Cl **00**   *SC*   *P*   *L*   # 140009

H. Worstell

Comment Type **GR**   *Comment Status* **D**

Access Point colaboration needs to be a part of the TGv suplement

SuggestedRemedy

Incorporate document 11-08-0419-03 into the TGv draft

Proposed Response   *Response Status* **W**

Declined, Decline as the cases where APs cannot be adequately isolated by frequency reuse and/or CSMA, are viewed to be very minimal. In addition:

1. The mechanism is defined only when a clause 9.3 point coordinator is present.

2. The mechanism is useful only when the vast majority of the load in the BSS is known to the point coordinator. When there is a large amount of contention-period load, the PC may give away bandwidth that is needed by its associated stations.

3. The mechanism requires inter-BSS communication, i.e., roughly collocated, co-channel APs, which are likely to occur only in the 2.4GHz band. The mechanism would be rarely used in the 5 GHz band, as there are significantly more channels available, allowing APs to have channels to themselves (which is a better solution).

4. It is unclear whether STAs in an adjacent, co-channel BSS will be able to respond to the bandwidth granted to their own AP, since their NAV is already set by the start of the contention-free period of the AP offering the unused medium time

Cl **00**   *SC*   *P*   *L*   # 140010

J. Worsham

Comment Type **GR**   *Comment Status* **D**

A mechanism for AP collaboration must be included.

SuggestedRemedy

Include the method for AP collaboration described in IEEE802.11-08/0419r3.

Proposed Response   *Response Status* **W**

Declined Same as resolution to CID 9

Cl **00**   *SC*   *P*   *L*   # 140107

B. Marshall

Comment Type **TR**   *Comment Status* **D**

An article published recently in Computer Networks (Mesut Ali Ergin, Kishore Ramachandran, Marco Gruteser, "An experimental study of inter-cell interference effects on system performance in unplanned wireless LAN deployments", Computer Networks 52(14) pp2728-2744 (2008)) includes both simulation and actual measurements to demonstrate the problems of access point interference. As stated in their abstract, "... we report on our experimental study of the effects of inter-cell interference on IEEE 802.11 performance. Due to growing use of wireless LANs (WLANs) in residential areas and settings supporting flash crowds, chaotic unplanned deployments are becoming the norm rather than an exception. Environments in which these WLANs are deployed have many nearby access points and stations on the same channel, either due to lack of coordination or insufficient available channels. Thus, inter-cell interference is common but not well-understood. According to conventional widsom the efficiency of an IEEE 802.11 network is determined by the number of active clients. However, we find that with a typical TCP-dominat workload, cumulative system throughput is characterized by the number of actively interfering access points rather than the number of clients. We verify that due to TCP flow control, the number of backlogged stations in such a network equals twice the number of active access points. Thus, a single access point network proves very robust even with over one hundred clients, while multiple interfering access points lead to a significant increase in collisions that reduces throughput and effects media traffic. Only two congested interfering cells prevent high quality VoIP calls. ..." The technical results reported in this paper require a technical response from 802.11, and Task Group v is the appropriate place to incorporate the network management tools needed to ameliorate the performance problems discovered. Access point collaboration is one such solution. While access point collaboration was identified early as an objective of TGv, it still does not appear in the draft.

SuggestedRemedy

Either: (1) cite a journal article appearing in a refereed technical journal that disputes the findings of the article cited in the comment, (2) incorporate some standardized mechanism (i.e. not vendor proprietary) to coordinate access points when unplanned overlap occurs, or (3) include a minimal solution that deals with the performance degradation in managed deployments, such as the MIB-based mechanism in 11-08-0419-03-000v.

A resolution that states that some submission was not accepted by vote of TGv, for whatever reason, is not an adequate response to the technical concerns raised in this comment.

Proposed Response   *Response Status* **W**

Counter Note: the paper referenced by the commenter is available here: http://www.winlab.rutgers.edu/~ergin/files/ergin08experimental.pdf.

A standardized mechanism currently exists in the standard to coordinate access points when unplanned overlap occurs, for frequency and power control of APs (and STAs). This existing standardized solution addresses cases for APs in both managed and unmanaged environments.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID # **140107**   7/16/2009 3:46:15 PM

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **1**   # 140108

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." Flexible Broadcase/Multicast Service is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to FBMS in the document

Proposed Response   *Response Status*   **W**

Declined The TGv PAR scope states:"This amendment provides Wireless Network Management enhancements to the 802.11 MAC, and PHY, to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks."

TGv has interpreted the PAR broadly in the past, to include the indicated feature, as the scope indicates "Wireless Network Management, "to extend prior work" "to effect a COMPLETE upper layer interface". The PAR does not indicate that it is limited to extending prior work in radio measurement. The PAR requires the group to both extend prior work and to provide a complete interface.

The commenter has asked for text related to one of the following to be removed. Additional description for the decline reason is listed below:

FMS - Enables the WLAN to more flexibly deliver group addressed frames, to reduce power consumption of stations and reducing the RF resources used.

Multiple BSSID - Enables the AP to manage/reduce the RF resources consumed by beacon frames.Note that the base multiple BSSID capability is added by TGk, and is extended by TGv.

