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Re:	Response to Sponsor Ballot on IEEE802.16e/D6 document
Abstract	This contribution describes the missing WirelessMAN-OFDMA system MAC and PHY profiles.
Purpose	To incorporate the text changes proposed in this contribution into the 802.16e/D6 draft.
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WirelessMAN-OFDMA System Profiles

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1. Problem Statement

In order to reflect new opportunities for providing broadband service in the 2.5 to 2.7 GHz bands, the FCC in June 2004, among other things, renamed the Multipoint Distribution Service (MDS) in the U.S. to become the Broadband Radio Service (BRS). Also, it renamed the Instructional Television Fixed Service (ITFS) in the same bands the Educational Broadband Service (EBS) for the same reason. The bands remain known as either MDS or the Multichannel, Multipoint Distribution Service (MMDS) in many other parts of the world. The FCC decision also expanded the original BRS/EBS (aka MDS-ITFS) band by adding to it five megahertz of additional spectrum from the Mobile Satellite Service below 2500 MHz, which increases the total size of the higher band to 194 megahertz.

There are missing WirelessMAN-OFDMA mobile system profile definitions in **Table 411** of IEEE Standard 802.16-2004. The 2.3GHz band for WiBro service in Korea should be also addressed in the profile definition.

2. Proposed solutions

We would like to propose 4.375MHz, 5MHz, 8.75MHz, and 10Mhz channel profiles (TDD only) to 2.3-2.7GHz licensed band.

3. Specific text changes

=== Start text changes ====

[Insert the following text after first paragraph in section 12.4]

A system profile consists of five components: MAC profile, PHY profile, RF profile, a duplexing selection, and a power class.

[Insert the following text to **Table 411a** *in section* **12.4 WirelessMAN-OFDMA and WirelessHUMAN(-OFDMA) system profiles** Editor to renumber table as appropriate*]*

Scaleable OFDMA system profiles shall contain multiple PHY and RF profiles. A complete OFDMA PHY and OFDMA MAC profile is listed in Table 411a.

Table 411a—WirelessMAN-OFDMA mobile profiles for 2.3-2.7GHz licensed band

Identifier	Description
OFDMA_profM2	WirelessMAN-OFDMA basic packet PMP MAC Profile supporting mobility
OFDMA_profP10̶8	WirelessMAN-OFDMA 4.375 MHz channel basic PHY profile for mobility
OFDMA_profP11̶9	WirelessMAN-OFDMA 5 MHz channel basic PHY profile for mobility
OFDMA_profP12̶1̶0	WirelessMAN-OFDMA 8.75 MHz channel basic PHY profile for mobility

| OFDMA_profP13~~11~~ | WirelessMAN-OFDMA 10 MHz channel basic PHY profile for mobility |
| ~~OFDMA_profP14~~ | ~~WirelessMAN-OFDMA 20 MHz channel basic PHY profile for mobility~~ |

=== End text changes ====

=== Start text changes ====

[Insert the following sections before section 12.4.3]

12.4.2.2 Basic Packet PMP WirelessMAN-OFDMA MAC Profile for Mobility

Profile identifier: OFDMA_profM2.

Mandatory Features:
—Support of Packet convergence sublayer.
—Support of Internet Protocol Ipv4 with Packet Header Suppression (PHS) ~~as the basic~~at a minimum.
—CRC functionality shall be supported for all connections.
—Support of dynamic services.
—Support of UGS/ert-PS services.
—Support of Real time services.
—Support of Best effort services.
—Support of Non-Real-Time Polling services.
—Support of CDMA based Initial and Periodic Ranging.
—Support of Contention based CDMA bandwidth requests.
—Support of Sleep Mode.
—Support of Idle Mode/Paging.
—Support of neighbor scanning procedures.
—Support of Break-Before-Make Handover.
—Support of ARQ.
—Support of H-ARQ.

12.4.2.2.1 Conventions for MAC Management Messages
The following rules shall be followed when reporting parameters in MAC Management messages:
—Service Class Names should not be used.
—No TLVs besides Error Encodings and MPDU Authentication tuples shall be reported back in DSA-RSP and DSC-RSP messages.
—No TLVs besides MPDU authentication tuples shall be reported back in DSA-ACK messages.
—DSC-REQ messages shall not contain Request/Transmission Policy, Fixed vs. Variable Length SDU Indicator,
SDU Size, ATM Switching, or Convergence Sublayer Specification TLVs.

