

IEEE P802.19
Wireless Coexistence

[Meeting Minutes for TVWS Coexistence]

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Abstract

In this meeting, the group discussed Haiguang Wang's contribution named as Media Independent Coexistence for devices in TV White Spaces (802.19-09/0034r0). The group also discussed the session arrangement of the coming plenary meeting.

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ATTENDANCE

Attendees	
Name	Affiliation
Steve Shellhammer (Chair)	Qualcomm, Inc.
Haiguang Wang (Secretary)	Huawei Technologies Co., Ltd.
Alex Renzik	InterDigital
Chen Hou-Shin	Thomson
George Vlantis	STMicroelectronics
Gerald Chouinard	CRC
Hyunduk Kang	ETRI
Ivan Reede	AmeriSys Inc
Joe Kwak	InterDigital
Mark Cummings	enVia Technology Partners, Inc
Prabodh Varshney	Nokia
Reddy, Ranga	CIV USA USAMC
Rich Kennedy	Research in Motion
Thomas Kolze	Broadcom
Victor Hou	Broadcom

1.00 Meeting called to order **Chair 0 7:05 pm**

The meeting was called to order by the Chair, Steve Shellhammar.

2.00 Attendance **Chair 1 7:05 pm**

Attendees are required to send their name and organization in through email to the Chair and Secretary.

3.00 Review IEEE Patent Policy **Chair 1 7:06 pm**

The patent policy slides were brought up. There is no specific requirement for them to be read word by word.

4.00 Approval of Previous Meeting Minutes **Chair 1 7:07 pm**

The chair required to approve the meeting minutes of previous meeting. There is no objection and the chair declares that the minutes are approved. The file name of the approved minutes is 19-09-0036-00-tvws-meeting-minutes-for-tvws-coexistence-sg-date-23-06-09.doc. :

5.00 Haiguang Wang presents contribution name as Media Independent Coexistence for Devices in TV White Spaces **Chair 52 7:08 pm**

Agenda of the meeting:

Agenda

- Attendance
 - The IEEE patent policy is available at the following location
 - <http://standards.ieee.org/board/pat/pat-slideset.pdf>
 - Approve minutes from previous conference call
 - Media Independent Coexistence for Devices in TV White Spaces (doc 19-09/34r0) (Haiguang Wang)
 - New Business
1. Before the meeting started, somebody asks whether this is the last call before the July plenary meeting. The chair answers that there can be another meeting on July 7 but he will not be able to chair the meeting. Ivan may chair the meeting.
 2. Mark asks that what are the expectation and planning for the meeting. The chair says that he will address these issues in email.
 3. Haiguang Wang presents the slides. The presentation starts from slides number two. There is no much discussion during presentation. There are two major points in the contribution. One is the suggestion of using Frequency Division Multiplexing (FDM) for coexistence among heterogeneous devices. To support this mechanism, Haiguang suggests further divide the TV channel into sub-channels and different types of devices may take part of channel for communication. Haiguang also suggest put a spectrum manage on top of the TV White Space database to manager the spectrum. The spectrum manager assigns the channel/sub-channel to devices according to information from database and the request from individual devices.
 4. After the presentation, there are warm discussions over the contribution.
 5. Joe Kwak says that using the FDM and spectrum manager are powerful ideas. He says that, although coexistence with Time Division Multiplexing (TDM) is feasible solution for some protocols such as 802.16 and 802.22, however, it is not universal solutions. It may set constraints to the protocols that may appear in the future. We can never predict what kind of physical layer technique that is adopted by the future protocol. Instead, FDM is a universal solution for coexistence. Joe also gives an example on 802.11. He says that AT & T has been working on a TDM solution in 802.11 working group and for five years it is still pending for approval.
 6. Mark Cummings asks whether Haiguang will attend the coming IEEE Plenary meeting at San Francisco. Haiguang answers yes. Mark Cummings also asks whether Haiguang has noticed that the database will only provide available channel list according to the FCC regulation. Haiguang answers yes, but he also says that FCC may change its Rules and Order in the future.
 7. Mark Cumming says to Chair, Steve Shellhammer, that there will be a meeting among large companies such as Google, HP etc. Steve can ask various questions during the meeting.
 8. Somebody says that now people are discussing about channel concatenation, why you suggests further divide a channel into narrower bands. Haiguang answers that with the advance of technology, the spectrum efficiency now is quite high, can be 10bits/Hz. Somebody answers that this may lead to a modulation constellation with more than one thousand points. (Haiguang here mean 10 bits/Hz/second, but he did not say that during the meeting)
 9. Mark Cumming says that in the spectrum sensing only devices mentioned in the slide 4 and 6 are not that common in real deployment.
 10. Gerald Chouinard says that FDM has limitations. Existing protocols have to down clock at the physical layers. Joe Kwak says that the down clock at the physical layer may not be that difficult.

11. Gerald Chouinard says that it is not a hundred percent true that TDM does not work. TDM can be used for the coexistence. Devices can use the GPS clock for time synchronization. Joe Kwak says that TDM can work for known system such as 802.22 and 802.16. However, it may not be true for protocols that may appear in the future.
12. Ivan says that 802.22 standard cannot support sub-canalization. FDM may need guard band and therefore lower down the spectrum efficiency.
13. Mark Cumming makes a suggestion to Chair that the group should construct a document on the coexistence mechanism since we have already had several proposals there. The document can include different coexistence mechanisms and list their pros and cons.
14. Hyunduk Kang says that how spectrum sensing only devices access the spectrum manager. Haiguang answers that the proposed scheme only considers the fixed and portable type II devices. Hyunduk Kang says that type I devices can work in sensing only mode. Haiguang answers that Type I devices are always under the control of fixed and type II devices. Hyunduk Kang responses by that when the power of type I device is under 50 mW, it can access the spectrum with sensing only mode. Haiguang says that we can consider the sensing only devices in the future.

6.00 Discuss the session arrangement issues for plenary meeting Chair 12 8:00 pm

15. Mark Cummings asks how much time we have in the coming plenary meeting. Steve answers that we have three two hour sessions.
16. Renga says that we can have longer discussion on Tuesday.
17. Ivan suggests that we can have more time as we are independent TAG.
18. Mark also support to have more time on discussion.
19. Steve mentions that he will not be available for meeting on next week. Ivan will chair the meeting.

7.00 Meeting closed Chair 0 8:12 pm