IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)
Title	**TG3 LB19 comment resolution**
Date Submitted	[12 September, 2002]
Source	[James P. K. Gilb] Voice: [858-538-3903] [Appairent Technologies] Fax: [858-538-3903] [9921 Carmel Mountain Rd. #247, San E-mail: [gilb@ieee.org] Diego, CA 92129]
Re:	[]
Abstract	[This document is a record of comment resolutions for LB19.]
Purpose	[To provide a record of the comment resolution for LB19.]
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1. Conference calls

1.1 Tuesday, 17 September, 2002

Attendees: Rene Struik, Ari Singer, Jay Bain, Jim Allen, John Barr, Allen Heberling, Knut Odman, Mark Schrader, James Gilb.

Meeting called to order, 8:07 am.

Agenda:

— Roll call
— Call schedule, volunteers to sponsor calls
— Comment resolution assignments (02/406r1)
— Comment resolution (02/392r5)
— Discuss other possible resolutions
— Jokes
— Adjourn

Call schedule - Oct 1 - Bailey/NTRU, Oct. 3 - Stuik/Certicom, September 24 - Bain/TDSI, September 20 - Barr/Motorola, September 19- Heberling/XSI, September 26 - Gilb/Appairent.

James to send update that calls are 1.5 hours. James to send out hotels in the area, drive time, alternate airports.

Comment resolution assignment. John Barr wanted to be assigned all of Singer's comments. Request to re-open 92 - Change security to one mode.

357 (Schrader, TR) - The powering down between awake beacons is spoken of as mandatory. See text changes in Schrader-LB19-T1.doc. **Suggest accept in principle**, "Change 'Being in the SLEEP state is defined as having the receiver function disabled.' to 'Being in the SLEEP state is defined as not listening for traffic and possibly being in a reduced power state.' change 'listens to all beacons and will listen to all CTAs' to be '... listens to all beacons and listens to all CTAs ...' Change 'In the SPS mode, a DEV is required to listen to periodic wake beacons and to GTSs allocated in its wake beacons.' to be 'In the SPS mode, a DEV is required to listen to periodic wake beacons and to the GTSs allocated with its DEVID as the destination.'"

> Accept in principle, "Resolve SLEEP and AWAKE as indicated in CID 506. Also Change 'In the SPS mode, a DEV is required to listen to periodic wake beacons and to GTSs allocated in its wake beacons.' to be 'In the SPS mode, a DEV is required to listen to periodic wake beacons and to the GTSs allocated with its DEVID as the destination.'".

506 (Gubbi, TR) - The new definitions of AWAKE and SLEEP states are vague and leave lot ofroom of con- tradicting interpretations. Change two sentences starting from "Being in the AWAKE state...." to the follow- ing: "AWAKE state defined as the state of the DEV where it is either transmitting or receiving. SLEEP state is defined as the state in which the DEV is neither transmitting nor receiving."

> Accept.

394 (Gubbi, TR) - The requirement in "All DEVs in PSPS mode are required to listen to wake beacons" is not clear. What does this mean? All PSPS DEVs have to receive it or just be awake to receive it if channel permits? I am sure the intent if NOT the former. If it is latter, then the maximum sleep time is made same for all PSPS DEVs. This is not acceptable. Depending on the power requirements some devices might want to go for longer, but permitted by PNC, sleep and wake up. Making those DEVs to wakeup to the time of TBTT

is fine as in 802.11. This sounds similar to DTIMs in 802.11, but with worst performance outcome. Remove PSPS and revert back to APS mode as in D10 of the draft **Suggest reject**: "The text 'required to listen' means that the DEVs shall stay awake for certain beacons named system wake beacons and attempt to receive this beacon. They are not required to stay awake for and listen to any other beacons. PSPS allows DEVs, as well as APS did, to select the time they wish to stay in power save mode, up to the ATP of the DEV. PSPS adds a solution to a shortcoming of APS, that there was no way to inform sleeping DEVs about broadcasts or system parameter changes such as channel change and shutdown. Note that a DEV in SPS may decline listening to system wake beacons."

Suggest add an SPS set 0 which allows DEVs to go to sleep up to the ATP. Text and MSCs to be generated by Schrader/Bain.

395 (Gubbi, TR) - The sentence "All asynchronous traffic to DEVs in PSPS mode will be allocated in the wake beacon". What does this mean? if a DEV is in PSPS mode and there are 100 other DEVs requesting to send async data to it, all the 100 requests are allocated in the wake beacon? Why is this sentence needed. Remove PSPS and revert back to APS mode as in D10 of the draft. **Suggest reject**: "The PNC is allowed to chain multiple system wake beacons if it has more GTS or announcements that would fit in a single beacon. This solves the rare events with clustered asynchronous traffic. In addition, the PNC is allowed to change the interval between system wake beacon to trade off between power save need and message transfer latency needs in the piconet."

Suggest add an SPS set 0 which allows DEVs to go to sleep up to the ATP. Text and MSCs to be generated by Schrader/Bain.

454 (Gubbi, TR) - The term "wake beacon" deserves a clear description. What is it intended for as far as DEV is concerned? Clearly state if DEV is allowed to sleep ONLY between two wake beacons and not allowed to sleep at TBTT of wake beacons. But if this is true, note that this is not acceptable for DEVs intending to save power in a large magnitude.Retain APS scheme from D10. **Suggest accept in principle**: "DEVs are allowed to refuse listening to system wake beacons. A DEV in an SPS set sets its own sleep period and may choose to participate or not participate in the PSPS. SPS DEVs not listening to system wake beacons (i.e. not participating in PSPS) will miss all PNC parameter change and broadcast announcements. If the piconet has changed in some manner during their sleep time, they have to scan and recover in a fashion out of scope of the standard. Add clarifying text in 8.13 'Wake beacon for a DEV is defined as the PNC defined system wake beacon for DEVs in PSPS mode {xref 8.13.1} and the SPS set wake beacon for a DEV in SPS mode {xref 8.13.2}'"

Suggest add an SPS set 0 which allows DEVs to go to sleep up to the ATP. Text and MSCs to be generated by Schrader/Bain.

499 (Gubbi, TR) - The DEVs must be required to "be awake to listen" than "required to listen" the latter gives the impression that they HAVE to somehow receive it as it is said in clause-5. Change "DEVs are required to listen to it" to "DEVs are required to be awake to listen to it" **Suggest accept in principle**: 'Change text on page 189, line 42 to: 'The system wake beacon is a normal beacon, with the additional requirement that all DEVs in PSPS mode shall be awake and listen for the system wake beacon.'"

Accept in principle: "Change text on page 189, line 42 to: 'The system wake beacon is a normal beacon, with the additional requirement that all DEVs in PSPS mode shall be awake and listen for the system wake beacon.' Add to the end of that paragraph 'If the there are not DEVs in PSPS mode or the PNC does not wish to use system wake beacons, it shall set the {Ed. note check name in new comment} system wake beacon field to 0x80 which indicates that every beacon is a system wake beacon.'"

507 (Gubbi, TR) - PSPS mode is very similar to DTIMs in 802.11 but only worse. There is no way that the PNC can stop a DEV from entering PSPS mode and hence sleep state. Hence if there is BC/MC traffic that is

pending transmission and a rogue DEV insists on going to SLEEP state, the BC/MC traffic gets held causing issues at other DEVs. If the thinking is that the ACK from PNC can be avoided, it causes other problems, like (a) Forcing PNC to take that decision of allowing DEV to enter PSPS mode within SIFS duration (Actually only the MAC part of it) (b) avoids the implementations to implement ACK transmission part independent of higher MAC functionality and (c) unnecessary retransmissions of PS mode command at the DEV To avoid this PSPS mode needs a PS-mode-response frame from PNC before which the DEV is not allowed to enter PSPS mode. However since there are other drawbacks as highlighted in later comments, this is not an acceptable scheme Remove PSPS mode update from the draft and retain the APS mode as in D10 However the PS status bit map is useful and hence retain that as applicable to APS instead of PSPS mode. This includes retaining APS related commands in clause 7 in D10 **Suggest reject**: "There is no desire in a piconet with power save mode to stop a DEV from entering power save mode. In this standard, DEVs are not required to follow BC/MC traffic. In PSPS mode, all BC/MC traffic is announced in the system wake beacon, giving all PSPS DEVs the option to listen to it if the so desire. a)PNC takes no decision. The entering of PSPS is always allowed. The PNC just ACKs the PS mode command using the normal Imm-ACK procedure. The requirement is that the DEV shall not consider itself in PSPS mode until the PNC confirms reception of the PS mode change command by an Imm-ACK. b)See a). No separate ACK procedure is used c) Since PNC cannot deny the request, no response in necessary. Note that no isochronous streams are terminated when the DEV enters sleep mode. The DEV enetering PSPS mode may terminate undesirable streams."

Reject "There is no desire in a piconet with power save mode to stop a DEV from entering power save mode. In this standard, DEVs are not required to follow BC/MC traffic. In PSPS mode, all BC/MC traffic is announced in the system wake beacon, giving all PSPS DEVs the option to listen to it if the so desire. a)PNC takes no decision. The entering of PSPS is always allowed. The PNC just ACKs the PS mode command using the normal Imm-ACK procedure. The requirement is that the DEV shall not consider itself in PSPS mode until the PNC confirms reception of the PS mode change command by an Imm-ACK. b)See a). No separate ACK procedure is used c) Since PNC cannot deny the request, no response in necessary. Note that no isochronous streams are terminated when the DEV enters sleep mode. The DEV enetering PSPS mode may terminate undesirable streams. Asynchronous allocations are re-scheduled by the PNC to occur in the system wake beacon or in beacons that immediately follow the system wake beacon."

508 (Gubbi, TR) - I am not sure how this new scheme (PSPS) can assume that all DEVs in the piconet have the same power save requirements and hence can use the same wake-beacon-interval. 802.15.3 caters for variety of devices and applications and hence there is a need for different such intervals depending on the kind of application served by the DEV. At least in 802.11 the DEVs are not mandated to be awake at all DTIMs and hence they can be sure that there will not be any directed frame that they are going to miss when they are asleep (doze mode). In APS mode this was enhnaced for better efficiency by allowing the DEV to request the sleep duration it wishes and the PNC permitting upto that duration. In PSPS mode that advantage has disappeared and hence this forces an upper limit on power saving for all DEVs in a given 802.15.3 piconet. Worst is it is same across the board for all DEVs in the piconet. To get around this issue, PSPS mode needs to allow DEVs to request intervals in multiples of wake-beacon-intervals. However given the quantization of the time durations involved and other drawbacks of the scheme, it is not recommended to retain this scheme. Remove PSPS mode update from the draft and retain the APS mode as in D10. However the PS status bit map is useful and hence retain that as applicable to APS instead of PSPS mode. This includes retaining APS related commands in clause 7 in D10: **Suggest reject**: "While it is true that the PNC makes the final decision of the system wake beacon interval, all DEVs indicate their preference in the PS mode change command and PNC makes a best effort compromise. Note that DEVs may refuse to participate in PSPS and its wake beacons by creating or joining an SPS set that fits their needs."

Suggest add an SPS set 0 which allows DEVs to go to sleep up to the ATP. Text and MSCs to be generated by Schrader/Bain.

315 (Heberling, TR) - [ParmChng] The whole paragraph on line 16-19 is residue from old text and totally wrong now/KO. Delete paragraph on line 16-19 "If the PNC decides to change PNID or BSID... ...value within the time-out duration and wait for beacons with the new PNID or BSID" **Suggest accept in principle**: Change text on page 201, line 16-19 to: 'If the PNC decides to change the PNID or BSID, the PNC shall send a beacon with the piconet parameter change element indicating the new PNID or BSID. The DEVs that received the beacon with the piconet parameter change element shall change the PNID or BSID to the new value at the time of the first beacon after the beacon with the change countdown field equal to zero has been sent.'"

> Accept.

64 (Gilb, TR) - IN B.3 it references a to-be-published reference, which is a big no-no and quite silly. Delete the references to RFC 3280 and RFC 3278. **Suggest accept**.

> Rene to provide new text.

