IEEE Standard for Information Technology—
Telecommunications and information exchange between systems
Local and metropolitan area networks—
Specific requirements

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications

Amendment 8: IEEE 802.11 Wireless Network Management

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

IEEE
3 Park Avenue
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Abstract: This amendment provides Wireless Network Management enhancements to the IEEE 802.11 MAC, and PHY, extending radio measurements to effect a complete and coherent upper layer interface for managing IEEE 802.11 devices in wireless networks.
Keywords: Radio Resource Management, Wireless Network Management

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Introduction

This introduction is not part of IEEE Std 802.11v-2011, IEEE Standard for Information Technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 11: Wireless Medium Access Control (MAC) and physical layer (PHY) specifications—Amendment 8: IEEE 802.11 Wireless Network Management.

This amendment defines enhancements to the IEEE 802.11 physical layer (PHY) and medium access control (MAC) to support managing IEEE 802.11 devices in wireless networks.

The amendment specifies enhancements to the following standard and amendments, in order to support wireless network management:

— IEEE 802.11-2007
— IEEE 802.11k-2008
— IEEE 802.11r-2008
— IEEE 802.11y-2008
— IEEE 802.11w-2009
— IEEE 802.11n-2009
— IEEE 802.11p-2010
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[This amendment is based on IEEE Std 802.11™-2007, as amended by IEEE Std 802.11k™-2008, IEEE Std 802.11r™-2008, IEEE Std 802.11y™-2008, IEEE Std 802.11w™-2009, IEEE Std 802.11n™-2009, IEEE Std 802.11p™-2010, and IEEE Std 802.11z™-2010.]

NOTE—The editing instructions contained in this amendment define how to merge the material contained herein into the existing base standard and its amendments to form a comprehensive standard.

The editing instructions are shown ***bold italic***. Four editing instructions are used: ***change***, ***delete***, ***insert***, and ***replace***. ***Change*** is used to make small corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by either using ~~strikethrough~~ (to remove old material) or underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. ***Replace*** is used to make large changes in existing text, subclauses, tables, or figures by removing existing material and replacing it with new material. Editorial notes will not be carried over into future editions because the changes will be incorporated into the base standard.

1. Overview

1.2 Purpose

Insert the following dash list item at the end of the list of items in 1.2:

— Defines mechanisms and services for Wireless Network Management of STAs that include BSS transition management, channel usage and coexistence, collocated interference reporting, diagnostic, multicast diagnostic and event reporting, flexible multicast, efficient beacon mechanisms, proxy ARP advertisement, location, timing measurement, directed multicast, extended sleep modes, traffic filtering, and management notification.

2. Normative references

Insert the following new references in alphabetical order:

IANA assigned EAP type, http://www.iana.org/assignments/eap-numbers.

IEEE Std 754™-2008, IEEE Standard for Binary Floating-Point Arithmetic.

IEEE P802.1AS™/Draft 7.7, Draft Standard for Local and Metropolitan Area Networks—Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks.

IETF RFC 791, Internet Protocol, September 1981.

IETF RFC 925, Multi-LAN Address Resolution, J. Postel, October 1984.

IETF RFC 2460, Internet Protocol, Version 6 (IPv6), S. Deering, R. Hinden, December 1998.

IETF RFC 3164, "The BSD Syslog Protocol," August 2001.

IETF RFC 3693, "Geopriv Requirements," Feb 2004.

IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, January 2005.

IETF RFC 4776, "Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses Configuration Information," November 2006.

IETF RFC 4861, Neighbor Discovery for IP version 6 (IPv6), T. Narten, E. Nordmark, W. Simpson, H. Soliman, September 2007.

3. Definitions

Insert the following definitions in alphabetical order into Clause 3, renumbering as necessary:

3.249 BSS Max idle period: A time period during which the access point (AP) does not disassociate a station (STA) due to non-receipt of frames from that STA.

3.250 collocated interference: Interference that is caused by another radio or station (STA) emitting radio energy located in the same physical device as the reporting STA, where the reported characteristics of the interference are known a priori without interference detection, measurement, or characterization by the reporting STA.

3.251 collocated radio: A radio capable of emitting radio-frequency energy located in the same physical device as the reporting station (STA), where the radio's type and some link characteristics are known without signal detection or measurement by the reporting STA.

3.252 configuration profile: A collection of parameters identified by a profile ID that represent a current or available configuration of a station (STA).

3.253 directed multicast service (DMS): A service in which the access point (AP) transmits group addressed frames as individually addressed frames to the requesting non-AP station (STA).

3.254 flexible multicast service (FMS): A service in which a non-access point (non-AP) station (STA) can request a multicast delivery interval longer than the delivery traffic indication message (DTIM) interval for the purposes of lengthening the period of time a STA may be in a power save state.

3.255 flexible multicast stream identifier (FMSID): An identifier assigned by the access point (AP) to a particular group addressed stream subsequent to a successful FMS Request.

3.256 flexible multicast service (FMS) stream: A succession of frames transmitted by the access point (AP) that correspond to a single flexible multicast stream identifier (FMSID).

3.257 flexible multicast service (FMS) stream set: A collection of FMS streams identified by an FMS Token, used during the FMS Request procedure.

3.258 location subject third party: The term used when the location request is for the location of a station (STA) other than the requesting STA or the requested STA, (i.e., when the requesting STA asks "Where is he/she?").

3.259 multiple BSSID capability: The capability to advertise information for multiple basic service set identifications (BSSIDs) using a single Beacon or Probe Response frame instead of using multiple Beacon or Probe Response frames, each corresponding to a single BSSID, and the capability to indicate buffered frames for these multiple BSSIDs using a single traffic indication map (TIM) element in a single Beacon.

3.260 non-transmitted BSSID: A basic service set identification (BSSID) corresponding to one of the basic service sets (BSSs) when the multiple BSSID capability is supported, where the BSSID is not announced explicitly but can be derived from the information encoded in the transmitted beacon frames.

3.261 Peer-to-Peer link: Either a direct link within a quality of service (QoS) basic service set (BSS), a tunnelled direct-link setup (TDLS) link or a STA-to-STA communication in an independent basic service set (IBSS).

3.262 TIM broadcast: A service in which a non-access point (non-AP) station (STA) can request periodic transmission of a traffic indication map (TIM) frame by the AP. TIM frames have shorter duration than Beacon frames and can be transmitted at a higher physical layer (PHY) rate, which allows the STA to save additional power while periodically checking for buffered traffic in standby mode, relative to the power consumed if the station (STA) were to periodically wake up to receive a beacon frame.

3.263 traffic filter: A set of traffic specifications defined by the use of traffic classification (TCLAS) information elements that are utilized by the traffic filtering service (TFS) to identify specific allowed frames.

3.264 traffic filtering service (TFS): A service provided by an access point (AP) to a non-AP station (STA) that can reduce the number of frames sent to the non-AP STA by not forwarding individually addressed frames addressed to the non-AP STA that do not match traffic filters specified by the non-AP STA.

3.265 transmitted BSSID: The basic service set identification (BSSID) included in the MAC Header transmitter address field of a Beacon frame when the multiple BSSID capability is supported.

3.266 WNM-Sleep mode: An extended power-save mode for non-access point (non-AP) stations (STAs) whereby a non-AP STA need not listen for every delivery traffic indication message (DTIM) Beacon frame, and does not perform group temporal key/integrity group temporal key (GTK/IGTK) updates.

4. Abbreviations and acronyms

Insert the following new acronyms in alphabetical order:

DMS	directed multicast service
DMSID	directed multicast service identifier
DST	daylight saving time
EDT	eastern daylight time
EST	eastern standard time
FMS	flexible multicast service
FMSID	flexible multicast stream identifier
TAI	Temps Atomique International (International Atomic Time)
TFS	traffic filtering service
TOA	time of arrival
TOD	time of departure
TTTT	target TIM transmission time
URI	uniform resource identifier
WNM	Wireless Network Management

5. General description

5.2 Components of the IEEE 802.11 architecture

Insert the following subclauses after 5.2.11:

5.2.12 Wireless Network Management

5.2.12.1 Overview

Wireless Network Management (WNM) enables STAs to exchange information for the purpose of improving the overall performance of the wireless network. STAs use WNM protocols to exchange operational data so that each STA is aware of the network conditions, allowing STAs to be more cognizant of the topology and state of the network. WNM protocols provide a means for STAs to be aware of the presence of collocated interference, and enable STAs to manage RF parameters based on network conditions.

In addition to providing information on network conditions, WNM also provides a means to exchange location information, provide support for the multiple BSSID capability on the same wireless infrastructure, support efficient delivery of group addressed frames, and enable a WNM-Sleep mode in which a STA can sleep for long periods of time without receiving frames from the AP.

The WNM service includes the following:

- BSS Max idle period management
- BSS transition management
- Channel usage
- Collocated interference reporting
- Diagnostic reporting
- Directed multicast service (DMS)
- Event reporting
- Flexible multicast service (FMS)
- Location services
- Multicast diagnostic reporting
- Multiple BSSID capability
- Proxy ARP
- QoS traffic capability
- SSID list
- Triggered STA statistics
- TIM broadcast
- Timing measurement
- Traffic filtering service
- U-APSD Coexistence
- WNM-Notification
- WNM-Sleep mode

A comprehensive statement on mandatory and optional functionality is available in A.4.21.

5.2.12.2 BSS Max idle period management

BSS Max idle period management enables an AP to indicate a time period during which the AP does not disassociate a STA due to non-receipt of frames from the STA. This supports improved STA power saving and AP resource management.

5.2.12.3 BSS transition management

BSS transition management enables an AP to request non-AP STAs to transition to a specific AP, or to indicate to a non-AP STA a set of preferred APs, due to network load balancing or BSS Termination.

5.2.12.4 Channel usage

Channel usage information is provided by the AP to the non-AP STA to recommend channels for non-infrastructure networks or an off-channel TDLS direct link. The non-AP STAs can use the channel usage information as part of channel selection processing for a non-infrastructure network or an off-channel TDLS direct link.

5.2.12.5 Collocated interference reporting

Collocated interference reporting enables the requesting STA to obtain information on interference due to collocated radios at the reporting STA. The requesting STA can use that information to schedule its transmissions to minimize the effects of the interference.

5.2.12.6 Diagnostic reporting

Diagnostic requests enable a STA to request a non-AP STA to report on information that may be helpful in diagnosing and resolving problems with the WLAN network. Diagnostic reports include information on hardware, configuration, and STA capabilities.

5.2.12.7 Directed multicast service (DMS)

The DMS enables a non-AP STA to request the AP to transmit group addressed frames destined to the requesting STA as individually addressed frames.

5.2.12.8 Event reporting

Event requests enable a STA to request a non-AP STA to send particular real-time event messages. The types of events include Transition, RSNA, WNM Log, and Peer-to-Peer Link events. A transition event is transmitted after a non-AP STA successfully completes a BSS Transition. Transition events are used to diagnose transition performance problems. An RSNA event report describes the type of Authentication used for the RSNA. RSNA events are used to diagnose security and authentication performance problems. A WNM Log event report enables a non-AP STA to transmit a set of WNM Log event messages to the requesting STA. WNM Log event reports are used to access the contents of a STA's WNM Log. A Peer-to-Peer Link event report enables a non-AP STA to inform the requesting STA that a Peer-to-Peer link has been established. Peer-to-Peer Link event reports are used to monitor the use of Peer-to-Peer links in the network.

5.2.12.9 FMS

The flexible multicast service enables a non-AP STA to request an alternate DTIM delivery interval for one or more sets of group addressed streams that the non-AP STA receives. This enables the non-AP STA to wake up at the alternate DTIM interval rather than every DTIM and enables significant power saving when a non-AP STA receives group addressed traffic. The FMS also enables a STA to establish a data rate and delivery interval for group addressed traffic higher than the minimum data rate available.

5.2.12.10 Location services

Location Configuration Request and Response frames enable STAs to configure a collection of location related parameters for Location Track Notification frames. The AP can indicate that it can provide location data to support applications such as emergency services. Location services also provide the ability for STAs to exchange location information using Radio Measurement Request and Report frames. The protocol supports exchange-by-value and exchange-by-reference mechanisms. The location value can be exchanged in Geospatial (LCI) and Civic formats. The location reference is a URL that defines from where the location value is retrieved.

5.2.12.11 Multicast diagnostic reporting

Multicast diagnostic reports enable a non-AP STA to report statistics for multicast traffic it received from a transmitting STA. This can be used by an AP to measure quality of multicast reception by a non-AP STA.

5.2.12.12 Multiple BSSID capability

The Multiple BSSID capability enables the advertisement of information for BSSIDs using a single Beacon or Probe Response frame instead of multiple Beacon and Probe Response frames, each corresponding to a single BSSID. The Multiple BSSID capability also enables the indication of buffered frames for multiple BSSIDs using a single TIM element in a single beacon.

5.2.12.13 Proxy ARP

The Proxy ARP capability enables an AP to indicate that the non-AP STA will not receive ARP frames. The Proxy ARP capability enables the non-AP STA to remain in power-save for longer periods of time.

5.2.12.14 QoS traffic capability

QoS traffic capability procedures enable the QoS STA to indicate that it is capable of transmitting traffic belonging to the corresponding user priority (UP) from applications that require generation of such traffic.The QoS Traffic Capability can be used for example as an input to estimate the blocking probability of a voice application based on the number of voice capable non-AP STAs.

5.2.12.15 SSID list

The SSID List element enables the non-AP STA to request information on a list of SSIDs. This is intended to reduce the number of Probe Request frames sent by the non-AP STA.

5.2.12.16 Triggered STA statistics

The Triggered STA Statistics reporting capability enables generation of a STA statistics report (see 5.2.7.8) when the statistics of interest reach a predefined threshold.

5.2.12.17 TIM broadcast

The TIM broadcast protocol defines a mechanism to enable a STA to receive an indication of buffered individually addressed traffic, independent of the Beacon frame, reducing the wake time of the STA.

5.2.12.18 Timing measurement

Timing Measurement action frames allow a recipient STA to accurately measure the offset of its clock relative to a clock in the sending STA. With the regular transfer of Timing Measurement action frames from one

STA to another, it is possible for the recipient STA to track changes in the offset of its clock with respect to the sending STA over time and thus detect and compensate for any drift between the clocks.

5.2.12.19 Traffic filtering service

Traffic filtering is a service that may be provided by an AP to its associated STAs, where the AP examines MSDUs and management frames destined for a STA. The AP determines if any of those frames match a specific set of traffic filters that may be enabled at the AP per the request of the STA. Individually addressed frames that do not match any of the traffic filters in the set are discarded. Individually addressed frames that do match at least one of the set of the enabled traffic filters are delivered to the STA. The STA may also negotiate to have a notification frame sent prior to the delivery of the frame matching the traffic filter.

5.2.12.20 U-APSD Coexistence

The U-APSD Coexistence capability enables the non-AP STA to indicate a requested transmission duration to the AP for use of U-APSD service periods. Use of the transmission duration enables the AP to transmit frames during the service period and improve the likelihood that the non-AP STA receives the frames when the non-AP STA is experiencing interference. The U-APSD Coexistence capability reduces the likelihood that the AP transmits frames during the service period that are not received successfully.

5.2.12.21 WNM-Notification

WNM-Notification provides a mechanism for a STA to notify another STA of a management event. One event is defined: firmware update notification.

5.2.12.22 WNM-Sleep mode

WNM-Sleep mode is an extended power-save mode for non-AP STAs in which a non-AP STA need not listen for every DTIM Beacon frame, and need not perform GTK/IGTK updates. WNM-Sleep mode enables a non-AP STA to signal to an AP that it will be sleeping for a specified length of time. This enables a non-AP STA to reduce power consumption and remain associated while the non-AP STA has no traffic to send to or receive from the AP.

6. MAC service definition

6.1 Overview of MAC services

6.1.3 MSDU ordering

Change the second paragraph as follows:

In a non-QoS STA, the MAC does not intentionally reorder MSDUs except as may be necessary to improve the likelihood of successful delivery based on the current operational (“power management”, FMS, DMS) mode of the designated recipient STA(s). The sole effect of this reordering (if any), for the set of MSDUs received at the MAC service interface of any single STA, is a change in the delivery order of broadcast and multicast MSDUs, relative to directed MSDUs, originating from a single source STA address. If a higher layer protocol using the data service cannot tolerate this possible reordering, the optional StrictlyOrdered service class should be used. MSDUs transferred between any pair of STAs using the StrictlyOrdered service class are not subject to the relative reordering that is possible when the re-ordered Multicast service class is used. However, the desire to receive MSDUs sent using the StrictlyOrdered service class at a STA precludes simultaneous use of the MAC power management facilities at that STA.

