License-Exempt Task Group Meeting Minutes – Session #38

IEEE 802.16 Session #38 – San Francisco USA
Chairman: Mariana Goldhamer, Alvarion
Vice Chairman: Barry Lewis, Redline Comm..
Editor: Xuyong WU, Huawei
Secretary: Nader Zein, NEC Europe

Tuesday July 19, 2005, Afternoon + Evening Sessions

Agenda:

Tuesday

1 Opening of the LE TG Sessions
2 Revision and approval of LE TG Agenda
3 Comments to 802.11 SG- 3.65 GHz
4 Input contribution discussion and approval
- Discussion on Number order or topics order?

Working document
- IEEE C802.16h-05/017
  Consolidation of the IEEE 802.16h Working document
- IEEE C802.16h-05/023r2
  CIS, community and power levels for non – interfering transmission

Security approach
IEEE C802.16h-05/021r3
  Privacy key management for BSs and CISs in 802.16 LE systems

Operational Issues
- IEEE C802.16h-05/018
  Proposal for 802.16h Interference Cancellation
- IEEE C802.16h-05/19
  Neighbor Discovery using Interference Free Coexistence Time Slot
- IEEE C802.16h-05/20
  Proposal for credit tokens based co-existence resolution and negotiation
  protocol
- IEEE C802.16h-05/22
  Cognitive radio concepts for 802.16h

Thursday

- IEEE C802.16h-05/25
  A collaborative approach to license-exempt operation
- IEEE C802.16h-05/26
  Messaging for Cognitive Radio Systems operating as Frequency Division
  Duplexing (FDD) IEEE 802.16h Networks

Performance
- IEEE C802.16h-05/24
  Performance Analysis of a Distributed Approach to Interference Mitigation in LE 802.16 Systems

5 Discussion of the 802.16h schedule
6 Future AI related to the maintenance of the Working Document
7 Elements for the next Call for contributions
8 Discussions on the 802.16h PAR

Meeting schedule

- Tuesday 1pm – 7pm
  - Breaks: 15 – 15.30, 17.00 – 17.30
- Thursday 8am – 12 am
  - Break 10 – 10 30
  - Total 8h 30 Min

Agenda approved as submitted by unanimous voice vote

AI 3 Comments to 802.11 SG- 3.65 GHz

802.11y PAR and SC Position and WG Vote

Mariana showed an email from Roger Marks which showed the motion done by the 802.11 group in removing the 802.11y PAR from the SC meeting in July 2005. It also showed that they will extend the SG with the scope to present a revised PAR in November 2005.

C80216-05_014r1 (Jose Puthenkulam, Intel) contribution prepared in the assumption that the PAR is still going ahead.

Discussion in what we could do in response to the foreseen IEEE802.11y PAR in November.
3 Options are proposed for consideration by the .16h TG:
        1- Continuing on the 16h proposed protocols independent from .11
        2- Joint study group.
        3- Propose a SG in 802.19.

Michael Lynch trying to arrange for a meeting with the groups interested in this. Jose (Intel) will present 802.16 characteristic to 802.19 groups. (8 to 10 am on Wednesday). All other groups are also presenting high level characteristics of their systems to 802.19 Groups.

Mariana suggested that FCC would change the name from contention based to coexistence.

Procedure 11 states that all wireless standards should submit a coexistence assurance document with other wireless standards under the 802 umbrella.

Conclusion of discussion:
802.16 recommends to form a SG in 802.19 to study the feasibility of a standard addressing 802.16 and 802.11 coexistence, with respect to 3.65 GHz band, while we expect that the 802.11 SG on 3.65 GHz – CBP will continue its activity. 802.16h will give assistance to the 802.19 for accomplishing this target.

Approved by unanimous voice vote.

AI 4 Input contribution discussion and approval

Working document
- **IEEE C802.16h-05/017**
  Consolidation of the IEEE 802.16h Working document

Mariana reviewed the above document. This is based on document IEEE C802.16h-05/013 with restructuring.

John Sydor (CRC- Canada) Commented that this looks like a stand alone standard. Mariana suggested producing out of this document an amendment to the 802.16-2004 standard. An alternative is to call for contribution specifically for the amendment document.

