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Title	**Clarification for TLV encodings (Revised)**
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	Yeongmoon Son **Samsung Electronics Ltd.** **ym1004.son@samsung.com**
Re:	**Call for Maintenance Change Requests on IEEE Std 802.16**
Abstract	**This document suggests changes in TGe Draft Document IEEE 802.16e-2005 to clarify TLV encodings**
Purpose	**Adopt into the current Maint TG draft**
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Clarification for TLV encodings

Yeongmoon Son*, Hyongoo Kang*, Guenwhi Lim*, Yerang Hur**, Lei Wang***, Erik Colban***
Dave Pechner#, Sang Youb Kim ##

Samsung Electronics Ltd*., Posdata**, Nextwave***, ArrayComm#, Nortel##

Background

In IEEE Std 802.16-2004 and 802.16e-2005, there are many TLV encodings used commonly in several MAC management messages besides common encodings, nevertheless, each of them is defined with different Type filed in each different message. It seems to be a duplicate. Why do they exist with each different Type? Why don't we merge them to a single TLV encoding as common TLV. Actually, there are many Types which are unused and available for common TLV encoding (61 ~ 141).

We think TLV encoding, which is used commonly in more than a message at least, should be defined in common encodings with scope field of messages.

For example)

Enabled-Action-Triggered TLV:

This TLV is included in MOB_SLP-REQ/RSP message (Type 3)

This TLV is also included in RNG-RSP message (Type 32). But, it has the same function as TLV included in MOB_SLP-REQ/RSP

Also, there are some errors in even current TLV encoding such as the null value and the value collision of Type field. In other words, some TLV encodings have Type field with no value, and some TLV encodings share the same Type value.

For example)

Ranging_Parameters_Validity_Time TLV has no value in TLV encoding

FSN size and PDU_SN extended subheader for HARQ reordering share the same Type 146/147.42 (Tag collision)

Besides the above examples, because there may be so many errors to fix, we have to check validity of TLV Type assignment together.

Proposed Changes

Before we propose the change, we have to know the following rule applied for common encoding. (Please refer to the section 11 on Page 645 in IEEE Std 802.16-2004)
TLV Type values are assigned in accordance with the following rules:
— Common encodings start at 149, subsequent values are assigned in descending order.
— For individual collections, non-PHY specification specific encodings start at 1, subsequent values are assigned in ascending order.
— For individual collections, PHY specification specific encodings start at 150, subsequent values are assigned in ascending order.
On basis of the above rules, we propose the followings

1. TLV encodings to be defined in Common TLV encodings

1.1. Enabled-Action-Triggered

[Move the section 11.17.3 on Page 755 after 11.1.7 and modify it as follows]

11.1.8 Sleep mode specific information
~~11.17.3~~11.1.8.1 Enabled-Action-Triggered
This value indicates the enabled action that MS performs upon reaching trigger condition in sleep mode. MS may include this TLV item in MOB_SLP-REQ message to request an activation of type of Power Saving Class. BS shall include this TLV in MOB_SLP-RSP message transmitted in response to the MOB_SLP-REQ message.

Type	Length	Value	Scope
~~3~~139	1	Indicates action performed upon reaching trigger condition in sleep mode If bit#0 is set to 1, respond on trigger with MOB_SCN-REP~~ORT~~ If bit#1 is set to 1, respond on trigger with MOB_MSHO-REQ If bit#2 is set to 1, on trigger, MS starts neighboring BS scanning process by sending MOB_SCN-REQ Bit#3–bit#7: *Reserved*. Shall be set to 0.	MOB_SLP-REQ/RSP RNG-REQ/RSP

[Remove Enabled-Action-Triggerd TLV encoding in Table 364 on Page 678 and Table 367 on Page 683]

[Modify the sentence on Page 55 Line 4, Page 114 Line 4 and Page 117 Line 43, as follows]

Enabled-Action-Triggered (11.1.8.1)
[Modify the sentence on Page 114 Line 4 as follows]

MS in sleep mode may maintain triggers to perform event-based actions based on TLV encodings for CINR, RSSI, and RTD trigger (see Table 358.) received in DCD message or the TLV encodings for Neighbor BS CINR and Neighbor BS RSSI trigger (see Table 348e.) received in MOB_NBR-ADV message. For this purpose, MS may include Enabled-Action-Triggered TLV(11.1.8.1) in RNG-REQ or MOB_SLP-REQ message requesting

to associate specific actions with certain triggers.

