Proposal for reducing Map overhead

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Base Contribution:

None

Purpose:

To be discussed and adopted by TGm for 802.16m amendment

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Proposal for Reducing Map Overhead

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About This Contribution

- Goal and scope of this contribution
  - Propose schemes for reducing Map overhead for 802.16m

- Issue to be addressed in this contribution
  - Map information in 802.16m
  - New scheme for reducing overhead in 802.16m

3

Map information in 802.16m

- Map information can includes the following.
    - Resource allocation information
    - MCS index : 4 bits
    - AS-IN : 1 bit
    - SPID (SubPacket ID) : 2 bits
    - ACID (HARQ channel ID) : 4 bits
    - CoRe version : 1 bit
    - Etc.
- In conventional map transmission, 3 bits resources are needed for SPID and CoRe version information at each transmission regardless of initial transmission and retransmission.

New schemes for 802.16m

- Using same resources in map, different information can be transmitted at each transmission.
  - Information only necessary for initial transmission
    - Code rate : At retransmission stage, code rate don't need to be transmitted any more because MS already knows burst size.
  - Information only necessary for retransmission
    - SPID : At initial transmission, it can be fixed by 00 without loss of performance.
    - CoRe : At initial transmission, it can be fixed by 0 without loss of performance.

- Using resource for code rate, SPID and CoRe version can be transmitted at retransmission if only values for SPID and CoRe version at initial transmission are fixed in advance.

New schemes for 802.16m

- MCS proposal for using SPID 2 bits, CoRe 1 bit, Modulation 3 cases (QPSK, 16QAM, 64QAM)
  - Modulation have to be transmitted at each transmission because modulation and resource allocation size can be changed at each transmission under adaptive HARQ.
  - If modulation at retransmission is NOT same to that at initial transmission,
    - When modulation is QPSK at initial transmission, "-" represents 64QAM while "+" represents 16QAM at retransmission.
    - When modulation is 16QAM at initial transmission, "-" represents QPSK while "+" represents 64QAM at retransmission.
    - When modulation is 64QAM at initial transmission, "-" represents 16QAM while "+" represents QPSK at retransmission.

New schemes for 802.16m

MCS for initial transmission

MCS index	Modulation	Code rate
0	QPSK	31/256
1	QPSK	47/256
2	QPSK	70/256
3	QPSK	98/256
4	QPSK	131/256
5	QPSK	166/256
6	QPSK	199/256
7	16QAM	123/256
8	16QAM	149/256
9	16QAM	176/256
10	16QAM	204/256
11	16QAM	229/256
12	64QAM	173/256
13	64QAM	196/256
14	64QAM	218/256
15	64QAM	234/256

MCS for retransmission

MCS index	Modulation	SPID	BitRe version
0		0	0
1		0	1
2		1	0
3	Modulation is same as initial transmission.	1	1
4		2	0
5		2	1
6		3	0
7		3	1
8	-	0	0
9	-	1	0
10	-	2	0
11	-	3	0
12	+	0	0
13	+	1	0
14	+	2	0
15	+	3	0

Modulation at initial transmission.	-	+
QPSK	64QAM	16QAM
16QAM	QPSK	64QAM
64QAM	16QAM	QPSK

Text Proposal to 802.16m amendment

------------------------------------- *Start of Proposed Text* -------------------------------------

Insert the following subsection at a new section 15:

15.x.1.1. MCS table

To determine the modulation and code rate for current transmission, the AMS shall read the 4-bit 'MCS index' field and 1-bit 'AS-IN' in MAP.

The MCS index represent the different information according to AI-SN. For AI-SN=0 (initial transmission), it denotes the modulation and code rate as shown in Table xxx, and for AI-SN=1 (retransmission), it denotes the modulation, CoRe version, and SPID as shown in Table yyy.

In Table yyy, "+" and "−" are utilized when modulation at retransmission is not same to that at initial transmission as follows.

- When modulation is QPSK at initial transmission, "−" and "+" represent 64QAM and 16QAM at retransmission, respectively.

- When modulation is 16QAM at initial transmission, "−" and "+" represent QPSK and 64QAM at retransmission, respectively.

- When modulation is 64QAM at initial transmission, "−" and "+" represent 16QAM and QPSK at retransmission, respectively.

Text Proposal to 802.16m amendment

Table xxx ― MCS for initial transmission (AI-SN=0)

MCS index	Modulation	Code rate
0	QPSK	31/256
1	QPSK	47/256
2	QPSK	70/256
3	QPSK	98/256
4	QPSK	131/256
5	QPSK	166/256
6	QPSK	199/256
7	16QAM	123/256
8	16QAM	149/256
9	16QAM	176/256
10	16QAM	204/256
11	16QAM	229/256
12	64QAM	173/256
13	64QAM	196/256
14	64QAM	218/256
15	64QAM	234/256

Table yyy ― MCS for retransmission (AI-SN=1)

MCS index	Modulation	SPID	CoRe version
0	Modulation is the same as that of initial transmission.	0	0
1		0	1
2		1	0
3		1	1
4		2	0
5		2	1
6		3	0
7		3	1
8	-	0	0
9	-	1	0
10	-	2	0
11	-	3	0
12	+	0	0
13	+	1	0
14	+	2	0
15	+	3	0

------------------------------------- *End of Proposed Text* -------------------------------------