

IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)		
Title	Minutes for 802.15 IG-BAN Meeting in Hyatt San Diego, CA, July 2006		
Date Submitted	July 31, 2006		
Source	[Yihong Qi] [National Institute of Information and communications technologies, NICT] [Yokosuka 239-0847, JAPAN]	Voice: Fax: E-mail:	[+81 46-847-5092] [+81 46-847-5431] [yhqi@ieee.org]
Re:	802.15 IG-BAN Meeting in Hyatt San Diego, CA		
Abstract	The document contains a summary of the work of the 802.15 BAN interest group during the week of July 16 th to 21 st 2006.		
Purpose	Official minutes of the 802.15 IG-BAN.		
Notice	This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.		
Release	The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.		

Hyatt San Diego, CA
July 16-22 2006

July 17, Monday

4pm: the meeting called to order

Art goes through the agenda for IG-BAN (to be uploaded on the server)

Ask if there is any call-for-technology presentation:

1. Kamyā Yekeh Yazdandoost (from NICT) will give a presentation and needs 30 mins.

Ask for approval of the Jacksonville meeting minutes (doc. 06/278r0) -- approved unanimously

Eric Schylander: Regarding ``how to distinguish IG-BAN from other TG/WGs'' presented on the last day of the Jacksonville meeting, Bob Helie thought it was fine, but John Barr had a question why Bluetooth or Zigbee cannot support all the requirements for BAN.

Presentation by Kamyā ``Medical implant communication system (MICS)'' (to be uploaded on the server)

Comment by Ryuji Kohno: I support separation of wearable BAN and MICS in IG-BAN because they have different channel models, EMC characteristics, power requirement, etc.

Ivan Reede: how many simultaneous operation devices in an MICS?

Depends on applications, e.g., around heart about 2-3 devices at most; in other part of body the number can be 10-20.

Ivan: Can a device be implanted immediately under skin?

Then the skin cannot support/hold the device. The device needs to be placed deeper in the skin where tissues such as fat and muscle are contained.

Ivan: how about MAC design? Will it be compatible with 802.15 MAC? Will it be the peer-to-peer type or the beacon controlled type?

Ryuji: both types need to be considered. And an MICS can be connected to other networks.

Eric: According to the last page, are you intending to separate MICS from IG-BAN and set up another group for MICS?

Ryuji: We intend to maintain one BAN group, but separate MICS from wearable BAN devices as two different categories. We shall revise the last page to avoid possible confusion.

Eric: Will those swallow-able devices be classified as an MICS?

Yes.

Eric: Regarding the definition on page 4, the device plugged into an ear transferring voice data could not be taken as an MICS?

No.

Eric: Would an MICS include applications like artificial leg/arm?

No, because nerve signals instead of radio signals are involved.

Ivan: On page 4, why the frequency is so low as 402-405 MHz?

Decided by FCC. The low frequency is for good body penetration.

Art: Where do the numbers related to those figures come from?

from US Air Force experimental data.

Ivan: Any comment on antenna efficiency?

In general, a small antenna will be less efficient than a big one, and the antenna size is on the order of the carrier wavelength. For the same frequency, the wavelength in body is much less than that of the free space, which naturally requires a smaller antenna. Some design techniques can make an antenna smaller. I currently design an MICS antenna with size 8 by 8mm.

Announcement: IG-BAN Tutorial on Tuesday 9-10:30pm

5pm: Adjourn

Meeting attendance: 30

July 19, Wednesday

1:30pm meeting called to order

Two BAN tutorials on Tuesday night with file doc. 06/331, 337

Art goes through the agenda of the two sessions in this afternoon, see doc 06/336r1

Ask for approval of the agenda – passes unanimously

Presentation doc. 06/340 on regulation issues by Huan-bang Li

No question raised.

Presentation doc 06/337 on channel models done in the MAGNET project by Anders J Johansson

Open to discussion

Kamya Yekeh Yazdandoost: why you only consider near-field communication, how about far-field communication?

There are several definitions on near and far fields. Here we are considering less than 2 wavelengths as near field, which is exactly the case of our experiments.

Kamya: How are the posture and polarization of Tx and Rx antennas set in your experiments?

The posture and polarization of the antenna of an implanted device in body are random. Hence a fixed antenna outside body needs to have polarization diversity.

Huan-bang: how did the LDR band 4.0/4.5GHz get decided?

LDR uses an unlicensed band and a low power consumption constraint; and HDR uses licensed band with high power consumption.

Huan-bang: why can the LDR UWB band not support HDR?

We develop a low-complexity receiver which only works with LDR UWB band.

Huan-bang: Are LDR and HDR applications working in the same communication range?

Yes 2-10m

Is RMS used for BAN measurements?

Needs to check.

David Julian: What is the difference of BAN from Zigbee and Bluetooth?

- 1. low power and low complexity
- 2. HDR is not a requirement of PHY but can be imposed on higher layer.

Siew Soon Tan: What is the power level of the LDR?

Both LDR and HDR are under regulation limits. HDR is below 100mW; and LDR is between -43 to -70dBm

3pm: recess

4pm: the meeting called for order

Presentation doc. 343r0 by Kenichi Takizawa

Open to discussion

Dave Cavalcanti: How to define `` low invasiveness''

Wearable device should pay attention to low interference to human body.

Amjad Soomro: Why does PAR not address the frequency bandwidth?

Kohno: We can propose a PAR without decision on bandwidth as 802.15.4a. We think distinct definitions of the implanted and wearable devices are better to be included. .

Amjad: ``Low-invasiveness'' does not provide a precise meaning. Needs a better word.

Discussion regarding how to distinct the identity of BAN from other WPANs, which is recorded in doc 343r1.

The following agreement is reached:

	Other 802 standards	BAN
Configuration	15.3, 15.4 MAC	single scalable MAC with reliable delivery
Power consumption	Low power consumption	Extremely low power while communicating to protect human tissue
Power source	Conventional power source	Possible scavenge operation
Requirements	Low latency	guaranteed response to external stimuli

Frequency band	ISM	Medical authorities approved bands for in and around human body
Channel	Air	Air in and around human body

Motion:

IG BAN recommends the formation of an 802.15 study group to investigate the use of unlicensed and medical authority approved bands for in and around human body communication.

Moved by: Amjad Soomro

Second by: Ryuji Kohno

Vote: yes 34 / no 0/abstain 0 → passes unanimously

5:45pm: Adjourn

Meeting attendance: 34