1.2. SLPID_Update

[Move the section 11.16.1 on Page 754 after 11.1.7 and Modify it as follows]

11.1.8 Sleep mode specific information
~~11.16.1~~11.1.8.2 SLPID_Update
The SLPID_Update TLV specifies a new SLPID that replaces an old SLPID. This TLV may include multiple Old_New_SLPID values for the MSs negatively indicated in MOB_TRF-IND message.

Type	Length	Value	Scope
~~1~~138	variable	See following table	RNG-RSP MOB_TRF-IND

Field	Length (bits)	Notes
Old New SLPID	20	First 10 bits indicates old SLPID and the second 10 bits indicates new SLPID

[Modify the sentence on Page 54 Line 37 and Page 120 Line 17, as follows]

SLPID_Update (~~11.17.1~~11.1.8.2)
[Modify the sentence in 6.3.2.3.46 on Page 118 Line 15 as follows]

There are two formats for the MOB_TRF-IND message, indicated by the FMT field. When FMT = 0, if the MS does not find its own SLPID-Group Indication bit-map or Traffic Indication bit-map to its SLPID in the MOB_TRF-IND message, it will consider this as a negative indication and may continue its sleep mode. The MS shall update its SLPID if it finds its own Old_New_SLPID in SLPID_Update TLV(11.1.8.2). When FMT = 1, if the MS does not find its own SLPID in the MOB_TRF-IND message, it will consider this as a negative indication and may continue its sleep mode.
[Modify the sentence in 6.3.21.1 on Page 229 Line 24 as follows]

In MOB_TRF-IND message with negative indication for the MS, the BS may include an updated SLPID for an MS by appending SLPID_Update TLV(11.1.8.2) in the MOB_TRF-IND message. When the received MOB_TRF-IND message includes a SLPID_Update TLV, the MS shall decode the TLV and, if addressed, update its SLPID to the new one. The MS shall identify if the SLPID_Update TLV addresses it by searching through the SLPID_Update TLV and determining if the MS's current SLPID matches the Old_SLPID in the SLPID_Update TLV. If they match, then the MS shall set its SLPID to the New_SLPID provided in the SLPID_Update TLV. For an example of sleep mode operation, see Annex D.
[Modify the sentence in 6.3.21.5 on Page 233 Line 34 as follows]

The BS may include a SLPID_Update TLV(11.1.8.2) item in a RNG-RSP message for an MS in sleep mode. If the serving BS receives a RNG-REQ message from an MS in sleep mode and there is any need to update SLPID assigned to the MS, the BS shall append a SLPID_Update TLV to the RNG-RSP message only for a RNG-RSP message with ranging status flag set to 'success'. When the received RNG-RSP message with ranging status flag set to 'success' includes a SLPID_Update TLV, the MS shall decode the TLV and update its SLPID to the new one. The MS shall identify if the SLPID_Update TLV addresses it by searching through the SLPID_Update TLV and determining if the MS's current SLPID matches the Old_SLPID in the SLPID_Update TLV. If they match, then the MS shall set its SLPID to the New_SLPID provided in the SLPID_Update TLV.

1.3. Next_Periodic_Ranging

[Move the section 11.16.2 on Page 754 after 11.1.7 and Modify it as follows]

11.1.8 Sleep mode specific information

~~11.16.2~~11.1.8.3 Next Periodic Ranging
This value indicates offset of the frame in which the periodic ranging will be performed with respect to the frame where MOB_SLP-RSP or RNG-RSP with ranging status = 'success' is transmitted. If MS receives MOB_SLP-RSP or RNG-RSP message with 'Next Periodic Ranging' = 0, it shall deactivate all active Power Saving Classes and return to Normal Operation.

Type	Length	Value	Scope
~~2~~137	2	Offset in frames	MOB_SLP-RSP RNG-RSP

[Remove Next Periodic Ranging TLV encoding in Table 367 on Page 682]

[Modify the sentence on Page 55 Line 14 and Page 117 Line 35, as follows]

Next_Periodic Ranging (11.1.8.3)
[Modify the sentence in 6.3.21.4 on Page 232 Line 31 as follows]

Alternatively Power Saving Class of type III may be defined/activated by TLV encodings in RNG-RSP message. For periodic ranging Next Periodic Ranging TLV encoding may be used. It activates special Power Saving Classes of type III associated with periodic ranging procedure. In this case the sleep window of the class starts in the next frame after RNG-RSP transmitted and ends in the previous frame, which Next Periodic Ranging TLV(11.1.8.3) indicates.
[Modify the sentence in 6.3.21.5 on Page 233 Line 18 as follows]

6.3.21.5 Periodic Ranging in sleep mode
For each MS in sleep mode, during its listening-window, BS may allocate an UL transmission opportunity for periodic ranging. Alternatively, BS may return the MS to Normal Operation by deactivation of at least one Power Saving Class to keep it in active state until assignment of a UL transmission opportunity for periodic ranging, or let the MS know when the periodic ranging opportunity shall occur with Next Periodic Ranging TLV(11.1.8.3) in last successful RNG-RSP.