12.4.2.2.2 MAC Management Message Parameter Transmission Order
Systems implementing the profile OFDMA_ProfM2 shall transmit the TLV encoded parameters for mandatory features in the respective messages. Those systems only include the parameters listed under the respective message in its transmission of said messages plus any parameters necessary for optional features. Parameters with defined default values should be omitted if the desired value coincides with the default one.

=== End text changes ====

=== Start text changes ====

*[Insert the following sections before section **12.4.4**]*

12.4.3.11 WirelessMAN-OFDMA 4.375 MHz channel basic PHY Profile for Mobility

Profile identifier: OFDMA_ProfP10.

Systems implementing OFDMA_ProfP10 shall meet the minimum performance requirements listed in Table 422a:

Table 422a—Minimum Performance requirements for OFDMA_ProfP10

Capability	Minimum Performance
Channel bandwidth	4.375 MHz
Operation mode	TDD (licensed bands only)
FFT Size	512
BER performance threshold, BER=10-6 (using all subchannels BS/SS) QPSK-1/2 QPSK-3/4 16QAM-1/2 16QAM-3/4 64QAM-2/3 (if 64-QAM supported) 64QAM-3/4 (if 64-QAM supported) (Add $10 \cdot \log_{10}\left(\dfrac{NumberOfSub ChannelsUsed}{TotalNumberOfSubchannels}\right)$ to sensitivity when not all subchannels are used in the BS/SS Rx)	$\leq$ -86.5 dBm $\leq$ -84.5 dBm $\leq$ -79.5 dBm $\leq$ -77.5 dBm $\leq$ -72.5 dBm $\leq$ -71.5 dBm

Reference frequency tolerance
   BS to BS
   BS
   SS to BS synchronization tolerance
	Synchronized with common time base
	
	$\leq$ $\pm$ 2*10-6
	$\leq$ 50 Hz

Frame duration code set	{4} (5ms)

12.4.3.12 WirelessMAN-OFDMA 5 MHz channel basic PHY Profile for Mobility

Profile identifier: OFDMA_ProfP11.

Systems implementing OFDMA_ProfP11 shall meet the minimum performance requirements listed in Table 422b:

Table 422b—Minimum Performance requirements for OFDMA_ProfP11

Capability	Minimum Performance
Channel bandwidth	5 MHz
Operation mode	TDD (licensed bands only)
FFT Size	512

BER performance threshold, BER=10-6 (using all subchannels BS/SS)	
QPSK-1/2	≤ -86 dBm
QPSK-3/4	≤ -84 dBm
16QAM-1/2	≤ -79 dBm
16QAM-3/4	≤ -77 dBm
64QAM-2/3 (if 64-QAM supported)	≤ -72 dBm
64QAM-3/4 (if 64-QAM supported)	≤ -71 dBm
(Add $$10 \cdot \log_{10}\left(\frac{NumberOfSub\,ChannelsUsed}{TotalNumberOfSubchannels}\right)$$ to sensitivity when not all subchannels are used in the BS/SS Rx)	
Reference frequency tolerance BS to BS BS SS to BS synchronization tolerance	Synchronized with common time base ≤ ± 2*10-6 ≤ 50 Hz
Frame duration code set	{4} (5ms)

12.4.3.13 WirelessMAN-OFDMA 8.75 MHz channel basic PHY Profile for Mobility

Profile identifier: OFDMA_ProfP12.