7. Frame formats

7.2 Format of individual frame types

7.2.3 Management frames

7.2.3.1 Beacon frame format

Change the current element order 31 and insert three new elements orders 42 through 44 to Table 7-8 as follows:

Table 7-8—Beacon frame body

Order	Information	Notes
31	Multiple BSSID	One or more ~~The~~ Multiple BSSID elements ~~is~~ are present if dot11RRMMeasurementPilotCapability is a value between 2 and 7 and the AP is a member of a Multiple BSSID Set (see 11.10.11) with two or more members, or if dot11MgmtOptionMultiBSSIDActivated is true.
42	FMS Descriptor	The FMS Descriptor element is present if dot11MgmtOptionFMSActivated is true.
43	QoS Traffic Capability	The QoS Traffic Capability element is optionally present if dot11MgmtOptionACStationCountActivated is true.
44	Time Advertisement	The Time Advertisement element is present every dot11TimeAdvertisementIntervalDTIMs if dot11MgmtOptionUTCTSFOffsetActivated is true.

7.2.3.4 Association Request frame format

Insert order 16 and 17 information fields into Table 7-10 as follows:

Table 7-10—Association Request frame body

Order	Information	Notes
16	QoS Traffic Capability	The QoS Traffic Capability element is present if dot11MgmtOptionQoSTrafficCapabilityActivated is true.
17	TIM Broadcast Request	The TIM Broadcast Request element is present if dot11MgmtOptionTIMBroadcastActivated is true.

7.2.3.5 Association Response frame format

Insert order 18 and 19 information fields into Table 7-11 as follows:

Table 7-11—Association Response frame body

Order	Information	Notes
18	BSS Max Idle Period	The BSS Max Idle Period element is present if dot11WirelessManagementImplemented is true.
19	TIM Broadcast Response	The TIM Broadcast Response element is present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in the Association Request that elicited this Association Response frame.

7.2.3.6 Reassociation Request frame format

Insert order 19 through 22 information fields into Table 7-12 as follows:

Table 7-12—Reassociation Request frame body

Order	Information	Notes
19	QoS Traffic Capability	The QoS Traffic Capability element is present if dot11MgmtOptionQoSTrafficCapabilityActivated is true.
20	TIM Broadcast Request	The TIM Broadcast Request element is present if dot11MgmtOptionTIMBroadcastActivated is true.
21	FMS Request	The FMS Request element may be present if dot11MgmtOptionFMSActivated is true.
22	DMS Request	The DMS Request element may be present if dot11MgmtOptionDMSActivated is true.

7.2.3.7 Reassociation Response frame format

Insert order 20 through 23 information fields into Table 7-13 as follows:

Table 7-13—Reassociation Response frame body

Order	Information	Notes
20	BSS Max Idle Period	The BSS Max Idle Period element is present if dot11WirelessManagementImplemented is true.
21	TIM Broadcast Response	The TIM Broadcast Response element is present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in the Reassociation Request frame that elicited this Reassociation Response frame.
22	FMS Response	The FMS Response element is present if dot11MgmtOptionFMSActivated is true and the FMS Request element is present in the Reassociation Request frame that elicited this Reassociation Response frame.
23	DMS Response	The DMS Response element is present if dot11MgmtOptionDMSActivated is true and the DMS Request element is present in the Reassociation Request frame that elicited this Reassociation Response frame.

7.2.3.8 Probe Request frame format

Insert order 10 and 11 information fields into Table 7-14 as follows:

Table 7-14—Probe Request frame body

Order	Information	Notes
10	SSID List	The SSID List element is optionally present if dot11MgmtOptionSSIDListActivated is true.
11	Channel Usage	The Channel Usage element is optionally present if dot11MgmtOptionChannelUsageActivated is true.

7.2.3.9 Probe Response frame format

Change the current element order 24 and insert order 40 through 43 information fields into Table 7-15 as follows:

Table 7-15—Probe Response frame body

Order	Information	Notes
24	Multiple BSSID	One or more Multiple BSSID elements are present ~~Included~~ if dot11RRMMeasurementPilotCapability is a value between 2 and 7 and the AP is a member of a Multiple BSSID Set (see 11.10.11) with two or more members, or if dot11MgmtOptionMultiBSSIDActivated is true.
40	QoS Traffic Capability	The QoS Traffic Capability element is optionally present if dot11MgmtOptionACStationCountActivated is true.
41	Channel Usage	The Channel Usage element is present if the Channel Usage element is present in the Probe Request frame and dot11MgmtOptionChannelUsageActivated is true.
42	Time Advertisement	The Time Advertisement element is present if dot11MgmtOptionUTCTSFOffsetActivated is true.
43	Time Zone	The Time Zone element is present if dot11MgmtOptionUTCTSFOffsetActivated is true.

7.3 Management frame body components

7.3.1 Fields that are not information elements

7.3.1.7 Reason Code field

Insert reason code 12 and change the Reserved reason code row in Table 7-22 as follows (note that the entire table is not shown here):

Table 7-22—Reason codes

Reason code	Meaning
12	Disassociated due to BSS Transition Management
13~~31~~–65535	Reserved

7.3.1.9 Status Code field

Insert status codes 56-58, 73-75, 80-82 and change the Reserved status code row in Table 7-23 as follows (note that the entire table is not shown here):

Table 7-23—Status codes

Status code	Meaning
56	Requested TCLAS processing is not supported by the AP.
57	The AP has insufficient TCLAS processing resources to satisfy the request.
58	The TS has not been created because the request cannot be honored; however, the HC suggests the STA transitions to other BSSs to setup the TS.
73	U-APSD Coexistence is not supported.
74	Requested U-APSD Coexistence mode is not supported.
75	Requested Interval/Duration value cannot be supported with U-APSD Coexistence.
80	Requested TCLAS Not Supported.
81	TCLAS Resources Exhausted.
82	Rejected with Suggested BSS Transition.
83~~31~~– 65535	Reserved

7.3.1.11 Action field

Insert category codes 10, 11 and change the Reserved category code row in Table 7-24 as follows (note that the entire table is not shown here):

Table 7-24—Category values

Code	Meaning	See subclause	Robust
10	WNM	7.4.12	Yes
11	Unprotected WNM	7.4.13	No
12~~10~~–125	Reserved	—	—

Insert the following new subclauses after 7.3.1.31 (TGp uses 31):

7.3.1.32 Rate Identification field

The Rate Identification field is 4 octets in length and contains the rate identification information for a frame that is not the current frame transmitted or received by a STA. This information allows services to exchange frame rate information prior to use of the frames that will use the rate specified by the Rate Identification field. The contents of the field is defined in Figure 7-36p.

	Mask	MCS Index	Rate
Octets:	1	1	2

Figure 7-36p—Identification field format

The Mask field specifies which other fields in the Rate Identification field are used by a STA. The format of the Mask field is shown in Figure 7-36q.

	B0 - B2	B3-B4	B5-B7
	MCS Selector	Rate Type	Reserved
Bits:	3	2	3

Figure 7-36q—Mask field format

The MCS Selector field set to 0 indicates the MCS Index field is reserved. The MCS Selector field set to 1 indicates the MCS Index field specifies an index value that is taken from Table 20-29 through Table 20-32 and Table 20-38 through Table 20-40 in 20.6. The MCS Selector field set to 2 indicates the MCS Index field specifies an index value that is taken from Table 20-33 through Table 20-37 and Table 20-41 through Table 20-43 in 20.6. The MCS Selector field values 3 to 7 are reserved.

The Rate Type field set to 0 indicates the Rate field is reserved. The Rate Type field set to 1 indicates the Rate field specifies a data rate that is in the basic rate set. The Rate Type field set to 2 indicates the Rate field specifies a data rate that is not in the basic rate set.

The MCS Index field is a 1 octet unsigned integer that specifies the row index for one of the MCS parameter tables in 20.6.

The Rate field contains a 2-octet unsigned integer that specifies the PHY rate in 0.5 Mb/s units.

7.3.2 Information elements

In Table 7-26, insert the following Element IDs and renumber the reserved values accordingly (note that the entire table is not shown here):

Table 7-26—Element IDs

Information element	Element ID	Length (in octets)	Extensible
Event Request (see 7.3.2.67)	78	5 to 257	Subelements
Event Report (see 7.3.2.68)	79	5 to 257	
Diagnostic Request (see 7.3.2.69)	80	6 to 257	Subelements
Diagnostic Report (see 7.3.2.70)	81	5 to 257	Subelements
Location Parameters (see 7.3.2.71)	82	2 to 257	Subelements
Non-transmitted BSSID Capability (see 7.3.2.72)	83	4	
SSID List (see 7.3.2.73)	84	2 to 257	
Multiple BSSID-Index (see 7.3.2.74)	85	3 to 5	
FMS Descriptor (see 7.3.2.75)	86	3 to 257	
FMS Request (see 7.3.2.76)	87	3 to 257	Subelements
FMS Response (see 7.3.2.77)	88	18 to 257	Subelements
QoS Traffic Capability (see 7.3.2.78)	89	3 to 5	Yes
BSS Max Idle Period (see 7.3.2.79)	90	5	Yes
TFS Request (see 7.3.2.80)	91	6 to 257	Subelements
TFS Response (see 7.3.2.81)	92	6 to 256	Subelements
WNM-Sleep Mode (see 7.3.2.82)	93	6	Yes
TIM Broadcast Request (see 7.3.2.83)	94	3	Yes
TIM Broadcast Response (see 7.3.2.84)	95	3 or 12	Yes
Collocated Interference Report (see 7.3.2.85)	96	23	Yes
Channel Usage (see 7.3.2.86)	97	3 to 257	Subelements
Time Zone (see 7.3.2.87)	98	3 to 257	Yes
DMS Request (see 7.3.2.88)	99	3 to 257	Subelements
DMS Response (see 7.3.2.89)	100	3 to 257	Subelements
Destination URI (see 7.3.2.90)	141	3 to 257	Yes
U-APSD Coexistence (see 7.3.2.91)	142	14 to 257	Subelements

7.3.2.6 TIM

Change the second to last paragraph in 7.3.2.6 as follows:

When dot11MgmtOptionMultiBSSIDActivated is false, t~~T~~he Partial Virtual Bitmap field consists of octets numbered $N1$ through $N2$ of the traffic indication virtual bitmap, where $N1$ is the largest even number such that bits numbered 1 through $(N1 \times 8) - 1$ in the bitmap are all 0 and $N2$ is the smallest number such that bits numbered $(N2 + 1) \times 8$ through 2007 in the bitmap are all 0. In this case, the Bitmap Offset subfield value contains the number $\lfloor (N1)/2 \rfloor$, and the Length field is $(N2 - N1) + 4$.

Insert the following paragraphs at the end of 7.3.2.6:

When dot11MgmtOptionMultiBSSIDActivated is true, the Partial Virtual Bitmap field of the TIM element is constructed as follows, where the maximum possible number of BSSIDs is an integer power of 2, n = log2 (maximum possible number of BSSIDs), k is the number of actually supported non-transmitted BSSIDs, and $k \leq (2^n - 1)$.

- The bits 1 to k of the bitmap are used to indicate that one or more group addressed frames are buffered for each AP corresponding to a non-transmitted BSSID. The AIDs from 1 to k are not allocated to a STA. The AIDs from $(k + 1)$ to $(2^n - 1)$ are reserved and set to 0. The remaining AIDs are shared by the BSSs corresponding to the transmitted BSSID and all non-transmitted BSSIDs.
- When the DTIM Count field is 0 for a BSS that has a non-transmitted BSSID, and one or more group addressed frames are buffered at the AP for this BSS, the corresponding bits from bit 1 to bit k is set to 1.
- Each bit starting from bit 2^n in the traffic-indication virtual bitmap corresponds to unicast traffic buffered for a specific STA within any BSS corresponding to a transmitted or non-transmitted BSSID at the time the Beacon frame is transmitted. The correspondence is based on the AID of the STA.
- Based upon its knowledge of the capability of associated stations to support the multiple BSSID capability, as indicated by the corresponding field in the Extended Capabilities element and the content of the traffic indication virtual bitmap, an AP shall encode the Partial Virtual Bitmap and the Bitmap Control field of the TIM element using one of the two following methods. Specifically, an AP uses Method B when it determines that the bit for each associated non-AP STA in the virtual bitmap that will be reconstructed by each non-AP STA from the received TIM element encoded using Method B is set correctly. Otherwise, an AP uses Method A.

Method A and Method B are described as follows:

a) Method A: The Partial Virtual Bitmap field consists of octets numbered 0 through $N2$ of the traffic indication virtual bitmap, where $N2$ is the smallest number such that bits numbered $(N2 + 1) \times 8$ through 2007 in the bitmap are all 0. If such a value $N2$ does not exist, that is, when not all bits in the last octet of the traffic indication virtual bitmap are equal to 0, $N2 = 250$. When using this method, the Bitmap Offset subfield value always contains the number 0, and the Length field is $N2 + 4$.

b) Method B: The Partial Virtual Bitmap field consists of a concatenation of octets numbered 0 through $N0 - 1$ and octets numbered $N1$ through $N2$ of the traffic indication virtual bitmap, where $N0$ is the smallest positive integer such that $N0 \times 8 - 2^n < 8$. If $N0$ is an odd number, then $N1$ is the largest odd number such that $N0 < N1$and each of the bits $N0 \times 8$ to $(N1 \times 8 - 1)$ is equal to zero. When $N0$ is an even number, $N1$ is the largest even number such that $N0 < N1$ and each of the bits $N0 \times 8$ to $(N1 \times 8 - 1)$ is equal to zero. If such a value $N1 > N0$ does not exist, $N1 = N0$. Additionally, $N2$ is the smallest integer value for which the values for bit $(N2+1) \times 8$ to 2007 in the bitmap are all 0. If such a value $N2$ does not exist, that is, when not all bits in the last octet of the traffic indication virtual bitmap are equal to 0, $N2 = 250$. When using this method, the Bitmap Offset subfield contains the value of $(N1 - N0)/2$, and the Length field is $N0 + N2 - N1 + 4$.

NOTE — When $N1 = N0$, Method B reduces to Method A.

For both Method A and Method B, when there are no frames buffered for any BSS corresponding to a transmitted or non-transmitted BSSID supported, the Partial Virtual Bitmap field is encoded as a single octet equal to 0, the Bitmap Offset subfield is 0, and the Length field is 4. When there are no buffered unicast frames for any BSS corresponding to a transmitted or non-transmitted BSSID, but there are buffered broadcast and/or multicast frames for one or more of the BSSs, the Partial Virtual Bitmap field consists of the octets number 0 through $N0 - 1$ where $N0$ is the smallest positive integer such that ($N0 \times 8 - 2^n < 8$). In this case, the Bitmap Offset subfield value contains the number 0, and the Length field is $N0+3$.

7.3.2.21 Measurement Request element

Change Table 7-29 in 7.3.2.21 and split the "Measurement Use" column into multiple separate entries as follows:

Table 7-29—Measurement Type definitions for measurement requests

Name	Measurement type	Measurement use
Basic Request	0	Spectrum Management
Clear Channel Assessment (CCA) request	1	
Receive power indication (RPI) histogram request	2	
Channel load request	3	Radio Resource Measurement
Noise histogram request	4	
Beacon request	5	
Frame request	6	
STA statistics request	7	Radio Resource Measurement and WNM
LCI request	8	Radio Resource Measurement and WNM
Transmit stream/category measurement request	9	Radio Resource Measurement
Multicast diagnostics request	10	WNM
Location Civic request	11	Radio Resource Measurement and WNM
Location Identifier request	12	Radio Resource Measurement and WNM
Reserved	13~~10~~–254	N/A
Measurement Pause request	255	Radio Resource Measurement

7.3.2.21.8 STA Statistics Request

Change Table 7-29j in 7.3.2.21.8 as follows:

Table 7-29j—Group Identity for a STA Statistics Request

Statistics Group Name	Group Identity
RSNA Counters	16
Reserved	~~16~~17–255

Change the paragraph starting with "The Measurement Duration field..." as follows:

The Measurement Duration field is the duration of the requested measurement in TUs except when triggered reporting is used. When triggered reporting is used, the measurement duration is 0.

