Project	**IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>**
Title	**Minutes of IEEE 802.16 WirelessHUMAN™ Study Group for Session #10, Tampa, FL, 11/06/00 – 11/09/00**
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	WirelessHUMAN™ Secretary

Re:	IEEE 802.16 Session #10 (Tampa, FL, U.S.A., 6-9 November 2000)
Abstract	This document records the minutes of **WirelessHUMAN™** Study Group meetings held during Session #10.
Purpose	To record the discussions and decisions of the Study Group.
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Minutes of the WirelessHUMAN™ Study Group

WirelessHUMAN Study Group   3:30 – 5:30 Monday, 11/06/00

The Chair started the meeting by examining the concerns of other WG members by reading email responses to the initial PAR submission.

A summary of the concerns stated:
1. IEEE has created the 802.11 standard in the U-NII band and it should not create a competing standard in that band.
2. If PAR permitted, then WG must make provisions for coexistence like LBT.
3. 802.11 members felt that the 802.11 MAC could accommodate the WirelessHUMAN needs adequately.

It was noted by attendees that many companies are already delivering fixed wireless solutions in the U-NII band and that they would continue to do so without an IEEE standard if necessary.

The study group felt that providing a standard for fixed wireless solutions in the U-NII band would encourage a coexistence solution with 802.11 and 802.15.

The Chair noted that the WirelessHUMAN Study Group had selected the 802.11a/HIPERLAN2 PHY solution as a starting point.

The group then created a list of reasons as to why the 802.16 MAC was chosen as a starting place rather than the 802.11 MAC.

-   802.11 MAC doesn't have ranging mechanism.
-   Scattered CPEs don't hear each other so contention based access scheme is inefficient.
-   Cellular like deployment and sectorization are required features
-   Traffic profiles are different. Propagation delays up to tens of uS (6km = 20uS).
-   802.16 MAC allows for various core networks via Convergence Layers.
-   A noted con was that the 802.16.1 MAC is missing interference mitigation techniques.
-   While 802.11 permits sharing of other systems in band, CDMA is inefficient for scattered "range limited" MAN networks.
-   802.11 was designed for mobile laptops, not as a point-to-multipoint MAN distribution system.

WirelessHUMAN tutorial 8PM Monday 11/06/00

Implications of the WirelessHUMAN PAR

Durga Satapathy and Mika Kasslin made presentations justifying the need for the WirelessHUMAN project.

Discussion followed:

1. It was suggested that because you can't charge for transporting data over an unlicensed band, that the WirelessHUMAN model would not work. However, it was also noted that one could charge for Internet service connectivity.
2. It was stated that coexistence between 802.11 and 802.16 should be a goal – Paul Thompson.

3. Marianna Goldhammer noted that channel spacing in WirelessHUMAN should be coordinated with 802.11a (outdoors WLAN, HYPERLAN2 use).
4. Naftali Chayat suggested that a WirelessHUMAN TG should be involved in the global 5GHz harmonization effort.
5. It was suggested by Demos Kostas that the average 15 dB signal attenuation of outside wall could be used to separate the WirelessHUMAN and the WLAN.
6. It was suggested that if 100 MHz is enough bandwidth for WirelessHUMAN,the U-NII band could be split for use by 802.11 and 802.15.
7. It was noted by Demos Kostas that the Wireless Communications Association International has 400 members and that they supported the PAR for the WirelessHUMAN group. They also are working to see that the U-NII band is used for Fixed Wireless Access for WRC2003 Agenda Item.

The meeting adjourned when no additional comments were available.

WirelessHUMAN SG Tuesday 11/07/00

After meeting for a short time, the Study Group unanimously agreed to attend the ad-hoc 802 regulatory meeting hosted by Vic Hayes from 8-10 am.

Numerous attendees stated their support for having Vic champion 802 interests with the FCC.

The ad-hoc group discussed the possibility of paying to have an FCC representative attend meetings. A suggested means of funding such a representation is to setup a parallel corporation that could solicit funds from interested corporations.

January meeting of FCC will seek comments on the reorganization of the Part 15 bands (Unlicensed bands). .11, .15 and .16 Chairs should come up with a single agenda

An attendee reported that the concerns of the FCC are:
    1.Connector rule – requiring professional installation of 5GHz Fixed Wireless
    2.Processing gain rule – e.g. OFDM denied for spread spectrum use
    3.Encourage standardization to improve spectrum efficiency

Vic stated that the IT industry must create a lobby soon for the WRC because the Satellite industry is intensely lobbying the ITU for their interests.

The State Department Bureau of Commerce is the US representative to ITU.
Currently 802.11d is looking for spectrum in Europe, so effective communication with the ITU is essential.