CIDs 533 and 357 are similar to 506

Adjourned at 9:00 am.

1.2 Thursday, 19 September, 2002

Meeting called to order at 8:06 am

Attendees: Allen Heberling, Knut Odman, Rene Struik, Dan Bailey, Ari Singer, John Barr, Jay Bain, James Gilb

533 (Bain, T) - The idea of sleep is perhaps greater than not receiving. It is at least not transmitting or receiving and perhaps reducing power in other portions of the DEV. Awake is also more than just receive. Make suggested change. **Suggest accept in principle**, "Resolve as indicated in CID 506."

> Accept suggested resolution.

304 (Heberling, T) - [ChnlChng/MSC] The MSC for changing piconet parameters is flawed. Please make these changes:Place a hexagon spanning the PNC DME and MLME columns just below the last beacon w/ Piconet parameter change IE and just above the first beacon(on new channel). The text in the hexagon shall be: "PNC moves to new channel"Extend the current "DEV moves to new channel hexagon so that it spans both the DEV-1 MLME and DME columns. Please make the indicated changes. **Suggest accept**.

> Accept.

58 (Gilb, TR) - Based on the clause 6 text, there should be an MLME-PNC-HANDOVER.ind after the DEV (now PNC) sends its first beacon. Add primitive to MSC. **Suggest accept**.

> Accept.

232 (Heberling, TR) - [PNCHndOvr] Make these corrections to the MSC: 1) There are two DEV-2 MLMEs. Replace the one furthest to the right with a DEV-2 DME. 2) The MLME-PNC-INFO.cfm is incorrect. Replace it with an MLME-PNC-INFO.ind. Confirms are only used when a service layer receives a request from the layer above it. An indication is used when an unexpected signal is received. 3) Remove the MLME-NEW-PNC.ind primitive directed from the PNC MLME to the PNC DME. The PNC does not need to tell itself that there is going to be a new PNC. It already knows that. Please make the indicated changes.

Suggest accept in principle "Accept in principle. "1) change as requested, 2) no change, it was decided to use the confirm signal in Monterey, 3) change as requested."

> Accept in principle, "1) change as requested, 2) no change, it was decided to use the confirm signal in Monterey, 3) change as requested. Add block in 02/275r9 that indicates the optional ACL handover."

269 (Heberling, TR) - [PNCHndOvr] Some errors in text remain or were introduced after LB17.MSC in Figure 91 is also wrong./KO Text changes for 8.2.3 and ne MSC for Figure 91 are all collected in:02276r7P802-15_TG3-commentsD11_KO.doc, Resolution [03]. **Suggest accept in princple**, "The MSC will be modified as indicated in the resolutions of CID 58 and 232. Make the following text changes: In 6.3.13.4, page 59, line 45, change 'This primitive informs the originating DME its request for information from the PNC is complete.' to be 'This primitive informs the DME that the MLME has received a PNC information command, {xref 7.5.4.2}.' In 7.5.3.1, page 138, line 20 'the number of information records to be transferred using the PNC information command frame(s).' to be 'the number of DEV information records, {xref PNC handover info command}, that will be transfered from the old PNC to the new PNC.' In 8.2.3 PNC Handover, delete page 156, line 8-9, redundant, same text in paragraph below. Add to page 156, line 19, 'The PNC handover information command shall not be sent if the PNC has indicated in the PNC handover request command that it does not have any CTRBs to transfer.

The SPS inquiry response command shall not be sent if the PNC has indicated in the PNC handover request command that it doesn't have any SPS sets to transfer.'

Add to page 156, line 35, 'The new PNC shall broadcast its first beacon at the time the beacon would have been sent by the old PNC. This time may vary from the actual time due to clock inaccuracies of old and new PNCs. The new PNC shall start sending beacons with the beacon number counter set to one more than the beacon number of the last beacon that will be sent by the old PNC.'
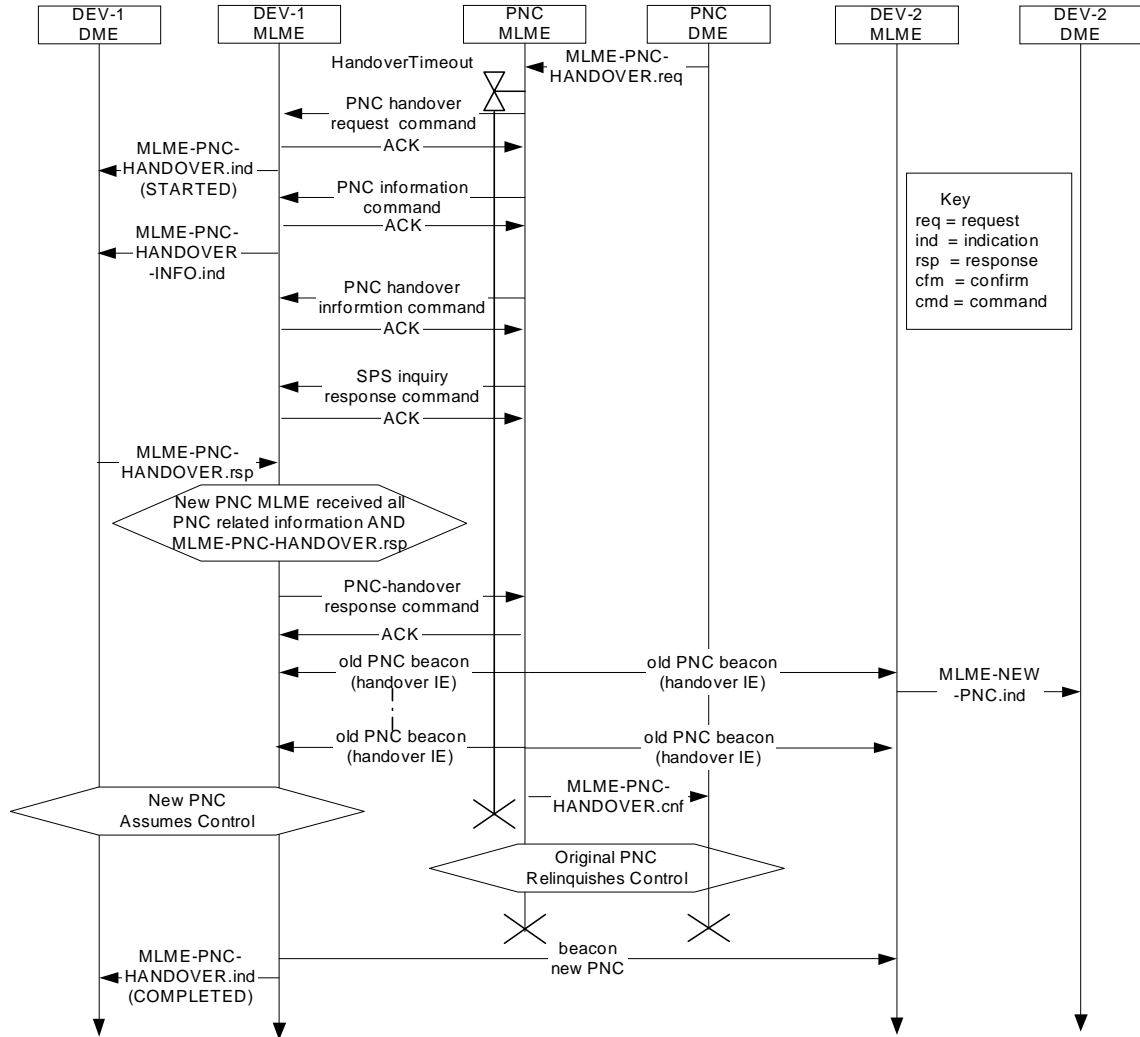
Add page 156, line 40ff, 'The PNC shall ensure that the beacon countdown includes at least one system wake beacon and at least aMaxLostBeacons beacons following that system wake beacon. The only exception to this requirement is if the PNC will be shutting down and does not have enought time to to wait for the next system wake beacon to complete the handover process. {Ed. note: This line may be moved to a new 8.1.1 that describes all beacon announcements.'}

The parent PNC shall not hand over to a DEV that is currently operating as a dependent PNC.'"

> Accept suggested resolution.

Handover MSC - various comments, suggestion from 02276r7P802-15_TG3-commentsD11_KO.doc below (with some editorial work):

| DEV-1 DME | DEV-1 MLME | PNC MLME | PNC DME | DEV-2 MLME | DEV-2 DME |

HandoverTimeout

MLME-PNC-HANDOVER.req

PNC handover request command

ACK

MLME-PNC-HANDOVER.ind (STARTED)

PNC information command

ACK

MLME-PNC-HANDOVER-INFO.ind

PNC handover inrformtion command

ACK

SPS inquiry response command

ACK

MLME-PNC-HANDOVER.rsp

New PNC MLME received all PNC related information AND MLME-PNC-HANDOVER.rsp

PNC-handover response command

ACK

old PNC beacon (handover IE)   old PNC beacon (handover IE)

MLME-NEW-PNC.ind

old PNC beacon (handover IE)   old PNC beacon (handover IE)

MLME-PNC-HANDOVER.cnf

New PNC Assumes Control

Original PNC Relinquishes Control

beacon new PNC

MLME-PNC-HANDOVER.ind (COMPLETED)

Key
req = request
ind = indication
rsp = response
cfm = confirm
cmd = command

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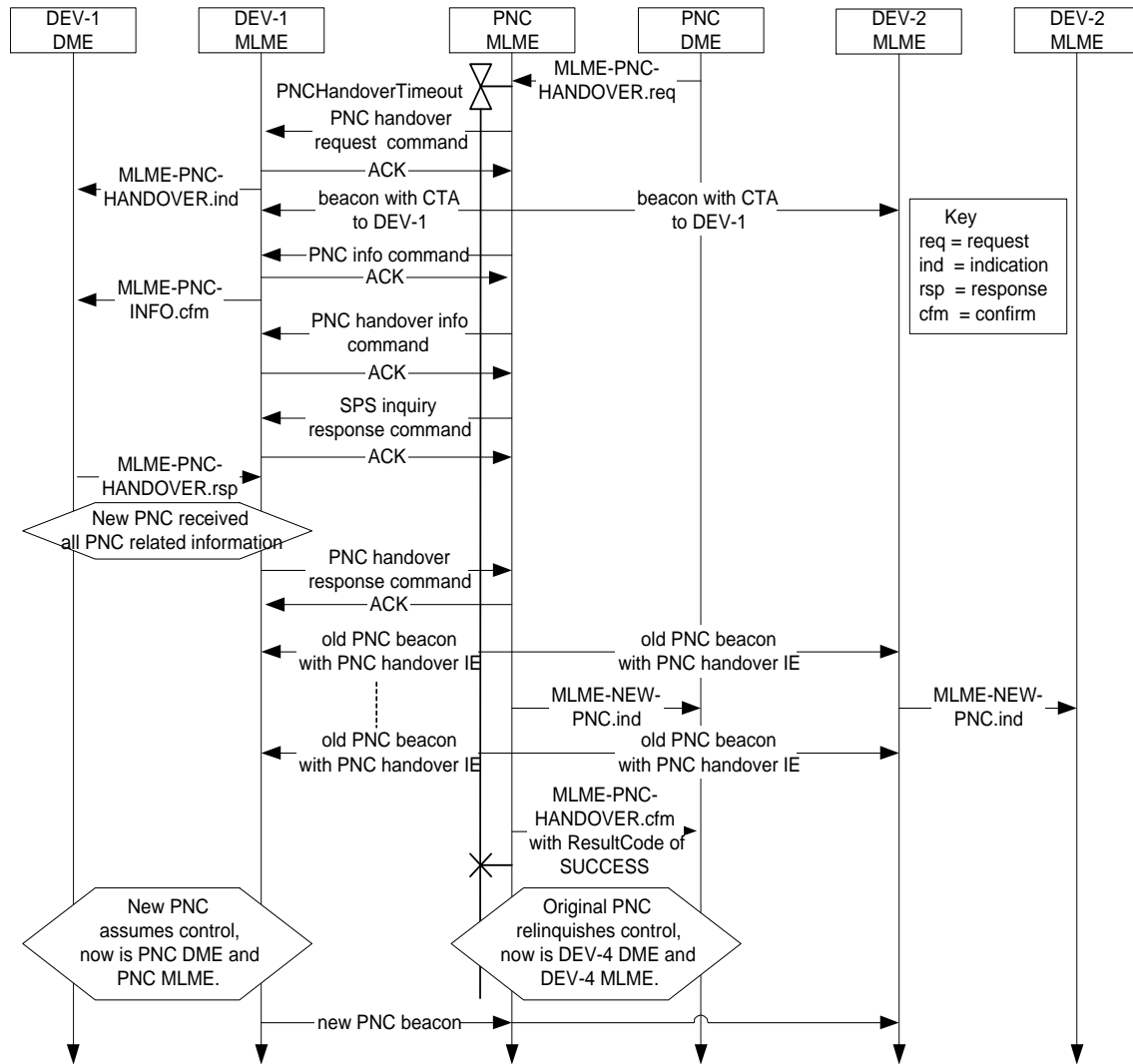48
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Original MSC:.

