

## Addressing Scheme in 802.16m

### IEEE 802.16 Presentation Submission Template (Rev. 9)

Document Number:

IEEE C802.16m-08/645r1

Date Submitted:

2008-07-11

Source:

Haihong Zheng, Shashikant Maheshwari, Adrian Boariu,  
Yousuf Saifullah  
Nokia Siemens Networks

E-mail: haihong.zheng@nsn.com

Andrea Bacioccola  
Nokia

E-mail: andrea.bacioccola@nokia.com

Venue:

IEEE 802.16m-08/024, “Call for Comments and Contributions on Project 802.16m System Description Document (SDD)”.

Target topic: “Upper MAC concepts and methods - Addressing”.

Base Contribution:

This is the base contribution.

Purpose:

To be discussed and adopted by TGm for the 802.16m SDD

Notice:

*This document does not represent the agreed views of the IEEE 802.16 Working Group or any of its subgroups.* It represents only the views of the participants listed in the “Source(s)” field above. It is offered as a basis for discussion. It is not binding on the contributor(s), who reserve(s) the right to add, amend or withdraw material contained herein.

Release:

The contributor grants a free, irrevocable license to the IEEE to incorporate material contained in this contribution, and any modifications thereof, in the creation of an IEEE Standards publication; to copyright in the IEEE’s name any IEEE Standards publication even though it may include portions of this contribution; and at the IEEE’s sole discretion to permit others to reproduce in whole or in part the resulting IEEE Standards publication. The contributor also acknowledges and accepts that this contribution may be made public by IEEE 802.16.

Patent Policy:

The contributor is familiar with the IEEE-SA Patent Policy and Procedures:

<http://standards.ieee.org/guides/bylaws/sect6-7.html#6> and <http://standards.ieee.org/guides/opman/sect6.html#6.3>.

Further information is located at <http://standards.ieee.org/board/pat/pat-material.html> and <http://standards.ieee.org/board/pat>.

# Motivation

- In 802.16e, each connection is uniquely identified by a 16-bit connection identifier within the cell.
- For each allocation, normally the basic/transport CID of the MS is included in the MAP, and the basic/primary/secondary CID or transport CID of the service flow is included in the GMH.
- This leads to unnecessary overhead, since duplicated information are included in both MAP and GMH.
  - Although CID in DL MAP could be omitted, it leads to power consumption issue since all the MS needs to decode the received user data to determine if it is for itself.
- A more efficient addressing scheme for connection needs to be defined for .16m.

# MS Identifier and Connection Index

- Each MS is assigned with a 12-bit MS Identifier (MSId), which uniquely identifies the MS within the cell.
- A connection is a mapping between BS and MS MAC peers, and is uniquely identified by a Connection Index (CI) within the MS.
  - The management connections (i.e., basic/primary/secondary connections) are automatically assigned with pre-defined Connection Index values.
  - A transport connection is assigned with a Connection Index during service flow setup.
  - Connection Index is bidirectional for management connections and unidirectional for transport connections.
- The combination of MSId and CI uniquely identifies a connection within the cell.
- For each UL or DL allocation, the MS Identifier is included in the MAP IE or masked with error detection code, while the Connection Index for the connection is included in the GMH.
- Each multicast/broadcast connection is assigned with an unique MSId, and Connection Index is not valid for these connections.

## Benefit

- 16-bit CID in .16e GMH can be reduced to Connection Index with smaller size (e.g., 4 bit), which significantly reduces overhead for user data traffic.
- During HO/network re-entry, only update on MSId is needed if necessary. There is no need to perform CID update for all the connections.

# Proposed text changes for 802.16m SDD

- Section 10.x.1: Addressing
  - Each MS is assigned with a 12-bit MS Identifier (MSId), which uniquely identifies the MS within the cell. Each connection is uniquely identified by a 4-bit Connection Index (CI) within the MS.
  - The management connections are automatically assigned with pre-defined Connection Index values. A transport connection is assigned with a Connection Index during service flow setup. Specific MSIds are reserved for multicast and broadcast connections.
  - For each UL or DL resource allocation, the MS Identifier is included in the unicast service control information or masked on error detection code (e.g., CRC) for the MAC PDU, while the Connection Index for the connection is included in the MAC header.