

Enhancement on Sleep Mode Operation by Grouping - Simulation Results for supporting the contribution

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Purpose:

The document is submitted for review by Handoff/Sleep Mode Ad Hoc Group and/or by 802.16 Working Group Members

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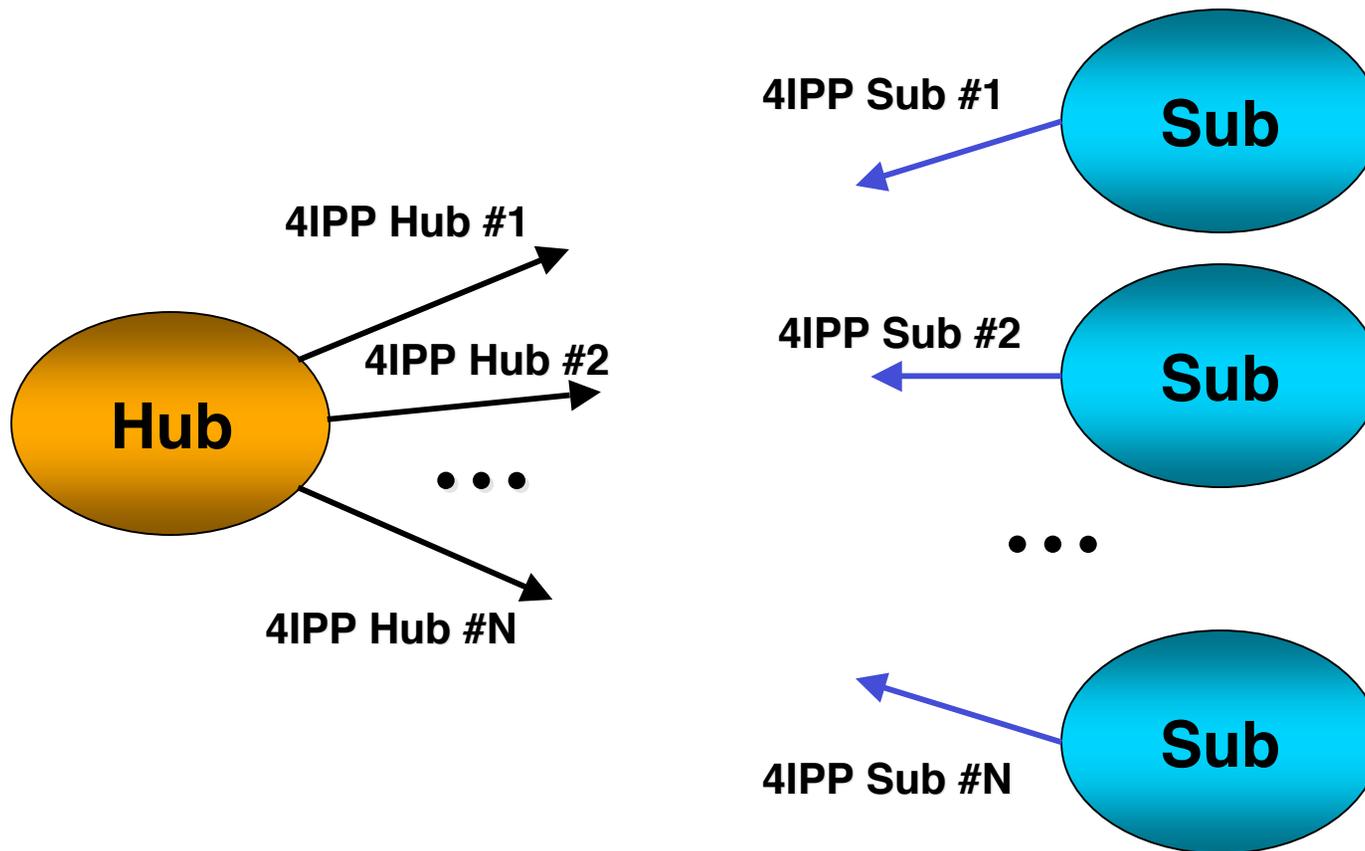
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Simulation environment



Simulation parameters

Items	Parameters
traffic model	4IPP (IEEE 802.16.3c-00/51)
frame size	5 msec
symbol duration	200 μsec
sub-channel number (only for OFDMA-PHY)	32
number of symbols for downlink per a frame	16
number of symbols for uplink per a frame	9