Figure 1—PNC handover MSC

463 (Gubbi, TR) - Figure-91 is a well done job, but the text needs to supplement some infothat can not expressed in the figure, which is incomplete in the currentupdate to this para. It should be mentioned that these commands shall besent by PNC even if there is no information present that fits into thosecommands so that the rx-DEV knows the exact end of the transaction. For example , what if there are no DEVs in power save mode. Still the SPS-inquiry-response-command shall be sent by PNC. It should be mentioned that the three commands in Figure-91 (PNC-info-command, PNC-handover-info-command and SPS-inquirey-response-cmd) shall be sent by PNC even if there is no information present that fits nto those commands so that the rx-DEV knows the exact end of the transaction. For example , what if there are no DEVs in power savemode. Still the SPS-inquiry-response-command shall be sent by PNC. **Suggest accept in principle**, "Rather than send the empty commands, the PNC handover request will contain the number of CTRBs and SPS sets that will be transferred. If the number of items is zero, then the old PNC shall not send the command and the new PNC will not expect to receive it. It is not possible for the number of DEVs to be less than 2 (i.e. the old PNC and the new PNC), so the PNC information command will always be sent. This is documented in the resolution of CID 269."

Accept suggested resolution.   1
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273 (Heberling, TR) - [PNCHndOvr] When chosing a DEV for voluntary or forced handover, one of the   3
most important parts is support for power save. A new PNC shall be selectedin order of how advanced pow-   4
ersave it supports/KO Add Table entries on 4th place, after PSRC: 4, SPS bit in Capability field, SPS=1 is   5
preferred5, PSPS bit in Capability field, PSPS=1 is preferred. **Suggest accept in principle** "Add the entries   6
for PSPS in the table and in the capability field, the definition is: 'The PSPS bit shall be set to 1 if the DEV   7
is capable of supporting PSPS as a PNC, {xref 8.13.1}. Otherwise the PSPS bit shall be set to 0.' If SPS is   8
made optional for PNC capable DEVs, then add the SPS entries as well (see resolution of CIDs 321, 324,   9
339, and 343), the definition for the capability field is: 'The SPS bit shall be set to 1 if the DEV is capable of   10
supporting SPS as a PNC, {xref 8.13.1}. Otherwise the SPS bit shall be set to 0.'"   11
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Accept suggested resolution.   13
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271 (Heberling, TR) [PNCHndOvr] Again: It is not the number of GTS that is the limiting factor of a   15
PNC,it's the number of CTRB it can support.In some superframes a CTRB doesn't lead to a GTS -> subrates   16
Sometimes a CTRB leads to multiple GTS -> superrate Sometimes a CTRB only leads to one instance of a   17
GTS -> asynchronous Sometimes a CTRB is split into GTS due to CT availability./KO Change table entry 5   18
from "Max number GTS" to "Max number of CTRB". **Suggest reject**, "Either measure, CTRB or GTS is   19
somewhat inaccurate with respect to determining the capabilites of the PNC. GTS has been used for many   20
versions of the draft (at least since D09) and is adequate for the purpose of PNC handover."   21
                                                                                             22
Accept in principle, "Change table entry 5 from 'Max number GTS' to 'Max number of CTRB' and   23
other appropriate locations, e.g. asociation request command."   24
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1.2.1 What to information to include in handover?   26
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235 (Heberling, TR) - [PNCHndOvr] It is crucial for handover that the old PNC knows if the new PNC can-   28
handle all associations and CTRB it manages. Therefore a DEV shall pass this info during association (ref   29
02/276r6 page 21, LB 17 CID 206,422) In addition, Power level needs to be passed. Last, MaxPro-   30
cessedCTA and MaxAssignedCTA should be moved here from 7.4.4 and 7.4.11./KO Add to Figure 45: 1   31
octet: MaxAssociations 1 octet: MaxCTRB 1 octet: MaxTXPowerLevel Move text for MaxProcessedCTA   32
and MaxAssignedCTA from 7.4.4 to this clause. Add text: The MaxAssociations field describes how many   33
associated DEVs this DEV can manage if it is PNC Capable and becomes the PNC. Non PNC Capable   34
DEVs shall set this value to 0.The MaxCTRB field describes how many CTRB this DEV can manage if it is   35
PNC Capable and becomes the PNC. Non PNC Capable DEVs shall set this value to 0.The MaxTXPower-   36
Level describes the maximum transmit power of this DEV as defined in {xref TxPowerLevel}. **Suggest**   37
accept in principle, "In the resolution of the last letter ballot, the TG considered the issue of handing over   38
too many DEVs or streams to the new PNC. The feeling was that it is best for the new PNC to determine   39
which DEVs or streams to retain and to disassociate any extra DEVs or terminate any streams that it was   40
unable to support. The DEVs that are in range of the new PNC could be different than the DEVs that are in   41
range of the old PNC. However, the max number of GTSs and max TX power level fields need to be added   42
with the following definitions: 43
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'The max number of GTS indicates how many GTSs the DEV is capable of allocating as a PNC. This shall   45
be set to 0 in a non-PNC capable DEV.   46
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The max TX power level indicates the maximum transmit power that is possible for the DEV. The power   48
level is in dBm, encoded in 2s complement notation. For example, if a DEV was capable of 14 dBm TX   49
power, the field would take on the value 0x0E while if the DEV was capable of -4 dBm TX power, the field   50
would take on the value 0xFC.'"   51
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Accept in prinple: "The max associated DEVS, max number of GTSs and max TX power level fields   53
need to be added with the following definitions: 54

'The max associated DEVs field indicatess how many associated DEVs this DEV can manage if it is PNC capable and becomes the PNC. Non PNC capable DEVs shall set this value to 0.

The max number of GTS indicates how many GTSs the DEV is capable of allocating as a PNC. This shall be set to 0 in a non-PNC capable DEV.

The max TX power level indicates the maximum transmit power that is possible for the DEV. The power level is in dBm, encoded in 2s complement notation. For example, if a DEV was capable of 14 dBm TX power, the field would take on the value 0x0E while if the DEV was capable of -4 dBm TX power, the field would take on the value 0xFC.'''

243 (Heberling, TR) - [PNCHndOvr] Since we now also hand over SPS sets, we need to add a numberof SPS set field to the PNC handover request./KO See frame and text in 02276r7P802-15_TG3-commentsD11_KO.doc, Resolution [03]. **Suggest accept in principle**, "Add one octet to the PNC handover request command named 'number of SPS sets' with the definition 'The number of SPS sets indicates the total number of SPS sets that will be transferred from the old PNC to the new PNC.'"

Accept suggested resolution.

253 (Heberling, TR) - [PNCHndOvr] MaxAssociations, MaxCTRB and MaxTxPowerLevel need to be passed during handover.(ref 02/276r6 page 21, CID 206)/KO. Add to Figure 64:1 octet: MaxAssociations1 octet: MaxCTRB1 octet: MaxTXPowerLevelAdd text:The MaxAssociations field is described in 7.5.1.1The MaxCTRB field is described in 7.5.1.1The MaxTXPowerLevel describes the maximum transmit power of this DEV as defined in {xref TxPowerLevel}. **Suggest accept in principle**, "Add max number of GTSs and max TX power level as indicated in the resolution of CID 235. Add definitions to this subclause for the new fields that say: 'The max CTRB field is defined in {xref Association request}.' and 'The max TX power level field is defined in {xref Association request}.'

Accept in principle: "Add max associated DEVs, max number of GTSs and max TX power level as indicated in the resolution of CID 235. Add definitions to this subclause for the new fields that say: 'The max associated DEVs field is defined in {{xref Association request}.', 'The max CTRB field is defined in {xref Association request}.' and 'The max TX power level field is defined in {xref Association request}.'"

40 (Gilb, TR) - The Number of CTRBs is probably unnecessary now that we are fragmenting the handover information command. Delete the field from the PNC handover request command. **Suggest reject**, "The CTRB field is used to indicate if the PNC will be sending the handover information command and the number of CTRBs it will be sending."

Resolution is to reject.

443 (Gubbi, TR) - Why is "Next Beacon" required? Once the CTRB description is provided tothe new PNC, it is upto that PNC to allocate CTAs? Remove all occurrences of the field "Next Beacon" from Figure-61. **Suggest reject**, "The next beacon field is used to facilitate seemless handover. DEVs with subrate allocations are expecting their allocations at a certain time and it is helpful if the new PNC is aware of these and is able to keep the allocations at the same time intervals. The new PNC is allowed to change the occurances of these allocations at any time (just as the old PNC was able to)."

Resolution is to reject.

Meeting adjourned at 9:30 am PDT.

1.3 Friday, 20 September, 2002

64 (Gilb, TR) - IN B.3 it references a to-be-published reference, which is a big no-no and quite silly. Delete the references to RFC 3280 and RFC 3278. **Suggest accept in principle**: "Change the typo on Page 347, line 19: RFC 3278 should be RFC 3279. On page 347, lines 17 and 19, delete '(soon to be published)'. Add the following references to the bibliography and put in the appropriate cross-references on page 347 (see 02/392r7 for formatted text).

[B1] RFC 3279, L. Bassham, R. Housley, W. Polk, "Algorithms and Identifiers for the Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) profile", Internet Request for Comments 3279, April 2002. See also http://www.faqs.org/rfcs/rfc3279.html.

[B2] RFC 3280, W. Ford, R. Housley, W. Polk, D. Solo, "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile", Internet Request for Comments 3280, April 2002. See also http://www.ietf.org/rfc/rfc3280.txt."

1.3.1 Security issues

104 (Gilb, TR) - After the authentication process has been completed, all security suites behave in an interoperable manner. Text should be added to clause 9 indicating that a PNC may support multiple security suites in the same piconet. **Suggest accept in principle**: "On page 226, lines 9-11, change this paragraph in sub-clause 9.4 to the following: 'A security suite defines mechanisms that may be used to perform the authentication process. A security subsuite, identified by a unique OID, specifies the operations within a security suite for performing authentication. After two DEVs perform the authentication process using any security suite, the two DEVs share keying material for use in the symmetric operations defined in {xref - 10.2.4}. The PNC may perform the authentication process using different security suites with different devices in the same piconet, since the resulting keying material will be of the same form in all cases. The list of accepted security suites and subsuites are specified in clause {xref - 10}.'"

113 (Gilb, TR) - There is no longer a mandatory sub-suite. Change last sentence in this paragraph to: "The list of accepted security suites and sub-suites are specified in clause 10." **Suggest accept in principle**, "Resolve as indicated in CID 104."

