###  **IEEE P802.11Wireless LANs**

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| Miscellaneous SB1 Resolutions |
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**Abstract**

CIDs 6081, 6082, 6083

**Revisions:**

* Rev 0: Initial version of the document.

***TGme editor: Please note Baseline is 11me D4.0. Edits are expressed via Word track changes:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 6081 | 11.19.3 | 2562 | 1 | The Time Zone procedure is heavyweight for some use cases | An 802.11 WG member will bring a proposal | Revised; in general agreement with commenter; see changes under 6081 in doc 23/xxxx<motionedRevision>. |

***Discussion***

11v defined a feature where **both** the Time Advertisement element (e.g., 13 octets) and the Time Zone element (e.g., 6 octets) could be sent in all probe responses and in intermittent beacons (etc):

|  |
| --- |
| 11.19.3 UTC TSF Offset proceduresWhen dot11UTCTSFOffsetActivated is true, **the Time Advertisement and Time Zone elements shall be included in all Probe Response frames, (11ay)the Time Advertisement element shall be included in the Beacon frame every dot11TimeAdvertisementDTIMInterval DTIM intervals(#4221)(11ay), and the Time Advertisement element shall be included in the DMG Beacon frame or in the Announce frame at least every dot11DMGTimeAdvertisementBeaconInterval. When dot11UTCTSFOffsetActivated is false, the Time Advertisement and Time Zone elements shall not be included in Beacon(11ay), Probe Response, and Announce frames.**The AP should periodically synchronize to a UTC reference clock (ITU-R Recommendation TF.460-6 (2002) [B59]) so that the UTC TSF offset can account for drift. The AP shall increment the Time Update Counter field value in the Time Advertisement element each time the synchronization occurs. The method the AP uses to synchronize with a UTC reference clock is out of scope of the standard. |

Meanwhile, cruise ships go from port to port and cross time-zones (for instance, consider a Mediterranean cruise). Typically, “Ship Time” is locally defined by the captain according to his/her convenience. We can assume that Ship Time always follows a well-known time-zone; and typically Ship Time uses the time-zone of the last / next port of call. Importantly, the transition from one time zone to the next does not follow normal geopolitical boundaries.

Meanwhile, a connected device (e.g., smartphone) can easily obtain and track UTC “over the top” without specific any ongoing signaling in a Probe Response or Beacon. The connected device just needs to know the local time-zone (here, the tome zone used for Ship Time).

Cruise lines and cruising patrons get confused when their connected devices do not report Ship Time. The smartphone might determine a time-zone from last cell tower (e.g., port of departure) / coastal cell towers along the way / GNSS / etc; but none of these are aware of Ship Time so are not good sources of information.

Accordingly we propose to define a new, more efficient mechanism where just the Time Zone element may be included in all probe response frames.

***Changes for CID 6081***

Table 9-67—Probe Response frame body (continued)

|  |  |  |
| --- | --- | --- |
| Order | Information | Notes |
| 39 | Time Zone | The Time Zone element is present if dot11UTCTSFOffsetActivated or dot11TimeZoneActivated is true. |

|  |  |  |
| --- | --- | --- |
| Bit | Information | Notes |
| 27 | UTC TSF Offset/Time Zone | The STA sets the UTC TSF Offset/Time Zone field to 1 when dot11UTCTSFOffsetActivated or dot11TimeZoneActivated is true and sets it to 0 otherwise. See 11.19.3 (UTC TSF Offset procedures). |

Table 9-190—Extended Capabilities field

11.19.3 UTC TSF Offset procedures

When dot11UTCTSFOffsetActivated is true, the Time Advertisement and Time Zone elements shall be included in all Probe Response frames, (11ay)the Time Advertisement element shall be included in the Beacon frame every dot11TimeAdvertisementDTIMInterval DTIM intervals(#4221)(11ay), and the Time Advertisement element shall be included in the DMG Beacon frame or in the Announce frame at least every dot11DMGTimeAdvertisementBeaconInterval. When dot11TimeZoneActivated is true, the Time Zone element shall be included in all Probe Response frames. When dot11UTCTSFOffsetActivated is false, the Time Advertisement element shall not be included in Beacon(11ay), Probe Response, and Announce frames. When both dot11UTCTSFOffsetActivated and dot11TimeZoneActivated are false, the Time Zone element shall not be included in Probe Response frames.