SSID LIST - Enables the station to send fewer Probe Request frames, reducing the RF resources used.

Proxy ARP - Enables the AP to manage the RF resources consumed by ARP request and response frames over the air.

Sleep Mode - Enables the WLAN to manage the network to reduce power consumption of stations.

TIM Broadcast - Enables the WLAN to manage the network to reduce power consumption of stations.

TFS - Enables the WLAN to manage the network to reduce power consumption of stations.

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **26**   # 140109

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." Multiple BSSID Support is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to Multiple BSSID Support in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **35**   # 140110

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." Proxy ARP is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to Proxy ARP in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **45**   # 140111

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." SSID List extension is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to SSID List in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID # **140111**   7/16/2009 3:46:17 PM

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **53**   # 140112

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." TIM Broadcast is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to TIM Broadcast in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

Cl **00**   *SC* **Frontmatter**   *P* **iv**   *L* **62**   # 140113

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." Traffic filtering service (TFS) is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to TFS in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

Cl **00**   *SC* **Frontmatter**   *P* **v**   *L* **4**   # 140114

B. Marshall

Comment Type   **TR**   *Comment Status*   **D**

The PAR for TGv authorized the Task Group to make certain changes to the 802.11 Standard, "to extend prior work in radio measurement to effect a complete and coherent upper layer interface for managing 802.11 devices in wireless networks." WNM-Sleep Mode is outside that scope, and is not an authorized change to the 802.11 Standard.

SuggestedRemedy

Delete this paragraph, and all refs to WNM-Sleep Mode in the document

Proposed Response   *Response Status*   **W**

Declined Same resolution as CID 108

Cl **05**   *SC* **5.2.11**   *P*   *L* **29**   # 140142

L. Ji

Comment Type   **TR**   *Comment Status*   **D**

comment = Adopt the AP Collaboration proposed in 11-08-0419-03-000v-access-point-collaboration.doc.

SuggestedRemedy

suggested_remedy = Adopt the AP Collaboration proposed in 11-08-0419-03-000v-access-point-collaboration.doc.

Proposed Response   *Response Status*   **W**

Declined Same as resolution to CID 9

Cl **07**   *SC* **7.3.2.46**   *P* **41**   *L* **2**   # 140255

H. Ptasinski

Comment Type   **TR**   *Comment Status*   **D**

The variables BSSID_REF and REF_BSSID appear to be different names for the same thing.

SuggestedRemedy

Pick one and use it consistently.

Proposed Response   *Response Status*   **W**

Counter REF_BSSID is used in 11k. So, replace BSSID_REF with REF_BSSID throughout the 11v spec.

Cl **11**   *SC* **11.10.8.5**   *P* **197**   *L* **62**   # 140256

H. Ptasinski

Comment Type   **TR**   *Comment Status*   **D**

STA Statistics Report should be sent at Best Effort or Background priority to avoid impacting Voice and Video traffic.

SuggestedRemedy

Provide a mechanism to send these reports at a lower priority, and require those reports to be sent at lower priority. Either a mechanism for QoS Management frames, such as 08-1354-00, or for sending the reports as low-priority data frames would suffice.

Proposed Response   *Response Status*   **W**

Counter Same as resolution to CID 135

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID #   **140256**   7/16/2009 3:46:17 PM

Cl **11**   *SC* **11.20.3**   *P* **205**   *L* **7**   # 140257

H. Ptasinski

Comment Type   **TR**   *Comment Status* **D**

Diagnostic Request and Report should be sent at Best Effort or Background priority to avoid impacting Voice and Video traffic.

SuggestedRemedy

Provide a mechanism to send these reports at a lower priority, and require those reports to be sent at lower priority. Either a mechanism for QoS Management frames, such as 08-1354-00, or for sending the reports as low-priority data frames would suffice.

Proposed Response   *Response Status* **W**

Counter Same as resolution to CID 135

Cl **07**   *SC* **7.3.2.71**   *P* **81**   *L* **23**   # 140258

H. Ptasinski

Comment Type   **TR**   *Comment Status* **D**

It's unclear if there are any higher-layer protocols that can take advantage of the FMS Delivery Interval without creating problematic timing interactions between the higher-layer applications' timeout/retry mechanisms and the significant additional latency created by a value of Delivery Interval > 1.

SuggestedRemedy

Provide examples of existing higher-layer applications that can actually operate with an FMS Delivery Interval > 1, or delete the feature.

Proposed Response   *Response Status* **W**

Declined The FMS service is a new capability that existing protocols may or may not make use of it. The capabilities of FMS are very clear how it can help devices save power. Within the TG there is agreement that FMS will save power for mcast traffic at Layer 2. Although existing higher layer protocols could use FMS there is no requirement for them to do so and the TGv cannot mandate such a use. Example protocols that could use FMS:
IGMP (Push to talk and other uses)
SMB
Bonjour
CDP (Proprietary protocol L2 discovery protocol)
LLDP
UPnP (possibly)
Router hello protocols

Cl **11**   *SC* **11.20.4.2**   *P* **210**   *L* **29**   # 140431

M. Fischer

Comment Type   **TR**   *Comment Status* **D**

I cannot find a definition for either "normal interval" or "motion interval" - also there is no explicit description of what sort of arrangement the frames in a "normal burst" must have - i.e. can the frames be spread evenly over the entire interval, or can they be all at the beginning of the interval?