115 (Gilb, TR) - Since the symmetric cryptography building blocks are shared by each security suite, there is no reason to reference them in the security suites themselves. Make sub-clause 10.2.4 a stand alone section that does not relate to the security suites. Each security suite should deal only with the authentication operations and the reference to 10.2.4 from the security suites should be removed. **Suggest accept in principle:** "Page 275, lines 36-37: Replace the text at the beginning of 10.2.4 with the following: 'An authenticated DEV operating in a secure piconet or a DEV that is authenticated with a peer DEV shall protect frames using the symmetric cryptography building blocks specified in {xref new sub-clauses}.' Page 276, lines 53-54: Replace the text at the beginning of 10.2.5 with the following: 'An authenticated DEV operating in a secure piconet or a DEV that is authenticated with a peer DEV shall protect frames using the symmetric cryptography operations specified in the following sub-clauses.' Page 282, lines 40-41: Change the text in 10.3.2.1 to the following: 'All sub-suites of the ECMQV Koblitz-283 security suite shall perform the symmetric operations within the authentication protocol as specified in the following sub-clauses.' Remove the sentence 'The symmetric operations performed in this security suite are those specified in 10.2.5.' from 10.4 on page 289 linhe 16. Remove the sentence 'The symmetric operations performed in this security suite are those specified in subclause 10.2.5." from 10.5 on page 291 lines 29-30.'

384 (Barr, TR) - MAC PIB ACL group defined as an array whose contents are defined in Table 33. All of the entries are dynamic, but no clear mechanism to update these entries has been included in the draft. There are no limits on the minimum and maximum number of entries allowed in the ACL. The only use for this array in the MAC is for generation of the CCM nonce and obtaining the keys associated with a particular SECID for encoding or decoding payloads. Either remove the MAC PIB ACL or add appropriate method for updat-

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ing the information in the array. If the ACL is kept, add limit for the minimum number of ACLs that must be supported for a DEV, SM, and PNC. Provide a mechanism for updating and accessing the contents of an ACL entry. Suggest defining MLME commands for doing this using an index to the array. Add MAC PIB entries to indicate last index used in the array. Finally, clarify relationship between DEVHost and MAC regarding use and management of informaiton in the ACL. **Suggest accept in principle:** "Insert a new sub-clause in 6.3 with the text given in 02/392r7.

(begin new text for CID 384)

1.3.2 Initializing and Updating SECID Information

This primitive is used to initialize or update the management security information associated with a new SECID as the result of an authorization process. The parameters used for the MLME-SECID-UUPDATE primitive are defined in Table 1..

Table 1—MLME-SECID-UPDATE primitive parameters

Name	Type	Valid Range	Description
ManagementSECID	Integer	Any valid SECID as defined in {xref }	Specifies the security session ID for the management key.
TrgtID	Integer	Any valid DEVID as defined in {xref 7.2.3.}	The DEVID of the target DEV for this relationship.
SecurityManager	Boolean	TRUE, FALSE	This DEV is the security manager for this relationship.
KeyInfoLength	Integer	0-255	Length of ManagementKeyInfo
ManagementKeyInfo	Octet string	Any valid key	The key agreed upon during authentication that are used for protecting commands.

1.3.2.1 SECID-UPDATE.request

This primitive requests that the SECID and management keying information associated with the DEV be included or updated. The semantics of the primitive are as follows:

    MLME-SECID-UPDATE.request   (
                                     ManagementSECID,
                                     TrgtID,
                                     SecurityManager,
                                     KeyInfoLength
                                     ManagementKeyInfo
)

The primitive parameters are defined in Table 1.

1.3.2.1.1 When generated

The DME sends this request to the MLME after completing authentication with the PNC or a peer DEV.

1.3.2.1.2 Effect of receipt

The MLME adds this SECID to the list of authenticated SECIDs that can be used to protect command data with the target DEV in this authentication relationship.

(end new text for CID 384)

1.3.3 Others

430 (Gubbi, TR) - The changes in command frames (Assoc and disassoc) have rendered this IE useless. Where is this IE used? Remove this IE and move the defintion of "capability field" to 7.4.4 whereit is used first. **Suggest accept in principle**: "The only command which includes the Capability Information IE is the probe command. DEVs in the piconet receive the capability information for a DEV when it associates and the PNC broadcasts a PNC Information Command for all DEVs in the piconet. This information is also peri-odically broadcast by the PNC. A DEV can also request the capability info for a DEV from the PNC using the PNC Information Request command. Therefore, there is no need for the Capability Information IE to exist. Delete clause 7.4.11. Move Figure 36 - Capability field format and associated field description text to clause 7.5.1.1 replacing the text "The capability field is defined in 7.4.11". Note that clause 7.5.1.1 is the first location to use the two byte capability field as this field has been removed from the DEV Association IE. Replace all further occurrences of "The capability field is defined in 7.4.11" with "The capability field is defined in 7.5.1.1". Replace all references to "7.4.11" regarding the capability field with a reference to "7.5.1.1". Remove all references to "7.4.11" regarding the Capability Information IE. In clause 8.12, remove method "b" and rename method "c" method "b". In clause 11.7, replace the text "The encoding of the sup-ported PHY data rates used in the capabilities information element,7.4.11," with "The encoding of the sup-ported PHY data rates used in the capabilities field defined in 7.5.1.1,""

227 (Heberling, TR) - [IE/DEVAddr] DEV Adress is no longer needed as an element since the beacon con-tains the BSID and not the MAC address of parent and dependents. It is not used anywhere in the standard./ KO. Delete this element/clause. **Suggest accept**.

429 (Gubbi, TR) - Where is this "DEV address" IE used? I can't see any use for it since atall places there seems to be direct 6-octet field for the same purpose. Remove this IE. **Suggest accept**.

460 (Gubbi, TR) - Removal hnadover timeout: What if the DEV to which the handover is happening dies or its power is plugged out? What does the PNC do in that case? Do NOT remove the timeout from the han-dover request command and hence in this paragraph. **Suggest reject**: "The New PNC cannot abort in the midst of the information transfer based on a remote timeout. The timeout only has a value for the DEV DME setting it. There is a local timeout in the old PNC, so that it can recover from a failed information transfer. The information transfer is considered completed when the handover response command has been received by the old PNC. At that time the old PNC starts the beacon countdown. This is the point of no return. After the countdown, the old PNC must stop sending beacons. Exception analysis:

1) Old PNC gets no handover response command before timeout:
=> hand over to other DEV, shut down or remain PNC (example in CID 460)
2) New PNC gets no ACK on handover response command
=> repeat command until retry limit. Wait for countdown beacons.
3) New PNC receives no countdown beacons.
=> remain as DEV. If no beacons received, shut down after ATP.
4) New PNC misses some countdown beacons, but get some
=> assume PNC role at the time for the first beacon after the countdown.
No other exceptions possible."

491 (Gubbi, T) - 8.5.1 - Sentence "There is no guarantee of the length ...": Isn't CTRRespTime designed to provide this? - Remove this sentence - **Suggest accept in principle:** "The CTRRespTime is provided to

DEVs to give them an approximation of the number of superframes for processing of commands. Change the sentence to 'There is no absolute guarantee of .... time allocation.' Then add 'The CTR RespTime {xref .. } is available to provide an average of the time the PNC is currently taking to process channel time requests.'"

455 (Gubbi, T) - There is a grave mistake here. This is not supposed to be "number of supported SPS sets" it is supposed to be "Number of existing SPS sets".What if a PNC supports 100 sets but only 3 are existing currently. How does the implementor is supposed to interpret this line in that case? PS: This this text has been there since D10, the comment is marked "Tech"only as opposed to "Tech-Req". The voter is aware that this comment maybe rejected since it is not a change from D10 to D11. **Suggest reject:** "This field is intended to communicate the number of SPS sets that are supported by the PNC. The number of sets currently defined may be determined counting the number of sets returned by this command (it returns all of them)."

395 (Gubbi, TR) - The sentence "All asynchronous traffic to DEVs in PSPS mode will be allocated in the wake beacon". What does this mean? if a DEV is in PSPS mode and there are 100 other DEVs requesting to send async data to it, all the 100 requests are allocated in the wake beacon? Why is this sentence needed. Remove PSPS and revert back to APS mode as in D10 of the draft. **Suggest accept in principle** "Change text to: "For asychronous time allocations to a destination DEV that is in either PSPS mode or SPS mode, the PNC shall not allocate any CTAs in superframes other than the awake superframes for that DEV." Part 2: This sentence is needed in order for the implementor to know what behavior to implement and to expect from PNCs. In this case the implementer needs to know that allocations will be made with an awarness of the correct superframes in which to insert them rather than in any superframe that is convenient."

1.3.4 PN Services

434 (Gubbi, TR) 1. The very concept of indicating "application layer" capabilities does not belong in MAC. This is a potential issue in sponsor ballot. If this is absolutely needed, there is application specific IE that can be used for this purpose. The payload of the "piconet services" IE is not defined in this draft anyway (that is, it is already vendor specific). 2. Inclusion of DEVID is redundant. Given that this IE is sent by a DEV in piconet to indicate its "application layer" capabilities, what is the need for adding DEVID here since the MAC header of the frame already contains the DEVID? - If possible remove this IE or at least remove DEVID. **Suggest reject**:"1)This is analogous to saying that we shouldn't be carrying application layer payloads in GTS. This standard provides the means for the applications to operate and this includes providing information about supported applications. 2) The DEVID is provided so that the associating DEV known which DEV in the piconet is providing a certain service. It is useful in reducing the thrashing after association to locate the DEV offering the service absent the DEVID.

PNServices provide a useful capability for DEVs considering membership in a piconet.

There is precious little information provided during scan procedures as to what services may be available to an associating DEV. The PNServices provides early information to associating DEVs of a broader range of DEV (application) information.

Application level information tagged to individual DEVIDs in a piconet and available early in the "connection" process is a valuable addition to this standard. PNServices are provided during association to reduce the time expended between scanning and payload delivery, a key performance parameter of this standard.

Devices that are sleeping need may not be able to respond to a new DEV trying to obtain information about it in a timely manner so having this information available via the PNServices IE is additional value.

This standard does not define the content of the information field. It only defines a method of carriage of information provided by DEVs to the PNC and at the appropriate time. The use of the registered vendor ID assures that devices sharing the same vendor ID will interoperate. Further, it is expected that the vendor ID

will represent industry organizations as well as individual companies and thus a single vendor ID will cover a wide range of interpretation of the field information represented in the PNServices."

446 (Gubbi, TR) - The very concept of indicating "application layer" capabilities does not belong in MAC. This is a potential issue in sponsor ballot. If this is absolutely needed, there is application specific IE that can be used for this purpose with vendor specific command. The payload of the "piconet services" IE is not defined in this draft anyway (that is, it is already vendor specific). Let the vendor use the combination of "Vendor specific command" and "Vendor specific IE" and the freedom of command payload format to achieve whatever is desired in their products without causing any interoperability issues - Remove this command from the draft. **Suggest reject:** "Similar in response to cid 434. Additionally, the comment does not provide information on potential interoperability issues so it is not possible to address this portion of the comment."

438 (Gubbi, TR) - DEV utility field is unnecessary. Since piconet services are vendor specific this should be part of vendor-specific command that can be sent by any PNC or DEV at any time after the assoc/auth process is complete as per the needs of the implementation. - Remove DEV-utility field from Figure 45 and clause 7.5.1.1. **Suggest reject:** "The intent of PNServices is to provide the information early in the connection process. The DEV utility field indicates the desire of the associating DEV to receive information available from other DEVs in the piconet as "part of" the association process."

479 (Gubbi, TR) - Another hoops to go through at PNC for this information that standard does not have any control on. LEt the vendors decide how to communicate that info. This is not the only vendor specific info that is communicated in implementations. - Remove any updates to this clause (and preferably the entire clause). **Suggest reject:** "I am not sure that there is a description of an issue. The vendors do in fact determine how to communicate the information. The standard provides the vehicle for carriage of the information at the appropriate time in the DEV connection process."

477 (Gubbi, TR) - First complete paragraph of cluse 8.3.2: It's disappointing to see how much time and energy has been wated on this piconet services IE given that there is very little use for it and the same can be better achieved by Vendor-specific commands and/or IE. If the pcionet services field definition is outside the scope of the standard how can that standard decide how this info is exchanged between DEVs? -Remove this exchange mechanism (and preferably the piconet services IE) from the draft. **Suggest reject:** "On the first part of the comment, there is a spelling error (associating) in line 54. The remaining portions of the comment are addressed in cid 438 and 434."