1.4. MAC Hash Skip Threshold
[Add a new section 11.1.9 after 11.1.7 as follows]

11.1.9 Idle mode specific information
11.1.9.1 MAC Hash Skip Threshold
'MAC Hash Skip Threshold' indicates the maximum number of successive MOB_PAG-ADV messages without individual notification to the MS. If the value is 0xFF, the BS shall omit the MS MAC address hash of the MS with Action Code=0x00 in MOB_PAG-ADV messages. If the value is zero, the BS shall include the MS MAC address hash of the MS in every MOB_PAG-ADV message.

Type	Length	Value	Scope
136	1	0x00 –0xFE: Initial value of the MAC Hash Skip Threshold Counter (refer to section 6.3.24.6) 0xFF: The BS shall omit the MS MAC Address hash in MOB_PAG-ADV messages and MS does not start MAC Hash Skip Counter (sections 6.3.24.6 and 6.3.24.8.1.4).~~This value indicates the maximum number of successive~~	RNG-REQ/RSP, DREG~~DRE~~-REQ/CMD

		~~MOB_PAG-ADV messages that may be sent from a BS without individual notification for an MS, including MAC address hash of an MS for which Action Code in DREG-CMD message is 00(i.e. 'No Action Required'). If the value is set to 0xFF, a BS shall omit MAC Address hash of the MS with 'No Action Required' for every MOB_PAG-ADV message. On the contrary, if the value is set to zero, a BS shall include the MS MAC Address hash in every MOB_PAG-ADV message.~~	

[Remove MAC Hash Skip Threshold TLV encoding in table 364 on Page 678 and table 367 on Page 682]

[Remove MAC Hash Skip Threshold TLV encoding in section 11.14 on Page 752]

[Modify the sentence on Page 52 Line 5, Page 54 Line 31, Page 78 Line 7, and Page 82 Line 3, as follows]

MAC Hash Skip Threshold (refer to 11.1.9.1)

[Modify the sentence in 6.3.24.1 on Page 261 Line 10 as follows]

The MS may request BS inclusion of MS MAC Address Hash in MOB_PAG-ADV message at regular intervals, regardless of need for notification, by including 'MAC Hash Skip Threshold' (11.1.9.1) in DREG-REQ with Action Code=0x01. The value of MAC Hash Skip Threshold specifies the maximum number of successive MOB_PAG-ADV messages that may be sent from a BS without individual notification for an MS, including MAC Address Hash of an MS for which Action Code is 00, 'No Action Required'. Provided the BS approves the MS deregistration with initiation of Idle Mode and elects MAC Hash Skip Threshold function, the BS shall respond by sending DREG-CMD message with Action Code=0x05 and including the MAC Hash Skip Threshold TLV.

[Modify the sentence in 6.3.24.6 on Page 264 Line 1 as follows]

When MAC Hash Skip Threshold (11.1.9.1) set to 0xFF is included in DREG-CMD message at MS Idle Mode Initiation, MAC Address Hash of an MS shall be omitted in every MOB_PAG-ADV message for which the MS need not be paged, and as would result in MOB_PAG-ADV

[Modify the sentence in 6.3.24.8.1.4 on Page 266 Line 13 as follows]

6.3.24.8.1.4 MAC Hash Skip Threshold update

The MS shall perform Location Update process when the MS MAC Hash Skip Counter exceeds MAC Hash Skip Threshold(11.1.9.1) successively. After successful Location Update, the BS and MS shall re-initialize their respective MAC Hash Skip Counters.

