IEEE 802.16 Working Group on Broadband Wireless Access

http://WirelessMAN.org

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9 December 2002

Dear IEEE-SA RevCom:

This letter is a supplement to Document IEEE 802.16-02/60 (“RevCom Submission of IEEE P802.16a/D6”).

The previous submission anticipated that the Second Recirculation would be the final one. That ballot ran 31 October through 9 November. It resulted in no new negatives, but it did generate additional comments that resulted in some changes to the draft.

A Third Recirculation was conducted; see the attached cover letter IEEE 802.16-02/67 <http://ieee802.org/16/docs/02/80216-02_67.pdf> and comments IEEE 802.16-02/62r1 <http://ieee802.org/16/docs/02/80216-02_62r1.pdf>. The new draft P802.16a/D7 was also included. This Third Recirculation was originally scheduled to run from 20-29 November. However, on 26 November, ballot group member John Barr expressed concern to the Balloting Center that the ballot package excluded unresolved comments that had been previously been recirculated without comment and therefore closed. The request of this balloter was accommodated by a supplement (IEEE 802.16-02/70 <http://ieee802.org/16/docs/02/80216-02_70.pdf>) with the requested information. The Balloting Center issued the ballot package supplement on 27 November, simultaneously extending the ballot until 5 December.

In the Third Recirculation, we received only one change of vote: from “Approve, no comments” to “Abstain, other.” The voter, Kevin Marquess, provided no reason for this change. The full voting report is attached.

Also in the Third Recirculation, we received two Disapprove comments (#382 and #383), both from John Barr. We also received a third comment (#381) from an Approve voter. The comments were considered by a Ballot Resolution Committee of seven members and two observers, as appointed by the IEEE 802.16 Working Group. The Committee concluded that the none of the comments would necessitate a Fourth Recirculation. The comments, and the Committee’s reasoning, are recorded in the attached IEEE 802.16-02/71. All three comments were out of scope of the recirculation, since the material discussed had not been mentioned in, nor altered since, the previous recirculation. Furthermore, the two Disapprove comments were reiterations of previous comments that had been rebutted by the Ballot Resolution Committee, with the rebuttals previously accepted by the ballot group. Comment #381 did not require recirculation because it was submitted by an Approve voter. The comment itself was essentially a repeat of a previously-recirculated comment, though the proposed remedy was new. The Committee provided a technical rebuttal.

At this point, the Ballot Resolution Committee considers that IEEE Sponsor Ballot of P802.16a/D7 (“Draft Amendment to IEEE Standard for Local and Metropolitan Area Networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems - Medium Access Control Modifications and Additional Physical Layer Specifications for 2-11 GHz”) is complete. I thereby request that it be considered for approval by RevCom at the next possible opportunity.

The draft itself is included separately in PDF format and supplied to the IEEE Staff Project Editor in FrameMaker format.

Please let me know of any questions or concerns that arise.

Sincerely,

Roger B. Marks

Document under Review: P802.16a/D7 **Ballot Number:** Third Recirculation **Comment Date**

Comment # 381 **Comment submitted by:** Ed Callaway 2002-11-29

Comment Type Technical, Non-binding **Starting Page #** 277 **Starting Line #** 12 **Fig/Table#** **Section** B.2.2.4

I am uncomfortable stating flatly that RLANs cannot coexist in the same channel with BWA devices. I am hoping that the situation is not quite so bleak, but I cannot agree with the following line that RLANs will not be used in residential areas--especially since many people I know already have them in their homes, and consider their biggest advantage to be the ability to sit outside on the porch with a laptop and work. What is such a person to do if a rooftop BWA device apprears next door? Simply saying it won't happen very often doesn't seem to be good engineering practice at a time when home RLANs are a growing market.

Suggested Remedy

Delete p. 277, l. 12, and include a coexistence analysis similar to those in B.2.4.2, but with an outdoor BWA transmitter, an indoor RLAN AP, and an outdoot RLAN user.

Resolution of Group

Do not recirculate.

Reason for Group's Decision/Resolution

(1) Since the balloter submitting this comment voted Approve, the comment is not an unresolved Disapprove comment and need not be recirculated.
(2) This comment is out of scope. No relevant comments or changes were under review in this Third Recirculation.
(3) This comment (although not the remedy) is a near duplicate of Comment 123, the response to which was recirculated and approved by the Sponsor Ballot Group.
(4) Per 5.4.3.2 of the IEEE-SA Standards Board Operations Manual, "once 75% approval has been achieved, the IEEE has an obligation to the majority to review and publish the standard quickly. Therefore, once 75% approval has been achieved, the IEEE requirements for consensus have been met. Efforts to resolve negative votes may continue for a brief period; however, should such resolution not be possible in a timely manner, the Sponsor should forward the submittal to RevCom. " Accordingly, the Ballot Resolution Committee believes that a further recirculation is not appropriate.
(5) The comment incorrectly states that the draft says "that RLANs will not be used in residential areas." RLANs are and will be used in residential areas. The draft specifically analyses the most common case, in which the RLANs are indoors. The comment specifically requests a coexistence analysis of the outdoor use of an RLAN terminals in conjunction with an indoor RLAN access point. Since there are many different propagation examples to be made, this scenario would be extremely complicated to analyze, and the resulting analysis would be so dependent on the assuptions as to be inconclusive. The analysis is therefore not included. The bottom line is that, in license-exempt bands, interference is expected and inevitable. In such bands, the draft makes DFS mandatory in order to address this issue. Detection of "unknown transmissions (such as RLAN transmissions)" in the channel is mandatory.

Document under Review: P802.16a/D7 **Ballot Number:** Third Recirculation **Comment Date**

Comment # 382 **Comment submitted by:** John Barr 2002-12-04

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section** general

Comment 326 has been satisfied by the recirculation of a complete updated draft. Comments 123, 124, and 325 are still unsatisfactory.

Suggested Remedy

Correct draft to include methods for realistic coexistence with other IEEE 802 radios that are designed to share the license-exempt bands or remove operation of 802.16a in any of the license-exempt bands to prevent interferecne with privately owned WLANs or other radios using the license-exempt bands that conform to realistic coexistence rules. Also, the 802.16 committee should vote against any other IEEE 802 standard proposed for license-exempt bands that does not also provide for realistic coexistence with other IEEE 802 radios in those bands. Stating that since others do not do this is not realistic. This is a new standard that is claiming operation in the same license-exempt bands already being used by other IEEE 802 radios. Adding a new radio to those bands should not cause interference.

Resolution of Group

Do not recirculate.

Reason for Group's Decision/Resolution

(1) This comment is out of scope. No relevant comments or changes were under review in this Third Recirculation.
(2) This comment is a duplicate of Comments 123, 124, and 325, all submitted by this balloter. Comment 325 simply reiterated Comments 123 and 124. Therefore, this is not a new comment but a repeat of an old comment.
(3) Each of the three comments and responses has already been reviewed in the First or Second Recirculation. No additional relevant comments arose for consideration in this Third Recirculation. Therefore, the Ballot Resolution Committee believes that its rebuttal has already been accepted by the Sponsor Ballot Group.
(4) Per 5.4.3.2 of the IEEE-SA Standards Board Operations Manual, "once 75% approval has been achieved, the IEEE has an obligation to the majority to review and publish the standard quickly. Therefore, once 75% approval has been achieved, the IEEE requirements for consensus have been met. Efforts to resolve negative votes may continue for a brief period; however, should such resolution not be possible in a timely manner, the Sponsor should forward the submittal to RevCom. " Accordingly, the Ballot Resolution Committee believes that a further recirculation of this comment is not appropriate.

Document under Review: P802.16a/D7 **Ballot Number:** Third Recirculation **Comment Date**

Comment # 383 **Comment submitted by:** John Barr 2002-12-04

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section** general

The MAC protocol relies on a higher layer (TCP/IP) functions like DHCP, UDP, and Time-of-Day services to provide configuration information to the MAC and is specified to be the 'communication channel' between the Base Stations and the Subscriber stations (for example in 6.2.15 MAC Management Message tunneling in Mesh Mode).

This causes architectural problems - ideally protocol layer (n) should be indepent of protocol layer (n+1). In the case of 802.16a, if the higher layer functionality is not working, then the layer 2 network does not operate correctly.

Suggested Remedy

Restrict node state, MAC messaging and inter-node communications within layer 2 and do not be reliant an any higher layer functionality.

Resolution of Group

Do not recirculate.

Reason for Group's Decision/Resolution

(1) This comment is out of scope. No relevant comments or changes were under review in this Third Recirculation.
(2) This comment is a virtual duplicate of Comment 006. Therefore, it is not a new comment but a repeat of an old comment.
(3) The Ballot Resolution Committee's responses to the old comment (006) were subject to review in the First Recirculation and did not result in comments then, nor in the Second Recirculation (in which it was included in the ballot package for completeness). Therefore, the Ballot Resolution Committee believes that its rebuttal has already been accepted by the Sponsor Ballot Group.
(4) Per 5.4.3.2 of the IEEE-SA Standards Board Operations Manual, "once 75% approval has been achieved, the IEEE has an obligation to the majority to review and publish the standard quickly. Therefore, once 75% approval has been achieved, the IEEE requirements for consensus have been met. Efforts to resolve negative votes may continue for a brief period; however, should such resolution not be possible in a timely manner, the Sponsor should forward the submittal to RevCom. " Accordingly, the Ballot Resolution Committee believes that a further recirculation is not appropriate.