Basic Assumptions

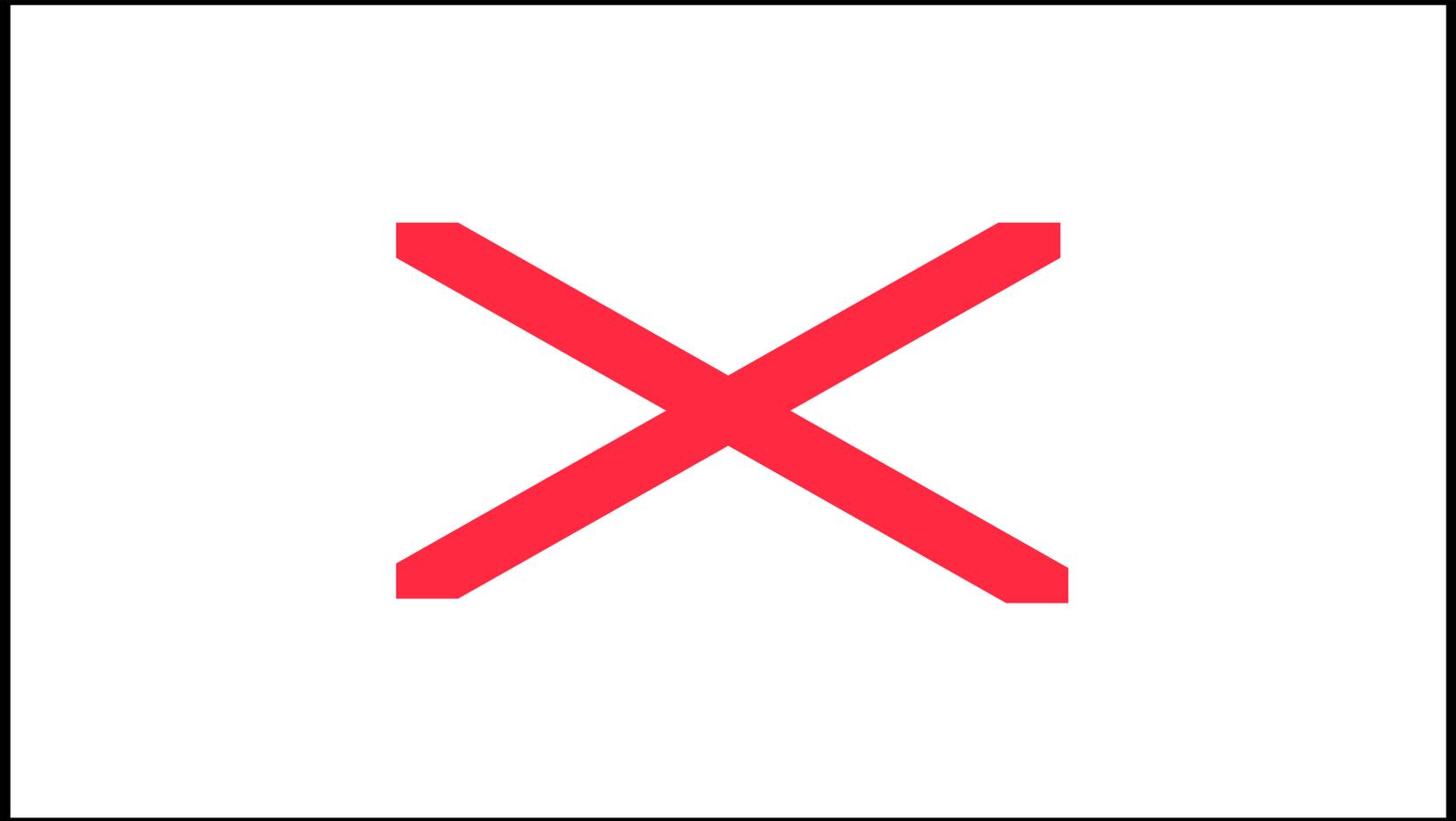
- ❑ **To get some implications for sleep grouping scheme, we simplify the simulations conditions using the following assumptions:**
 - **Only considers downlink traffic**
 - **Assume uplink traffic depends upon downlink traffic: most of the uplink traffic consists of ACK/NACK data and webpage retrieving data.**
 - **SLP-REQ/RSP procedures are perfect and have no delay.**
 - **All the sleep request are approved.**
 - **Sleep mode entering conditions are designated by the condition of DL/UL data are existed in the specified frame duration.**