SuggestedRemedy

Define the undefined terms and explicitly state that there are no normative requirements as to exactly when during the interval, the frames must appear.

Proposed Response   *Response Status* **W**

Counter Insert the following bullet P210 L35
"For both normal and motion track notification frames, the Location Track Notification frames transmitted on a single channel shall be transmitted with a minimum gap specified by the Burst Interframe Interval field."

Cl **11**   *SC* **11.20.7**   *P* **215**   *L* **21**   # 140434

M. Fischer

Comment Type   **TR**   *Comment Status* **D**

It is not clear when an AP can stop obeying an FMS schedule. There needs to be some normative text here, related to explicit FMS "end" requests, or whatever they are called, and dissociation events, either excplit, or where the AP times out an association without ever successfully sending a dissociation message, for example.

SuggestedRemedy

Provide a more clear description of some of the missing details of this feature.

Proposed Response   *Response Status* **W**

Counter Clarifying text for AP behavior added. Incorporate text in 09/0144r2

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID # **140434**   7/16/2009 3:46:17 PM

Cl **07** *SC* **7.3.2.66.8** *P* **77** *L* **39** # 140436

R. Roy

Comment Type **TR** *Comment Status* **D**

Text reads: "The TOD StdDev field specifies estimated standard deviation of the TOD Timestamp field value." The std dev of the timestamp field value is of little value in any statistical analysis since it is the square-rot of the second central moment of a counter which can take on arbitrary values from 0 to 2^32-1. Furthermore, the 2 bytes allocated for this value would be insufficient most of the time. What was probably intended was for the standard deviation to be the square-root of the estimate error variance, where the estimate error is the difference between the "true" timestamp value and the "estimated" one where the estimated timestamp value is the value actually put in the TOD Timestamp field by the STA.

SuggestedRemedy

The sentence should be expanded into a paragraph as described. The same fix should be made in subclause 15.2.6 lines 60-62. Note that clause 17.2.4 has for the most part the appropriate text.

Proposed Response *Response Status* **W**

Counter Adopt text in submission 09/0252r0

Cl **17** *SC* **17.2.4.2** *P* **230** *L* **43** # 140438

R. Roy

Comment Type **TR** *Comment Status* **D**

Text reads: "TIME_OF_DEPARTURE_STDDEV may be included in transmitted frames in order for recipients on multiple channels to determine the time differences of air propagation times between transmitter and recipients and hence to compute the location of the transmitter, wherein the computation can assign higher weight to time of departure values with lower standard deviation." The std dev is not used to determine time differences. The TOD timestamp value itself is used for that purpose. The standard deviation allows the consumer of the TOD timestamp value to estimate the uncertainty in the TOD timestamp value and make statistical inferences based thereon.

SuggestedRemedy

Change the paragraph to properly reflect the usage of the estimated TOD and its estimate error std dev as described.

Proposed Response *Response Status* **W**

Counter Adopt text in submission 09/0252r0

Cl **U** *SC* **Annex U** *P* **329** *L* **52** # 140441

R. Roy

Comment Type **TR** *Comment Status* **D**

Text reads: "The TRAINING_FIELD of the derotated signal is up-sampled to meet the TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH requirement. For example, a TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH of 1ns requires up-sampling at least 1 GHz." By the fundamental data processing inequality, upsampling of a signal can not add information, at best it can do no damage. Furthermore, the uncertainty principle basically sets a lower bound on the accuracy with which "time of arrival" can be measured (and it is iversely proportional to the bandwidth of the waveform). Thus, for example, to state the TOA of a 20MHz waveform (e.g., I&Q sampled at 20Msps) is to be measured to 1nsec accuracy is a stretch. While the upsampling and cross-correlation operations may yield results with a numerical precision of 1nsec, that does not mean the estimated TOAs are that accurate.

SuggestedRemedy

This discussion should be modified to correctly reflect underlying theoretical principles of data processing in the time and frequency (i.e., conjugate) domains. Also, the reference to subclause 11.20.6 on line 15 should probably read 11.20.5.

Proposed Response *Response Status* **W**

Counter Adopt text in submission 09/0252r0

Cl **07** *SC* **7.3.2.66.2** *P* **72** *L* **56** # 140445

R. Roy

Comment Type **TR** *Comment Status* **D**

Text reads: "Motion is the act or process of moving, or a particular action or movement. Motion may be detected using one of the following criteria:" This begs the question: Motion with respect to what? Object afixed to the earth are moving at something shy of 1000 MPH with respect to a non-rotating coordinate system, and much larger velocities with respect to an inertial frame at the center of the Milky way galaxy. Just consider a WLAN implementation aboard an airplane (they are coming soon to a plane near you) ... I suggest that for most of the trip the STA will be moving at about 550MPH or thereabouts. So will the AP of course (unless its ejected), an the relative velocities between the STA and the AP are likely to be very small in that instance.

SuggestedRemedy

The meaning of motion needs to be thought trough more carefully and explained in detail so the meaning of the associated messages is clear and unambiguous.