Change Table 7-29k as follows:

Table 7-29k—Optional Subelement IDs for STA Statistics Request

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Triggered Reporting	variable	
~~0~~2–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

Insert the following before the paragraph that reads "The Vendor Specific subelements …":

The Triggered Reporting subelement is used to specify trigger conditions and thresholds for triggered STA Statistics measurements. It is present when setting up triggered reporting from STA Counters, QoS STA Counters, or RSNA Counters, see 11.10.8.5.

The format of the Triggered Reporting subelement for STA Counters is shown in Figure 7-62h1. The fields marked as optional are only present if the appropriate bit in the STA Counter Trigger Condition field is 1.

The value in the Measurement Count field specifies the number of MSDUs or MPDUs transmitted and/or received by the STA that are to be used to determine if one or more of the trigger conditions have been met.

The Trigger Timeout field contains a value in units of 100 TUs during which a measuring STA does not generate further triggered STA Statistics Reports after a trigger condition has been met.

	Measurement Count	Trigger Timeout	STA Counter Trigger Condition	dot11FailedCount Threshold (optional)	dot11FCS ErrorCount Threshold (optional)
Octets:	4	2	2	0 or 4	0 or 4

	dot11Multiple RetryCount Threshold (optional)	dot11Frame DuplicateCount Threshold (optional)	dot11RTS FailureCount Threshold (optional)	dot11ACK FailureCount Threshold (optional)	dot11RetryCount Threshold (optional)
Octets:	0 or 4	0 or 4	0 or 4	0 or 4	0 or 4

Figure 7-62h1—Triggered Reporting subelement for STA Counters

The STA Counter Trigger Condition field specifies trigger values used when requesting triggered STA Statistics reporting. The format of the STA Counter Trigger Condition field is shown in Figure 7-62h2.

	B0	B1	B2	B3
	dot11FailedCount	dot11FCSError Count	dot11Multiple RetryCount	dot11Frame DuplicateCount
Bits	1	1	1	1

	B4	B5	B6	B7-B15
	dot11RTS FailureCount	dot11ACK FailureCount	dot11RetryCount	Reserved
Bits	1	1	1	9

Figure 7-62h2—STA Counter Trigger Condition field

For each bit in the STA Counter Trigger Condition field that is 1, a corresponding threshold value exists (defined in Figure 7-62h1) in the Triggered Reporting subelement for STA Counters. With this, the STA Statistics Request indicates that a STA Statistics Report be generated when the corresponding STA counter defined in Figure 7-68i and Figure 7-68j (in 7.3.2.22.8) exceeds the value of the specified threshold, within the total number of MSDUs or MPDUs indicated in the Measurement Count field. See 11.10.8.5. One or more trigger conditions are set with specified thresholds. In the triggered STA Statistics request, the value of the Group Identity field is either 0 or 1. When the Group Identity field value of the triggered STA Statistics request is 0, B2–B6 in the STA Counter Trigger Condition field are set to 0. When the group identity of the triggered STA Statistics request is 1, B0 and B1 in the STA Counter Trigger Condition field are set to 0.

The format of the Triggered Reporting subelement for QoS STA Counters is shown in Figure 7-62h3. The fields marked as optional are only present if the appropriate bit in the QoS STA Counter Trigger Condition is 1.

The UP of the QoS STA Counters for triggered QoS Statistics measurement is determined by the group identity of the measurement request field for a STA Statistics Request frame as defined in Table 7-29j.

The value in the Measurement Count field specifies the number of MSDUs or MPDUs transmitted and/or received by the STAs that are to be used to determine if one or more of the trigger conditions have been met.

	Measurement Count	Trigger Timeout	QoS STA Counter Trigger Condition	dot11QoSFailed Count Threshold (optional)	dot11QoSRetry Count Threshold (optional)
Octets:	4	2	2	0 or 4	0 or 4

	dot11QoSMultiple RetryCount Threshold (optional)	dot11QoSFrame DuplicateCount Threshold (optional)	dot11QoSRTSC ount Failure Threshold (optional)	dot11QoSACK FailureCount Threshold (optional)	dot11QoSDisca rdedCount Threshold (optional)
Octets:	0 or 4	0 or 4	0 or 4	0 or 4	0 or 4

Figure 7-62h3—Triggered Reporting subelement for QoS STA Counters

The Trigger Timeout field contains a value in units of 100 TUs during which a measuring STA does not generate further triggered STA Statistics Reports after a trigger condition has been met.

The QoS STA Counter Trigger Condition field specifies reporting triggers when requesting triggered STA Statistics reporting. The format of the QoS STA Counter Trigger Condition field is shown in Figure 7-62h4.

	B0	B1	B2	B3
	dot11QoS FailedCount	dot11QoS RetryCount	dot11QoSMultiple RetryCount	dot11QoSFrame DuplicateCount
Bits:	1	1	1	1

	B4	B5	B6	B7-B15
	dot11QoSRTS FailureCount	dot11QoSACK FailureCount	dot11QoS DiscardedCount	Reserved
Bits:	1	1	1	9

Figure 7-62h4—QoS STA Counter Trigger Condition field

For each bit in the QoS STA Counter Trigger Condition field that is 1, a corresponding threshold value exists (defined in Figure 7-62h3) in the Triggered Reporting subelement for QoS STA Counters. With this, the STA Statistics Request indicates that a STA Statistics Report be generated when the corresponding QoS STA counter defined in Figure 7-85j (in 7.3.2.22.8) exceeds the value of the specified threshold, within the total number of MSDUs or MPDUs indicated in the Measurement Count field. See 11.10.8.5. One or more trigger conditions are set with specified thresholds.

The format of the Triggered Reporting subelement for RSNA Counters is shown in Figure 7-62h5. The fields marked as optional are only present if the appropriate bit in the RSNA Trigger Condition is 1.

The value in the Measurement Count field specifies the number of MPDUs transmitted and/or received by the STA that are to be used to determine if one or more of the trigger conditions have been met.

The Trigger Timeout field contains a value in units of 100 TUs during which a measuring STA does not generate further triggered STA Statistics Reports after a trigger condition has been met.

	Measurement Count	Trigger Timeout	RSNA Counter Trigger Condition	dot11RSNAStats CMACICVErrors Threshold (optional)	dot11RSNA StatsCMACReplays Threshold (optional)
Octets:	4	2	2	0 or 4	0 or 4

	dot11RSNA StatsRobust Mgmt CCMPReplays Threshold (optional)	dot11RSNAStats TKIPICVErrors Threshold (optional)	dot11RSNAStats TKIPReplays Threshold (optional)	dot11RSNAStats CCMPDecryptErrors Threshold (optional)	dot11RSNAStats CCMPReplays Threshold (optional)
Octets:	0 or 4	0 or 4	0 or 4	0 or 4	0 or 4

Figure 7-62h5—Triggered Reporting subelement for RSNA Counters

The RSNA Counter Trigger Condition field specifies reporting triggers when requesting triggered STA Statistics reporting. The format of the RSNA Trigger Condition field is shown in Figure 7-62h6.

	B0	B1	B2	B3
	dot11RSNAStats CMACICVErrors	dot11RSNA StatsCMACReplays	Dot11RSNAStats RobustMgmt CCMPReplays	dot11RSNAStats TKIPICVErrors
Bits:	1	1	1	1

	B4	B5	B6	B7-B15
	dot11RSNAStats TKIPReplays	dot11RSNAStats CCMPDecryptErrors	dot11RSNAStats CCMPReplays	Reserved
Bits:	1	1	1	9

Figure 7-62h6—RSNA Trigger Condition field

For each bit in the RSNA Trigger Condition field that is 1, a corresponding threshold value exists (defined in Figure 7-62h5) in the Triggered Reporting subelement for RSNA Counters. With this, the STA Statistics Request indicates that a STA Statistics Report be generated when the corresponding RSNA counter defined in Figure 7-68l1 (in 7.3.2.22.8) exceeds the value of the specified threshold, within the total number of MPDUs indicated in the Measurement Count field. See 11.10.8.5. One or more trigger conditions are set with specified thresholds.

7.3.2.21.9 Location Configuration Information Request

Change Table 7-29l as follows:

Table 7-29l—Location subject definition

Value	Location subject
0	LCI Subject Local
1	LCI Subject Remote
2	Location Subject Third Party
~~2~~3–255	Reserved

Change Table 7-29m as follows:

Table 7-29m—Optional Subelement IDs for LCI Request

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Azimuth Request	1	Yes
2	Originator Requesting STA MAC Address	6	No
3	Target MAC Address	6	No
~~2~~4–220	Reserved		
221	Vendor Specific	1 to 246	
222–255	Reserved		

Insert the following text at the end of 7.3.2.21.9:

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA requesting the Location Information and it is present whenever the location subject definition field is set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information is requested and it is present whenever the location subject definition field is set to 2. The format of the Target MAC address subelement is shown in Figure 7-62k2.

	Subelement ID	Length	Originator Requesting STA MAC Address
Octets:	1	1	6

Figure 7-62k1—Originator Requesting STA MAC Address subelement format

	Subelement ID	Length	Originator Requesting STA MAC Address
Octets:	1	1	6

Figure 7-62k2—Target MAC Address subelement format

Insert the following subclause after 7.3.2.21.11:

7.3.2.21.12 Multicast Diagnostics Request

The Measurement Request field corresponding to a Multicast Diagnostics Request is shown in Figure 7-62r1. The response to a Multicast Diagnostics Request is a Multicast Diagnostics Report.

	Randomization Interval	Measurement Duration	Group MAC Address	Multicast Triggered Reporting (optional)	Optional Subelements
Octets:	2	2	6	0 or 5	variable

Figure 7-62r1—Measurement Request field format for a Multicast Diagnostics Request

The Randomization Interval field is the desired upper limit of random delay before the measurement begins, expressed in TUs. The use of the Randomization Interval is described in 11.11.3. When requesting a triggered multicast diagnostic report, the Randomization Interval field is reserved.

The Measurement Duration field is the duration of the requested measurement, expressed in TUs. When requesting a triggered multicast diagnostic report, the Measurement Duration field is reserved.

A Group MAC Address field with the LSB of the first octet set to one contains the MAC address of the group addressed frames to which the measurement request relates. A Group MAC Address field with the LSB of the first octet set to zero indicates that all group addressed frames, apart from the broadcast MAC address, are requested.

The Multicast Triggered Reporting field is used to specify trigger conditions and thresholds. It is only present when requesting triggered multicast diagnostic reporting. The format of Multicast Triggered Reporting subelement is as shown in Figure 7-62r2.

The Multicast Trigger Condition field specifies reporting triggers for triggered management diagnostic reporting. The format of the Multicast Trigger Condition field is shown in Figure 7-62r3.

	Subelement ID	Length	Multicast Trigger Condition	Inactivity Time-out	Re-activation Delay
Octets:	1	1	1	1	1

Figure 7-62r2—Multicast Triggered Reporting subelement format

	B0	B1 B7
	Inactivity Time-out Request	Reserved
Bits:	1	7

Figure 7-62r3—Multicast Trigger Condition field

The Inactivity Timeout Request field is 1 to request that a Multicast Triggered Report be generated when no multicast frames with the monitored multicast or broadcast address are received in a time equal to the value given in the Inactivity Timeout field. The Inactivity Timeout Request field is 0 when a multicast reception timeout is not requested.

The Inactivity Timeout field contains a time value in units of 100 TUs to be used as the threshold value for the Inactivity Timeout trigger condition.

The Re-activation Delay field contains a value in units of 100 TUs during which a measuring STA does not generate further Multicast Triggered Reports after a trigger condition has been met.

The Optional Subelements field format contains zero or more Subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-29q. A Yes in the Extensible column of a subelement listed in Table 7-29q indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelements, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-29q—Optional Subelement IDs for STA Multicast Diagnostics Request

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Multicast Triggered Reporting	5	
2–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

The use of Multicast Diagnostics Request is defined in 11.10.16.

7.3.2.21.13 Location Civic Request

The Measurement Request field corresponding to a Location Civic Request is shown in Figure 7-62r4. The response to a Location Civic Request is a Location Civic Report.

	Location Subject	Civic Location Type	Location Service Interval Units	Location Service Interval	Optional Subelements
Octets:	1	1	1	2	variable

Figure 7-62r4—Location Civic Request field format

The Location Subject field is a single octet and is defined in Table 7-29l.

The Civic Location Type field contains the format of location information in the Location Civic Report, as indicated in Table 7-29r.

Table 7-29r—Civic Location Type

Civic Location Type Value	Description
0	RFC4776-2006; includes all subsequent RFCs that define additional civic address Types
1	Vendor Specific
2–255	Reserved

When the Civic Location Type value is Vendor Specific, a Vendor Specific subelement is included in the Optional Subelements field that identifies the Organization Identifier corresponding to the Civic Location Type.

The Location Service Interval Units field contains the units for the Location Service Interval field, as indicated in Table 7-29s.

Table 7-29s—Location Service Interval Units

Location Service Interval Units Value	Description
0	Seconds
1	Minutes
2	Hours
3–255	Reserved

The Location Service Interval field is the time interval, expressed in the units indicated in the Location Service Interval Units field, at which the STA requests to receive Location Civic Reports. A Location Service Interval of 0 indicates that only a single Location Civic Report is requested.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-29t. A Yes in the Extensible column of a subelement listed in Table 7-29t indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-29t—Optional Subelement IDs for Location Civic Request

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Originator Requesting STA MAC Address	6	No
2	Target MAC Address	6	No
3–220	Reserved		
221	Vendor Specific	1 to 237	
222–255	Reserved		

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA requesting for the Location Information and it is present whenever the location subject definition field is set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information is requested and it is present whenever the location subject definition field is set to 2. The format of the Target MAC address subelement is shown in Figure 7-62k2.

7.3.2.21.14 Location Identifier Request

The Measurement Request field corresponding to a Location Identifier Request is shown in Figure 7-62r5. The response to a Location Identifier Request is a Location Identifier Report.

	Location Subject	Location Service Interval Units	Location Service Interval	Optional Subelements
Octets:	1	1	2	variable

Figure 7-62r5—Location Identifier Request field format

The Location Subject field is a single octet and is defined in Table 7-29l.

The Location Service Interval Units field is defined in Table 7-29s.

The Location Service Interval field is the time interval, expressed in the units indicated in the Location Service Interval Units field, at which the STA requests to receive Location Identifier Reports. A Location Service Interval of 0 indicates that only a single Location Identifier Report is requested.

The Optional Subelements field format contains zero or more Subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. Any optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-29u. A Yes in the Extensible column of a subelement listed in Table 7-29u indicates that the Length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-29u—Optional Subelement IDs for Location Identifier Request

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Originator Requesting STA MAC Address	6	No
2	Target MAC Address	6	No
3–220	Reserved		
221	Vendor Specific	1 to 237	
222–255	Reserved		

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA requesting the Location Information and it is present whenever the location subject definition field is set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information is requested and it is present whenever the location subject definition field is set to 2. The format of the Target MAC address subelement is shown in Figure 7-62k2.

7.3.2.22 Measurement Report element

Change the third paragraph in 7.3.2.22 as follows:

The Measurement Token field is set to the Measurement Token in the corresponding Measurement Request element. If the Measurement Report element is being sent autonomously then the Measurement Token is set to 0. If the Measurement Report element is being sent in a Location Track Notification frame then the Measurement Token is set to the same value as the Location Configuration Request frame Dialog Token field that configured the STA to send the location track notification frames.