Ballot Summary

P802.16a/D7 Third Recirculation
Closing date: 2002-12-05

This is a recirculation ballot. The report collates the results from the following groups: 0000224 0000365 0000394 0000419.

1. This ballot has met the 75% returned ballot requirement.

```
    76 eligible people in this ballot group.


    51 affirmative votes
     7 negative votes
     9 abstention votes
=====
    67 votes received =  88% returned
                         13% abstention
```

2. The 75% affirmation requirement is being met.

```
    51 affirmative votes
     7 negative votes
=====
    58 votes =  87% affirmative
```

Ballot Details

Coordination Responses Only

IEEE/Coord Number	Name	Role	Phone / E-mail	Coordination Ballot Received	Coordination Comment(s) Received
00601054	Bruce Barrow	SCC14	301-493-4374 bbarrow@nist.gov	yes	-
00001000	Michelle Turner	SCC10	732-562-3825 m.d.turner@ieee.org	-	yes
00001001	Michelle Turner	Editorial	732-562-3825 m.d.turner@ieee.org	-	yes

Balloters

Number	Name	Phone / E-mail	Vote	T	E	Graphics	Status Notes	Interest Category
41371999	Gordon Antonello Wi-LAN Inc. 2891 Sunridge Way NE Calgary, Alberta T1Y 7K7 Canada	+1 (403) 207-6477 gantonello@wi-lan.com	Approve, no comments (Y)	-	-	-		Producer
06154470	Morris Balamut 13 Matawan Green Lane Matawan, NJ 07747 USA	732-566-3588 m.balamut@ieee.org	Approve, no comments (Y)	-	-	-		General Interest

05587654	John Barr Motorola 1303 E. Algonquin Road, IL01/4th Schaumburg, IL 60196 USA	847-576-8706 john.barr@motorola.com	Disapprove, comments (N)*	5	-	1		Producer
07335656	Anader Benyamin-Seeyar Consultant to Harris Corporation 3 Hotel de Ville Dollard des Ormeaux, Quebec H9B 3G4 Canada	(514)421-8435 Anader.Benyamin@AdvantechAMT.com	Approve, no comments (Y)	2	-	1		User
01682194	Maurice Bizzarri Bizzarri Software 420 El Dorado Ave Palo Alto, California 94306-2421 USA	6505753694 bizzarri@well.com	Approve, no comments (Y)*	-	-	-		General Interest
04503512	Ed Callaway Motorola 8000 W. Sunrise Blvd., MS 2141 Plantation, Florida 33322-8292 USA	954-723-8341 ed.callaway@motorola.com	Approve, no comments (Y)	1	-	-		General Interest
00812131	Naftali Chayat Alvarion 21a HaBarzel st. Tel Aviv 61131 Israel	+972-54-225549 naftali.chayat@alvarion.com	Disapprove, comments (N)	4	1	-		Producer
41437562	Remi Chayer Harris Corporation 3 Hotel de Ville Dollard-des-Ormeaux, Quebec H9B 3G4 Canada	1 (514) 421-8360 rchayer@harris.com	Approve, comments (Y1)	-	6	-		Producer
40237493	Keith Chow 28 Hawthorn Way Cambridge, Cams CB4 1AX UK	+44 (0)7796217543 chow.keith@computer.org	Approve, no comments (Y)	-	-	-		General Interest
40255444	Lim Christina The University of Melbourne 11 Lincoln Street Victoria, Victoria 3020 Australia	61-3-8344-6678 c.lim@ieee.org	Approve, no comments (Y)	-	-	-		General Interest
03210820	Todor Cooklev Aware, Inc. 3685 Mt Diablo Blvd,	781-687-0682 tcooklev@aware.com	Approve, no comments	-	-	-		General Interest

	suite 395 Lafayette, CA 94549 USA		(Y)					
06503270	Jose Costa Nortel Networks 14 Ridgefield Crescent Nepean, Ontario K2H 6R9 Canada	613 763-7574 costa@nortelnetworks.com	Approve, no comments (Y)	-	-	-		Producer
41338009	Donald Cowick Sprint MS: KSOPKB0803 9300 Metcalf, Overland Park, Kansas 66210 USA	913-534-3396 donald.k.cowick@mail.sprint.com	-	-	-	-		General Interest
40199311	Thomas Dineen Dineen Consulting PO Box 361801 Milpitas, CA 95036 USA	(408) 956-0539 tdineen@ix.netcom.com	Approve, no comments (Y)	-	-	-		Producer
08972887	Dr. Sourav Dutta V S N L 16th Floor, Internet HQ, VSB, M G Road, Fort Mumbai, MH 400001 INDIA	+91 22 267-4269 s.dutta@ieee.org	Abstain for lack of time (A1)	-	-	-		General Interest
05472527	Richard Eckard Verizon Laboratories 40 Sylvan Road Waltham, MA 02451 USA	781-466-2780 dick.eckard@verizon.com	-	-	-	-		User
40263910	Dominic Espejo Caltrans District 7 120 S. Spring St. MS15 Los Angeles, CA 90012 USA	213-897-6623 despejo@ieee.org	Approve, no comments (Y)	-	-	-		Government
06810238	Michael Fischer Intersil Corporation 4242-3 Medical Drive San Antonio, TX 78229 USA	+1-210-614-4096 mfischer@choicemicro.com	-	-	-	-		Producer
03533247	Keng Fong Ralink Technology 20300 Stevens Creek Cupertino, CA 95014 USA	(408) 725-8070 x 18 fong@ieee.org	Approve, no comments (Y)	-	-	-		Producer

08518995	Avraham Freedman Hexagon System Engineering Ltd 2 Kaufman st. Tel-Aviv, Israel 68012 Israel	+972-3-5101128 avif@hexagonltd.com	Approve, comments (Y1)	-	1	1		General Interest
40148012	Mike Geipel REMEC Broadband Wireless 1600 East Parham Road Glen Allen, Virginia 23228 USA	804-864-4125 geipel@ieee.org	Disapprove, comments (N)	1	-	-		Producer
41414896	Andrew Germano Tantivy Communications 1450 S. Babcock Street Melbourne, Florida 32901 USA	321-956-8846 agermano@tantivy.com	-	-	-	-		General Interest
01883768	James Gilb Appairent Technologies 9921 Carmel Mountain Rd, #247 San Diego, CA 92129 USA	858-538-3903 gilb@ieee.org	Approve, no comments (Y)	-	-	-		Producer
41361934	Mariana Goldhamer Alvarion 21, Ha Barzel St. Tel Aviv, n.a. 69710 Israel	+972-54-22 55 48 marianna.goldhammer@alvarion.com	Disapprove, comments (N)	3	-	3		Producer
00028464	Qiang Guo Motorola, Inc. 600 North U.S. Highway 45 Libertyville, Illinois 60048 U.S.A.	(847) 523-3217 qa3565@email.mot.com	Approve, no comments (Y)	-	-	-		General Interest
40306847	Simon Harrison Red-M (Communications) Ltd Neptune House, Mercury Park Wycombe Lane, Wooburn Green, Buckinghamshire HP10 0HH UK	+44 (0) 1628 819604 simon.harrison@red-m.com	Approve, no comments (Y)*	-	-	-		General Interest
01670801	Robert Heile Wireless Communications	508-222-1393 bheile@ieee.org	Approve, no comments	-	-	-		General Interest

	Consulting 11 Louis Road Attleboro, MA 02703 USA		(Y)					
41242888	Andreas Jochen Holtmann Deutsche Bank S.A.E. Via Interpolar s/n Sant Cugat, Barcelona 08190 Spain	+34-93-851-8605 andreas_holtmann@yahoo.de	Abstain for lack of time (A1)	-	-	-		User
08124661	Osamu Ishida NTT 1-1, Hikari-no-oka Yokosuka, Kanagawa 239-0847 Japan	+81-468-59-3445 ishida@exa.onlab.ntt.co.jp	-	-	-	-		User
06710792	Raj Jain Nayna Networks, Inc. 481 Sycamore Dr Milpitas, CA 95035 United States	(408) 956-8000 x309 raj@nayna.com	Approve, no comments (Y)	-	-	-		User
01556620	Hamadi Jamali DST 983 Johnson st Redwood City, CA 94061 USA	(650)367-7697 hjamali@ieee.org	Approve, no comments (Y)	-	-	-		General Interest
41448969	Tal Kaitz alvarion 21 a Habarze st. Tel Aviv, Israel 69710 Israel	972-3-6456273 tal.kaitz@alvarion.com	Disapprove, comments (N)	2	-	2		Producer
40357068	Stuart Kerry Philips Semiconductors Inc. 1109 McKay Drive, MS 48 SJ San Jose, CA 95130-1706 USA	408-474-7356 stuartk@ieee.org	Approve, no comments (Y)*	-	-	-		Producer
05995253	Brian Kiernan InterDigital Communications Corp. 781 Third Avenue King of Prussia, PA 19406 USA	610-878-5637 brian.kiernan@interdigital.com	Approve, no comments (Y)	-	-	-		General Interest
41335428	Jerome Krinock Radia Communications 275 N. Mathilda, Suite A	408-830-9726 ext 239 jkrinock@radiacommunications.com	Approve, comments (Y1)	-	-	-	Approve, comments without comment	Producer