Motion: To accept IEEE C802.16h-05/017 as the new temporarily working document. Accepted unanimous voice vote.

- **IEEE C802.16h-05/023r2**
  CIS, community and power levels for non – interfering transmission

Mariana presented this contribution which proposes changes and corrections to the working document.

The document addressed the following topics:

- Coexistence Identification Server
- Power levels for sub-frames dedicated to non-interfering traffic
- Interferer identification (during Master sub-frame)
- Regional data base

John Sydor warned that some national administrator already expressed there concerned regarding using data bases.

Mariana replied that the use of data base simplify many issues and make deployment and sharing works better.

Mark Thomson (Airspan) asked about IP address at each sector of one base station. Mariana clarified that each sector in 802.16 has its own BSID.

Paul (Cygnus) if you could think about providing extra text to where in the working document the proposed changes should be made.

Motion: to accept proposed changes in the document above.
Accepted unanimous voice vote.

Security approach
IEEE C802.16h-05/021r3
  Privacy key management for BSs and CISSs in 802.16 LE systems
  Presented by HungLin Chou (ITRI)

The contribution proposes network architecture for the provision of IPSEC connection between BSs.

Comment that during this meeting the 802.16e is currently rewriting the whole of the security protocol (under recommendations from IETF). It was suggested to use the same security protocols as the 802.16e one for harmonisation purpose.

HungLin thinks that the 802.16 security protocol is good enough to provide basic encryption however PKM needs to be further addressed in order to provide dynamic key exchange.

Agreed to update the contribution document to reuse the new 802.16e security protocol and eventually compare it with current proposal to be submitted for the next meeting.

HungLin is kindly requested to provide a contribution for the standard whether it is based on the802.16e or on this contribution.

Operational Issues
- **IEEE C802.16h-05/018**
  Proposal for 802.16h Interference Cancellation
  Presented by Robin Zheng (Huawei)

The contribution proposes additional text on IC to be added to the working document.

John Sydor commented that while MIMO works for WCDMA, there is no evidence that this would work for 802.16 operating in unlicensed band with about 20 dB reduced power.

The group felts that this would add complexity to the system while the 802.16 WG is trying to reduce it. There was suggestion that it may be enough to just include the hooks in the working documents and leave it to vendors to decide whether to implement it or not. Reference to existing MIMO in 802.16 would also be helpful.

The author is encouraged to improve his proposal towards more practical inclusion in the working document and submitted for the next meeting.

- **IEEE C802.16h-05/19**
  Neighbour Discovery using Interference Free Coexistence Time Slot
  (Xuyong WU, Huawei)

  This contribution proposes a method for neighbourhood discovery which overcomes the problem of hidden SS.

  Discussion:

  Same PHY or common capability is needed for the proposed method to work.

  Some concern about the introduction of GPS in every BS, but this should be anyway done for sync.

  Suggestion by John Sydor that no need to carry out the neighbourhood discovery and reporting until needed. That is when interference is sensed. This is in order to limit extra overhead.

  John concerns about the required synchronisation between BS which all have different frame sizes and sequences etc. Does not believe this would work.

  Suggestion that information management server could be a better approach and more practical than the proposed approach.

  No agreement to accept this proposal as it is:
  Next meeting to get more consolidate approach.

  Barry then suggests that this contribution could still be included in the working document and call for contribution to comments on this method.

  This was agreed.

- **IEEE C802.16h-05/20r1**
  Proposal for credit tokens based co-existence resolution and negotiation protocol (David Grandblaise, Motorola)

Many questions were raised relating to the operation and working of this method.
- Exchange of messages
- Biding channel
- Biding on frame or on packets
- Complexity
- Synchronisation and TDD and FDD issues!
- Implementation of biding process
- Tracking new comers and leavers

There were concerns regarding case 2 which assumes biding for sub-channels that would require mandatory sub-channelisation.

Mariana suggested to limit this to the time domain only (Thus eliminating the problem of sub-channelisation).

The group agreed to introduce in working document all parts with the exception of chapters 6 and 7. David should also prepare exact format of messages to be included in the working document.