Change Table 7-30 in 7.3.2.22 as shown below, changing the "Measurement Use" column to include separate rows beginning with the "STA Statistics Report" entry:

Table 7-30—Measurement Type definitions for measurement reports

Name	Measurement Type	Measurement Use
Basic report	0	Spectrum Management
Clear Channel Assessment (CCA) report	1	
Receive power indication (RPI) histogram report	2	
Channel load report	3	Radio Resource Measurement
Noise histogram report	4	
Beacon report	5	
Frame report	6	
STA statistics report	7	Radio Resource Measurement and WNM
LCI report	8	Radio Resource Measurement and WNM
Transmit stream/category measurement report	9	Radio Resource Measurement
Multicast diagnostics report	10	WNM
Location Civic report	11	Radio Resource Measurement and WNM
Location Identifier report	12	Radio Resource Measurement and WNM
Reserved	13~~10~~–255	N/A

7.3.2.22.8 STA Statistics Report

Insert a new row and change the Reserved row accordingly in Table 7-31f:

Table 7-31f—Group Identity for a STA Statistics Report

Group Identity Requested	Statistics GroupData field length (octets)	Statistics Returned
16	28	dot11RSNAStats Group for the Interface on which the STA Statistics Request was received: dot11RSNAStatsCMACICVErrors (Counter32) dot11RSNAStatsCMACReplays (Counter32) dot11RSNAStatsRobustMgmtCCMPReplays(Counter32) dot11RSNAStatsTKIPICVErrors (Counter32) dot11RSNAStatsTKIPReplays (Counter32) dot11RSNAStatsCCMPDecryptErrors (Counter32) dot11RSNAStatsCCMPReplays (Counter32)
17~~16~~–255	Reserved	Reserved

Change Table 7-31g as follows:

Table 7-31g—Optional Subelement IDs for STA Statistics Report

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Reporting Reason	Variable	
~~0~~2–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

Insert the following before the paragraph that reads "The Vendor Specific subelements …":

The format of the Measurement Report field for RSNA Counters Group is shown in Figure 7-68l1.

	dot11RSNAStats CMACICVErrors	dot11RSNAStatsCM ACReplays	dot11RSNAStats RobustMgmt CCMPReplays	dot11RSNAStats TKIPICVErrors
Octets:	4	4	4	4

	dot11RSNAStats TKIPReplays	dot11RSNAStats CCMPDecryptErrors	dot11RSNAStats CCMPReplays
Octets	4	4	4

Figure 7-68l1—Measurement Report field format for RSNA Counters Group

The Reporting Reason subelement indicates the reason why the measuring STA sent the STA Statistics report. It is present if Statistics Group Name is from STA Counters, QoS STA Counters, or RSNA Counters (see 11.10.8.5).

The Reporting Reason subelement for STA Statistics Group Identities 0 or 1 (STA Counters) is shown in Figure 7-68l2.

	B0	B1	B2	B3
	dot11Failed	dot11FCS Error	dot11Multiple Retry	dot11Frame Duplicate
Bits	1	1	1	1

	B4	B5	B6	B7
	dot11RTS Failure	dot11ACK Failure	dot11Retry	Reserved
Bits	1	1	1	1

Figure 7-68l2—Reporting Reason subelement for STA Counters

The Reporting Reason subelement for STA Statistics Group Identity 2 through 9 (QoS STA Counters) is shown in Figure 7-62h3.

	B0	B1	B2	B3
	dot11QoS Failed	Dot11QoS Retry	dot11QoSMultiple Retry	dot11QoSFrame Duplicate
Bits	1	1	1	1

	B4	B5	B6	B7
	dot11QoSRTS Failure	dot11QoSACK Failure	dot11QoS Discarded	Reserved
Bits	1	1	1	1

Figure 7-68l3—Reporting Reason subelement for QoS STA Counters

The Reporting Reason subelement for STA Statistics Group Identity 16 (RSNA Counters) is shown in Figure 7-68l4.

	B0	B1	B2	B3
	dot11RSNAStats CMACICVErrors	dot11RSNA StatsCMACReplays	dot11RSNAStats RobustMgmt CCMPReplays	dot11RSNAStats TKIPICVErrors
Bits:	1	1	1	1

	B4	B5	B6	B7
	dot11RSNAStats TKIPReplays	dot11RSNAStats TKIPReplays	dot11RSNAStats CCMPReplays	Reserved
Bits:	1	1	1	1

Figure 7-68l4—Reporting Reason subelement for RSNA Counters

In a non-triggered STA Statistics Report, all fields in the Reporting Reason subelement are set to 0.

7.3.2.22.9 Location Configuration Information Report

Change Table 7-31h as follows:.

Table 7-31h—Optional Subelement IDs for LCI Report

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Azimuth Report	2	Yes
2	Originator Requesting STA MAC Address	6	No
3	Target MAC Address	6	No
~~2~~4–220	Reserved		
221	Vendor Specific	1 to 232	
222–255	Reserved		

Insert the following text at the end of 7.3.2.22.9:

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA that requested the Location Information and it is present whenever the location subject definition field in the corresponding LCI Request was set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information was requested and it is present whenever the location subject definition field in the corresponding LCI Request was set to 2. The format of the Target MAC Address subelement is shown in Figure 7-62k2.

Insert the following subclause after 7.3.2.22.10

7.3.2.22.11 Multicast Diagnostics Report

The format of the Measurement Report field of a Multicast Diagnostics report is shown in Figure 7-68r.

	Measurement Time	Measurement Duration	Group MAC Address	Multicast Reporting Reason	Multicast Received MSDU Count
Octets:	8	2	6	1	4

	First Sequence Number	Last Sequence Number	Multicast Rate	Optional Subelements
Octets:	2	2	2	variable

Figure 7-68r—Measurement Report field format for a Multicast Diagnostics Report

The Measurement Time field is the value of the STA TSF timer at the time the measurement started. For a triggered Multicast Diagnostics report, this is the TSF value at the reporting STA when the trigger condition was met. When the reason for sending the report is Performance Measurement and the Multicast Received MSDU Count is nonzero, the Measurement Time field is the value of the STA TSF timer at the time of the first multicast MSDU received during the measurement interval.

The Measurement Duration field specifies the period over which the Multicast Diagnostic Report was generated, expressed in units of TUs.

The Group MAC Address field contains the value from the Group MAC Address field from the Multicast Diagnostics Request to which the report relates.

The Multicast Reporting Reason field indicates the reason why the measuring STA sent the Multicast Diagnostics report. The Multicast Reporting Reason field is shown in Figure 7-68s.

	B0	B1	B2-B7
	Inactivity Timeout Trigger	Measurement Result	Reserved
Bits:	1	1	6

Figure 7-68s—Multicast Reporting Reason field

The subfields of the Multicast Reporting Reason field are defined as follows:

— The Inactivity Timeout Trigger field set to 1 indicates that Multicast Diagnostics Report was generated as a triggered report due to the timeout of the multicast diagnostic timer.

— The Measurement Result field set to 1 indicates that the Multicast Diagnostic Report contains the result of completing a multicast diagnostic request that did not contain a Multicast Triggered Reporting subelement.

All the bits in the Multicast Reporting Reason field can be independently set.

The Multicast Received MSDU Count field contains the total number of multicast MSDUs with the indicated Multicast MAC Address that were received during the Measurement Duration. For a triggered multicast diagnostics measurement, the Multicast Received MSDU Count field contains the total number of multicast MSDUs with the indicated Multicast MAC Address that were received between the acceptance of the multicast diagnostics measurement request and the occurrence of the trigger condition.

When the LSB of the first octet of the Multicast MAC address field in the multicast diagnostic request is 1, the twelve LSBs of the First Sequence Number field contain the sequence number of the first frame received with destination address equal to the value in the Multicast MAC address field during the measurement period. When the LSB of the first octet of the Multicast MAC address field in the multicast diagnostic request is 0, the twelve LSBs of the First Sequence Number field contain the sequence number of the first group addressed frame, that does not have the broadcast MAC address as its destination, received during the measurement period. The four most significant bits of the First Sequence Number field are set to zero.

When the LSB of the first octet of the Multicast MAC address field in the multicast diagnostic request is 1, the twelve LSBs of the Last Sequence Number field contain the sequence number of the last frame received with destination address equal to the value in the Multicast MAC address field during the measurement period. When the LSB of the first octet of the Multicast MAC address field in the multicast diagnostic request is 0, the twelve LSBs of the Last Sequence Number field contain the sequence number of the last group addressed frame, that does not have the broadcast MAC address as its destination, received during the measurement period. The four most significant bits of the Last Sequence Number field are set to zero.

The First Sequence Number field and the Last Sequence Number field are set to 0 if the Multicast Received MSDU Count is 0.

The Multicast Rate field specifies the highest data rate, in 0.5 Mb/s units, at which the STA has received a group addressed frame with a valid FCS during the measurement period.The Multicast Rate field is encoded with the MSB set to 1 to indicate that the data rate is in the basic rate set, and set to 0 to indicate that the data rate is not in the basic rate set. The remaining 15 bit value is multiplied by 0.5 Mb/s to indicate the data rate. The Multicast Rate field is 0 by the STA to indicate that it has not received a group addressed frame with a valid FCS during the measurement period.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-31k. A Yes in the Extensible column of a subelement listed in Table 7-31k indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-31k—Optional Subelement IDs for Multicast Diagnostics Report

Subelement ID	Name	Length field (octets)	Extensible
0–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

The summary of fields used in the STA Multicast Diagnostics Report is shown in Table 7-31l.

Table 7-31l—Summary of fields used in the STA Multicast Diagnostics Report

Field	Measurement Result	Triggered Report
Measurement Time	Yes	Yes
Measurement Duration	Yes	Yes
Group MAC Address	Yes	Yes
Multicast Reporting Reason	Yes	Yes
Multicast Received MSDU Count	Yes	Yes
First Sequence Number	Yes	Yes
Last Sequence Number	Yes	Yes
Multicast Rate	Yes	Yes
Optional Subelements	Optional	Optional

The use of Multicast Diagnostics Report is defined in 11.10.16.

7.3.2.22.12 Location Civic Report

The Location Civic Report includes the location information defined in Civic format for the location subject provided in the Location Civic measurement request, as shown in Figure 7-68t.

	Civic Location Type	Optional Subelements	Civic Location
Octets:	1	variable	variable

Figure 7-68t—Location Civic Report field format

The Civic Location Type field contains the format of location information in the Civic Location field, as indicated in Table 7-29r.

When the Civic Location Type is RFC4776-2006, the Optional Subelements field can include the Location Reference, Location Shape, Map Image and Vendor Specific subelements as defined in Table 7-31m.

When the Civic Location Type value is Vendor Specific, a Vendor Specific subelement is included in the Optional Subelements field that identifies the Organization Identifier corresponding to the Civic Location Type.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field, and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-31m. A Yes in the Extensible column of a subelement listed in Table 7-31m indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-31m—Optional Subelement IDs for Location Civic Report

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Originator Requesting STA MAC Address	6	No
2	Target MAC Address	6	No
3	Location Reference	Variable	
4	Location Shape	Variable	
5	Map Image	Variable	
6–220	Reserved		
221	Vendor Specific	1 to 237	
222–255	Reserved		

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA that requested the Location Information and it is present whenever the location subject definition field in the corresponding Location Civic Request was set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information was requested and it is present whenever the location subject definition field in the corresponding Location Civic Request was set to 2. The format of the Target MAC Address subelement is shown in Figure 7-62k2.

The format of the Location Reference subelement is shown in Figure 7-68u.

	Subelement ID	Length	Location Reference
Octets:	1	1	variable

Figure 7-68u—Location Reference Subelement format

The Location Reference is an ASCII string that defines a position on a floor from which the relative location contained in the Location Shape subelement is offset. A Location Reference value of 0 length indicates that the position of the Location Shape is top north west corner (i.e., 0,0) of the floor plan that on which the Location Shape is defined.

The format of the Location Shape subelement is shown in Figure 7-68v.

	Subelement ID	Length	Location Shape ID	Location Shape Value
Octets:	1	1	1	variable

Figure 7-68v—Location Shape Subelement format

The Location Shape subelement defines the position in meters, including uncertainty, of the entity being located. A Shape is specified with respect to either a 2-Dimensional or 3-Dimensional Coordinate Reference System where each point in the shape defines the direction from the Location Reference starting point. A positive X-axis value corresponds to an easterly direction relative to the Location Reference; a negative X-axis value corresponds to a westerly direction relative to the Location Reference; a positive Y-axis value corresponds to a northerly direction relative to the Location Reference; a negative Y-axis value corresponds to a southerly direction relative to the Location Reference and the Z-axis value corresponds to the altitude above the horizontal plane at the Location Reference.

The Location Shape ID field contains a one-octet identifier that defines the shape contained in the subelement and is one of the values defined in Table 7-31n.

Table 7-31n—Location Shape IDs

Location Shape ID	Name	Length (octets)
0	Reserved	
1	2-Dimension Point	8
2	3-Dimension Point	12
3	Circle	12
4	Sphere	16
5	Polygon	Variable
6	Prism	Variable
7	Ellipse	18
8	Ellipsoid	26
9	Arcband	20
10–255	Reserved	

The Location Shape Value field contains the location shape value for each corresponding Location Shape ID. The formats of Location Shape Values are described in the following text.

All shape field value units that are 4-octet single precision floating point values are in meters and are represented by binary32 floating point values as defined in IEEE Std 754-2008, with the least significant bit of the fraction occurring in bit 0 of the field.

The format of the 2-Dimension Point Location Shape Value is defined in Figure 7-68w.

	X-coordinate	Y-coordinate
Octets:	4	4

Figure 7-68w—2-Dimension Point Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The format of the 3-Dimension Point Location Shape Value is defined in Figure 7-68x.

	X-coordinate	Y-coordinate	Z-coordinate
Octets:	4	4	4

Figure 7-68x—3-Dimension Point Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Z-coordinate field contains a 4-octet single precision floating point value.

The format of the Circle Location Shape Value is defined in Figure 7-68y.

	X-coordinate	Y-coordinate	Radius
Octets:	4	4	4

Figure 7-68y—Circle Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Radius field contains a 4-octet single precision floating point value.

The format of the Sphere Location Shape Value is defined in Figure 7-68z.

	X-coordinate	Y-coordinate	Z-coordinate	Radius
Octets:	4	4	4	4

Figure 7-68z—Sphere Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Z-coordinate field contains a 4-octet single precision floating point value.

The Radius field contains a 4-octet single precision floating point value.

The format of the Polygon Location Shape Value is defined in Figure 7-68aa.

	Number of Points	List of 2-Dimension Points
Octets:	1	variable

Figure 7-68aa—Polygon Location Value format

The Number of Points field is a 1 octet unsigned integer that specifies the number of points defined in the polygon. The value 0 is reserved.

The List of 2-Dimension Points is a sequence of 2D Point field values that define the closed polygon.

The format of the Prism Location Shape Value is defined in Figure 7-68ab.

	Number of Points	List of 3-Dimension Points
Octets:	1	variable

Figure 7-68ab—Prism Location Value format

The Number of Points field is a 1 octet unsigned integer that specifies the number of points defined in the prism. The value 0 is reserved.

The List of 3-Dimension Points is a sequence of 3-Dimension Point field values that define the closed prism.

The format of the Ellipse Location Shape Value is defined in Figure 7-68ac.

	X-coordinate	Y-coordinate	Angle	Semi-Major Axis	Semi-Minor Axis
Octets:	4	4	2	4	4

Figure 7-68ac—Ellipse Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Angle field contains a 2-octet unsigned integer between 0 and 359 degrees.

The Semi-Major Axis field contains a 4-octet single precision floating point value.

The Semi-Minor Axis field contains a 4-octet single precision floating point value.

The format of the Ellipsoid Location Shape Value is defined in Figure 7-68ad.

	X-coordinate	Y-coordinate	Z-coordinate	Angle	Semi-Major Axis	Semi-Minor Axis	Semi-Vertical Axis
Octets:	4	4	4	2	4	4	4

Figure 7-68ad—Ellipsoid Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Angle field contains a 2-octet unsigned integer between 0 and 359 degrees.

The Semi-Major Axis field contains a 4-octet single precision floating point value.

The Semi-Minor Axis field contains a 4-octet single precision floating point value.

The Semi-Vertical Axis field contains a 4-octet single precision floating point value.

The format of the Arcband Location Shape Value is defined in Figure 7-68ae.

	X-coordinate	Y-coordinate	Inner Radius	Outer Radius	Start Angle	Opening Angle
Octets:	4	4	4	4	2	2

Figure 7-68ae—Arcband Location Value format

The X-coordinate field contains a 4-octet single precision floating point value.

The Y-coordinate field contains a 4-octet single precision floating point value.

The Inner Radius field contains a 4-octet single precision floating point value.

The Outer Radius field contains a 4-octet single precision floating point value.