	Sunnyvale, CA 94086 USA							
41283461	Jonathan Labs Wavesat Wireless, Inc 4600 rue Cousens Ville St-Laurent, Quebec H4S 1X3 Canada	(514)956-6325 jlabs@wavesat.com	Approve, comments (Y1)	1	-	1		General Interest
08108896	Yeou-Song Lee Anritsu 5734 Tan Oak Drive Fremont, CA 94555 U.S.A.	408-778-2000 ext. 4976 brian.lee@ieee.org	Approve, no comments (Y)	-	-	-		Producer
06426456	John Lepore Technology Service Corp. 80 M. Street SE, Suite 640 Washington, D.C. 20003 USA	202-554-4172 Ext. 23 jlepore@tscwo.com	Approve, comments (Y1)	-	1	-		General Interest
05845615	Gregory Luri CITY OF ST. CHARLES-ILLINOIS 2 East Main Street St. Charles, IL 60174-1984 USA	630-377-4475 gluri@ci.st-charles.il.us	Approve, no comments (Y)*	-	-	-		User
40354777	Yuan Ma GEMS 3200 N. Grandview Blvd. Waukesha, WI 53188 USA	262 521 6223 YUAN.MA@med.ge.com	Abstain for lack of expertise (A2)	-	-	-		User
06760854	J. Scott Marin 131 Skyline Drive Murphy, Texas 75094 United States	972-516-5158 smarin@ix.netcom.com	-	-	-	-		General Interest
08122103	Roger Marks NIST 325 Broadway, MC 813.00 Boulder, CO 80305 USA	+1 303 497 3037 r.b.marks@ieee.org	Approve, no comments (Y)	1	-	1		Government
40219720	Kevin Marquess Hyper Corporation 1279 Quarry Lane, Suite B Pleasanton, CA 94566-8499 USA	+1.925.549.7601 kevin.marquess@ieee.org	Abstain, other (A3)*	-	-	-	Abstain, other without comment	General Interest

08940611	Peter Martini University of Bonn, Dept. of CS IV Roemerstr. 164 Bonn, none 53117 Germany	49228734571 martini@cs.uni-bonn.de	Approve, no comments (Y)	-	-	-		General Interest
40183512	Kyle Maus AITG 6007 N. Sheridan Rd., #28J Chicago, IL 60660 US	312-371-9727 sargon@ieee.org	Approve, no comments (Y)*	-	-	-		General Interest
40066042	Patrick McCaughey Renaissance Doors and Windows 130 N. Gilbert Fullerton, California 92633 USA	(714) 521-5747 pmccaughey@irishabroad.com	Abstain for lack of expertise (A2)	-	-	-		User
07871098	Mehrdad Mehdizadeh DuPont Co. Mail Stop E357/105, PO Box 80357 Wilmington, DE 19880-0357 USA	302-695-8623 mehrdad.mehdizadeh@usa.dupont.com	Approve, no comments (Y)	-	-	-		User
07446628	Michael Newman CSI Telecommunications Engrs. 1700 California Street, Suite 420 San Francisco, CA 94109 USA	415-751-8845 miken@csitele.com	Approve, no comments (Y)*	-	-	-		General Interest
07858459	Paul Nikolich Chair, IEEE802 LAN/MAN Standards Project 18 Bishops Lane Lynnfield, MA 01940 usa	857-205-0050 p.nikolich@ieee.org	Disapprove, comments (N)	1	-	-		General Interest
05280607	Mike Paff Radia Communications 275 N. Mathilda Ave. Sunnyvale, CA 94086 USA	408 830 9726 x243 mpaff@radiacommunications.com	Approve, no comments (Y)	-	-	-		Producer
07022429	Roger Pandanda MCS Corporation Box 20451 Palo ALto, CA 20451	650-618-1786 rogerp@ieee.org	Approve, no comments (Y)	-	-	-		General Interest

	USA							
00353235	Subbu Ponnuswamy Self 1005 Blue Ravine Road, #926 Folsom, CA 95630 USA	916-425-1276 subbu@acm.org	Approve, no comments (Y)	-	-	-		General Interest
40266494	Eugene Robinson E.A. Robinson Consulting Inc. 1200 Lake Point Circle McKinney, Texas 75070 USA	972 529-6395 rob1200@aol.com	Approve, no comments (Y)*	-	-	-		General Interest
01378470	Walt Roehr TNC 11317 sout shore rd reston, va 20190 usa	703-435-1787 w.c.roehr@ieee.org	-	-	-	-		General Interest
41413768	Shane Rogers Wi-LAN Inc. 2891 Sunridge Way N.E. Calgary, AB T1Y 7K7 Canada	403 207-6355 srogers@wi-lan.com	Approve, no comments (Y)	-	-	-		Producer
21770065	Thomas Ruf SysKonnect Siemensstrasse 23 Ettlingen, BW 76275 Germany	+49 7243 502 324 truf@syskonnect.de	Approve, no comments (Y)	-	-	-		General Interest
40239981	Thomas Siep Bluetooth SIG, Inc. m/s 365, 1802 Pleasant Valley Dr, Suite 100 Garland, TX 75040 USA	+1 972 495 5491 tom.siep@ieee.org	-	-	-	-		User
40286647	Manoneet Singh Radia Communications 275 N Mathilda Ave Suite A Sunnyvale, CA 94086 USA	(408) 870 9726 x 244 msingh@radiacommunications.com	Approve, no comments (Y)	-	-	-		Producer
41392686	Kenneth Stanwood Ensemble Communications 9890 Towne Centre Dr San Diego, CA 92009	(858) 404 6559 ken@ensemble.com	Approve, no comments (Y)	1	-	1		Producer

	USA							
00832790	Paul Struhsaker	972-516-1254 paul@razetechnologies.com	Approve, no comments (Y)	-	-	-		Producer
41279013	Shawn Taylor Wi-LAN 2891 Sunridge Way NE Calgary, Alberta T2E 4A8 Canada	403-207-6491 staylor@wi-lan.com	Approve, no comments (Y)	2	-	-		Producer
41452605	David Trinkwon Medley Systems Ltd 8 Blenheim Road Maidenhead, Berkshire SL6 5HD United Kingdom	650 245 5650 trinkwon@compuserve.com	Approve, no comments (Y)*	-	1	-		General Interest
03239332	Joan Viaplana RETEVISION JOSEP PLA, 15 ARENYS DE MUNT, BARCELONA 08358 SPAIN	+34670221398 jviaplana@acm.org	Approve, no comments (Y)	-	-	-		General Interest
41328136	LEI WANG Wi-LAN Inc. 2891 Sunridge Way, N.E. Calgary, Alberta T1Y 7K7 Canada	(403)204-3288 leiw@wi-lan.com	Approve, no comments (Y)	4	3	-		General Interest
41387608	Stanley Wang Ensemble Communications, Inc. 13268 Larkfield Court San Diego, CA 92130 USA	+1 (858) 526-7265 Stanley@reddotwireless.com	Approve, no comments (Y)	-	-	-		Producer
07368616	Jay Warrior Agilent Technologies 3500, Deer Creek Road Palo Alto, CA 94304 USA	650-485-2086 jay_warrior@agilent.com	Abstain for lack of time (A1)	-	-	-		General Interest
02982643	John Westmoreland LSI Logic Corporation 1778 McCarthy Blvd. Milpitas, CA 95035 USA	408-532-6234 john.westmoreland@lsil.com	Approve, no comments (Y)	-	-	-		User
07124290	Paul Yang OTC Wireless 10176 English Oak	510-490-8288 x239 pyang@otcwireless.com	-	-	-	-		General Interest

	Way Cupertino, CA 95014-5653 USA							
41446880	Vladimir Yanover Alvarion Ltd. 22a Habarzel Str. Tel-Aviv, Sorry, there are no states or provinces in Israel 32176 Israel	+972-36457834 vladimir.yanover@alvarion.com	Disapprove, comments (N)	3	-	3		Producer
40262090	Huanchun Ye Beamreach Networks 755 North Mathilda Ave Sunnyvale, CA 94086 USA	408-869-8748 hcye@ieee.org	Abstain for lack of time (A1)	-	-	-		User
40354434	Jung Yee IceFyre Semiconductor 411 Legget Drive, Suite 300 kanata, Ontario K2K 2C9 Canada	613.599.3000 x226 jyee@icefyre.com	Abstain for lack of time (A1)	-	-	-		Producer
05907266	Oren Yuen 1504 Steinhart Ave Redondo Beach, CA 90278 USA	310-372-9334 oren.yuen@ieee.org	Approve, no comments (Y)	-	-	-		User
41392758	micheal chukwu Elect Elect eng. unizik, Awka Awka, Anambra State pmb5025 Nigeria	082228948 shawnweb@onebox.com	Approve, comments (Y1)	-	-	-	Approve, comments without comment	User
04804282	carl scarpa Hitachi america 307 college road east princeton , nj 08540 usa	609-945-0117 CScarpa@siriusradio.com	Abstain, other (A3)	-	-	-	Abstain, other without comment	General Interest
41249250	Nico van Waes Nokia 313 Fairchild Dr. Mountain View, CA 94043 USA	650 625 2201 nico.vanwaes@nokia.com	Approve, no comments (Y)	3	-	3		Producer
41435547	Cor van de Water Agere Systems Zadelstede 1-10 Nieuwegein, Utrecht 3435EA Netherlands	+31 30 609 7563 water@agere.com	Approve, no comments (Y)	-	-	-		Producer

Comment Totals *	34	13	17

(*) *You have at least these many comments: each unstructured binary file (i.e., Word) is counted as a single G file, which may consist of one or hundreds of individual T and E comments.*

