IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)	
Title	**TG3 LB12 Comment resolution working document**	
Date Submitted	[5 March, 2002]	
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Re:	[]	
Abstract	[This document is an additional record of comment resolution of LB12.]	
Purpose	[To provide a record of comment resolution, particularly for comments that are resolved based on the resolution of prior comments.]	
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1. Comment resolution

a) Coexistence - Response in 1728, “The proposed informative Annex (00000r0P802-15-3-Annex_Coexistence.pdf) has a description of the coexistence methods that are available in the draft. Also see 02/041r2 for a presentation and additional text on this issue. For 802.15.4 compatibility see subclause 6.9 in 00000D13P802-15-4__Draft_Standard.pdf. TG2 has been consulted and they will help with analysis.”
Also resolved: 1850 (Dydyk, T), 1765 (Callaway, E)

b) Security - Response in 781, “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”
Also resolved: 1845 (Dydyk, T), 894 (Roberts, TR), 904 (Roberts, TR), 1015 (Roberts, TR), 1233 (Roberts, T), 1293 (Roberts, TR), 1725 (Rofheart, TR), 1682 (Shvodian, TR, Add response: “Since there are no shalls, shoulds or mays, this section is informative and needs to be moved to the informative Annex. The commenter is invited and encouraged to provide additional text that describes other methods that provide the function of the certificate authority.”), 1689 (Shvodian, TR), 1767 (Y-C Chen, TR), 1741 (Maa, TR), 1785 (Liu, TR), 802 (Kinney, T), 1750, (H-K Chen, TR), 727 (Herold, T)

c) TBD’s - For page 107, response in 296 “Bit has been removed.”, for page 133, response in 294 “Security is applicable on a piconet basis, not a stream-by-stream basis. Delete the sentence and the associated bits in figure 76 (b4-b6). Reassign the bits as reserved and move the other bits foward so that the reserved bits are contiguous.”, for page 175, response in 1744 “Clause 9 has been deleted. TBD has been removed.”
Also resolved: 1674 (Shvodian, T), 1097 (Roberts, TR), 1119 (Schrader, T), 52 (Bain, T), 1846 (Dydyk, T)

2. Comment resolution order

2.1 February 5, 2002

768 (Huckabee, T): 1 second connect time, suggest accept in principle: “1 second connect time is a goal, not a requirement. Clause 5 is a qualitiative overview that does not place any requirments on devices. The authentication time required depends on the security suite that is selected. The security suite selection criteria indicates that a total connect time including authentication of less than one second is desired.”

Accept.

1663 (Shvodian, T): suggest accept, 0 length fields should be OK.

Accept.

1517 (Shvodian, TR): Add security parameters IE to association repsonse. Suggest accept.

Accept, OID goes into the association response rather than the beacon.

1513 (Shvovdian, TR): Add error code for security required to association. Suggest accept.

Accept.

308 (Gilb, T), 964 (Roberts, TR): No separate security information in data frame anymore. Suggest accept 308, accept in principle 964.

Accept as indicated above.

894 (TR), 904 (TR), 1015 (TR), 1233 (T), 1725 (TR), 1682 (TR), 1689 (TR): Various security related items. Suggest accept in principle with the response for other security suite comments “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”

> 894 - will accept if the following is appended to the response in 781
> In clause 6.3.6.2.2, reference is made to the security subclauses that present the details on how the challenge commands are used.
> 904 - will accept if the following is appended to the response in 781
> In clause 6.3.8.1.1, reference is made to the security subclauses that present the details on how the PNC does the security manager function.
> 1015 - will accept if the following is appended to the response in 781
> In clause 7.5.3, reference is made to the security subclauses that present the details on how the PNC does the security manager function.
> 1233 - accept as per the response in 781
> 1293 - accept as per the response in 781
> 1725 - accept as per the response in 781
> 1097 - accept as per the response in part 1.c of doc 02/075r0
>
> Accepted as indicated above.

2.2 February 7, 2002

547 (Gubbi, TR), 892, 895, 897, 1037, 1125, 1231, 1234, 1239, 1244, 1246, 1296 (Roberts, TR), 1247 (Roberts, T), 1682 (Shvodian, TR), 1689 (Shvodian, TR): Various security related items. Suggest accept in principle with the response for other security suite comments “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.” For 1682, suggest adding “Since there are no shalls, shoulds or mays, this section is informative and needs to be moved to the informative Annex. The commenter is invited and encouraged to provide additional text that describes other methods that provide the function of the certificate authority.”

Email from Rick Roberts:

> LB12 Comment Resolutions from Rick Roberts. All acceptances are based upon text presented in doc 02/075r1.
>
> 1. On the comments that deal with security ... I accept the technical editors suggested resolution for the following items
>
> 892, 895, 897, 1037, 1231, 1239, 1246, 1296 and 1247
>
> 2. I reject the editors suggested resolution for the following items
>
> 1125, 1234, 1244
>
> Both 1125 and 1234 are comments on security policy during a PNC handover. Basically the question is does the authentication list transfer during a PNC handover, or do all DEV's have to re-authenticate with the new PNC. In my mind, this is a security policy issue and not a security suite issue (unless someone can convince me that they are one in the same). I lack technical expertise in this area otherwise I would generate text. I prefer that the certificates transfer (old PNC vouches for all authenticated DEVs) but I understand that some of the security experts believe this is a bad idea. So I am confused and want to defer to the experts.

On item 1244, the question is where is the list of authenticated DEV's maintained. It seems it should be in the PSM which is co-located with the PNC. If this is true then a simple resolution would be to add the following text.

"In all scenarios, the security manager, which is co-located with the PNC, shall update the list of authenticated piconet DEVs to exclude the disassociating DEV."

3. For comment 1131 ... I accept the suggested resolution as proposed by the technical editor.

Committee

Accept, as above 547, 892, 895, 897, 1037, 1231, 1239, 1246, 1296, 1247, 1682, 1689 (and 1694)
Skip 1125, 1234, 1244

1299 (Shvodian, TR): Do we need de-authenticate? Why not just disassociate? Suggest accept, “Delete the deauthentication command, frame formats and MLME’s.”

Accept

1127 (Roberts, TR): When is PNC handover required? Suggest accept in principle. The intention, lost in the words, is that handover always occurs if the Des-Mode bit is set and may occur otherwise. Either change last sentence to read: “Therefore, if re-authentication is not desirable and the PNC Des-Mode bit is not set in the new DEV, a PNC running security in the piconet should not perform PNC handover unless it is leaving the piconet.” or simply delete the last sentence.

Accept

1574 (Shvodian, TR): The PNC should wait until after the authentication if authentication is required for the piconet before broadcasting the Dev-Info (now PNC-Info) table. Suggest accept.

Accept

1131 (Roberts, TR): Authentication sub-clause in Clause 8 is considered silly, please delete. Suggest accept.

Accept

1832 (Rasor, TR), 1803 (Rasor, TR): PSM and PNC as separate entities: Suggest reject, reason as follows: “The task group previously considered this option and instead chose to co-locate the PSM and PNC. The main reason for requiring the PNC to also be the PSM is to prevent having two points of failure in the piconet. If the PSM and PNC reside in separate DEVs, then all of the DEVs in the piconet need to be able to hear both DEVs rather than just the PNC. With the current architecture, the piconet is defined as all devices that are able to hear the PNC. Another reason for co-locating the two functions is that it reduces the communications overhead and complexity of the security suite.”

Skip

1837 (Rasor, TR): Security and communication with child and neighbor piconets. Suggest accept in principle. “The draft already states (see 8.2.5 and 8.2.6) that the child and neighbor piconets are autonomous and do not share authentication or security. Add a note to the end of the first paragraph in 10.2 that says ‘These requirements apply only to the piconet and are not transferred to child or neighber piconets, which have distinct security requirements.’”

Skip

1798 (Rasor, TR): Delete reference to IEEE MAC address. This is a re-definition of the Device ID (now Device Address), so deleting the reference to the IEEE MAC address is actually a good thing, suggest accept.

Accept

1679 (Shvodian, T): Clean up text in security requirements to reflect choices: Suggest accept.

Accept

1805 (Rasor, TR): Editorial change to the introduction text to include the mention of roles of the DEVs. Recommend accept (doesn't change implementation anyway).

Accept

1681 (Shvodian, TR): Allow for keys to be entered by the user. Suggest accept deletion of sentence and parenthetical comment.

Accept

1810 (Rasor, TR), 1811 (Rasor, TR): The PNC is PSM connection is listed twice, it can be removed from the first reference. Suggest accept in principle, "Delete the sentence in 10.3.2.1, line 25, and change "assumes" to be "shall assume" in 10.3.2.2, lines 15 and 16 (two places total)."

Accept

1817 (Rasor, TR): Specify what happens when group structure and role change simultaneously. Suggest accept in principle. "Add the following sentence after the enumerated points in 10.3.3.1 'Simultaneous changes of the group structure and of the role are conceptually thought of as taking place sequentially."

Skip

1819 (Rasor, TR): Add new security event for handover. Suggest accept in principle. "Add an enumeration item as "2) PNC promotion. This refers to a PNC-capable DEV assuming the role of PNC.'"

Accept

1821 (Rasor, TR), 1829 (Rasor, TR): Should changing the PNC require re-authentication (note that this does change the PSM): Suggest accept in principle, reason "The requirement for re-authentication when the PNC handover occurs will be specified by the security suite implementation. The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security. Changes to the current description will be made when the security suite is selected."

Skip

1692 (Shvodian, TR): Make the cipher suite (now security suite) requirements normative. Suggest accept in principle with "The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security. The description of the requirements for the security suite would be listed in an annex."

Accept

291 (Gifford, T): Review the use of shall/should/may/can/will/must throughout the document to be sure they are used in accordance with IEEE's style. Suggest accept, reason "The editor (and others) have closely

reviewed the document for proper usage. The word must occurs only in the copyright information on the first page, the word can does not appear at all. The technical editor has been trully annoying in enforcing the no must or can rule."

Accept

583, 588, 590 (Heberling, T): Reason code for disassociation is unnecessary: Suggest reject, reason "The committee reviewed the reason codes for the disassociate command in Dallas and felt that there was still useful information that could be passed using this reason code. Therefore, the reason code needs to stay in the MLME-DISASSOCIATE.xxx commands as well."

Withdrawn

2.3 Tuesday, 12 February, 2002

Closed via email: 1669, 304, 306, 309, 322, 323, 357, 360, 363.

455 (Gilb, T): Should have been closed with 74, now closed with 74's resolution.

Accept

123 (DuVal, T) - Why is the neighbor piconet needed? Suggest accept in principle, add text as described in documet 02/060r1 for clause 5.3.7, 5.3.8.

Accept

1664, 1665, 1667 (Shvodian, T): Allow 0 length fields in MLME. Same comment that we accepted for 1663 on 5 Feb, 2002, suggest accept.

Accept

458 (Gilb, T): Add reason code. Closed this issue with 907 (Roberts, TR) and 1419 (Shvodian, TR), but we have different reason codes and no description. Suggest close all with following:.

Table 1—MLME-REQUEST-KEY primitive parameters

Name	Type	Valid Range	Description
ReasonCode	Enumeration	SUCCESS, FAILURE, TIMEOUT	The result of the key request command.

Accept

460 (Gilb, T): No reason code for MLME-DISTRIBUTE-KEY. Closed with 913 (Roberts, TR) and 1421 (Shvodian, TR), suggest accept as in 1421, result is below:

Table 2—MLME-DISTRIBUTE-KEY primitive parameters

Name	Type	Valid Range	Description
ReasonCode	Enumeration	SUCCESS, TIMEOUT	The result of the key distribution attempt.

Accept

463, 464 (Gilb, T): Add reason code for deauthenticate: Suggest accept in principle, reason “De-authenticate command has been removed, so reason code is not needed.”

Accept

902 (Roberts, TR): Add two acronyms: Suggest, add “DEK - data encryption key and DIK - data integrity key. SEED will be changed to lower case, ‘seed’ and a definition added ‘seed: initial small bit stream used as input by an algorithm to generate a (usually bigger) bit stream.”

Accept

900 (Roberts, TR): What are KEK, DEK, DIK and SEED? Suggest, accept in principle, “Add ‘KEK - key encryption key’ to the acronyms clause. The other acronyms will be defined as in the resolution for comment 902. The items will be defined with the proposals for the security suite. The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”

Accept

905, 906, 909 (Roberts, TR): Suggest accept in principle, “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”

Accept

459 (Gilb, T): Device ID description is incorrect (cut ‘n paste error) in Table 16, page 42. Suggest accept.

Accept

461 (Gilb, T): Cut ‘n paste error, there is no MLME-DISTRIBUTE-KEY.response command. The response is the ACK, not a separate command. Suggest accept.

Accept

462 (Gilb, T): Fix de-authenticate table. Suggest accept in principle: reason “De-authenticate command has been removed, so reason code is not needed.”

Accept

465 (Gilb, T): Already accepted in 592, 593 (Heberling, T), suggest accept.

Accept

595 (Heberling, T): Add that the DEV sends a disassociation request to the PNC. Suggest accept in principle, “The DEV MLME, upon receiving this primitive, sends a disassociation request command frame to the PNC, if it is currently associated, sets the MAC to its initial conditions and clears all of its internal variables to their default values.”

Accept

596 (Heberling, T): Suggest accept

Accept

598 (Heberling, T): We don't need MLME-RESET.confirm, and its description is incomplete. Suggest accept, "Delete sub-clause as specified in comment 598."

Accept

293 (Gilb, T): The capability information element does not need to be passed in the primitive, it is derived from the PIB. Suggest accept.

Accept

466 (Gilb, T) The primitive parameters for MLME-STREAM-CTA.indication are not defined, solution is to copy them from table 25 into table for this sub-clause. Suggest accept.

Accept

467 (Gilb, T): Missing reason code. Suggest accept, would look like below:

Table 3—MLME-TERMINATE-STREAM primitive parameters

Name	Type	Valid Range	Description
ReasonCode	Enumeration	SUCCESS, TIMEOUT	Indicates the result of the stream termination command.

Table, pending changes to CTR, tag as CTR related.

468 (Gilb, T): The RequestorDEVAddress is missing a definition. Also add TIMEOUT to the valid range of the reason code. Suggest accept.

Table 4—MLME-CHANNEL-STATUS primitive parameters

Name	Type	Valid Range	Description
RequestorDEVAddress	MAC address	Any valid MAC address	The MAC address of the DEV which is requesting the channel status.

Accept

607, 610 (Heberling, T), 470 (Gilb, T): Don't need ChannelIndex for this command, everyone is on the same channel. Suggest accept.

Accept

469 (Gilb, T): Change DestinationDEVAddress to RemoteDEVAddress to match the definition in table 28. Suggest accept.

Accept

616 (Heberling, T): Change from ACK_TIMEOUT to RESPONSE_TIMEOUT. Suggest accept in principle "Make change as indicated and add RESPONSE_TIMEOUT to the valid range of the ReasonCode in Table 28."

Accept

617 (Heberling, T): Add a response timer to the MSC. Suggest accept, reason “Add response timers where appropriate in all MSCs in clause 6.”

Accept

619 (Heberling, T): Add MLME-CHANNEL-STATUS and MLME-CREATE-REPEATER message sequence chart clause and diagram just after the last clause of the MLME-CREATE-REPEATER.confirm primitive. Text and diagram are in clause 6.3.1.12 of doc 01/410r1. Suggest accept.

Withdrawn

621 (Heberling, T): Change NewChannelIndex data type from octet to integer on page 64. Suggest accept.

Accept

622 (Heberling, T): Change timeout type to duration on page 64. Suggest accept.

Accept

624 (Heberling, T): Add MLME-PNC-HANDOVER.request, indication, response and confirm clauses into the space just before current D09 clause 6.3.19. Based on doc 01/410r1? Suggest accept if 01/410r1 has been posted with the new MLME. Reason “Insert just before current D09 clause 6.3.19.”

Accept,

623 (Heberling, T): Add MLME-CHANNEL-STATUS, MLME-REMOTE-SCAN, and MLME-CHANGE-CHANNEL MSCs to the MLME-SAP interface clause from 01/410r0. Suggest accept if 01/410r1 has been posted with the MSCs and with caveat that the remote scan has been updated with the changes agreed to in Dallas (i.e. removing the channel change from the MSC). Reason “Accept MSCs, except that the remote scan MSC will have split into separate channel change and remote scan MSCs. Update should be put in 01/410r2.”

Accept

629, 635, 637 (Heberling, T): Change DevInfoSet to PNCInfoSet. Suggest accept in principle, “Change DevInfoSet to be DEVCTRSet.”

Accept

472 (Gilb, T), 1670 (Singer via Shvodian, T): DEV does not need to be authenticated to use probe command so delete the word “authenticated" from line 19, 20, 36 and 37 all on page 66 (i.e. every occurance in 6.3.18.1). Suggest accept. For 1670, accept in principle, add “The command is used to request information about the current channel time requests from the PNC. However, authentication is not necessarily required, so the word “authenticated” has been deleted from this sub-clause.”

Accept in principle, change “authenticated” to “associated (or associated and authenticated if authentication is required)”

1440 (Shvodian, T): Naming collision between probe and DEV-info commands. Suggest accept in principle, “The MLME-PROBE-PNC primitives (now renamed PNC Info primitives) are used to issue DEV Info commands (now renamed PNC Info commands.) The MLME-DEV-INFO primitives (now MLME-PROBE) are used to issue probe commands.”

Accept

2.4 Thursday, 14 February, 2002

456 (Gilb, T): Change "with which ... process" to "that is requesting the key"

Accept.

653 (Heberling, T): Add MLME-NEW-PNC information from doc 01/410r1. Suggest accept in principle, “Add the text in 01/410r1 with the following corrections: change “with which it is associated and authenticated.” in 6.3.1.31 to be “either as a result of the coordinator selection process, 8.2.3, or the PNC handover process, 8.2.4.”, change “the non-initiating DEV or DEVs.” in 6.3.1.32 to be “a non-initiating DEV.”, delete “which it is associated and authenticated” from 6.3.1.33 and change enumeration item “e) x number ... superframes)” to be “b) The required number of new PNC announcement commands have been broadcast as indicated in 8.2.3 for PNC selection or in 8.2.4 for PNC handover.””

Accept

654 (Heberling, T): Add clause 6.3.1.34 MLME-DEV-INFO, MLME-PNC-HANDOVER, MLME-PROBE-PNC, and MLME-NEW-PNC message sequence chart from doc 01/410r1. Suggest accept in principle, “Add new MSC and text from 6.3.1.35 instead of 6.3.1.34. The DEV does not challenge the PNC to become PNC, rather the PNC evaluates the data in the association request to determine if PNC handover should happen. Also, change ‘which is currently associated and authenticated.’ to be ‘which is currently associated, and if required, authenticated.”

Accept

1438 (Shvodian, T): Should the requestor or responder choose the window size for channel status. Specifying a window size in the request will potentially force a delay of that amount of time while the responding DEV gathers the statistics. Suggest accept in principle, “Add a sentence to 8.12 that says ‘Every DEV shall maintain channel statistics for a window size of at least the current superframe duration.’ Having the requesting DEV specify a window size will either introduce delay in the response of the channel status request command or would require every DEV to keep a detailed history rather than simply a running count. While there are reasons why the requesting DEV might wish to specify the measurement window, the committee feels that the corresponding delay or added complexity to every DEV would be too much.”

Accept

1817 (Rasor, TR): Specify what happens when group structure and role change simultaneously. Suggest accept in principle. “Add the following sentence after the enumerated points in 10.3.3.1 ‘Simultaneous changes of the group structure and of the role are conceptually thought of as taking place sequentially.”

Accept.

1125, 1234, 1244 (Roberts, TR), 1821, 1829 (Rasor, TR): Should changing the PNC require re-authentication (note that this does change the PSM): Suggest

Table

1425 (Shvodian, TR): Do we use DEV addresses or DEV IDs for the MLME primitives and why? What is our editorial policy? Suggest the following: “DEV IDs will be used for MLMEs except in those specific instances where the frame specifically requires a DEV Address (e.g. in the association request frame). This change will be applied to all MLMEs in clause 6 to provide a uniform interface.”

Accept.

1447 (Shvodian, T): Change max number of CTAs processed to be 8 bits (i.e. a maximum of 256 per device). Note that this implies a change in the frame format as well (which has a 2 byte number). Suggest reject. “While 65536 CTAs is likely way too many and 256 may be adequate, allowing the extra byte adds very little overhead.”

Reject.

1671 (Singer via Shvodian, T): Why does the device care about the last device to authenticate and deauthenticate? Where does it get this information? Remedy: Remove AuthenticateFailDevice (why is it called "Fail" anyway?) and DeauthenticateDevice. Suggest accept.

Accept.

1731 (Karaoguz, T), 444 (Gilb, T): Remove reference to other PHY types (5 GHz and UWB) since they have not yet been approved (new PHY drafts will update this section as part of their draft). This comment was accepted for 550 (Gubbi, TR). Suggest accept.

Accept.

1451 (Shvodian, TR): Current Power Level doesn't belong in the PIB. It is sent with each packet at the PHY SAP. Remove PHYPIB_CurrentPowerLevel from the PIB. Suggest accept.

Accept.

941 (Roberts, TR): PHY PIB values referenced, but not defined. Suggest accept in principle: “Move PHY PIB definition to clause 11.7, make it specific for the 2.4 GHz PHY. Additional PHYs will include an appropriate PHY PIB clause with any new draft. Add defintions for the three items, PHYPIB_TxMaxPower and is a 2’s complement encoding in dBm, as defined 7.4.8 and PHYPIB_TxPowerStepSize is the step size in dB, also as defined in 7.4.8. The PHYPIB_CurrentPowerLevel will be deleted as indicated in the resolution of comment 1451.”

Accept.

1449 (Shvodian, TR): PHYPIB_CurrentDataRate shouldn't be a PHY PIB. It is passed at the PHY SAP on a packet by packet basis. Remove PHYPIB_CurrentDataRate from the PIB. Suggest accept.

Accept.

940 (Roberts, TR): The text in line 4 claims there is a mapping between the data rate vector and the actual data rate that is PHY dependent. Where is this mapping in clause 11. How does this map to the PHYPIB_DataRateVector and the PHYPIB_CurrentDataRate? Suggest accept in principle: “The PIB references will be moved to clause 11.7. The PHYPIB_DataRateVector encoding is defined in 11.7 as the mapping of supported data rates to a single octet, but the cross reference to this will be clarified when the PIB tables are moved. The PHYPIB_CurrentDataRate, which is set through the PHY SAP on a packet by packet basis, will be removed, as indicated in the resolution of comment 1449.”

Accept.

943 (Roberts, TR): Clause 11 does not list the managed object. Define PHYPIB_MPDULengthMax in clause 11 ... refer to PHY subcommittee. Suggest accept in principle, “The PHYPIB_MPDULengthMax is the same as the aMaxFrameSize and is fixed for compliant 2.4 GHz PHY DEVs. Thus the PIB entry is not needed and will be deleted.”

Accept.