478 (Gubbi, TR) - Third and fourth complete paragraph of cluse 8.3.2: It's disappointing to see how much time and energy has been wated on this piconet services IE given that there is very little use for it and the same can be better achieved by Vendor-specific commands and/or IE. If the pcionet services field definition is outside the scope of the standard how can that standard decide how this info is exchanged between DEVs? a probe from any interested DEV to another interesting DEV can obtain this IE. Why should PNC go through this hoops for this otherwise easily achivable task? Bottom line is, once a DEV comes to know of existence of another DEV in the piconet, through PNC, the second DEVs properties must be obtained by the first DEV by sending a SIMPLE, DIRECTED probe (req) and getting a probe (Response) in return. - Remove this exchange mechanism (and preferably the piconet services IE) completely from the draft. **Suggest reject:** – "See CIDs 438 and 434. Part of the point of the IEServices is to address the "interested DEV to another interesting DEV". This IE and the exchange provides this very early on in the connection."

1.3.5 Directed notification vs. announcement of CTAs

CIDs - 299, 301, 303, 305, 208, 71, 493.

1.3.6 Max CTAs

Is it useful to specify MAX assigned CTAs? MAX processed CTAs?

CIDs 201, 206, 219

1.4 Hard Issues

The hard issues are listed in the assignment spreadsheet by the terms in brackets.

1.4.1 MTS - do we need it? [MTS]

CIDs 56, 349, 350, 351, 352, 353, 354, 355, 513,

1.4.2 PM - SPS optional? Merge PSPS into SPS? [PM]

CIDs 321, 324, 339, 343,

1.4.3 PM - terminating streams when DEVs sleep. [PMwake]

CIDs - 65, 262, 450

2. Opening report

2.1 Status at opening in Monterey

.

Table 2—Ballot resolution as of opening of Monterey meeting

Type	LB19
T (technical)	72
TR (Technical required)	326
T and TR	398
E (editorial)	153
Total	551

2.2 Process for comment resolution

a)   Add topic category to comments
b)   Identify hot button topics
c)   Schedule resolution of hot button topics
d)   Begin resolution by topic of comments
   1)   Write resolutions if possible
   2)   Table issues that need more work
   3)   Add to hot topics if necessary
e)   Resolve hot button topics
f)   Get all text written and posted
g)   Hold BRC meeting if required

2.3 Editing process

a)   Put editorial edits into draft (already started)
b)   Send clauses to editors
c)   Integrate results
d)   Post interim version of the draft for review.
e)   Final edits
f)   Post for letter ballot

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3. Comment resolution in Monterey

3.1 Hot topic issues

Bit order

       Monday 7:00 pm - Resolved

Notifying DEVs of new CTA - Directed vs. in beacon (previously resolved by BRC as directed)

       Tuesday Morning, 8:00 am. - Resolved, waiting text. Open issues: how to request the CTA status IE? What is done with SPS DEVs waking up? (use PCTM to wake up plus allow mode change + CTRB?) James to gather up, Jay and Mark to handle SPS wakeup.

Probe - possible error code?

       Tuesday 8:00 am after notifying DEVs - Resolved, waiting text - James to locate CID and get text.

PNService IE - use probe instead of command? - Resolved

       Tuesday 8:00 am after probe

CTRB - fixed vs. variable length format?

       Tuesday 3:30 pm

Open/association MTS - Do we still need them?

       Tuesday 1:00 pm

Security modes - Do we have 2 or 3 modes?

ACL/PIB

       Wedneday 8:00 am

PM/SPS - SPS mandatory or optional?

       Wednesday 1:00 pm

3.2 Monday resolution

ACK

272 - Accept

274 - ACCEPT IN PRINCIPLE. On line 36, change "Dly-ACK request bit" with "Dly-ACK policy and the DlyACK request bit" , same change on line 48.

289 - Accept

233 - REJECT. The ACK serves the purpose of telling the transmit state machine if it was successful in getting the frame. The response is used to close the process at the DME level.

310 - ACCEPT IN PRINCIPLE. Add text: 'The source upon reception of the Imm-ACK shall send a MAC_ISOCH_DATA.confirm with the ResultCode set to DLY_ACK_FAILED to the FCSL. This implies acknowledgment of the data frame and additionally indicates that the dly-ACK policy has been refused by the destination.'

312 - Accept

270 - Accept

215 - Accept

526 - Proposed resolution, pending more text: "1) This is fixed by referencing both "Dly-ACK policy and Dly-ACK request bit" being set. 2) The FCSL is now notified in the MAC-ISOCH-DATA.confirm as indicated in CID 310. 3) Same resolution as 1). 4) Move the sentence "The destination DEV may change the max burst value in each Dly-ACK frame." to the end of the previous paragraph that ends "... max num (sp) frames, as provided in the Dly-ACK frame 7.3.2.2." (note spelling error). 5) Change "souce" to "source" 6) Add a sentence that says "The FCSL would then notify the DME that the Dly-ACK negotiation failed. The DME then knows that a modification of the channel time allocation might be required." 7) Some more text? Jay to write suggested new text to clarify, due Tuesday by 1:00 pm. 8) Resolved as indicated in CID 189.

523 - Accept

195 - Accept in principle: ACCEPT IN PRINCIPLE. Add the text for clause 6 and clause 8 from Clause 2.2.7 of 02/273r17 to describe the use of the ASIE.

347 - Accept in principle: ACCEPT IN PRINCIPLE. Add the text for clause 6 and clause 8 from Clause 2.2.7 of 02/273r17 to describe the use of the ASIE.

331 - Accept in principle: ACCEPT IN PRINCIPLE. Add the text for clause 6 and clause 8 from Clause 2.2.7 of 02/273r17 to describe the use of the ASIE.

217 - Accept

318 - ACCEPT IN PRINCIPLE. Change to UnassocID and change the acronym list to be UnassocID - unassociated ID.

530 - ACCEPT. Change from "Before a DEV has completed the association process, all frames between the PNC and the DEV shall be exchanged either in the CAP of the superframe or in an association MTS." to be "Before a DEV has completed the association process, all frames sent to the PNC by the DEV shall be exchanged either in the CAP of the superframe or in an association MTS."

Add additional sentence at the end of the first paragraph "For association using MTS, the association response command is sent in an MTS with PNCID as source and UnassocID as destination."

34 - Accept

35 - Accept in principle: ACCEPT IN PRINCIPLE. Insert the PiconetServicesInquiry field (values: enumeration; REQUEST, NOREQUEST; Requests that the PNC sends the services information about the piconet as described in {xref AssociationRequest}) into the table. The capability field is still used.

133 - ACCEPT IN PRINCIPLE. Insert the PiconetServicesInquiry field (values: enumeration; REQUEST, NOREQUEST; Requests that the PNC sends the services information about the piconet as described in {xref AssociationRequest}) into the table. The capability field is still used.

149 - Accept.

411 - Accept

425 - Can we remove the application data ID? Ask M. Schrader. Table until response, AI for JPKG to contact him.

426 - Can we remove the DEVID? Ask M. Schrader. Table until response, AI for JPKG to contact him.

414 - ACCEPT IN PRINCIPLE. Delete the sentence "The PNC may use multiple beacons to broadcast successive DEV association IEs if too many DEVs are associating than will fit in a single beacon.." as it is confusing and does not add any new information. The PNC is able to choose when it sends any IE.

417 - ACCEPT IN PRINCIPLE. Delete the capability field, change the name of the Association status field to be "DEV characteristic". In the new DEV characteristic field, put in a 1 bit Association status field that is 0 for disassociated and 1 for associated, a 5 bit "Supported data rates" with an xref to where defined in 7.11 (or where this goes in the future) and 2 reserved bits. Check in other places where Association status field is defined to see if they need to be changed to match.

418 - ACCEPT IN PRINCIPLE. DEVs are not required to authenticate to other DEVs in a piconet. They are only required to authenticate with the PNC in a secure piconet. However, this status is not useful here, therefore it will be removed as valid value as indicated in the resolution of CID 417.

415 - ACCEPT IN PRINCIPLE. This is already required in 8.3.1, page 164, lines 50-51 where the PNC repeats it at least aMinBeaconInfo which has a value of 4.

419 - ACCEPT IN PRINCIPLE. Move DEV address to the first position in this IE and in the PNC info command's DEV record on page 139, figure 64.

33 - ACCEPT IN PRINCIPLE. Delete the three sentences. In 8.3.4 change the last sentence in the paragraph on page 167, line 1 to be 'Similarly, if the beacons from the PNC are not received by the DEV for longer than the ATP, the DEV shall consider itself disassociated from the piconet and may try to associate again. The DEV notifies the DME that the ATP expired using the MLME-ATP-EXPIRED.ind primitive.' Keep MLME-SYNCH.{request,confirm} as they are used for the association process. Delete figure119. Rename MLME-SYNCH-LOST as MLME-ATP-EXPIRED. Add text to 8.3.1 that indicates that the DEV needs to perform an MLME-SYNCH prior to starting the association process. {Ed. note: Generate the text}.

18 - Accept

37 - ACCEPT IN PRINCIPLE. Add a second MLME-ASSOCIATE.ind to the MSC after the second association request command. Add the OrigID to the MLME-ASSOCIATE.ind and put a definition in the table that says it is either the UnassocID or the DEVID that was just assigned by the PNC. Add DEVID=UnassocID to the first MLME-ASSOCIATE.ind and DEVID=0xzz to the second one.

439 - Accept.

53 - ACCEPT IN PRINCIPLE. Delete aDEVIDReuseTime. Change 'However, the reallocation of the same DEVID by PNC shall be at least aDEVIDReuseTime after the disassociation of the DEV that was allocated the same DEVID.' to be 'After the PNC sends a disassociation command to a DEV, the PNC shall not reuse the same DEVID of that DEV until at least two times the ATP duration for that DEV has passed.' Add to the

ATP discussion in disasociation 'The PNC shall send a disassociation command to a DEV that sends a frame after its ATP has expired.'

437 - ACCEPT IN PRINCIPLE. Add that the units are in millisconds here and in 7.5.1.2.

43 - ACCEPT. Double check to make sure that all of the IEs that need to be there are in Table 39 (e.g. PSPS status and SPS status).

38 - REJECT. Although in some cases it may help to have the CTAs last so that a DEV can shutdown early if it has not decoded a CTA assigned to that DEV within MaxProcessedCTAs. However, with the CTAs first, the DEVs have more time to react to the channel time allocations and the CTAs start in a known location.

405 - REJECT. Although in some cases it may help to have the CTAs last so that a DEV can shutdown early if it has not decoded a CTA assigned to that DEV within MaxProcessedCTAs. However, with the CTAs first, the DEVs have more time to react to the channel time allocations and the CTAs start in a known location.

413 - ACCEPT. Double check to make sure that all of the IEs that need to be there are in Table 39.

406 - ACCEPT IN PRINCIPLE. Change the figure 9 title to be 'Piconet synchronization parameters field format.' Change the sentence 'All beacons include the piconet synchronization parameter field.' to be 'All beacons include the piconet synchronization parameter field, as shown in the frame formats for the non-secure, {xref} and secure beacons, {xref}.'

94 - Accept.

192, 345 - Table, everyone to ask for help.

281 - Accept

467 - REJECT. The PNC DEV-Address is no longer used to distinguish the piconet, instead BSID identifies the piconet (with the PNID). However, many parts of the standard refer to the Parent PNC DEV-Address and these will be changed to refer to the Parent BSID.

433 - REJECT. The overlapping PNID element is only used to report PNIDs. The PNC is required to change its PNID if an overlapping piconet is found that uses the same one. However, the PNC is not required to change its BSID. The actual number of piconets using the PNID is not important, rather it is simply the existence of at least one piconet with that PNID that matters. Furthermore, this IE is sent even if only a frame and not the beacon is detected on another channel. In this case, the DEV doesn't know the BSID.

242 - ACCEPT IN PRINCIPLE. Change this sentence frag.: <from> "...remove the parent PNC DEV address element from ..." <to> "...remove the parent BSID IE from ..."