***** This balloter cast this ballot in the current circulation of this recirc ballot.

Summary of Eligible Voters by Interest Category

Interest Category	Affirmative(s)	Negative(s)	Abstention(s)	Not Returned	Total
User	7	0	4	3	14
Producer	18	6	1	1	26
General Interest	24	1	4	5	34
Government	2	0	0	0	2
Voting Tally	**51**	**7**	**9**	**9**	**76**

Abstention details:	5 for lack of time (A1)	2 for lack of expertise (A2)	2 for other reasons (A3)

The following table lists the remaining unresolved Disapprove comments in this ballot:

Disapprove Balloter	**Unresolved Disapprove Comments**
John Barr	123, 124, 325, 382, 383
Naftali Chayat	
Mike Geipel	004
Marianna Goldhammer	357, 358, 359, 361, 362, 367, 368, 369
Tal Kaitz	330, 344, 348, 365, 366
Paul Nikolich	006
Vladimir Yanover	364

Document under Review: P802.16a

Comment # 004 **Comment submitted by:** Mike Geipel Member

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

The 802.16 standard needs to reflect the current realities of dimished R&D spending. While the technological concepts included in the latest version of the standard is impressive, the odds are slim that a critical mass of companies will commit the level of R&D investment required to realize the current spec into a commercial system. To establish itself as a true industry standard the 802.16 specification must be more than an optimal engineering solution to wireless propagation, it must also achieve a balance with respect to the level of effort required to realize the associate hardware and software.

The history of technology adoption teaches us that technology changes typically occur in incremental steps and that the most deterministic (i.e. low risk) steps are the simple ones. With this simplicity heuristic as our guide, a number of changes are suggested to the current 802.16a/D5-2002 standard in order to match the current realities of R&D investments.

Suggested Remedy

- Make ITU J.83 Annex A or B an optional transmit encoding scheme
- Make adaptive modulation optional.
- The MAC is functionally equivalent to the DOCSIS MAC, why not adopt the DOCSIS MAC and list possible enhancements as options.

Resolution of Group **Decision of Group:** Rejected

vote:
0 in favor
21 against

Reason for Group's Decision/Resolution

{Note: this comment was included in the first recirculatation, but in truncated form. Therefore, it is being included in the second recirculation verbatim.}

The Working Group recognizes the economic realities that influence the acceptance of a standard. It believes that it has found the right balance, introducing advanced technology that can be economically developed and deployed. The group does not believe it would benefit the standard to introduce addtional transmit encoding options. It believes that adaptive modulation is essential to the successful operation of a system in the long term.

In order for a standard to be success, it also has to be capable of effective operation in the intended environment. The ITU J.83 PHY (which, by the way, is used in DOCSIS) was designed for FDD *cable* systems, and solves a different set of problems from BWA.
Some of the shortcomings of the ITU J.83 PHY and DOCSIS MAC proposal for the 802.16a application are as follows: it
a) is not defined for TDD systems (a functional requirement of 802.16a);
b) does not perform well (has low capacity) in the NLOS slow fading environments typical of 802.16a applications (see BWIF white paper for

documented details, since it does use the DOCSIS PHY in comparisons with V-OFDM);
c) does not possess framing/modulation structures that facilitate capacity-improving channel estimation and equalization techniques;
d) does not possess pilot symbols and preambles that enable fast acquisition and re-acquisition when a fade is experienced (note that preambles also facilitate TDD operation);
e) does not enable the operator to implement MAC-based ARQ, and therefore must rely on ARQ from TCP/IP, which greatly reduces capacity over a slow fading channel;
f) does not enable the use of per-user adaptive modulation which greatly improves capacity, since, unlike cable, not all users have the same CINR (both distances and shadowing).
g) Has no mechanism to introduce other BWA capacity enhancing options, including space-time coding, AAS, and MESH.

Document under Review: P802.16a

Comment # 006 **Comment submitted by:** Paul Nikolich Member

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

The MAC protocol relies on a higher layer (TCP/IP) functions like DHCP, UDP, and Time-of-Day services to provide configuration information to the MAC and is specified to be the 'communication channel' between the Base Station and the Subscriber stations (for example in 6.2.15 MAC Management Message tunneling in Mesh Mode).

This causes architectural problems - ideally protocol layer (n) should be independent of protocol layer (n+1). In the case of 802.16a, if the higher layer functionality is not working, then the layer 2 network does not operate correctly.

Suggested Remedy

Restrict node state, MAC messaging and inter-node communications within layer 2 and to not be reliant on any higher layer functionality.

Resolution of Group **Decision of Group:** **Accepted-Modified**

Insert on page 6, line 44: Though the MAC specification invokes IP protocols, they are required only as a standard basis for element management rather than MAC operation, since, in all practicality, element management is necessary in this type of network.

Reason for Group's Decision/Resolution

For PMP systems:
The MAC does not really rely on the higher layer protocols. These functions are intended to be a standard way of providing connectivity between the SS and a network management and/or element management system. From the MAC's point of view, the SS could simply respond to the BS with a TFTP-CPLT message and be done with it. The SS would be unmanageable at the NOC level, but you could still authenticate, set up services, transfer data, perform RLC functions, etc. So from a MAC point of view none of the higher layer functions are required. However, they are required as a standard basis for element management (rather than MAC) since, in all practicality, element management is necessary in this type of network.

For mesh systems:
In mesh systems there is need to support transactions that take place between entities separated by multiple hops. This need arises out of the following:
The intermediate nodes neither have access to nor should be trusted with all information necessary to complete all transactions that currently rely on MAC message tunneling.

Also in 802 the CIDs (the addresses used by the MAC layer) are unique only over a single hop and not known by the BS if separated from a node by more than a single hop. Also 802.16 does not include routing functionality that is necessary for making correct forwarding decisions as this functionality is non-trivial and is already readily available for IP.

The current choice of tunneling the MAC messages over UDP is motivated by the following facts:

1) Tunneling the messages over UDP provides, in conjunction with off the shelf higher layer protocols, a mechanism to deliver the MAC message over multiple hops to the intended recipient.
2) The implementation burden of the current approach is minimal on the devices supporting mesh.
3) The tunneling does not compromise the security of the authentication and authorization transactions.

Document under Review: P802.16a

Comment # 123 **Comment submitted by:** John Barr Member

Comment Type Technical, Binding **Starting Page #** 90 **Starting Line #** **Fig/Table#** **Section** 6.2.14

The use of only "primary users" to determine when a channel should not be used does not prevent a P802.16a BS or SS from interferring with a currently operating IEEE 802 wireless system using that same channel. P802.16a should follow recommendations for allowing multiple IEEE 802 wireless systems to operate on separate channels in license-exempt bands.

The informative text in appendix B provides a good analysis of possible interference with existing IEEE 802 wireless systems, but mistakenly makes the assumption that P802.16a deployments will not interfere with other IEEE 802 wireless systems in the license-exempt bands since the only outdoor usage would be for public hot spots. However, there is a growing acceptance of 802.11b/a/g wireless systems for home usage, some of which will be extended to 'backyard' areas around a home for the convenience of the homeowner. The lack of a mechanism within P802.16a to mitigate interference with home IEEE 802 wireless systems must be corrected before this becomes an official IEEE standard.

Suggested Remedy

Modify text in 6.2.14 to include IEEE 802 wireless systems as users of channels to be avoided as stated for primary users. Also update to ensure that avoidance of operating IEEE 802 wireless systems includes those operating in the 2.4 GHz license-exempt band.

Resolution of Group **Decision of Group:** Rejected

vote: in favor 0
against 20

Reason for Group's Decision/Resolution

{Note: this comment was included in the first recirculatation, but in truncated form. Therefore, it is being included in the second recirculation verbatim.}

802.16's approach is in line with the approach taken by the other wireless groups with 802.
Within this context, primary user refers to a regulatory designation, regardless of technology.
Requiring the detection of any 802 compliant wireless system, current and future, would be prohibitive.
The specified DFS mechanism is frequency independent.
This issue would be different if all license-exempt systems required DFS (as in the CEPT RLAN bands), but given that other 802 standards do not mandate DFS, placing the entire burden on MAN systems is unreasonable.

Document under Review: P802.16a

Comment # 124 **Comment submitted by:** John Barr Member

Comment Type Technical, Binding **Starting Page #** 90 **Starting Line #** 10 **Fig/Table#** **Section** 6.2.14.2

The definition of "primary user" used in this document does not promote the coexistence of P802.16a with other IEEE 802 standards that may also be operating in the license-exempt bands. The statement "A BS or SS shall not use a channel that it knows contains primary users or has not been tested recently for the presence of primary users." does not prevent a BS or SS from establishing operation on a channel already being used by another IEEE 802 wireless system (e.g., 802.11b/a/g or 802.15.1/3/4).

Suggested Remedy

Change "A BS or SS shall not use a channel that it knows contains primary users or has not been tested recently for the presence of primary users." to "A BS or SS shall not use a channel that it knows contains primary users or other IEEE 802 wireless systems, or has not been tested recently for the presence of primary users or other IEEE 802 wireless systems."

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

see comment 123

Document under Review: P802.16a

Comment # 325 **Comment submitted by:** John Barr Member 2002/10/11

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

Resolution of comments 123 and 124 are not satisfactory and my disapprove vote still holds.