946 (Roberts, TR): Clause 11 does not address the managed objects of table 50. The PHY committee needs to add reference to the values used for PHYPIB_NumPSLevels and PHYPIB_PSLevelReturn. Suggest accept in principle, “The PHY PIB table will be moved to 11.7. Both values are implementation dependent. Will add the implementation dependent notation to the definition of PHYPIB_NumPSLevels and add that PHYPIB_PSLevelReturn is a time duration in microseconds.”

Accept

1696 (Siwiak, TR), 1733 (Karaoguz, T), 945 (Roberts, TR): Definition of the ranging item. Suggest accept in principle, “The PHY PIB tables will be moved to 11.7 and a note will be added that the ranging for the 2.4 GHz PHY is optional and that its method is implementation dependent and outside of the scope of the current standard. The range encoding will be changed to be 2 bytes, with the distance indicated in cm (i.e. a range of 0 cm to 655.35 m with a resolution of 1 cm). The item will be a list object that contains DEV-ID/ range pairs. New PHY projects will define a ranging parameter that is appropriate for that PHY.”

Accept

147 (DuVal, T): MAC CPS SAP is not shown in Figure 2. It is hard to understand how it fits in without seeing the relationships pictorially. Suggest accept, “The figure from annex A (figure A.1) will be copied to clause 6 as well as supporting text that describes the various layers of the model.”

Accept

1456 (Shvodian, T): Need a MAC_DATA.confirm to indicate status in the event of a failure. Suggest accept, “WMS will submit text.”

Table

476 (Gilb, T): There is only one type of primitive defined in the PHY service specification now. Delete "The primitives associated ... sub-layer to sub-layer interactions." and connect the following paragraph to the previous one. Suggest accept.

Accept.

477 (Gilb, T): This sub-clause is redundant and therefore really irritates the technical editor while simultaneously promoting bad habits. Delete sub-clause 6.9.3.1 in its entirety and wipe it from our minds. Suggest accept, reason “The committee would like to thank the technical editor for this enlightenment.”

Accept.

952 (Roberts, T): Add figures to illustrate the vectors TXVECTOR and RXVECTOR. Suggest accept in principle “Tables 55 and 56 illustrate the components of the logical entities TXVECTOR and RXVECTOR. Add xref’s to these tables in the value column of table 54.”

Accept in principle, “Move the items from tables 55 and 56 into table 54. Delete TXVECTOR and RXVECTOR from Table 54. Change TXVECTOR and RXVECTOR in the primitive parameters to be a list of the items. Create TXDataRate and RXDataRate parameters separately.”

551 (Gubbi, TR), 1732 (Karaoguz, T), 445 (Gilb, T): Set the CCA detection threshold to be dependent on the TX power in a manner similar to 802.11. Suggest reject, “802.11 has a much greater range of transmit powers (from 10s of mW up to 1 W) where 802.15.3 DEVs would typically use lower TX power, around 0 to 8 dBm.”

Withdrawn (1732, 445), waiting on 551 (Gubbi).

953 (Roberts, TR): In table 55, in the value column for parameter Length, it is stated the max number of octets is determined by PHYPIB_LengthMax. Should this be PHYPIB_MPDU_LengthMax. If not, then where is PHYPIB_LengthMax defined? Suggest accept in principle, “Change ‘PHYPIB_LengthMax’ to be ‘aMaxFrameSize’. Also change it in table 56 which will now be in table 54.”

Accept.

1457 (Shvodian, TR): Data Rate and Power Level should not be PIB parameters. Rename the value. Suggest accept in principle, “Change the values to be, ‘The data rate for the packet, PHY dependent. For the 2.4 GHz PHY this is defined in 11.7.’ and ‘The TX power level for the packet, PHY dependent. For the 2.4 GHz PHY this is defined in 11.7.’”

Accept.

2.5 Email resolution, responses requested by 19 Feb, 2002

471 (Gilb, T): Add TIMEOUT to ReasonCode valid range. Suggest accept in principle, “Add RESPONSE_TIMEOUT to the valid range of the ReasonCode in Table 30 (see comment 639).”

639 (Heberling, T): Change from ACK_TIMEOUT to RESPONSE_TIMEOUT. Suggest accept in principle “Make change as indicated and add RESPONSE_TIMEOUT to the valid range of the ReasonCode in Table 30.”

644 (Heberling, T), 473(Gilb, T): Type and valid range wrong for reason code. Suggets accept 644, accept in principle 473, “Change the valid range to be SUCCESS, RESPONSE_TIMEOUT as indicated in comment 644.”

474 (Gilb, T): The sentence "The ReasonCode ... for failure." does not belong here since it has been put into the table, so delete it. Suggest accept.

652 (Heberling, T): Change from ACK_TIMEOUT to RESPONSE_TIMEOUT on page 70, line 37. Suggest accept.

929, 930, 932 (Roberts, T): Change “LME” to “PLME”, suggest accept in principle, for 929 “Change ‘shall be a request by the LME to reset’ to be ‘shall be a request by either the DME or MLME to reset’. The PLME-SAP is the same interface for both the MLME-PLME and the DME-PLME.” for 930 and 932 “Change ‘The LME is’ to be ‘The requesting management entity, either the DME or MLME, is’. The PLME-SAP is the same interface for both the MLME-PLME and the DME-PLME.”

934, 935, 936, 937 (Roberts, T): Add xref to appropriate MAC PIB tables, suggest accept.

1446 (Shvodian, T): No such thing as MACPIBCFPMaxDuration anywhere else in the draft, so delete it from the PIB. Suggest accept.

939 (Roberts, T): Add the note that 11.1 is for the 2.4 GHz PHY, “... on the regulatory domains for the 2.4 GHz PHY is given in 11.1.” Suggest accept.

942 (Roberts, TR): Managed Object in Table 47 is misspelt. Correct spelling ... it should be PHYPIB_MPDULengthMax. Suggest accept.

944 (Roberts, TR): Managed Object is misspelt. Spelling should be PHYPIB_CCAThreshold. Suggest accept.

2.6 Tuesday, 19 February, 2002

Email resolution.

Accept all resolutions as proposed by email that were due on 19 February, 2002.
Also, comment 852 was withdrawn and the resolution of 813 agreed to by K. Guenter via email to the reflector.
First email from R. Roberts

I believe we cleared comments 929, 930 and 932 on the Conference Call.
934, 935, 936 and 937 - Accept the suggested solution
939 - Accept the suggested solution
942 and 944 - Accept (sorry about the TR on spelling ... I had "TR'itis")

Email from Roberts:

1125, 1234, 1244 - I thought we agreed last week to defer these until after the Chicago ad-hoc after hearing the security suite proposals. Am I confused?
954 - Accept
999 - I'll accept the resolution of comment 1477 (Shvodian, TR)
970, 971, 975, 976, 978, 979, 981, 984, 986, 987, 995, 998, 1050 - accept the rejection as shown in 02/075r6 based upon our email exchange
972 - accept
973 - accept
983 - accept
997 - accept (that is, either finish the MLME or delete the text)
955 - accept
982 - accept

1456 (Shvodian, T): Need a MAC_DATA.confirm to indicate status in the event of a failure. Suggest accept, “WMS will submit text.”

Accept based on text submitted by email.

1125, 1234, 1244 (Roberts, TR), 1821, 1829 (Rasor, TR): Should changing the PNC require re-authentication (note that this does change the PSM): Suggest ?

Still no progress, table until Schaumburg meeting

1454 (Shvodian, TR): "All DEVs shall support the asynchronous data service." This is a LAN mentality, not WPAN. Devs can may be simplified by eliminating asynchronous data service. Make asynchronous data service optional. Suggest ?

Table until Schaumburg.

954 (Roberts, T): Add text to explain why the TX and RX MAC headers are passed in the TX and RX vectors. Roberts suggest: Text that can be added to clause 6.9.4 "The MAC headers TxMacHead and RxMacHead are passed in the TX vector and RX vector respectively to facilitate calculation of the HCS as illustrated in Figure 107." Suggest accept in principle, “The TxMacHead and RxMacHead are now explicitly passed in the PHY-TX-START.request and PHY-RX-START.indication. Add text to PHY-TX-START.request ‘The TXMACHeader is passed to the PHY for transmission and for the PHY to calculate the HCS. For the 2.4 GHz PHY, the HCS calculation is defined in 11.2.8.’ The ‘When generated’ text for PHY-RX-START.indication already indicates that this command is only issued when the HCS has been successfully calculated.”

Accept

1459 (Shvodian, TR): Need to specify that the preamble starts when this command is received. Specify that the Preamble starts when PHY-TX-START.request is received. Suggest accept in principle, “The current ‘Effect of receipt’ specifies that it starts the ‘local transmit state machine’, which would imply that it begins sending the preamble.”

Accept change ‘local transmit state machine’ to be ‘transmitting’

480 (Gilb, T): The criteria given are not applicable to this standard. Change ‘the period indicated ... has expired.’ to be ‘the chnannel has been quiet for an aCCADetectTime period.’

Accept (correcting the spelling for channel).

1478 (Shvodian, TR): "A command data unit (MCDU) may also be transmitted in fragments, as described in 8.7." This is inconstent with the fact that the sequence numbers from all command frames use a single counter. Since all command frames do not go to the same destination, fragementation does not work. Change to : "Command data units (MCDUs) cannot be fragmented." Suggest accept in principle: “Add text to the sequence numbers and fragmentation sections that indicate that fragmented MCDUs shall have consecutive sequence numbers, regardless of the order of transmission on the air.”

Accept, add that this applies to MPDUs in non-stream connections as well.

1477 (Shvodian, TR), 999 (Roberts, T): Don't really need two octets for command type. One is more than adequate. Suggest reject, “While it is absolutely true that 1 octet is sufficient for enumerating the commands, a 2 octet command identifier with 2 octet length indicator results in even octet boundaries for the fields. Changing the command type to 1 octet would require changing the command length to 1 octet, which could be too short.”

Accept, original comments, change command type to one byte, make changes throughout clause 7.

312 (Gilb, T): Not all commands are allowed to be chained together. Some shall be sent individually. Insert the following sentence after "... as shown in Figure 15." ‘The following commands shall be sent in a command frame that contains only the command: alternate PNC announcement, new PNC announcement, association request, disassociation request.’ Suggest accept.

Accept, make a dashed list, change shall to should.

970, 971, 975, 976, 978, 979, 981, 984, 986, 987, 995, 996, 998, 1050 (Roberts, T): Explicitly provide element ID. Suggest reject, “The element IDs are uniquely defined in table 63 for all of the information elements. Repeating that definition in the sub-clauses would have the effect of defining the same thing in two different places. Besides the fact that this keeps the technical editor up at nights worrying about this, it makes the standard difficult to maintain and leads to errors in the assignment of the numbers when the order and number of information elements is changed. The current table has been set up so that both the information element name and sub-clause update automatically to ensure a 1-1 correspondence between the subclauses and the summary table to prevent potential errors.”

Accept

1002, 1004, 1006, 1010, 1012, 1016, 1018, 1020, 1025, 1027, 1029, 1035, 1040, 1041, 1045, 1047, 1048, 1050, 1051, 1053, 1055, 1064, 1070, 1073, 1083 (Roberts, T): Explicitly provide the command types in the figures, Suggest reject, “The comamnd types are uniquely defined in table 65 for all of the commands. Repeating that definition in the sub-clauses would have the effect of defining the same thing in two different places. Besides the fact that this keeps the technical editor up at nights worrying about this, it makes the standard difficult to maintain and leads to errors in the assignment of the numbers when the order and number of information elements is changed. The current table has been set up so that both the command name

and sub-clause update automatically to ensure a 1-1 correspondence between the sub-clauses and the summary table to prevent potential errors."

Move to email resolution due by Thursday, 21 February, 2002.

1341 (Shvodian, TR, 7.5.10.3), 1605 (Shvodian, TR, 8.16), 972 (Roberts, T, 7.4.2): Change resolution of fields to 1 us in the piconet synchronization parameters. We accepted this change in general for 1491 (Shvodian, TR). Suggest accept in principle, "Resolve as indicated in the resolution of comment 1491, see also document 02/100r0."

Accept

973, (Roberts, TR): Reference is made to the "current data encyrption key (DEK)". Provide reference to the DEK details. If the subclause is missing in clause 10 then provide the details. Suggest accept in principle, "The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security."

Accept

1673 (Singer, via Shvodian, T), 983 (Roberts, TR): The cipher suites are not defined according to any standard. In particular, the IEEE P1363 standard, which is Std IEEE 1363-2000, does not contain any cipher suites in it. Recommend changing the sentence to "The OID field specifies a unique security suite." Suggest accept 1673, accept 983 in principle, "The reference to P1363 has been changed to a reference to the cipher (now security) suite. The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security."

Accept

314 (Gilb, T): The CAP duration is not the time offset from the start of the beacon to the start of the CFP. Change "The same value is used as the time offset" to "The same value is used to calculate the time offset". Suggest accept in principle, "The CAP duration is now explicitly sent in the beacon, rather than being calculated, as described in 01/076r2."

Accept

45 (Bain, T): There is no mention here of what the setting should be when MTS is used rather than CAP. Also, the xref to 8.4.2 would indicate that more would be found there, and 8.4.2 is fairly short in description. Suggest accept in principle, "The inability to send a frame in the CAP implies that it is to be sent in an MTS or GTS. Add text to 7.4.2, page 103, line 19, following '... sent in the CAP.' 'If a type of data or command is not allowed to be sent in the CAP, then that data or command needs to be sent in a GTS or MTS.'"

Accept

499 (Gubbi, TR): Why should PNC increment and publish DEK? if the key is changed the key-distribution scheme should make sure all the relavant DEVs in the piconet are informed before the change. Moreover, keys must be per-link and not global per piconet. Suggest reject, "The TG has specifically voted on using a security model that has keys that are global for the piconet rather than being on a per-link basis. The PNC issues the keys for the piconet and acts as the piconet security manager. The commenter is encouraged to participate in the selection of the security suite for 802.15.3 at the Schaumburg and St. Louis meetings to make suggestions to the implementation of security for the piconet."

Accept in principle, "The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security. The commenter is invited to participate and/or propose solutions."

813 (Guenter, T): There is a bit for 'Neighbor PNC', but not for 'Child PNC'. Add a bit for 'Child PNC', if required. Suggest accept in principle, “The neighbor PNC field is required so that the PNC knows that the DEV that is associating wishes only to become a neighbor PNC, rather than a full-fledged member of the piconet. A child PNC, however, is a full-fledged member of the piconet, and so it has no special capabilities with respect to the piconet. Thus the child PNC bit is not required.”

Accept

2.7 Email resolution, due 21 February 2002

1002, 1004, 1006, 1010, 1012, 1016, 1018, 1020, 1025, 1027, 1029, 1035, 1040, 1041, 1045, 1047, 1048, 1050, 1051, 1053, 1055, 1064, 1070, 1073, 1083 (Roberts, T): Explicitly provide the command types in the figures, Suggest reject, “The comamnd types are uniquely defined in table 65 for all of the commands. Repeating that definition in the sub-clauses would have the effect of defining the same thing in two different places. Besides the fact that this keeps the technical editor up at nights worrying about this, it makes the standard difficult to maintain and leads to errors in the assignment of the numbers when the order and number of information elements is changed. The current table has been set up so that both the command name and sub-clause update automatically to ensure a 1-1 correspondence between the sub-clauses and the summary table to prevent potential errors.”

1458 (Shvodian, TR): Remove PHYPIB_DataRates from the Rx vector. It should be RxRate, not PIB. Suggest accept in principle, “Change ‘PHYPIB_DataRates’ in table 56 (which will now be in table 54) to be ‘PHY data rate to transmit the current packet, encoding is PHY dependent. For the 2.4 GHz PHY this is defined in 11.7’ Make the same change in table 55 (which will now be in table 54).”

478 (Gilb, T): The definition of the DATA parameter is redundant and annoying. Delete the sentence "The DATA parameters is an octet value." in 6.9.4.1 and 6.9.4.2. Suggest accept.

479 (Gilb, T): There is no PLCP. Change "contains both the PLCP and PHY" to be "contains the PHY". Suggest accept.

481 (Gilb, T): The AntSelect parameter is already defined and we don't need any more ants at our picnic. Replace the sentence "AntSelect is an ... shall be used." with "The primitive parameter is defined in Table 55.” Suggest accept.

955 (Roberts, TR): In line 6 and also in line 10, the parameter STATE is incorrect. The parameter name is actually STATUS. This is needed to be consistent with table 54. Replace STATE with STATUS in two places as discussed above. Suggest accept.

482 (Gilb, T): The descriptions of When generated and Effect of receipt are copied from another sub-clause and are incorrect for this one. Change "sub-layer needs to ... of an MPDU." to be "sub-layer wants to change the PHY power management state." in 6.9.4.19.1, line 22 Change "will be to start the ... state machine." to be "will be to enter the indicated power management level." in 6.9.4.19.2, line 26. Suggest accept.

313 (Gilb, T): The transmit power change is a command, not an information element and has already been moved to the appropriate location in the draft. Update tables 63 and 65 by moving the transmit power change command from 63 to 65. Renumber the information element ID's and command ID's as necessary. Suggest accept.

1480 (Shvodian, TR): What is the purpose of max burst duration? Is this for a single frame, or for multiple frames? Clarify the use of max burst duration or eliminate it. Suggest accept: “The ability to have burst transmission (i.e. sequential frames sent without applying backoff for each frame), was removed in prior revision of the draft, thus max burst duration for the CAP no longer applies and will be deleted.”

982 (Roberts, TR): Add OID to acronym list. Suggest accept, “Add to acronyms, OID - object identifier”

319 (Gilb, T): Delete reserved field, elements can be defined as odd lengths, the protocol automatically pads them to even numbers of octets. Delete reserved field, elements can be defined as odd lengths, the protocol automatically pads them to even numbers of octets. Suggest accept.

320 (Gilb, T): Change the label "Slot Start time or SFNext" to be "slot location" since that is how it is referenced in the definitions. This is in figure 30, page 106.

1113 (Schrader, T), 161 (DuVal): CTA type specified the same for ACTIVE and EPS modes. Suggest accept, “Change to: ‘... and shall be set to 1 if they are in EPS mode.’”

2.8 Thursday, February 21, 2002

Email resolution: accept all email resolution, except 1050, which has 2 issues.

Accept

1050 (Roberts, T): BTW: There is an oops with the transmit power control element/command, which you commented on with 1050 (and Raju caught it in 498). The transmit power control was written as an information element when it was really a command. I propose we modify the resolution of 498 and 1050 to include the following: "On page 122, sub-clause 7.5.5.1, change `transmit power control element' to be `transmit power change command', change `This element is used' to be `This command is used', both on line 7, and change the `Element ID' field to be `Comamnd type', now with a length of 1 octet (as per the resolution of comments 1477 and 999) in Figure 54 and change the caption of Figure 54 to read `Transmit power change command format'"

Accept in principle for 1050 as with 498 (Gubbi, TR) as described. above.

316 (Gilb, T): The PNC Des-mode description is incorrect. Change the definition to match what is now in clause 8, the new definitions chould read: ‘The PNC Des-Mode is the designated mode of the DEV. This bit shall be set to 1 if it is desired that the DEV be the PNC of the piconet and the AC bit is set to 1. Otherwise this bit shall be set to 0.’ Suggest accept.

Accept

43 (Bain, T): The task group has indicated before that 8 supported rates will be sufficient for PHYs other than the current one described in clause 11. However, it would seem that the limit be somewhat higher. 16 seems too high but perhaps that would be a good ceiling. Change Figure 25 in clause 7.4.6 to allow up to 16 supported rates. Suggest accept.

Accept in principle, ‘The supported rates element is not used any where else in the draft and the information is communicated capability information field. Thus this information element will be deleted.’

318 (Gilb, T): The description of piconet maximum transmit power is incorrect. Change "... communicate the transmit power control (TPC) capabilities of a DEV." to be "... communicate the maximum power allowed by the PNC as described in 8.14.1" Suggest accept.

Accept

164 (DuVal, T): Where is SFNext defined? Did not find reference to it in the following text. Is it a specific value? Or based on system design and is specified in the PIB? Suggest accept in principle, “SFNext is

defined on page 107, lines 27-31. In addition, the label in Figure 30 is going to be changed to ‘slot location’ to reflect how it is referenced in the definitions (see the resolution of comment 320).”

Accept

1310, 1528, 1579, 1580 (Shvodian, TR), 1052 (Roberts, TR), 1160 (Roberts, T), 344, 345, 346, 393, 395 (Gilb, T), 154 (DuVal, T), 711, 712 (Heberling, TR): Comments related to repeater frame formats, suggest accept in principle, “The repeater functionality has been deleted, as indicated in the resolution of comment 78, and so the corrections to the frame formats are moot.”

Accept

1114 (Schrader, T): Line in table says AWAKE rather than WAKE, and does not indicate that there is a GTS slot. Change entry to: EPS CTA, WAKE superframe w/ GTS. Suggest accept. This will likely be superceded by PM and CTA changes, but for now it won’t hurt to make it consistent.

Accept

997 (Roberts, T), 1502 (Shvodian, TR): Justification for ASIE. Suggest accept in principle, “The ASIE was accepted by the TG to provide a method for implementers to add specific functionality without breaking compatibility (i.e. a DEV failing to decode the beacon due to the presence of this item.)” For comment 1502, this was originally accepted with Bob Huang tasked to write the MLME (since he had a similar comment). However, Bob withdrew his comment, so there is no text for this MLME. Suggest commenter either withdraw or offer MLME text.

Withdraw 997, table 1502 until Schrader submits text for the MLME.

1486, 1487 (Shvodian, T): Why would we limit transmit power and not EIRP? Change piconet maximum transmit power to limit EIRP. Suggest reject, ‘The PHY committee discussed this particular issue at our meeting and it was decided to simply use the "nominal TX power." Unless the device keeps close tabs on its TX power, it will vary somewhat with temperature, battery voltage, etc.’

Accept rejection.

165 (DuVal, T): What is a "EPS set"? Where is it defined? For that matter, where is RPS defined? Is it a parameter set by the design and communicated through the PIB? (no suggested solution) Suggest accept in principle, “EPS set and RPS are defined in clause 8.13. RPS, however, will be removed as a distinct mode a a resolution to another comment. Add cross reference to the location of the definition of EPS sets (currently 8.13.3.8) to line 18, page 109. Add a short description of what the EPS (now SPS) sets are to the same location.’”

Accept.

295 (Gilb, T): Some of the commands have the settings specified for the MAC header fields, while other commands do not. Add a sentence that says that the MAC header fields are set as appropriate unless otherwise specified. Suggest accept.

Accept

711, 712 (Heberling, TR): Suggested fixed to repeater functionality, suggest accept in principle, “The repeater functionality was removed from the draft (see the resolution of comment xxx), so the suggested fixes are no longer required.”

Accepted earlier.

706, 707, 708, 709 (Heberling, TR), 1312, 1317, 1319, 1321, 1322, 1497, 1504, 1586, 1629 (Shvodian, TR), 1168, 1172, 1173 (Roberts, TR), 526, 538, 539 (Gubbi, TR), 1724 (Rofheart, TR): The current power management are too complex. Remove clauses 7.5.7 through 7.5.7.6 and 8.13 through 8.13.3.12. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.” For 1319 and 1172, add following reason to the prior one “The RPS mode will be deleted and replace by text that notes that the DEV is able to shut down whenever it is not required to either transmit or receive.”