The Start Angle field contains a 2-octet unsigned integer between 0 and 359.

The Opening Angle field contains a 2-octet unsigned integer between 0 and 359.

The Map Image subelement contains a map reference that is used in combination with the Location Reference and Location Shape subelements. The format of the Map Image subelement is shown in Figure 7-68af.

	Subelement ID	Length	Map Type	Map URL
Octets:	1	1	1	variable

Figure 7-68af—Map Image Subelement format

The Map Type field is a 1-octet unsigned integer that defines the type of map referred to by the Map URL field, as defined in Table 7-31o.

Table 7-31o—Map Types

Map Type Value	Name
0	URL Defined
1	Png
2	Gif
3	Jpeg
4	Svg
5	dxf
6	Dwg
7	Dwf
8	cad
9	Tiff
10	gml
11	Kml
12	Bmp
13	Pgm
14	ppm

Table 7-31o—Map Types *(continued)*

Map Type Value	Name
15	Xbm
16	Xpm
17	ico
18–255	Reserved

The Map Type field value "URL Defined" indicates the Map URL field value has a file extension, defined as a mime type and is self-descriptive.

The Map URL field is a variable-length field formatted in accordance with IETF RFC 3986-2005 and provides the location of a floor map.

The Civic Location field is a variable octet field and contains the location information in the format as indicated in the Civic Location Type field.

7.3.2.22.13 Location Identifier Report

The Location Identifier Report includes an indirect reference to where the location information for the location subject provided in the Location Identifier measurement request can be retrieved, as shown in Figure 7-68ag.

	Expiration TSF	Optional Subelements	Public Identifier URI
Octets:	8	variable	variable

Figure 7-68ag—Location Identifier Report field format

The Expiration TSF field is the value of the TSF when the Public Identifier URI field value is no longer valid. The Expiration TSF field set to 0 indicates the Public Identifier URI does not expire.

The Optional Subelements field format contains zero or more Subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. Any optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-31p. A Yes in the Extensible column of a subelement listed in Table 7-31p indicates that the Length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

The Originator Requesting STA MAC Address subelement contains the MAC address of the STA that requested the Location Information and it is present whenever the location subject definition field in the corresponding Location Identifier Request was set to 2. The format of the Originator Requesting STA MAC Address subelement is shown in Figure 7-62k1.

The Target MAC Address subelement contains the MAC address of the STA whose Location Information was requested and it is present whenever the location subject definition field in the corresponding Location

Table 7-31p—Optional Subelement IDs for Location Identifier Report

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	Originator Requesting STA MAC Address	6	No
2	Target MAC Address	6	No
3–220	Reserved		
221	Vendor Specific	1 to 237	
222–255	Reserved		

Identifier Request was set to 2. The format of the Target MAC Address subelement is shown in Figure 7-62k2.

The Public Identifier URI field contains a value in URI format that points to a location object. It can be used to return the location value for the requesting STA. The format of the location value returned when the URI is dereferenced is dependent on the provider of the URI and is beyond the scope of this document. The Public Identifier URI confirms the validity of the location estimate to an external agent when a STA forwards a location estimate to that agent. The protocol used to query the infrastructure for a location report based on the Public Identifier URI is beyond the scope of this standard.

Change 7.3.2.27 as follows:

7.3.2.27 Extended Capabilities information element

Insert the following Bits and change the Reserved row in Table 7-35a as follows (note that the entire table is not shown here):

Table 7-35a—Capabilities field

Bit(s)	Information	Notes
7	Event	The STA sets the Event field to 1 when the MIB attribute dot11MgmtOptionEventsActivated is true, and sets it to 0 otherwise. See 11.22.2.
8	Diagnostics	The STA sets the Diagnostics field to 1 when the MIB attribute dot11MgmtOptionDiagnosticsActivated is true, and sets it to 0 otherwise. See 11.22.3.
9	Multicast Diagnostics	The STA sets the Multicast Diagnostics field to 1 when the MIB attribute dot11MgmtOptionMulticastDiagnosticsActivated is true, and sets it to 0 otherwise. See 11.22.2.
10	Location Tracking	The STA sets the Location Tracking field to 1 when the MIB attribute dot11MgmtOptionLocationTrackingActivated is true, and sets it to 0 otherwise. See 11.22.4.

Table 7-35a—Capabilities field *(continued)*

Bit(s)	Information	Notes
11	FMS	The STA sets the FMS field to 1 when the MIB attribute dot11MgmtOptionFMSActivated is true, and sets it to 0 otherwise. See 11.2.1.4a and 11.22.7.
12	Proxy ARP Service	The AP sets the Proxy ARP Service field to 1 when the MIB attribute dot11MgmtOptionProxyARPActivated is true, and sets it to 0 otherwise. See 11.22.13. A non-AP STA sets the Proxy ARP Service field to 0.
13	Collocated Interference Reporting	The STA sets the Collocated Interference Reporting field to 1 when the MIB attribute dot11MgmtOptionCoLocIntfReportingActivated is true, and sets it to 0 otherwise. See 11.22.9.
14	Civic Location	The STA sets the Civic Location field to 1 when the MIB attribute dot11RRMCivicMeasurementActivated is true, and sets it to 0 otherwise. See 11.10.8.9.
15	Geospatial Location	The STA sets the Geospatial Location field to 1 when the MIB attribute dot11RRMLCIMeasurementEnabled is true, and sets it to 0 otherwise. See 11.10.8.6.
16	TFS	The STA sets the TFS field to 1 when the MIB attribute dot11MgmtOptionTFSActivated is true, and sets it to 0 otherwise. See 11.22.11.
17	WNM-Sleep Mode	The STA sets the WNM-Sleep Mode field to 1 when the MIB attribute dot11MgmtOptionWNMSleepModeActivated is true, and sets it to 0 otherwise. See 11.2.1.16.
18	TIM Broadcast	The STA sets the TIM Broadcast field to 1 when the MIB attribute dot11MgmtOptionTIMBroadcastActivated is true, and sets it to 0 otherwise. See 11.2.1.15.
19	BSS Transition	The STA sets the BSS Transition field to 1 when the MIB attribute dot11MgmtOptionBSSTransitionActivated is true, and sets it to 0 otherwise. See 11.22.6.
20	QoS Traffic Capability	The STA sets the QoS Traffic Capability field to 1 when the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is true, and sets it to 0 otherwise. See 11.22.9.
21	AC Station Count	The STA sets the AC Station Count field to 1 when the MIB attribute dot11MgmtOptionACStationCountActivated is true, and sets it to 0 otherwise. See 11.22.10.
22	Multiple BSSID	The STA sets the Multiple BSSID field to 1 when the MIB attribute dot11MgmtOptionMultiBSSIDActivated is true, and sets it to 0 otherwise. See 11.10.11 and 11.1.2.3a.
23	Timing Measurement	The STA sets the Timing Measurement field to 1 when the MIB attribute dot11MgmtOptionTimingMsmtActivated is true, and sets it to 0 otherwise. See 11.22.5.
24	Channel Usage	The STA sets the Channel Usage field to 1 when the MIB attribute dot11MgmtOptionChannelUsageActivated is true and sets it to 0 otherwise. See 11.22.14.

Table 7-35a—Capabilities field *(continued)*

Bit(s)	Information	Notes
25	SSID List	The STA sets the SSID List field to 1 when the MIB attributedot11MgmtOptionSSIDListActivated is true, and sets it to 0 otherwise. See 11.1.3.
26	DMS	The STA sets the DMS field to 1 when the MIB attribute dot11MgmtOptionDMSActivated is true and sets it to 0 otherwise. See 11.22.15.
27	UTC TSF Offset	The STA sets the UTC TSF Offset field to 1 when the MIB attribute dot11MgmtOptionUTCTSFOffsetActivated is true and sets it to 0 otherwise. See 11.20.3.
44	Identifier Location	The STA sets the Identifier Location field to 1 when the MIB attribute dot11RRMIdentifierMeasurementActivated is true, and sets it to 0 otherwise. See 11.10.8.10.
45	U-APSD Coexistence	The STA sets the U-APSD Coexistence field to 1 when the MIB attribute dot11MgmtOptionUAPSDCoexistenceActivated is true and sets it to 0 otherwise. See 11.21.1.4.1.
46	WNM-Notification	The STA sets the WNM-Notification field to 1 when the MIB attribute dot11MgmtOptionWNMNotificationActivated is true and sets it to 0 otherwise. See 11.22.16.
47–*n*	Reserved	All other bits are reserved, and are set to 0 on transmission and ignored on reception.

7.3.2.31 TCLAS element

Change the first paragraph of 7.3.2.31 as follows:

The TCLAS element specifies an information element that contains a set of parameters necessary to identify incoming MSDUs (from a higher layer in all STAs or from the DS in an AP) ~~with a particular TS to which they belong~~ that belong to a particular TS. The TCLAS element is also used when the traffic does not belong to a TS, for example by the FMS, DMS, and TFS services. If required, the TCLAS element is provided in ADDTS Request and ADDTS Response frames only for the downlink or bidirectional links. TCLAS element need not be provided for the uplink or direct link transmissions. The structure of this element is shown in Figure 7-85.

Insert Classifier types 3 and 4, and change the Reserved row in Table 7-42 as follows (note that the entire table is not shown here):

Table 7-42—Frame classifier type

Classifier type	Classifier parameters
3	Filter Offset parameters
4	IP and higher layer parameters
~~3~~5–255	Reserved

Change the fourth paragraph of 7.3.2.31 as follows:

The Frame Classifier field comprises the following subfields: Classifier Type, Classifier Mask, and Classifier Parameters. The Classifier Type subfield is 1 octet in length and specifies the type of classifier parameters in this TCLAS as defined in Table 7-42. ~~Three~~ Five classifier types are defined later in this subclause.

Insert the following paragraphs after the eighth paragraph:

The value in the Version subfield is the value specified in IETF RFC 791-1981 or IETF RFC 2460-1998.

Change the seventh paragraph as follows:

For Classifier Type 1, frame classifier is defined for both IPv4 and IPv6, shown in Figure 7-88 and Figure 7-89, and distinguished by the Version subfield. Use of Classifier Type 1 for IPv6 is deprecated and replaced by Classifier Type 4. The subfields in the classifier parameters are represented and transmitted in the big-endian format. The classifier parameters are the following parameters:

Insert the following text at the end of 7.3.2.31:

For Classifier Type 3, the classifier parameters are defined by a Filter Offset subfield, a Filter Value subfield and a Filter Mask subfield. The Frame Classifier subfield of Classifier Type 3 is defined in Figure 7-90a. It has a variable length.

	Classifier Type (3)	Classifier Mask	Filter Offset	Filter Value	Filter Mask
Octets:	1	1	2	variable	variable

Figure 7-90a—Frame Classifier field of Classifier Type 3

The Classifier Mask subfield is reserved.

The value of the Filter Offset subfield is the number of octets from the beginning of the MSDU or MMPDU at which the Filter Value is compared. A value of zero for the Filter Offset indicates that the Filter Value subfield is to be compared to the first octet of the payload prior to encryption following the MAC header.

The length of the Filter Value and Filter Mask subfields is (Length – 5)/2, where Length is the value in the Length field of the TCLAS element.

The Filter Value subfield is an octet string that is compared to the MSDU or MMDPU content, beginning at the octet indicated by the Filter Offset.

The Filter Mask subfield is an octet string that is used to indicate which bits in the Filter Value subfield are compared. The length of the Filter Mask subfield is equal to the length of the Filter Value subfield. A bit in the Filter Value subfield is only compared if the matching bit in the Filter Mask subfield is 1.

For Classifier Type 4, frame classifier is defined for both IPv4 and IPv6, shown in Figure 7-90b (with the Classifier Type subfield set to 4) and Figure 7-90c, and distinguished by the Version subfield. The classifier parameters represent corresponding values in a received IPv4 or IPv6 frame and are defined in Table 7-42a. The subfields in the classifier parameters are represented and transmitted in big-endian format.

Table 7-42a—Classifier Parameters for Classifier Type 4

Subfield	Included in IPv4	IPv4 Field Length	Included in IPv6	IPv6 Field Length
Version	Yes	1	Yes	1
Source IP Address	Yes	4	Yes	16
Destination IP Address	Yes	4	Yes	16
Source Port	Yes	2	Yes	2
Destination Port	Yes	2	Yes	2
DSCP	Yes	1	Yes	1
Protocol	Yes	1	No	n/a
Next Header	No	n/a	Yes	1
Flow Label	No	n/a	Yes	3

The Frame Classifier subfield of Classifier Type 4 for traffic over IPv4 is shown in Figure 7-90b.

	Classifier Type (4)	Classifier Mask	Version(4)	Source IP Address	Destination IP Address
Octets:	1	1	1	4	4

	Source Port	Destination Port	DSCP	Protocol	Reserved
Octets:	2	2	1	1	1

Figure 7-90b—Frame Classifier subfield of Classifier Type 4 for traffic over IPv4

The Frame Classifier subfield of Classifier Type 4 for traffic over IPv6 is shown in Figure 7-90c.

NOTE—Frame classification when extension headers are used is supported only if the TCLAS does not classify on ports (Classifier Mask has the Source and Destination Port bits set to 0).

The value in the Version subfield is the value specified in IETF RFC 791-1981 or IETF RFC 2460-1998.

The DSCP subfield contains the value as described in IETF RFC 2474-1998 in the 6 least significant bits. The 2 most significant bits are reserved.

	Classifier Type (4)	Classifier Mask	Version(6)	Source IP Address	Destination IP Address
Octets:	1	1	1	16	16

	Source Port	Destination Port	DSCP	Next Header	Flow Label
Octets:	2	2	1	1	3

Figure 7-90c—Frame Classifier subfield of Classifier Type 4 for traffic over IPv6

The Next Header subfield contains the next encapsulated protocol and is compatible with the values specified for the IPv4 Protocol subfield. In the presence of options in the IPv6 header, the Next Header subfield specifies the presence of one or more out of six extension headers as defined in IETF RFC 2460-1998.

The Flow Label subfield contains the value in the 20 least significant bits. The 4 most significant bits are reserved.

NOTE—For example, the flow label 0x12345 is represented as the octet sequence 0x01, 0x23, 0x45.

A TCLAS element is valid when the Classifier Mask Version bit is 1.

7.3.2.33 TCLAS Processing element

Change the first sentence of 7.3.2.33 as follows:

The TCLAS Processing element is present in the ADDTS Request, ~~and~~ ADDTS Response, FMS Request, DMS Request, and TFS Request frames if there are multiple TCLASs associated with the request.

7.3.2.37 Neighbor Report element

Change Table 7-43b as follows:

Table 7-43b—Optional Subelement IDs for Neighbor Report

Subelement ID	Name	Length field (octets)	Extensible
0	Reserved		
1	TSF Information	4	Yes
2	Condensed Country String	2	Yes
3	BSS Transition Candidate Preference	1	
4	BSS Termination Duration	12	
5	Bearing	8	
~~3~~6–65	Reserved		

Table 7-43b—Optional Subelement IDs for Neighbor Report *(continued)*

Subelement ID	Name	Length field (octets)	Extensible
66	Measurement Pilot Transmission Information	1 to 238	Subelements
67–69	Reserved		
70	RRM Enabled Capabilities	4	Yes
71	Multiple BSSID	1 to 238	Subelements
72–220	Reserved		
221	Vendor Specific	1 to 238	
222–255	Reserved		

Insert the following text at the end of 7.3.2.37 as follows:

The format of the BSS Transition Candidate Preference subelement field is shown in Figure 7-95e1.

	Subelement ID	Length	Preference
Octets:	1	1	1

Figure 7-95e1— BSS Transition Candidate Preference subelement field format

The value of the Length field in the BSS Transition Candidate Information subelement is 1.

The Preference field indicates the network preference for BSS transition to the BSS listed in this BSS Transition Candidate List Entries field in the BSS Transition Management Request frame, BSS Transition Management Query frame, and BSS Transition Management Response frame. The Preference field value is a number ranging from 0 to 255, as defined in Table 7-43b1, indicating an ordering of preferences for the BSS transition candidates for this STA. Additional details describing use of the Preference field are provided in 11.22.6.3.