The AP should periodically synchronize to a UTC reference clock (ITU-R Recommendation TF.460-6 (2002) [B59]) so that the UTC TSF offset can account for drift. The AP shall increment the Time Update Counter field value in the Time Advertisement element each time the synchronization occurs. The method the AP uses to synchronize with a UTC reference clock is out of scope of the standard.

Annex C

Dot11WirelessMgmtOptionsEntry ::=

SEQUENCE {

dot11LocationActivated TruthValue,

dot11FMSImplemented TruthValue,

dot11FMSActivated TruthValue,

dot11EventsActivated TruthValue,

dot11DiagnosticsActivated TruthValue,

dot11MultiBSSIDImplemented TruthValue,

dot11MultiBSSIDActivated TruthValue,

dot11TFSImplemented TruthValue,

dot11TFSActivated TruthValue,

dot11WNMSleepModeImplemented TruthValue,

dot11WNMSleepModeActivated TruthValue,

dot11TIMBroadcastImplemented TruthValue,

dot11TIMBroadcastActivated TruthValue,

dot11ProxyARPImplemented TruthValue,

dot11ProxyARPActivated TruthValue,

dot11BSSTransitionActivated TruthValue,

dot11QoSTrafficCapabilityImplemented TruthValue,

dot11QoSTrafficCapabilityActivated TruthValue,

dot11ACStationCountImplemented TruthValue,

dot11ACStationCountActivated TruthValue,

dot11CoLocIntfReportingImplemented TruthValue,

dot11CoLocIntfReportingActivated TruthValue,

dot11MotionDetectionImplemented TruthValue,

dot11MotionDetectionActivated TruthValue,

dot11TODImplemented TruthValue,

dot11TODActivated TruthValue,

dot11TimingMsmtImplemented TruthValue,

dot11TimingMsmtActivated TruthValue,

dot11ChannelUsageImplemented TruthValue,

dot11ChannelUsageActivated TruthValue,

dot11TriggerSTAStatisticsActivated TruthValue,

dot11SSIDListImplemented TruthValue,

dot11SSIDListActivated TruthValue,

dot11MulticastDiagnosticsActivated TruthValue,

dot11LocationTrackingImplemented TruthValue,

dot11LocationTrackingActivated TruthValue,

dot11DMSImplemented TruthValue,

dot11DMSActivated TruthValue,

dot11UAPSDCoexistenceImplemented TruthValue,

dot11UAPSDCoexistenceActivated TruthValue,

dot11WNMNotificationImplemented TruthValue,

dot11WNMNotificationActivated TruthValue,

dot11UTCTSFOffsetImplemented TruthValue,

dot11UTCTSFOffsetActivated TruthValue,

dot11FineTimingMsmtRespActivated TruthValue,

dot11FineTimingMsmtInitActivated TruthValue,

dot11LciCivicInNeighborReport TruthValue,

dot11RMFineTimingMsmtRangeRepImplemented TruthValue,

dot11RMFineTimingMsmtRangeRepActivated TruthValue,

dot11RMLCIConfigured TruthValue,

dot11RMCivicConfigured TruthValue,

dot11TimeZoneImplemented TruthValue,

dot11TimeZoneActivated TruthValue

}

***After dot11RMCivicConfigured, insert:***

dot11TimeZoneImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by STA capabilities.

This attribute, when true, indicates that the Station implementation is capable of supporting Time Zone advertisement when dot11WirelessManagementImplemented is equal to true."

::= { dot11WirelessMgmtOptionsEntry 54}

dot11TimeZoneActivated OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity or the SME.

Changes take effect as soon as practical in the implementation. This attribute, when true, indicates that Time Zone advertisement is enabled at the station. The capability is disabled, otherwise."

DEFVAL { false}

::= { dot11WirelessMgmtOptionsEntry 55}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 6082 | 9.4.2.2 | 860 | 30 | The "\_nomap" SSID opt-out proposal is heavyweight for some use cases | An 802.11 WG member will bring a proposal | Revised; in general agreement with commenter; see changes under 6082 in doc 23/xxxx<motionedRevision>. |

***Discussion***

Fast accurate location is provided by crowdsourcing (BSSID, geographic location of receiver, etc). However:

* Some network owners do not want to be tracked (certain home networks, corporate networks, government networks including networks , etc). The crowdsourcers in general recognize this issue, but provide an untenable solution (or solutions?): such as [appending “\_nomap” to the SSID](https://support.google.com/maps/answer/1725632?hl=en#zippy=%2Chow-do-i-opt-my-access-point-out-of-google-location-services). However,
	+ an SSID represents an identity or brand but “\_nomap” represents a policy. It is undesirable to append a low-level policy parameter to a high-level identity or brand
	+ this method is vendor-specific
	+ this method is not internationalized
* The crowdsourcer does not have any information about the venue. They do not know if the network seeks privacy, if it is stable or transient (on-board a bus, a boat along a river, a cruise ship, a set of APs that nomadically moves from conference venue to conference venue, etc). As a result, the information inferred may be completely wrong (e.g., location is reported as a Paris train station rather than a London train station). Although crowdsourcers could in theory detect moving APs, administrators of such mobile / nomadic APs do not experience this as a practical reality. For instance, cruising patrons get confused when their connected devices do not report their current location correctly.