Accept 526, 538, 539, 707, 708, 709, 1172 and 1173
1312, 1317, 1319, 1321, 1322, 1497, 1504, 1586, 1629, 1724 waiting on text.
Withdraw 706, resolved with another comment.
Table 1168

540 (Gubbi, TR), 1587 (Shvodian, TR), 398 (Gilb, T): Slot positioning for EPS DEVs. Suggest accept for 398, Suggest accept in principle for 540 and 1587, “While for some PHYs idling the front end will not save much power, for other types of PHYs and architectures, it may have a beneficial effect. Remove 8.13.1.1 and all references to "slot positioning" (example 8.13.2.2) from the draft. Add a line in 8.4.3.1 as follows "The PNC should attempt to allocate the GTSs of all APS and SPS power management DEVs first in the superframe. Exceptions to placing these allocations first include MTSs for PNC commands, QoS streams that need mulitple GTSs within a superframe and requests from child/neighbor piconets.""

Accept

1178 (Roberts, T), 399 (Gilb, T): Reference to "power resources as dictated by the DEV-host". Suggest accept 399, accept 1178 in principle, “Resolve as indicated in comment 399.”

Accept

1617 (Shvodian, T): A low power DEV may belong to a piconet that has encryption on, but that DEV may wish to communicate without encryption to save power. Sec is a field in the stream management. We should allow streams to negotiate wheter they want to use encryption or not. Document the ability of DEVs to turn encryption off for a stream, or get the SEC bit out of stream management. Suggest accept, “The SEC bit has been removed from stream management.”

Accept, ‘The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.’

324 (Gilb, T): The restrictions on negotiating the use of the ASIE is too restrictive. Delete " using a standard a GTS or CFP message exchange" since the negotiation is outside of the scope of the standard. Suggest accept.

Accept

1505 (Shvodian, TR): We cannot understand the benefit of sending more than one command in a frame. Are we going to queue commands until we get enough to send? How long are they held? Won't this create latency? For the good of the protocol, only allow one command per command frame. Suggest reject, “Most of the commands are significanly shorter than the overhead required for one packet (i.e. a SIFS+preamble+header is equivalent to 55 bytes of data at 22 Mb/s). Latency is controlled by the DEV, if it wishes a command to go out quickly, it will send it as soon as it gets the request. If not, it can wait and add it to another command.”

Accept 1505, ‘Search the draft to find and change all locations where it is allowed that more than one command is allowed in the frame.’

326 (Gilb, T): There are no more directed frames in the PNC selection process, so the ACK policy shall always be No-ACK. In addition, the stream control field should be set to 0 in these commands. Change "set to request ... zero." to be "set to No-ACK." Change "frame control field of the MAC header" to be "frame control field and the stream control field of the MAC header" Suggest accept.

Accept

327 (Gilb, T): Directed frames are no longer used in the PNC selection process. Change the sentences "The DA is set to the ... upon reception." to read "The DA is set to the broadcast address." (i.e. change first sentence and delete the two that follow). Suggest accept.

Accept

1475, 1476, 1506, 1510, 1511 (Shvodian, TR): Why set the frag start and frag end bits to zero and ignore? this creates an exception at the receiver. Why not set both to one, then the receiver has the OPTION of ignoring, rather than forcing the receiver to ignore. Change frag start and frag end to 1 for PNC selection and handover. Suggest accept in principle, “Change the frag start and frag end bits to 1 and remove the requirement to ignore them on reception, which is the correct setting for a single frame command (i.e. it is the start and the end of the command). Also, change the frag start and end bits to be 1 in tables 61 and 62 (unless beacon fragmentation is allowed, in which case they would be set as appropriate).”

Accept, also change shall be ignored to may be ignored, particularly in tables 61 and 62. Currently command are allowed to be fragemented, so for some commands the start and end bits may be set as appropriate.

1507 (Shvodian, TR): Tx power level should be PHY dependant. Some PHYs may be regulated as power-spectral density, not power. Make Tx Power level PHY dependent and move the description of this field to Clause 11. Suggest accept, “Move text to 11.7, indicate that it is PHY dependent and add cross reference.”

Accept

1508 (Shvodian, T): "A late joining, new DEV may extend this time via its frame which shall be adopted by all the currently participating DEVs." What if all the other DEVs can't hear? How does it get propagated? Suggest accept in principle, “Delete the sentence “A late ... participating DEVs.” from 7.5.1, page 112, line 34-35. Add the following paragraph after the last sentence on page 139, “If an AC participating in the the selection process wishes to change indicated timeout period, it puts this number in the alternate PNC selection command. All other DEVs that receive this frame shall update the timeout period based on this new duration. If a DEV or AC does not receive the frame, it shall continue to use the old timeout period until it either receives a beacon, alternate PNC announcement command or New PNC announcement frame. Note that if an AC or DEV misses a new timeout period, it will eventually synchronize with the new piconet when another AC or the new PNC sends a frame. If the AC or DEV is out of range of the new PNC, then it is unable to participate in the new piconet.”

Accept

332 (Gilb, T): Need to add a definition of the stream control field (0x00). Best place to put this is 7.5 since all commands are non-stream data. Also need to delete the redundant and therefore evil definition of what goes in the PNID field (that is defined much earlier, 7.2.2). Add the sentence to 7.5 at the end of the first paragraph, "All commands shall have the stream index field in the MAC header set to 0x00 and shall be ignored upon reception." Delete the sentence "The PNID values ... to associate." Suggest accept.

Accept, except change ‘shall be ignored upon reception’ to be ‘may be ignored on reception’

1509 (Shvodian, T): Ignoring the header fields should be optional and not mandatory. Setting the bits should be mandatory, ignoring them on reception should be optional. Change to "may be ignored upon reception" This applies to all of the commands. If you allow a DEV to interpret a field that was not supposed to be used, what is the proper response for the DEV? For example, if the frag-stop bit is set to zero for an Imm-ACK, does the DEV wait for the other fragment of the Imm-ACK frame? What good would it do for a DEV to decode the stream control field of a command (0x00), i.e. non-stream data, when the command is not data? In every case where the field shall be ignored on reception, there is no advantage to be gained by decoding the field, while there is potential mischief if the sender has a bug in their MAC. Requiring the setting on transmission and ignoring it upon reception makes it less likely for a bug to propagate from one DEV to another. At the very least, the wording needs to be should rather than may. Both words allow the DEV to do what it wishes, but the should indicates the recommend course of action. Suggest reject.

Accept 1509 suggested resolution.

331 (Gilb, T): The PNC handover command has unnecessary items in the frame format and adds a redundant and therefore evil definition of how the frame will be used. “Change ‘The PNC shall use this command’ to be ‘The PNC uses this command’ and delete the following fields from both the frame format and the definitions that follow: superframe duration - every DEV associated with the piconet is required to know this anyway. PNC device ID - every DEV knows this from the beacon. AC device ID - The DEV already knows its own device ID Change the command length from 18 to 4 octets.” Suggest accept.

Accept

334 (Gilb, T): The ACK policy for the association response command is defined in three places and therefore is evil. Delete the sentence "Hence this command shall not be ACKed" Also delete "If there is a match, ... future communications." on line 48 since this is already defined in clause 8. Suggest accept.

Accept

1512 (Shvodian, T), Why is "DEV wishes to disassociate" a reason code? Suggest accept in principle, “Delete the reason code ‘DEV wishes to disassociate’. See also the resolution of comment 335.”

Accept

335 (Gilb, T): The condition code "DEV wishes to disassociate" is not possible in the PNC's response. However, we do not have a code for when the PNC does not wish to allow neighbor piconets. Change reason code 5 from "DEV wishes to disassociate" to "Neighbor piconet not allowed”. Suggest accept.

Accept

678 (Heberling, T), 336 (Gilb, T), 1514 (Shvodian, T): Problems with disassociation request command. Suggest accept in principle, “Remove the Device ID and reserved octet from Figure 41 and the associated text on line 33. Change the valid reason codes to be the following: 0 - ATP has expired, DEV needs to re-associate, 1 - Channel is to severe to serve the DEV, 2 - PNC unable to service DEV, 3- PNC is turning off with no AC in the piconet, 4-255 - reserved. See also the resolution of comments 583, 588, 590.”

Accept

337 (Gilb, T): The definition of the role of the PNC as PSM redundant and is therefore an abomination to the technical editor. Delete the two sentences "In all cases ... manager in a piconet." Suggest accept.

Accept

1017, 1019, 1021, 1026, 1028, 1032, 1033, 1036, 1039 (Roberts, TR): Missing definitions of security items. Suggest accept in principle, “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”

Send as email resolution for 25 February 2002.

341 (Gilb, T): The stream control field should be defined once for all commands in 7.5 (as indicated in an earlier comment). Hence it should be deleted from this location. Redundancy is evil. This sentence also occurs in 7.5.4.2 and should be deleted from there as well.

Send as email resolution for 25 February 2002.

1042 (Roberts, T): No margin on information request. From Table 63, there are exactly 15 defined commands to date with 241 element IDs reserved for future use. Yet, in the informatioin request field of the probe request commmand we only have room for 16 commands. Increase to 3 octets to allow some growth or get rid of the extra 241 element IDs. If this is done then in line 12, replace 15 bits with 23 bits. Analysis: the command allows the requestor to specify up 128 different commands by setting the msb to 1 and sending the binary coded number that corresponds to the element ID. However, you still can’t get all 256 possible element IDs (probably a bad idea to have that many anyway). Two suggestions, first one, accept in principle, “The probe command supports up to 128 element IDs using the binary coded option (i.e. when the msb is set to 1). 127 information element IDs should be sufficient.’ or accept in principle, “Change the information element field to be 32 (or 16) octets that represent a bit map and remove the option for binary encoding the information element ID.’

1044 (Roberts, TR): So how is the MSB of the information request filed mapped (ref. Figure 50)? Suggestion below. 1=binary coded 0=bit map. Suggest accept, “Change the two paragraphs ‘The least significant 15 bits of the ... rom its intended recipient.’ ito be

‘The msb of the information request field is used to indicate how to interpret the 15 lsbs. The msb shall be set to 0 if the lsbs are a bit map and shall be set to 1 if the lsbs are a binary encoding of the information element’s ID.

If the msb indicates that the lsbs are a bit map, then the sender shall set a value of ‘1’ in a bit to request the information element that corresponds to the bit position. Otherwise the sender shall set the bit to ‘0’. The bit position for an information element is same as the value of the element-ID for that information element. That is, the bit position of ‘n’ in information request field corresponds the information element whose element ID, Table 63, is ‘n’. An all-zero value in this field shall be used when the source DEV is not expecting any probe information from the destination DEV, but is providing the information about itself to the destination DEV in the elements following this field.

If the most significant bit of information request field indicates that the rest of the bits are binary coded, then the field contains the element ID of the information element that is being requested by the sender of this command from its intended recipient.’

2.9 Email resolution, due 25 February, 2002

1017, 1019, 1021, 1026, 1028, 1032, 1033, 1036, 1039 (Roberts, TR): Missing definitions of security items. Suggest accept in principle, “The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security.”

341 (Gilb, T): The stream control field should be defined once for all commands in 7.5 (as indicated in an earlier comment). Hence it should be deleted from this location. Redundancy is evil. This sentence also occurs in 7.5.4.2 and should be deleted from there as well. Suggest accept

325 (Gilb, T): The restriction on transmitting command frames is too restrictive. It would not allow an unassociated DEV to associate. Change "No command ... within a piconet." to be "Other than the association request, association response, alternate PNC selection command and new PNC announcement command, no command frame shall be transmitted to or by and unassociated DEV within a piconet." Suggest accept

683, 685, 688, 689, 690, 703, 706, 714, 715 (Heberling, TR), 679, 680, 681, 682, 720 (Heberling, T): Rename probe as device information, rename DEV info to be probe PNC. We have already resolved this in other comments (see 516 and 1440), Suggest accept in principle, “The probe commands will become a single probe command, the DEV info command is renamed PNC info command and the clause titled ‘Broadcasting DEV information’ will be changed to be ‘Broadcasting CTR information’”

1301 (Shvodian, TR), 343 (Gilb, T): Why does the probe request command contain information elements? This is requesting IEs not sending them. Remove Information Elements from the probe request command. Suggest accept in principle, “The probe request and response commands have been merged into a single command, see resolution of comment 516, that allows information both to be sent as well as requested.”

1602 (Shvodian, TR), 414 (Gilb, T): aProbeResponseDelay of 8 ms is too short. Should be at least 2 superframe durations. But, responding DEV may have no channel time. (Gilb suggested setting it to at least aMaxSuperframeDuration.) Suggest accept in principle, “Change aProbeResponseDelay from 8 ms to 2*aMaxSuperframeDuration.” Alternative suggestion, “Change all ‘aProbeResponseDelay’ references to be ‘2 times the current superframe duration’. Since this is no longer a constant, remove aProbeResponseDelay from the table 73, page 173, sub-clause 8.16.”

704, 670, 671 (Heberling, TR), 329(Gilb, T): Alternate PNC announcement command and Alternate PNC pull out command are not needed. Please remove the indicated commands and their xrefs. Suggest accept 329, 671, accept 704 in principle, “The alternate PNC pullout command will be deleted and all of its references. The alternate PNC annoucement command is required for the PNC selection process that has been chosen by the TG for this draft standard.” and reject 671, “The alternate PNC annoucement command is required for the PNC selection process that has been chosen by the TG for this draft standard.” .

687 (Heberling, TR), (Gilb): Suggest accept in principle, “Change ‘The queried device ID is the device ID of the DEV whose information is being requested from the PNC.’ to: ‘The queried device ID is for the DEV whose information is being requested from the PNC.’ and change ‘broadcast address’ to be ‘broadcast ID’."

716 (Heberling, T): Remove reason code for disassociation command, suggest reject “While it is true that many of the reason codes for the disassociation command are either unneeded or poorly described, the committee feels that there are still at least two valid disassociation reason codes required. Thus the reason codes have been maintained and the reference to them in this section is required. See also the resolution of 583, 588, 590 (withdrawn by commenter).”

705 (Heberling, TR): Add Remote-Scan-Request and Remote-Scan-Response to table. Suggest accept in principle, “The commands and cross references will be added to the summary table for Remote-Scan-Request and Remote-Scan-Response.”

328 (Gilb, T): Reserved fields are no longer used in the commands or information elements. Delete the reserved field and move the 3 1 byte fields to the end of the command so that the other fields end on 2 byte boundaries. Suggest accept.

330 (Gilb, T): The new PNC announcement command doesn't need to use all of the bytes in the other PNC commands. It really only needs the new beacon timeout parameter. Suggest accept in principle, “Add to the text, following ‘as PNC in the piconet.’ on line 52 with ‘This command is also used at the end of a PNC han-

dover by the new PNC of the piconet to signal the end of PNC handover. The new PNC announcement command shall be formatted as illustrated in Figure xref.'.

octets: 2	**2**	**6**	**2**
Command type	Length (=14)	Device Address	New beacon timeout

Figure 1—PNC selection frame body

Delete old paragraph beginning 'At the end of ... hand over'" and change the paragraph "The CSTimeout ... in the channel.' to read as follows:

'The device address is the address of the new PNC.

The new beacon timeout field indicates the time offset in milliseconds before which the first beacon shall be sent by the winning AC, in the case of PNC selection, or by the new PNC, in the case of PNC handover.'"

333 (Gilb, T): A DEV that fails ATP will not neccessarily re-associate and so the PNC should not expect that to happen. The PNC does not need to expect anything. Change "the DEV and expect the DEV to associate again." to be "the DEV." Suggest accept.

675 (Heberling, T): Device ID and AD-AD parm names are incorrect. Suggest accept in principle, "Change 'Device ID' to be 'DEV Address' and change 'AD-AD' to be 'DEV ID'."

676 (Heberling, T): DeviceAID (aka AD-AD) is mislocated in the figure. Suggest accept in principle, "Exchange the locations of the 'AD-AD' and 'Reason code' fields in figure 40. 'AD-AD' will be come 'DEV ID' and 'Device ID' will become 'DEV Address', per other comment resolution."

1014 (Roberts, T): Add PSM to acronyms clause, suggest accept "Add PSM - piconet security manager, to the acronyms clause."

315 (Gilb, T): Add guard time element to beacon, suggest accept in principle, "The requirements for guard time in the piconet will be added based on the text in document 01/100r1."

1516 (Shvodian, TR): What is the maximum size of a public key object? If it won't fit in a max frame size, the command frame would need to be fragmented. Fragmenting command frames won't work becasue of single sequence counter. Need to sensure max key object size is less than the max frame size or figure out how to fragement commands. Suggest accept in principle, "The use of the sequence counter with fragmented commands will be resolved as indicated in the resolution of comment number 1478."

1515, 1518, 1519, 1520 (Shvodian, TR): The object length field and Length are redundant. Delete the object length field. Suggest accept.

1022, 1023, 1024, 1030, 1031, 1034, 1038 (Roberts, TR): Wrong figure number, make it correct. Suggest accept.

338, 339, 340 (Gilb, T): Move the variable length field so that it is the last one. Suggest accept.

342 (Gilb, T): Clarify what is the purpose of the information elements field. Change "information elements, described in 7.4." to be "information elements, 7.4, about the source DEV that is being provided to the destination DEV." Suggest accept.

3. Schuamburg ad-hoc, Feb. 25-27

3.1 Results of email comment resolution

Accept all except, 670, 330 and 704.

3.2 General items (as we have time).

1042 (Roberts, T): No margin on information request. From Table 63, there are exactly 15 defined commands to date with 241 element IDs reserved for future use. Yet, in the informatioin request field of the probe request commmand we only have room for 16 commands. Increase to 3 octets to allow some growth or get rid of the extra 241 element IDs. If this is done then in line 12, replace 15 bits with 23 bits. Analysis: the command allows the requestor to specify up 128 different commands by setting the msb to 1 and sending the binary coded number that corresponds to the element ID. However, you still can't get all 256 possible element IDs (probably a bad idea to have that many anyway). Two suggestions, first one, accept in principle, "The probe command supports up to 128 element IDs using the binary coded option (i.e. when the msb is set to 1). 127 information element IDs should be sufficient.' or accept in principle, "Change the information element field to be 32 (or 16) octets that represent a bit map and remove the option for binary encoding the information element ID.'

Accept "Change the information request field to be 4 octets with the msb indicating either bitmap or binary encoded."

1044 (Roberts, TR): So how is the MSB of the information request filed mapped (ref. Figure 50)? Suggestion below. 1=binary coded 0=bit map. Suggest accept, "Change the two paragraphs 'The least significant 15 bits of the ... rom its intended recipient.' ito be

'The msb of the information request field is used to indicate how to interpret the 15 lsbs. The msb shall be set to 0 if the lsbs are a bit map and shall be set to 1 if the lsbs are a binary encoding of the information element's ID.

If the msb indicates that the lsbs are a bit map, then the sender shall set a value of '1' in a bit to request the information element that corresponds to the bit position. Otherwise the sender shall set the bit to '0'. The bit position for an information element is same as the value of the element-ID for that information element. That is, the bit position of 'n' in information request field corresponds the information element whose element ID, Table 63, is 'n'. An all-zero value in this field shall be used when the source DEV is not expecting any probe information from the destination DEV, but is providing the information about itself to the destination DEV in the elements following this field.

If the most significant bit of information request field indicates that the rest of the bits are binary coded, then the field contains the element ID of the information element that is being requested by the sender of this command from its intended recipient.'

Accept

1454 (Shvodian, TR): "All DEVs shall support the asynchronous data service." This is a LAN mentality, not WPAN. Devs can may be simplified by eliminating asynchronous data service. Make asynchronous data service optional. Suggest accept in principle, change ‘’ to be ‘’

Table
Withdrawn, 26 February, 2002.

988 (Roberts, T): In figure 30 do two things: 1. name the last column as "slot location field" 2. Add SFNext to acronym list in clause 4. Suggest accept

Accept

989 (Roberts, T): This paragraph references a field that contains "the least significant two octets of a beacon number". This paragraph is confusing. Power management subcomittee needs to clarify and provide adddditional references to other clauses. Suggest accept in principle, “Change the second sentence to read ‘For ACTIVE CTA, the SFNext field contains the least significant two octets of a beacon number, xref (beacon number), corresponding to next superframe in which an actual time slot will be allocated, xref 8.xx.’”

Accept

705 (Heberling, TR): Add remote scan to clause 7. Suggest accept, this was accepted in Dallas.

Accept (actually, this was accepted on email).

355 (Gilb, T): The command structure is not indicated in formal language. In addition, the introductory paragraph gives a redundant and therefore evil functional description in the frame formats clause that belongs the functional description clause. Replace the sentences "Only the PNC ... all DEVs in the piconet." with "The device information response command shall be formatted as illustrated in Figure 63." Suggest accept.

Accept

354 (Gilb, T): The first sentence is a redundant (aka evil) definition of the functional use of the device information request command that already is in clause 8. Also, the AD-AD should be used instead of the device ID. Suggest accept in principle with new names, “Delete the sentence ‘Only a DEV shall send the device information request command.’ Change "device ID" to be "DEV ID" in the figure, change the field length to 2 and the command length to 2. Change "The queried device ID is the device ID" to be "The queried DEV ID is the ID" on line 14.”

Accept

1324 (Shvodian, TR): It is not clear why a DEV would need to know the CTRBs for another DEV. Remove all CTRBs from the device information response command records. Suggest accept in principle, “Remove the CTRBs and number of TX slots from the device (now PNC) information response command. Delete the last sentence in 8.2.4, page 141, lines 7-8 ‘To facilitate fast handovers ... every aBroadcastDEVInfoDuration.’ Also, on page 143, 8.2.7, lines 40-41, change ‘is intended to help in reducing the delay in a PNC handover by enabling other PNC-capable DEVs to keep their local tables current.’ to be ‘is intended to keep all of the DEVs in the piconet informed about the status and capabilities of other DEVs in the piconet.’”

Accept, additionally, ‘Also remove number of TX slots from the PNC info command. The PNC info command will now be used only to communicate the information about DEVs in the piconet, e.g. addresess, capabilities, etc. Add a command (possibly 2) that is used to pass all of the relevant information to a new PNC in the PNC handover process. The command name will be the handover infor-

mation command. Note that the information would include CTRs and possibly, security information."

1076, 1077 (Roberts, T): How is broadcast mode supported? Note that this command has the CTRBs and capabilities, which can only be issued by a real DEV. Suggest accept in principle, "Delete the sentence 'This field ... to the PNC' since it is redundant. Add a sentence in its place, 'This field shall not contain the broadcast or multicast IDs.'"

Accept.

1079, 1080 (Roberts, T): Problems with the child or neighbor information response command. Suggest accept in principle, "This command was deleted in the resolution of comment 356 and so the fixes required in the comments are moot."

Accept

1328, 1330 (Shvodian, TR): Why is End sequence number needed? The start sequence number and the RxStatus bitmap is all that is needed. Suggest accept 1328, accept 1330 in principle, "Delete the sentence 'The end sequence number ... in the RX status bitmap'".

Accept (Ask Raju if there was some other reason for the end sequence number.)

