

Project	IEEE 802.16 Broadband Wireless Access Working Group < http://ieee802.org/16 >	
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Re:	Minutes of 802.16 TG4 for Session 12, Hilton Head, NC, USA, March 12 – 15, 2001	
Abstract	Report of meeting events.	
Purpose	Recording of meeting events.	
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IEEE 802.16 TG4 Meeting Minutes

Session #12, Hilton Head, SC, USA

March 12 – 15, 2001

Monday

Durga Satapathy called the meeting to order at 4PM

Durga presented a proposal agenda for the week.

TG4 Goals

- Review contributions for Strawman document
 - PHY : 4
 - MAC : 6
- Co-existence Issues
 - Julius Knapp (FCC) 802.16 slot Tue, 3:30
- Finalize TG4 Strawman Document

Brief Agenda

- Mon 3:30 - 5:00 Joint Session
- Tue 8:00 - 5:00 MAC/PHY parallel sessions
 - Review contributions & work on draft
 - Co-existence meeting (3:30 p.m.)
 - FCC tutorial (6:30 - 8:00 p.m.)
- Wed
 - 8:00 - 9:00 Joint Session
 - 9:00 - 5:00 MAC/PHY parallel sessions
- Thu
 - 8:00 - 2:00 MAC/PHY parallel sessions
 - 2:00 - 3:00 Joint Session

Contributions

- 802.16.4c-01/24 (Drayt Avera)
- 802.16.4c-01/23 (Nico Van Waes)
- 802.16.4c-01/20 (Yossi Segal et al.)

- 802.16.4c-01/18 (Octavian Sarca)
- 802.16.4c-01/22 (Radu Selea and Subir Varma)
- 802.16.3c-01/40 (Subbu Ponnuswamy and Jacob Jorgensen)
- 802.16.3c-01/38 (Subir Varma)
- 802.16.3c-01/36 (Vladimir Yanover et al.)
- 802.16.4c-01/21 (Demos Kostas)
- 802.16.4c-01/19 (Demos Kostas)

Prior Session Minutes

Ken Peirce presented the minutes from Session 11 and Session 11.5. Both were unanimously approved with the following modifications:

1. Session 11 minutes needed to reflect a presentation by Demos Kostas
2. Session 11.5 minutes needed to be updated to reflect correct attendance list. Ken asked for those excluded to notify him.
3. Session 11.5 minutes must reflect a motion by Demos Kostas to appoint an ITU-R liaison.

Demos Kostas asked Durga to add the ITU-R Liaison consideration to the agenda. Durga agreed to add this to the agenda.

Durga announced that both the PHY and MAC team leads would now report.

MAC Team Report

Ken Peirce walked through the Session 11.5 MAC team results.

Ken outlined the MAC activities of the week.

1. Consider the comments submitted for the straw man text.
2. Go through the straw man text and resolve issues where different options were provided.

Ken stressed to the group that the call for comments on the straw man text was not a call for contributions.

Ken asked for questions.

James Brennan asked if new MAC contributions for TG3 would be considered. Ken replied that no new contributions have been solicited by TG4.

Octavian Sarca asked how issues that overlap both PHY and MAC would be resolved and cited ARQ v FEC.

Ken replied that there would be a joint PHY/MAC meeting this week and that it should be considered then.

Lei Wang asked if the email she sent to Ken would be considered as a comment, although it had not been formally presented in the method specified by the call for comments on the straw man text. Ken agreed to consider the comment as if it had been properly submitted.

PHY Team Report

Sanjay Moghe walked through the Session 11.5 PHY group report.

Sanjay stressed that the PHY group would not consider new contributions but would entertain comments on the PHY strawman text document.

Several members voiced concern that some of the comments submitted for the PHY group straw man text included new functionality. Sanjay noted that the comments would be examined and that the group could control the accepted content from all comments.

Octavian Sarca requested that both MAC and PHY straw man documents clearly differentiate between baseline and optional elements.

One of the objectives of this meeting was to have a strawman text of the PHY document. In that regard the group discussed and refined the strawman text further and assigned the tasks to do further work on each section by various teams lead by one person.