Indication size performances

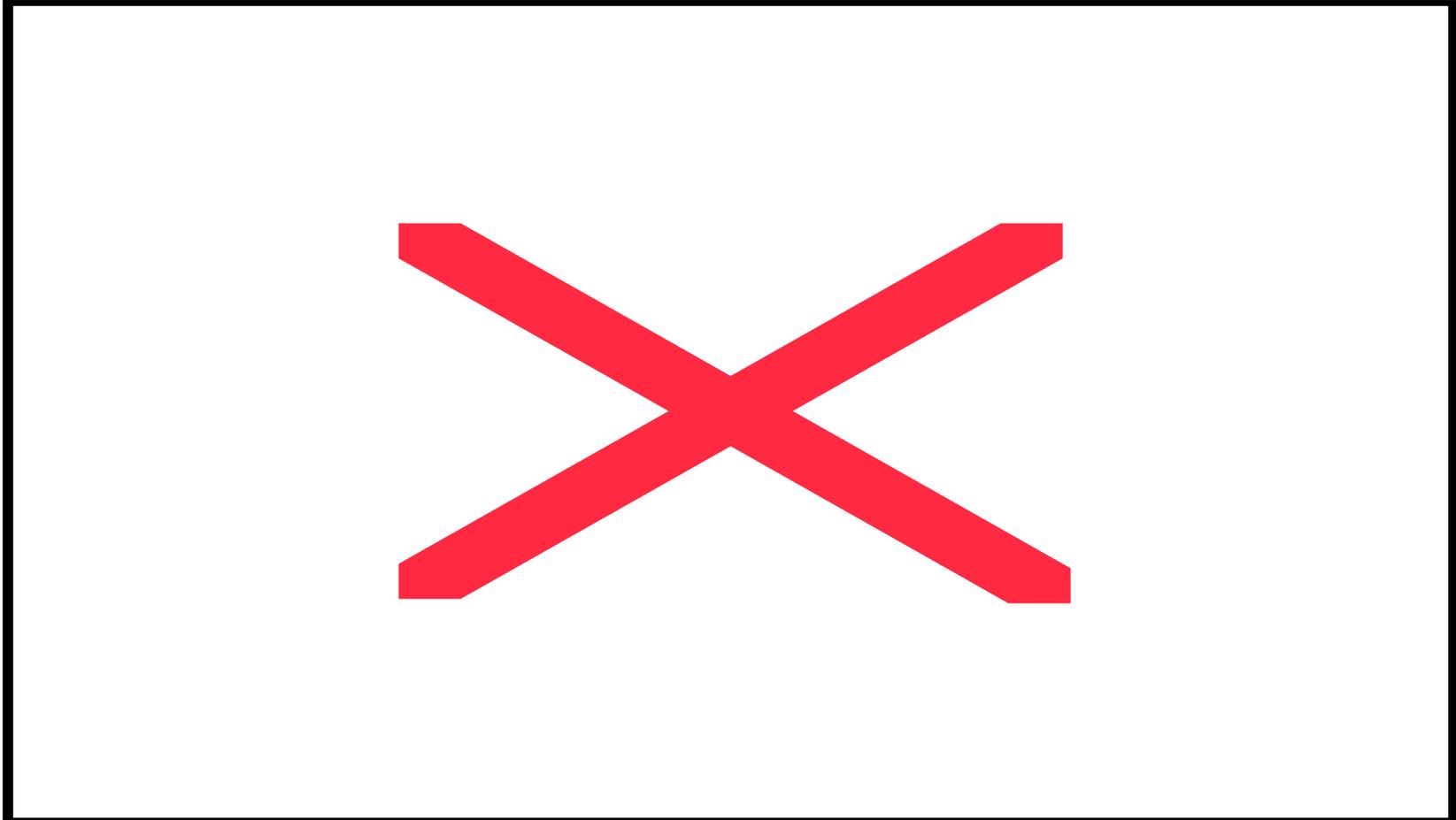
- ❑ Original BITMAP vs. a new grouped BITMAP method
 - The indication bitmap size of original-BITMAP method ~ 4 * that of the new method

Data rate (Kbps)	Sleep condition (number of idle frames)	Avg. indication size of BITMAP method (bits/frame)	Avg. indication size of the proposed BITMAP method (bits/frame)
128	6	8.89	2.22
64	6	38.8	9.7
64	12	11.24	2.81
32	10	91.39	22.85
32	20	26.87	6.71
32	30	2.61	0.65
16	18	196.23	49.09
16	36	62.31	15.59