Suggested Remedy

Correct draft to include methods for realistic coexistence with other IEEE 802 radios that are designed to share the license-exempt bands or remove operation of 802.16a in any of the license-exempt bands to prevent interference with privately owned WLANs or other radios using the license-exempt bands that conform to realistic coexistence rules.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

802.16's approach is in line with the approach taken by the other wireless groups within 802.
Within this context, “primary user” refers to a regulatory designation, regardless of technology.
Requiring the detection of any 802 compliant wireless system, current and future, would be prohibitive.

The specified DFS mechanism is frequency independent.

This issue would be different if all license-exempt systems required DFS (as in the CEPT RLAN bands). However, given that other 802 standards do not mandate DFS, placing the entire burden on MAN systems is unreasonable.

Document under Review: P802.16a

Comment # 326 **Comment submitted by:** John Barr Member 2002/10/11

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

The process used by the 802.16 committee during recirculation does not allow balloters to reasonably access totality of changes resulting from resolution of comments. Also, the originally provided documentation for the recirculation ballot was incomplete and not corrected until one day before the recirculation ballot closed.

Suggested Remedy

Declare the recirculation ballot invalid until a time when the following are completed:

1. All Technical Binding commenters are asked to state whether their comments were satisfactorly resolved and documentation of unsatisfactory resolutions are included with the recirculation ballot.

2. An updated draft is prepared with appropriate change indications to allow balloters to determine where changes were made and how they may affect their next ballot.

Resolution of Group **Decision of Group:** Accepted-Modified

Conduct a second recirculation, to include an updated draft incorporating changes as documented by resolutions adopted by Ballot Resolution Committee. This second recirculation will include all comments requiring recirculation in which relevant fields were truncated during first recirculation.

Reason for Group's Decision/Resolution

The Ballot Resolution Committee recognizes the importance of recirculating an updated draft

The Ballot Resolution Committee recognizes that some balloters had incomplete access to comments and resolutions due to field truncation in the PDF distributed with the first recirculation.

The recirculation process provides the requested opportunity for commenters “to state whether their comments were satisfactorly resolved.” Also as requested, the resulting “documentation of unsatisfactory resolutions” (as collected during recirculation) is included with the recirculation package. The process followed is as described in the IEEE-SA Standards Board Operations Manual: 'If the negative vote is not satisfied, either entirely or in part, the negative voter shall be informed of the reasons for the rejection and be given an opportunity either to change his or her vote to "approve" or to retain his or her negative vote *during a recirculation ballot*. '

The request for an updated draft with change indications is labor-intensive and difficult to accommodate. However, in order to accommodate the balloter’s request (“to allow balloters to determine where changes were made”), recirculation will follow the appropriate rule in the IEEE-SA Standards Board Operations Manual: ”all substantive changes” will be recirculated.

Document under Review: P802.16a

Comment # 330 **Comment submitted by:** Tal Kaitz Member 2002/10/10

Comment Type Technical, Binding **Starting Page #** 10 **Starting Line #** **Fig/Table#** **Section**

Related to comment 11 (and also to comments 162, 166, 167)

The 256 OFDM system can be greatly improved by adding an optional sub-channelization support in the UL.
Sub-channelization has the following advantages:
a. It reduces data granularity.
b. It reduces overheads due to preambles.
c. It allows power concentration in increased link budget in the UL.

The proposed scheme fits naturally into the existing OFDM mode and is completely interoperable with it. This scheme was already adopted by HiperMAN.

During the comment resolution process, the subchannelization-related comments did not gain the required 75 % support. In my view the technical arguments against subchannelization were not justified. Some of these arguments are discussed below.

a. High degree of UL synchronization is required:

The proposed sub-subchannelization scheme is inherently robust to synchronization errors. In the proposed scheme, the subcarriers are arranged in clusters of 12 or 13. When frequency errors are present some inter-carrier interference is introduced. Because of the clustered allocation, only the clusters' edges interact and the overall inter subchannel interference is small.
In fact, the proposed scheme is more robust to frequency offsets than the 2K OFDMA. This is due to:
1. The carrier allocation. The 2K OFDMA uses a permutation approach in which subcarriers form different sub-channel are adjacent in frequency. Thus the inter-subchannel interference is much more severe.
2. The subcarrier spacing. The 2K OFDMA systems employ a much narrower subcarriers spacing than that of the 256 OFDM systems. For the same frequency error in Hz, the interference in the 2K system is much higher.

b. Due to shorter block sizes the Coding gain is reduced
.
This is only partly true. In some case the coding loss may be up to 1.5dB. However:
1. Using shorter block is one of the motivations of introducing subchannelization
2. The loss is well compensated by the 6dB power concentration gain.

c. Loss of estimation accuracy
The same estimation techniques can be used for both the OFDM and subchannelization modes. The estimation accuracy is expected to be the same.

d. Not enough frequency diversity.

The clustered approach was selected as a compromise between frequency diversity and robustness to frequency errors. The clusters are spread over the entire bandwidth. The loss in the frequency diversity is small.
It is true that one can obtain pathological channel responses for which the entire subchannel is faded. For instance, the channel 1+z-5, has notches at a period of 256/5=50 subcarriers, and a single subchannel is completely faded.
In such rare cases, the dynamics at the MAC level will insure that the SS sees this channel only for 25% of the time.

e. Not enough pilots

There are only 2 pilots per sub-channel. From a technical perspective it would be advantageous to increase the number of pilots. This can be accomplished by increasing the total number of subcarriers (say from 200 to 208 giving 4 pilots per subchannel). This will increase the occupied bandwidth by a small fraction.
However, to align with the existing OFDM mode the number of subcarreris was not increased.
To operate with a small number of pilots the BS can:
1. Allocate only short bursts, in which phase tracking is less important. (Not enough time for phase drift accumulation).
2. Use decision aided techniques in which no pilot subcarriers are necessary.

Suggested Remedy

copied from 42r3 comment 166.

Supporting subchannelization requires the following changes:
a. Divide the channel into sub-channels.
b. Change the UL map to support Subchannelization. The approach here was proposed by Nico and is similar to that of HiperMAN. A new Subchannelization_IE is defined. This element defines a region in the UL for which subchannelization is employed. The element also defines how many subchannelization UL map elements are to follow.
c. Change the FEC mechanism to CC only for subchannelization. No change when subchannelization is not employed. The motivation is that CC code work better for small block sizes than CC+RS.

a. Divide the channel into subchannels

page 143:

"

When subchannelization is employed, the channel is dived into subchannels as shon in table 116ab:

table 116ab

Subchannel number:	Allocated frequency offset indices of carriers
1:	{-100,…,-89},{-50,...,-39},{1,...13},{51,...,63}
2:	{-88,…,-76},{-38,...,-26},{14,...,25},{64,...,75}
3:	{-75,…,-64},{-25,...,-14},{26,...,38},{76,...,88}
4:	{-63,…,-51},{-13,...,-1},{39,...,50},{89,...,100}

"

b. Change the UL map

Add section 8.4.4.3.5 UL MAP Subchannelization information element

Within a frame, the BS may allocate a portion of the UL allocations to sub-channelized traffic. The UL_subchannelization_IE implicitly indicates the start of the allocation and explicitly indicates the Duration and the Number of allocations. A SS not capable of subchannelization shall skip the number of allocation times 7 nibbles that follow, and resume interpreting the UL-MAP afterwards with the start of the next allocation Duration OFDM symbols after the last allocation ended.

Table 116az-OFDM UL subchannelization IE Format

Subchannelization_IE() {		
extended UIUC	4 bits	subchannelization = 0x03
Duration	12 bits	Cumulative duration of the allocations
Number of allocations	12 bits	Number of sub-channelized allocations following this IE

}

….

A SS capable of sub-channelization shall decode the sub-channelized allocations, whereby the 12 bit Duration field in non-sub-channelized UL-MAP messages is replaced by a 3 bit Subchannel Index field and 5 bit Duration field as shown in Table 116at. A sub-channelized allocation shall start when all previous allocations to all allocated sub-channels have terminated.

In table 116at replace the 'Duration' row with:

"

else If (BS supports subchannelization and UIUC = 1,2 ,5:13) {

Subchannel Index	3 bits
0x0 Reserved	

0x1 Sub-channel 1
0x2 Sub-channel 2
0x3 Sub-channel 3
0x4 Sub-channel 4
0x5 Sub-channel 1 and 3
0x6 Sub-channel 2 and 4
0x7 Reserved

Duration 5 bits
}
else
Duration 12 bits

}

"
Add
"
"If several consecutive allocations are granted to the same SS on same subchannels and UIUC values, then the SS shall use all allocations for sending a single PHY burst"

c. add CC only:

Add to Table 116ab 1/2, 10, 1,1,X1Y1

When sub-channelization is active (see 8.4.4.3.5), the FEC shall bypass the RS encoder and use the Overall Coding Rate as indicated in Table 116ac as CC Code Rate. The Uncoded Block Size and Coded Block size may be computed by dividing the values listed in Table 116ac by 4 and 2 for 1 and 2 sub-channel allocations respectively.

Resolution of Group **Decision of Group: Accepted-Modified**

Adopt changes in C802.16a-02/90r7.

Reason for Group's Decision/Resolution

The comment is similar to that of Comment 336, and the proposed remedy is identical. Please see Comment 336 comments for discussion of this issue.

Document under Review: P802.16a

Comment # 336 **Comment submitted by:** Marianna Goldhammer Member 2002/10/10

Comment Type Technical, Satisfied **Starting Page #** 143 **Starting Line #** **Fig/Table#** **Section** 8.4.3.