1.5. Paging Controller ID

[Add a new section 11.1.9 after 11.1.7 as follows]

11.1.9 Idle mode specific information

11.1.9.2 Paging Controller ID

Type	Length	Value	Scope
135	6	This is a logical network identifier for the serving BS or other network entity retaining MS service and operational information and/or administering paging	RNG-REQ/RSP, DREG-CMD

		activity for the MS while in Idle Mode. ~~In case of RNG-RSP message, Paging Controller ID shall be included in it only if Location Update Response is set to 0x01 and Paging Controller ID has changed.~~	

[Remove Paging Controller ID TLV encoding in table 364 on Page 678 and table 367 on Page 682]

[Remove Paging Controller ID TLV encoding in section 11.14 on Page 752]

[Modify the sentence on Page 51 Line 34, Page 54 Line 12 and Page 77 Line 18]

The following TLV shall be included only if the Location Update Response is set to 0x00 (Success of Idle Mode Location Update) and the Paging Controller ID has changed

Paging Controller ID (refer to 11.1.9.2)

[Modify the sentence in 6.3.2.3.8 on Page 57 Line 33 as follows]

For mobile stations, when the information is available to create CID update TLV, the target BS shall include the CID_update and SAID_update TLVs in the REG-RSP for an MS recognized by the target BS as performing HO or Network Re-entry from Idle Mode. BS may include the Compressed CID Update TLVinstead of the CID_update TLV in REG-RSP message if CID update procedure is required. The target BS recognizes an MS performing Network Re-entry from Idle Mode by the presence of a serving BSID or Paging Controller ID(refer to 11.1.9.2) and Ranging Purpose Indication with Bit #0 set to 1 in the RNG-REQ message.

[Modify the sentence in 6.3.24.1 on Page 261 Line 27 as follows]

For MS terminating Normal Operation with the serving BS and entering Idle Mode, the Paging Controller—the serving BS or other network entity administering Idle Mode activity for the MS—may retain certain MS service and operational information useful for expediting a future MS network re-entry from Idle Mode. The MS may request the Paging Controller (refe to subclause 11.1.9.2) ~~retention of~~to retain specific MS service and operational information for Idle Mode management purposes through inclusion of the Idle Mode Retain Information element in the DREG-REQ management message.

[Modify the sentence in 6.3.24.8.2.1 on Page 266 Line 27 as follows]

6.3.24.8.2.1 Secure Location Update process
If the MS shares a valid security context with the target BS such that the MS may include a valid HMAC/ CMAC Tuple in the RNG-REQ, then the MS shall conduct initial ranging with the target BS by sending a RNG-REQ including Ranging Purpose Indication TLV with Bit #1 set to 1, Location Update Request and Paging Controller ID TLVs(refer to 11.1.9.2) and HMAC/CMAC Tuple. If the target BS evaluates the HMAC/CMAC Tuple

[Modify the sentence in 6.3.24.9 on Page 267 Line 7 as follows]

6.3.24.9 Network Re-Entry from Idle Mode
For the Network Re-Entry from Idle Mode method, the MS shall initiate network re-entry with the target BS by sending a RNG-REQ including Ranging Purpose Indication TLV with Bit #0 set to 1 and Paging Controller ID TLVs(refer to 11.1.9.2).

1.6. Paging Information
(Problem : In addition to common usage this TLV encoding , there is one more problem .

In IEEE802.16e-2005, the following text is described.

A BS Paging Interval shall occur during the N frames beginning with the frame whose Frame number, Nframe, meets the condition

Nframe modulo PAGING_CYCLE == PAGING_OFFSET

on each BS, where N is Paging Interval Length.

As you know in the above equation, PAGING_OFFSET can have the range from '0' to 'PAGING_CYCLE-1'. Therefore, PAGING_OFFSET shall have the same length as PAGING_CYCLE in TLV encoding. That is, PAGING_OFFSET shall be 16bit -long like a PAGING_CYCLE.

It means that BS can disperse the MS entering idle mode over the duration 'PAGING_CYCLE' for the scheduling)

[Add a new section 11.1.9 after 11.1.7 as follows]

11.1.9 Idle mode specific information
11.1.9.3 Paging Information
In case of RNG-RSP message, Paging Information shall be included if Location Update Response is set to 0x00~~1~~ and Paging Information has changed.

Type	Length	Value	Scope
134	~~5~~6	Bits ~~15:0~~#0-15 - PAGING_CYCLE--Cycle in which the paging message is transmitted within the paging group Bits ~~23:16~~#16-31 – PAGING OFFSET—Determines the frame within the cycle in which the paging message is transmitted. Must be smaller than PAGING CYCLE value Bits~~39:24~~#32-47– Paging-group-ID—ID of the paging group the MS is assigned to	RNG-RSP, DREG-CMD

[Remove Paging Information TLV encoding in table 367 on Page 682 and in section 11.14 on Page 752]

[Modify the sentence on Page 77 Line 15]

Paging Information (see ~~11.14~~11.1.9.3)

[Modify the sentence on Page 54 Line 9]

The following TLV shall be included only if the Location Update Response is set to 0x00 (Success of Idle Mode Location Update) and the Paging Controller ID has changed

Paging Information (11.1.9.3)
New Paging Information assigned to MS. Paging Information shall only be included if Location Update Response = 0b01 and if Paging Information has changed.