Proposed Response *Response Status* **W**

Counter Change "Motion is the act or process of moving, or a particular action or movement" to
"Motion is the act or process of moving, or a particular action or movement relative to the point at which the STA is configured to send Location Track Notification frames

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TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID # **140445** 7/16/2009 3:46:18 PM

Cl **11**   *SC* **11.20.15**   *P* **221**   *L* **7**   # 140498

J. Epstein

Comment Type   **TR**   *Comment Status*   **D**

Transmitting multicast frames as unicast frames discards potentially useful or necessary information contained in the destination group address. For IP, this is not the case, but the standard is more generic than IP.

SuggestedRemedy

Introduce a new data frame format that contains the original group address in addition to the contained content, and enforce that non-IP traffic that matches DMS must use this frame formant to encode the transmitted data. In the alternative, introduce text stating that the non-AP STA shall not request DMS except for IP traffic types.

Proposed Response   *Response Status*   **W**

Declined Directed multicast data frames are transmitted via A-MSDU frame format, which does preserve the destination group address.

Cl **11**   *SC* **11.20.15**   *P* **221**   *L* **44**   # 140499

J. Epstein

Comment Type   **TR**   *Comment Status*   **D**

It is impossible for the AP to know which STAs are in the multicast group, as multicast group membership is not required to be signalled in 802.

SuggestedRemedy

There are not a lot of options: either all group memberships must be mandatory to express, or DMS will break backwards compatability. Explicitly state that DMS cannot be used in a BSS unless every associated STA supports DMS, that all DMS-capable STAs that join a DMS-capabpe AP must express their group memberships to receive any frames in that group, rename DMS to "Multicast Group Services", and add a new action frame that requests and deletes directed delivery after a "MGS" group has been established and that uses the group ID from that. This will also require renaming "Enabled" to "Mandatory" for the AP.

Proposed Response   *Response Status*   **W**

Counter same as CID 233, change
"The AP shall still transmit the matching frames as group addressed frames (see 9.2.7.1, 9.2.7.2 and 11.20.14.3) if at least one associated STA within the multicast group has not requested DMS for these frames." To
"The AP shall continue to transmit the matching frames as group addressed frames (see 9.2.7.1, 9.2.7.2 and 11.20.14.3) if at least one associated STA has not requested DMS for these frames."

Cl **07**   *SC* **7.3.2.46**   *P* **41**   *L* **5**   # 140500

J. Epstein

Comment Type   **TR**   *Comment Status*   **D**

Even though 11k already defines this element, the requirement that BSSIDs be derived based on adjacency according to powers of two is arbitrary and potentially wasteful of Ethernet addresses.

SuggestedRemedy

Add an optional six-byte field to the end of the IE in figure v55 (Multiple BSSID Index) that contains the explicit BSSID to use. Write text stating that, if the Multiple BSSID Index field contains such a BSSID, then that BSSID, and not the result of the BSSID(i) formula, will be used as the BSSID in question for the Multiple BSSID features; otherwise, the behavior remains identical.

Proposed Response   *Response Status*   **W**

Declined The currently defined method is sufficient for the multiple BSSID feature. Most implementations today use a contiguous address space for virtual AP capabilities. It is also unlikely that a large number (more than 16) of BSSIDs would be used.

Cl **00**   *SC*   *P*   *L*   # 140526

Q. Wang

Comment Type   **GR**   *Comment Status*   **D**

11v spec contains many orthogonal features that are intended for very different applications and use cases. Each feature shall be specified as an option for implementation to give implementers flexibility to choose appropriate feature for a specific use case.

SuggestedRemedy

Modify the relevant text and the PICS table accordingly.

Proposed Response   *Response Status*   **W**

Declined Same as resolution to CID 321

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

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Comment ID #   **140526**   7/16/2009 3:46:18 PM

Cl **00**   *SC*   *P*   *L*   # 146002

D. Bagby

Comment Type   **TR**   *Comment Status*   **D**

In considering the TGV draft, I have become concerned about IP issues, specifically those relating to the concepts of location services.

There are several sets of patents related to the concepts of location services I am aware of from past work in the field. I want to identify these patents to the 802.11 WG and to TGv.

I request that 802.11 and TGv confirm that the holders of these patents have satisfied the IEEE requirements for IP potentially being included in a standard.

In particular I want confirmation that

1) The patent holders have filed appropriate LOAs, and

2) That the patents identified are covered by filed LOAs accepted by IEE, and

3) LOAs from the current patent owners cover these patents (I believe that the ownership of the patents has changed since they were first granted), and

4) If LOAs have already been filed, that the LOAs specify a scope of all of 802.11 (not just a prior partial amendment) so that this will not become an issue when TGv is eventually rolled up into a later 802.11 revision.

The following are the patents that are the subject of this letter ballot comment.

A) Wayport:

The set of patents was granted to Wayport and include:

#5,835,061 (granted in 1998): "A geographic-based communications service system has a mobile unit for transmitting/receiving information, and access points connected to a network. The access points are arranged in a known geographic locations and transmit and receive information from the mobile unit. When one of the access points detects the presence of the mobile unit, it sends a signal to the network indicating the location of the mobile unit and the information requested by the mobile unit. Based on the signal received from the access point, the network communicates with information providers connected to the network and provides data to the mobile unit through the access point corresponding to the location of the mobile unit."