1329 (Shvodian, TR): The figure says Record for stream 1, 2, ...n, but you could have multiple records for the same stream. Add text that says that that there could be multiple records for the same stream. Suggest accept, 'Following '... shall be formatted as illustrated in Figure 72.' add text 'A single stream may have multiple records associated with it.' Change the text in the figure from 'Record for stream-x' to 'Record-x'."

Accept

1336 (Shvodian, TR): What is the CTA element set to if it is not the same in every superframe? Need to define what the CTA is set to in the chanel time grant if it is not the same for every SF. Suggest accept in principle, "The CTA in the channel time grant is set to what ever the value is for the current superframe. The next superframe may have a different value, but a channel time grant has only the values that were sent in the beacon. The last sentence of this subclause states: 'The channel time allocations that have been announced in the immediately preceding beacon at the beginning of the CFP shall not be changed using this command.' The updates to the SPS power management will address how this command is used with low rate allocations."

Accept

1096 (Roberts, T), 1116 (Schrader, T): Replace the 4th word in line 51 (index) with the word "identifier". Suggest accept 1096, accept 1116, "Resolve as indicated in comment 1096."

Accept

1094 (Roberts, T): Figure 75 shows this field as being 20 octets wide but adding up the octets in Figure 77 we get 23 octets. Which width is correct? Assign to MAC subcommittee. Suggest accept in principle, "The field size in figure 75 will be adjusted to match the size indicated in Figure 77, which may change due to the resolution of other comments."

Accept

1533 (Shvodian, TR): Stream management command should use the 48 bit address instead of the 8 bit address. Even though each DEV should have the latest table, it may get out of sync. Using the 48 bit address will prevent problems. Have stream management command use the 48 bit address. 2 options,

a) Suggest reject, “The DEV clearly knows 2 of the addresses involved, i.e. its own and the PNCs. Before it sends the stream management command, it has the opportunity to request the information about the target DEV if its information is stale. Also, since addresses have a re-use timeout, a DEV that has information that is fresh relative to this time knows that it either has the correct address or will find out that the target DEV is no longer part of the piconet.”
b) Suggest accept in principle, “Since the DEV knows 2 of the addresses involved, i.e. its own and the PNCs, send both the target DEV ID and target DEV Address in both the stream management and CTR commands.”

Table until resolution of CTRBs

361 (Gilb, T), 1121 (Schrader, T): The action type requires a 3 bit field, not a 2 bit field. Change the text from "a 2-bit" to "a 3-bit" and re-number the bits accordingly in figure 76. Suggest accept 361, accept 1121 “Resolve as indicated in comment 361.”

Accept

362 (Gilb, T): Duplicate of 294, withdrawn

Withdrawn by commenter.

1098 (Roberts, TR): Figure 77 lists the QoS parameters but it doesn't implicitly show which order the parameters are sent. Add a figure that shows how to put the QoS VECTOR together and where are the MSBs. Suggest accept in principle, “Figure 77 is supposed to explicitly indicate the order in which the parameters are sent (i.e. top to bottom). However it is clear that this format is confusing and so this table will be changed back into a figure in a format similar to the other frame formats.” (This would become moot if the subclause is deleted by the CTR cleanup).

Accept

170 (DuVal, T): What does "ReTX" mean? It also appears on page 135, line 18. Need a definition to understand. Suggest accept in principle, “ReTX is defined on page 135, line 18. However, since this is an acronym and is not specifically defined, it will be added to clause 4, ‘ReTX - retransmission’”

Accept

1342 (Shvodian, TR): All of these parameters have use K which is 1024. They should be small k, which according to the definitions is 1000. Change K to k. Suggest accept in principle, “The technical editor would like to profusely apologize and beg forgiveness for not changing these instances from Kus to ms in the D08 to D09 revisions. The group has adopted ms instead of Kus for this timing as a resolution of another comment by the same commenter, 1482, and resolved comments 160 and 544. The unit kilo-microseconds is improper, milliseconds should be used instead. For Koctets/s, change to kilo-octets/s.”

Accept, “Change Kus to milliseconds on line 6 and 18. Change Koctets/s on kilo-octets/s on lines 8, 10 and 12.”

1099 (Roberts, T): In line 18 ... in the middle of the sentence is the word "over" ... would a better word be "after". Suggest accept.

Accept

299 (Gilb, T), 1112 (Schrader, T), 957 (Roberts, TR):

(Gilb's comment) Enumeration items are incomplete in their description. In a) change "frame control, address " to "frame control, network identification, source address, destination adress " In d) change "(FCS) which" to "(FCS), if the frame body is non-zero length, which".
(Schrader's comment): The frame header structure is not described clearly, the CRC type of HCS should be specified, and a correction made to the specification of the FCS CRC designation. Rewrite as follows: a) A frame header that includes the PHY header and the MAC header. The MAC header comprises frame control, ...,traffic category informantion. b) A fixed length header check sequence (HCS), which contains an IEEE 16-bit cyclic redundncy code CRC-16) for the frame header. c) ... d) ... code(CRC-32). Suggest accept in principle, "
(Roberts comment) reference is made to a "traffic category". This term is used just once in the whole docuement (i.e. used only in this sentence).

Suggest accept both in principle, "New enumeration list is given below:

a) A MAC header
b) A variable length frame body
c) A frame check sequence (FCS).

Note that the MAC header check sequence (HCS) is PHY dependent and protects both the MAC header and the PHY header."

Accept

1462 (Shvodian, T): "order in which they are passed to the PHY," is not technically correct, since the interface between the MAC and the PHY is likely not serial. Replace with "order in which they are transmitted on the air," Suggest accept in principle, "Replace with 'order in which they are transmitted in the medium,"

Accept

300 (Gilb, T): Requirements are not strong enough for bit ordering. Change "left-most bit is transmitted" to "left-most bit shall be transmitted" in line 26, change "a single octet are sent to" to be "longer than a single octet shall be sent to" in line 31, change "convention and is transmitted" to "convention and shall be transmitted" in line 34 and change "in decimal are coded" to be "in decimal shall be coded" in line 37. Suggest accept.

Accept

960 (Roberts, TR): Please add the definition of a "natural number" to clause 3. Suggest accept in principle, change "coded in natural binary" to be "coded in binary".

Accept in principle, "Change 'coded in natural binary' to 'coded in unsigned binary'."

153 (DuVal, T): Where is the PHY preamble and PHY header in this figure? (no suggested remedy). Suggest accept in principle, "The PHY preamble and PHY header do not appear in the figure because they are part of the PHY frame and not part of the MAC frame format. The illustration of the PHY preamble and PHY header appear in clause 11."

Accept

302 (Gilb, T): The description of the frame control field repeats what is in the figure and therefore is redundant and evil. Change "consists of the ... and repeater" with "is used to identify the type of frame and how it is to be handled." Suggest accept.

Accept

303 (Gilb, T): "will" is not formal language. Change "supports will discard" to "supports may discard". Suggest accept.

Accept, “Change ‘supports will discard’ to ‘supports shall discard’. Add the protocol version field to the capability information element in bits b8-b9. Add text ‘The protocol version field is defined in 7.2.1.1’.”

961 (Roberts, TR): Why two Frag fields ... start and end? Couldn't the fragmentation process be signified by setting a single bit? 0=not fragmentating and 1=fragmentating. Suggest accept in principle, “Using only one bit does not indicate which is the first or last fragement of the data packet. The combination of start, stop and sequence number allow the receiving MAC to correctly assemble or discard the packet.”

Withdrawn

806, 807 (Guenter, T): Clarify value of frag-start field for frames, which are not fragmented. Add additional text at the end of the first sentence e.g.: ...start of the current MSDU/MCDU, which consists of multiple fragments. Suggest accept in principle, “Change ‘current MSDU/MCDU’ to be ‘current MSDU/MCDU or MSDUs/MCDUs which are not fragemented.’”

Accept

1467 (Shvodian, TR): "The PNID remains constant during the current instantiation of the piconet and may be persistent for multiple sequential instantiations of the piconet by the same PNC." "May be persistent"? How is it determined if it is persistent? Up to the implenter? Do PNCs always use the same PNID? Need to describe the details of persistence of the PNID. Suggest ?

Table, WMS will propose a solution for the text.

1464 (Shvodian, T): Get rid of Delayed ACK. This will unnecessarily complicate the MAC to implement. We should keep a WPAN as simple as possible. Eliminate Delayed ACK. Suggest reject “The use of delayed ACK greatly increase the throughput, particularly at higher data rates. Because of this, the task group feels that the added complexity is justified by the increased throughput.”

Table, WMS to propose a recommendation.

3.3 Schaumburg items, 26 Tuesday, 2002

1602 (Shvodian, TR), 414 (Gilb, T): aProbeResponseDelay of 8 ms is too short. Should be at least 2 superframe durations. But, responding DEV may have no channel time. (Gilb suggested setting it to at least aMaxSuperframeDuration.) Suggest accept in principle, “Change aProbeResponseDelay from 8 ms to 2*aMaxSuperframeDuration.” Alternative suggestion, “Change all ‘aProbeResponseDelay’ references to be ‘2 times the current superframe duration’. Since this is no longer a constant, remove aProbeResponseDelay from the table 73, page 173, sub-clause 8.16.” Suggest first option, not the second one.

Accept second option, Change all ‘aProbeResponseDelay’ references to be ‘2 times the current superframe duration’. Since this is no longer a constant, remove aProbeResponseDelay from the table 73, page 173, sub-clause 8.16.”

1303 (Shvodian, T): Max window size should be an integer number of superframes, not ms. Change max window size to be an integer number of superframes. Suggest accept in principle, “Change the sentence to read ‘The measurement window size is the number of superframes during which the measurements were carried out.’”

Accept

1049 (Roberts, TR), 1304 (Shvodian, T): Question to PHY subcommittee about which directed frames should be counted. Is it that we should only count frames from the probe response source? (Shvodian) Should specify that the frame counts was for frames received from the destination of the command. Modify the sentence as follows "by the sender of this command from the destianation of this command." Suggest accept in principle, “Change ‘Only the directed frames intended for this DEV are included.’ to be ‘Only the directed frames transmitted by the destination of this command intended for the sender of this command are included.’”

Accept

1305 (Shvodian, T): Specify that the frames received in error were from the destination of this command. Modify the sentence as follows: "The RX error frames count is the total number of frames, not including Imm-ACK frames, that were received in error by the sender of this command from the destination of this command." Suggest accept.

Accept

1306, 1307, 1308 (Shvodian, T): This paragraph is inconsistent. First it says the frame loss count is frames that were not successfully received on their first attempt. Then it says that missing frames (a gap in sequence number) is the way that lost frames are determined. However, successful retries will not show up as a gap in sequence number. Then it says that frames with retry bit set are not included in the calculation. Redo this paragraph and remove inconsistencies so that we have a solid definition of what frame loss count means.

Suppose there are two DEVs, the sending and the destination (relative to this command). For Imm-ACK, Del-ACK or Implied ACK, the destination DEV knows how many frames it had to retry. Only in the case of no-ACK can the sending DEV shed light on which frames were lost. Therefore this parameter should only apply to streams that are sent with no-ACK set. Suggest accept in principle, “Replace the paragraph ‘The RX frame loss count ... by the destination DEV.’ with

> ‘The RX frames loss count is the number of frames in streams with no-ACK policy, not including Imm-ACK frames, that were determined by the sender of the command to have been lost. The sending DEV determines this for a particular stream index by observing gaps in the sequence numbers of received frames. These numbers are accumulated for all streams between the sending DEV and the destination DEV and sent as RX frame loss count.’
>
> Also, change the nomenclature in this section such that the ‘sender’ is the ‘originator’ and the ‘destination’ is the ‘target’ and add text that describes this to the conventions part, 7.1, of this clause.”

Accept

1302 (Shvodian, TR): The Channel Status request command should specify a window size, not leave it up to the responer. Add channel status request window field and the appropriate descriptive text. Suggest accept in principle, “Accept as in the resolution of comment 1438.”

Resolution to 1438: “Add a sentence to 8.12 that says ‘Every DEV shall maintain channel statistics for a window size of at least the current superframe duration.’ Having the requesting DEV specify a window size will either introduce delay in the response of the channel status request command or would require every DEV to keep a detailed history rather than simply a running count. While there are reasons why the requesting DEV might wish to specify the measurement window, the committee feels that the corresponding delay or added complexity to every DEV would be too much.”

Accept

1108 (Roberts, TR): When a DEV who wants to use EPS (the slave) asks the PNC to form an EPS set with a particular DEV who will be the "master", how does the "master" DEV get informed that he is now member of an EPS master/slave set? I'm having trouble following how all this works so I need the power management folks to help me on this one. Refer to power management folks. Suggest accept in principle, “The references to master and slave will be removed from the draft (currently, they only appear in clause B). Other DEVs learn about membership in EPS (now SPS) sets via an SPS inquiry command.”

Accept

1169 (Roberts, T), 347 (Gilb, T): In the sentence at line 41, a statement is made "When an EPS set is confirmed as created ...". Add in this sentence reference to the clause in the text which describes how EPS sets are created. I need help from the power management folk on this one. Suggest accept 347, accept 1169 in principle, “This sentence provides a redundant description of the functional behavior of the EPS (now SPS) mode. Delete the sentence ‘When an EPS set ... for an EPS set.’ as indicated in the resolution of comment 347. The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1056 (Roberts, T): Better terminology. Instead of saying "place in set" how about instead "add to set". Make a universal replacement. Suggest accept.

Accept

1312 (Shvodian, TR): Need to describe what each of these action types do and when they are used. Need to describe what each of these action types do and when they are used. Suggest accept in principle, “Add a sentence following ‘... for certain action types.’ that is ‘The usage of the action types is described in xref 8.13.3.3.’ The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1314 (Shvodian, TR): "The EPS set value is a octet that is assigned by the PNC to a group of DEVs that share the same EPSTime and EPSNext." Are all DEVs with the same EPSTime and EPSNext in a single EPS set? This needs to be fully clarified. Suggest accept in principle, “Yes, all DEVs that share the same EPSTime and EPSNext are synchronized in their wakeup cycle and so are part of the same EPS (now SPS) set. Add a cross reference to clause 8.13.3 to the end of the sentence, i.e. ‘... that share the same EPSTime and EPSNext, xref 8.13.3.’”

Accept

1316 (Shvodian, TR): This is all but unreadable: "Since the wake time is bounded by superframe beacon location, the beacon start point immediately preceding the completion of EPSTime shall be the wake point." Replace with: "The wake point is the start of the beacon immediately preceding the completion of

EPSTime." I am putting this as a TR because I honestly don't know what was meant by the original sentence and I want to make sure I am not changing the meaning. Suggest accept.

Accept in principle, “The concept of EPSTime has been replaced with SPS Next and SPS Interval and does not require this definition anymore.”

1317 (Shvodian, TR): "For this command, the value of EPSNext is taken from the EPSSync parameter in the MLME-POWERMGT.request primitive." EPSSync is a boolean value. How can the 2 Octet EPSNext be taken from a boolean parameter? The authors need to explain this. Suggest accept in principle, “Most of the description is applicable to the MLME actions rather than the frame formats. Delete the sentences ‘For this command ... building the EPS action request command.’ As indicated in the resolution of comment 1318, the MLME's for power management will be separated into command that reflect the frame formats using the new compromise proposal with the reduced number of commands.”

Accept

1061 (Roberts, T): Rewrite sentence as shown below: ‘The current beacon number, as received by the DME, is used to calculate the beacon number for the next EPSTime event; that is, it is inserted into EPSNext field of the EPS action request command.’ Suggest accept in principle, ‘This sentence has been deleted from clause 7 in the resoluton of comment 1317. However, this description is appropriate for clause 6 and will be added to the new MLMEs in that clause. As indicated in the resolution of comment 1318, the MLME's for power management will be separated into command that reflect the frame formats using the new compromise proposal with the reduced number of commands.”

Accept

1060 (Roberts, TR): Reference to SME, Change to DME. Suggest accept.

Accept

348 (Gilb, T): Again, there is a redundant and evil inclusion of functional description in the frame formats clause. Delete the sentence "When an EPS set is confirmed ... for that EPS set." Suggest accept.

Accept

349 (Gilb, T): The sentences "Each DEV in the piconet using either EPS or RPS modes ... as is the priority information." adds no useful information about the frame format. The first sentence is incomplete and is a functional definition that is already in clause 8. (redundancy = evil) The fact that mode and priority are provided is obvious from the frame format. Delete the two sentences. Suggest accept.

Accept

1319 (Shvodian, TR): Why should a device have to notify the PNC that it is going to be using RPS mode? RPS just says that you can save power by not listening to GTS slots that are not assigned to you. You will never send or receive frames in a slot that is not assigned to you, so why does the PNC need to know that you won't be listening. Having RPS mode is an unnecessary complication of this protocol. Remove the reference to RPS mode. Suggest accept, “See also the resolution of comment 1172.”

Accept

1170 (Roberts, TR): Add a 9th action type value. In table 67, add 9th action type value ... Power Saving Modes Not Supported ... 9. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes. The compromise included the requirement

that every AC capable DEV support at least one EPS (now SPS) set. When the PNC has reached its limit of SPS sets, it would return action type 7."

Accept

350 (Gilb, T): The DEV to PNC PS command shall only be sent by associated devices and therefore shall not be sent during the association process. Heck, it can't be sent before the DEV is associated since it doesn't know its AD-AD yet. Change the sentence "The command ... requirements change" to be "The command may be repeated while a DEV is associated in the piconet if the DEV requirements change." Suggest accept

Accept

1171 (Roberts, TR): Add to the exisiting sentence ending at line 23 the following: If the EPS action response type is #9 (power savings mode not supported) then the DEV to PNC PS information command shall not be sent by a DEV. Suggest reject, "The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes. The compromise included the requirement that every AC capable DEV support at least one EPS (now SPS) set."

Accept

1321 (Shvodian, TR): Why is PowerManagementMode of 1 (rps) allowed but mode 0 (PM_Off) not allowed? What will RPS do with EPS actions? Explain why an rps device would send an EPS action, but not a PM_OFF device. Suggest accept in principle, "The RPS mode will be deleted and therefore the Power-ManagementMode field is unnecessary and will be deleted as well. There is no mode 0 since the command is only sent by DEVs that support PM, either what is now called APS or SPS. The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes."

Accept

1322 (Shvodian, TR): Use of PowerManagementPriority to specify power sensitivity is open to abuse by manufacturers and should be eliminated. Remove PowerManagementPriority completely. Suggest accept, "With the deletion of RPS and the PowerManagementMode field, this implies that the entire DEV to PNC PS information command will be deleted as well."

Accept, additionally, "Remove the PowerManagementPriority fields entirely from the draft, note that this changes the resolution of 1402."

31 (Bain, T): There is a possible authentication question with EPS and switch to ACTIVE mode or EPS mode commands. The use of these commands requires agreements between peers (after association and authentication). There may be an opportunity for an unauthorized DEV to control another DEVs power use. Sending DEVs are normally responsible for the mode shift to have the destination DEV react to changes in data transmission flow that the destination is not directly aware of. I am not clear on the security mecha-nisms to understand if this is an issue or not. This may be as simple as adding a note in this subclause that the destination DEV may reject the operation if not setup in a stream managment command sequence. The offended DEV would then send a switch command to the PNC to let the PNC and other network DEVs know its correct state. The intent is to not burden the PNC with filtering unless this is a simple fit into existing PNC filtering operations (e.g., CTRs are not processed unless they match to an existing stream setup). If this is simple then the PNC should reject the operation. Suggest accept in principle, "Add text to clause 8.13 that says that if a DEV is awakened when it wanted to sleep, it just sends the appropriate go to sleep command to the PNC, in essence it hits the snooze button."

Accept

1067, 1074, 1075, 1078, 1081, 1087, 1092, 1093 (Roberts, T): provide command number. (this is the explict vs. table command type discussion, I just missed this one). Suggest reject, “The comamnd types are uniquely defined in table 65 for all of the commands. Repeating that definition in the sub-clauses would have the effect of defining the same thing in two different places. Besides the fact that this keeps the technical editor up at nights worrying about this, it makes the standard difficult to maintain and leads to errors in the assignment of the numbers when the order and number of information elements is changed. The current table has been set up so that both the command name and sub-clause update automatically to ensure a 1-1 correspondence between the sub-clauses and the summary table to prevent potential errors.”

Approve resolution.

351 (Gilb, T): The structure of the command is not stated in formal language (missed in the last update). Change the sentences "The structure of the ... DEV. The use is to instruct" to be "The switch to EPS CTA mode command shall be formatted as illustrated in Figure 60. The command is used to instruct" Suggest accept.

Approve resolution

352 (Gilb, T) A DEV should not be able to force other DEVs to sleep. Thus, the swich to EPS CTA should only apply to the DEV that is sending the command. The PNC already knows which CTAs to change from the information that was given when the CTAs were set up. Delete the sentences "Additional destination... for self sleep only." Delete the field "Destination DEV addresses" from the figure and change the command length to 0. Delete the sentence "The destination DEV ... to EPS mode." on line 30. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1066 (Roberts, T): Reference to "self wake". Power management committee needs to supply definition of what a "self wake" is ... I don't understand what is being implied here. Suggest accept in principle, “Change the text ‘for self wake only’ to be ‘to switch only itself to the AWAKE mode.”

Accept

1349 (Schrader, T): This applies also to 7.5.7.4., p126, line 3. The use of the Destination DEV address is not arbitrary and should be indicated. A DEV issuing a Switch to EPS (ACTIVE) mode command shall only use the Destination DEV Address if the Destination DEV and the issuing DEV agree amoung themselves that this is allowed. The mechanism for this negotiation is beyond the scope of this standard. Otherwise a DEV shall issue the command without any Destination DEV addresses indicating that only its own mode will change. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept in principle, “A DEV shall only switch itself to AWAKE or EPS (now SPS) mode as indicated in the resolution of other comments.”

1069 (Roberts, T): Clairfication of self sleep. Ask power management guys what self sleep is ... I don't understand. Suggest accept in principle, “Change ‘for self sleep only.’ to be ‘to indicate that only the sending DEV is entering SPS mode.”

Accept

353 (Gilb, T): The command format is specified in formal language (missed in the last round of updates). Change "The structure ... as illustrated in Figure 61." to "The momentary EPS CTA command shall be formatted as illustrated in Figure 61." Suggest accept.

Accept

1071 (Roberts, TR): The sentence says that the EPS CTR is contained within the EPS CTA. The EPS CTR is NOT contained within the EPS CTA. Clarify what is intended here. (power management subcommittee). Suggest accept in principle. “Most of this paragraph provides a redundant description of the functionality of this command rather than its format. Replace the sentences ‘This command instructs ... the EPS CTR for that DEV.’ with ‘This command is used by a DEV to request that the PNC allocate a previously requested GTS for only one superframe, xref 8.13.3’. However, this command may be deleted due to the compromise solution for power management. The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1072 (Roberts, TR): The sentence beginning with "If the wake beacon ..." is poorly written and I don't understand. Please have power management subcommittee rewrite the sentence to clarify the text. Suggest accept in principle, “Resolve as indicated in the resolution of comment 1071.”

