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	[22 February, 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 sub-clauses 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.

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."

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, “Change ‘Broadcasting DEV information’ 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 ype	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."

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

3.1 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.'

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.'

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 ''

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

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.'

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

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.

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.

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.’”

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.’

1079, 1080 (Roberts, T), (Gilb, 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.”

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’”.

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 CTRBs associated with it.’ If 1324 is accepted, then accept in principle, “The CTRBs in the command have been removed as the resolution of comment 1324, so the additional explanation is unecessary.”

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.’”

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.”

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."

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."

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."

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).

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'"

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."

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

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,”

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 lin 37. Suggest 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”.

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.”

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.

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

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.”

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 fregments. Suggest accept in principle, “Change ‘current MSDU/MCDU’ to be ‘current MSDU/MCDU or MSDUs/MCDUs which are not fragemented.’

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"? Hos 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 ?

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.”

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

857, 859, 989, 1088, 1090 (Roberts, T) - various (tagged PM in database)

543, 526 (Gubbi, TR): General comments about PM in CTR. (tagged PM in database)

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)

1332, 1499, 1500, 1504, 1632, 1639, 1640, 1648, 1653, 1655, 1656, 1657 (Shvodian, TR) (tagged PM in database)

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.

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.

1091 (Roberts, T): Restructure sentence assuming the technical comment is correct. It appears that 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")

50 (Bain, T), 1347 (Schrader, T): SFNext definiton in channel time grant.

1497 (Shvodian, TR): It is not clear to me where thie Power management parameters infotmation 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.

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

1333, 1340, 1429, 1434 (Shvodian, TR): Clean up CTR, suggested remedy in 02/100r2 (tagged CTR)

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 thins it doesn't have a slot for 2^16 superframes. Remove grant status from the channel time grant. (tagged CTR)

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

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

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.

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)

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."

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."

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.

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

3.1.3 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.

3.1.4 Others

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

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 deter-

mine 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.’

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.

3.2 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)

3.3 Security policy

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