Demos Kostas reported that the WRC2000 made agenda items for global harmonization at WRC2003. WRC task groups 1,3,9 are responsible for this but they are having difficulty understanding the items.

It was noted that one is supposed to be able to get ITU documents via the State Department. You can apparently sign up for this on the web.

Ultra Wide Band is coming and it wants to use the U-NII band as well. They have low average power, but they spike power occasionally. This could result in disruptions to 802.11, .15 and .16 services.

The ITU-USA SARS issue was brought up to emphasize that timely action was required for ITU liaison efforts.

WirelessHUMAN Stduy Group Meeting Resumed 10AM-12PM 11/07/00

The chair suggested that the SG perform the following tasks:

1. Consolidate all stated concerns and address them in a new revision of the WirelessHUMAN PAR.

2. Select a representative for a regulatory group when it is created.

3. Issue CFPs for modifications to the 802.16.1 MAC and 802.11 PHY

4. Provide market estimations, required spectrum, and expected problems in 3G formats by January. It was suggested that we follow the 3G group model for efforts on the standardization and to help to mitigate coexistence issues.

5. A 3G-style Modeling offer by our SG can go into the PAR.

6. Provide support to 802.11 and 802.15 in FCC and ITU issues.

7. Address outdoor usage of WLANs and the potential interference issues.

8. Consider asking for increased power in the low band. However, laptop 802.11 adapters are usually limited to less than 100 mW (due to battery power limitations), so asking the increase of the lower band power to 300 mW could be an issue. John Sydor stated that a Canadian indoor/outdoor HIPERLAN study addresses this issue and supposedly shows that the increased power level is not a problem.

9. Determine what needs to be in the CFPs?

Suggested CFP components:

> - A suggestion for a universal etiquette for U-NII was suggested for the CFP. (coexistence strategies)
> - MAC, 802.11a/HIPERLAN-2 PHY modifications
> - 5 GHz Harmonization
> - FCC Part 15 revisions
> - Modeling exercise: Market demands, spectrum requirements. It was suggested that the WG use the 3G model for creating this information. This is necessary to justify our place in the spectrum. The intent is to provide cell density models to use in examining impact on harmonization issues (as with SARS).

10. A question was brought up concerning manufacturers that have selected PHYs based on models dissimilar to 802.11a/HIPERLAN? The Chair explained that the study group selected 802.11a PHY to be able to accelerate the WG's schedule.

11. A question was brought up asking if we would talk with BWIF. The Chair answered that a WirelessHUMAN SG is too small an entity and that .16 would have to be the initiator of any contact between the groups.

WirelessHUMAN Meeting Wednesday 8AM 11/08/00

The Chair presented the agenda for the day.

1. Prepare a response to all 802.11 and 802.15 comments by 4PM.
2. Get a WG approved PAR ready for consideration by 4:30PM.
3. Get PAR into 802 executive mailboxes by 5PM.

The 802.15 WG provided explicit sample text requesting that a sixth criterion, co-existence with WLAN and WPAN, be added to the PAR. The exact text was:

MOTION: Moved that to secure the official support of 802.15, the working group wants to see language in the WirelessHUMAN PAR, as part of the scope, that requires co-existence with other applications in the unlicensed bands and also that the issue of coexistence be explicitly addressed as the sixth criteria in the five criteria document.

Suggestion for Sixth Criteria: We have identified WirelessHUMAN co-existence with WLANs and WPANs as a critical success factor.

A member of the 802.11 5GHz Globalization Study Group issued the following statement:

This group believes that the approval of new standards in the 5GHz unlicensed bands should be consistent with the guidelines
–Specifically, we have concerns about compatibility and distinct identity of WirelessHUMAN (802.16.1b), WPAN Low Rate (802.15.4) and WPAN High Rate (802.15.3) to the extent that they will operate in the 5 GHz unlicensed bands.
–Without co-existence guidelines, the broad market acceptance of all of these standards is threatened.

The SG approved the removal of the following text: "…and maximize the carrying capacity in the unlicensed band" from the PAR purpose statement. The vote was 13 for, 0 against and 0 abstentions.

Purpose

This Amendment enhances the original project by extending it to license-exempt bands. It will identify techniques to tolerate interference in the unlicensed bands, and facilitate strategies for coexistence with other unlicensed band systems such as 802.11 and 802.15. It will encourage consistent worldwide spectrum allocation and accelerate the commercialization of unlicensed broadband wireless access spectrum. Utilization of unlicensed frequencies will address a market that includes residences, small office-home office (SOHO), telecommuters, and small and medium enterprises (SME).

