Connection and Connection Management in 802.16m

IEEE 802.16 Presentation Submission Template (Rev. 9)

Document Number:

IEEE C802.16m-08/1085

Date Submitted:

2008-09-05

Source:

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Venue:

Re: MAC: Connection Establishment & Maintenance; in response to the TGm Call for Contributions and Comments 802.16m-08/033 for Session 57

Base Contribution:

This is the base contribution.

Purpose:

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

Motivation

- In 802.16e, one connection is uniquely identified by a connection identifier, assigned by BS.
- In 802.16m, MS logical address includes two parts – Station identifier and Flow identifier.
  - The mechanism to identify connection needs to be changed.
  - The allocation of Station identifier and Flow identifier needs to be defined.

Connection

- A connection is identified by the combination of station identifier and flow identifier.
- Connection Type
  - Management connection
    - Used to carry MAC management message
  - Transport connection
    - Used to carry user data

Management Connection

- Basic management connection
  - Bi-directional
  - For short, time-urgent unicast MAC management messages
  - Default value of Flow Identifier (e.g., 0) is reserved for basic management connection
- Primary management connection
  - Bi-directional
  - For longer, more delay-tolerant unicast MAC management messages
  - Default value of Flow Identifier (e.g., 1) is reserved for primary management connection
- Multicast/Broadcast management connection
  - Uni-directional
  - For multicast/broadcast MAC management messages
  - Identified by Station Identifier; no Flow Identifier is used

Transport Connection

- Uni-directional
- Transport connection types
  - Unicast transport connection
    - Used to carry unicast user data including upper layer signaling messages such as SNMP, TFTP, DHCP, etc.
    - An admitted/active service flow is uniquely mapped to a transport connection
    - Flow Identifier is allocated during service flow establishment procedure.
  - Multicast/Broadcast transport connection
    - Used to carry multicast/broadcast user data
    - Identified by Station Identifier; no Flow Identifier is used

Connection Management

- Connection establishment
  - Management connections are established during initial network entry or reentry.
    - Station Identifier is assigned in RNG-RSP, after which Basic and primary connections are automatically established.
  - Transport connections are established after network entry using service flow establishment procedure.
    - Flow Identifier is assigned in DSA procedure.
- Connection release
  - Transport connections are automatically released when the corresponding service flow is removed.
- After MS transitions to idle mode or power down, all the management and transport connections are released at expiration of management resource holding timer.
- During HO, Station Identifier is reassigned and Flow Identifiers remain unchanged for management and transport connections.

Proposed text changes for 802.16m SDD (1)

- Section 10.x: Connection
- Connections are identified by the combination of station identifier and flow identifier.
- Two types of connections are used – management connection and transport connection. Management connections are used to carry MAC management message. Transport connections are used to carry user data including upper layer signaling messages such as DHCP, etc.
- Management connection is bi-directional and default values of flow identifier are reserved for unicast management connections (0 for basic connection and 1 for primary management connection). Management connections are automatically established after station identifier is assigned to an MS during MS initial network entry.

Proposed text changes for 802.16m SDD (2)

- Transport connection is uni-directional and established with unique flow identifier assigned during service flow establishment procedure. Each admitted/active service flow is uniquely mapped to a transport connection. Transport connection is released when the associated service flow is removed.
- Multicast/broadcast management and transport connections are identified by station identifier and no flow identifier is used.
- After MS transitions to idle mode or power down, all the unicast management and transport connections are released at expiration of management resource holding timer.
- During HO, station identifier is reassigned and flow identifiers remain unchanged for unicast management and transport connections.