238 - ACCEPT IN PRINCIPLE. Change this sentence frag.: <from> "...remove the parent PNC DEV address element from ..." <to> "...remove the parent BSID IE from ..."

408 - ACCEPT IN PRINCIPLE. After the sentence ending "... the CAP of the current superframe." add "The CAP command bit applies to all commands except for the association request command, which is covered by the CAP association bit."

67 - Accept.

74 - ACCEPT IN PRINCIPLE. Add a new timing parameter called BIFS = SIFS + aCCADetectTime and use it instead of RIFS in the backoff procedure. Add BIFS - backoff interframe spacing to the acronyms clause. Modify clause 11 to match this new usage.

451 - 'When the DestID of this command is PNCID, the values in the command shall correspond to all frames exchanged by the DEV with other DEVs in the piconet. When the DestID of this command is a non-PNC DEVID, the values in the command shall correspond to the frames exchanged between the requesting DEV and the target DEV.'

3.3 Tuesday

Directed vs. beacon announcement of new CTA.

299, 301, 303, 305 - Use IEs in the beacon, for BC/MC and pseudo-static slots to ACTIVE DEVs they are in the system wake beacon plus 3 following. For power save DEVs, they are in the DEVs wake beacon plus 3 following wake beacons. Also, a DEV that wants this info but missed it, may request it from the PNC with with probe command? How do you indicate the stream index? Or do you get all of them. How do we add text to probe to request multiple IEs? Do we add a CTA information request and CTA information response (or use PNC handover information command).

PNService IE - use probe instead of command?

　　　　Tuesday 8:00 am after probe

255 - REJECT. The information sent in the PN services command is likely much longer than an IE, thus it is easier to send it in a command. With a single command, the DEV knows when it has received all of the data, as opposed to an set of IEs.

283 - REJECT. The information sent in the PN services command is likely much longer than an IE, thus it is easier to send it in a command. With a single command, the DEV knows when it has received all of the data, as opposed to an set of IEs.

346 - REJECT. The information sent in the PN services command is likely much longer than an IE, thus it is easier to send it in a command. With a single command, the DEV knows when it has received all of the data, as opposed to an set of IEs.

Probe - possible error code?

　　　　Tuesday 8:00 am after notifying DEVs

CID ?? - Which one do we need to say no? Suggest overall probe procedure, if you get an IE you are not able to respond to (i.e. it is listed as may respond or shall not respond), the DEV sends back the appropriate IE with the identifier and a zero length. Also need to work on the clause 8 table for different wording, you always respond, but sometimes you give a null IE. {Ed. note: Need to work on the words}.

282 -Withdrawn

46 - Accept.

23 - ACCEPT IN PRINCIPLE. For the PNC received request from DEV, change the following to shall ignore: DEV association, PNC shutdown, Piconet parameter change, PNC handover, SPS status.

44 - ACCEPT IN PRINCIPLE. Add an MLME-PROBE.confirm to just before the first MLME-PROBE.ind sent to DEV-2. Change the probe primitve parameters to match the following (same definitions).

MLME_PROBE.request
(
TrgtId,
InfoElementMap,
InfoElementList,
ProbeTimeout
)

MLME_PROBE.indicate

(
OrigId
InfoElementMap
)

MLME-PROBE.response   (
OrigId,
InfoElementMap,
InfoElementList,
ProbeTimeout
)

MLME-PROBE.confirm   (
TrgtId,
InfoElementList,
ResultCode
)

52 - Replace Table 53 with the following.

503 - ACCEPT IN PRINCIPLE. Change the sentence to 'A DEV shall not report overlapping piconets if it determines that the beacons were received from a child or 802.15.3 neighbor piconet that is associated with the DEVs current piconet.'

306 - ACCEPT IN PRINCIPLE. Change the field to be the Parent BSID IE, length 8-34, change the text to be: The parent BSID IE is the address from a parent BSID IE, 7.4.3, found by the DEV in a beacon. If the DEV found only a frame and did not find a beacon, it shall include a zero length parent BSID IE. Change the length of the Piconet BSID IE to be 8-34.

45 - Accept.

452 - ACCEPT. Change the BSID IEs to include the MAC address of the PNC (or parent PNC). Rename the IEs to be the Piconet IE and Parent piconet IE. Rename throughout (after change from Parent DEV address IE to Parent BSID IE.) Change the lengths of the fields in this command to be 14-40.

Table 3—Rules for sending to probe requests

Information element	Subclause	PNC allowed to request?	DEV allowed to request?	PNC sends?	DEV sends
Channel time allocation	7.4.1	Shall not request	Shall not request (no)	Shall not send	Shall not send
Piconet BSID	7.4.2	Shall not request	May request (yes)	Shall not send	Shall not send
Parent BSID	7.4.3	Shall not request	May request	Shall not send	Shall not send
DEV association	7.4.4	Shall not request	Shall not request	May send	Shall not send
PNC shutdown	7.4.5	Shall not request	Shall not request	May send	Shall not send
Piconet parameter change	7.4.6	Shall not request	Shall not request	May send	Shall not send
Application specific	7.4.7	May request	May request	May send	May send
Pending channel time map (PCTM)	7.4.8	Shall not request	May request	May send	Shall not send
PNC handover	7.4.9	Shall not request	Shall not request	May send	Shall not send
DEV address	7.4.10	May request	May request	May send	May send
Capability information	7.4.11	May request	May request	May send	May send
Transmit power parameters	7.4.12	May request	May request	May send	May send
SPS status	7.4.13	Shall not request	Shall not request	May send	Shall not send
PSPS status	7.4.14	Shall not request	May request	May send	Shall not send
Public-key object	7.4.15	May request	May request	May send	May send
Security suite OID	7.4.16	May request	May request	May send	May send
Overlapping PNID	7.4.17	May request	Shall not request	Shall not send	May send
Piconet services	7.4.18	May request	May request	May send	May send
Vendor specific or reserved	7.4	May request	May request	May send	May send

24 - ACCEPT IN PRINCIPLE. Add a table to 6.3.18 called remote piconet description, as shown in 02/ 392r2. In table 21, change PiconetDescription to be RemotePiconetDescription with cross references to the new table.

216 - ACCEPT IN PRINCIPLE. Add a table to 6.3.18 called remote piconet description, as shown in 02/ 392r2. In table 21, change PiconetDescription to be RemotePiconetDescription with cross references to the new table.

500 - ACCEPT IN PRINCIPLE. Change "Any frame may beattempted at most aMaxRetransmissionLimit number of times before the transmitting DEV gives up on that frame and discards it. If a fragment of an MSDU fails retransmission up to the retry limit, the source DEV shall discard all MPDUs of that MSDU. However, a DEV might choose to attempt retransmission of an MPDU a fewer number of times as some data streams have a short life time." to be "A DEV determines the number of times a frame is retried before the DEV gives up on that frame and discards it. If the DEV gives up on a fragment of an MSDU, the DEV shall discard all MPDUs of that MSDU."

Table 4—Elements of RemotePiconetDescription

Name	Type	Valid Range	Description
BSID	As defined in Table 4	As defined in 7.4.2	The text string of a discovered piconet.
PNCDEVAddress	MAC address	Any valid individual MAC address	The MAC address of the PNC of the piconet that was found.
PNID	As defined in Table 4.	As defined in Table 4.	The PNID of a discovered piconet
PiconetType	Enumeration	PARENT, DEPENDENT	The type of a discovered piconet.
Parent BSID	As defined in 7.4.3.	As defined in 7.4.3.	The BSID of the parent piconet if a beacon of a dependent piconet was found.
ParentPNCDEVAddress	MAC address	Any valid individual MAC address.	The MAC address of the parent PNC of the piconet that was found.
ScannedFrameType	Enumeration	BEACON, NON-BEACON	Indicates what type of frame was found. {Ed. note: change table 5 as well}
ChannelIndex	Integer	0-255	A PHY dependent channel as defined in 7.5.6.4

Open/association MTS - Do we still need them?

Tuesday 1:00 pm, CIDs 56, 349, 350, 351, 352, 353, 354, 355, 387, 513

Issues:

Con MTS: Do we need two multiple access methods? IP cost if any? Complexity from supporting both and in the specifying in the standard. Efficiency of contention? How much efficiency? For minimum CAP of say 160 us, average backoff is 16 (1/2 of 32) with 16 us slots or 320 us. That makes about a 1 out of 2 or 3 possibility of getting through. Lack of predictability of determinism of when an MTS is made available by the PNC. Any prior art? WMS says that there are plenty of examples of sloted aloha in the literature. KO: Hiperlan uses RACH (random access channel). Gubbi proposal used RACH anyway (Q slot for reQuest slot). For predictable responses, would sub-rate CAPs work as well?

Pro MTS: CAP needs to be long enough. If you want a minimum contention period, then slotted aloha takes up the least amount of time. Will new PHYs really be able to support a CAP?

Reschedule for Thursday 1:00 pm.

425 - Accept

426 - Accept

435 - ACCEPT IN PRINCIPLE. Change "PNC" to be "PNC or destination DEV"

488 - ACCEPT IN PRINCIPLE. Change the sentence 'If an Imm-ACK or del-ACK is expected for that frame, ... PHY rate as the transmitted frame.' to be 'If an Imm-ACK or Dly-ACK is expected for that frame, the DEV shall check whether there is enough time remaining in the time slot to accomodate the current frame, 2 SIFS periods and the Imm-ACK or Dly-ACK frame at the same PHY rate as the transmitted frame.'

22 - Options: New request replaces all old for both? Or add a single bit that says what to do?

483 - ACCEPT IN PRINCIPLE. 1. Add definitions for subrate and super-rate slots to Clause 3. 2. The TG is open for suggestions for new names for subrate and super-rate. To date, we have been unable to find better terminology. 3. Yes, the text indicates that psuedo-static CTAs are not allowed to happen once per many superframes, rather they are allocated every superframe.

484 - Accept.

400 - ACCEPT IN PRINCIPLE. Change 'of an isochronous stream that is currently employing the Dly-ACK mechanism.' to be 'of a stream that is currently employing the Dly-ACK mechanism. It is not valid for frames using the asynchronous stream index or the MTS index.'

166 - ACCEPT IN PRINCIPLE. Add to when generated in MLME-CREATE-STREAM.request: 'If a multi-cast or broadcast stream was opened with any other ACK-Policy than no-ACK, the MLME will not send a channel time request command to the PNC and shall be respond with MLME-CREATE-STREAM.confirm with ResultCode set to ILLEGAL_ACK_POLICY.'

182 - ACCEPT IN PRINCIPLE. Add text to When generated: 'If the dly-ACK policy was used, but the destination refused the use of dly-ACK, the ResultCode shall be set to DLY_ACK_FAILED. This indicates successful transmission of the corresponding data frame.'

498- REJECT. The use of null CTAs allows DEVs that were listening to a BC or MC stream to know that it is no longer allocated. This can't be done with a directed frame. In addition, the standard is using directed frames to communicate with the source and IEs in the beacon to communicate with destinations. The TG discussed this issue at length in Vancouver, on conference calls, the ad-hoc meeting in Schaumburg and in Monterey. Both methods, directed frames and null-CTAs were considered in the discussions and it was felt that null-CTAs would better serve the purposes of the standard.

168 - Accept.

449 - Accept.

48 - ACCEPT IN PRINCIPLE. Add the priority parameter with definition in the table as indicated in CID 160.

51 - ACCEPT IN PRINCIPLE. Change as indicated. Also, show the data frame as coming from the MAC/MLME to the other MAC/MLME as well as the ACK.

265 - ACCEPT IN PRINCIPLE. Correct the figure as indicated in CID 51.

50 - Accept. {Ed. note: we need to write some text for the error code in the MAC-ISOCH-DATA.confirm.}

156 - Accept.

160 - Accept.

307 - Accept.

