

Project	<b>IEEE 802.16 Broadband Wireless Access Working Group</b> < <a href="http://ieee802.org/16">http://ieee802.org/16</a> >		
Title	<b>Proposed ToC for the IEEE 802.16m System Description Document</b>		
Date Submitted	<b>2007-11-07</b>		
Source(s)	Hokyu Choi, Jaeweon Cho, Jungje Son, Panyuh Joo Samsung Electronics	Voice: +82-31-279-4660 E-mail: <a href="mailto:choihk@samsung.com">choihk@samsung.com</a>	
	Changhoi Koo Samsung Telecommunication Ameri	Voice: +1-972-761-7934 E-mail: <a href="mailto:chkoo@samsung.com">chkoo@samsung.com</a>	
	Rakesh Taori Samsung Advanced Institute of Technology		
Re:	Call for System Description Document		
Abstract	This contribution provides table of content for the IEEE 802.16m System Description Document		
Purpose	Discuss and adopt as table of content for the IEEE 802.16m System Description Document		
Notice	<i>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.</i>		
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: < <a href="http://standards.ieee.org/guides/bylaws/sect6-7.html#6">http://standards.ieee.org/guides/bylaws/sect6-7.html#6</a> > and < <a href="http://standards.ieee.org/guides/opman/sect6.html#6.3">http://standards.ieee.org/guides/opman/sect6.html#6.3</a> >. Further information is located at < <a href="http://standards.ieee.org/board/pat/pat-material.html">http://standards.ieee.org/board/pat/pat-material.html</a> > and < <a href="http://standards.ieee.org/board/pat">http://standards.ieee.org/board/pat</a> >.		

# Proposed ToC for the IEEE 802.16m System Description Document

*Hokyu Choi, Jaeweon Cho, Jungje Son, Panyuh Joo*  
*Samsung Electronics*

*Changhoi Koo*  
*Samsung Telecommunication America*

*Rakesh Taori*  
*Samsung Advanced Institute of Technology*

## ***Author's Proposal***

This contribution provides proposed table of content for the IEEE 802.16m System Description Document. The distinctive features that are not employed in legacy system are highlighted in the separated section, i.e. sub-clause 15. At the same time, potential sub-clause with brackets are provided as placeholders in PHY and MAC protocol sections. Authors of this contribution propose to discuss first feasibility and shape/scope of those distinctive features, and to update the sub-clause 15. After reaching consensus on them at TG, the sub-clauses of PHY and MAC protocol sections should be updated correspondingly

## Table of Content

<b>1</b>	<b>Scope</b> .....	<b>6</b>
<b>2</b>	<b>References</b> .....	<b>6</b>
<b>3</b>	<b>Definition, Symbols, Abbreviation</b> .....	<b>6</b>
<b>4</b>	<b>Abstract</b> .....	<b>6</b>
<b>5</b>	<b>Overall Network Architecture (informative)</b> .....	<b>6</b>
<b>6</b>	<b>Legacy Support</b> .....	<b>6</b>
<b>7</b>	<b>IEEE 802.16m Reference Model</b> .....	<b>6</b>
<b>8</b>	<b>IEEE 802.16m System State Diagram</b> .....	<b>6</b>
<b>9</b>	<b>IEEE 802.16m Air-Interface Protocol Structure</b> .....	<b>6</b>
<b>10</b>	<b>Convergence Sub-Layer (CS)</b> .....	<b>6</b>
<b>10.1</b>	<b>Data Plane Functions</b> .....	<b>6</b>
<b>10.1.1</b>	<b>Packet Header Compression</b> .....	<b>6</b>
<b>10.1.2</b>	<b>Packet Classification</b> .....	<b>6</b>
<b>10.1.3</b>	<b>CS PDU Construction</b> .....	<b>6</b>
<b>11</b>	<b>MAC Common Part Sub-layer</b> .....	<b>6</b>
<b>11.1</b>	<b>Resource Control and Management Functions</b> .....	<b>6</b>
<b>11.1.1</b>	<b>Unicast Control Plane Functions</b> .....	<b>6</b>
<b>11.1.1.1</b>	<b>Network Entry Management</b> .....	<b>6</b>
<b>11.1.1.2</b>	<b>[Self-Organization Procedures]</b> .....	<b>6</b>
<b>11.1.1.3</b>	<b>Mobility Management</b> .....	<b>6</b>