Joint meeting of the MAC and PHY groups were held on Wednesday and it was decided that the TG4 PHY group would list all the PHY issues where we need inputs from the MAC group and vice versa.

One of the decisions made by the PHY group at the interim meeting (session 11.5) was to have 256 FFT mandatory and 64 FFT optional or have OFDMA with 1K FFT. There was a motion made to reconsider this decision. The motion was made by Van Waes Nico seconded by Marianna Goldhammer to have only 64 and 256 FFT sizes as mandatory. It was extensively debated. The votes were 12 in favor of the motion and 9 against. Since this motion was a change from the decision we made at the previous meeting it required a 75% majority to get accepted. So this motion was not accepted. Another motion was made by Van Waes Nico and seconded by Radu Selea to have 256 FFT mandatory and have 64 and 1K FFT optional. There were 12 votes in favor of this motion and 9 votes against. The motion did not pass since it required a 75 % majority. A motion was made by Zion Hadad and seconded by Itzik Kitroser to have 64 or 1K mandatory and 256 optional. The motion failed since it got 9 votes for and 13 votes against it. A motion was made by Bob Heise and seconded by Van Waes Nico to have 64 and 256 mandatory with 1024 optional. The motion passed with 16 votes for and 5 against the motion.

A motion made by John Sydor seconded by Marianna Goldhammer to select 10 or 20 MHz channel bandwidth as mandatory. An amendment made by Yossi Segal seconded by Sanjay to add 5 MHz channel bandwidth as optional. Motion was accepted and passed by 7 votes for the motion and 2 against the motion. Thus the motion to select 10 and 20 MHz bandwidth as mandatory and 5 MHz as optional passed.

The PHY team discussed possible coding schemes. It was agreed that the group would narrow further the choices for coding schemes from the choices made at the interim meeting in San Jose. The group agreed to get further comments from all parties and make a decision / selection at the next meeting.

The PHY strawman text was captured as modified in these meeting, showing the decisions made during this session. This strawman text shows the outline of the PHY document with twelve sections, each headed by a team leader and a team of interested people who want to participate in making comments to that section. This document also defines the dates by which the team leaders will complete their sections and submit those to Sanjay Moghe and Octavian. Octavian will help with editing and combining the document. This new combined strawman text document will be published before the next session and we would call for comments on this document at the next meeting. It was agreed that the first revised version of each section will be due by April 16 and a second version by April 30. The group will have periodic conference calls to help complete each section on time. Radu Selea made a motion which was seconded by Sanjay to approve the PHY strawman text document showing the status of the progress made by the PHY group so far. The motion passed by 4 votes for and 0 against the motion.

PHY sessions were attendance varied from 10-30 people. Many of the attendees were new people who were not members yet. At one of the meetings there were 21 votes counted indicating that at least 21 voting members were present in one of the sessions.

FCC Activities

Durga asked liaison David Chauncey to give a brief report of the activities at the FCC. David reported the following:

1. The FCC is considering changing the 3.5 Ghz band from military to civilian use.
2. A proposal to reallocate the MMDS ITFS band for 3G mobile services (docket 00-258)
3. NPRM for Software Defined Radios (SDR). Some equipment built for 802.16 will be categorized as a SDR
4. The FCC is considering what to do with the unlicensed PCS band.
5. FCC may change Part 15.247 rule that would affect the UNII band at 5.725Ghz – 5.825 Ghz.

The task group discussed establishing 802.11 and 802.15 coexistence liaisons. David proposed to meet with the 802.11 and 802.15 chairs to establish the liaisons.

Durga noted that the joint meeting at 8AM would include TG1, TG3 and TG4. At 10AM the TG3 and TG4 group would continue the joint meeting.

Durga Satapathy adjourned the meeting at 4:55PM

Tuesday

8AM Joint TG1, TG4, TG3 MAC session

Carl Eklund called the meeting to order at 8:05 AM

Carl went over the comments briefly and noted that MAC header comments would be addressed first.

Ken Stanwood presented his comment for the TG1 Generic Header
IEEE 802.16.1c-00/10

Discussion yielded a new header format involving the type field.

The changing of the PDE bit to Reserved was unanimously approved.