Thursday July 21, 2005, Morning Session 800 - 1200
- **IEEE C802.16h-05/22r1**
  Cognitive radio concepts for 802.16h
  Barry chaired the session during Mariana presentation

Basic idea is to transmit the MAC PDU over specified sub channels called here bins with 5 dB more power.

802.16 systems will be able to detect the presence of 16h systems by recognising its MAC and non .16 systems will be able to detect the .16h systems by their energy.

John Sydor concerns that the extra 5 dB may put more strain on the RF amplifier which is already exhausted by the large PAPR of OFDM. Mariana suggested that this may not be much due to the large back-off required by the amplifier anyway.

The proposed text in document 22r1 is to be included in section 5.1 "Signalling to other systems" of the working document 17. Note not to include the discussion.

Robin (Huawei), again brought back up the subject and concern on the effect it may have on the RF.

Group accepted this proposal to be included in the working document.

Note: the cognitive signalling may have effect on the power amplifier and on the PAPR. Call for contribution to investigate if there are any such effects.

Mariana continued chairing the meeting.

- **IEEE C802.16h-05/25r1 (not yet uploaded)**
  A collaborative approach to license-exempt operation
  Paul Piggin (Cygnus communications)

Xuyong Wu (Huawei) commented that ACS can be used to solve some problem but not all, so we need BS to BS to go through the 802.16 air-interface.

Barry commented on scope in our work to have grey/relaxed rules to distinguish between different deployments scenarios. Paul agreed.

Paul and other are invited to propose a text to be included in the working document.

Agreed that a call for contributions on this subject will be made.

- **IEEE C802.16h-05/26**
  Messaging for Cognitive Radio Systems operating as Frequency Division
  Duplexing (FDD) IEEE 802.16h Networks
  John Sydor (CRC Canada)

Tolis Papathanassiou (Intel) has Concern about the type of modulation that is proposed whether its is based on 802.11 or 802.16 PHYs. John replied this is 802.16 standard, so the assumption it is based on the 802.16 PHY modulation. Then there was concern that if different modulations need to be used so that other systems can also listen to the information it would severely complicate the system. John confirmed that he does not propose any change to 802.16 PHY format. He only proposes some extra MAC messages.

There was a question on how the change to the beam pattern would be made? John replied that adaptive antenna are not always available but they are simple to accommodate.

Mariana said that the communication with MAC messages is done assuming same PHY. A chapter in the WD is covering this and the MAC messages should be placed in this chapter.

Xuyong Wu (Huawei) commented on fairness in protocol; changes of messages, need a standardised messages; no proposed text is submitted yet for inclusion.
As for messages can not issue messages for changing network management, however these messages are sent for information. It is up to the notified network to take action or not.

Mariana reiterated Xuyoing's comments, stressing that this could be included in the WD subject to conforming to 802.16 PHY and MAC formats.

Overall the proposal includes introducing 2 MAC messages and 6 IP messages. The question is how to incorporate them in the standard.

Robin Zheng (Huawei) can not accept this proposal as he does not see it fitting within the architecture of the current working document.

The group agreed to include the MAC messages in chapter 6.9, and the IP messages in the coexistence protocol while deleting the words SNMP, traps, cognitive radio.

Performance
- **IEEE C802.16h-05/24**
  Performance Analysis of a Distributed Approach to Interference Mitigation in
  LE 802.16 Systems
  Sean (University of Dublin)

John asked if Omni direction reception is assumed for SS. Sean confirmed this. The result is therefore surely affected by this poor assumption.

Mariana asked if he has taken into account the effect of out of band interference. Sean confirmed that that this is not taken into consideration and the assumption is that all SSs operating in the same frequency channel. This is purely MAC layer simulation.

Mariana commented that SS that are working on a different channel but close to a BS can still cause significant interference due to out of band radiation.

Many suggestions were made to improve Sean's model and performance into more realistic scenarios.

Sean will continue his work on this topic and will bring more simulation results to future meetings.

AI 5 Discussion of the 802.16h schedule

Mariana presented a proposed work schedule for the TG.