The BSS Termination TSF field contained in the BSS Termination Duration subelement is the TSF time of the BSS transmitting the Neighbor Report that corresponds to the time when termination of the neighbor BSS will occur. How the BSS determines the neighbor BSS termination time is out of scope of the standard. The format of the BSS Termination Duration subelement field is shown in Figure 7-95e2.

The value of the Length field in the BSS Termination Duration Information subelement is 10.

The BSS Termination TSF field indicates the value of the TSF counter when BSS termination will occur in the future. A BSS Termination TSF field value of 0 indicates that termination of the BSS will occur imminently. Prior to termination of the BSS, all associated STAs are disassociated by the AP.

Table 7-43b1—Preference field values

Preference field value	Description
0	Excluded BSS; reserved when present in the BSS Transition Management Query or BSS Transition Management Response frames.
1–255	Relative values used to indicate the preferred ordering of BSSs, with 255 indicating the most preferred candidate and 1 indicating the least preferred candidate.

	Subelement ID	Length	BSS Termination TSF	Duration
Octets:	1	1	8	2

Figure 7-95e2—BSS Termination Duration subelement field format

The Duration field is an unsigned 2-octet integer that indicates the number of minutes for which the BSS is not present. The Duration field value of 0 is reserved. The Duration field value is 65535 when the BSS is terminated for a period longer than or equal to 65535 minutes.

The format of the Bearing subelement field is shown in Figure 7-95e3.

	Subelement ID	Length	Bearing	Distance	Relative Height
Octets:	1	1	2	4	2

Figure 7-95e3—Bearing subelement field format

The value of the Bearing Information subelement length field is 4.

The Bearing field specifies the direction that the neighbor, specified by the BSSID field in the Neighbor Report element, is positioned, relative to the reporting BSS and defined in relation to true north, increasing clockwise, measured in degrees from 0 degree to 359 degrees. If the Bearing value is unknown, the subelement is not included.

The Distance field specifies the distance that the neighbor, specified by the BSSID field in the Neighbor Report element, is positioned relative to the reporting BSS as a 4-octet single precision floating point value represented by a binary32 floating point value as defined in IEEE Std 754-2008, with the least significant bit of the fraction occurring in bit 0 of the field, in meters. If the Distance field value is unknown the field is set to 0.

The Relative Height field, defined by a 2-octet signed integer, specifies the relative height in meters that the neighbor is positioned, relative to the reporting BSS. If the Relative height is unknown or at the same height as the reporting BSS, the field is 0.

7.3.2.40 Antenna Information element

Change the fourth paragraph as follows:

The Antenna ID field contains the identifying number for the relevant antenna(s). When included in a Beacon, ~~or~~ Probe Response, or Location Track Notification frame, the Antenna ID identifies the antenna(s) used to transmit the Beacon, ~~or~~ Probe Response, or Location Track Notification frame. 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. In a Beacon Report or Frame Report the Antenna ID always identifies the antenna used to receive the reported beacon or frame. If during frame reception, different antennas are used to receive the preamble and body, the antenna ID identifies the antenna that receives the frame body. In these cases, the value 255 is not used. The value 1 is the only value used for a STA with only one antenna. STAs with more than one antenna will assign Antenna IDs to each antenna and each antenna configuration as consecutive, positive integers starting with 1. Each Antenna ID number represents a unique antenna or unique configuration of multiple antennas characterized by a fixed relative position, a fixed relative direction, and a fixed peak gain for that position and direction.

7.3.2.46 Multiple BSSID Element

Change 7.3.2.46 as follows:

The format of the Multiple BSSID element is shown in Figure 7-95o.

	Element ID	Length	Max BSSID Indicator	Optional Sub-elements
Octets:	1	1	1	variable

Figure 7-95o—Multiple BSSID element format

The Element ID field is equal to the Multiple BSSID value in Table 7-26.

The value of the Length field is 1 plus the length of the extensions in units of octets.

The Max BSSID Indicator field is n, where 2^n is the maximum possible number of BSSIDs in the multiple BSSID set, including the reference BSSID (see 11.10.11). The actual number of BSSIDs in the multiple BSSID set is not explicitly signalled. The BSSID(i) value corresponding to the *ith* BSSID in the multiple BSSID set is derived from a reference BSSID (REF_BSSID) as follows:

BSSID(i) = BSSID_A ~~(REF_BSSID modified to set the *n* LSBs to zero)~~ | BSSID_B ~~((*n* LSBs of REF_BSSID) + i) mod 2ⁿ)~~, where | indicates the OR operation.

BSSID_A is a BSSID with (48–n) MSBs equal to the (48–n) MSBs of the REF_BSSID and n LSBs equal to zero; and, BSSID_B is a BSSID with (48–n) MSBs equal to zero and n LSBs equal to [(n LSBs of REF_BSSID) +i] mod 2^n.

When the Multiple BSSID element is transmitted in a Beacon or Probe Response frame, the reference BSSID is the BSSID of the frame. More than one Multiple BSSID element may be included in a Beacon frame. The AP determines the number of Multiple BSSID elements. The AP does not fragment a non-transmitted BSSID profile subelement for a single BSSID across two Multiple BSSID elements unless the length of the non-transmitted BSSID profile subelement exceeds 255 octets. When the Multiple BSSID element is transmitted as a subelement in a Neighbor Report element, the reference BSSID is the BSSID field in the Neighbor Report element.

The Optional Subelements field format contains zero or more Subelements, each consisting of a 1-octet Subelement ID field, a 1-octet Length field and a variable length Data field, as shown in Figure 7-95p. Any optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-43f. A Yes in the Extensible column of a subelement listed in Table 7-43f indicates that the Length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-43f—Optional Subelement IDs for Multiple BSSID

Subelement ID	Name	Length field (octets)	Extensible
0	Non-Transmitted BSSID Profile	Variable	
1~~0~~–220	Reserved		
221	Vendor Specific	1 to 255	
222–255	Reserved		

The Non-Transmitted BSSID Profile subelement contains a list of elements for one or more APs that have non-transmitted BSSIDs, and is defined as follows:

— For each non-transmitted BSSID, the Non-transmitted BSSID Capability element (see 7.3.2.72) is the first element included, followed by a variable number of information elements, in the order defined in Table 7-8.

— The SSID and multiple BSSID-index subelements are included in the Non-Transmitted BSSID Profile subelement.

— The FMS Descriptor element is included in the Non-Transmitted BSSID Profile subelement if the Multiple BSSID element is included in a Beacon frame and if the TIM field indicates there are buffered multicast frames for this non-transmitted BSSID.

— The Timestamp and Beacon Interval fields, DS Parameter Set, FH Parameter Set, IBSS Parameter Set, Country, FH Parameters, FH Pattern Table, Channel Switch Assignment, Extended Channel Switch Announcement, Supported Regulatory Classes, IBSS DFS, ERP Information, HT Capabilities and HT Operation elements are not included in the Non-Transmitted BSSID Profile field; the values of these elements for each non-transmitted BSSID are always the same as the corresponding transmitted BSSID element values.

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26). Multiple Vendor Specific subelements can be included in the list of Optional Subelements.

The Multiple BSSID element is included in Beacon frames, as described in 7.2.3.1, and Probe Response frames, as described in 7.2.3.9. The use of the Multiple BSSID element is described 11.10.11. Non-transmitted BSSID Advertisement procedures are described in 11.1.2.3a.

Change 7.3.2.61 as follows:

7.3.2.61 Time Advertisement information element

The Time Advertisement information element, shown in Figure 7-95o28, specifies fields describing the source of time corresponding to a time standard, an external clock (external time source), an estimate of the offset between that time standard and the TSF timer, and an estimate of the standard deviation of the error in the offset estimate. This information is used by a receiving STA to align its own estimate of the time standard based on that of another STA.

	Element ID	Length	Timing capabilities	Time Value (~~if needed,~~ optional)	Time Error (~~if needed,~~ optional)	Time Update Counter (optional)
Octets:	1	1	1	0 or 10	0 or 5	0 or 1

Figure 7-95o28—Time Advertisement element format

The Timing capabilities field specifies the STA's source and encoding of the Time Value field. The encoding of the Timing capabilities field is specified in Table 7-43q.

Table 7-43q—Encoding of the Timing Capabilities field

Value	Usage
0	No standardized external time source.
1	Timestamp offset based on UTC [see ITU-R Recommendation TF.460-4(2002).] The Timestamp offset value in nanoseconds is defined to be 0 at the beginning of the first nanosecond of the first day of the year 1958.
2	UTC time at which the TSF timer is 0.
~~2~~3–255	Reserved

When the value of the Timing Capabilities field is 0, only the Element ID, Length, and Timing Capabilities fields are included in the Time Advertisement information element.

When the value of the Timing Capabilities is 1, the following additional fields are included in the Time Advertisement information element:

— Time Value field, a two's complement integer in nanoseconds which, when added to the Timestamp present in the same transmitted frame, gives the receiving STA an estimate of the time standard at the time the frame was transmitted. The Timestamp is derived from the TSF Timer as defined in 11.20.

— Time Error field, which is set to an unsigned integer in nanoseconds that defines the standard deviation of the error in the Time Value estimate. The value of all 1s is used to indicate that the error is unknown.

When the Timing Capabilities field is 2, the following fields are included in the Time Advertisement information element:

— The Time Value field is the UTC time at which the TSF Timer is 0, given that the TSF Timer units are 1 microsecond as defined in 11.1.2. The format, including all subfields is shown in Table 7-43r. For any subfield not known in the Time Value field, the subfield value is 0.

— The Time Error field is an unsigned integer in milliseconds that defines the standard deviation of the error in the Time Value estimate.

— The Time Update Counter field is a modulo 256 counter that increments each time the AP updates the Time Value UTC at which the TSF Timer is 0.

Table 7-43r—Time Value field format when Timing Capabilities is 2

Octet	Description
0–1	Year (0–65534)
2	Month (0–12)
3	Day of month (0–31)
4	Hours (0–23)
5	Minutes (0–59)
6	Seconds (0–59)
7–8	Milliseconds (0–999)
9	Reserved

Insert the following new subclauses after 7.3.2.66:

7.3.2.67 Event Request element

7.3.2.67.1 Event Request definition

The Event Request element contains a request to the receiving STA to perform the specified event action. The format of the Event Request element is shown in Figure 7-95o34.

	Element ID	Length	Event Token	Event Type	Event Response Limit	Event Request
Octets:	1	1	1	1	1	variable

Figure 7-95o34—Event Request element format

The Element ID field is equal to the Event Request value in Table 7-26.

The value of the Length field is 3 plus the length of the Event Request field.

The Event Token field is a nonzero number that is unique among the Event Request elements sent to each destination MAC address for which a corresponding Event Report element has not been received.

The Event Type field is a number that identifies the type of event request. The Event Types are shown in Table 7-43s.

Table 7-43s—Event Type definitions for event requests and reports

Name	Event Type
Transition	0
RSNA	1
Peer-to-Peer Link	2
WNM Log	3
Reserved	4–220
Vendor Specific	221
Reserved	222–255

The Event Response Limit field contains the maximum number of requested Event Reports to be included in the Event Report element. A value of 0 indicates that no limit is set on the number of Event Reports to be included in the Event Report element.

The Event Request field contains the event request corresponding to the Event Type as described in 7.3.2.67.2 through 7.3.2.67.4. The Event Request field is not present when requesting a WNM Log report.

The Event Request element is included in an Event Request frame as described in 7.4.12.2. The use of the Event Request element and Event Request frame is described in 11.22.2.

7.3.2.67.2 Transition event request

The Event Request field corresponding to the Transition event request contains zero or more Transition Event Request subelements. A transition event is a STA movement or attempted movement from one BSS (the source BSS) in one ESS to another BSS (the target BSS) within the same ESS.

The Transition Event subelements specify the conditions in which a Transition Event Report is sent by a STA. The set of valid Transition Event Request subelements is defined in Table 7-43t.

The Transition Target BSSID subelement is used to request that a Transition Event Report includes the transition event entry when the target BSSID is equal to the specific BSSID in the Target BSSID field. Excluding this subelement from the Event Request element indicates a request for transition events for all target BSSIDs. The format of the Transition Target BSSID subelement is shown in Figure 7-95o35.

The Subelement ID field is equal to the Transition Target BSSID value in Table 7-43t.

Table 7-43t—Transition Event Request Subelement

Order	Transition Event Request Subelement	Subelement ID
1	Transition Target BSSID	0
2	Transition Source BSSID	1
3	Transition Time Threshold	2
4	Transition Result	3
5	Frequent Transition	4
—	Reserved	5–255

	Subelement ID	Length	Target BSSID
Octets:	1	1	6

Figure 7-95o35—Transition Target BSSID subelement format

The value of the Length field is 6.

The Target BSSID field contains a 6-octet BSSID.

The Transition Source BSSID subelement is used to request that a Transition Event Report includes the transition event entry when the source BSSID is equal to the BSSID specified in the Source BSSID field. Excluding this subelement from the Event Request element indicates a request for transition events for all source BSSIDs. The format of the Transition Source BSSID subelement is shown in Figure 7-95o36.

	Subelement ID	Length	Source BSSID
Octets:	1	1	6

Figure 7-95o36—Transition Source BSSID subelement format

The Subelement ID field is equal to the Transition Source BSSID value in Table 7-43t.

The value of the Length field is 6.

The Source BSSID field contains a 6-octet BSSID.

The Transition Time Threshold subelement is used to request that a Transition Event Report includes the transition event entry when the Transition Time is greater than or equal to the Transition Time Threshold value. The format of the Transition Time subelement is shown in Figure 7-95o37.

The Subelement ID field is equal to the Transition Time Threshold value in Table 7-43t.

	Subelement ID	Length	Transition Time Threshold
Octets:	1	1	2

Figure 7-95o37—Transition Time Threshold subelement format

The value of the Length field is 2.

The Transition Time Threshold field contains a value representing the Transition Time to be used as the threshold value for the Transition Time condition in TUs. The Transition Time is defined in 11.22.2.2.

The Transition Result subelement is used to request that a Transition Event Report includes the transition event entry that matches the transition result defined by this subelement. The format of Transition Result subelement is shown in Figure 7-95o38.

	Subelement ID	Length	Match Value
Octets:	1	1	1

Figure 7-95o38—Transition Result subelement format

The Subelement ID field is equal to the Transition Result value in Table 7-43t.

The value of the Length field is 1.

The Match Value field is set with each bit as defined in Figure 7-95o39 to request that the specified transition results that match the bit descriptions are included in the Transition Event Report.

	B0	B1	B2-B7
	Include Successful Transitions	Include Failed Transitions	Reserved
Bits	1	1	6

Figure 7-95o39—Match Value field definitions

The Frequent Transition subelement is used to request that an alerting Transition Event report be generated when the total transition count during the specified time period is equal to or greater than the value given in Frequent Transition Count Threshold field. The format of the Frequent Transition subelement is shown in Figure 7-95o40.

The Subelement ID field is equal to the Frequent Transition value in Table 7-43t.

The value of the Length field is 3.

The Frequent Transition Count Threshold field is a one octet field containing the number of transitions in the measurement duration after which a Transition Event Report is generated.

	Subelement ID	Length	Frequent Transition Count Threshold	Time Interval
Octets:	1	1	1	2

Figure 7-95o40—Frequent Transition subelement format

The Time Interval field is the time interval in TUs during which the STA determines if the Frequent Transition Count Threshold is exceeded.

7.3.2.67.3 RSNA event request

The Event Request field corresponding to an RSNA event request contains zero or more RSNA Event Request subelements.

The RSNA Event Request subelements are defined to have a common format consisting of a 1 octet Subelement ID field, a 1 octet Length field, and a variable length subelement specific information field. See Figure 7-95p. The set of valid RSNA Event Request subelements is defined in Table 7-43u.

Table 7-43u—RSNA Event Request Subelement

Order	RSNA Event Request Subelement	Subelement ID
1	RSNA Target BSSID	0
2	Authentication Type	1
3	EAP Method	2
4	RSNA Result	3
—	Reserved	4–255

The RSNA subelements specify reporting conditions for RSNA Event Reports.

The RSNA Target BSSID subelement identifies the BSS at which an RSNA Event establishment was attempted. Excluding this subelement from the Event Request element indicates a request for transition events for all source BSSIDs. The format of the RSNA Target BSSID subelement is shown in Figure 7-95o41.