Now two type values are needed for bandwidth requests. 000000 – incremental b/w req.,
000001 – aggregate b/w request.

Subbu Ponnuswamy presented his comment for a fragmentation header (#24).

After discussion involving ARQ and fragmentation, Carl asked for the topic to be discussed at the joint TG3 and TG4 meeting instead.

A discussion on the packing sub-header followed with a question as to why the FSN field went from 4 bits to 3 bits. Ken Stanwood explained that TG1 felt that 3 bits were enough and that TG3 or TG4 could create another scheme to meet their needs.

A discussion concerning concatenation v packing took place. No changes to the TG1 MAC occurred as a result.

Joint TG3, TG4 MAC Meeting 10:35

Ken Peirce announced that this was the third time that TG4 had seen the first 3 presentations and asked the presenters to use less than the 30 minutes allotted.

Vladimir Yanover presented his ARQ comment (802.16.3c-01/36).

Brief discussion followed concerning MSDU v MPDU.

Subir Varma presented his ARQ comment (802.16.3c-01/38).

Brief discussion followed concerning the use of MPDU sequence numbers versus byte vectors. He suggested that the byte vector was better for point to multipoint systems. Discussion followed concerning the use of a byte vector.

It was noted that using MPDUs as transmission entities prevents the resizing of retransmissions.

Meeting adjourned at 11:45

Meeting joined again at 1PM

Subbu Ponnuswamy presented his ARQ comment (802.16.3c-01/40).

Discussion of the three proposed ARQ mechanisms followed, but no consensus was achieved.

Demos Kostas presented his ARQ comment (802.16.4c-01/21).

Ken Peirce asked the TG3 group if they were ready to vote on ARQ algorithms. If not, then TG4 would move its meeting into side room.

A discussion followed in which it was decided that the ARQ question was not ready to be voted on yet.

Ken announced that a default algorithm and unit of transmission, or similar mechanism, must be accepted to insure interoperability.

The remainder of the meeting consisted of the TG3 MAC group going through the TG4 MAC document and identifying common issues.

Wednesday 8:00 AM

Joint TG3, TG4 MAC Meeting

Ken Peirce motioned to have ARQ required (motion 1).

Jacob Jorgensen asked for clarification.

Ken Peirce clarified to have ARQ used for every connection in TG4.

Demos seconded the motion.

Itzik Kitroser made a motion (motion 2) for a friendly amendment to require that ARQ be in the standard but not required for all connections.

Ken Peirce and Demos Kostas accepted the friendly amendment.

Vladimir Yanover requested clarification of the motion.

Itzik Kitroser offered clarification that ARQ not be required to be implemented.

Itzik Kitroser motioned to require that ARQ be in the standard, as an optional feature.

Demos rejected the friendly amendment (motion 2).

Motion 2 failed.

Demos made a motion (motion 3) to table the original motion. Subir seconded the motion.

Motion to Table (motion 3) vote: 1 yea, 11 nays

Motion 3 failed.

Motion to require ARQ for each connection (motion 1) vote: 1 yea 11 nays

Motion 1 failed.

Meeting adjourned at 10:00 AM to permit further discussion on ARQ proposal consolidation by the contribution authors.

TG4 Meeting Started at 1:40

Durga announced that we would now have a report on coexistence by David Chauncey.

David presented a report of the coexistence meeting that he had attended. He also presented the text for a sixth PAR criterion that came out of that meeting.

A motion (motion 4) was made by David Chauncey to accept the sixth criteria for coexistence for PARs. John Sydor seconded the motion. The motion (motion 4) vote: 11 yeas 0 nays.

David presented a letter that would be sent to the ITU-R for WRC-2003, Agenda item 1.5, Resolution 736{GT PLEN-2/1}{WRC 2000}.

The letter was discussed and language added to indicate to the ITU-R that TG4 is interested in working on coexistence issues.

David motioned (motion 5) that the letter and Ken Peirce seconded the motion. Motion 5 vote: 11 yeas, 0 nays. Motion 5 passed.