Systems implementing OFDMA_ProfP12 shall meet the minimum performance requirements listed in Table 422c:

Table 422c—Minimum Performance requirements for OFDMA_ProfP12

Capability	Minimum Performance
Channel bandwidth	8.75 MHz
Operation mode	TDD (licensed bands only)
FFT Size	1024
BER performance threshold, BER=10-6 (using all subchannels BS/SS)	
QPSK-1/2	≤ -83.5 dBm
QPSK-3/4	≤ -81.5 dBm
16QAM-1/2	≤ -76.5 dBm
16QAM-3/4	≤ -74.5 dBm
64QAM-2/3 (if 64-QAM supported)	≤ -70.5 dBm
64QAM-3/4 (if 64-QAM supported)	≤ -68.5 dBm
(Add $$10 \cdot \log_{10}\left(\frac{NumberOfSub\,ChannelsUsed}{TotalNumberOfSubchannels}\right)$$ to sensitivity when not all subchannels are used in the BS/SS Rx)	
Reference frequency tolerance BS to BS BS SS to BS synchronization tolerance	Synchronized with common time base ≤ ± 2*10-6 ≤ 50 Hz
Frame duration code set	{4} (5ms)

12.4.3.14 WirelessMAN-OFDMA 10 MHz channel basic PHY Profile for Mobility

Profile identifier: OFDMA_ProfP13.

Systems implementing OFDMA_ProfP13 shall meet the minimum performance requirements listed in Table 422d:

Table 422d—Minimum Performance requirements for OFDMA_ProfP13

Capability	Minimum Performance
Channel bandwidth	10 MHz
Operation mode	TDD (licensed bands only)
FFT Size	1024
BER performance threshold, BER=10-6 (using all subchannels BS/SS) QPSK-1/2 QPSK-3/4 16QAM-1/2 16QAM-3/4 64QAM-2/3 (if 64-QAM supported) 64QAM-3/4 (if 64-QAM supported) (Add $$10 \cdot \log_{10}\left(\frac{\text{NumberOfSub ChannelsUsed}}{\text{TotalNumberOfSubchannels}} \right)$$ to sensitivity when not all subchannels are used in the BS/SS Rx)	 $\leq$ -83 dBm $\leq$ -81 dBm $\leq$ -76 dBm $\leq$ -74 dBm $\leq$ -69 dBm $\leq$ -68 dBm

Reference frequency tolerance
   BS to BS
   BS
   SS to BS synchronization tolerance
	Synchronized with common time base
	$\leq \pm 2*10\text{-}6$
	$\leq$ 50 Hz

Frame duration code set	{4} (5ms)

12.4.3.15 WirelessMAN-OFDMA 20 MHz channel basic PHY Profile for Mobility

Profile identifier: OFDMA_ProfP14.

Systems implementing OFDMA_ProfP14 shall meet the minimum performance requirements listed in Table 422e:

Table 422e—Minimum Performance requirements for OFDMA_ProfP14

Capability	Minimum Performance
Channel bandwidth	20 MHz
Operation mode	TDD (licensed bands only)
FFT Size	2048

BER performance threshold, BER=10-6 (using all subchannels BS/SS)	
QPSK 1/2	≤ -79 dBm
QPSK 3/4	≤ -76 dBm
16QAM 1/2	≤ -72 dBm
16QAM 3/4	≤ -69 dBm
64QAM 2/3 (if 64-QAM supported)	≤ -65 dBm
64QAM 3/4 (if 64-QAM supported)	≤ -63 dBm
(Add $10 \cdot \log_{10}\left(\dfrac{NumberOfSub\,ChannelsUsed}{TotalNumberOfSubchannels}\right)$ to sensitivity when not all subchannels are used in the BS/SS Rx)	
Reference frequency tolerance	Synchronized with common time base
BS to BS	
BS	≤ ± 2*10-6
SS to BS synchronization tolerance	≤ 50 Hz
Frame duration code set	{4} (5ms)

=== End text changes ====

=== Start text changes ====

*[Insert the following **Table 423a** in section **12.4.4**]*

Table 423a - 802.16e Addendum for RF Profiles in BRS Licensed Band (TDD)

RF Profile Name	Channel Bandwidth	Center Frequency Step ΔFc	F_{start}	N_{range}
OFDMA_ProfR32	4.375	0.25	2498	{0, …, 760}
OFDMA_ProfR33	5	0.25	2498	{0, …, 760}
OFDMA_ProfR34	8.75	0.25	2498	{0, …, 760}
OFDMA_ProfR35	10	0.25	2498	{0, …, 760}
OFDMA_ProfR36	20	0.25	2498	{0, …, 760}

=== End text changes ====

4. References

[1]   IEEE Standard 802.16e/D6-2005
[2]   IEEE Standard 802.16-2004