	Subelement ID	Length	Target BSSID
Octets:	1	1	6

Figure 7-95o41—RSNA Target BSSID subelement format

The Subelement ID field is equal to the RSNA Target BSSID value in Table 7-43u.

The value of the Length field is 6.

The Target BSSID field contains a 6-octet BSSID.

The Authentication Type subelement is used to request that an RSNA Event Report includes the RSNA event entry when the Authentication Type is equal to the authentication type specified in the Authentication Type field. The format of the Authentication Type subelement is shown in Figure 7-95o42.

	Subelement ID	Length	Authentication Type
Octets:	1	1	4

Figure 7-95o42—Authentication Type subelement format

The Subelement ID field is equal to the Authentication Type value in Table 7-43u.

The value of the Length field is 4.

The Authentication Type field contains one of the AKM suite selectors defined in Table 7-34 in 7.3.2.25.2.

The EAP Method subelement is used to request that an RSNA Event Report includes the RSNA event entry when the EAP Method is equal to the EAP method specified in the EAP Method field. The format of the EAP Method subelement is shown in Figure 7-95o43.

	Subelement ID	Length	EAP Type	EAP Vendor ID (optional)	EAP Vendor Type (optional)
Octets:	1	1	1	0 or 3	0 or 4

Figure 7-95o43—EAP Method subelement format

The Subelement ID field is equal to the EAP Method value in Table 7-43u.

The value of the Length field is 1 or 8.

The EAP Type field contains a value that identifies a single EAP method and is any valid IANA assigned EAP type.

The EAP Vendor ID field contains a value that identifies the EAP Vendor. The EAP Vendor ID field is included when EAP Type field is 254, and is excluded otherwise.

The EAP Vendor Type field contains a value that identifies the EAP Type as defined by the vendor. The EAP Vendor Type field is included when EAP Type field is 254, and is excluded otherwise.

The RSNA Result subelement is used to request that an RSNA Event Report includes the RSNA event entry that matches the transition result defined by this subelement. The format of RSNA Result subelement is shown in Figure 7-95o44.

	Subelement ID	Length	Match Value
Octets:	1	1	1

Figure 7-95o44—RSNA Result subelement format

The Subelement ID field is equal to the RSNA Result value in Table 7-43u.

The value of the Length field is 1.

The Match Value field bits are set as defined in Figure 7-95o45 to request that the specified RSNA results that match that bit descriptions are included in the RSNA Event Report.

	B0	B1	B2-B7
	Include Successful RSNA	Include Failed RSNA	Reserved
Bits	1	1	6

Figure 7-95o45—Match Value Field definitions

7.3.2.67.4 Peer-to-Peer Link event request

The Event Request field corresponding to Peer-to-Peer Link event request contains zero or more Peer-to-Peer Link Event Request subelements.

The Peer-to-Peer Link Event Request subelements are defined to have a common format consisting of a 1 octet Subelement ID field, a 1 octet Length field, and a variable length subelement specific information field. The set of valid Peer-to-Peer Link Event Request subelements is defined in Table 7-43v.

Table 7-43v—Peer-to-Peer Link Event Request subelement

Order	Peer-to-Peer Link Event Request subelement	Subelement ID
1	Peer Address	0
2	Channel Number	1
—	Reserved	2–255

The Peer-to-Peer Link subelements specify reporting conditions for Peer-to-Peer Link Event Reporting.

The Peer Address subelement identifies the peer STA, BSS, or IBSS of the Peer-to-Peer links to be reported. Excluding this subelement from the Event Request element indicates a request for Peer-to-Peer Link events for any peer STA, any BSS, and any IBSS. The format of the Peer Address subelement is shown in Figure 7-95o46.

The Subelement ID field is equal to the Peer Address value in Table 7-43v.

	Subelement ID	Length	Peer STA/ BSSID Address
Octets:	1	1	6

Figure 7-95o46—Peer Address subelement format

The value of the Length field is 6.

The Peer STA/BSSID Address field contains a 6-octet MAC address of a peer STA or a BSSID for Peer-to-Peer links in an IBSS. If the indicated address matches the Address 1 field of the MAC Header contents (see Table 7-7), then the address is a peer STA address for a TDLS or IBSS. If the indicated address matches the Address 3 field of the MAC Header contents, then the address is a BSSID for the Direct Link in an infrastructure BSS or for the IBSS.

The Channel Number subelement identifies the channel for the Peer-to-Peer links to be reported. Excluding this subelement from the Event Request element indicates a request for Peer-to-Peer Link events for any channel. The format of the Channel Number subelement is shown in Figure 7-95o47.

	Subelement ID	Length	Regulatory Class	Channel Number
Octets:	1	1	1	1

Figure 7-95o47—Channel Number subelement format

The Subelement ID field is equal to the Channel Number value in Table 7-43v.

The value of the Length field is 2.

The Regulatory Class field indicates the channel set of the Peer-to-Peer link to be used for the Peer-to-Peer Link event report. Regulatory Classes are defined in Annex J.

The Channel Number field indicates the channel number of the Peer-to-Peer Link events requested and included in the Peer-to-Peer Link event report. A Channel Number of 0 indicates a request to report any Peer-to-Peer Link event for any supported channel in the specified filtering Regulatory Class.

7.3.2.67.5 Vendor Specific event request

The Event Request field corresponding to Vendor Specific event request contains zero or more Vendor Specific subelements. The Vendor Specific subelement has the same format as the Vendor Specific element (see 7.3.2.26).

7.3.2.68 Event Report element

7.3.2.68.1 Event Report Definition

The Event Report element is used by a STA to report an event. The format of the Event Report element is shown in Figure 7-95o48.

	Element ID	Length	Event Token	Event Type	Event Report Status
Octets:	1	1	1	1	1

	Event TSF (optional)	UTC Offset (optional)	Event Time Error (optional)	Event Report (optional)
Octets:	0 or 8	0 or 10	0 or 5	variable

Figure 7-95o48—Event Report element format

The Element ID field is equal to the Event Report value in Table 7-26.

The value of the Length field is 3 or 26 plus the length of the Event Report field.

The Event Token field is the Event Token in the corresponding Event Request element. If the Event Report element is being sent autonomously then the Event Token is 0.

The Event Type field is a number that identifies the type of event report. The Event Types are shown in Table 7-43s.

The Event Report Status field is a value in Table 7-43w, indicating the STA's response to the Event Request.

Table 7-43w—Event Report Status

Event Report Status	Description
0	Successful
1	Request failed
2	Request refused
3	Request incapable
4	Detected frequent transition
5–255	Reserved

The Event TSF, UTC Offset, Event Time Error and Event Report fields are only present when the Event Report Status field is 0.

The Event TSF field is TSF value when the STA logged the event.

The UTC Offset field is the UTC value that corresponds to the UTC time when the TSF timer is equal to 0. If the UTC Offset is unknown, the field is 0.

The Event Time Error field is the UTC standard deviation, as described in 7.3.2.61, that corresponds to the TSF value logged for the event. If the Event Time Error is unknown, the field is 0.

The Event Report field contains the specification of a single event report, as described in 7.3.2.68.2 through 7.3.2.68.5.

The Event Report element is included in an Event Report frame as described in 7.4.12.3. The use of the Event Report element and frame is described in 11.22.2.

7.3.2.68.2 Transition event report

The format of the Event Report field corresponding to a Transition event report is shown in Figure 7-95o49.

	Source BSSID	Target BSSID	Transition Time	Transition Reason	Transition Result
Octets:	6	6	2	1	2

	Source RCPI	Source RSNI	Target RCPI	Target RSNI
Octets:	1	1	1	1

Figure 7-95o49—Event Report format for Transition event

The Source BSSID field contains the 6-octet BSSID address of the associated AP prior to the attempted transition.

The Target BSSID field contains the 6-octet BSSID address of the AP that is the target of the attempted Transition.

The Transition Time field contains the transition time in TUs. The transition time is defined in 11.22.2.2.

The Transition Reason field indicates the reason why a transition attempt occurred and contains one of the values in Table 7-43x.

Table 7-43x—Transition and Transition Query reasons

Transition Reason Value	Description
0	Unspecified
1	Excessive frame loss rates and/or poor conditions
2	Excessive delay for current traffic streams
3	Insufficient QoS capacity for current traffic streams (TSPEC rejected)
4	First association to ESS (the association initiated by an Association Request message instead of a Reassociation Request message)
5	Load balancing

Table 7-43x—Transition and Transition Query reasons *(continued)*

Transition Reason Value	Description
6	Better AP found
7	Deauthenticated or Disassociated from the previous AP
8	AP failed IEEE 802.1X EAP Authentication
9	AP failed 4-Way Handshake
10	Received too many replay counter failures
11	Received too many data MIC failures
12	Exceeded maximum number of retransmissions
13	Received too many broadcast disassociations
14	Received too many broadcast deauthentications
15	Previous transition failed
16	Low RSSI
17	Roam from a non-IEEE 802.11 system
18	Transition due to received BSS Transition Request frame
19	Preferred BSS Transition Candidate List Included
20	Leaving ESS
21–255	Reserved

The Transition Result field contains the result of the attempted transition and is one of the status codes specified in Table 7-23 in 7.3.1.9.

The Source RCPI field indicates the received channel power of the most recently measured frame from the Source BSSID before the STA reassociates to the Target BSSID. The Source RCPI is reported in dBm, as defined in the RCPI measurement clause for the PHY Type.

The Source RSNI field indicates the received signal-to-noise indication of the most recently measured frame from the Source BSSID before the STA reassociates to the Target BSSID. The Source RSNI is reported in dB, as defined in 7.3.2.41.

The Source BSSID, Source RCPI, and Source RSNI fields are set to 0 if the transition is initiated by an Association Request frame.

The Target RCPI field indicates the received channel power of the first measured frame just after the STA reassociates to the Target BSSID. If association with the Target BSSID failed, the Target RCPI field indicates the received channel power of the most recently measured frame from the Target BSSID. The Target RCPI is reported in dBm, as defined in the RCPI measurement clause for the PHY Type.

The Target RSNI field indicates the received signal-to-noise indication of the first measured frame just after the STA reassociates to the Target BSSID. If association with the Target BSSID failed, the Target RCPI field indicates the received signal-to-noise indication of the most recently measured frame from the Target BSSID. The Target RSNI is reported in dB, as defined in 7.3.2.41.

7.3.2.68.3 RSNA event report

The format of the Event Report field corresponding to an RSNA event report is shown in Figure 7-95o50.

	Target BSSID	Authentication Type	EAP Method	RSNA Result	RSN Element
Octets:	6	4	1 or 8	2	variable

Figure 7-95o50—Event Report format for RSNA event

The Target BSSID field contains the 6-octet BSSID address of the AP accepting the authentication attempt.

The Authentication Type field contains the Authentication type in use at the time of the authentication attempt and is one of the AKM suite selectors defined in Table 7-34 in 7.3.2.25.2.

When the Authentication Type field is the value of either 00-0F-AC:1 (Authentication negotiated over IEEE 802.1X or using PMKSA caching as defined in 8.4.6.2) or 00-0F-AC:3 (AKM suite selector for Fast BSS Transition as defined in 8.4.3), the EAP Method field contains the IANA assigned EAP type. The EAP type contains either the legacy type (1 octet) or the expanded type (1 octet type = 254, 3-octet Vendor ID, 4-octet Vendor-Type). The EAP Method field is 0 otherwise. The EAP Method field is a single octet set to 0 otherwise.

The RSNA Result field contains the result of the RSNA establishment attempt and is one of the status codes specified in Table 7-23 in 7.3.1.9.

The RSN Element field contains the entire contents of the negotiated RSN information element at the time of the authentication attempt. The maximum length of the RSN Element field is less than the maximum length of an RSN information element, as defined in 7.3.2.25. If the length of the RSN information element included here exceeds the maximum length of the RSN Element field, the RSN information element shall be truncated to the maximum length allowed for the RSN Element field.

7.3.2.68.4 Peer-to-Peer Link event report

The format of the Event Report field corresponding to a Peer-to-Peer Link event report is shown in Figure 7-95o51.

	Peer STA/ BSSID Address	Regulatory Class	Channel Number	STA Tx Power	Connection Time	Peer Status
Octets:	6	1	1	1	3	1

Figure 7-95o51—Event Report format for Peer-to-Peer Link event

A Peer-to-Peer link is defined to be either a Direct Link within a QoS BSS, a TDLS, or a STA to STA communication in an IBSS.

The Peer STA/BSSID Address field contains a 6-octet MAC address. If this event is for a Peer-to-Peer link in an infrastructure BSS, this field contains the MAC address of the peer STA. If this event is for a Peer-to-Peer link in an IBSS, this field contains the BSSID of the IBSS.

The Regulatory Class field indicates the channel set of the Peer-to-Peer link. Valid values of the Regulatory Class are shown in Annex J.

The Channel Number field indicates the Peer-to-Peer channel number of the Peer-to-Peer link. The Channel Number is defined within a Regulatory Class as shown in Annex J.

The STA Tx Power field indicates the target transmit power at the antenna in dBm with a tolerance of ± 5 dB of the lowest basic rate of the reporting STA.

The Connection Time field contains the connection time in seconds. If the Peer Status is 0, this field indicates the duration of the Direct Link. If the Peer Status is 1, this field indicates the time difference from the time the Direct Link was established to the time at which the reporting STA generated the event report. If the Peer Status is 2, this field indicates the duration of the IBSS membership. If the Peer Status is 3, this field indicates the time difference from the time the STA joined the IBSS to the time at which the reporting STA generated the event report. See 11.22.2.4.

The Peer Status field indicates the Peer link connection status as indicated in Table 7-43y.

Table 7-43y—Peer Status definitions

Peer Status	Description
0	Direct Link terminated
1	Direct Link active
2	IBSS membership terminated
3	IBSS membership active
4–255	Reserved

7.3.2.68.5 WNM Log event report

The format of the Event Report field corresponding to a WNM Log event report is shown in Figure 7-95o52.

	WNM Log Msg
Octets:	variable

Figure 7-95o52—Event Report format for WNM Log event

The WNM Log Msg field contains the entire syslog message, consisting of the PRI, HEADER, and MSG portion of a WNM Log message as described in IETF RFC 3164-2001. The TAG field of the MSG portion of the message is a 17 octet string containing the ASCII representation of the STA MAC address using hexadecimal notation with colons between octets. The octet containing the individual/group bit occurs last, and that bit is in the least significant position within that octet. See 11.22.2.5.

7.3.2.68.6 Vendor Specific event report

The Event Report field corresponding to Vendor Specific event report contains zero or more Vendor Specific subelements. The Vendor Specific subelement has the same format as the Vendor Specific element (see 7.3.2.26).

7.3.2.69 Diagnostic Request element

7.3.2.69.1 Diagnostic Request definition

The Diagnostic Request element contains a request that the receiving STA undertake the specified diagnostic action. The format of the Diagnostic Request element is shown in Figure 7-95o53.

	Element ID	Length	Diagnostic Token	Diagnostic Request Type	Diagnostic Timeout	Diagnostic Information Subelements (optional)
Octets:	1	1	1	1	2	variable

Figure 7-95o53—Diagnostic Request element format

The Element ID field is equal to the Diagnostic Request value in Table 7-26.

The value of the Length field is 4 plus the length of the Diagnostic Information Subelements field. The minimum value of the Length field is 4 (based on a minimum length for the Diagnostic Information Subelements field of 0 octets).

The Diagnostic Token field is a number that is unique among the Diagnostic Request elements sent to each destination MAC address for which a corresponding Diagnostic Report element has not been received.

The Diagnostic Request Type field is a number that identifies a type of diagnostic request. The values of Diagnostic Request Types are shown in Table 7-43z.

The Diagnostic Timeout field contains the time, in seconds, after which no response is returned.

The Diagnostic Information Subelements field contains zero or more diagnostic information subelements depending on the specific Diagnostic Request Type, as defined in 7.3.2.69.2 through 7.3.2.69.4.

The Cancel Diagnostic Request, Manufacturer Information STA Report, and Configuration Profile Diagnostic Request elements carry no Diagnostic Information subelements.

The Diagnostic Request element is included in a Diagnostic Request frame as described in 7.4.12.4. The use of Diagnostic Request element and frames is described in 11.22.3.