Enhance the OFDM 256FFT mode with optional sub-channelization, to improve both link-budget and granularity and align with BRAN-HM.

The comment resolution does not indicate the technical arguments against the OFDM channelization, that obiously introduces similar concepts with those implemented by the OFDMA PHY in uplink. The proposed mode has better granularity performance, better robustness to phase-noise, better frequency diversity than the optional 2k permutation mode.

To make more clear that the proposed enhancement is an option, the "optional" word has been inserted now.

Suggested Remedy

Supporting subchannelization requires the following: changes
a. Divide the channel into subchannels.
b. Change the UL map to support Subchannelization. The approach here was proposed by Nico and is similar to that of HiperMAN. A new Subchannelization_IE is defined. This element defines a region in the UL for which subchannelization is employed. The element also defines how many subchannelization UL map elements are to follow.
c. Change the FEC mechanism to CC only for subchannelization. No change when subchannelization is not employed. The motivation is that CC code work better for small block sizes than CC+RS.

a. Divide the channel into subchannels

page 143:
"
When subchannelization is employed, the channel is dived into subchannels as shon in table 116ab:

table 116ab

Subchannel number:	Allocated frequency offset indices of carriers
1:	{-100,…,-89},{-50,...,-39},{1,...13},{51,...,63}
2:	{-88,…,-76},{-38,...,-26},{14,...,25},{64,...,75}
3:	{-75,…,-64},{-25,...,-14},{26,...,38},{76,...,88}
4:	{-63,…,-51},{-13,...,-1},{39,...,50},{89,...,100}

"

b. Change the UL map

Add section 8.4.4.3.5 UL MAP Subchannelization information element

Within a frame, the BS may allocate a portion of the UL allocations to sub-channelized traffic. The UL_subchannelization_IE implicitly indicates the start of the allocation and explicitly indicates the Duration and the Number of allocations. A SS not capable of

subchannelization shall skip the number of allocation times 7 nibbles that follow, and resume interpreting the UL-MAP afterwards with the start of the next allocation Duration OFDM symbols after the last allocation ended.

Table 116az-OFDM UL subchannelization IE Format

```
Subchannelization_IE() {
      extended UIUC          4 bits          subchannelization = 0x03
      Duration               12 bits         Cumulative duration of the allocations
      Number of allocations  12 bits          Number of sub-channelized allocations following this IE
}
….
```

A SS capable of sub-channelization shall decode the sub-channelized allocations, whereby the 12 bit Duration field in non-sub-channelized UL-MAP messages is replaced by a 3 bit Subchannel Index field and 5 bit Duration field as shown in Table 116at. A sub-channelized allocation shall start when all previous allocations to all allocated sub-channels have terminated.

In table 116at replace the 'Duration' row with:

"

```
else If (BS supports subchannelization and UIUC = 1,2 ,5:13) {
Subchannel Index          3 bits
0x0  Reserved
0x1  Sub-channel 1
0x2  Sub-channel 2
0x3  Sub-channel 3
0x4  Sub-channel 4
0x5  Sub-channel 1 and 3
0x6  Sub-channel 2 and 4
0x7  Reserved



Duration                5 bits
}
else
    Duration            12 bits

}
```

"
Add
"
"If several consecutive allocations are granted to the same SS on same subchannels and UIUC values, then the SS shall use all allocations for sending a single PHY burst"

c. add CC only

Add to Table 116ab 1/2, 10, 1,1,X1Y1

When sub-channelization is active (see 8.4.4.3.5), the FEC shall bypass the RS encoder and use the Overall Coding Rate as indicated in Table 116ac as CC Code Rate. The Uncoded Block Size and Coded Block size may be computed by dividing the values listed in Table 116ac by 4 and 2 for 1 and 2 sub-channel allocations respectively.

Resolution of Group **Decision of Group: Accepted-Modified**

Adopt changes in C802.16a-02/90r7.

Reason for Group's Decision/Resolution

{"Commentor has agreed to withdraw this comment and stipulate that it be considered as superceded by Comment 367".}
Document C802.16a-02/90r7 encompass the suggested remedy with two exceptions: 1) It does not allow UIUC's 1 ("Initial ranging") and 2 ("REQ Region Full") to be used during subchannelization. 2) It does not contain the language: "If several consecutive allocations are granted to the same SS on same subchannels and UIUC values, then the SS shall use all allocations for sending a single PHY burst".

The language under point 1) above was omitted because it would allow a subscriber to demand service from a BS when its link budget is sufficient only to allow the use of 1 subchannel. This would occur if the SS implements a PA which is economized to the point where it anticipates the gain achieved by subchannelization. This gain is in theory 6 dB (1/4th the bandwidth), but in practice will be less due to the effects of smaller possible FEC blocks, only 2 pilots per subchannel, and interference from the other subchannels.

Three problems would arise from this.

The first problem is that the peak UL data rate for an SS with such a link budget would be reduced by a factor of 4. The second problem is that it would force the BS scheduler to always provision UL allocations to SSs with such a link budget, instead of having the choice to optimize allocations over subchannels and full symbol allocations. Consider for example a 7 MHz licensed channel in which an SS capable of communicating only over one subchannel requests an allocation for 1500 bytes. This would mandate the BS to allocate a total of 8.25 ms (the order of an entire frame duration) solely for this subchannelized traffic. To allow this single allocation in combination with a few mandatory full OFDM symbol allocations, the BS would be forced to spread the allocation over multiple frames, causing excessive end to end delays. The third problem is that during initial ranging, substantial offsets from the desired received power can occur at the BS side, which could produce substantial distortion in other subchannels, were this to be allowed. With the adopted C80216a-02/90r7 language,

subchannelization is only allowed after the SS power has been adjusted to result in near-equal received power at the BS side, so that this problem would not occur.

In addition, the adopted C80216a-02/90r7 language does not allow the use of UIUC 2, since an efficient method of requesting bandwidth has already been defined through UIUC 3 ("REQ Region Focused"), which also allows the SS to indicate its preference (though not a demand) for a subchannelized allocation. Of course, a SS can also use the REQ Region Full or the "piggy-backing" mechanism to request bandwidth. There is hence no need to duplicate the bandwidth request through a fourth mechanism.

The language under point 2) was omitted because it would not achieve any substantial additional preamble overhead reduction (which is the second aim of subchannelization, after granularity reduction), whereas the BS would have to deal with the increasingly difficult phase tracking problem due to the availability of only two pilots. The adopted C80216a-02/90r7 language allows for 5 bit, or 32 OFDM symbols of subchannelized allocation (allowing for 180 to 830 bytes of data). The overhead, 1 OFDM symbol preamble, would hence result in about 3% of overhead.

In addition, Comment 336 motivates the sought changes as a harmonization with the ETSI BRAN HIPERMAN OFDM PHY. It should be noted that this has been achieved fully by the language in C802.16a-02/90r7, as the omitted changes listed above are not part of that draft standard either (see BRAN30d023r1).

Document under Review: P802.16a

Comment # 344 **Comment submitted by:** Tal Kaitz Member 2002/10/10

Comment Type Technical, Binding **Starting Page #** 168 **Starting Line #** **Fig/Table#** **Section** 8.4.5.3

Comment 212, resubmitted

This comment is supplementary to the subchannelization comment (#11 #162 #166 #167), and is resubmitted.

To gain the full benefits of subchannelization, the system needs to optionally support subchannelized transmissions in the REQ-region-full.

Suggested Remedy

Add in pg 168/line 62:
"REQ-region Full interval can be allocated to SSs which use subchannelization. In this case the BS allocates an UL interval using the procedure of 8.4.4.3.5 and an UIUC code of 2"

Resolution of Group **Decision of Group:** Accepted-Modified

Adopt changes in C802.16a-02/90r7.

Reason for Group's Decision/Resolution

The proposed remedy is identical in scope to permitting the usage of UIUC 2 ("REQ Region Full) when using subchannelization in Table 116at as proposed in Comments 330, 336 and 337. Please see the response to Comment 336 for discussion of this issue.

Document under Review: P802.16a

Comment # 348 **Comment submitted by:** Tal Kaitz Member 2002/10/10

Comment Type Technical, Binding **Starting Page #** 168 **Starting Line #** 62 **Fig/Table#** **Section** 8.4.5.2

Comment 211, resubmitted

TThis comment is supplementary to the subchannelization comment (#11 #162 #166 #167), and is resubmitted.

To gain the full benefits of subchannelization, the system needs to optionally support subchannelized transmissions in the initial ranging interval.

Suggested Remedy

Add in pg 168/line 62:
"The initial ranging interval can be allocated to SSs which use subchannelization. In this case the BS allocates an UL interval using the procedure of 8.4.4.3.5 and an UIUC code of 1."

Resolution of Group **Decision of Group:** **Accepted-Modified**

Reason for Group's Decision/Resolution

The proposed remedy is identical in scope to permitting the usage of UIUC 1 ("Initial Ranging") when using subchannelization in Table 116 as proposed in Comments 330, 336 and 337. Please see the response to Comment 336 for discussion of this issue.

Document under Review: P802.16a

Comment # 357 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

I insisted in last meeting of the Ballot Resolution Committee to mark the comment 345 as REJECTED. No one of the BRC members objected this decision. BRC report states clearly that: "Comment 345 was further discussed and REJECTED by the Committee. Detailed technical rationale for the rejection was developed and incorporated into the database. A new database, 802.16-02/54r3 will be issued today with the technical rationale incorporated."

