

MCS Set Signaling for Assignment A-MAP

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Target topic: “15.3.6 Downlink control structure”.

Base Contribution:

None

Purpose:

To be discussed and adopted by TGm for the 802.16m amendment.

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Outline

- **SLS Environment**
- **SLS Results**
- **Conclusion and Proposed Text**

- **Current AWD: 15.3.6.3.2.2 Assignment A-MAP**
 - ... with two different effective code rates. The set of code rates is (1/2, 1/4) or (1/2, 1/8).
 - Need to define how to signal the MCS set
 - Superframe Header vs. Non-user-specific A-MAP

Assumption and Condition

- **Candidate-1: Signaling by SFH**

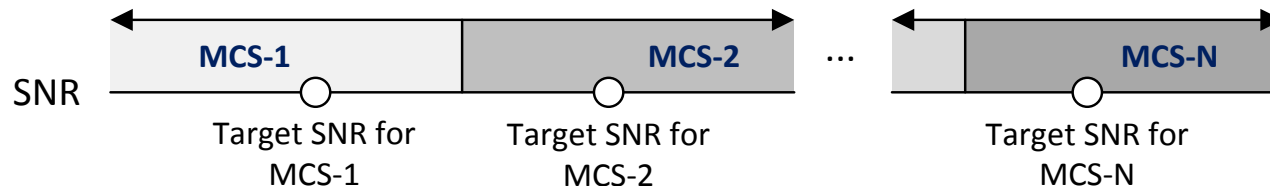
- Set-1: QPSK 1/2 or 1/4
- Set-2: QPSK 1/2 or 1/8

- **Candidate-2: Signaling by Non-user-specific A-MAP**

- Assume we can use QPSK 1/2 or 1/4 or 1/8 in a subframe

- **MCS Selection**

- Based on CQI
- Target SNR below contains margin value to meet the outage requirement



SLS Environments

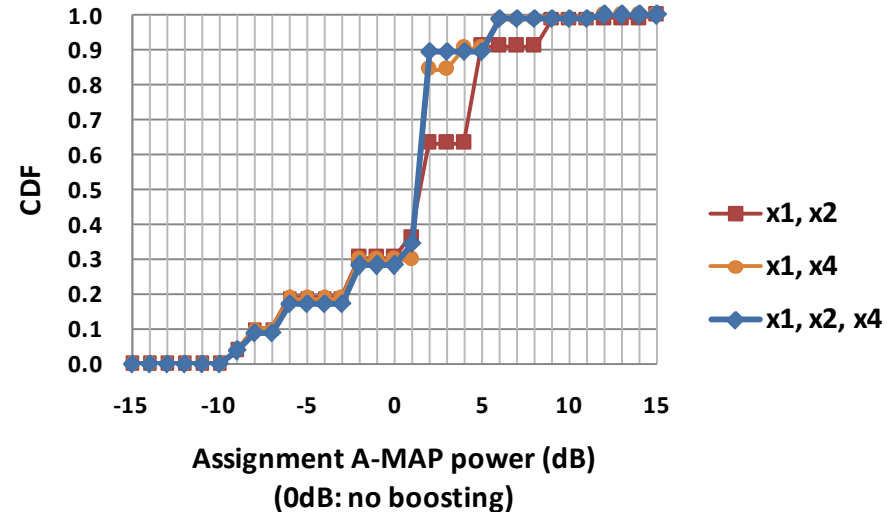
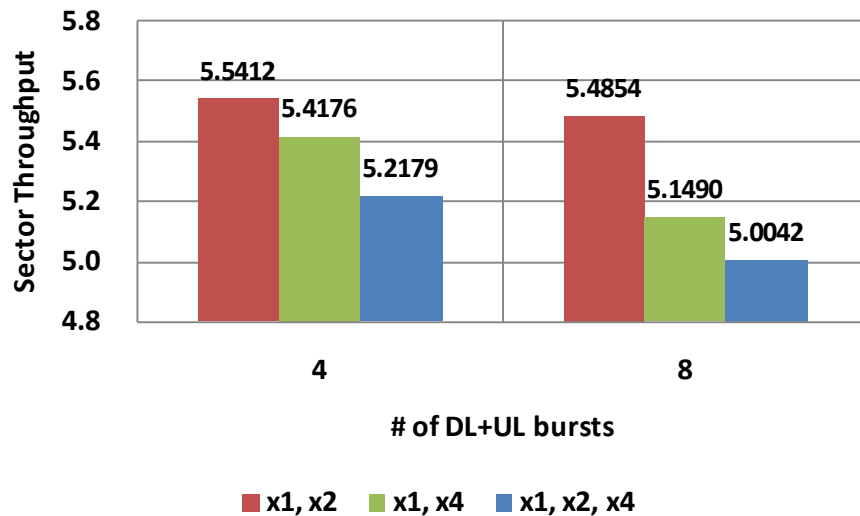
- EMD: IEEE 802.16m-08/004r5

Index	Value
Deployment Scenario	Baseline / Open rural macrocell
MCS for Assignment A-MAP	- QPSK 1/2, QPSK 1/4 - QPSK 1/2, QPSK 1/8 - QPSK 1/2, QPSK 1/4, QPSK 1/8
HARQ	Asynchronous (DL)
Scheduler	Proportional fairness
# of Users per Sector	20
# of Scheduled Users	2, 4 per subframe (4, 8 for both DL and UL)
Antenna Configuration	SIMO 1x2
Channel Model	Mixed (Ped B-3kmph-60%, Veh A-30kmph-30%, Veh A-120kmph-10%)
Channel Estimation	Real channel estimation (Channel estimation impairment)
CQI Reporting Period	8 frames
Other Simulation Assumptions	EMD baseline