Accordingly, it is desirable for such APs to be provided with a more robust, internationalized opt-out mechanism.

***Changes for CID 6082***

Table 9-190—Extended Capabilities field

|  |  |  |
| --- | --- | --- |
| Bit | Information | Notes |
| <ANA> | Tracking Opt Out | The AP sets the Tracking Opt Out field to 1 when dot11TrackingOptOutActivated is true.This subfield is reserved for a non-AP STA. |

11.21 Wireless network management procedures

11.21.17a Tracking Opt Out procedures

NOTE – When an external management entity or the SME of an AP seeks location privacy for the AP or is aware that the AP is mobile or nomadic and external tracking of the AP is liable to report a stale location, the external management entity or the SME might set dot11TrackingtOptOutActivated to true.

When dot11TrackingtOptOutActivated is true in an AP, the Tracking Opt Out subfield in the Extended Capabilities shall be set to 1; otherwise, the Tracking Opt Out subfield shall be set to zero.

Annex C

Dot11WirelessMgmtOptionsEntry ::=

SEQUENCE {

…

dot11TrackingOptOutImplemented TruthValue,

dot11TrackingOptOutActivated TruthValue,

}

***After dot11RMCivicConfigured, insert:***

dot11TrackingOptOutImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

“This is a capability variable.

Its value is determined by STA capabilities.

This attribute, when true, indicates that the AP implementation is capable of supporting Tracking Opt Out when dot11WirelessManagementImplemented is equal to true.

Set to false in a non-AP STA."

::= { dot11WirelessMgmtOptionsEntry 54}

dot11TrackingOptOutActivated OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity or the SME.

Changes take effect as soon as practical in the implementation. This attribute, when true, indicates that Tracking Opt Out is enabled at an AP. The capability is disabled, otherwise and at a non-AP STA."

DEFVAL { false}

::= { dot11WirelessMgmtOptionsEntry 55}

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 6083 | 26.17.2.3.3 | 3989 | 28 | PSCs are proving limiting | An 802.11 WG member will bring a proposal | Revised; in general agreement with commenter; see changes under 6083 in doc 23/xxxx<motionedRevision>. |

***Discussion***

Preferred Scanning Channels were designed for nominally 80 MHz channels (or wider) at 6GHz. However, with Europe only offering 500 MHz of 6 GHz spectrum, and greater deployment experience and measurements as to the interference / throughput trade-offs, we find that, in surprisingly many enterprise use cases, 40 MHz is actually a more optimal choice of channel bandwidth.

Accordingly we propose to introduce the notion of “Secondarily Preferred Scanning Channels” (SPSCs), in order to make 40 MHz BSSs easier to discover via passive scanning.

From Annex E, at 6 GHz, the SSF is 5950 MHz and the 20 MHz channels are 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 105, 109, 113, 117, 121, 125, 129, 133, 137, 141, 145, 149, 153, 157, 161, 165, 169, 173, 177, 181, 185, 189, 193, 197, 201, 205, 209, 213, 217, 221, 225, 229, 233

Then the PSCs are:

>> ((5950-55+80\*(1:15)) - 5950)/5

 5 21 37 53 69 85 101 117 133 149 165 181 197 213 229

And the SPSCs fall evenly between these:

>> ((5950-15+80\*(1:14)) - 5950)/5

 13 29 45 61 77 93 109 125 141 157 173 189 205 221

***Changes for CID 6083***

26.15.7 Additional rules for group addressed frames in an HE MU PPDU

The broadcast RU shall be located within

— The primary 20 MHz channel if the group addressed frame is a FILS Discovery or a Probe Response frame, except when either:

* the primary 20 MHz channel does not coincide with a PSC and the AP is a 6 GHz-only AP. For this exception, the broadcast RU may be in a PSC that is within the BSS operating channel width (see 26.17.2.3 (Scanning in the 6 GHz band)).
* No PSC is within the BSS operating channel, the primary 20 MHz channel does not coincide with an SPSC, and the AP is a 6 GHz-only AP. For this exception, the broadcast RU may be in an SPSC that is within the BSS operating channel width (see 26.17.2.3 (Scanning in the 6 GHz band)).