Suggested Remedy

Mark comment 345 as REJECTED in the new data base version. Mention in meeting minutes the change and its cause.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote in favor of changing comment 345 group resolution to "rejected": in favor: 4
against: 16

The comment resolution database was available to the entire BRC and no-one identified this specific problem in the database. Furthermore, the issue is irrelevant to the sponsor ballot process.

Document under Review: P802.16a

Comment # 358 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section** 8.4.5.3

Open the subchannelization to all the MAC functionnality, defined for OFDM.
The sub-channelization brings significant system improvemens. As all the features are possible for the OFDMA mode, there is no technical reason for artificial restrictions for FFT 256 sub-channelization.

Suggested Remedy

Delete any restriction refering sub-channelization.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 4
against: 14

No specific text proposed, but see also the response to 359

Document under Review: P802.16a/D7

Comment # 359 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Non-binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section**

The "Group resolution" to my comment 336 demonstrates lack of system design understanding. The artificial prevention of the OFDM-subchannelization mode from some of its basic features was done from non-technical considerents!

1. The SS PA design is generaly optimized to cost, not to link-budget. At the resulting transmitted power, the cell size can be increased accordingly with 6 dB (see simulation results) link-budget increase, if power concentration is made on one channel.

2. The error correction performance should be considered as a combination of the 2 mechanisms provided by the 802.16a standard: FEC and ARQ. These mechanisms work in a complementary mode, the ARQ being efficient for small packets, where the FEC has a reduced performance.

3. The example related to peak data rate:
- is restricted to TDD systems only, where there are interruptions in up-link traffic due to the MAC frame character
- does not take into account the possibility of making fragmentation, invented by the standard in order to support such cases
- the peak-data rates are actually 8 times lower with OFDMA systems (32 sub-channels instead of 4), but this does not prevent the standard to allow full sub-channelization capabilities for OFDMA
- the peak data rates are almost 8 times lower for Mesh systems, having 10 nodes (see supporting paper), but this does not prevent Mesh inclusion within the standard
- the delays are always inverse proportional with data rates, so Mesh systems and OFDMA systems will always have much higher delays

4. The "Region focused" BW request is a mechanism that require minimum BW, but the HUGE penalty is the much higher delays, 2 MAC frames and more. I would not recommend the use of this mechanism with Mesh systems, that anyway require a double MAC frame duration at least!

5. The REQ region full has HUGE bandwidth consumptions (see supporting paper). The resulting system will not be able to provide symmetrical data rates!

6. The "REQ region full" with sub-channelization is the best compromize, allowing 4 times lower BW consumption (see supporting paper) and minimum delays.

7. The piggy-back mechanism works only if there is UL data for transmission. Generally is not the case due to:
- bursty nature of IP traffic
- FTP high windows in down-link, making the up-link FTP ACK to come at large intervals

8. The length field of transmitted data problem (max. 5bits (31 symbols), 4 bits reserved) reflects the reluctance of main companies involved

in OFDM design to technical improvements, that will affect their existing designs:

- we requested to add 8 pilots to the existing 200 pilots, in order to make easier the phase tracking process; this would assign 4 pilots/sub-channel. REJECTED
- we and IMEC demonstrated that is possible to make decision aided phase tracking, and use no pilots at all. Wi-LAN not accepted this solution.
- we proposed, as a compromise solution, while keeping the existing 5 bits length, a concatenation mode, the was REJECTED due to 3% overhead ?!

Conclusion: all the argumentation against the network-entry, full-region BW request and normal packet transmissoin are artificial. These modes were blocked due to non-technical considerates, in flagrant contradiction with the IEEE 802 standards developing principles!

Suggested Remedy

Resolution of Group **Decision of Group:** **Rejected**

Reason for Group's Decision/Resolution

P80216a/D6 does not allow UIUC's 1 ("Initial ranging") and 2 ("REQ Region Full") to be used during subchannelization and does not allow for allocations longer than 32 OFDM symbols in sub-channelization mode.

The UIUCs were omitted because it would allow a subscriber to demand service from a BS when its link budget is sufficient only to allow the use of 1 subchannel. This would occur if the SS implements a PA which is economized to the point where it anticipates the gain achieved by subchannelization. This gain is in theory 6 dB (1/4th the bandwidth), but in practice will be less due to the effects of smaller possible FEC blocks, only 2 pilots per subchannel, and interference from the other subchannels.

Three problems would arise from this.

The first problem is that the peak UL data rate for an SS with such a link budget would be reduced by a factor of 4. The second problem is that it would force the BS scheduler to always provision UL allocations to SSs with such a link budget, instead of having the choice to optimize allocations over subchannels and full symbol allocations. Consider for example a 7 MHz licensed channel in which an SS capable of communicating only over one subchannel requests an allocation for 1500 bytes. This would mandate the BS to allocate a total of 8.25 ms (the order of an entire frame duration) solely for this subchannelized traffic. To allow this single allocation in combination with a few mandatory full OFDM symbol allocations, the BS would be forced to spread the allocation over multiple frames, causing excessive end to end delays. The third problem is that during initial ranging, substantial offsets from the desired received power can occur at the BS side, which could produce substantial distortion in other subchannels, were this to be allowed. With the adopted P80216a/D6 language, subchannelization is only allowed after the SS

power has been adjusted to result in near-equal received power at the BS side, so that this problem would not occur.

In addition, P80216a/D6 does not allow the use of UIUC 2, since an efficient method of requesting bandwidth has already been defined through UIUC 3 ("REQ Region Focused"), which also allows the SS to indicate its preference (though not a demand) for a subchannelized allocation. Of course, a SS can also use the REQ Region Full or the "piggy-backing" mechanism to request bandwidth. There is hence no need to duplicate the bandwidth request through a fourth mechanism.

Allocations longer than 32 OFDM symbols are omitted because these would not achieve any substantial additional preamble overhead reduction (which is the second aim of subchannelization, after granularity reduction), whereas the BS would have to deal with the increasingly difficult phase tracking problem due to the availability of only two pilots. P80216a/D6 allows for 5 bit, or 32 OFDM symbols of subchannelized allocation (allowing for 180 to 830 bytes of data). The overhead, 1 OFDM symbol preamble, would hence result in about 3% of overhead.

P80216a/D6 provides the mechanism of allocating certain Focused Contention codes for SSs to REQUEST a subchannelized allocation as per the suggested remedy. However, this language differs from the proposed remedy in that the proposed remedy seeks the mechanism of allocating certain Focused Contention codes for SSs to DEMAND a subchannelized allocation. The reason why this was not adopted is that it places undesirable additional constraints on the BS scheduler as discussed as above.
Using Focused Contention on a subchannel does not add any efficiency, since it only uses 4 carriers, exactly as when using the full channel. It would only make a small difference if an economically unviable low number of SSs were present, such that only one or two subchannels allocated to this would suffice. It would however require allocations both on the full channel and on the subchannel to support both SSs capable and not capable of sub-channelization, which would actually decrease the efficiency.

Document under Review: P802.16a

Comment # 361 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** 168 **Starting Line #** 62 **Fig/Table#** **Section** 8.4.5.2

This comment provides a slightly modified text to the comment 345, which refers to initial ranging with sub-channelization.
The intention is to gain 5-6 dB due to power concentration.

Suggested Remedy

Insert :
The initial ranging interval can be allocated to SSs which use subchannelization. In this case the BS allocates an UL interval , to be used with sub-channelization. Using the procedure of 8.4.4.3.5 and an UIUC code of 1 in the OFDM UL MAP Information Element will be possible to specify on which sub-channel will be sent the initial ranging burst.
An SS will first attempt to perform the initial ranging in full OFDM mode. If the network entry process failed, the SS may try to use the network entry sub-channelization mode.

Delete the note under the table 116av.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 11
against: 13
see rationale in 359

Document under Review: P802.16a

Comment # 362 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** 170 **Starting Line #** **Fig/Table#** 116 **Section** 8.4.5.3

The Region-full bandwidth request, when using sub-channelization, requires 4 times more spectrum than transmitting the BW request MAC header on one sub-channel, The MAC header has 6 bytes, as compared with 24 bytes of one OFDM symbol and with 6 bytes of a sub-channelization symbol. This mechanism is the only one suitable for time-critical applications.
The mechanism of focused BW request , with subchannelization, introduces delays, that can be 2 MAC frames or more.
See the supporting document for performance

Suggested Remedy

Delete note bellow table 116av

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 8
against: 11
see rationale in 359

Document under Review: P802.16a

Comment # 364 **Comment submitted by:** Vladimir Yanover

Comment Type Technical, Binding **Starting Page #** 170 **Starting Line #** 24 **Fig/Table#** 116 **Section** 8.4.5.3

Table 116av and sentence
"When subchannelization is active (see 8.4.4.3.5), only UIUCs 5 through 13 shall be used."
preclude from using of focused contention function in subchannelization region. There is no visible reason to refuse from using this extremely efficient type of signaling in subchannelization region (once it implemented in the system).

Suggested Remedy

Delete "else {" at line 24 and the correspondent "}"

Delete the sentence at the line 44:
"When subchannelization is active (see 8.4.4.3.5), only UIUCs 5 through 13 shall be used."

