), (h) and (i) at the SS is optional. These phases shall only be performed if the SS has indicated in the REG-REQ message that it is a managed SS.

This is truly different from the original intention of secondary management connection, and can prevent the secondary management connection from supporting mobile applications. In other word, an unmanaged SS will not have secondary management connection, even though it wants to support other standard-base IP protocol for other purpose.

There can be a conflict between SS management support and IP management mode parameters in REG-REQ message. SS management mode can be '0', means unmanaged SS, and hence no secondary management connection. But, IP management mode can be "1", means the SS will accept IP based traffic on the secondary management connection.

Moreover, the *managed SS* and *unmanaged SS* values in the SS management SS support parameter in REG-RSP is very misleading.

This contribution clarifies the usage of the secondary management connection, and proposes the following changes to the 802.16REVd standard.

2. Proposed Changes

2.1 Secondary management connection Definition

Secondary management connection is not limited to support network management messages.

Page 9, line 61, changes “A connection that may be established during subscriber station (SS) registration that is used to transport standards-based (SNMP, DHCP, etc.) network management messages.” to “A connection that may be established during subscriber station (SS) registration that is used to transport standards-based (SNMP, DHCP, etc.) messages that are carried in IP datagrams.”,

2.2 SS Management Support

- Page 54, line 26, need a reference in "SS management support" parameter to indicate the TLV defined in 11.7.2 shall be used for SS management support parameter

  Change “SS management support” in REG-RSP message to “SS management support (11.7.2.)”

- Page 54, line 27, "Response to REG-REQ indication of whether or not the requester wishes to be managed by the Secondary Management Connection.” is misleading.

  Change the "Response to REG-REQ indication of whether or not the requester wishes to be managed by the Secondary Management Connection.” to “Response to REG-REQ indicating the mode of SS management operation.”

- SS management support parameter shall be mandatory, since it determines how SS shall be managed.

  Move SS Management Support to Page 54, line 51, the mandatory parameters.

2.3 IP Management Mode

Delete IP management mode parameter in page 594, line 1-4, and in REG-REQ and REG-RSP messages to avoid the conflict described in the previous section.

2.4 SS management support encoding

"SS management support" parameter really determines if the SS should be managed by standard-based IP messages over the secondary management connection, as opposed to “unmanaged SS vs. managed SS”.

- Page 593, line 48, change “This field indicates whether or not the SS is managed.” to “This field indicates whether or not the SS is managed by standard-based IP messages, and receive IP-based traffic over the secondary management connection.”

- Page 593, line 59, change the value from “0 – SS is unmanaged” to “0 – no secondary management connection

- Page 593, line 60, change the value from “1 – SS is managed” to “1 – secondary management connection”

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