Octavian and Radu brought up several issues that needed to be discussed by the TG4 MAC and PHY teams:

1. Block coding size impact on MAC
2. Smart Antenna

3. PHY layer parameters
4. Arq Retransmission and adaptive modulation
5. Symbols may provide non-integer number of bytes for MSDUs.

Durga asked the MAC and PHY teams determine what information would be required of the other group in order to speed progress.

The PHY and MAC team separated at this point.

TG4 MAC Team Report

The goal of this MAC meeting was to refine the TG4 MAC Straw man text.

The MAC group addressed each section of the Straw man text.

Ranging and Frame Synchronization

Radu Salea suggested that the Ranging section of the TG4 MAC straw man was not needed because the TG1 MAC document's mechanism would meet the TG4 group's needs.

Jori Arrakoski noted that the TG1 section 10 counter/timer used in ranging would require higher granularity for the TG4 MAC than that of the TG1 MAC.

Discussion followed concerning the granularity of the counter/timer that covers the propagation delay.

Results:

1. Radu Salea will take the counter/timer issue to the TG4 PHY group and insure that the counter would be described there with the appropriate granularity.
2. Ken noted that he would remove the now unnecessary section from the MAC straw man document.

MAP Flexibility in Burst Definition Type

Radu Selea noted that the MAC straw man document needs a coding type/data rate/symbol table similar to that in the TG1 MAC specification.

Brian Gieschen noted that setting up a convolutional coder required "tail" bits and that the MAC should be able to know the number of tail bits for scheduling accuracy.

Radu noted that the straw man needs its own version of tables 4 and 5 in the TG1 MAC.

A discussion followed concerning frame sizes and periods. The TG1 MAC has 0.5mS, 1.0 mS and 2.0mS frames. Jori Arrakoski noted that a TG4 system would need frame sizes of between 4 and 9 mS to avoid excessive signaling overhead. It was noted that a frame size/latency tradeoff exists and that further examination was required.

The group noted that the MAC straw man needed to get channel bandwidth sizes from the PHY group.

Results:

1. Radu Salea, John Sydor and Brian Gieschen will work on updating this section as noted above.

Transmit Power Control

The mechanism for providing power control was discussed and it was decided that this section of the straw man needed a rewrite. There were three mechanisms proposed for handling power control:

1. A periodic ranging process could accomplish power control.
2. A new MAC message could be created for this purpose.
3. Power control information could be sent as part of the Uplink MAP. The amount of overhead generated would have to be considered.

Results:

1. John Sydor and Radu Salea will rewrite this section of the document.

Mesh Mode Option

Mika Casslin was not present to discuss this section.

Results: Ken will contact Mika and ask him to update this section.

Packet Section

This section belongs in the Mesh Mode section and was misformatted.

Results: This section will be reformatted.

ARQ Solution

No resolution had been reached between the competing proposals as of this point in time.

Results: A joint TG3 and TG4 MAC session was scheduled for Thursday morning.

Dynamic Frequency Selection

The MAC needs to have new messages added to it for obtaining and providing frequency change messages.

A synchronization and channel scanning mechanism will be required of the TG4 PHY.

It will be necessary to define a periodic contention period for DFS listening. The PHY will gather this information and the MAC must provide an interface to receive it.

Results: John Sydor accepted the task of defining these messages as well as the conditions for DFS message transmission.

Coexistence

The RFMM as a BS only message was found to be problematic as the BS might not be able to sense other BS frequency usage at or near the SS.

Results: John Sydor volunteered to provide a new message for this purpose.

The meeting adjourned at 4:30PM.

Thursday

9:00 AM

Joint TG3, TG4 MAC

Brian Kiernan opened the meeting

Subir Varma announced that a compromise had been reached between the three ARQ proposals.

Subir then presented the compromise document and noted that ARQ was optional and was on a per connection basis.

(Meeting moved to Palisade 3 TG2 room)

The TG4 MAC lead, Ken Peirce, explained the TG4 straw man and comment system.

The TG3 MAC lead, Subir Varma, brought the TG3 group through the straw man outline creation process. Topics were identified and teams created that are responsible for creating the straw man text.

Subir gave these teams have one month to provide the first text.

The TG4 members present offered advice on the straw man process they used.

The meeting was adjourned at 11:42.