#6,452,498 (granted Sept. 2002): "A geographic-based communications service system has a mobile unit for transmitting/receiving information, and access points connected to a network. The access points are arranged in known geographic locations and transmit and receive information from the mobile unit. When one of the access points detects the presence of the mobile unit, it sends a signal to the network indicating the location of the mobile unit and the information requested by the mobile unit. Based on the signal received from the access point, the network communicates with information providers connected to the network and provides data to the mobile unit through the access point corresponding to the location of the mobile unit."

Additional (WLAN related) patents gratend to wayport can be found via:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2Fsearch-bool.html&r=0&f=S&l=50&TERM1=wayport&FIELD1=ASNM&co1=AND&TERM2=&FIELD2=&d=ptxt

FYI, I understand that wayport was bought by ATT. I assume the patent ownership transferred to ATT also (but do not have any first hand knowledge of that).

B) Newbury

The second basic location service patent with wich I am concerned was granted to

Newbury networks

United States Patent 6,674,403

Gray , et al. January 6, 2004

Position detection and location tracking in a wireless network

Abstract

A system and method for performing real-time position detection and motion tracking of mobile communications devices moving about in a defined space comprised of a plurality of locales is provided. A plurality of access points are disposed about the space to provide an interface between mobile devices and a network having functionality and data available or accessible therefrom. Knowledge of adjacency of locales may be used to better determine the location of the mobile device as it transitions between locales and feedback may be provided to monitor the status and configuration of the access points.

The patent can be found here:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=%2Fnetahtml%2FPTO%2Fsearch-adv.htm&r=1&f=G&l=50&d=PTXT&p=1&S1=newbury.ASNM.&OS=AN/newbury&RS=AN/newbury

FYI, I understand that Trapeze now owns Newbury.

C) Cognio

A third set or related patent was issued to Cognio and can be found here:

http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=%2Fnetahtml%2FPTO%2Fsearch-adv.htm&r=0&f=S&l=50&d=PTXT&RS=AN%2Fwayport&Refine=Refine+Search&Query=AN%2Fcognio

I think that Cognio was purchased by Cisco.

All the patents referred to in this comment are part of the subject of the comment (whether directly quoted or indirectly referred to via a URL).

Until I am assured that the required IP processes have been followed and that all the referenced patents are covered by valid filed LOAs, I must vote ôdisapproveö for the TGv Draft.

Sincerely,

David Bagby

Calypso Ventures, Inc.

dave@calypsoventures.com

(650) 637-7741

SuggestedRemedy

I request that 802.11 and TGv confirm that the holders of these patents have satisfied the IEEE requirements for IP potentially being included in a standard.

In particular I want confirmation that

1) The patent holders have filed appropriate LOAs, and

2) That the patents identified are covered by filed LOAs accepted by IEE, and

3) LOAs from the current patent owners cover these patents (I believe that the ownership of the patents has changed since they were first granted), and

4) If LOAs have already been filed, that the LOAs specify a scope of all of 802.11 (not just a prior partial amendment) so that this will not become an issue when TGv is eventually rolled up into a later 802.11 revision.

The following are the patents that are the subject of this letter ballot comment.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
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Comment ID # **146002**   7/16/2009 3:46:18 PM

Proposed Response   *Response Status* **W**

Open TGv has asked the WG chair to initiate the LOA process for the IP identified. The IEEE 802.11 WG Chair has sent requests for LOAs to the parties identified by the commenter. Until the process is complete and the related LOAs are either received (or not received), TGv canÆt take any further action for this comment. The comment is left open pending an update from the WG chair.

Cl **07**   *SC* **7.3.2.73 and 7.4.11.23**   *P* **86**   *L*   # 146008

G. Smith

Comment Type   **TR**   *Comment Status* **D**

The useful intention of this element appears to be twofold: one a STA can tell an AP "I am a phone!", and two, an AP can advertise "I have x phones connected to me!" All well and good as now some load sharing might be worthwhile etc. In addition, because of the restricted back off slots in AC_VO, too many phones represents a possible problem for peak traffic. So basically, for voice traffic, this element makes good sense. My question is whether it also makes sense for CL and VI applications (UP4 and 5) which both relate to AC_VI? CL is defined as "controlled load" which is "some important application" and VI is "video" which has a vast range of requirements. Hence I query as the usefullness of this element when applied for CL and VI in that the traffic requirments are not defined in any real way. I would suggest that this element be renamed as "QoS Voice Traffic element". The element is then simplified to 3 octets so that a STA simply sets bit 0 in the third octet to 1 to inform an AP that it is a Voice STA and the AP uses the third octet to indiucate how many voice STA are associated .

SuggestedRemedy

Change to "QoS Voice Traffic Element". Fixed at 3 octets. In third octet STA sets bit 0 to 1 to indicate it is a voice STA. AP indicates in third octet the number of voice STAs associated.