11.1.1.3.1	Measurement .....	6
11.1.1.3.2	Reporting .....	6
11.1.1.3.3	Inter-RAT .....	6
11.1.1.3.2	Intra-RAT .....	6
11.1.1.4	Idle Mode Management .....	7
11.1.1.5	Radio Resource Management (RRM).....	7
11.1.1.5.1	Fixed Frequency Reuse.....	7
11.1.1.5.2	Fractional Frequency Reuse (FFR) .....	7
11.1.1.5.3	BS Coordination.....	7
11.1.1.5.4	Load Control .....	7
11.1.1.5.5	[Multi-carrier Support] .....	7
11.1.1.6	Location Management.....	7
11.1.1.7	[Routing].....	7
11.1.2	Multicast and Broadcast Service Control Plane Functions .....	7
11.1.2.1	Multicast and Broadcast Service Admission Control.....	7
11.1.2.2	Multicast and Broadcast Service Session Management .....	7
11.1.2.3	Multicast and Broadcast Service Radio Resource Management.....	7
11.1.2.4	[Routing].....	7
11.2	Medium Access Control Functions .....	7
11.2.1	Control Plane Functions .....	7
11.2.1.1	Connection Management .....	7
11.2.1.2	Packet Forwarding .....	7
11.2.1.3	QoS Control.....	7
11.2.1.4	Flow Control.....	7
11.2.1.5	Airlink Error Control.....	7
11.2.1.6	Link Control and Adaptation .....	7
11.2.1.7	Measurement and Feedback Control.....	7
11.2.1.8	Control and Signaling.....	7
11.2.1.8.1	Downlink.....	7
11.2.1.8.2	Uplink.....	8
11.2.1.9	Ranging and Random Access Mechanisms .....	8
11.2.1.10	[Multi-Radio Coexistence and Coordination Mechanisms].....	8
11.2.2	Data Plane Functions .....	8
11.2.2.1	Packetization and Framing .....	8
11.2.2.1.1	MAC Headers and Sub-headers .....	8
11.2.2.1.2	Duplicate Detection and Sequencing .....	8
11.2.2.1.3	[Packet Forwarding for Relay] .....	8
11.2.2.1.4	Packet Segmentation and Reassembly .....	8
11.2.2.1.5	Packet Fragmentation .....	8
11.2.2.2	Scheduling Functions.....	8
12	Security Sub-layer .....	8
12.1	Data plane security functions and protocols .....	8
12.2	Control plane security functions and protocols .....	8

13	Physical Layer .....	8
13.1	Multiple Access Methods .....	8
13.1.1	Downlink .....	8
13.1.2	Uplink .....	8
13.2	OFDMA Numerology and Frame Structure.....	8
13.3	Duplexing Modes .....	8
13.4	Channel Coding and Signal Modulation .....	8
13.4.1	Channel coding .....	8
13.4.1.1	Downlink.....	8
13.4.1.1.1	Code structure and rates .....	8
13.4.1.1.2	FEC block sizes .....	8
13.4.1.1.3	H-ARQ .....	9
13.4.1.1.4	Interleaving.....	9
13.4.1.2	Uplink .....	9
13.4.1.2.1	Code structure and rates .....	9
13.4.1.2.2	FEC block sizes .....	9
13.4.1.2.3	H-ARQ .....	9
13.4.1.2.4	Interleaving.....	9
13.4.2	Signal Modulation .....	9
13.4.2.1	Downlink.....	9
13.4.2.1.1	Modulation orders .....	9
13.4.2.2	Uplink .....	9
13.4.2.2.1	Modulation orders .....	9
13.5	MIMO Structure .....	9
13.5.1	Single Codeword and Multi-codeword.....	9
13.5.2	Downlink .....	9
13.5.2.1	Single user MIMO .....	9
13.5.2.1.1	Open loop.....	9
13.5.2.1.2	Closed loop.....	9
13.5.2.2	Multi-user MIMO.....	9
13.5.2.2.1	Open loop.....	9
13.5.2.2.2	Closed loop.....	9
13.5.2.3	Mode/Stream adaptation.....	9
13.5.3	Uplink .....	9
13.5.3.1	Single user MIMO .....	9
13.5.3.1.1	Open loop.....	9
13.5.3.1.2	Closed loop.....	10
13.5.3.2	Multi-user MIMO.....	10
13.5.3.2.1	Virtual (Collaborative) MIMO .....	10
13.5.3.3	Mode/Stream adaptation.....	10
13.6	Physical Channels.....	10
13.6.1	Physical Data Channels.....	10
13.6.2	Physical Control Channels.....	10