485 - ACCEPT IN PRINCIPLE. Change "the PNC may overlap the allocations for the old and new psuedo-static GTSs" to "However note that the PNC may overlap the old and new locations of the same psuedo-static GTS within a superframe as it does not cause any issue of frame collisions. If PNC sees the usage of the new allocation by both the source of the destination of old allocation before the expiration of aMAxLost-Beacons number of supreframes, then the PNC may reuse the old allocation for another pair of DEVs" After

the end of sentence "... and begin using the new GTS." The second point is already handled in the draft with the requirment on page 171, line 6, "When the source of a pseudo-static GTS receives a beacon with the new CTA, it shall cease using the old GTS and begin using the new GTS."

256 - Accept.

3.4 Wednesday, 11 September, 2002

Security modes - Do we have 2 or 3 modes?

ACL/PIB

PNC handover of ACL information

      Wedneday 8:00 am

PM/SPS - SPS mandatory or optional?

      Wednesday 1:00 pm

92 - ACCEPT IN PRINCIPLE. Suggest a table that has security levels (i.e. claimed bits) and if the OID offers cryptographic authenticiation of public keys for each of the OIDs. Merge Mode 1 and Mode 2 services offered, pointing out that some OIDs use certificates, some don't. Throughout the draft, use only mode 0 or mode 1 or security off or security on. Change the SEC mode field in the beacon to be only one bit.

ACL

370 - Why can't a mode 0 PNC use the ACL? I thought this is how we got rid of mode 1. Maybe this is just an oversight.

384 - MAC PIB ACL group defined as an array whose contents are defined in Table 33. All of the entries are dynamic, but no clear mechanism to update these entries has been included in the draft. There are no limits on the minimum and maximum number of entries allowed in the ACL. The only use for this array in the MAC is for generation of the CCM nonce and obtaining the keys associated with a particular SECID for encoding or decoding payloads.

Table until Thursday at 1:00 pm, look for compromise text.

Handover - Dan Bailey from NTRU said that they have no patents or applications on this method. He does not personally know of any from other companies.

102, 91 - Suggest passing hashes of public keys. Add 160 bit (20 octets) with the associated DEV address and the OID (possibly length). Rene asked why not hand over the public keys instead of the hash? Dan said for length concerns (160 up to 1757 bits, 20-200 octets, currently. It could be up to 4 times 256 bytes for certificates). Table until Thursday at 1:00 pm, need specific text that describes how to do it.

520 - Accept.

49 - ACCEPT IN PRINCIPLE. Resolve as indicated in CID 166.

180 - Accept.

258 - Accept.

154 - Accept.

212 - Accept.

494 - ACCEPT IN PRINCIPLE. The sentence was to indicate that this was the initial allocation of the CTA, not to say that it would occur first in the superframe. Therefore, change 'The PNC shall issue the first GTS for the stream in the superframe indicated in the channel time allocation command.' to be 'The PNC shall issue the initial GTS for the stream in the superframe indicated in the CTA status IE.'

492 - REJECT. The goal here is that the PNC is allowed to update its CTAs without waiting for another process to complete, either partially or completely. This is the fastest way to get the channel time allocated. As soon as the DEV sees the CTA in the beacon, it is able to use the time.

160 - Accept.

162 - Accept.

169 - ACCEPT IN PRINCIPLE. The stream termination bit is implied by the MLME-TERMINATE-STREAM command and doesn't need to be passed. It is implied as well for the other MLME-XXX-STREAM commands. The priority parameter will be added as indicated in CID 160.

257 - ACCEPT IN PRINCIPLE. Modify the MSC in Figure 108 as follows: 1) Delete the Evaluate request symbol from the PNC MLME column. 2) Delete the Allocate resources symbol from the PNC MLME column. 3) Move the channel time response command to just below the Check resources symbol, since this is where the decision regarding the two error conditions is determined. Also move the ACK up in the diagram as well. 4) Move the MLME-CREATE-STREAM.cfm primitive to just below the starting point of the ACK to the channel time response command.

263 - ACCEPT IN PRINCIPLE. Add the MLME-TERMINATE-STREAM.request and the MLME-TERMINATE-STREAM.confirm to the MSC. Also, delete the first condition symbol 'de-allocate stream'.

259 - ACCEPT IN PRINCIPLE. Delete figure 110.

134 - ACCEPT IN PRINCIPLE. Also add a definition to the table, StreamIndex, As defined in {xref}; As defined in {xref}; The stream index that was assigned in the channel time allocation process for the dependent piconet.

277 - Withdrawn, 11 September, 2002

221 - ACCEPT IN PRINCIPLE. Add to the figure '1 octet, Remaining DEVID', Also add the description 'The remaining DEVID indicates which dependent piconet is able to continue operation as described in {xref shutdown}. It shall be set to the PNCID if there are not dependent piconets in the current piconet.

541 - ACCEPT IN PRINCIPLE. Delete all parameters for the MLME-START-DEPENDENT.confirm except for the ResultCode.

141 - Accept, See also CID 541 and 136.

136 - ACCEPT. See also CID 541 and 141.

140 - Accept.

487 - ACCEPT IN PRINCIPLE. Delete the sentence 'However, the PNC shall not reduce the channel time allocation of a private GTS allocated for a child or neighbor network.'

317 - ACCEPT IN PRINCIPLE. (see 02/392r3 for formatting help) Page 199, lines 45 and 46 change 'The exceptions to this are when the parent is changing its PNID or BSID and that a child or neighbor PNC decides not to change channels, 8.11.1, with the parent PNC.' to 'The exceptions to this are:

— when the parent is changing its PNID or BSID
— A child or neighbor PNC decides not to change channels with the parent PNC and is shutting down, 8.11.1.'

page 202, line 44: Change '... piconet parameter change IE, 7.4.6 in ...' to be'... piconet parameter change IE, 7.4.6, with ChangeType set to CHANNEL, in ...'

page 203, at appropriate location, 'All DEVs shall not transmit on the new channel until a beacon has been correctly received on the new channel.'

page 202, line 51, Change 'from their current channel to the new channel immediately after the beacon when the change countdown field becomes zero.' to be 'from their current channel to the new channel before the first expected beacon on the new channel.'

472 - ACCEPT IN PRINCIPLE. On page 163, line 12 Change 'shall cease operations by the time of the last beacon sent by the parent PNC.' to be 'shall either cease operations, change channels or join another piconet as a dependent piconet by the time of the last beacon sent by the parent PNC.'

469 - ACCEPT IN PRINCIPLE. On page 162, line 53, change 'shall cease operations by the time of the last beacon' to be 'shall either cease operations, change channels or join another piconet as a dependent piconet by the time of the last beacon'

465 - ACCEPT IN PRINCIPLE. Add text at the end of line 2 that says, 'There is no restriction in this standard on the number of levels that may be created. However, there is a practical limitation to the number of dependent piconets and the levels that are able to be supported.'

464 - ACCEPT IN PRINCIPLE. Change 'a child of a child or child of a neighbor' to be 'It is also possible for another dependent piconet to be formed in a child or neighbor piconet'. Ed. Note: combine all stuff that is common to child and neighbor in an introductory subclause, if possible.

391 - REJECT. The standard allows the child PNC to allocate its channel time in any way that it wants. Therefore, a child PNC may allow the formation of both child and neighbor piconets. See also the resolution CID 464.

392 - ACCEPT IN PRINCIPLE. The standard already requires a DEV to be a member of a piconet in order to communicate with other DEVs in that piconet. Therefore, a member of a child piconet shall not communicate with members of the parent piconet, unless that DEV is a member of the parent piconet (which is allowed).

458 - ACCEPT IN PRINCIPLE. The primitive has had the StreamIndex added which indicates the CTA to be used as well as the DEVID. The DEVID indicates if the dependent piconet is a child or neighbor. At this point in the process, the only difference between the two piconets is the DEVID used in the CTA. Within its own piconet, there is no difference between a child or neighbor.

521 - ACCEPT IN PRINCIPLE. Change to "A piconet which allocates guaranteed time slots for another piconet (child or neighbor types) operating in the same channel".

Suggested text for CID 475:

'8.2.6.4 Parent PNC termination of a dependent piconet

If the parent PNC wishes to stop the child piconet, it shall terminate the stream allocated to the child piconet using the isochronous stream termination procedure, 8.5.1.3. If the parent PNC wishes to stop the neighbor piconet, it shall send a disassociate request, 8.3.4, to the neighbor PNC. In either case, the dependent PNC shall then immediately initiate its shutdown procedure, 8.2.6. The parent PNC shall listen for the dependent PNC shutdown beacon sequence to determine when the dependent piconet CTA should be removed. The parent PNC may set a maximum time for the completion of the dependent shutdown sequence, after which the CTA will be removed regardless of the completion of the dependent shutdown procedure. In the case of a child piconet, this timeout is set in the MLME while for a neighbor piconet, this time is set via the MLME-DISASSOCIATE. request primitive, 6.3.6.1. If the dependent PNC is a neighbor that is not 802.15.3 compliant, the parent PNC shall provide the same time as it allows for its own shutdown sequence, for the neighbor PNC to stop its piconet before removing its private CTA.'

Suggested text for Beacon information announcement.

8.1.1 Beacon Information Announcement

The PNC sends several IEs in its beacons to inform the piconet about constant or temporary conditions. Some are sent in every beacon. In some cases these are only sent if certain features are in use, such as power save or a dependent piconet. Other IEs are only sent as an announcement of a changed condition in the piconet. These IEs could be for the benefit of all DEVs or for a particular DEV. All IEs that are not put sent in every beacon are called announcements and shall be sent for {xref aMinBeaconInfoRepeat} beacons.

Table 5—Repeated beacon announcements

Element	Clause	Announced in	Intended for	Clause
DEV association	7.4.4	aMinBeaconInfoRepeat	All DEVs	8.3.1, 8.3.4
PNC shutdown	7.4.5	aMinBeaconInforRepeat	All DEVs	8.2.6
Piconet parameter change	7.4.6	a MinBeaconInfoRepeat	All DEVs	8.10, 8.11.1, 8.11.2
Application specific	7.4.7	As needed	As appropriate	
Pending channel time map (PCTM)	7.4.8	As needed	All DEVs	
PNC handover	7.4.9	aMinBeaconInfoRepeat	All DEVs	8.2.3
SPS status	7.4.13	As needed	All DEVs	8.13.2
PSPS status	7.4.14	As needed	All DEVs	8.13.1
CTA status IE	{xref 7.4.x}	aMinBeaconInfoRepeat	Depends on DestID	8.5.1.1, 8.5.1.2

If the intended recipient of the IE is all DEVs, the following rules apply:

— The IEs shall be sent in aMinBeaconInfoRepeat subsequent beacons.
— If any DEV is in PSPS or SPS mode, the first IE announcement shall be made in a system wake beacon.

If the intended recipient of the IE is one individual DEV, the following rules apply:

— If the DEV is in Active mode, the IEs shall be sent in aMinBeaconInfoRepeat subsequent beacons.

— If the DEV is in PSPS mode, the first IE announcement shall be made in a system wake beacon.

— If the DEV is in SPS mode, the IEs shall be sent in aMinBeaconInfoRepeat subsequent SPS set wake beacons.

In the case of the CTA status IE, this is considered to be intended for all DEVs if the TrgtId of a CTRB for a stream is BcstId or McstId. Otherwise it is considered to be for an individual DEV.

3.5 Thursday, 12 September, 2002.

Bit ordering, CIDs 192, 345, 199

Suggest adding 'The payload in the data frame is sent with the lowest numbered octet first, least significant bit first, over the air.' to the beginning of line 51. After 'the highest numbered bits.' add 'For any text fields, the first character is in the first octet of the field with other characters following sequentially.' Also add a new figure for the data payload from 02/239r4.

192 - ACCEPT IN PRINCIPLE. Add 'The payload in the data frame is sent with the lowest numbered octet first, least significant bit first, over the air.' to the beginning of line 51. After 'the highest numbered bits.' add 'For any text fields, the first character is in the first octet of the field with other characters following sequentially.' Also add a new figure for the data payload from 02/239r4.

345 - ACCEPT IN PRINCIPLE. Add 'The payload in the data frame is sent with the lowest numbered octet first, least significant bit first, over the air.' to the beginning of line 51. After 'the highest numbered bits.' add 'For any text fields, the first character is in the first octet of the field with other characters following sequentially.' Also add a new figure for the data payload from 02/239r4.

