Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Resolving IP Broadcast Issues**
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Re:	Letter Ballot #13, IEEE P802.16-REVd/D1-2003.
Abstract	This document contains suggestions for improvement of the DHCP IP broadcast transport and data packet broadcast in the BS downstream direction.
Purpose	The document is submitted for discussion by 802.16d Task Group
Notice	
Release	
Patent Policy and Procedures	

Resolving IP Broadcast Issues

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1. Background

The IP transport mode specified in IEEE802.16-REVd/D1 requires the subscriber stations, as part of the network entry and registration, to obtain an IP address via the DHCP protocol (RFC 2131) to download the TFTP configuration file. The DHCP protocol is composed of IP broadcast packets exchanged between the DHCP server and DHCP client. Nevertheless, IEEE802.16-REVd/D1, section 6.4.9.10, requires the DHCP exchange must be sent over the secondary management CID, regardless of the location of the DHCP server in the wireless network. This presents two issues.

Issue 1: Mapping of DHCP packets to downstream secondary management CID

DHCP server broadcast packets in the downstream direction do not have characteristics in the IP or MAC header that are identifiable to the packet classifier so that they can be directed to the correct SS secondary management CID. Furthermore, the BS classifier cannot distinguish between the DHCP broadcast packets transported during the SS initialization process from other transport DHCP broadcast packets so it can route them to their respective CIDs.

Issue 2: There is no explicit BS downstream IP broadcast mechanism

In lieu of identifying a secondary management CID, the BS has no mechanism to transmit broadcast packets, such as a DHCP offer, to all subscriber stations. The broadcast CID value of FFFF in table 278 has been used for transport of management messages throughout the standard, therefore, it is deemed to be unsuitable for transport of data payloads.

2. Proposed changes to IP Connections in IEEE 802.16-REVd_D1

[in 6.4.9.10, Establishing IP Connectivity]

Change

”At this point, the SS shall invoke DHCP mechanisms [IETF RFC 2131] in order to obtain an IP address and any other parameters needed to establish IP connectivity. The DHCP response shall contain the name of a file, which contains further configuration parameters. Establishment of IP connectivity shall be performed on the SS’s Secondary Management Connection; see Table 92.”

to

“At this point, the SS shall invoke DHCP mechanisms [IETF RFC 2131] in order to obtain an IP address and any other parameters needed to establish IP connectivity. The DHCP response shall contain the name of a file, which contains further configuration parameters. Establishment of IP connectivity shall be performed on the SS’s Secondary Management Connection in the upstream direction and the BS data transport broadcast CID (see table 273) in the downstream direction; see Table 92.”

[in 6.4.1.1, PMP (second paragraph)**]**

Change

”… The packets shall be assigned to the secondary management connection based on the full IP source address in the uplink and the full IP destination address in the downlink.”

to

"… ~~The~~ Unicast packets shall be assigned to the secondary management connection based on the full IP source address in the uplink and the full IP destination address in the downlink; downlink broadcast packets shall use the transport broadcast CID."

[in 10.4, Well-known Address and Identifiers]

Change

Table 278 - CID's

CID	Value	Description
Initial ranging	0x0000	Used by an SS during initial ranging as part of initial ranging process
Basic CID	0x0001—m	
Primary management	m+1—2m	
Transport CIDs and Secondary Mgt CIDs	2m+1—0xFEFE	
AAS initial ranging CID	0xFEFF	A BS supporting AAS shall use this CID when allocating a Initial Ranging period for AAS devices
Multicast polling CIDs	0xFF00—0xFFFD	An SS may be included in one or more multicast polling groups for the purposes of obtaining bandwidth via polling. These connections have no associated service flow.
Padding CID	0xFFFE	Used for transmission of padding information.
Broadcast CID	0xFFFF	Used for broadcast information that is transmitted on a downlink to all

to

Table 278 - CID's

CID	Value	Description
Initial ranging	0x0000	Used by an SS during initial ranging as part of initial ranging process
Basic CID	0x0001—m	
Primary management	m+1—2m	
Transport CIDs and Secondary Mgt CIDs	2m+1—0xFEF~~E~~ED	
Transport broadcast CID	0xFEFE	A BS shall use this CID to send transport broadcast messages to all subscriber stations
AAS initial ranging CID	0xFEFF	A BS supporting AAS shall use this CID when allocating a Initial Ranging period for AAS devices
Multicast polling CIDs	0xFF00—0xFFFD	An SS may be included in one or more multicast polling groups for the purposes of obtaining bandwidth via polling. These connections have no associated service flow.

Padding CID	0xFFFE	Used for transmission of padding information.
Management Broadcast CID	0xFFFF	Used for broadcast information that is transmitted on a downlink to all