Proposed Response   *Response Status* **W**

Declined There are use cases where QoS Traffic Capability may be useful for video applications. The following is some of the examples:
- band steering (e.g. voice stations in 5GHz vs. video stations in 2.4 GHz)
- capacity planning for admission control (e.g. optimizing resources for voice, video, and data)

Cl **11**   *SC* **11.20.9**   *P* **220**   *L*   # 146009

G. Smith

Comment Type   **TR**   *Comment Status* **D**

See comment on 7.3.2.73 for explanation

SuggestedRemedy

To Read as follows:
11.20.9 QoS Voice Traffic capability procedure

Implementation of the QoS Voice Traffic capability is optional for a WNM STA. A STA that implements QoS Voice Traffic capability has the MIB attribute dot11MgmtOptionVoiceTrafficGenerationImplemented set to true. When dot11MgmtOptionVoiceTrafficGenerationImplemented is true, dot11WirelessManagementImplemented shall be true.

If the MIB attribute dot11MgmtOptionQoSVoiceTrafficCapabilityImplemented is set to true, a non-AP QoS STA that supports the QoS Voice Traffic capability shall be able to set the QoS Voice Traffic Capability Flag as specified in 7.3.2.73 and 7.4.11.23. QoS Voice Traffic Capability Flag is constructed at the SME of the non-AP QoS STA, from application requirements supplied to the SME. The QoS Voice Traffic Capability Flag is constructed from two application requirements: whether QoS Voice Traffic capability is required for applications and whether the specific UP6 is required for the generated traffic. If such requirements are known to an application, the application supplies them to the SME.

NOTE — The requirements may be known before the traffic is actually generated. For example, the phone application may be configured to generate UP 6 traffic upon the initiation of a voice session.

If there is insufficient information available to the SME, the corresponding flag bit shall be set to 0. When provided with the QoS Voice Traffic capability requirements, the SME updates the QoS Voice Traffic Capability Flag and the non-AP QoS STA may transmit the QoS Voice Traffic Capability Update frame to the AP.

If the MIB attribute dot11MgmtOptionQoSVoiceTrafficCapabilityEnabled is set to true, a non-AP QoS STA shall include the QoS Voice Traffic Capability element in an Association Request frame or in a Reassociation Request frame when it is sending such a frame to associate or reassociate with an AP. If there is any change in QoS Voice Traffic Capability Flags while associated with an AP, the non-AP STA shall send a QoS Voice Traffic Capability Update frame (see 7.4.11.23) including the updated QoS Voice Traffic Capability Flag to the AP.

If the MIB attribute dot11MgmtOptionQoSVoiceTrafficCapabilityEnabled is set to true, a QoS AP shall determine the station count the user priority, UP6, based on the number of associated STAs that indicate the QoS Voice Traffic capability. The use of the station counts is implementation specific. However, an informative description is given in the following text. Based on the station counts for UP6, an AP may determine the station count for access category (AC3) as specified in 11.20.10. Based on the reported non-AP QoS STA UP6 and other information, an AP may determine the station count information

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
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Comment ID # **146009**   7/16/2009 3:46:18 PM

advertised in the QoS Voice Traffic Capability element. The AC Station Count List field may be interpreted as the number of STAs that are expected to access the channel to transmit MSDUs of AC3.

Proposed Response   *Response Status* **W**

Declined See CID 8.

Cl **11**   *SC* **11.20.2.1**   *P* **205**   *L* **25**   # 146142

H. Ptasinski

Comment Type **TR**   *Comment Status* **D**

Requirement to use ethertype frames needs to specify which of the possible frames to use.

SuggestedRemedy

Change ôEvent Request and Event Report frames shall only be sent using the Ethertype frames defined in Annex Uö to ôEvent Request and Report frames shall only be sent using Event Request and Event Report protocol payloads in Data frames using Ethertype 89-0d with Remote Frame Type field value set to Data Function, as defined in Annex Uö

Proposed Response   *Response Status* **W**

Accepted

Cl **11**   *SC* **11.20.3.1**   *P* **208**   *L* **14**   # 146143

H. Ptasinski

Comment Type **TR**   *Comment Status* **D**

Requirement to use ethertype frames needs to specify which of the possible frames to use.

SuggestedRemedy

Change ôDiagnostic Request and Diagnostic Report frames shall only be sent using the Ethertype frames defined in Annex Uö to ôDiagnostic Request and Report frames shall only be sent using Diagnostic Request and Diagnostic Report protocol payloads in Data frames using Ethertype 89-0d with Remote Frame Type field value set to Data Function, as defined in Annex Uö

Proposed Response   *Response Status* **W**

Accepted As in comment

Cl **03**   *SC* **3**   *P* **5**   *L* **6**   # 146168

R. Roy

Comment Type **TR**   *Comment Status* **D**

Text reads: "3.159a transmitted BSSID: When multiple BSSIDs are supported, the BSSID included in the MAC Header transmitter address field of a Beacon frame." This does not seem correct. The tx address (Address 2 field) in the MAC header is ALWAYS the MAC address of the STA transmitting the frame as per clause 7. I suspect what was actually intended here is that the "transmitted BSSID" be the value of the address field containing the BSSID (see clause 7 table 7-7). This is an important distinction, since otherwise when transmitting a Beacon frame the question arises which of the multiple BSSIDs should be used top populate Address 3?