22 - ACCEPT IN PRINCIPLE. Define the reserved bit in the CTRB field to be the 'flush' bit, definition, 'The flush bit field shall be set to 0 for isochronous requests (i.e. for requests that do not use the asynchronous stream index). It shall be set to 0 in an asynchronous request if the originating DEV wants this request to replace all of the previous asynchronous requests or if there is more than one TrgtID in the CTRB. It shall be set to 1 otherwise.' Also update 8.5.2.1 to indicate that this bit is used with the two request methods.

436 - ACCEPT IN PRINCIPLE. Add the following at the end of sentences on ln 31:35 'The fragmentation and defragmentation of these commands are using the same method as that for data frames, as described in {xerf 8.7} and update 8.7 by replacing all occurences of MSDU with "MSDU/MCDU", define MCDU in the acronyms clause as "MAC command data unit"

59, 68 - (Push) Make MaxTransferUnitSize to PHY depedent in table 56, define it in clause 11.2.8 to be 8091 octets.

69 - (Push) Add a MAC sublayer parameter "aMinFragmentSize" in Table 56 on page 215, and set this to 128 (octets). If fragmentation is in use, DEVs may not transmit frames (except the last) with payloads smaller than this value. Also change the definition of the "Capability" field in association and beacon MMP-DUs, as defined on page 126 in Figure 36, by using bits b8-b5 and naming this field "FragmentationThreshold". DEVs must store and use this information on a per-destination DEV basis, fragmenting any frames sent to the DEV when a frame's payload exceeds FragmentationThreshold octets. This relationship holds: aMinFragmentSize <= FragmentationThreshold <= aMaxFrameSize. All fragments except the last shall be sent using the same fragment size.

70 - ACCEPT IN PRINCIPLE. Add: 'A DEV shall support concurrent reception of fragments of at least three MSDUs.'

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60 - ACCEPT IN PRINCIPLE. Add a sentence that says 'The smallest size of a fragment, excluding the last fragment shall be at least aMinFragmentSize.' and define aMinFragmentSize in table 56 to be PHY depdent, and define it in 11.2.8 to be 128 octets.

189 - ACCEPT IN PRINCIPLE. After 'aMaxFrameSize-4, inclusive.' add 'Note that null data frames, I.e. a zero length are allowed. For example, a null data frame may be used with Dly-ACK negotiation, {xref Dly-ACK}.'

95 - ACCEPT IN PRINCIPLE. After 'the frame control field.' add 'The payload field in the secure MAC frame body is protected as indicated {xref 10.2.4.2}.'

191 - ACCEPT IN PRINCIPLE. The FCS is always in a secure frame, therfore, change the octet indication for the FCS to be only 4.

183 - Pending new text.

410 - REJECT. Two variables are needed, the total amount that can be sent as well as the number of frames that the destination DEV is able to handle. The number of frames is important because there are physical limitations in the Dly-ACK generation. The other reason is that there are physical limitations in the buffer implemention, e.g. addressing.

322 - ACCEPT IN PRINCIPLE. Delete the table and the subclause.

249 - ACCEPT IN PRINCIPLE. Change the SPS info field in figure 64 to be the PS info field and add definition, 'The PS info field is defined in {xref 7.5.7.1}.'

42 - Accept.

442 - REJECT. The standard has stated since before D09 and LB12 that a DEV shall accept the nomination to become the new PNC. Therefore, it is not possible to have a rejection code because this behavior is not allowed. If a DEV really doesn't want to do it, it could disassociate in the middle of handover and reassociate with PNC capable bit set off.

161 - Accept.

297 - ACCEPT IN PRINCIPLE. If the request is for a private pseudo-static GTS, and the PNC will not support the creation of a child piconet, it shall respond with the reason code set to 'request denied'.

275 - ACCEPT IN PRINCIPLE. If the PNC rejects the formation of a child PNC for any other reason than insufficient channel time or unable to allocate as pseudo-static, it shall send the channel time response command with the reason code set to 'request denied' (check final text with Bob Huang).

547 - ACCEPT IN PRINCIPLE. Change the text 'Figure 92 illustrates the relationship between the parent piconet superframe and the child piconet superframe. Note that in the figure the superframe periodicity is the same for both the child and the parent piconets.'

148 - Accept.

57 - Accept.

72 - Mark Schrader to provide reference.

544 - ACCEPT IN PRINCIPLE. Change the minimum to be 2 (the current PNC and the new one) add {xref 7.2.x.x} as the maximum. Change the valid range for number of handover beacons to be 'As defined in {xref 8.2.3}'

66 - ACCEPT IN PRINCIPLE. Change line 43 to read "source and destination DEVID, by communicating in an unspecified manner with the DME, which maintains this information."

39 - ACCEPT IN PRINCIPLE. Change the description to read "A set of DEV record elements for all of the DEVs currently associated in the piconet." Ed. Note: Check globally for DEV information elements to change to DEV record elements.

475 - ACCEPT IN PRINCIPLE. 1. and 2. Merge the two subclauses, text is:

'8.2.6.4 Parent PNC termination of a dependent piconet

If the parent PNC wishes to stop the child piconet, it shall terminate the stream allocated to the child piconet using the isochronous stream termination procedure, 8.5.1.3. If the parent PNC wishes to stop the neighbor piconet, it shall send a disassociate request, 8.3.4, to the neighbor PNC. In either case, the dependent PNC shall either change channels, join another piconet as a dependent piconet or immediately initiate its shutdown procedure, 8.2.6. The parent PNC shall listen for the dependent PNC shutdown beacon sequence to determine when the dependent piconet CTA should be removed. The parent PNC may set a maximum time for the completion of the dependent shutdown sequence, after which the CTA will be removed regardless of the completion of the dependent shutdown procedure. In the case of a child piconet, this timeout is set in the MLME while for a neighbor piconet, this time is set via the MLME-DISASSOCIATE. request primitive, 6.3.6.1. If the dependent PNC is a neighbor that is not 802.15.3 compliant, the parent PNC shall provide the same time as it allows for its own shutdown sequence, for the neighbor PNC to cease operations as a dependent piconet of the parent piconet before removing its private CTA.'

3. Not all timeouts are communicated in the standard, for example the time that a DEV attempts a packet transmission. In addition, the dependent PNCs requirement for shutting down is unknown the parent PNC. Due to the added complexity to add a new command to handle this case, the TG decided not to send the timeout information.

4. The standard does not require a PNC to disassociate a child PNC when it terminates the child piconet's CTA. However, in the case of a neighbor, the process is to disassociate the neighbor, because its only purpose in being in the piconet is to act as a neighbor PNC."

150 - Accept.

152 - ACCEPT IN PRINCIPLE. Add text to the end of line 10 on page 60, 'If the PNC info command was received as an unsolicited frame then the DME is informed of the current information for all of the DEVs currently a member of the piconet.'

41 - 'Add a new field to PNC handover request, 1 octet, title "Handover status". Add the following description for the field 'The handover status field shall be set to 0 when the PNC is starting the PNC handover process with destination DEV. It shall be set to 1 if the PNC is cancelling the handover process with the destination DEV.'

Add a parameter to MLME-PNC-HANDOVER.{request, indication}, called HandoverStatus. Add HandoverStatus to the table with type enumeration, valid range STARTED, CANCELLED, description: Indicates if the PNC is beginning or cancelling a handover to the DEV.

Add to clause 8, PNC handover, 'When the handover is initiated, the HandoverStatus is STARTED. If the handover timer expires, the PNC handover command shall be sent to the DEV with a HandoverStatus of CANCELLED.'

Also add text to clause 8 that indicates if the DEV sees a shutdown IE from the PNC during the handover process, it knows that the handover was cancelled.

218 - Accept.

548 - ACCEPT IN PRINCIPLE. Delete all of the parameters except ResultCode from the MLME-START.confirm primitive. In 6.3.3.2.2, change 'If all of the channels for the PHY are either occupied by other 802.15.3 piconets or have unacceptable then the ResultCode shall be set to CHANNEL_BUSY.' to be 'If the channel for the PHY is either occupied by other 802.15.3 piconets or has unacceptable interference, then the ResultCode shall be set to PICONET_DETECTED.'. Change 'as either a regular DEV, child or neighbor piconet' to be 'as either a regular DEV or a dependent piconet'

31 - Accept.

145 - Accept.

129 - Accept.

32 - Accept.

17 - Accept.

471 - ACCEPT IN PRINCIPLE. Add the DEVID field to the PNC handover IE as indicated in CID 221.

470 - ACCEPT IN PRINCIPLE. Add the DEVID field to the PNC handover IE as indicated in CID 221.

135 - Accept.

424 - ACCEPT IN PRINCIPLE. Change "Vendor ID" length to 3 octets, change the definition to be 'The vendor ID field is the OUI as assigned by the IEEE RAC." (Ed. Note, find out best reference) Add OUI to acronyms as "Organization unique identifier' (Ed. Note verify this).

313 - Accept.

209 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.' Change 0x00 in stream index to be 0x00 or 0xFD.

207 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.' Change 0x00 in stream index to be 0x00 or 0xFD.

205 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.' Change SEC Interpretation on reception to: May be decoded.

204 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.' Change SEC Interpretation on reception to: May be decoded.

202 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.'

200 - ACCEPT IN PRINCIPLE. Add a sentence to the end of line 5, page 107, 'The PNID shall be set to the current PNID for the piconet and is used to identify frames from DEVs in the piconet.'

153 - Accept.

144 - Accept.

151 - Accept.

137 - Accept.

19 - Accept.

36 - Accept.

278 - Accept.

540 - Accept.

337 - ACCEPT IN PRINCIPLE. Page 99, line 31 second sentence "Add this is called an extended beacon." Also add a definition to clause 3 "extended beacon - A beacon followed by one or more broadcasted probe commands from the piconet controller."

14 - Accept.

266 - Withdrawn, 12 September, 2002.

29 - Accept.

28 - Accept.

178 - Accept.

25 - Accept.

266 - Withdrawn, 12 September, 2002.

62 - Accept.

30 - Accept.

504 - ACCEPT IN PRINCIPLE. Change "aMinChannelScan" to "aMinChannelScan and less than the shortest ATP of any of the current member DEVs in the piconet"

47 - Accept.

545 - ACCEPT IN PRINCIPLE. Change BeaconDuration to SuperframeTiming.

501 - REJECT. While it is true that the stream index uniquely identifies the source of an isochronous stream, it is not true of commands or asynchronous data where many sources share a single stream index.

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456 - Accept.

26 - Accept.

512 - REJECT. While we all appreciate the hard work that goes into reviewing a document for letter ballot, neither the ballot resolution committee nor the task group has the power to set the length of the letter ballot. The working group voted to set that duration.

142 - Accept.

138 - Accept.

247 - ACCEPT IN PRINCIPLE. Resolve as indicated in CID 249.

21 - ACCEPT IN PRINCIPLE. Add a sentence to page 138, line 53, "Note that asynchronous CTRBs are not passed in this command, thus the num targets field is always 1 and so the CTRBs are all of a fixed length."

245 - Withdrawn, 12 September, 2002.

441 - ACCEPT IN PRINCIPLE. Resolve as indicated in CID 41.

196 - ACCEPT IN PRINCIPLE. Add the text from 02/273r18, 2.1.7.2.2.

96 - Accept.

72 - ACCEPT IN PRINCIPLE. ANSI X3.66-1979: Advanced data communication control procedures (ADCCP). Change the reference clause 7.2.7.2 to be "ANSI X3.66-1979"

4. Status Thursday, 3:30 pm in Monterey

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Table 6—Ballot resolution as of close of Monterey meeting

Type	LB19	Unresolved as of 13 September, 2002
T (technical)	72	31
TR (Technical required)	326	172
T and TR	398	203
E (editorial)	153	153
Total	551	356

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5. Status at closing in Monterey

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Table 7—Ballot resolution as of close of Monterey meeting

Type	LB19	Unresolved as of 13 September, 2002
T (technical)	72	17
TR (Technical required)	326	117
T and TR	398	134
E (editorial)	153	153
Total	551	287

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