1.7. Global Service Class Name

(Problem : In addition to common usage this TLV encoding , there is one more problem .

Currently, the TLV encoding Global Service Class Name has a 4 byte-long value field

as you see in the table 124a on Page 211 and 367 on Page 680.)

[Modify the 2nd Table 367 on Page 680 as follows]

Table 367 – RNG-RSP message encodings

Name	Type (1 byte)	Length	Value (Variable-length)	PHY Scope
Service Level Prediction	17	1	This value indicates the level of service the MS can expect from this BS. The following encodings apply: 0 = No service possible for this MS 1 = Some service is available for one or several service flows authorized for the MS. 2 = For each authorized service flow, a MAC connection can be established with QoS specified by the AuthorizedQoSParamSet. 3 = No service level prediction available.	All
Global Service Class Name	~~18~~[145/146].35	4	— Compound TLV incorporating one or more ~~11.13.24~~ Global Service Class Name encodings (11.13.24)	All
QoS Parameters	[145/146]	variable	Compound TLV incorporating one or more 11.13 QoS Parameter Set definition encodings	All

[Modify the section 11.13.24 on Page 746 as follows]

11.13.24 Global Service Class Name

The value of this field refers to a predefined BS service configuration to be used for this service flow. The Global Service Class Name itself contains coded references to extensible tables defining QoS Parameters.

Type	Length	Value	Scope
[145/146].35	~~64~~	Variable: combination of ASCII characters and hex values	DSx-REQ DSx-RSP DSx-ACK RNG-RSP

2. TLV encodings to be fixed

2.1. Conventions for TLV encoding

(Problem : In IEEE Std 802.16-2004, it is defined that MAC message is constructed and transmitted by the descending order starting from MSB (refer to 6.3.3.1 on Page 121 in IEEE Std 802.16-2004).

But, regarding TLV encodings, it is not explicitly defined whether TLV encoding is encoded

by the descending order starting from MSB or by the ascending order starting from LSB. Hence, we need to explicitly describe that the descending order starting from MSB should be applied to construct the TLV encoding within a MAC management message in IEEE Std. 802.16e-2005.)

[Change the following sentence at section 6.3.3.1]

b) Fields of MAC messages and fields of TLV encodings, which are specified in this standard as binary numbers (including CRC and HCS), are transmitted as a sequence of their binary digits, starting from MSB. Bit masks (for example, in ARQ) are considered numerical fields. And the fields of TLV encodings in MAC management messages are encoded in the order of Type, Length and Value. For signed numbers MSB is allocated for the sign. Length field in the "definite from" of ITU-T X.690 is also considered a numerical field.

2.2 Ranging_Parameters_Validity_Time

(Problem : The value field of this TLV encoding is missing)

[Assign Type '1' to Ranging_Parameters_Validity_Time TLV encoding on Page 758 , as follows]

11.19 MOB_SCN-REP message encodings

Name	Type	Length	Value
Ranging_Parameters_Validity_Time	—1	1	Estimated number of frames starting from the frame following the reception of the MOB_SCN-REP message, in which channel parameters learned by the MS during Association of specific BS stay valid and can be reused during future Network Reentry to the BS without additional CDMA-based Initial Ranging. A value of zero in this parameter signifies that this parameter should be ignored

2.3. FSN size

(Problem : This TLV shares the Type value which is assigned to PDU_SN extended subheader for HARQ. Actually FSN size already has Type 145/146.38 as defined in Table 383 on Page 735)

[Modify the section 11.13.22 as follows]

11.13.22 FSN size

This TLV indicates the size of the FSN for the connection that is being setup. A value of 0 indicates that FSN is 3-bit long and a value of 1 indicates that FSN is 11-bit long.

Type	Length	Value	Scope
[145/146].~~42~~38	1	0 = 3-bit FSN 1 = 11-bit FSN Default = 1	DSA-REQ, DSA-RSP, DSA-ACK

2.4. OFDM SS uplink power control support

(Problem : This TLV is not OFDMA specific parameter. It should be moved to the section 11.8.3.6 WirelessMAN -OFDM specific parameters

[Move the section 11.8.3.7.10 on Page 704 after 11.8.3.6.6 and Modify it as follows]

~~11.8.3.7.10~~ 11.8.3.6.7 OFDM SS uplink power control support
The 'OFDM SS uplink power control support' field indicates the uplink power control options supported by a WirelessMAN-OFDM PHY SS for uplink transmission This field is not used for other PHY specifications. A bit value of 0 indicates "not supported" while 1 indicates "supported".