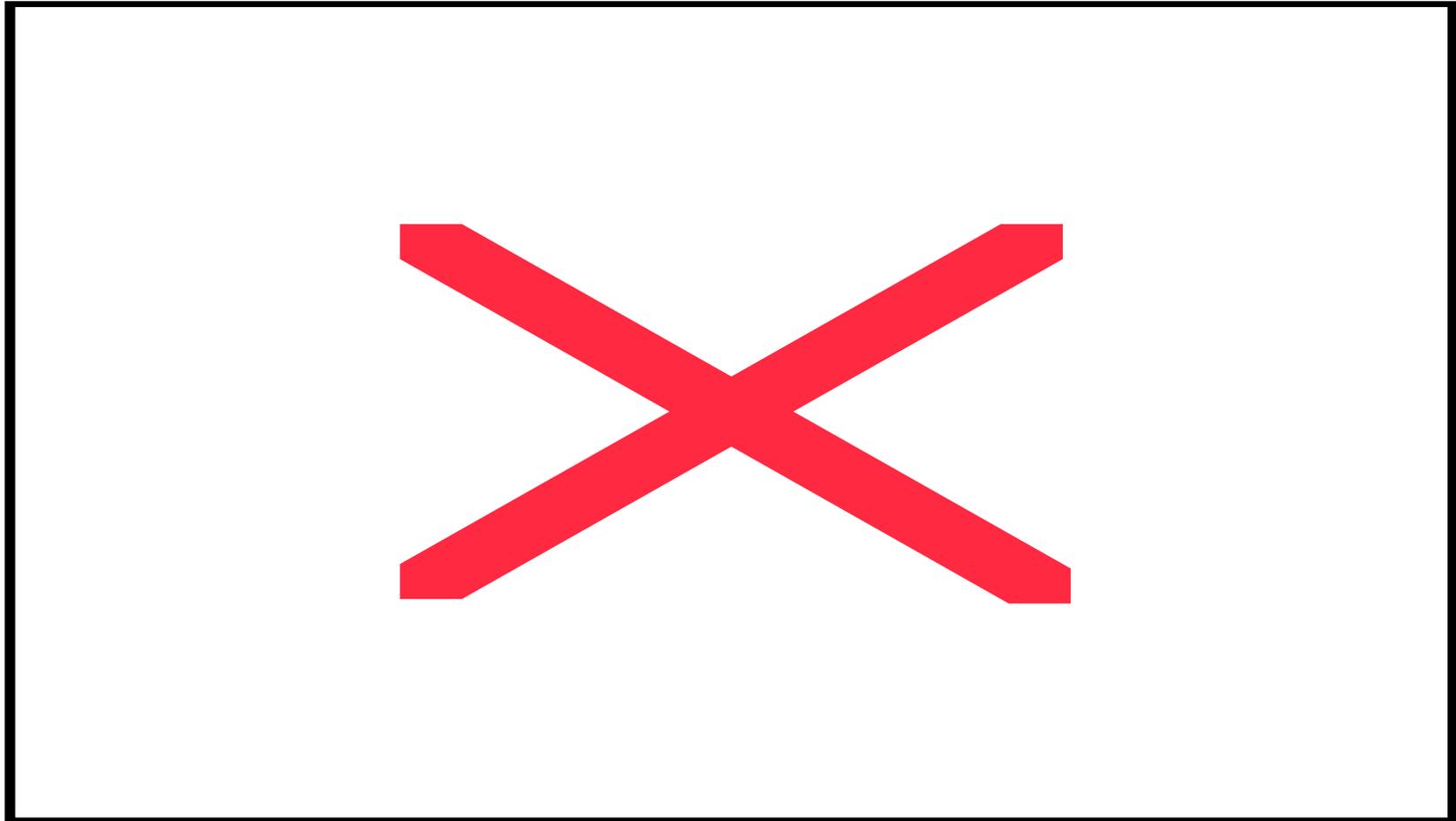
Indication size performance (32Kbps case)



Indication size performance (16Kbps case)



Indication size performance (8Kbps case)



Number of Average Indications & Number of Sleeping Ss

data rate (Kbps)	sleeping condition	avg. indi. (#/frame)	avg. sleeping SS (#/frame)
32	10	15.12	118.56
32	20	7.4	44.5
32	40	0.139	0.23
32	60	0.115	0.115
16	18	23.917	240.22
16	36	13.7	89.39
16	72	2.42	2.44