Major milestones are:
- 1st draft January 2006
- WG letter ballot February 2006
- IEEE sponsor ballot staring by October 2006
- RevCom submittal by March 2007

It is not clear if the scope is for IEEE 802.16-2004 (or its latest version Cor1)

TG approved by unanimity b the proposed schedule

AI 6 Future AI related to the maintenance of the Working Document

- Overlapping text
  - Protocol description
    - Source ITRI/Alvarion
    - Proposal: instruct the editor to keep the ITRI text only and deleting Alvarion text.

The above proposal was accepted.

- Messages missing fields
    - Mariana proposed that the editor will insert message numbers
    - Request ITRI to finalise the text

AI 7 Elements for the next call for contributions

See Document "Call for contribution: IEEE 802.16 license-Exempt Task Group"

- Deployment applications, architectures and parameters for inclusion as an Annex to the working document.
- Possible operation rules targeting coexistence improvement.
- Mapping the elements in the Working Document to a revision of 802.16 – 2004 standard.

Motion to adjourn.
Passed unanimous voice vote.

AI 8 Discussions on the 802.16h PAR
Formally, no contribution was submitted and the discussed was deferred to the next meeting due to shortage of time.

Attendance List:

Tuesday July 19, 2005

Andy Sago	BT	andy.sago@bt.com
Charles Rush	TMG, Inc	crush@tmgtelecom.com
Chieeh-Ying Kan	ITRI	cykan@itri.org.tw
David Grandblaise	Motorola	david.grandblaise@motorola.com
David Maidment	Picochip	david.maidment@pciochip.com
David Maldonad	VT University	davidm@vt.edu
Frank Ren	ITRI	frank_ren@itri.org.tw
Greg Philips	Airtegrity Wireless	greg.phillips@airtegrity.com
Heinz Lycklama	Adaptix	heinz@osta.com
Hunglin Chou	ITRI	hlchou@mail2000.tw
Jeff Poston	Mitre	jdposton@mitre.org
John Sydor	CRC	John.sydor@crc.ca
Juka Pihlaja	Nokia	juha.pihlaja@nokia.com
Mark Austin	Ofcom	mark.austin@ofcom.org.uk
Mark Thomas	Airspan	mthomas@airspan.com
Mariana Goldhamer	Alvarion	marianna.goldhammer@alvarion.com
Nader Zein	NEC	nader.zein@ttd.neceur.com
Ofer Kelman	Airspan	okelman@airspan.com
Paul Piggin	Cygnus Communications	ppiggin@cygnuscom.com
Robin Zheng	Huawei	robin@huawei.com
Sean Murphy	University College Dublin	sean.murphy@iname.com
Shyamal Ramachandran	Motorola	shyamal.ramachandran@motorola.com
Xuyong Wu	Huawei	wuxuyong@huawei.com

Thursday July 21, 2005

Aik Chindapol	Siemens	aik.chindapol@siemens.com
Barry Lewis	redlinecommunication	blewis@redlinecommunications.com
Carl Day	Harris MCD	wday02@harris.com
Charles Rush	TMG, Inc	crush@tmgtelecom.com
David Grandblaise	Motorola	david.grandblaise@motorola.com
Frank Ren	ITRI	frank_ren@itri.org.tw
Hunglin Chou	ITRI	hlchou@mail2000.tw
Jeff Poston	Mitre	jdposton@mitre.org
John Sydor	CRC	John.sydor@crc.ca
Kenji Saito	KDDI R&D	saito@kddilabs.jp
Mark Austin	Ofcom	mark.austin@ofcom.org.uk
Mariana Goldhammer	Alvarion	
Nader Zein	NEC	nader.zein@ttd.neceur.com
Paul Piggin	Cygnus Communications	ppiggin@cygnuscom.com
Robin Zheng	Huawei	robin@huawei.com
Sanjeev Athalye	Qualcom	
Sean Murphy	University College Dublin	sean.murphy@iname.com
Shyamal Ramachandran	Motorola	shyamal.ramachandran@motorola.com
Tolis Papathanassiou	Intel	apostolos.papathanassiou@intel.com
Xuyong Wu	Huawei	wuxuyong@huawei.com