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Re:	TGm SDD: Other
Abstract	Proposal for IEEE 802.16m Super-frame Header Design and its contents
Purpose	Discussion and Approval
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Proposal for Information Contents of PBCH and SBCH

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1. Introduction and Background

Section 11.7.2.2.1 of current SDD IEEE 802.16m-08/003r5 provides description about the PBCH and SBCH broadcast channels. However, currently the information content of these two channels is FFS. This contribution proposes the contents of PBCH and SBCH.

PBCH is small in size and carries essential information to receive SBCH. This minimizes the size of PBCH that is transmitted using most robust transmission format. Different fields of PBCH are as follows

- system BW index (4-5 bits to specify system BW, a number of BW indices can be reserved to indicate the different multi-carrier operation mode)

- Transmission format of SBCH (3-4 bits)

- Resources (# of PRUs) used for SBCH (4-5 bits) (the existence and the number of SBCH blocks can be identified by the number of resources in number of PRUs that is consumed for SBCH)

- LSBs for frame number (3-4 bits)

- CRC 8-16 bits

- Size of PBCH is around 22-34 bits

SBCH carries rest of the system information (excluding extended system information). Instead of using many different methods such as use of DCD/UCD, neighbor advertisement etc it is desirable to design SBCH in such a way that different system information can be transmitted in a flexible manner in SBCH. Thus SBCH transmits rest of system information (excluding extended system information) in one channel so that a terminal has to look for one place for this information. Different fields of SBCH are as follows

- Sector ID, Super-frame number, PHY protocol revision, MAC protocol revision, Number of Tx antennas, System bandwidth, CP length (1/32, 1/16/, 1/8, ¼), Cell type (femto, pico, micro, macro cell), UL load indicator, Relay station or BS station Indicator, DCD count, UCD count, Information required for HO ranging, Size, MCS and repetition coding for CCSCH, DL/UL ratio, additional subcarrier for multicarrier support, Maximum number of LRU for DL USCCH, FFR info. for DL region, DL Resource configuration info., FFR infor. for UL region, UL resoucre configuration info., UL Control Channel's configuration information, Information required for initial ranging, Duplex mode (TDD, FDD, HFDD), DL/UL ratio, additional sub-carrier for multi-carrier support, UL Control Channel's configuration

information, neighbor cell/system information, multi-carrier information, inter-RAT handoff information.

The transmission format and structure (arrangement on information fields in SBCH) should be such that it is flexible for different deployment scenarios and achieve a good balance between the latency requirement for different system information acquisition and L1/L2 overhead.

This contribution has the following advantages:

- It minimizes the size of PBCH that is transmitted using most robust transmission format

- It transmits rest of system information (excluding extended system information) in one channel, i.e. SBCH so that a terminal has to look for one place for this information.

- Instead of using many different methods such as use of DCD/UCD, neighbor advertisement etc it is desirable to design SBCH in such a way that different system information can be transmitted in a flexible manner in SBCH

2. Proposed text changes for SDD

Replace the last sentence in 11.7.2.2.1 with the following text:

-------------------------------- Text Start --
Different fields of PBCH are as follows: system BW index (4-5 bits to specify system BW, a number of BW indices can be reserved to indicate the different multi-carrier operation mode), Transmission format of SBCH (3-4 bits), Resources (# of PRUs) used for SBCH (4-5 bits) (the existence and the number of SBCH blocks can be identified by the number of resources in number of PRUs that is consumed for SBCH), LSBs for frame number (3-4 bits), CRC 8-16 bits.

Different fields of SBCH are as follows: Sector ID, Super-frame number, PHY protocol revision, MAC protocol revision, Number of Tx antennas, System bandwidth, CP length (1/32, 1/16/, 1/8, ¼), Cell type (femto, pico, micro, macro cell), UL load indicator, Relay station or BS station Indicator, DCD count, UCD count, Information required for HO ranging, Size, MCS and repetition coding for CCSCH, DL/UL ratio, additional sub-carrier for multi-carrier support, Maximum number of LRU for DL USCCH, FFR information, for DL region, DL Resource configuration information, FFR information, for UL region, UL resource configuration information, UL Control Channel's configuration information, Information required for initial ranging, Duplex mode (TDD, FDD, HFDD), DL/UL ratio, additional sub-carrier for multi-carrier support, UL Control Channel's configuration information, neighbor cell/system information, multi-carrier information, inter-RAT handoff information.

Different fields of SBCH are transmitted with varying transmission periodicity to meet their acquisition latency (the average time required to acquire a particular field of SBCH) requirements.

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3. References

[1] IEEE Std. 802.16e-2005, IEEE Standard for Local and metropolitan area networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems, Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands, and P802.16Rev2/D3 (February 2008).

[2] WiMAX Forum™ Mobile System Profile, Release 1.0 Approved Specification (Revision 1.4.0: 2007-05-02), http://www.wimaxforum.org/technology/documents.

[3] IEEE 802.16m-08/003r4, "The Draft IEEE 802.16m System Description Document"