2.5. CMAC and Short-HMAC Tuple

(Problem : As described in section 11 in IEEE Std 802.16-2004, Common encodings shall have the Type value less than 150. But, CMAC tuple and Short-HMAC tuples have 150 and 151 respectively. Actually, Type 150 assigned for CMAC tuple is shared by 'OFDMA SSMS FFT sizes' TLV in SBC-REQ/RSP message. Type 151 assigned for Short-HMAC Tuple has a conflict with 'OFDMA SS demodulator' TLV in SBC-REQ/RSP message.)

[Modify the Table 348a on Page 662 as follows]

Table 348a—CMAC Tuple definition

Type	Length	Value	Scope
~~150~~141	13 or 19	See Table 348b	DSx-REQ, DSx-RSP, DSx-ACK, REG-REQ,REG-RSP, RES-CMD, DREG-CMD, TFTP-CPLT, PKM-REQ, PKM-RSP, MOB_SLP-REQ, MOB_SLP-RSP, MOB_SCN-REQ, MOB_SCN-RSP, MOB_BSHO-REQ, MOB_MSHO-REQ, MOB_BSHO-RSP, MOB_HO-IND, DREG-REQ

[Modify the Table 348c on Page 662 as follows]

Table 348c—Short-HMAC Tuple definition

Type	Length	Value	Scope
~~151~~140	variable	See Table 348d	MOB_SLP-REQ, MOB_SLP-RSP, MOB_SCN-REQ, MOB_SCN-RSP, MOB_MSHO-REQ, MOB_BSHO-RSP, MOB_HO-IND, RNG-REQ, RNG-RSP, PKM-REQ, PKM-RSP

2.6. Power Down Response

(Problem : Power Down Response TLV encoding is described in section 6.3.2.3.6 but not defined in section 11.

Actually, Power Down Response TLV encoding is included in RNG-RSP in response to Power Down Indicator in RNG-REQ message from an MS that is performing Location Update due to power down. Therefore, the function of Power Down Response TLV is duplicated with Location Update Response TLV encoding.

~~(The following is modified from original version which is shown in WiMAX_MTG_Cor2_TLV Adhoc R4.doc as a resolution)~~

[Modify the paragraph on Page 54 Line 1 as follows]

When a BS sends a RNG-RSP message in response to a RNG-REQ message containing Paging Controller ID or a Power Down Indicator, the BS shall include the following TLV parameter in the RNG-RSP message:
Location Update Response
Response to Idle Mode LocationUpdate Request (refer to Table 367)~~:~~
~~0x00= Success of Location Update~~

~~0x01 = Failure of Power Down Location Update~~

~~0bx002=Failure of Idle Mode Location Update except Power Down Location Update (i.e Paging Group Update, Timer Update, or MAC Hash Skip Threshold Update). The MS shall perform Network Re-entry from Idle Mode~~

~~0b01=Success of Idle Mode Location Update~~

~~0b10, 0b11~~0x03~~-0xFF: *Reserved*~~

[~~Modify~~ Delete the paragraph on Page 55 Line 26 ~~as follows~~]

~~The following TLV parameter shall be included in the RNG-REQ~~RSP ~~message when a BS sends RNG-RSP message as a reply to the RNG-REQ message from an MS that is performing Location Update due to power down and:~~
~~Power Down Response~~
~~Indicates the MS's Power Down Location Update result.~~
~~0x00= Failure of Power Down Information Update.~~
~~0x01= Success of Power Down Information Update.~~

[Modify Location Update Response TLV to Table 367 on Page 682 as follows]

Table 367 – RNG-RSP message encodings *(continued)*

Name	Type (1 byte)	Length	Value (Variable-length)	PHY Scope
SBC-RSP encodings	29	variable	SBC-RSP TLV items for HO optimization Only transmitted if HO Process Optimization[bit#8]==1	All
REG-RSP encodings	30	variable	REG-RSP TLV items for HO optimization Only transmitted if HO Process Optimization[bit#9]==1.	All
Location Update	23	1	0x00= Success of Location Update	All

Response			~~0x000~~0x01= Failure of Location Update~~ - The MS shall perform Network Re-entry from Idle Mode~~ ~~0x01= Success of Location Update~~ ~~0x10, 0x11~~0x02 ~ 0xFF: *Reserved*	
…	…	…	…	…

2.7. REP-RSP management message encodings

(Problem : Wrong type defintions in the TLVs for REP-RSP message.