SuggestedRemedy

Make the appropriate changes to this text and elsewhere in the draft where this distinction needs to be made.

Proposed Response   *Response Status* **W**

Declined The meaning of the tx address (Address 2 field) per the clause 7 of the base-pec is not redefined here. 3.159a defines, in the context of multiple BSSIDs, a beacon frame's tx-address is the same as the tranmstted BSSID.

Cl **07**   *SC* **7.3.2.66.3**   *P* **76**   *L* **38**   # 146172

R. Roy

Comment Type **TR**   *Comment Status* **D**

Text reads:: "The Regulatory Class field each indicates the frequency and on which a STA transmits Location Track Notification frames. All regulatory Class field values are for the Country specified in the Beacon frame. Valid values of the Regulatory Class field are defined in Annex J." Regulatory class is not sufficient to indicate the freqeuncy . . . the country code found often in a country infdormation element is required as well.

SuggestedRemedy

Here and elsewhere in the draft where Regulatory class points to a frequency to be used, make the appropriate changes to indicate a country code is required as well.

Proposed Response   *Response Status* **W**

Declined An AP already knows the country code that the transmitter is in and therefore it is not required to include this information in every location track notification frame. This suggestion would create additional data transmission and subsequent reduction in bandwidth for the shared medium.

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COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
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Comment ID # **146172**   7/16/2009 3:46:18 PM

Cl **07**   *SC* **7.3.2.66.5**   *P* **77**   *L* **35**   # 146173
R. Roy

Comment Type   **TR**   *Comment Status*   **D**

The Radio Information subelement is supposed to conatin the Tx pwr used to transmit the frame the element is contained in. This does not seem possible is the transmit power is "adaptable" and set by the PHY is real time. Secondly, the antenna ID field is set to the identifying number for "the antenna" used to transmit the frame. There may be more than one if 11n is used.

SuggestedRemedy

Make appropriate changes to this clause to clarify the issues raised.

Proposed Response   *Response Status*   **W**

Counter Tx Power: Many radios will transmit the locaiton track notification frame at maximum power allowed by the cell to ensure good location detection. However, even in the circumstance where the radio is adapting the power it is a step function based on algorithms that provide tx power information before the frame is created. So no change is required to the text.

For antenna issue: Change the following sentence in 7.3.2.40

"When included in a measurement report, the Antenna ID identifies the antenna(s) used for the reported measurement. The valid range for the Antenna ID is 1 through 254. The value 0 indicates that the antenna identifier is unknown. The value 255 indicates that this measurement was made with multiple antennas, i.e., antennas were switched during the measurement duration or transmit beamforming was employed" to

"When included in a measurement report or Location Track Notification frame, the Antenna ID identifies the antenna(s) used for the reported measurement or transmission of the location track notification frame. The valid range for the Antenna ID is 1 through 254. The value 0 indicates that the antenna identifier is unknown. The value 255 indicates that this measurement or transmission was made with multiple antennas, i.e., antennas were switched during the measurement duration or transmit beamforming was employed.ö

Cl **07**   *SC* **7.4.11.24**   *P* **117**   *L* **16**   # 146176
R. Roy

Comment Type   **TR**   *Comment Status*   **D**

In sveral places, the text reads: " ... Error field contains the upper bound for error in the value ...". First there is no "the upper bound". There are an infinity of upper bounds, there is in some context a "least upper bound" which could be used. However, in problems such as these where it is desirable to have an estimate of the estimate error variance (or std) for use in stochastic estimation algorithms bounds on the max error are less useful than second central moments of probability distributions (aka estimate error variances).

SuggestedRemedy

make the appropriate changes to replace "max Errror bounds" with estimate error variances here and elsewhere throughout the draft.

Proposed Response   *Response Status*   **W**

Counter Agree with the comment on "the upper bound". Replace "the upper bound" with "an upper bound". Editor to incorporate changes as described in document 09/0513r3.

Agree in principle with the comment on the usefulness/appropriateness of the second central moments (aka variance). However, considering the acceptable tolerances (+/- 70nseconds) for the targetted applications of this mechanism and the individual uncertainties in the factors that contribute to the specified upper bound, the complexity of computing second central moments does not provide any tangible benefit.

It is expected that it will be relatively easy for an implementor to arrive at an upper bound on the error using a knowledge of the system and manufacturing tolerance. However, it will would be a lot more burdensome to expect the implementer to do a statistical analysis and arrive at a value for the variance.

Cl **L**   *SC* **L.3**   *P* **278**   *L* **27**   # 146322
D. Engwer

Comment Type   **ER**   *Comment Status*   **D**

With the modifications to the sample code to support multiple BSSID encoding of the TIM, the formatting of the sample code is now inconsistent both with itself and the 802.11 style guideline for code.

SuggestedRemedy

As the author and formatter of the original Annex L sample code, the commenter offers to provide sample code that has been reformatted to conform to the guidelines and that is consistent throughout. This will be an editorial reformatting only. The reformatted sample code should also be verified by the originator of the 802.11v amendments to Annex L to ensure consistency with the normative text in clause 7.3.2.6 and clause 11.
see www.tinyurl.com/annex-l-tim6 for the first version of the revised sample code.