Accept

697 (Heberling, TR): Clauses 7.5.8 through 7.5.8.3 do not belong in the MAC command frame format section of this document. These clauses would be better served being defined as control plane frame formats for the convergence layer defined in the Annex. The data to be requested is better served being passed as a unit-data payload than as part of a MAC command frame. See document 01469r3 for details regarding resolution to this comment. Suggest reject, “This command has been changed to focus on distributing information about the DEVs in the piconet and their capabilities. Thus, the modified commands and their focus belong in this section rather than a convergence layer.”

Accept in principle, “The purpose of clause 7.5.8.1 and 7.5.8.2 has been changed to distributing PNC address and ID mapping as well as the capabilities. Since the CTRBs have been removed, it isn’t necessary to move these clauses to the control plane frame formats. Subclause 7.5.8.3 will be deleted.”

684 (Heberling, T): The text between lines 50 and 51 is incorrect. Please change the text between lines 50 and 51 to: "This group of commands is used to request information from the PNC or to enable the PNC to respond with information it uses to manage the piconet." Suggest accept in principle, “Change the sentence to: ‘This group of commands is used to request from the PNC and provide to the DEVs information about any or all of the currently associated DEVs.”

Accept

1122 (Schrader, T): The current text allows for changing an ACTIVE CTA to an EPS CTA or vice versa. This should not be allowed to simplify the PNC. Add the following text after the end of the sentence: A channel time request for an exitsting stream shall not change an ACTIVE CTA to an EPS CTA, nor vice versa. A channel time request for an existing stream may modify the persistence of an ACTIVE CTA. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

358 (Gilb, T): The frame format description contains a redundant (evil) functional description. Delete the sentence "The PNC shall create and retain this EPS CTR based on this request." Suggest accept.

Accept

359 (Gilb, T): Need to add clarification for the stream index setting when this command is used to allocate a non-stream CTA. After the paragraph that ends "This field is defined in 7.2.4." add the following: "For a new channel time request, the stream index shall be 0x00 for this command. All time requests that are for non-zero stream indices use the stream management command, 7.5.10.3, to initiate the request." Suggest accept.

Accept in principle, “The stream management/CTR relationship is fixed in 01/469r3.”

1090 (Roberts, TR): The line on 26 seems to indicate that the CTRB type field indicates a request for the EPS mode; however, in the paragraph starting at line 8 we saw that a device in EPS could have CTRB=0 or 1 ... so how can the CTRB field alone indicate the EPS mode? Have power management subcommittee clarify line 26. Suggest accept in principle, “The CTRB type value of 2 (see lines 14) is used to indicate that this is for an EPS channel time request. However, the usage of the CTRB type may change based on the compromise adopted for power management. The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1345 (Schrader, T): "A zero value is not allowed ... to be ignored by the recipient" is not correct. A requested edit did not make this draft. Delete the sentence and add the following replacement: A zero value shall be treated as "never", which will have the effect that the only EPS CTA elements generated by the PNC will be the result of the EPS DEV sending a Momentary EPS CTA command. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

Accept

1091 (Roberts, T): Restructure sentence assuming the technical comment is correct. It appears thta CTRB=0 indicates the active mode ... is this correct? If so then rewrite the sentence of line 31 as If the CTRB type field is zero, the allocation period is for an ACTIVE ... (i.e. delete the word "otherwise"). Suggest accept, “In addtition, the power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes. This may have an impact on the format of the channel time request command.”

Accept

1088 (Roberts, T): Poor sentence structure. There is something wrong at the end of the sentence that lies between lines 8 and 12. Since I'm having trouble understanding the EPS mode I don't want to guess at the fix. Have the power management subgroup fix this sentence. Suggest accept in principle, “Change the paragraph to read as follows:

‘The difference between using a 0 and a 1 CTRB type is the persistence of the CTR. A value of 0 indicates that the PNC will delete the CTR and de-allocate the associated channel time when the DEV switches to EPS mode from ACTIVE mode, and a 1 indicates that the PNC shall retain the CTR, and if possible, return the channel time to the DEV when the device returns to ACTIVE mode from EPS mode.’”

Accept in principle, “This functionality has been been removed in the compromise proposal and so the CTR will not use the 0/1 of CTRB type.”

1347 (Schrader, T): Incorrect term used. Change: "...start time of next GTS" to ... superframe of next GTS. Suggest accept.

Accept

50 (Bain, T): I don't understand the use of the grant status field format. Isn't the SFNext a short form of the next beacon that an EPS DEV will wake on? It would seem that what we want in Figure 74 is the start time of the adjacent GTS as the text in line 31 states. Change from SFNext to adjacent GTS start time in Figure 74 and then use adjacent GTS start time instead of SFNext on line 31. Suggest reject, "The start time of the next GTS is not necessary, the duration of the GTS is now in the CTA. The SFNext indicates the next superframe in which the DEV will have a GTS allocated."

Accept

1100 (Roberts, T): Reference to sub-clause 8.2.7, Should be sub-clause 8.2.4. Suggest accept.

Accept

1101 (Roberts, T): Wrong sub-clause reference. Reference to 8.6 but should be 8.4? Have MAC people verify. Suggest accept in principle, "The access methods are described in 8.4, but the channel time requests are defined in 8.6, so the cross-reference is correct in this instance."

Accept

1102 (Roberts, T): Add some words to exclude open scan mode ... as shown below. 'While searching, and not in open scan mode, if the DEV receives ...' (the reason is we need to prevent our equipment from joining the neighbors piconet). Suggest accept.

Accept

1104 (Roberts, T): Need to add two acronyms to clause 4, 1. PSRC 2. PSAVE. Suggest accept.

Accept

175 (DuVal, T): Diagram hard to read. Where are the terms aMinHandOvrTo, aMaxHandOvrTo, aCHFrameRepeat and aBroadcastDEVInfoDuration in this diagram? I would like to see their timing relationships. Suggest accept in principle, "aMinHandOvrTo and aMaxHandOvrTo are not timing parameters but rather are limits on the timing paramters and so would not be useful in the diagram. Likewise, aCHFrameRepeat does not display well on a message sequence chart since it indicates a repetition of the broadcast. The text states that aBroadcastDEVInfoDuration does not apply to Figure 79, rather it is for another process. This sentence (lines 7-8 on page 141, 8.2.4, have been removed as a part of the resolution of another comment. However, the diagram is difficult to read and will be deleted and replaced with a cross reference to where the MSC will appear in clause 6. This MSC does show where aCHFrameRepeat is used. The MSC was adopted as a part of the resolution of another comment."

Accept

1105 (Roberts, TR): line 17 (going into line 18) refers to a table in clause 7.5.8. There is no table in clause 7.5.8. MAC folks ... where is this table? Suggest accept in principle, "Change 'capabilities information in the DEV info table 7.5.8, with the ...' to '... the capability information of the DEVs in the piconet with the ...'"

Accept

1123 (Roberts, TR): Line 20 refers to aMinHandOvrTO. I don't understand why we need a aMinHandOvrTO ... have MAC folks verify it is needed. If not then delete. Suggest accept in principle, "The aMinHandOvrTO is to allow enough time for the PNC to communicate the required information to the new PNC before the handover is expected. Thus this parameter is required."

Accept

1124 (Roberts, TR): In line 21 we have a parameter aMaxHandOvrTO. Question is what happens if aMaxHandOverTO occurs. Refer to the clause in the text where the next action is indicated after a time out. MAC folks. Suggest accept in principle, “The aMaxHandOvrTO is only a limit for the number that is passed in the PNC handover command, it does not directly affect the timing of the actions on the piconet.”

Accept

734 (Huang, T): As stream transmission need not be inturrpted during coordinator handover, it would be useful to add that the PNID remains the same. Insert text ', using the original PNID,' between the words 'beacon at'. Suggest accept.

Accept

364 (Gilb, T): Change "The new PNC shall begin using address of 0x00 for all" to be "Following its first beacon, the new PNC shall use the PNC address, 7.2.3, for all". Suggest accept.

Accept in principle, “Change ‘The new PNC shall begin using address of 0x00 for all’ to be ‘Following its first beacon, the new PNC shall use the PNC ID, 7.2.3, for all’”

857 (Roberts, T): Unclear sentence structure ... not sure what is the correct definition. Have power management sub-group rewrite this sentence. Suggest accept in principle, “Change the definition to be ‘awake mode: A power management mode in which a device that is using synchronous power save is communicating during the superfame.”

Accept

859 (Roberts, T): Definition for enhanced power save seems incomplete. Does differentiate EPS from RPS. Have power management sub-group clarify the definition. Suggest accept in principle, “Add the definition ‘synchronous power save: A colaborative power management mode in which multiple devices wake up periodically on the same beacon in order to communicate.’ also add this definition, ‘asynchronous power save: A power management mode in which a single device independently goes to sleep for multiple superframes.’”

Accept

3.3.1 Resolution by email

Email from Gregg Rasor.

1832 (Rasor, TR), 1803 (Rasor, TR): PSM and PNC as separate entities: Suggest reject, reason as follows: "The task group previously considered this option and instead chose to co-locate the PSM and PNC. The main reason for requiring the PNC to also be the PSM is to prevent having two points of failure in the piconet. If the PSM and PNC reside in separate DEVs, then all of the DEVs in the piconet need to be able to hear both DEVs rather than just the PNC. With the current architecture, the piconet is defined as all devices that are able to hear the PNC. Another reason for co-locating the two functions is that it reduces the communications overhead and complexity of the security suite."

For purposes of advancing D10, I withdraw TR without explanation (kind of).

The scenario suggested above is defective and too simplistic when considering a completely distributed security and trust model. Reference 02114r2P802-15_TG3-MAC-Distributed-Security-Proposal.ppt which deals with each DEV establishing trust independently, thus lowering the probability of a security failure at the PNC by requiring each DEV to maintain their own security information.

1837 (Rasor, TR): Security and communication with child and neighbor piconets. Suggest accept in principle. "The draft already states (see 8.2.5 and 8.2.6) that the child and neighbor piconets are autonomous and do not share authentication or security. Add a note to the end of the first paragraph in 10.2 that says 'These requirements apply only to the piconet and are not transferred to child or neighbor piconets, which have distinct security requirements.'"

Accept in principle.

1817 (Rasor, TR): Specify what happens when group structure and role change simultaneously. Suggest accept in principle. "Add the following sentence after the enumerated points in 10.3.3.1 'Simultaneous changes of the group structure and of the role are conceptually thought of as taking place sequentially."

Accept in principle.

1821 (Rasor, TR), 1829 (Rasor, TR): Should changing the PNC require re-authentication (note that this does change the PSM): Suggest accept in principle, reason "The requirement for re-authentication when the PNC handover occurs will be specified by the security suite implementation. The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory security suite for DEVs that implement security. Changes to the current description will be made when the security suite is selected."

Accept in principle.

3.3.2 Schaumburg, Wednesday, 27 February, 2002

526 (Gubbi, TR): The complexity of power management has crept into frame formats of channel time grant and stream management also. The PNC must strive to rx and set these values appropriately for all different combinations, while the DEVs strive to produce/consume those bits and act appropriately. Why? Why not a simple mechanism of one command exchange between DEV and PNC to tell whether a DEV is planning to go to sleep? I don't see any justification for this complexity all around the spec for power management. Remove Grant-status(s) from figure-73, remove figure 74 and all references to those fields from the draft. Remove GTS type from figure-76 and all references to that field from the draft. Suggest accept in principle, “The grant status field is used for non-power management functionality, and so it will not be deleted. However, the SFNext field of the grant status is not required and accidently slipped in. Thus it will be deleted from the grant status field. GTS type is required for pseudo static GTS slots, it is not related to power management and so it will not be deleted.”

Accept

1657 (Shvodian, TR): Can the PNC negotiate EPSTime and EPS N. IF not, and all EPS sets choose a different EPSTime, periodically they will all occur on the same beacon and may use a tremendous amount of channel time. Address what happens when all EPS Wake beacons happen together.

Part of the resolution is requiring the SPS interval is a power of 2. EPSTime is not negotiable, it is set only by the requesting DEV.
Accept in principle, “Resolve as indicated in 02/100r3 and 02/115r1, 02/118r0.”

1313 (Shvodian, TR): How does a DEV know what EPS sets are out there and which to join? Proponets of this power management scheme need to specify how a device knows what ESP sets are out there, who the members are so it can decide which to join.

Accept in principle, “DEVs in the piconet will get information about the SPS sets and their membership using the SPS inquiry command, which is going to be added as a part of the power management

compromise. The text will appear in 02/118r0. See also the resolution of comment 1108." WMS has not yet accepted this resolution as of 26 Feb. 2002.
WMS accept resolution on 27 Feb. 2002.

1125, 1234, 1244 (Roberts, TR): Should changing the PNC require re-authentication (note that this does change the PSM): Suggest accept in principle. "The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security. The security frame work and security suite adopted by the TG will determine if changing the PNC requires re-authentication." For 1244, add the following reason to the above, "In all scenarios, the security manager, which is co-located with the PNC, shall update the list of authenticated piconet DEVs to exclude the disassociating DEV."

Accept

1468 (Roberts, T): Not sure why 3 addresses are reserved for neighbor piconets. Why 3? Is that enough? Describe the benefit of using a reserved address, or else just use the capability field for a DEV to indicate a neighbor piconet? Suggest accept in principle, "The neighbor piconet uses a reserved ID to clearly indicate that communication to or from this ID is not allowed (with the exception of CTR and association commands.) While this could be done in the capability field, the committee felt that maintaining the distinction in the ID field would be better. Each neighbor piconet that the PNC allows takes up the limited channel time. 3 neighbor piconets implies that there are 4 networks co-located on the channel sharing the time. Without the overhead of the beacon, this reduces the overall throughput to 25% of the maximum. The committee feels that allowing more than 3 neighbor piconets would not make sense."

Accept 1468 in principle, "Resolve as indicated in 963."

963 (Roberts, TR): There are only 3 addresses available for neighor piconets. Please increase the addresses available from 3 to 6 ... 4 on each side, 1 above and 1 below. Suggest reject, "Each neighbor piconet that the PNC allows takes up the limited channel time. 3 neighbor piconets implies that there are 4 networks co-located on the channel sharing the time. Without the overhead of the beacon, this reduces the overall throughput to 25% of the maximum. 6 neighbor piconets would imply 7 piconets sharing the channel, each with a maxium 14% of the channel time, not including overhead for the beacon. The committee feels that allowing more than 3 neighbor piconets would not make sense."

Accept 963 as the commenter has written.

808 (Guenter, T): There are address values for neighbor piconets, but not for child piconets. Add address values for child piconets, if required. Suggest accept in principle, "The PNC of a child piconet is a full member of the parent piconet and so it receives a regular DEV ID (was AD-AD) from the PNC. The PNC of a neighbor piconet, on the other hand, is not a full member of the parent piconet and its DEV ID (was AD-AD) indicates this difference."

Accept

307 (Gilb, T): Add requirement for formatting. Change "... and priority." to be "... and priority and shall be formatted as illustrated in Fig. 13." Suggest accept.

Accept in principle "Change 'This field ... and priority.' to be 'The stream control field shall be formatted as illustrated in Fig. 13.'"

962 (Roberts, TR): Lack reference to information on encryption key. Please provide reference for the following sentence fragment "currently assigned data encryption key" where in clause 10 is this data contained? If not present it needs to be added. Suggest accept in principle, "The 802.15.3 committee is going to issue a CFP, evaluate and choose a mandatory cipher suite for DEVs that implement security."

Accept

1469 (Shvodian, T): Do we really need a 16 bit sequence number? If we eliminate delayed ACK, we can probably get away with a 4 bit sequence number. Reduce sequence number to 4 bits if we eliminate delayed ACK. Suggest reject, “Even if we delete delayed ACK, no ACK requires the sequence number. 4 bits is probably too few (16 in the sequence), 8 bits (256 in the sequence) would likely be the minimum that would be required and it would at least end on an octet boundary. The 16 bit (65536 in the sequence) allows a long time before a DEV could perceive that it received a packet out of order.”

Accept (the comment is rejected).

1470 (Shvodian, T): Is the same sequence number counter used for asynchronlous data to all destinations? If so, this will mess up the Rx frame loss counter in channel status response. If a separate counter is needed it will complicate implementations. Specify that a single counter is used for all frames and that the Rx frame loss counter may not be accurate for asynchronous frames. Suggest accept in principle, “Add to the end of the paragraph on page 97, line 16, that ends ‘... with that stream index.’ this sentence ‘Since all asynchronous data use the same stream index, they also share the same sequence counter.’ Change the text that is the result of the in the resolution of 1306, 1307 and 1308 to read

> The RX frames loss count is the number of frames in streams with no-ACK policy, not including Imm-ACK frames and streams with stream index zero, that were determined by the sender of the command to have been lost. The sending DEV determines this for a particular stream index by observing gaps in the sequence numbers of received frames. These numbers are accumulated for all streams between the sending DEV and the destination DEV and sent as RX frame loss count.’”

Accept

1471 (Shvodian, T): Need to clarify that the MAC ignores the HCS. Add the following sentence "The MAC always ignores the HCS field upon reception." Suggest accept in principle, “Add the following sentence, ‘Since the PHY checks the HCS, the MAC shall ignore the HCS field upon reception.”

Accept

1474 (Shvodian, T), 311 (Gilb, T): Need to add DEV GTS Status in table 60. This appears in every beacon. Add DEV GTS status to table 60. It appears in every beacon. It is described in 7.4.12 (Gilb) The channel time allocations are required in every beacon. Also, the DEV GTS status is not indicated as an allowed element in the beacon. Change "As needed" to "In every beacon" for channel time allocation in table 60. Also, add a row at the bottom of Table 60 that is "DEV GTS Status" "7.4.12" "Indicates if a DEV's GTSs have changed" "As needed". Suggest accept 311, accept in principle 1474, “Resolve as indicated in comment 311.”

> Accept 1474, 311 in principle, “Add a row at the bottom of Table 60 that is ‘DEV GTS Status’ ‘7.4.12’ ‘Indicates if a DEV's GTSs have changed’ ‘In every beacon’. Also, the DEV GTS status is not indicated as an allowed element in the beacon. Change ‘As needed’ to ‘In every beacon’ for channel time allocation in table 60. ”

310 (Gilb, T): Informal language. Also, shouldn't all implementations initiallize the the HCS remainder to the same number? Delete "As a typical implementation, " and change "division is preset" to be "division shall be preset" in line 1 and change "remainder is preset" to be "remainder shall be preset" in line 5. Suggest accept.

Accept.

157 (DuVal, T): "The information elements in the beacon frame may appear in any order in the beacon ..." - How do you know what you are looking at if they can appear in any order? Clarify meaning or method of information determination. Suggest accept in principle, “The elements of the beacon are information elements, described in each of the sub-clauses listed in table 60. All information elements are encoded in type, length, value (TLV) format and so they unambiguously indicate both what they are and how many octets they occupy. To clarify this, change ‘The individual information elements in the beacon frame are described in 7.4’ to be ‘The individual information elements in the beacon frame are encoded in type, length, value format and are defined in 7.4.”

Accept.

1473 (Shvodian, TR): Allowing information elements in any order in the beacon will complicate the design. CTAs should be the last IEs in the beacon. Change the sentence as follows: "The information elements in the beacon frame may appear in any order in the beacon, except that chanel time alocations (CTAs) appear last. DEVs may ignore any elements in the beacon which are not listed in Table 60." Suggest accept.

Accept in principle, “Change as indicated in the comment, additionally delete the sentence ‘All ASIEs shall be the last information elements in the beacon.’ on line 110, page 8.

158 (DuVal, T): "... DEVs may ignore any elements in the beacon that are not listed in Table 60." - then what are the optional elements that can be ignored. Please state them explicitly. Need a clear understanding of what is optional and what is mandatory. Suggest reject, “There are no optional elements defined in this version of the standard. However, a future revision of the standard may add additional elements to the beacon and we don’t want this to break backward compatibility. The text for this section is clear and unambiguous. The elements that may be ignored are any elements that are not listed. The list of elements that can be ignored includes all of the information elements listed in clause 7.4 but not listed in Table 60. However, that is not the entire list. It is not possible to list all elements that might be present in the beacon that the DEV is allowed to ignore because backward compatible revisions of this standard might place new information elements in the beacon that DEVs compliant to an older revision would not recognize and are allowed to ignore. Furthermore, keeping two lists, those that shall be decoded and those that may be decoded introduces another point of failure in the maintenance of the standard. Each new information element, even those that are not related to the beacon, would now have to be added to a table of elements that may be ignored as well as to the summary table in 7.4.”

Accept.

800 (Kinney, T): There is a possibility of duplicate network id's. A device will check to see if there are any similar ids but this search cannot be 100% sure, additionally, a PAN may walk into another's coverage area. I did not see any detection nor resolution of this event. Describe the techniques to detect network id duplication and the procedures to resolve it. Suggest accept in principle, “The beacons in any piconet are unique since they contain the PNCs address. However it is possible for a DEV to hear packets from adjacent piconets that are using the same PNID. Add to the end of the paragraph in subclause 8.2.2 the following sentence, ‘However, when a DEV starts a piconet, it shall not use a PNID that was found in the scan that was used to start the piconet.’”

Table, looking for additional suggestions from the committee.

Various clause 10 comments, “Due to the changes that will be made in the adoption of a security frame work and mandatory security suite, all of the text in clause 10 will be replaced by the text that is approved by the task group as the security framework and mandatory security suite.”

Accept the proposed resolution, all clause 10 T and TR commenters will need to be contacted to approve or reject the resolution.

297 (Gilb, T): The PNC selection process does not define a channel access method for the ACs that are broadcasting their messages. Change the text in 8.2.3 to require the ACs to use the backoff procedure defined in 8.4.2.1 for channel access during the PNC selection process. Suggest accept

Accept

722 (Heberling, T): The PNC handover process illustrated in this figure is poorly represented. The MLME-Handover message sequence chart in doc 01/410r1 provides a much clearer representation of the handover function. Suggest accept in principle, “Delete figure 79 and replace the reference to Figure 79 to a reference to the new MLME-Handover MSC, which was added as a resolution of comment 654.”

Accept

1530 (Shvodian, T): What happens when two piconets wander withing range of each other? They will not know that the other PNC is there. Need to have the PNCs do a periodic scan to look for traffic from other piconets including beacons in their channel. Suggest accept in principle, “Add the following sentence as the last paragraph in 8.2.1, ‘In addition to other methods that the PNC may use to find out that there are other piconets using the same channel, the PNC should periodically allocate the CFP such that there is quiet time for it to scan the channel for other piconets. If the PNC detects another piconet in the same channel it may take action to improve coexistence with the other piconet. Some of the actions the PNC may take include:

— Changing to a different channel
— Become a child or neighbor piconet of the other piconet
— Reduce the piconet’s transmit power’”

Accept

1128 (Roberts, TR): Wrong table reference. Should be Table 68, NOT table 79. Suggest accept.

Accept (note, the editor should make sure this is a real link and not static text, perhaps seach on the word table and figure.)

531 (Gubbi, TR): The restriction for forming child piconet is not clear, although it might have been the intent. Add "Only an AC that is associated to a PNC in an existing piconet shall form a child piconet" Suggest accept in principle, “Add the sentence to the beginning of the first paragraph of 8.2.5.”

Accept

176 (DuVal, T): I would like to see an example of the handover process in relationship to other traffic. This should provide a system overview of the timing. Provide new figure. Suggest accept in principle, “The new PNC handover MSC clearly shows the traffic relevant to the handover process. This MSC will be added as a resolution of comment 654.”