SLS Results (1/2)

Baseline Test Scenario

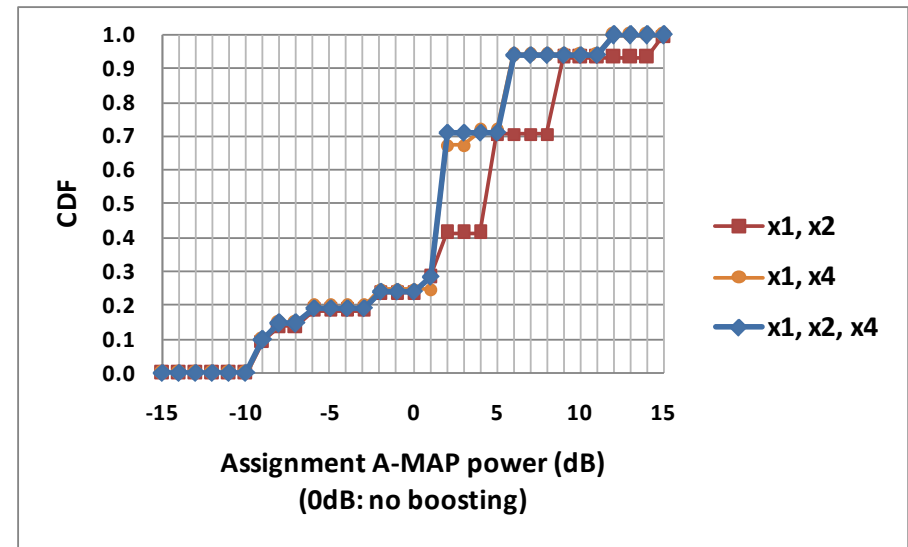
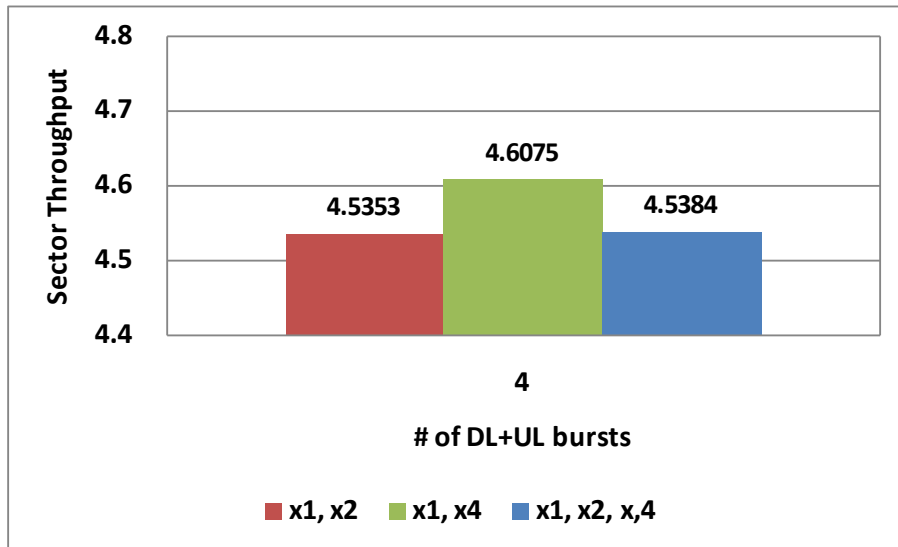
	1/2, 1/4	1/2, 1/8	1/2, 1/4, 1/8
Spectral Efficiency	- High	- Medium	- Low
Outage (3%)	- Meet requirement	- Meet requirement	- Meet requirement



SLS Results (2/2)

Open Rural Macrocell (Optional)

	1/2, 1/4	1/2, 1/8	1/2, 1/4, 1/8
Spectral Efficiency	- Lower	- Higher	- Lower
Outage (3%)	- Meet requirement	- Meet requirement	- Meet requirement



Conclusion

- **To meet both high spectral efficiency and outage requirement efficiently,**
- **Propose to use Two MCS sets signaled by SFH**
 - 0b0: (1/2, 1/4), 0b1: (1/2, 1/8)
 - According to cell geometry, etc
- **Note**
 - Signaling by NUS A-MAP makes it difficult to optimize data burst allocation within given total resources
 - Burden to scheduler Or no advantage of signaling by NUS A-MAP

Text Proposal (1/2)

----- Text Start -----

15.3.6.3.2.2 Assignment A-MAP

The Assignment A-MAP (A-A-MAP) shall include one or multiple A-A-MAP-IEs and each A-A-MAP-IE is encoded separately.

...

After rate matching and repetition, the encoded bit sequences shall be modulated using QPSK. For a given system configuration, assignment A-MAP IEs can be encoded with two different effective code rates. The set of code rates is $(1/2, 1/4)$ or $(1/2, 1/8)$, and explicitly signaled by SFH.

Text Proposal (2/2)

15.3.6.5.1.2 S-SFH IE

...

Table 663—S-SFH SP1 IE format

Syntax	Size (bit)	Notes
S-SFH SP1 IE format () {		
MSB of superframe number	[8]	Remaining bit of SFN except LSB of SFN in P-SFH
LSB of BS ID	24	Specifies the 24 least bit of BS ID
Periodicity of A-MAP	1	0b0: every subframe 0b1: every 2 subframes
A-MAP transmission format	<u>1</u>	0b0: 1/2 or 1/4 code rate for assignment A-MAP 0b1: 1/2 or 1/8 code rate for assignment A-MAP

⋮

Reserved	TBD	
}		

----- Text End -----