The following clarification was unanimously approved:

Item 12:

IEEE 802.11, ETSI HIPERLAN/2, and IEEE 802.15 standards and projects address primarily short range WLAN and WPAN applications, respectively. PACS-UA and PACS-UB address unlicensed operation in the unlicensed personal communication services (UPCS) bands at 1910-1930MHz and 2390-2400MHz. This Amendment is specifically directed towards wireless point-to-multipoint MAN/WAN systems that provide access

to core public networks using the unlicensed band spectrum. These systems typically serve large numbers of dispersed subscribers.

The SG held a vote for the following revised PAR scope. The vote was 12 for, 0 against and 0 abstentions.

Revised PAR scope section:

This standard specifies the medium access control layer and physical layers of the air interface of interoperable fixed point-to-multipoint broadband wireless access systems. The specification enables transport of data, video, and voice services. Physical layers are specified for both licensed and license-exempt bands.

*This Amendment expands the scope of the original project by extending it to license-exempt bands (thereby defining the Wireless High-Speed Unlicensed Metropolitan Area Network [**WirelessHUMAN^{TM}]** Standard). It specifies the physical layer and medium access control layer of the air interface of interoperable fixed broadband wireless metropolitan area network systems, including point-to-multipoint. The standard enables access to data, video, and voice services with quality of service in unlicensed bands designated for public network access. It will focus on the 5-6 GHz range and may be applied to unlicensed bands between 2 and 11 GHz. It will address strategies for coexistence with other unlicensed applications. The project will utilize or modify applicable elements from the following:*
- *MAC: IEEE 802.16*
- *PHY: IEEE 802.11a; ETSI BRAN HIPERLAN/2*

Sixth Criteria

Sixth Criteria: We have identified mutual coexistence of WirelessHUMAN (High-Speed Unlicensed Metropolitan Area Networks), WLANs and WPANs as a critical success factor

A presentation to accompany the PAR was created for the afternoon mid-week plenary.

Upon receiving requests to address regulatory issues, the Chair urged SG members follow the efforts of the WCAI organization as they are heavily involved with regulatory work(see wcai.org) There is a list on the egroups.com email website. See especially LESS (License Exempt Spectrum Subcommittee).

Thursday Meeting 8AM 11/09/00

Proposed Agenda:

-Thu before 3 pm: prepare Call For Proposals as described in PAR
-Thu 3-5 pm: get plans approved at 802.16 Closing Plenary
-Thu night: attend 802 ExCom meeting during WirelessHUMAN motion

Agenda was unanimously approved by voice vote. A draft CFP was presented by the Chair, which led to the following discussion:

The issue of the lack of a channel model category in the proposed area within the CFP was brought up. The CFP was modified to include a Channelization Plan category.

Chair suggested that we might need to use a matrix as the 802.16.3 has in evaluating proposals if many are presented.

A request was made to use a non-OFDM PHY due to equipment cost. The Chair responded that an ad-hoc group could look into this issue, but that the PHY has been chosen for the November ballot issue as 802.11a (OFDM).

A Peek to Average Power Reduction (PAPR) mechanism was brought up as an issue category for the CFP. The SG added this category.

A "QoS availability in unlicensed environments" category was added to the MAC section of the CFP. Specifically, does operation in the unlicensed bands cause difficulties in delivering QoS require modifications to the MAC?

It was proposed that a hyperlink be sent onto the egroups list to the latest 802.16.1 MAC and TG3 recommendation changes documents. However, there is no such document, and this activity needs to be followed within TG3 documentation.

It was suggested that the modeling exercise to determine the bandwidth needs of the WirelessHUMAN model must be able to compete with the ~36 Mbps capacity of first mile Ethernet.

The Chair added a statement to the CFP that asks for evaluation criteria of candidate proposals.

The SG determined that they would meet on February 12th for an interim meeting in Dallas at Nokia. The SG agreed to it as tentative.

The Chair will look into a parliamentary procedure regarding a Study Group issuing a CFP.

The Chair presented the WG timeline:

1) Call For Proposals for WirelessHUMAN PHY/MAC: Nov 2000)
   a) PHY: Modifications of 802.11a / HIPERLAN/2
   b) MAC: Modifications of 802.16
2) Review proposals : Jan 2001
3) Select candidate proposals at Interim meeting: Feb 2001
4) Decision on specific modifications: March 2001
5) First Draft Standard: May 2001
6) Comment Resolutions: July 2001
7) Second Draft Standard: Sep 2001
8) Finalize WirelessHUMAN Standard: Nov 2001

At the IEEE 802 Executive Committee meeting on Thursday evening, the **WirelessHUMAN^{TM}** PAR was approved unanimously.