Accept

1126 (Roberts, TR): Line 7 refers to a "DEV information table" in clause 7.5.1.4 Clause 7.5.1.4 does not contain any tables. Where is the table located? Assign to MAC subcommittee. Suggest accept in principle, “This sentence has been deleted due to the modifications of the DEV info (now PNC info) command. See comment 1324.”

Accept

177 (DuVal, T): What is a directed frame? The allocated private GTS response? Need clarification. Suggest accept in principle, “Add a defintion to clause 3, ‘directed frame: A frame where the destination address or

ID is a single device as opposed to a frame where the destination address or ID is broadcast or multicast.' The term allocated private GTS response does not occur in either the text or the figures. However, the term allocated private GTS does occur in the text on page 141, line 28. Delete the word 'allocated' since it is redundant. GTSs only exist if they are allocated."

Accept

365 (Gilb, T): The directed frame with Private GTS is optional and should be noted as such in Figure 81. Add the word "Optional" to "Directed frame with Private GTS". Also, change the direction of the child beacon, it is not sent to the Parent PNC. Add to the paragraph ending "its capabilities and security policy." the following: "If the PNC allocates the private GTS, it may also send a directed channel time grant to the child PNC to confirm the allocation." Make the same changes with Figure 82. On page 142, 8.4.2, line 46, change "destination addresses. After receiving" to be "destination addresss. The PNC may also send a directed channel time grant to the neighbor PNC to confirm the allocation. After receiving" Suggest accept.

Table

532 (Gubbi, TR): The restriction on transactions with neighboring piconet is not clear, although it might have been the intent. Clearly list all the commands that can be exchanged between the parent and neighbor piconets and state that other commands and frame types shall not be exchanged between them. Suggest accept in principle, "Change 'and thus is ... the parent piconet beacon.' to be 'and shall only send the association request comamnd, the disassociation request command, the channel time request command or any required Imm-ACK frames in the parent piconet.'"

Accept

1129 (Roberts, T): It will help to clarify by adding the actual address. association address (0xFE), 7.2.3, as the ... Suggest reject, "The technical editor has established the policy of only defining items in one location. Using both the term 'association address' and the hex value '0xFE' together acts as another definition and leads to problems in maintaining the standard as well as creating possible sources of error."

Accept

1130 (Roberts, T): In the line straddling line number 39, we are instructed what the PNC is to do if the request is not accepted. MAC folks ... add a sentence to indicate what the neighbor is suppose to if the request is not accepted. Suggest accept in principle, "Add the sentence to the end of the paragraph on line 39, 'If the request was rejected, depending on the reason code, the neighbor AC may retry the request at a later time. If the reason code in the rejection indicates that neighbor piconets are not supported, then the neighbor AC should not retry the request while that DEV is PNC of the parent piconet."

Accept

1532 (Shvodian, T): In a neighbor piconet, how does the parent decide how much time to allocate to the neighbor? Does it have to allocate any? Need to figure out a policy for allocation bandwidth to neighbor piconets and how to enforce the rules. Suggest reject, "All decisions regarding channel time allocations are made in the DME which is outside of the scope of this standard."

Accept (comment 1532 is rejected as indicated).

182 (DuVal, T): If diagram is not wrong, paragraph is wrong. Make the two consistent. "... it is neither authenticated nor associated) ..." - but figure 82 shows an association sequence. Suggest accept in principle, on line 30, page 143, change 'neither authenticated nor associated' to be 'neither authenticated nor fully associated'"

Accept in principle, “Delete the parenthetical text, ‘(i.e. it is neither authenticated nor associated)’”

184 (DuVal, T): The section words do not indicate a SIFS time before an ACK. State what is intended consistently in words and figure. Suggest accept in principle, “Delete the ‘SIFS’ from two locations in Figure 83 since the SIFS is implied whenever an ACK is sent.”

Accept

1536 (Shvodian, T): Figure 83 shows a SIFS between Association reauest and ACK. Is this a time that is at least 1 SIFS, Less than 1 SIFS or equal to 1 SIFS /- some delta (like .11 does). In clause 11, SIFS may actually a range (aTXRXTurnAroundTime = between 10 and 11 us)??? This same comment applies to Figure 84. Decided exactly what 1 SIFS means and document it. I think it will be =1 SIFs +/- some delta. Suggest accept in principle, “The usage of the SIFS for ACKs is defined in 8.4.1 where it indicates that the response starts within a SIFS duration. The reference to the SIFS as a range in clause 11 was corrected in response to comment 1620. Delete the words ‘at the end of SIFS’ from three locations in Figure 84 since the SIFS is implied whenever an ACK is sent. Fix figure 83 as indicated in the resolution of comment 184.”

Accept

367 (Gilb, T): Need to clarify how the PNC acknowledges the association request commands. Change "an Imm-ACK frame." to be "an Imm-ACK frame with the DA set to the association address." Suggest accept.

Accept

183 (DuVal, T): You define what an associated response is not ... "directed frame". So what is an associated response? A broadcast frame? Please clarify. Suggest reject, “This is implied in the paragraph beginning on line 17 and is explicitly stated on line 24, ‘Since the association response is a broadcast command, ...’”

Accept in principle, “The association response command is not a directed frame as defined (now) in clause 3. However, the sentence on line 24 is incorrect, so delete ‘Since the association ... piconet, if needed.’

368 (Gilb, T): There is no exit criteria for the PNC in doing an association response and directed frame. Limit it to an integer number of attempts, I suggest 10. Change text from "the PNC shall repeat the sequence of association response and directed frame as illustrated in Figure 83." to be "the PNC shall repeat the sequence of association response and directed frame as illustrated in Figure 83 up to aMaxAssocRespRepeat times. If the PNC does not receive an ACK after aMaxAssocRespRepeat attempts, it shall consider the association process for the DEV to have failed." Add aMaxAssocRespRepeat to the table at the end of clause 8 with a value of 10. Suggest accept in principle, “The new association process uses a directed frame (the association request frame with source ID set to the new source ID) sent from the associating DEV to the PNC with an Imm-ACK from the PNC back to the DEV. Note that the DEV will retry the command according to the retry limit, although this is implicit in the text.”

Accept

1132 (Roberts, TR), 366 (Gilb, T): Need to indicate that the MTS can also be used for association. Modify as shown below. ... during the CAP or MTS of an existing piconet. (Gilb suggested resolution) Change "during the CAP of an existing piconet." to be "during the CAP or association MTS of an existing piconet." Suggest accept 366, accept 1132 in principle, “Resolve as indicated in comment 366.”

Accept

1628 (Shvodian, T): Need to add a text on how asynchronus data will be efficiently handled. Need to specify how asynchronous data will be handled in a scheme that is both power and bandwidth efficient.

Table, WMS to supply text by 10 March, 2002.

1539 (Shvodian, T): Should mention that the CAP is optional. Change sentence to say "The superframe is composed of three major parts: the beacon, the optional CAP and the CFP," Suggest accept.

Accept

535 (Gubbi, TR): Backoff or IFS for beacon transmission is not clear. Either Beacon tx should be after a small backoff or reasonably long IFS. Suggest accept in principle, “The new text added for guard time, see document 01/100r2, addresses the SIFS plus guard time required to ensure that all traffic has stopped when the beacon is scheduled to begin.”

Accept

1544 (Shvodian, TR): In clause 11 it says SIFS =aRXTXTurnAourndTime. Yet, aRXTXTurnAroundTime is a range of between 10 and 11 us. SIFS is never talked of as being a range in clasue 8. Should it be? Suggest accept in principle, “The SIFS is not supposed to be a range, that was a mistake in clause 11 that will be fixed in the resolution comment 1620. Thus clause 8 does not need to discuss it as a range.”

Accept

534 (Gubbi, TR): Clearly state the relation between SIFS and RIFS. Change "SIFS < RIFS" to "RIFS = SIFS + aBackoffSlot" change "actual values of IFSs are" to "actual value of aBackoffSlot is". Suggest accept in principle, “RIFS will be clearly defined in clause 11 as indicated in the resolution of comment 426.”

Accept 534 in principle, “Change ‘SIFS < RIFS’ to ‘RIFS = SIFS + aBackoffSlot’ change ‘actual values of IFSs are’ to ‘actual values of the SIFS and aBackoffSlot are’, withdraw 426.

1346 (Schrader, T): The text should elaborate on the Non-CAP case, especially with regards to processing time for the beacon. If the CAP is not present there must be a gap or unallocated time slot allocated to allow all deviecs to process the information in the beacon. If the amout time is not specified, a PNC may assign slots before a device can interpret its CTA. Indicate in the text that a minimum size CAP will be assigned even for the MTS only case, where the CAP will serve only as a gap between the Beacon and the GTS slots. Suggest accept in principle, “Indicate in the text that the PNC shall not allocate any time slots within aNew-Parameter time of the end of the beacon.”

Table

57 (Bain, T): In the absence of CAP, the first GTS is bumped against the end of the beacon. The development of real implementations of this standard may be hindered if the parsing of the beacon body must occur in the very few microseconds available. Provide guidance to implementers but also place a minimum time till the beginning of the first GTS in the absense of CAP. If a PNC to DEVs MTS is always present, then this would not be a problem. Suggest accept in principle, “Resolve as indicated in 1346.”

Table, proposals due by March 6.

1540 (Shvodian, T): Change "CAP is used for non-QoS frames." to "CAP can be used for non-QoS frames as regulated by the PNC." Change "CAP is used for" to "CAP can be used for". Suggest accept in principle, “Change ‘CAP is used for’ to be ‘CAP may be used for as regulated by the PNC.’”

Accept

1543 (Shvodian, T): Figure 84 says ACK at the END of a SIFS, but line 22 says "Both in the CAP and the CFP, a response frame (ACK) transmission over the medium shall start within a SIFS duration after the end

of the transmission of the previous frame for which the response is intended." Which is it? Does the ACK come before a SIFS or after a SIFS? Suggest accept in principle, “This is why it is not permissible to define the same thing in two place, the definitions will invariably get out of sync. The correct answer is that the ACK shall start a SIFS after the end of the transmission of the previous frame for which the response is intended. There is actually a small delta around when this happens, but it is not necessary to specify this, it can be deduced from the PHY parameters. Change ‘shall start within a SIFS duration’ to be ‘shall start a SIFS duration’.”

Accept

1110 (Roberts, TR): Both in the CAP and the CFP, a response frame (ACK) transmission over the medium shall start within a SIFS duration after the end of the transmission of the previous frame for which the response is intended. From table 76, the SIFS is between 10 uS and 11 uS. The above sentence from line 22 is not clear. Does it mean the ACK has to start between 10 uS to 11 uS after the previous frame - or - does it mean the ACK has to start <10 uS after the previous frame. If the meaning is the latter than this becomes the RX-to-TX turnaround time that should be used in clause 11.2.6.2. MAC & PHY committee to advise. Suggest accept in principle, “The SIFS definition has been changed to be a single number rather than a range in clause 11 as a resolution of comment 1620.”

Accept

1546 (Shvodian, TR): If each DEV is only alowed to transit one frame at a time during the CAP with backoff time applied to every frame, then what is the "CAP MaxBurstDuration" in 6.3.12.1 used for Get rid of CAP MaxBurstDuration in clause 6.3.12.1. Suggest accept.

Accept

1547 (Shvodian, TR): Transmtting station needs to allow for Guard Time. Change sentence to "If an Imm-ACK is expected for that frame, the remaining time in CAP needs to be large enough to accommodate the current frame, 2 SIFS periods and the Imm-ACK frame at the same PHY rate as the transmitted frame and the guard time. Suggest accept in principle, “Change as described in document 02/100r2.”

Accept

1134 (Roberts, TR): Line 52 refers to a "CAP mode field" that is in clause 7.4.2. There is not CAP mode field reference in clause 7.4.2. What is meant here? Refer to MAC folks. Suggest accept in principle, “The name of the field changed to piconet mode. Replace ‘CAP mode field’ with ‘piconet mode field’ everywhere it appears in the draft.”

Accept

369 (Gilb, T): bw_random(retry_count) is defined twice. Delete "-- bw_random(retry_count): A pseudorandom integer ... [0,backoff_windo(retry_count)]." Move the sentence "It is important that ... among DEVs." to the end of the previous paragraph.

Accept

1551 (Shvodian, TR): When is the retry counter decremented? Specify when retry counter is decremented. I think there is disagreement about this. Suggest accept in principle, “The retry_count is not decremented, it is simply used to choose the size of the window from which the random backoff number is selected. The retry counter is reset to 0 for the first attempt at transmitting any frame (see line 33, page 147). While there was some disagreement over this issue, the method used is acceptable and works fine for many traffic patterns. It may not be the optimal choice for some traffic patterns, but then no choice is optimal for all potential traffic patterns.”

Accept

1542 (Shvodian, TR): I provided 3 pages of text on Guard Times in document 01/439 that I thought we included in the draft. I don't know how it fell through the cracks. I think it was becasuse we decided to put slot duration back into the CTAs on a Con Call and no one ever updated the text. Add Guard Time Text from 01/439 after I update it to add slot durations back into the channel time request. Suggest accept in principle, “Add the guard time modifications and text from document 02/100r2.”

Accept

53 (Bain, T): maybe not the correct location but it seems that there should be mention that for pseudo-static, that the PNC shall not change the superframe duration while devices are presuming a location for their slot don't get confused. Add wording: The PNC shall not vary any paramters, such as superframe length, that would invalidate the pseudo-static GTS assigned to one or more DEVs in the piconet. Suggest accept.

Table, proposals due 6 March, 2002.

186 (DuVal, T): It is hard to know what this figure represents. Is there a legend on the shade meanings? Are TX and RX the same slots? What is the difference in each frame? Is it an advance of time? Clarify what the figure is showing. Suggest accept in principle, “Add a legend that defines ‘beacon’, ‘CAP’ and ‘unallocated time’ and ‘GTS’.”

Accept, WMS will update the table.

370 (Gilb, T): The sentence "In addition to this the PNC ... connection process." does not add any information to the present discussion. In addition, the PNC is supposed to make use of this, but we don't say how. For example, an implementation may use the information as an input to a PRNG to generate the slot assignments and still be considered conformant. Delete the sentence. Suggest accept.

Accept

371 (Gilb, T): The sentences "The slot assignments ... as described in 8.4.3.1" is a repeat of earlier requirements and so is an evil redundancy. Delete the sentences since this behavior has already been adequately defined. Suggest accept.

Accept

1555 (Shvodian, T): Need to be clear that a DEV that does not hear the Beacon cannot transmit during dynamic GTS, but it can still listen. Change the sentence as follows: "If a DEV did not receive the beacon, it shall not transmit in any dynamic GTSs during the CFP but it can still receive." Suggest accept in principle, “While it is true that it can recieve, it can also send Imm-ACKs since the sender allows time in the GTS for this response. However, other types of ACKs, i.e. Del-ACK and implied-ACK would not be allowed. Modify the text to be ‘If a DEV did not receive the beacon, it shall not transmit in any dynamic GTSs during the CFP but it may still receive frames and send Imm-ACKs, if requested.’”

Accept

372 (Gilb, T): The channel time grant does not enable a DEV to access its GTS if it loses the beacon. The previous paragraph clearly states that a DEV shall not access a dynamic GTS if it misses the beacon. Likewise, a psuedostatic GTS does not need a channel time grant to access its slot. All of the text in the draft makes the beacon the one authoritative indication of channel time allocation. Delete the entire paragraph. If we want to keep the usefulness of the channel time grant supplementing the beacon, then the text in other places needs to be modified to allow this. For example, this would require changes in the prior paragraph of

the sort: "did not receive the beacon, it shall not" changed to "did not receive either the beacon or a directed channel time grant command, it shall not" Suggest accept “Delete the paragraph, see also comment 1556.”

Accept

1556 (Shvodian, T): Remove this entire paragraph. The use of channel time grants for stations that cannot hear the NC well is no longer needed. It has been replaced by pseudostatic GTS slots. Remove the paragraph. Suggest accept, “See also comment 372.”

Accept

1136 (Roberts, T): Is believe that line 2 also needs to reference the MTS slot but I need the MAC folks to verify this. Should line 2 read ... ... DEV shall use only the CAP or MTS for sending ... (If this still is not correct then how do we fix this sentence?) Suggest accept in principle, “MTSs are only to convey commands to and from the PNC (hence the management part). A DEV in a non-CAP network would need to allocate a slot to send Del-ACK. So the sentence is correct as written.”

Accept in principle, “Add the following sentence to the end of the first paragraph on page 150, ‘In the case where there is no CAP in the superframe, the DEV shall request a GTS for the purpose of sending the Delayed ACK command.’”

1553 (Shvodian, TR): Using the CAP for delayed ACK is a bad idea. Should allocate a GTS. Always allocate a GTS for delayed ACK frames. Suggest reject, “Bill needs to tell us why this is a bad idea.”

Suggest accept in principle, “Add the sentence ‘While a DEV may use the CAP to send the delayed ACK command, the DEV should request a GTS so that the response will occur in a timely manner.’”

1557 (Shvodian, TR): Guard time is not mentioned here. We need to explicitly state how guard time is used or teh TDMA scheme will not work. Suggest accept in principle, “Add the guard time text from document 02/100r2.”

Accept

1558 (Shvodian, T): Private GTSs will always be pseudo-static. Change to "Private GTSWs will always be pseudo-static GTSs," Suggest accept with spelling correction and corrections for formal language, “Change to ‘Private GTSs shall always be pseudo-static GTSs.’”

Accept

55 (Bain, T): I will put the comment here but it may impact other clauses. If the CAP is reduced to zero length and MTS used in its place, some of the text that we still may have regarding use of the CAP for small amounts of data are not correct. Correct the data in a non-existant CAP issue in this clause with a note that in this case, data must be handled in GTS only. Suggest accept.

Accept

1348 (Schrader, T): There does not appear to be a guarantee that MTS only mode will have the same performance as a network with a CAP. Either a minimum latency in superframes must be specified or some equivalent to the CAP should be provided to insure that devices can communicate with the PNC in a timely fashion. Suggest reject, “It is not possible to guarantee anything in a wireless medium. The MTS only mode is not designed to provide equivalent peformance, but rather to deal with limitations inherent in some PHYs.”

Accept

537 (Gubbi, TR): What is the point in having slotted aloha access in addition to the backoff in CAP, TDMA in CFP? Why is this complexity being thrusted on the implementors of this "low cost", "low complexity" and "low power" standard? I don;t see any justification in having yet another access scheme with WPAN. Suggest reject, “Slotted Aloha was added to make the MAC more versatile so that more PHYs that could use the 802.15.3 MAC. While it could be added at a later date, that would make the MACs incompatible.”

Accept (resolution is to reject the comment)

56 (Bain, T): Is there a case where an open MTS is less than one per superframe? If so, is there appropriate wording to change the responsivness of the PNC to requests for change. I believe that up to 4 superframes may pass from CTR till CTA reflecting the change. The 4 superframe lag is long already. It should not go beyond that. put the appropriate SHALL to keep the lag from CTR (or Stream) till CTA from getting higher than 4 superframes when MTS is used. Suggest that Jay make a better suggestion.

Table, J. Bain to submit exact text to accomplish this for approval by the group.

373 (Gilb, T): Uplink MTS has not been defined. Change "uplink MTS within" to "MTS with the new DEVs AD-AD as the SA within". Else, define uplink and downlink MTSs where they are first referred to (i.e. around line 3 on page 151). Suggest accept in principle. “Add to clause 8.4.3.3, page 151, line 3, following the sentence ‘... plus MTSs for association.’ this sentence ‘An uplink MTS is one where the destination ID of the CTA is the PNC ID. A downlink MTS is one where the source ID of the CTA is the PNC ID.’”

Accept (or put at a nearby location of the editor’s choice.)

1138 (Roberts, T): The paragraph between lines 38 and 45 implies that the DEV knows where the MTS's are located by passive monitoring. Should this be explicitly stated? Suggest accept in principle, “The DEV knows exactly where all of the the MTSs are by listening to the beacon. This is implied when 8.4.3.3 says that MTSs are identical to GTSs.”

Accept

374 (Gilb, T): Should clarify what sort of RNG is to be used. Re-use the text from the backoff algorithm. Replace "While the random number generator is not specified, it is important" with "The method for choosing the random integer should be unique for each DEV and use the random number generator resident on the DEV. If the DEV does not possess a random number source, the random integer should be generated using its unique 48-bit device ID (and any other information that the implementer wishes to use) and a pseudo-random number generator (PRNG) such as MGF1 as defined in IEEE Std 1363-2000. Note that the current state of the PRNG should be maintained and subsequent backoffs should use subsequent bits in the pseudo-random sequence. It is important" Suggest accept.

Accept

375 (Gilb, T): The variable r_a is overloaded. It means both the random number that is to be counted up to as well as the current MTS count. Either use r for the count variable (i.e. r=1 rather than r_a=1 for the start and r=r_a for the access slot) or replace "r_a=1" with "1" Suggest accept, “Use r for the count variable (i.e. r=1 rather than r_a=1 for the start and r=r_a for the access slot).”

Accept

54 (Bain, T): Considering that the aMTSAssocPeriod is 0.6 milliseconds, there is a question that the sub 1 second begin scan to payload ready interval may be attained. The unspecified authentication must be considered as well as the extensive number of message exchanges necessary for the typical DEV to get ready to deliver payload. Understand the numbers and then set the aMTSAssocPeriod accordingly.

Table

536 (Gubbi, TR): If SA is broadcast and anybody could start tx, how's collision handled? What is the point in getting devices to collide here instead of making this MTS part of CAP and letting devices freely use CAP as already defined. This is useless and adds unnecessary complexity. Remove lines 8:22 on page 151 and all references to "MTS/GTS with BC/MC-SA" from the draft. Suggest reject, “The slotted aloha access method is used to provide access to these slots just as CSMA/CA is used in the CAP. The TG has decided to allow both access methods, CSMA/CA in the CAP and slotted aloha in the MTSs so that the 802.15.3 MAC is capable of supporting different types of PHYs.”

Accept

1139 (Roberts, T): Modify line 28 to reflect a tolerance and not an absolute. ... to be less than or equal to +-25 ppm. Suggest accept in principle, “On page 152, subclause 8.5.1, change the sentence ‘A compliant implementation ... to be +/- 25 ppm.’ to be ‘A compliant implementation shall maintain the accuracy of the timer to be less than or equal to aPHYClockAccuracy.’ Add ‘aPHYClockAccuracy’ to subclause 8.16 with a value of ‘PHY dependent, defined in 11.5.5 for the 2.4 GHz PHY’. In 11.5.5, change ‘... of 11 Mbaud +/- 25 ppm.’ to be ‘of ‘11 Mbaud +/- aPHYClockAccuracy. The clock accuracy, aPHYClockAccuracy, shall be be 25 ppm.”

Accept

1559 (Shvodian, TR): Devs are synchronized to the Beacon interval, not the PNC's clock. Change to "All DEVs within a single piconet shall be synchronized to the Beacon Interval." Suggest accept in principle, “Change ‘All DEVs ... the PNCs clock.’ to be ‘All DEVs within a single piconet shall be synchronized to the beacon of the piconet.’”