There are only two compound parameters(refer to 11.12 in IEEE Std 802.16-2004)

in the top-level TLV of REP-RSP message as follows

- Type 1 : Report

- Type 2 : Channel Type Report in WirelessMAN OFDMA PHY

Therefore, there only can be 1.X or 2.X for the sub-types..

However, 16e added tables with sub-types 3.x, 4.x, 5.x, and 6.x, by mistake / misunderstanding of the TLV mechanism.)

[Modify the tables on Page 729 Line 11 as follows]

Insert the following table at the end of the subclause:

REP-REQ Zone-specific physical CINR request	Name	Type	Length	Value
Bits #0-2 = 0b000	PUSC zone with 'use all SC=0'	~~3.1~~2.6	1 or 2	…….
Bits #0-2 = 0b001	PUSC zone with 'use all SC=1'	~~3.2~~2.7	1 or 2	…….
Bits #0-2 = 0b010	FUSC zone	~~3.3~~2.8	1 or 2	…….
Bits #0-2 = 0b011	Optional FUSC zone	~~3.4~~2.9	1 or 2	…….
Bits #0-2 = 0b100	Safety channel	~~3.5~~2.10	5	…….
Bits #0-2 = 0b101	AMC zone	~~3.6~~2.11	1 or 2	…….

REP-REQ Zone-specific physical CINR request	Name	Type	Length	Value
Bits #0-1 = 0b00	The estimation of physical CINR measured from preamble for frequency reuse configuration=1	~~4.1~~2.12	1 or 2	…….
Bits #0-1 = 0b01	The estimation of physical CINR measured from	~~4.2~~2.13	1 or 2	…….

	preamble for frequency reuse configuration=3			
Bits #0-1 = 0b10	The estimation of physical CINR measured from preamble for Band AMC zone.	~~4.3~~2.14	4	…….

REP-REQ Zone-specific effective CINR request	Name	Type	Length	Value
Bits #0-2 = 0b000	PUSC zone with 'use all SC=0'	~~5.1~~2.15	1	…….
Bits #0-2 = 0b001	PUSC zone with 'use all SC=1' / PUSC AAS zone	~~5.2~~2.16	1	…….
Bits #0-2 = 0b010	FUSC zone	~~5.3~~2.17	1	…….
Bits #0-2 = 0b011	Optional FUSC zone	~~5.4~~2.18	1	…….
Bits #0-2 = 0b101	AMC AAS zone	~~5.5~~2.19	1	…….

REP-REQ preamble effective CINR request	Name	Type	Length	Value
Bits #0-1 = 0b00	The estimation of effective CINR measured from preamble for frequency reuse configuration= 1	~~6.1~~2.20	1	…….
Bits #0-1 = 0b01	The estimation of effective CINR measured from preamble for frequency reuse configuration= 3	~~6.2~~2.21	1	…….

NOTE—CQICH_ID applies to triggered update (see 6.3.18.2) for CQI channel allocated with a CQICH_ID, and shall be zero in all other cases.

REP-REQ Channel selectivity report	Name	Type	Length	Value
Bits #0 = 1	Frequency selectivity report	~~6.3~~2.22	3	…….

2.8. SLPID

(Problem : As you know, the length of SLPID used in Sleep Mode is 10bits. But, the length of SLPID TLV encoding is 1 byte-long. Therefore, the length of SLPID TLV encoding should be at least 2 byte-long to cover a range from 0 to 1023.)

[Modify the table 364a on Page 670 as follows]

Table 364a – Power saving class parameters

Name	Type (1 byte)	Length	Value (Variable-length)
Flags	1	1	……
……	……	……	……
SLPID	9	~~1~~2	Assigned Power Saving Class identifier Not used for RNG-REQ message
…	…	…	…

2.9. Paging Interval Length

(Problem : As you know, Paging Interval Length TLV encoding has a range from 2 to 5 frames as you know from Table 342 on Page 657. And, an MS shall awaken and monitor MOB_PAG-ADV message so that BS can notify MS of its paging anytime within period notified via DCD message (i.e. Paging Interval Length). Therefore, the definition needs to be modified)

[Insert the following entries into Table 358 at section 11.4.1 and remove section 11.7.20.2]

Name	Type	Length	Value	PHY Scope
Paging Interval Length	45	1	Duration in frames of Paging Listening Interval; used in calculation of Paging Listening Interval; value must be between 2 and 5 frames (default=2)	All

2.10. OFDMA SS uplink power control support

(Problem : misplacement of table)

[Modify the section 11.8.3.7.10 and 11.8.3.7.11 on Page 704 as follows]

11.7.20.2 Paging Interval Length
11.8.3.7.11 OFDMA SS uplink power control support
The 'OFDMA SS uplink power control support' field indicates the uplink power control options supported by a WirelessMAN-OFDMA PHY SS for uplink transmission This field is not used for other PHY specifications. A bit value of 0 indicates "not supported" while 1 indicates "supported".