<b>13.6.3</b>	<b>Physical Broadcast Channels.....</b>	<b>10</b>
<b>13.6.4</b>	<b>Structure of Physical Resource Blocks .....</b>	<b>10</b>
<b>13.6.5</b>	<b>Subcarrier Permutation .....</b>	<b>10</b>
<b>13.6.6</b>	<b>Synchronization .....</b>	<b>10</b>
<b>13.6.7</b>	<b>Pilot Structure.....</b>	<b>10</b>
<b>13.6.8</b>	<b>Physical Channel Multiplexing.....</b>	<b>10</b>
<b>13.7</b>	<b>Physical Layer Procedures .....</b>	<b>10</b>
<b>13.7.1</b>	<b>Measurement.....</b>	<b>10</b>
<b>13.7.2</b>	<b>System Acquisition .....</b>	<b>10</b>
<b>13.7.3</b>	<b>Link adaptation .....</b>	<b>10</b>
<b>13.7.3.1</b>	<b>Adaptive Modulation and Coding.....</b>	<b>10</b>
<b>13.7.3.2</b>	<b>Power control .....</b>	<b>10</b>
<b>13.7.4</b>	<b>H-ARQ Mechanisms .....</b>	<b>10</b>
<b>14</b>	<b>RF Requirements.....</b>	<b>10</b>
<b>14.1</b>	<b>Out of Band Emissions .....</b>	<b>10</b>
<b>14.2</b>	<b>Spectral mask for mobile station.....</b>	<b>10</b>
<b>14.3</b>	<b>Spectral mask for the base station .....</b>	<b>10</b>
<b>15</b>	<b>Distinctive Features.....</b>	<b>10</b>
<b>15.1</b>	<b>Relay .....</b>	<b>11</b>
<b>15.2</b>	<b>Multi-Carrier Operation.....</b>	<b>11</b>
<b>15.3</b>	<b>Self-Organization.....</b>	<b>11</b>
<b>15.4</b>	<b>Multi-Radio Coexistence and Coordination Mechanisms .....</b>	<b>11</b>

- 1 Scope
- 2 References
- 3 Definition, Symbols, Abbreviation
- 4 Abstract
- 5 Overall Network Architecture (informative)
- 6 Legacy Support
- 7 IEEE 802.16m Reference Model
- 8 IEEE 802.16m System State Diagram
- 9 IEEE 802.16m Air-Interface Protocol Structure
- 10 Convergence Sub-Layer (CS)
  - 10.1 Data Plane Functions
    - 10.1.1 Packet Header Compression
    - 10.1.2 Packet Classification
    - 10.1.3 CS PDU Construction
- 11 MAC Common Part Sub-layer
  - 11.1 Resource Control and Management Functions
    - 11.1.1 Unicast Control Plane Functions
      - 11.1.1.1 Network Entry Management
      - 11.1.1.2 [Self-Organization Procedures]
      - 11.1.1.3 Mobility Management
        - 11.1.1.3.1 Measurement
        - 11.1.1.3.2 Reporting
        - 11.1.1.3.3 Inter-RAT
        - 11.1.1.3.2 Intra-RAT