Proposed Response   *Response Status*   **W**

Declined The website "www.tinyurl.com/annex-l-tim6" cannot be found. Annex L in 11v_D5.0 uses the same style as Annex L in the base spec 802.11-2007.

TYPE: TR/technical required   ER/editorial required   GR/general required   T/technical   E/editorial   G/general
COMMENT STATUS: D/dispatched   A/accepted   R/rejected   RESPONSE STATUS: O/open   W/written   C/closed   U/unsatisfied   Z/withdrawn
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Comment ID #   **146322**   7/16/2009 3:46:19 PM

Cl **00** *SC* *P* *L* # 150067
G. Bajko

Comment Type **GR** *Comment Status* **D**

The encoding of the LCI field from 802.11k is based on RFC3825, which is broken. IETF has decided to revise the encoding, but they do not have a final document yet. The open issues are editorial, the encoding is agreed. TGv should change the LCI encoding as well before going to SB, otherwise IEEE specs will end up being again published with a broken location representation. IEEE should also consider adopting the encoding from 3GPP, rather than waiting for IETF. IETF does not have expertise in location encoding, they did it once and did it wrongly. The 3GPP encoding is widely used and proven to work.

SuggestedRemedy

as suggested.

Proposed Response *Response Status* **W**

Declined IETF is working on the revision. The commenter has two comments in one. Updates to the LCI fields can be done in either TGmb or TGv once the document is completed in IETF. The 2nd comment on use of 3GPP format should be submitted as a formal submission for the group to consider. Same resolution as CID43 for 2nd comment.

Cl **11** *SC* **11.21.5** *P* **223** *L* **30** # 150075
G. Bajko

Comment Type **TR** *Comment Status* **D**

The Timing Measurement Procedure could be used to measure the distance between the STAs based on the average flight time [(t2-t1)+(t4-t3)]/2. But this calculation should be done at the STA initiating the time measurement procedure, ie STA-A, but STA-A does not have the values t2 and t3. If M2-Ack carries back the values t2 and t3 back to STA-A, that would allow STA-A to perform these measurements.

SuggestedRemedy

add Follow on Dialog Token = n, ToA Timestamp = t2 and ToD Timestamp = t3 to M2-Ack.

Proposed Response *Response Status* **W**

Declined The indicated text change is not sufficient to implement a complete extension of the required functionality.
The commenter is encouraged to submit a proposal that justifies the need and text changes for this addition.

Cl **07** *SC* **7.3.2.1** *P* **12** *L* **38** # 150079
G. Bajko

Comment Type **TR** *Comment Status* **D**

The purpose of the Date Time and TimeZone element in TGU was to provide the non AP STA with the local time and time zone of the AP. Providing the STA only with the TimeZone means that the MAC layer will need to compute the local time using UTC and the offset, or using the date (which is not available any more) and the timezone information. It was discussed and decided in TGU, that the MAC layer should not be required to compute the local time.

SuggestedRemedy

Either: a) reverse the changes in TGu and remove this element from the beacon, or b) add the local time and date to this element

Proposed Response *Response Status* **W**

Declined The AP advertises the real-time when TSF is 0. The receiving STA can determine the current time of the AP by knowing the current value of TSF, UTC0 and Timezone which is receives in multiple ways. Therefore the STA can calculate the current time of the AP when it receives a Time Advertisement information element in beacons or probe responses.

Cl **07** *SC* **7.3.2.6** *P* **18** *L* **37** # 150087
M. Hamilton

Comment Type **TR** *Comment Status* **D**

Response to CID 207 on LB146 really wasn't sufficient. If we (as the Standard writers) "know the conditions under which method B or method A is used" we should state those conditions explicitly in the Standard. Otherwise, we are expecting every implementer to (re)derive the same understanding of these conditions, which is risky and a waste of effort.

SuggestedRemedy

We seem to know the conditions ("For example, when all the associated STAs support the multiple BSSID capability, the AP knows it and encodes the TIM element using method B. There are other example conditions as well."), so list them, and there will no room for misinterpretation.

Proposed Response *Response Status* **W**

Declined The existing text is clear. The commenter is encouraged to develop additional text to be added to Annex L.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
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Comment ID # **150087** 7/16/2009 3:46:19 PM

Cl **L**   *SC* **L.3**   *P* **284**   *L* **34**   # 150127

D. Engwer

Comment Type   **ER**   *Comment Status* **D**

With the modifications to the sample code to support multiple BSSID encoding of the TIM, the formatting of the sample code is now inconsistent both with itself and the 802.11 style guideline for code. As a representative comparison point the 802.11v D6.0 Annex L sample code formatting is inconsistent with 802.11-2007.

SuggestedRemedy

As the author and formatter of the original Annex L sample code, the commenter offers to provide sample code that has been reformatted to conform to the guidelines and that is consistent throughout. This will be an editorial reformatting only. The reformatted sample code should also be verified by the originator of the 802.11v amendments to Annex L to ensure consistency with the normative text in clause 7.3.2.6 and clause 11.
A revised version of the sample code will be made available at www.tinyurl.com/annex-l-tim6

Proposed Response   *Response Status* **W**

Counter On TGv D6.0 P288, L11, change from "==" to "="

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