Type	Length	Value	Scope
170	1	Bit #0: Uplink open loop power control support Bit #1: Uplink AAS preamble power control support. Bits #2–7: *Reserved*, shall be set to zero	SBC-REQ (see 6.3.2.3.23) SBC-RSP (see 6.3.2.3.24)

171	1	The minimum number of frames that SS takes to switch from the open loop power control scheme to the closed loop power control scheme or vice versa	SBC-REQ (see 6.3.2.3.23) SBC-RSP (see 6.3.2.3.24)

Insert new subclause 11.8.3.7.12:

11.8.3.7.12 OFDMA MAP Capability

The 'OFDMA MAP Capability' field indicates the different MAP options supported by a WirelessMANOFDMA PHY. This field is not used for other PHY specifications. A bit value of 0 indicates "not supported" while 1 indicates "supported".

~~Type~~	~~Length~~	~~Value~~	~~Scope~~
~~170~~	~~1~~	~~Bit #0: Uplink open loop power control support Bit #1: Uplink AAS preamble power control support. Bits #2–7: *Reserved*, shall be set to zero~~	~~SBC-REQ (see 6.3.2.3.23) SBC-RSP (see 6.3.2.3.24)~~
~~171~~	~~1~~	~~The minimum number of frames that SS takes to switch from the open loop power control scheme to the closed loop power control scheme or vice versa~~	~~SBC-REQ (see 6.3.2.3.23) SBC-RSP (see 6.3.2.3.24)~~

Support for Extended HARQ IE in mandates a support for SUB-DL-UL-MAP for first zone.

Type	Length	Value	Scope
172	1	Bit #0: HARQ MAP Capability Bit #1: Extended HARQ IE capability Bit #2: Sub MAP capability for first zone Bit #3: Sub MAP capability for other zones Bit #4: DL region definition support Bits #5-7: *Reserved*	SBC-REQ (see 6.3.2.3.23) SBC-RSP (see 6.3.2.3.24)

2.11. MBS zone identifier assignement

(Problem : In IEEE Std 802.16e-2005, MBS zone identifier is 7bit-long. Please refer to 6.3.2.3.43.6.9 and 8.4.5.3.12. Hence, the length of MBS zone idenfier TLV enconding should be 1 byte-long.. An MBS zone identifier is required during MBS connection establishment because MS needs to know which MBS service is associated with this connection(i.e. CID). Hence, MBS zone identifier TLV encoding should included in DSA-REQ/RSP message. But, MBS connection is available in Down Link as you know. Hence, we don't need 145.33 (i.e. MBS zone Idendfier in UL connection). On the other hands, Actually, BS can have multiple MBS zone Identifer as described in IEEE 802.16e-2005. MBS zone identifier TLV encoding is also included in DCD message. But, in this case, It requires two bytes for type of MBS zone identifier in DCD message. Moreover, this is specific to service flow. Hence, we propose to add another MBS zone identifier TLV encoding to DCD message. It can diminish the length of Type field)

[Modify the section 11.13.29]

11.13.29 MBS zone identifier assignment

The DSA-RSP message may contain the value of this parameter to specify a MBS Zone identifier. This parameter indicates a MBS zone through which the connection or virtual connection for the associated service flow is valid.

Name	Type	Value	PHY Scope
[~~145~~/146].33	81	MBS zone identifier (MSB shall be zero)	DSA-REQ/RSP ~~DCD~~

[Append the following entries to the end of Table 358 at section 11.4.1 on page 675 as follows]

Table 358—DCD channel encoding *(continued)*

Name	Type	Length	Value	PHY Scope
Hysteresis margin	51	1	Hysteresis margin is used by the MS to include a neighbor BS to a list of possible target BSs. When the CINR of a neighbor BS is larger than the sum of the CINR of the current serving BS and the hysteresis margin for the time-to-trigger duration, then the neighbor BS is included in the list of possible target BSs in MOB_MSHO-REQ. It is the unit of dB and applicable for only HHO.	All
…	…	…	…	…
…	…	…	…	…
MBS zone identifier list	61	variable	This parameter may include multiple MBS zone identifiers (i.e. n*MBS zone identifier) with which BS is associated. An MBS zone identifier is 1byte-long (MSB shall be zero)	All