Accept

3.3.3 Power management (TBD date, tagged PM in database)

989 (Roberts, T): This paragraph references a field that contains "the least significant two octets of a beacon number". This paragraph is confusing. Power management subcomittee needs to clarify and provide adddi-tional references to other clauses. Suggest accept in principle, “The new SPS set (was EPS set) uses the parameter ‘next WAKE beacon’ instead of SFNext. The new parameter is defined to be the next beacon number when the DEVs which are members of the set will be listening to the beacon.”

Accept

543 (Gubbi, TR): This clause is a standing proof for the complexity of EPS. EPS is affecting control of net-work, quality of service for all DEVs, adding significant overhead through transactions related to EPS states and most importantly making PNC implementation very complex and an high-cost one. Transactions listed in figure-94, 95 and 96 provide this picture, although not completely. Then there are combinations of EPS devices and additional traffic to EPS devs and exception conditions described in 8.13.3.8, 9 and 10 which further complicate the management of these EPS devices After all this complexity, 1. There is no mechanism described for BC/MC traffic from an RPS/EPS device to another EPS device is handled? 2. There is no mechanism described for isoch or asynch traffic flow from DEVs in one EPS set to DEV in another EPS set? 3. How does a DEV from one EPS set transmit to or receive from DEV from multiple EPS devices each being in different EPS set for other reasons? Answer to this can be one of two things either (a) they use repeater service through PNC and/or (b) PNC, knowing who is asleep, avoids providing a GTS with that DEV as rx-DEV. In either of these case we do not need this highly complex mechanism. As the mechanisms get more complex and affect all the other aspects of the standard, there is an higher risk of creating corner cases which can not be visualized easily at the time of standard, but are certain to haunt us in the field. There are proven examples in this within 802-wireless standards. Let's learn from those examples and avoid any

one mechanism to affect deeply all the other mechanism in the standard. OR for any mechanism to be too complex that the implementors do not implement it, but instead they are forced to find some other solution. In any case, I am absolutely convinced that the EPS mechanism asa defined in this draft does not belong in 802.15.3. It has to be absolutely, positively simplified before we move further with this draft. Simplify power management to the following - Request for sleep time by DEV - Accept/Reject by PNC - Broadcast the addresses of sleeping DEV in Beacon - Allocation/modification of GTS by PNC depending on who is awake.

> Accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

44 (Bain, T): A left over in that EPS is called sleep state. Also, this bit should be to indicate possiblility of operating in EPS mode. Other information carried elsewhere. Change text: The PSAVE bit shall be set to 1 if the DEV is capable of using EPS mode as part of power management. (tagged PM in database)

> Accept in principle, “The PSAVE bit shall be set to 1 if the DEV is capable of using SPS mode as part of power management.”

1332 (Shvodian, TR): 2 fields had to be added to the CTREZB, plus 7 paragraphs to attempt to explain their usage. This type of complexity in the name of powermangement is unwarranted. Revisit power management.

> Accept in principle, “The new CTRB field, as documented in 02/100r2 plus new fields for power managment, as documented in 02/115r0, will simplify the power management. The merged CTRB will be in document 02/100r3.

1504 (Shvodian, TR): 6 commands were added just for power management. Something is wrong when so many new commands are needed just for power management. Simplify power management.

> Accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

1632 (Shvodian, TR): I don't see anything in Annex B about how the EPS-Hosts provide anything through the MLME interface. Fix this or remove this statement.

> Accept in principle, “Delete the sentence ‘Annex B provides ... the MLME interface.’”

1639 (Shvodian, TR): If higher layers are setting up the EPS Sets, how does a new DEV find the EPS set to join? Does it have to wake up every single EPS DEV in every EPS set in order to find the DEV with the higheer layer "master or peer" that it wants to talk to? Need to add text to explain how a new EPS DEV finds the higher layer entity that it wishes to communicate with.

> Accept in principle, “If higher layers are setting up the EPS sets, then the higher layers provide the protocol that performs service discovery for that application. The SPS inquiry command, which will be added, provides a list of all of the DEVs that are members of the SPS sets.”

1640 (Shvodian, TR): Can the PNC overbook CTAs for DEVs in EPS state? If so, what happens if there is no chanel time available when a DEV wants to switch to use the ACTIVE CTA? If this can happen, we need a command to tell the upper layers "Channel time not currently available."

> Suggest accept in principle, “Use the MLME-WAKE-OPERATION.confirm command, 02/118r0, to indicate if the CTAs were made available in the beacon. If they are not allocated within a certaing timeout, then this command returns a ReasonCode “RESPONSE_TIMEOUT” to indicate the failure.”

1648 (Shvodian, TR): EPS is so complex that I am afraid that no one will implement it. Also, the number of commands, MLME parameters, states, etc is overwhelming. The complexity is overkill for a WPAN. I will propose something that meets the requirements with much lower complexity. Adopt a new power management Scheme.

> Accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

1653 (Shvodian, TR): Need to clearly explain the relationship between The EPS CTRB parameters of slot size and N, and the EPS set time of EPSTime. Please clarify the relationship. A picture would be helpful

> Accept in principle, “Add a figure that illustrates the relationship between SPS slot interval, SPS interval, etc. to clause 8 that shows how they are allocated and calculated.”

1655 (Shvodian, TR): "If a DEV does not have an ACTIVE or EPS slot in a particular superframe," Does this mean a slot where it is the source or destination, or only where it is the source.

> Accept in principle, “Delete the sentence ‘If a DEV does not ... block definitions of 7.4.10.’ DEVs in the piconet find out that another DEV is in SPS mode through the SPS information element in the beacon.”

1656 (Shvodian, TR): “Can any DEV that is not a member of an EPS set make a request for active channel time with an EPS DEV? Please clarify.

> Accept in principle, “Add text to clause 8.13.3 that says ‘If a DEV in SPS mode is allocated a CTA in its wake beacon with another DEV that is not a part of its SPS set, then the DEV in SPS mode may choose to enter ACTIVE mode to communicate with the other DEV.’”

1657 (Shvodian, TR): Can the PNC negotiate EPSTime and EPS N. IF not, and all EPS sets choose a different EPSTime, periodically they will all occur on the same beacon and may use a tremendous amount of channel time. Address what happens when all EPS Wake beacons happen together.

> Part of the resolution is requiring the SPS interval is a power of 2. EPSTime is not negotiable, it is set only by the requesting DEV.
> Table.

1313 (Shvodian, TR): How does a DEV know what EPS sets are out there and which to join? Proponets of this power management scheme need to specify how a device knows what ESP sets are out there, who the members are so it can decide which to join.

> Accept in principle, “DEVs in the piconet will get information about the SPS sets and their membership using the SPS inquiry command, which is going to be added as a part of the power management compromise. The text will appear in 02/118r0. See also the resolution of comment 1108.” WMS has not yet accepted this resolution.

1497 (Shvodian, TR): It is not clear to me where thie Power management parameters information element resides? In the Beacon? In a power management frame? I did a search and I didn't find "power management parameters element anywhere in the rest of the draft. Please clarify where this element is used or remove it.

> Accept in principle, “The power management parameters information element will be replaced by the SPS information element which will be an ‘as needed element’ in the beacon.”

3.3.4 Channel time request clean up (tagged as CTR in database)

1333 (Shvodian, TR): Since the PNC clock and the application clocks on the DEV won't be perfectly synchronized, the superframe and the application clock will slip with respect to each other. Therefore, the applications need to be able to handle at least a superframe worth of jitter. By limiting the max superframe size to 65.535 ms, we put a 65.535 ms bound on delay variation. This should be suitable for most applications. If not, 65 ms of buffering can smooth out the jitter. Remove maximum allocation delay variation from the CTRB.

Accept, “The changes are indicated in 02/100r2.”

1434 (Shvodian, TR): Eliminate tripartate negotiation. bipartate negotiaon between the PNC and DEV is all that is needed.

Table

1340 (Shvodian, TR): We should not be negotiation for all of these parameters in the stream management command. The PNC cannot control the minimum,peak, rate, average rate, max burst size, average frame size. The PNC can only guaranteee access to the channel. Remove all of the stream parameters and only request channel time. This will greatly simplify the protocol.

Accept in principle, “Remove Max TX delay variation, minimum rate, peak rate, average rate, max burst size and average frame size. Keep max ReTX duration and receive window size until Del-ACK is resolved.”

1429 (Shvodian, TR): The PNC cannot guarantee any of these. It can only guarantee channel time. If RSVP or other reservation protocol is used, the will negotiate at a higher layer, not at the MAC. Remove Peak Rate, Min rate and Max Burst Size from from service flow and stream management. Remove Peak Rate, Min rate and Max Burst Size from from service flow and stream mangement.

Accept

1334 (Shvodian, TR): We never voted to include a grant status field. What if the grant is queued and either is sent or resent after the beacon number of the SFNext? Then the DEV thinks it doesn't have a slot for 2^16 superframes. Remove grant status from the channel time grant. (tagged CTR)

Accept in principle, “The grant status field will now only contain the 4 bit reason code, SFNext will be deleted as a result of the resolution of another comment.”

1115 (Schrader, T): Add PM to CTR and match stream management to CTR. (tagged CTR)

Accept in principle: “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

725, 726 (Heberling, TR): CTR and Stream management commands need fixing. (tagged CTR)

Table, review on 6 March, 2002.

1716 (Song-Lin, TR): It is confusing that this command seems suggesting a DEV seeking to communicate with target DEV needs to use this command, even if after a stream connection has been established. While CTA for one stream is assigned at the end of stream conection (Fig.3). Clarify if this command is used in conjunction with stream management command for establishment of communication and required for allocating time slots for the stream. (tagged CTR)

467 (Gilb, T): Missing reason code. Suggest accept, would look like below:

Table 5—MLME-TERMINATE-STREAM primitive parameters

Name	Type	Valid Range	Description
ReasonCode	Enumeration	SUCCESS, TIMEOUT	Indicates the result of the stream termination command.

Table, pending changes to CTR. (tagged CTR)

48 (Bain, T): We should be talking about microseconds and not milliseconds. If we stay consistent, the resolution should be 8 us and range is 0 to 524280. Change to 8 us and 0 - 524280.

1117 (Schrader, T): This will tie into a proposed change to the text in 8.6. The stream connection process involves communication between the PNC and each of the two peers (originaor of the stream connection request and the target) destined to use the stream. The stream connection process involves the PNC to determine if it can provide the GTS slot allocation requested, and the two peers must agree on a set of QoS parameters. As currently proposed the communication flow is Originator->PNC->Target->PNC->Originator. The originator will then reply to only to the PNC if it rejects the Targets modified QoS values. The trigger for PNC generation of time slots should be a response from the Target to the PNC confirming acceptance of the final QoS parameters relayed from the Target. At line 36 add the following text to create a final confirmation or acceptance of the stream connection which is the trigger to the PNC to begin creating GTS: -- A value of "6" indicates that the frame is sent by the originator DEV to the PNC as a final confirmation or acceptance of the steam connecton.

Accept in principle, “Add the additional action code, but now we need to modify the text and MSCs to reflect the additional frame exchange. A. Heberling will update the MSCs.”

1118 (Schrader, T): "frequency" is the wrong term. change "frequency" to period.

Accept in principle, “All of the parameters for channel time request have been referenced to the superframe duration, as indicated in document 02/100r2.”

602 (Heberling, TR): The MLME-CHANNEL-TIME.request, indication,response and confirm are missing. Please insert clauses 6.xxxx from 01/410r1 into the space just before clause 6.3.13 Stream creation.

3.3.5 PNC selection process (tagged as PNC selection in database).

670, 704, 723, 724 (Heberling, TR): PNC selection, request to change the previously accepted process, see document 02/037. (tagged PNC selection).

174 (DuVal, T): Diagram hard to read. How does this diagram relate to the previous paragraph? Where are the terms aCSFrameRepeat and aCSFrameBroadcast in this diagram? I would like to see their timing relationships.

330 (Gilb, T): The new PNC announcement command doesn't need to use all of the bytes in the other PNC commands. It really only needs the new beacon timeout parameter. Suggest accept in principle, “Add to the text, following ‘as PNC in the piconet.’ on line 52 with ‘This command is also used in the PNC handover by

the new PNC of the piconet to indicate a pending change in the PNC. The new PNC announcement command shall be formatted as illustrated in Figure xref.'.

octets: 2	**2**	**6**	**2**
Command type	Length (=14)	Device Address	New beacon timeout

Figure 2—New PNC announcement frame body

Delete old paragraph beginning 'At the end of ... hand over'" and change the paragraph "The CSTimeout ... in the channel.' to read as follows:

'The device address is the address of the new PNC.

The new beacon timeout field indicates the time offset in milliseconds before which the first beacon shall be sent by the winning AC, in the case of PNC selection, or by the new PNC, in the case of PNC handover.'"

Accept

1526 (Shvodian, T): Why bother with PNC selection at all? Now that we can do handover if a better PNC shows up, Just wait a random time and start sending out beacons. This would be a much simpler process. Also, the odds of turning on a bunch of machines all at the exact time is small. Eliminate PNC selection and simplify by just waiting a random amount of time then start sending out beacons. Then, handover if more qualified PNC.

Table, text due on 11 March, 2002

3.3.6 Others

1529 (Shvodian, TR), 597 (Heberling, T): Piconet shutdown element. (tagged PiconetShutdown)

Table, text due on 11 March, 2002

1309 (Shvodian, TR): Channel status gives no more information to the transmitter than if acknowledgements are used. Eliminate channel status request and response altogether an just use ACKs if you want to determine channel status. Suggest reject, "ACKs do provide information about the channel quality, however, it includes both ends of the link, i.e. both the outbound frame and the ACK have to get through. The channel status command also provides information about the quality of the link at the remote DEVs location, including how many packets that were unsuccessfully sent, which an ACK is not able to determine.'"

Accept (resolution is to reject)

301 (Gilb, T): Need a figure to show how the bit ordering is used in the figures that follow. Add the figure once it has been generated and reviewed. Figure should have multiple fields with LSb and MSb indicated for each of the fields, an indication of the order in which they are sent over the air and an example of a simple command or information element with specific values.

Table, text due on 11 March, 2002

3.4 Tuesday, 5 March, 2002

1724 (Rofheart, TR): The power management method is overly complex and vague. Refer to the remedy indicated by Bill Shvodian. Suggest accept in principle, Accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.” (Can we get an email confirmation on this one?).

48 (Bain, T): We should be talking about microseconds and not milliseconds. If we stay consistent, the resolution should be 8 us and range is 0 to 524280. Change to 8 us and 0 - 524280. Suggest accept in principle, “The allocation period has been replaced by the CTR Interval and CTR Type fields as described in 02/076r2.”

365 (Gilb, T): The directed frame with Private GTS is optional and should be noted as such in Figure 81. Add the word "Optional" to "Directed frame with Private GTS". Also, change the direction of the child beacon, it is not sent to the Parent PNC. Add to the paragraph ending "its capabilities and security policy." the following: "If the PNC allocates the private GTS, it may also send a directed channel time grant to the child PNC to confirm the allocation." Make the same changes with Figure 82. On page 142, 8.4.2, line 46, change "destination addresses. After receiving" to be "destination addresss. The PNC may also send a directed channel time grant to the neighbor PNC to confirm the allocation. After receiving"

Suggest accept in principle, “Delete figure 81 and 82 since they are a redundant and therefore evil description of the channel time request process. Replace them with a state diagrams that show how child and neighbor piconets are formed.”

53 (Bain, T): maybe not the correct location but it seems that there should be mention that for pseudo-static, that the PNC shall not change the superframe duration while devices are presuming a location for their slot don't get confused. Add wording: The PNC shall not vary any paramters, such as superframe length, that would invalidate the pseudo-static GTS assigned to one or more DEVs in the piconet. Suggest accept.

54 (Bain, T): Considering that the aMTSAssocPeriod is 0.6 milliseconds, there is a question that the sub 1 second begin scan to payload ready interval may be attained. The unspecified authentication must be considered as well as the extensive number of message exchanges necessary for the typical DEV to get ready to deliver payload. Understand the numbers and then set the aMTSAssocPeriod accordingly. Suggest accept, “0.6 ms is the upper bound, DEVs would typically take less than this time. Since the maximum superframe duration has been reduced, the aMTSAssocPeriod will be set to 4*aMaxSuperframeDuration.”

1560 (Shvodian, TR): This sentence makes it sound like a DEV only needs to stop transmitting once no beacon is heard for ATP duration. The DEV still needs to follow the rules for dynamic or pseudostatic GTS. Add the following sentence between "PNC." and "If a DEV": If a beacon is not correctly received, a DEV shall follow the rules for transmitting in a GTS, depending on whether it is a dynamic or pseudo-static GTS.” Suggest reject, “When the ATP has expired, the DEV needs to assume that piconet has gone away and that it is no loger associated to the piconet. In this case, psuedo-static GTSs no longer exist and the DEV should not use them.

1561 (Shvodian, TR): Need to add that the DEV will send a Beacon Lost MLME to the DME to indicate that the Beacon is lost and the DEV is disassociated. Add the following: "The DEV shall send the Beacon-Lost.indication MLME to the DME to indicate that the Beacon has been lost. Suggest accept in principle, “Add the following text, ‘In addition, the DEV shall send the MLME-BEACON-LOST.indication to the DME.’”

376 (Gilb, T): All DEVs need to reset their clocks based on the best estimate of the beacon timing if they did not hear the beacon. Change "it should reset" to "it shall reset". Suggest accept.

1120 (Schrader, T): This comment supplements as suggestion for adding stream management command in section 7.5.10.3, page 133 for final confirmation or acceptance of stream connection. One of the primary purposes of the stream connection process is to determine if the originator and the target agree on a single set of QoS parameters. As currently proposed the communication flow is: Originator->PNC->Target->PNC->Originator. The originator will then reply to only to the PNC only if it rejects the Targets modified QoS values. The trigger that starts PNC generation of time slots should be a response from the Originator to the PNC conThe stream connection process involves the PNC to determine if it can provide the GTS slot allocation requested, and the two peers must agree on a set of QoS parameters. As currently proposed the communication flow is Originator->PNC->Target->PNC->Originator. The originator will then reply to only to the PNC if it rejects the Targets modified QoS values. The trigger for PNC generation of time slots should be a response from the Target to the PNC confirming acceptance of the final QoS parameters relayed from the Target, not the absence of any negative response. The following is a rewrite of lines 12-27 on page 153. Either the sending DEV or the intended recipient DEV for the new stream may send a stream management command with the request for stream connection. The process of stream connection is illustrated in Figure 88. In this figure, DEV A is the originator of stream connection request and DEV B is the target, consistent with the stream management command section 7.5.10.3. In all stream management communications from the PNC to the other involved DEV, the PNC appropriately changes the value of the direction field to imply the same direction of the stream as originally requested. The values for direction, security, stream type and priority shall be non negotiable and are decided by the DEV A that is sending the stream connection request. These values shall not be changed anytime after the first transmission of the command frame containing the request for that stream. The target DEV B responding to the forwarded stream connection request may modify the remaining QoS parameters including bandwidth and latency requirements. All the bandwidth and latency related requirements of the stream shall be confirmed or rejected by the originator of the stream connection request in response to the final PNC acceptance message. The PNC decision on the values of the stream QoS parameters that are supported in the piconet shall be final. If the originating DEV A does not accept the PNCs final stream parameters, then DEV A shall send a stream management command to the PNC with action type set to disconnection/rejection as specified in 7.5.10.3. Then the PNC shall then send a stream management command to the target DEV B with action type set to disconnection/rejection. Otherwise, DEV A shall send a stream management command with a final confirm/accept action type, and the PNC shall then begin generating ACTIVE type CTA elements and GTS timeslots as specified upon receipt of this command. Suggest that this comment wins the prize for longest comment.

Suggest accept in principle, “Change the paragraphs ‘Either the sending ... set to disconnection/rejection’ in lines 12-27 on page 153 to read

> ‘The source DEV for the new stream may send a stream management command with the request for stream connection. The process of stream connection is illustrated in Figure 88. In this figure, DEV A is the originator of stream connection request and DEV B is the target of the stream management command. In addtion, the originator the command is also the souce of the stream while the target of the command is the destination of the stream.
>
> The values for direction, security, stream type and priority shall be non negotiable and are decided by the originating DEV. These values shall not be changed anytime after the first transmission of the command frame containing the request for that stream.
>
> The target DEV responding to the forwarded stream connection request may modify only the receive window size. Any change the receive window size of the stream shall be confirmed or rejected by the originator of the stream connection request in response to the final PNC acceptance message. The PNC’s decision on the values of the stream parameters that are supported in the piconet shall be final.
>
> If the originating DEV does not accept the PNC’s final stream parameters, then the originating DEV shall send a stream management command to the PNC with action type set to disconnection/rejection as specified in xref 7.5.10.3. Then the PNC shall then send a stream management command to

the target DEV with action type set to disconnection/rejection. Otherwise, the originating DEV shall send a stream management command with a final confirm/accept action type. The PNC shall then allocate the GTSs via CTAs in the beacon.'"

378 (Gilb, T): Since the direction field is constant during the negotiation (since the target and originator addresses are now included), this sentence is incorrect. Delete the sentence "In all stream management ... as originally requested." Suggest accept in principle, "Resolve as indicated in the resolution of comment 1120."

1563 (Shvodian, TR): "All the bandwidth and latency related requirements of the stream shall be negotiated between the sender of the stream and the PNC. The PNC decision on the values of the stream QoS parameters that are supported in the piconet shall be final." The PNC knows nothing about bandwidth. It only knows about channel time. I don't think these QoS parameters should be negotiated at the MAC, but if they are the other DEV should have the oportunity to negotiate the values down. Suggest accept in principle, "Resolve as indicated in the resolution of comment 1120."

379 (Gilb, T): The roles and terms for the stream negotiation are not clear. They should be clarified here. Add the following text at the end of 8.6 prior to 8.6.1. "In the negotiation of stream connection, the following entities and roles are used: - PNC: the arbiter of channel time allocation - originator/originating DEV: The DEV that initiates the stream negotiation process. The originator may be either the source or the receiving DEV. - target/target DEV: the DEV (or broadcast address) with which the originator wants to open communications. The target may be either the source or receiving DEV. - sending DEV: The DEV that provides the source of the data in the stream. - receiving DEV: The DEV that will receive the data in the stream." Suggest accept.

383 (Gilb, T): No group addressing is supported in this standard. Change "group addressed" to "broadcast". Suggest accept in principle, "Change 'group addressed' to be 'broadcast or multicast' in this location."

391 (Gilb, T): Group addressed frames are not supported in the standard. Change "group addressed" to "broadcast" in table 69. Suggest accept in principle, "Change 'group addressed' to be 'broadcast or multicast' in table 69"

413 (Gilb, T): Group addressed frames are not supported in this standard. Change "Group addressed" to be "Broadcast" in figures 71 and 72. Suggest accept in principle, "Change 'group addressed' to be 'broadcast or multicast' in tables 71 and 72"

1566 (Shvodian, T): Need to specify that non-stream data cannot used delayed ACK Add the following sentence: "Non Stream data cannot use the delayed ACK policy for a couple of reasons. There is no opportunity for the receiving DEV to negotiate the window size. Also, since all non stream data uses stream number zero, they all use the same sequence number counter so delayed ACK is not possible." Suggest accept in principle, "Add the following sentence to 157, line 21, 'Non-stream data shall not use delayed-ACK. There are are two reasons for this: First there is no opportunity for the receiving DEV to negotiate the receive window size. Second, all non-stream data uses the same stream number and hence the same sequence number, so it is not possible to detect missing frames.'"