The broadcast RU size shall not exceed 106 subcarriers if the MU PPDU has a bandwidth that is greater than 20 MHz.

26.17.2.3.2 AP behavior for fast passive scanning

A 6 GHz-only AP should set up the BSS with a primary 20 MHz channel that coincides with a preferred scanning channel (PSC) (see 26.17.2.3.3 (Non-AP STA scanning behavior)). If no PSC is within the BSS operating channel, a 6 GHz-only AP should set up the BSS with a primary 20 MHz channel that coincides with a secondarily preferred scanning channel (SPSC) (see 26.17.2.3.3 (Non-AP STA scanning behavior)).

NOTE 2—An AP might initiate a BSS with a primary channel that coincides with a PSC in order to assist STAs that are scanning the 6 GHz band to discover the BSS. The AP might subsequently switch its operating channel to a non-PSC (e.g., using a CSA mechanism) if it does not expect that additional (not yet associated) STAs need to discover the BSS.

26.17.2.3.3 Non-AP STA scanning behavior

The 20 MHz channels in the 6 GHz band, with channel center frequency (ch\_a = Channel starting frequency – 55 + 80 × n, in megahertz) are referred to as preferred scanning channels (PSCs). Channel starting frequency is defined in 27.3.23.2 (Channel allocation in the 6 GHz band), and n = 1, …, 15.

The 20 MHz channels in the 6 GHz band, with channel center frequency (ch\_a = Channel starting frequency – 15 + 80 × n, in megahertz) are referred to as secondarily preferred scanning channels (SPSCs). Channel starting frequency is defined in 27.3.23.2 (Channel allocation in the 6 GHz band), and n = 1, …, 14.

NOTE 1—PSCs and SPSCs might not all be available in a specific location due to regulatory restrictions. A STA scanning the 6 GHz band knows where these PSCs and SPSCs are located since their position is fixed.

If the non-AP STA is scanning a channel, then the following apply:

* If the STA has received a FILS Discovery frame indicating that an AP is operating in that channel, or if the STA has received a Reduced Neighbor Report or Neighbor Report element indicating that an AP is operating in that channel, then the STA may, subject to the other rules in this clause, send a Probe Request frame to the broadcast address(#1313) in that channel, with the SSID field set to the SSID that corresponds to that AP or with the Short SSID field of the Short SSID List element set to the short SSID that corresponds to that AP and/or with the Address 3 field set to the BSSID of that AP, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA).
* Otherwise, if the channel is a PSC or an SPSC and the STA has determined the medium to be idle for a continuous period of at least dot11MinPSCProbeDelay from the start of the scan on the channel, then the STA may, subject to other rules in this subclause, send a Probe Request frame to the broadcast address(#1313) in that channel, with the SSID field set to the SSID that corresponds to an AP or with the Short SSID field of the Short SSID List element set to the short SSID that corresponds to an AP, and/or with the Address 3 field set to the BSSID of an AP, after invoking the backoff procedure, described in 10.23.2.2 (EDCA backoff procedure), starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA).
* Otherwise, if the STA has discovered the presence of an AP in that channel through means that are beyond the scope of this standard and the AP (#2310)is on the same channel and is range of the STA, then the STA may send a Probe Request frame to the broadcast address(#1313) in that channel, with the Address 3 field set to the BSSID of that AP, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA).
* Otherwise, if the FILSProbeTimer reaches dot11FILSProbeDelay and the channel is a PSC or an SPSC, then the STA may, subject to the other rules in this subclause, send a Probe Request to the broadcast address(#1313) in that channel, starting from step c) of 11.1.4.3.2 (Active scanning procedure for a non-DMG STA).
* Otherwise, the STA shall not send a Probe Request frame to the broadcast address(#1313) in that channel.

Annex C

(11ax)dot11MinPSCProbeDelay OBJECT-TYPE

SYNTAX Unsigned32 (5484..100000)

UNITS "microseconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity.

Changes take effect as soon as practical in the implementation.

A STA does not send a Probe Request frame if it is scanning a preferred scanning channel or a secondarily preferred scanning channel in the 6 GHz band, unless the channel has been continuously idle for this duration since the start of the scan on that channel."

DEFVAL { 7000 }

::= { dot11HEStationConfigEntry 38 }