Update Table 116bc to ensure that for each Contention Channel all Carrier Offset Indexes fail into certain subchannels, for example as suggested by Marianna Goldhammer -see the following table with columns
1) Contention Channel Index2) Carrier offset index 0 3)Carrier offsetindex 1 4)Carrier offset index 2 5) Carrier offset index 3 6) Sub-channel

0	-87	-50	1	64	1
1	-86	-49	2	65	1
…	…	….	…	….	1
11	-76	-39	12	75	1
12	-75	-12	39	76	4
13	-74	-11	40	77	4
…	…	…	…	…	4
23	-64	-1	50	87	4
24	-100	-37	14	51	3
25	-99	-36	15	52	3
…	…	…	…	…	3
35	-89	-26	25	62	3
36	-62	-25	26	89	2
37	-61	-24	25	88	2
…	…	…	…	…	2
47	-51	-14	37	100	2

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 6
against: 10
see rationale in 359

Document under Review: P802.16a

Comment # 365 **Comment submitted by:** Tal Kaitz

Comment Type Technical, Binding **Starting Page #** 170 **Starting Line #** 33 **Fig/Table#** 116 **Section** 8.4.5.3

The duration of the subchanelized allocation is represented by 5 bits only is therefore handicapped to be only 31 symbols.

This restriction is contrary to any technical logic:

A. In the subchannelized UL-MAP there are 4 resreved bits. The bits can and should be used to increase the duration field to 9 bits.

B. It is true that tracking long packets may require deidcated synchronization mechanism in the BS. However, there are absolutley no complexity considerations for the SS. The decsion wether to implement better tracking mechanism should be left to the decision of the BS vendor. If the mechanisms are implemented in the BS, then the BS can allocate long packets. If not , then the BS will allocte only short bursts (perhaps even shorter than the said 32 symbols). **The standard should NOT address the lowest common denominator for optional modes.** By following the same rationale, we might as well delete the turbo coding option, because some vendors dislike the increased complexity.

Suggested Remedy

Change the fieds duration field to 9 bits.
Delete the 4 reserved bits.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 10
against: 10
see rationale in 359

Document under Review: P802.16a

Comment # 366 **Comment submitted by:** Tal Kaitz

Comment Type Technical, Binding **Starting Page #** 170 **Starting Line #** 43 **Fig/Table#** 116 **Section** 8.4.5.3

The use of all UIUC for subchannelization is artificially restricted to 5-13 without valid technical reasons.
All relevant MAC functionalities should be supported in subchannelization mode. Specifically:
A. Allow network entry in subchannelization. This will allow distant SSs to gain a 6dB improvemnt in link budget. See Tal's document for some discussion.
B. Allow BW requests in subcahhenlzition. This will reduce the overheads associated with BW requests. See Marianna's submission for analysis.
C. Allow Focused contention requests in subchannelization.

Suggested Remedy

Replace the footnote on line 44 pg 170 with ... UIUC 1...13.

Resolution of Group **Decision of Group:** Superceded

Reason for Group's Decision/Resolution

superceeded by group decision on comment 362, 364, 368 and 369
see also rationale in 359

Document under Review: P802.16a

Comment # 367 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** 171 **Starting Line #** **Fig/Table#** 116 **Section** 8.4.5.3.2

Define the focused contention information element (up-link BW allocation) for subchannelization.

Suggested Remedy

Replace "Duration"field with:

if (subchannelization a){

Subchannel Index	3 bits	0x1 = subchannel 1 0x5 = subchannel 1 and 2 0x2 = subchannel 2 0x6 = subchannel 3 and 4 0x3 = subchannel 3 0x0 = reserved 0x4 = subchannel 4 0x7 = reserved
Duration	9 bits	in OFDM symbols

}else

Duration 12 bits

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 6
against: 10
see rationale in 359

Document under Review: P802.16a

Comment # 368 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** 174 **Starting Line #** 79 **Fig/Table#** **Section** 8.4.5.3.1

If the BW request is made on a specific sub-channel, is no need to use the Cse threshold. Obviously, only SS supporting sub-channelization will request BW in this way.
Text should be provided to clearly describe the focused contention BW request in both OFDM and OFDMS (OFDM with sub-channelization) modes.

Suggested Remedy

Replace the text starting at line 49:
IIf the BS supports subchannelization, and the BW request allocation uses the full band, the last C SE contention codes shall only be used by subchannelization-enabled SSs that wish to receive a subchannelized allocation. In response, the BS may provide the requested allocation as a subchannelized allocation, may provide the requested allocation as a full (default) allocation,
or may provide no allocation in at all. The value of C SE is transmitted in the UCD channel encoding TLV
messages. The default value of C SE is 0.

If the BW request allocation is included in a sub-channelization allocation, the Cse value is not relevant. The BW request will use only focused contention channels that are, according to table 116bc, included in the specified sub-channel.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor : 5
against : 9
see rationale in 359

Document under Review: P802.16a

Comment # 369 **Comment submitted by:** Marianna Goldhammer

Comment Type Technical, Binding **Starting Page #** 175 **Starting Line #** 30 **Fig/Table#** 116 **Section** 8.4.5.3.1

It is beneficial to take full advantage of the focused contention in the sub-channelization region. The carriers used in focused contention, for every contention channel, occupy generally 2 sub-channels.
These 2 sub-channels are different from the couple of sub-channels that can be combined for data transmission, so actually no sub-channel can be used during the focused-contention. This implies that all the traffic, even on not-used subchannels, has to be fragmented and delayed.
The proposed allocation is in line with the new 802.16a-D6 sub-channel carrier allocation.
See supporting document for performance.

Suggested Remedy

Realocate the carriers for contention channels and their indexes according to Table 3 in suporting document. Replace table 116bc with Table 3.

Resolution of Group **Decision of Group:** Rejected

Reason for Group's Decision/Resolution

vote: in favor: 6
against: 11
see rationale in 359

Document under Review: P802.16a

Comment # 382 **Comment submitted by:** John Barr 2002-12-04

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section** general

Comment 326 has been satisfied by the recirculation of a complete updated draft. Comments 123, 124, and 325 are still unsatisfactory.

Suggested Remedy

Correct draft to include methods for realistic coexistence with other IEEE 802 radios that are designed to share the license-exempt bands or remove operation of 802.16a in any of the license-exempt bands to prevent interferecne with privately owned WLANs or other radios using the license-exempt bands that conform to realistic coexistence rules. Also, the 802.16 committee should vote against any other IEEE 802 standard proposed for license-exempt bands that does not also provide for realistic coexistence with other IEEE 802 radios in those bands. Stating that since others do not do this is not realistic. This is a new standard that is claiming operation in the same license-exempt bands already being used by other IEEE 802 radios. Adding a new radio to those bands should not cause interference.

Resolution of Group **Decision of Group:**

Do not recirculate.

Reason for Group's Decision/Resolution

(1) This comment is out of scope. No relevant comments or changes were under review in this Third Recirculation.
(2) This comment is a duplicate of Comments 123, 124, and 325, all submitted by this balloter. Comment 325 simply reiterated Comments 123 and 124. Therefore, this is not a new comment but a repeat of an old comment.
(3) Each of the three comments and responses has already been reviewed in the First or Second Recirculation. No additional relevant comments arose for consideration in this Third Recirculation. Therefore, the Ballot Resolution Committee believes that its rebuttal has already been accepted by the Sponsor Ballot Group.
(4) Per 5.4.3.2 of the IEEE-SA Standards Board Operations Manual, "once 75% approval has been achieved, the IEEE has an obligation to the majority to review and publish the standard quickly. Therefore, once 75% approval has been achieved, the IEEE requirements for consensus have been met. Efforts to resolve negative votes may continue for a brief period; however, should such resolution not be possible in a timely manner, the Sponsor should forward the submittal to RevCom. " Accordingly, the Ballot Resolution Committee believes that a further recirculation of this comment is not appropriate.

Document under Review: P802.16a

Comment # 383 **Comment submitted by:** John Barr 2002-12-04

Comment Type Technical, Binding **Starting Page #** **Starting Line #** **Fig/Table#** **Section** general

The MAC protocol relies on a higher layer (TCP/IP) functions like DHCP, UDP, and Time-of-Day services to provide configuration information to the MAC and is specified to be the 'communication channel' between the Base Stations and the Subscriber stations (for example in 6.2.15 MAC Management Message tunneling in Mesh Mode).

This causes architectural problems - ideally protocol layer (n) should be indepent of protocol layer (n+1). In the case of 802.16a, if the higher layer functionality is not working, then the layer 2 network does not operate correctly.

Suggested Remedy

Restrict node state, MAC messaging and inter-node communications within layer 2 and do not be reliant an any higher layer functionality.

Resolution of Group **Decision of Group:**

Do not recirculate.

Reason for Group's Decision/Resolution

(1) This comment is out of scope. No relevant comments or changes were under review in this Third Recirculation.
(2) This comment is a virtual duplicate of Comment 006. Therefore, it is not a new comment but a repeat of an old comment.
(3) The Ballot Resolution Committee's responses to the old comment (006) were subject to review in the First Recirculation and did not result in comments then, nor in the Second Recirculation (in which it was included in the ballot package for completeness). Therefore, the Ballot Resolution Committee believes that its rebuttal has already been accepted by the Sponsor Ballot Group.
(4) Per 5.4.3.2 of the IEEE-SA Standards Board Operations Manual, "once 75% approval has been achieved, the IEEE has an obligation to the majority to review and publish the standard quickly. Therefore, once 75% approval has been achieved, the IEEE requirements for consensus have been met. Efforts to resolve negative votes may continue for a brief period; however, should such resolution not be possible in a timely manner, the Sponsor should forward the submittal to RevCom. " Accordingly, the Ballot Resolution Committee believes that a further recirculation is not appropriate.