1567 (Shvodian, TR): "The start of transmission of the response data frame shall start at the end of a SIFS, like an Imm-ACK frame transmission." This is inconsistent with the previous section which says that Immediate ACK is sent within a SIFS. Need to clarify the use of SIFS. Suggest accept in principle, "The previous section that said that the Imm-ACK 'shall start within a SIFS duration' has been changed to be 'shall start a SIFS duration' as part of the resolution of comment 1543, which is now consistent with the current section."

1565 (Shvodian, TR): "within a SIFS" needs clarification. In some places it says that ACK comes before a SIFS and others it says after a SIFS. Throroughly describe be the ACK timing with a detailed description including SIFS complete with drawings. Suggest accept in principle, "The same requirement is described in

two different locations, leading to confusion. Change ‘it shall start the transmission ... of the directed frame.’ to be ‘it shall start transmission of theImm-ACK frame after the appropriate interframe spacing as defined in xref .8.4.1’”

385 (Gilb, T): The retransmission for Imm-ACK is defined with in two incompatible methods. Either: 1) Delete "either Imm-ACK or the" from line 35. Here, the Imm-ACK retransmission starts after the Imm-ACK would have been finished. 2) Delete the sentence "When an Imm-ACK is ... attempting another transmission." Here, the Imm-ACK retransmission begins with the same timing as for implied-ACK, i.e. when the channel has been idle for the wait time. Suggest accept in principle, “Delete the sentence "When an Imm-ACK is ... attempting another transmission." Here, the Imm-ACK retransmission begins with the same timing as for implied-ACK, i.e. when the channel has been idle for the wait time.”

1569 (Shvodian, TR): Transmitting station must wait for immediate ACK time plus 2 SIFS to retransmit. Change the sentence as follows: "it shall wait for the duration of Imm-ACK frame plus two SIFSs before attempting another transmission." Suggest accept in principle, “The sentence has been deleted as a resolution of comment 385. Additional wording regarding this has been added at the end of the paragraph as a resolution of comment 386.

386 (Gilb, T): Clarify when the retransmission begins. After "of the time slot." add the sentence "That is, the retransmission begins RIFS+SIFS following the last transmission." Suggest accept.

387 (Gilb, T): Redundant (and therefore evil) information on collision detection that is better defined in 8.4.2. Delete the sentence "A collision during the ... for that frame." Suggest accept.

1568 (Shvodian, T): Move this sentence: "A collision during the transmission of a directed frame in the CAP is detected by the absence of the acknowledgement for that frame." to the first paragraph is 8.8.5. Move the sentence. Suggest accept in principle, “The sentence has been removed as a resolution of comment 387.”

1155 (Roberts, TR): This sentence describes an algorithm with an exponential increasing time interval. Does this algorithm need an upper limit on the time delay. MAC committee to provide comment. Suggest accept in principle, “Change the sentence, ‘... by a factor of 2 (i.e. exponential increasing).’ to be ‘... by a factor of 2 (i.e. exponentially increasing) up to 16*aProbeResponseDelay’.”

1156 (Roberts, T): Add reference to text. Power management ... what is the reference that describes the process of returning a DEV to the EPS mode. Suggest accept in principle, “Change the paragraph ‘EPS DEVs present ... after completion of probing’ to be

> ‘If the originating DEV wishes to probe a target DEV that is in power management mode it shall either wake up the target DEV using the appropriate power managmenet commands, xref 8.13, first or wait until the target DEV is scheduled to be awake before sending the probe request. Once the target DEV is awake, the originating DEV shall use the regular probe procedure to obtain the required information.’

388 (Gilb, T): This paragraph should list the commands that are used to wake and sleep DEVs. Change "into ACTIVE mode" to "into ACTIVE mode using the switch to ACTIVE CTA mode command, 7.5.7.4" and change "to EPS mode after" to be "to EPS mode using switch to EPS CTA mode command, 7.5.7.5, after" Suggest accept in principle, “Resolve as indicated in the resolution of comment 1156.”

1571 (Shvodian, TR): The DEV should not have to do a probe to determine the PHY capability for the DEV it wants to communicate with. That is in the DEV infor table that is broadcast by the PNC. Change as follows: "Each DEV in a piconet shall check the DEV capabilities from the device information table that is broadcast by the PNC when a DEV associates to obtain the supported rates from other DEV(s) that it is interested in communicating. Suggest accept in principle, “Change the sentence ‘Each DEV in a piconet

shall use probe request command, 7.5.4.1 ... is interested in communicating' to be 'In order to determine what rates are supported by a target DEV in the piconet, the DEV shall use one of three methods:

a) Check the capabilities of the target DEV broadcast by the PNC when the DEV associated with the piconet.
b) Send a probe command, xref 7.5.4.1, to the target DEV to request its capabilities information element, xref 7.4.3.
c) Request the information from the PNC using the PNC information request command, xref 7.5.8.1.'

1157 (Roberts, TR): There are a number of problems with the paragraph starting at line 42, of which the most serious is a reference to a wrong command. On line 47 the probe request command is found at clause 7.5.4.1, not at 7.5.8.1. Suggest accept in principle, "This paragraph will be changed and the reference corrected as a result of the resolution of comment 1571."

389 (Gilb, T): Should not require the DEV to check the channel status. Change "each DEV shall periodically" to "each DEV may periodically" Suggest accept.

1576 (Shvodian, TR): ACK feedback can be used to determine if rate or power change is required. Add the following sentence: "Additionally, the channel quality can be judged by the presence of ACKs on transmitted frames. This ACK feedback can be used to determine if rate of transmssion or the power level needs to change." Suggest accept in principle, "Add the following sentence at the end of the paragraph on page 159, line 50, 'Additionally, the channel quality may be evaluated by the presence or absence of ACKs to transmitted frames. This information may be used to determine if the rate of transmssion or the power level needs to change.'"

392 (Gilb, T): We should allow the lower rate modes to be used in the CAP for more reliable communications. Change in 2 places: "In a GTS or MTS: ... the base rate." to be "Any rate supported by both the source and destination." Second location is at line 20. Suggest accept.

1578 (Shvodian, TR): Immediate ACK has no frame body, only a header. Since the header is always transmitted at the base rate, the table should say that Imm. ACK is transmitted at base rate. Change to base rate. Suggest accept (although secure ACKs may have a frame body).

396 (Gilb, T): The PNC cannot keep the piconet quiet since psuedostatic timeslots still operate even without the beacon. Change "The PNC shall keep the piconet quiet by not" to "The PNC shall not" on line 40, change "The PNC may change" to "The PNC shall change" on line 41, change "beacon to cancel the quiet state of the piconet." to "beacon." on line 46, change "beacon following the cancellation of quiet state of the piconet." to "beacon." Suggest accept.

1581 (Shvodian, T): "If the decision is made by the PNC to change the channel, the PNC shall keep the piconet quiet by not transmitting any beacon for one or more beacon interval." The quiet command was eliminatd before pseudo-static GTS slots were introduced. With pseudo-static GTS a DEV is allowed to transmit even if it does not hear a liminted number of beacons. The quiet command should be added back. Add back the quiet command. Suggest reject, "While it is not possible for the PNC to keep the psuedo-static slots quiet, by not transmitting the beacon, they will stop after 4 lost beacons. In addition, if the PNC broadcasts the keep-quiet message, it is not guaranteed that the participants in the psuedo-static slots will hear it on the first transmission or if it is in the beacon that they will hear it either. The PNC knows when the psuedo-static slots will be transmitting and can adjust its search to fit around these time periods."

1583 (Shvodian, TR): Instead of "PNC stops sending beacons" should say "PNC issues quiet command and stops sending beacons" Change "PNC stops sending beacons" to "PNC issues quiet command and stops sending beacons" Suggest reject, "Rather than adding the quiet command back in, the PNC will simply avoid the psuedo-static slots, all other transmissions will stop with the loss of the beacon. See also the resolution of comment 1581."

710 (Heberling, TR): The text between lines 41 and 47 describing how the PNC determines the availablity of a more suitable channel is incorrect. See text in doc 02/037 for details regarding a more reasonable approach to determining the suitability of another channel. Suggest accept in principle, “The channel scanning methods have been expanded with the remote scan command as well as the current process of keeping the piconet quiet and having the PNC search as the resolution of comment 713.”

1162 (Roberts, T): In the opening line of the paragraph starting at line 41, we are informed of a desire to quiet the piconet. The scheme to quiet the piconet, by stopping beacons, will not quiet pseudo-static GTS slots. MAC committee to clarify if this is a problem and modify text if needed. Suggest accept in principle, “All of the references to quieting the piconet have been removed as part of the resolution of comment 396.”

28 (Bain, T): The dynamic channel selection text does not mention the pseudo-static operation allows a DEV to continue to operate for up to 4 superframes without seeing a beacon. I don't think that this is a problem because the pseudo-static is limited to the peer-to-peer transfer in a CTR or stream setup and does not extend to commands to the PNC. Make mention that specific DEV to DEV operations are allowed during the quiet time but that no DEV to PNC traffic is allowed. Suggest accept in principle, “All of the references to quieting the piconet have been removed as part of the resolution of comment 396.”

1166 (Roberts, T): The sentence on line 49, starting with "The DEVs that ...", indicates a channel switch can take place. What happens to those devices that are in a power save mode. Is this going to be a problem for them? Power management to comment. Suggest accept in principle, “Add to thie paragraph a sentence that says ‘The PNC shall wake up all DEVs in APS or SPS power managment modes, xref 8.13, before changing channels and shall ensure that the time-out for the channel change is long enough to allow the DEVs to wake up and read a beacon with the channel change element.’”

1585 (Shvodian, TR): If anything RPS should be a state, not a mode. No DEV should ever listen to GTS slots that are not assigned to it, so there is no difference between EPS and ACTIVE mode.. Remove all references to EPS mode. Suggest accept in principle, “The RPS mode/state has been removed as a part of the compromise solution for power management. See the resolution of comments 1319 and 1172.”

1586 (Shvodian, TR): Remove this sentence "ACTIVE mode devices may use the capabilities defined in RPS mode to provide a modest power reduction." This only proves that ACTIVE mode and EPS mode are one and the same. Remove this sentence (along with RPS mode). Suggest accept in principle, “The RPS mode/state has been removed as a part of the compromise solution for power management. See the resolution of comments 1319 and 1172.”

1629 (Shvodian, TR): A complex power management solution has been specified, but we need a very simple approach that will be useful for very low power devices that are not. If the current apprach stays it sould be optional, and we should add a low-complexity solution as an alternative. I will be proposing a low complexity power management solution. Suggest accept in principle, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes.”

1168 (Roberts, TR): A general comment about power management. I can not support power management being mandatory; in other words, power management must be an optional mode ... not only for a DEV but also for a PNC. A method must be included that allows a piconet to indicate that power management is not supported. A DEV already has the option to not support power management. One method to "not support power management" at the PNC level is: 1. In table 67, add a 9th action type value for the EPS action response command, and that is "EPS mode not supported" Modify table 67 as shown above and then add text to 8.13 at the end of line 31 that says: In the case where a PNC does not support any power management mode, the EPS action response command "action type value" (Table 67) shall be value 9, "EPS mode not supported". Those DEVs desiring RPS mode will not get slot assignments friendly to RPS mode of operation. Suggest reject, “The power management section is going to be rewritten based on proposals 01/384r2, 02/067r1 and the minutes. A DEV does not have to implement any power management process. If it doesn’t,

it won't send any of the SPS or APS commands. The AC capable DEVs will be required to provide some level of power management support as indicated in the compromise documents."

1651 (Shvodian, TR): How do you know what EPS Sets are active? If you want to interrogate all DEVs in all EPS sets, you first have to know what EPS sets are active. I don't see a way to ask for the set of active EPS sets. Need a command and MLME to request which EPS sets are active (in use). Suggest accept in principle, "The compromise power management solution will provide new MLMEs and commands for power management. The SPS inquiry command, which will be added, provides a list of all of the DEVs that are members of the SPS sets."

3.5 Email resolution, due Thursday, 7 March, 2002

1159 (Roberts, TR): Wrong Figure number. Figure 92, not figure 8.12. Suggest accept in principle, "The repeater functionality has been deleted and so the correction to the cross reference is moot."

394 (Gilb, T): It is not specified what the SA and DA of the repeated frames is. To avoid confusion (e.g. the DEV and the PNC ACKing the same packet), the addressing should go throught the PNC (see resolution).Change "its frames as before." to be "its frames as before except that the DA of the frames is set to the PNC's address." and change "and repeat them in the time slot" with "and repeat them with the SA set to the PNC's address in the time slot" Also need to check the impact on 7.5.6.x. Suggest accept in principle, "The repeater functionality has been deleted and so the correction to the cross reference is moot."

1144 (Roberts, T): In general Figure 88 is in poor shape. The font appears distorted and the arrows are falling on top of text. This figure needs to be corrected. Reformat drawing. Suggest accept, "Yes the drawing stinks. It will be improved for the next revision."

1146 (Roberts, T): In the shaded box at the bottom of Figure 89, modify the text as shown below. Rest of the sequence follows as if the sender of the stream intiated the stream connnection process, as shown in Figure 88. Suggest accept in principle, "In the shaded box at the bottom of Figure 89, change the text to read 'The rest of the sequence follows as if the sender of the stream intiated the stream connnection process, as shown in xref Figure 88."

1148 (Roberts, T): Add a reference to clause 7.2.1 ... suggested text below ".... in the frame control field (clause 7.2.1) set to "1"." Suggest accept in principle, "Change 'in the frame control field set to '1'.' to be 'in the frame control field, xref 7.2.1, set to '1'.'"

381 (Gilb, T): aFragThreshold is not a constant and so should loose the a and the reference in the table at the end of Clause 8. Also, we need to require that FragThreshold shall be less than the biggest allowed frame. Change aFragThreshold to FragThreshold. Delete aFragThreshold from Table 73. Change "and change them as desired." to be "and change them as desired provided that FragThreshold shall be less than aMaxFrameSize."

384 (Gilb, T): The text "at the end of RIFS" only partially describe the timing for the re-transmission and neglects to mention the SIFS that is indicated further down. Delete the text "at the end of RIFS" since it is better described at the end of the paragraph. Suggest accept.

1152 (Roberts, T): In line 46, reference is made to "the negotiated retransmission window". Please add to the sentence reference to the clause where this negotiation is described. (assigned to MAC committee). Suggest accept in principle, "Change 'the negotiated retransmission window for the stream.' to be 'the negotiated receive window size, xref 7.5.10.3, for the stream.'"

390 (Gilb, T): The first sentence is redundant and therefore evil since the requirement is in the table. Delete the sentence "All group ... receive these frames."

391 (Gilb, T): Group addressed frames are not supported in the standard. Change "group addressed" to "broadcast" in table 69. Suggest accept in principle, “Change ‘group addressed’ to be ‘broadcast or multicast’ in table 69.”

1165 (Roberts, T): Add reference to the association response command. ‘... association response command (7.5.2.2), the DEVs ...’ Suggest accept in principle, “Change ‘... association response command (7.5.2.2), the DEVs ...’ to be ‘... association response command, xref 7.5.2.2, the DEVs ...’”

1174 (Roberts, TR): Reference to CAP without reference to associate MTS. I need some help here from the MAC folks ... in paragraph 8.13.1, we reference an event relative to the CAP (lines 50 and 51). Should this be rewritten to include the MTS ... for example, replace the two instances of CAP with CAP --> CAP or associate MTS. Suggest accept in principle, “The power managment section is being rewritten, however, in the new description, references to the CAP should be written as ‘following the CAP or the beacon, in the case where the superframe does not have a CAP.’ or ‘as close to the beacon as possible in the superframe’.”

1175 (Roberts, TR): Reference to CAP without reference to associate MTS. I need some help here from the MAC folks ... in paragraph 8.13.2, we reference an event relative to the CAP (line 47). Should this be rewritten to include the MTS ... for example, replace the instance of CAP with CAP --> CAP or associate MTS. Suggest accept in principle, “Resolve as indicated in the resolution of comment 1174.”

541 (Gubbi, TR): some more inconsistencies that can potentially lead to non-interoperable implementations 1. line 48, page 163: change "assigned to it for reception." to "assigned to it for reception, and all the GTSs allocated for BC/MC reception" 2. line 49, page 163: change " within 25 percent of the slot time" to "within 25 percent of the slot time that does not show any channel activity as indicated by CCA". Suggest accept in principle, “The RPS mode has been deleted as a result of the compromise on power management and so the corrections are moot.”

1588 (Shvodian, TR): Delete all of clauses 8.13.2, 8.13.21.1 and 8.13.2.2. There is no need to have an RPS mode since it is identical to PM_OFF mode. Suggest accept, “The RPS mode has been deleted as a result of the compromise on power management.”

189 (DuVal, T): Where is RPS listed? It seems to be missing. Does this mean the definition of RPS is incomplete? Complete RPS definition. Suggest accept in principle, “The RPS mode has been deleted as a result of the compromise on power management and so the definition is no longer necessary.”

397 (Gilb, T): What is changed is not listed here. Change "Latency to change is" to "Latency to change channel time allocations is" Suggest accept in principle, “The RPS mode has been deleted as a result of the compromise on power management and so the corrections are moot.”

3.6 Thursday, March 7, 2002

3.6.1 General

1564 (Shvodian, TR): Fragmentation and defragmentation should not be in the MAC. It will overly complicate the designs and require large per-stream buffers. Fragmentation should be done at the convergence layer. Move Fragmenation to the convergence layer. Suggest reject, “Fragmentation is required for commands as well as data. The standard specifies the logical requirements of the protocol, not the archictecture. Regardless of where the functionality is described in the draft, the implementer is free to put that functionality anywhere in the final architecture. For example, if fragmentation/defragmentation is the first/last things done to data in the MAC (which is up to the implementer to design), then it could easily reside with either the MAC or the convergence layer in the implementation. However, while it could be put into either, there are three reasons why fragmentation belongs in the MAC: 1) fragmentation is required for commands, which generally do not travel to the convergence layer. 2) Fragmentation can be used to overcome difficulties in the

channel, e.g. interferers. The channel information is monitored by the DME, not the convergence layer. 3) The fragmentation specification needs to be the same for all of the potential convergence layers or else it would not be possible to send from one DEV that is using one CL while the receiver is using another CL. Placing identical definitions for the same functionality in more than one location in the draft will lead to incompatibilities, make it difficult to maintain the standard and make it harder to implement more CL's."

3.6.2 Delayed ACK

1464 (Shvodian, T): Get rid of Delayed ACK. This will unnecessarily complicate the MAC to implement. We should keep a WPAN as simple as possible. Eliminate Delayed ACK. Suggest reject "The use of delayed ACK greatly increase the throughput, particularly at higher data rates. Because of this, the task group feels that the added complexity is justified by the increased throughput."

1151 (Roberts, T): In general, this paragraph deals with sending the delayed ack. The sentence at line 18 that beguns "However the recipient ..." since it implies a DEV should send a delayed ACK at the expiration of the retransmission window. My question is this ... do you sent this at the expiration only if not previously send or do you send it again regardless. MAC committee to comment and clarify text if necessary.

3.6.3 Gap between beacon and first GTS/MTS in the non-CAP case

(tagged MTS gap)

1346 (Schrader, T): The text should elaborate on the Non-CAP case, especially with regards to processing time for the beacon. If the CAP is not present there must be a gap or unallocated time slot allocated to allow all deviecs to process the information in the beacon. If the amout time is not specified, a PNC may assign slots before a device can interpret its CTA. Indicate in the text that a minimum size CAP will be assigned even for the MTS only case, where the CAP will serve only as a gap between the Beacon and the GTS slots. Suggest accept in principle, "Indicate in the text that the PNC shall not allocate any time slots within aNew-Parameter time of the end of the beacon."

57 (Bain, T): In the absence of CAP, the first GTS is bumped against the end of the beacon. The development of real implementations of this standard may be hindered if the parsing of the beacon body must occur in the very few microseconds available. Provide guidance to implementers but also place a minimum time till the beginning of the first GTS in the absense of CAP. If a PNC to DEVs MTS is always present, then this would not be a problem. Suggest accept in principle, "Resolve as indicated in 1346."

3.6.4 CTR

467 (Gilb, T): Missing reason code. Suggest accept, would look like below:

Table 6—MLME-TERMINATE-STREAM primitive parameters

Name	Type	Valid Range	Description
ReasonCode	Enumeration	SUCCESS, TIMEOUT	Indicates the result of the stream termination command.

Table, pending changes to CTR. (tagged CTR)

380 (Gilb, T): The use of the channel time request and channel time grant to get non-stream CTAs is not described. Add a short description of the frames that are exchanged to get a non-stream CTA via the channel time request and channel time grant commands. Also, the commands that are exchanged to disconnect a non-stream CTA. Suggest accept in principle, "The use of the channel time request will be added based on document ??."

3.6.5 Power mangement

(tagged PM)

1584 (Shvodian, TR): How is broadcast traffic handled when a device is in EPS mode? Is the PNC forced to perform repeater service to every DEV that is in EPS. Need to decide how to handle broadcast traffic when devices are in EPS mode since TCP/IP uses broadcast.

4. Unfinished categories

4.1 PNID related issues

(tagged PNID)

1524 (Shvodian, T): Piconet randomization does not address if the PNID is the same each time the piconet starts, or if it chooses a different random PNID each time. Clarify if each PNC calculates the same random number each time they generate a PNID, or if it is different each time. Resolve with 1467.

1467 (Shvodian, TR): "The PNID remains constant during the current instantiation of the piconet and may be persistent for multiple sequential instantiations of the piconet by the same PNC." "May be persistent"? How is it determined if it is persistent? Up to the implenter? Do PNCs always use the same PNID? Need to describe the details of persistence of the PNID. Suggest ?

800 (Kinney, T): There is a possibility of duplicate network id's. A device will check to see if there are any similar ids but this search cannot be 100% sure, additionally, a PAN may walk into another's coverage area. I did not see any detection nor resolution of this event. Describe the techniques to detect network id duplication and the procedures to resolve it. Suggest accept in principle, “The beacons in any piconet are unique since they contain the PNCs address. However it is possible for a DEV to hear packets from adjacent piconets that are using the same PNID. Add to the end of the paragraph in subclause 8.2.2 the following sentence, ‘However, when a DEV starts a piconet, it shall not use a PNID that was found in the scan that was used to start the piconet.’”

Table, looking for additional suggestions from the committee.

4.2 New association response proposal

(Tagged AssociationInfo in the database)

576, 662, 717, 718 (Heberling, TR), 661 (Heberling, T)

700 (Heberling, TR): Add Association info and Piconet shutdown information elements, (tagged AssociationInfo).

719 (Heberling, TR): Suggest change to current association process. (tagged AssociationInfo)

721 (Heberling, TR): Change broadcasting DEV (now CTR) information description. (tagged AssociationInfo)