- 11.1.1.4 Idle Mode Management
- 11.1.1.5 Radio Resource Management (RRM)
  - 11.1.1.5.1 Fixed Frequency Reuse
  - 11.1.1.5.2 Fractional Frequency Reuse (FFR)
  - 11.1.1.5.3 BS Coordination
  - 11.1.1.5.4 Load Control
  - 11.1.1.5.5 [Multi-carrier Support]
- 11.1.1.6 Location Management
- 11.1.1.7 [Routing]
- 11.1.2 Multicast and Broadcast Service Control Plane Functions
  - 11.1.2.1 Multicast and Broadcast Service Admission Control
  - 11.1.2.2 Multicast and Broadcast Service Session Management
  - 11.1.2.3 Multicast and Broadcast Service Radio Resource Management
  - 11.1.2.4 [Routing]
- 11.2 Medium Access Control Functions
  - 11.2.1 Control Plane Functions
    - 11.2.1.1 Connection Management
    - 11.2.1.2 Packet Forwarding
    - 11.2.1.3 QoS Control
    - 11.2.1.4 Flow Control
    - 11.2.1.5 Airlink Error Control
    - 11.2.1.6 Link Control and Adaptation
    - 11.2.1.7 Measurement and Feedback Control
    - 11.2.1.8 Control and Signaling
      - 11.2.1.8.1 Downlink

11.2.1.8.2 Uplink

11.2.1.9 Ranging and Random Access Mechanisms

11.2.1.10 [Multi-Radio Coexistence and Coordination Mechanisms]

11.2.2 Data Plane Functions

11.2.2.1 Packetization and Framing

11.2.2.1.1 MAC Headers and Sub-headers

11.2.2.1.2 Duplicate Detection and Sequencing

11.2.2.1.3 [Packet Forwarding for Relay]

11.2.2.1.4 Packet Segmentation and Reassembly

11.2.2.1.5 Packet Fragmentation

11.2.2.2 Scheduling Functions

## 12 Security Sub-layer

12.1 Data plane security functions and protocols

12.2 Control plane security functions and protocols

## 13 Physical Layer

13.1 Multiple Access Methods

13.1.1 Downlink

13.1.2 Uplink

13.2 OFDMA Numerology and Frame Structure

13.3 Duplexing Modes

13.4 Channel Coding and Signal Modulation

13.4.1 Channel coding

13.4.1.1 Downlink

13.4.1.1.1 Code structure and rates

13.4.1.1.2 FEC block sizes

- 13.4.1.1.3 H-ARQ
- 13.4.1.1.4 Interleaving
- 13.4.1.2 Uplink
  - 13.4.1.2.1 Code structure and rates
  - 13.4.1.2.2 FEC block sizes
  - 13.4.1.2.3 H-ARQ
  - 13.4.1.2.4 Interleaving
- 13.4.2 Signal Modulation
  - 13.4.2.1 Downlink
    - 13.4.2.1.1 Modulation orders
  - 13.4.2.2 Uplink
    - 13.4.2.2.1 Modulation orders
- 13.5 MIMO Structure
  - 13.5.1 Single Codeword and Multi-codeword
  - 13.5.2 Downlink
    - 13.5.2.1 Single user MIMO
      - 13.5.2.1.1 Open loop
      - 13.5.2.1.2 Closed loop
    - 13.5.2.2 Multi-user MIMO
      - 13.5.2.2.1 Open loop
      - 13.5.2.2.2 Closed loop
    - 13.5.2.3 Mode/Stream adaptation
  - 13.5.3 Uplink
    - 13.5.3.1 Single user MIMO
      - 13.5.3.1.1 Open loop

13.5.3.1.2 Closed loop

13.5.3.2 Multi-user MIMO

13.5.3.2.1 Virtual (Collaborative) MIMO

13.5.3.3 Mode/Stream adaptation

## 13.6 Physical Channels

13.6.1 Physical Data Channels

13.6.2 Physical Control Channels

13.6.3 Physical Broadcast Channels

13.6.4 Structure of Physical Resource Blocks

13.6.5 Subcarrier Permutation

13.6.6 Synchronization

13.6.7 Pilot Structure

13.6.8 Physical Channel Multiplexing

## 13.7 Physical Layer Procedures

13.7.1 Measurement

13.7.2 System Acquisition

13.7.3 Link adaptation

13.7.3.1 Adaptive Modulation and Coding

13.7.3.2 Power control

13.7.4 H-ARQ Mechanisms

## 14 RF Requirements

14.1 Out of Band Emissions

14.2 Spectral mask for mobile station

14.3 Spectral mask for the base station

## 15 Distinctive Features

- 15.1 Relay
- 15.2 Multi-Carrier Operation
- 15.3 Self-Organization
- 15.4 Multi-Radio Coexistence and Coordination Mechanisms