Table 7-43z—Diagnostic Type definitions

Name	Diagnostic Type values
Cancel Diagnostic Request	0
Manufacturer Information STA Report	1
Configuration Profile	2
Association Diagnostic	3
IEEE 802.1X Authentication Diagnostic	4
Reserved	5–220
Vendor Specific	221
Reserved	222–255

7.3.2.69.2 Association Diagnostic request

The Diagnostic Information Subelements field corresponding to an Association Diagnostic Request Type is shown in Table 7-43aa. The corresponding Diagnostic Information Subelements are defined in 7.3.2.69.5.

Table 7-43aa—Association Diagnostic request contents

Order	Information subelement
1	AP Descriptor
2	Profile ID

7.3.2.69.3 IEEE 802.1X Authentication Diagnostic request

The Diagnostic Information Subelements field corresponding to an IEEE 802.1X Authentication Diagnostic Request Type is shown in Table 7-43ab. The corresponding Diagnostic Information Subelements are defined in 7.3.2.69.5.

Table 7-43ab—IEEE 802.1X Authentication Diagnostic request contents

Order	Information subelement
1	AP Descriptor
2	EAP Method
3	Credential Type
4	Profile ID

7.3.2.69.4 Vendor Specific Diagnostic request

The Diagnostic Information Subelements field corresponding to a Diagnostic Report element of type Vendor Specific Diagnostic Report contains zero or more Vendor Specific subelements. The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26).

7.3.2.69.5 Diagnostic Information Subelement descriptions

The following text describes the various subelements that may be included in Diagnostic Information Subelements field of a Diagnostic Request element or a Diagnostic Report element. The format of a Diagnostic information subelement is shown in Figure 7-95o54.

	Diagnostic Information Subelement ID	Length	Diagnostic Information Subelement Contents
Octets:	1	1	variable

Figure 7-95o54—Diagnostic Information Subelement format

The Diagnostic Information Subelement ID field indicates the Diagnostic Information Subelement ID and is any allocated value in Table 7-43ac.

Table 7-43ac—Diagnostic Information Subelement ID values

Identifier	Subelement name	Length (in octets)
0	Credential Type	3
1	AKM Suite	6
2	AP Descriptor	10
3	Antenna Type	4 to 251
4	Cipher Suite	6
5	Collocated Radio Type	3
6	Device Type	3
7	EAP Method	3 to 10
8	Firmware Version	3 to 251
9	MAC Address	8
10	Manufacturer ID String	3 to 251
11	Manufacturer Model String	3 to 251
12	Manufacturer OI	5 or 7
13	Manufacturer Serial Number String	3 to 251

Table 7-43ac—Diagnostic Information Subelement ID values *(continued)*

Identifier	Subelement name	Length (in octets)
14	Power Save Mode	6
15	Profile ID	3
16	Supported Regulatory Classes	3 to 251
17	Status Code	4
18	SSID	4 to 36
19	Tx Power Capability	3 to 251
20	Certificate ID	3 to 251
21–220	Reserved	
221	Vendor Specific	3 to 251
221–255	Reserved	

The Length field is the length in octets of the Diagnostic Information Subelement Contents field.

The Diagnostic Information Subelement Contents values are described in the following paragraphs.

The format for the Credential Type subelement is shown in Figure 7-95o55.

	Subelement ID	Length	Credential Values
Octets:	1	1	variable

Figure 7-95o55—Credential Type Subelement format

The Credentials field indicates one or more types of credential. Each value is chosen from those shown in Table 7-43ad.

The format for the AKM Suite subelement is shown in Figure 7-95o56.

The OUI and AKM Suite fields identify the authentication method and is one of the values in Table 7-34 in 7.3.2.25.2.

The format of the AP descriptor subelement is described in Figure 7-95o57.

The BSSID field is a 6-octet field as described in 7.1.3.3.3 that identifies the BSS indicated in the AP Descriptor subelement.

The Regulatory Class field contains an enumerated value from Annex J specifying the frequency band in which the Channel Number is valid.

Table 7-43ad—Credentials values

Value	Description
0	None
1	Pre-shared key
2	Username and password
3	X.509 certificate
4	Other certificate
5	One time password
6	Token
7–255	Reserved

	Subelement ID	Length	OUI	AKM Suite
Octets:	1	1	3	1

Figure 7-95o56—AKM Suite Subelement format

	Subelement ID	Length	BSSID	Regulatory Class	Channel Number
Octets:	1	1	6	1	1

Figure 7-95o57—AP Descriptor Subelement format

The Channel Number field indicates the current operating channel of the AP identified by the BSSID in the AP Descriptor.

The format for the Antenna Type subelement is shown in Figure 7-95o58.

	Subelement ID	Length	Antenna Count	Antenna Gain	Antenna Type
Octets:	1	1	1	1	variable

Figure 7-95o58—Antenna Type Subelement format

The Antenna Count field contains a one octet field indicating the number of antennas of the indicated Antenna Type and Antenna Gain pair. The Antenna Count field value 0 is reserved.

The Antenna Gain field contains the peak gain, in dBi, of the antenna.

The Antenna Type field contains an ASCII string (truncated to 251 octets if required) describing the manufacturer's type information (i.e., a series of letters/numbers) of the antenna(s) connected to the wireless adapter. The Antenna Type field does not change based on different modes of operation of the antenna(s), as may be identified by the Antenna ID field (see 7.3.2.40). This string is not null terminated.

NOTE—Beamforming antennas might have several Antenna IDs, depending on antenna bearing.

The format for the Cipher Suite subelement is shown in Figure 7-95o59.

	Subelement ID	Length	OUI	Suite Type
Octets:	1	1	3	1

Figure 7-95o59—Cipher Suite Subelement format

The OUI and Suite Type fields identify the cipher suite and is one of the values in Table 7-32.

The format for the Collocated Radio Type subelement is shown in Figure 7-95o60.

	Subelement ID	Length	Collocated Radio Type
Octets:	1	1	1

Figure 7-95o60—Collocated Radio Type Subelement format

The Collocated Radio Type subelement contains a one octet field indicating the type of collocated radio, and is one of the values in Table 7-43ae. The method that a STA uses to obtain the information on the Collocated Radio is out of the scope of this standard.

The Device Type subelement reports the type of device in which the IEEE 802.11 STA resides. The format of the Device Type subelement is shown in Figure 7-95o61.

The Device Type field is a one octet field indicating the category of device.[1] The numerical assignment to each device type category is defined in Table 7-43af.

The format for the EAP method subelement is shown in Figure 7-95o62.

The EAP Type field contains a value that identifies a single EAP method and is any valid IANA assigned EAP type.

The EAP Vendor ID field contains a value that identifies the EAP Vendor. The EAP Vendor ID field is included when EAP Type field is 254, and is excluded otherwise.

The EAP Vendor Type field contains a value that identifies the EAP Type as defined by the vendor. The EAP Vendor Type field is included when EAP Type field is 254, and is excluded otherwise.

The format for the Firmware Version subelement is shown in Figure 7-95o63.

[1]The category of device is based on the Wi-Fi Alliance® category definitions found at http://www.wi-fi.org/knowledge_center/insist-on-wifi-certified.

Table 7-43ae—Collocated Radio Type

Collocated Radio Type	Value
Reserved	0
Cellular	1
Cordless	2
GPS	3
IEEE 802.11	4
IEEE 802.15	5
IEEE 802.16	6
IEEE 802.20	7
IEEE 802.22	8
Digital Audio Broadcasting	9
Digital Video Broadcasting	10
Reserved	11–255

	Subelement ID	Length	Device Type
Octets:	1	1	1

Figure 7-95o61—Device Type Subelement format

Table 7-43af—Device Type definitions

Device Type	Value
Reserved	0
Reference Design	1
Access Point or Wireless Router for Home or Small Office	2
Enterprise Access Point	3
Cable, DSL or Other Broadband Gateway	4
Digital Still Camera	5
Portable Video Camera	6
Networked Web Camera	7

Table 7-43af—Device Type definitions *(continued)*

Device Type	Value
Digital Audio—Stationary	8
Digital Audio—Portable	9
Set-Top Box, Media Extender, Media Server (includes players & recorders)	10
Display Device (television, monitor, picture frame)	11
Game Console or Game Console Adapter	12
Gaming Device —Portable	13
Media Server or Media Adapter	14
Network Storage Device	15
External Card	16
Internal Card	17
Ultra-Mobile PC	18
Notebook Computer	19
PDA (Personal Digital Assistant)	20
Printer or Print Server (includes scanner and/or fax capability)	21
Phone—Dual-Mode	22
Phone—Single-Mode	23
Smartphone—Dual-Mode	24
Smartphone—Single-Mode	25
Reserved	26-220
Other devices	221
Reserved	222–255

	Subelement ID	Length	EAP Type	EAP Vendor ID (optional)	EAP Vendor Type (optional)
Octets:	1	1	1	0 or 3	0 or 4

Figure 7-95o62—EAP Method Subelement format

	Subelement ID	Length	Firmware Version
Octets:	1	1	variable

Figure 7-95o63—Firmware Version Subelement format

This Firmware Version field contains an ASCII string identifying the version of firmware currently installed on the wireless network adaptor. This string is not null terminated.

The format for the MAC Address subelement is shown in Figure 7-95o64.

	Subelement ID	Length	MAC Address
Octets:	1	1	6

Figure 7-95o64—MAC Address Subelement format

This MAC Address field contains the 6-octet IEEE 802 MAC address of the STA.

The format for the Manufacturer ID String subelement is shown in Figure 7-95o65.

	Subelement ID	Length	ID
Octets:	1	1	variable

Figure 7-95o65—Manufacturer ID String Subelement format

The ID field contains an ASCII string indicating the manufacturer identifier of the wireless network adaptor. This string is not null terminated.

The format for the Manufacturer Model String subelement is shown in Figure 7-95o66.

	Subelement ID	Length	Model
Octets:	1	1	variable

Figure 7-95o66—Manufacturer Model String Subelement format

The Model field contains an ASCII string indicating the model of the wireless network adaptor. This string is not null terminated.

The format for the Manufacturer OI subelement is shown in Figure 7-95o67.

The OI field contains an Organizational Identifier, as defined in 7.3.1.31.

	Subelement ID	Length	OI
Octets:	1	1	3 or 5

Figure 7-95o67—Manufacturer OI Subelement format

The format for the Manufacturer Serial Number String subelement is shown in Figure 7-95o68.

	Subelement ID	Length	Serial Number
Octets:	1	1	variable

Figure 7-95o68—Manufacturer Serial Number String Subelement format

The Serial Number field contains an ASCII string indicating the serial number of the wireless network adaptor. This string is not null terminated.

The format for the Power Save Mode subelement is shown in Figure 7-95o69.

	Subelement ID	Length	Power Save Mode
Octets:	1	1	4

Figure 7-95o69—Power Save Mode Subelement format

The Power Save Mode field is a bitmap field that indicates the power save mode(s) in use by the STA, as defined in Table 7-43ag.

Table 7-43ag—Power Save Mode definition

Power Save Mode	Bit
Unknown	0
None	1
PS mode (ReceiveDTIMs=1, see 11.2.1)	2
PS mode (ReceiveDTIMs=0, see 11.2.1)	3
U-APSD (see 11.2.1.4)	4
S-APSD (see 11.2.1.4)	5
U-PSMP (see 9.16)	6
S-PSMP (see 9.16)	7

Table 7-43ag—Power Save Mode definition *(continued)*

Power Save Mode	Bit
SM Power Save (see 11.2.3)	8
WNM-Sleep Mode (see 11.2.1.16)	9
FMS (see 11.2.1.4a)	10
TIM Broadcast (see 11.2.1.15)	11
TFS (see 11.22.11)	12
TDLS Peer U-APSD (see 11.2.1.14)	13
TDLS Peer PSM (see 11.2.1.13)	14
Reserved	15–31

The format for the Profile ID subelement is shown in Figure 7-95o70.

	Subelement ID	Length	Profile ID
Octets:	1	1	1

Figure 7-95o70— Profile ID Subelement format

The Profile ID field contains a unique identifier for referencing a configuration profile available on a device. The value of the identifier can be any arbitrary value, as long as it is uniquely associated to a single configuration profile on the device sending the identifier.

The format for the Supported Regulatory Classes subelement is shown in Figure 7-95o71.

	Subelement ID	Length	Supported Regulatory Classes Element
Octets:	1	1	variable

Figure 7-95o71—Supported Regulatory Classes Subelement format

The Supported Regulatory Classes Element field contains the Supported Regulatory Classes element, as defined in 7.3.2.54.

The format for the Status Code subelement is shown in Figure 7-95o72.

The Status Code field contains the final IEEE 802.11 Status code, as defined in Table 7-23 in 7.3.1.9, received at the end of the applicable operation.

The format for the SSID subelement is shown in Figure 7-95o73.

	Subelement ID	Length	Status Code
Octets:	1	1	2

Figure 7-95o72—Status Code Subelement format

	Subelement ID	Length	SSID
Octets:	1	1	0 to 32

Figure 7-95o73—SSID Subelement format

The SSID field contains a Service Set Identifier with a maximum length of 32 octets, as defined in 7.3.2.1.

The format for the Tx Power Capability subelement is shown in Figure 7-95o74.

	Subelement ID	Length	Tx Power Mode	Tx Power
Octets:	1	1	1	variable

Figure 7-95o74—Tx Power Capability Subelement format

The Tx Power Mode field identifies the transmit power mode of the non-AP STA and is one of the values in Table 7-43ah.

Table 7-43ah—Tx Power Modes

Tx Power Mode	Value
Discrete	0
Range	1
Reserved	2–255

The Tx Power field indicates the target transmit power level(s) at the antenna(s), where the actual power is within ±5 dB to the target. Each transmit power level is encoded in a single octet as a 2's complement value in dBm, rounded to the nearest integer. If the Tx Power Mode field is 0 then the Tx Power field contains one or more transmit power levels in increasing numerical order. If the Tx Power Mode field is 1, the Tx Power field contains the STA's minimum and non-zero maximum transmit power levels, in that order.

The format for the Certificate ID subelement is shown in Figure 7-95o75.

The Certificate ID field contains an UTF-8 string indicating the assigned identifier for the STA. This string is not null terminated. The Certificate ID typically takes the form of "WFA3991" and can be used by a

	Subelement ID	Length	Certificate ID
Octets:	1	1	variable

Figure 7-95o75—Certificate ID Subelement format

receiving STA to look up the certificate assigned to that ID using a web lookup url such as "http://certifications.wi-fi.org/pdf_certificate.php?cid= WFA3991".

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26).

7.3.2.70 Diagnostic Report element

7.3.2.70.1 Diagnostic Report definition

The Diagnostic Report element contains a Diagnostic report. The format of the Diagnostic Report element is shown in Figure 7-95o76.

	Element ID	Length	Diagnostic Token	Diagnostic Report Type	Diagnostic Status	Diagnostic Information Subelements
Octets:	1	1	1	1	1	variable

Figure 7-95o76—Diagnostic Report element format

The Element ID field is equal to the Diagnostic Report value in Table 7-26.

The value of the Length field is 3 plus the length of the Diagnostic Information Subelements field. The minimum value of the Length field is 3.

The Diagnostic Token field is the Diagnostic Token in the corresponding Diagnostic Request element.

The Diagnostic Report Type field is a number that identifies the Diagnostic report. The Diagnostic Report Types are defined in Table 7-43z.

The Diagnostic Status field is a value in Table 7-43w (see 7.3.2.68), indicating the STA's response to the Diagnostic Request indicated by the Diagnostic Token.

The Diagnostic Information Subelements field contains the results of the diagnostic request.

The Diagnostic Information Subelements field contains the Diagnostic Subelement values, defined in 7.3.2.69.5 corresponding to the Diagnostic Report Type field value.

The Diagnostic Report element is included in a Diagnostic Report frame as described in 7.4.12.5. The use of Diagnostic Report element and frames is described in 11.22.3.

7.3.2.70.2 Manufacturer Information STA Report

The contents of the Diagnostic Information Subelements field of a Diagnostic Report element of type Manufacturer Information STA Report is shown in Table 7-43ai. The corresponding Diagnostic Information subelements are defined in 7.3.2.69.5.

Table 7-43ai—Manufacturer Information STA Report contents

Order	Information Subelement
1	Manufacturer OI
2	Manufacturer ID string
3	Manufacturer model string
4	Manufacturer serial number string
6	Firmware Version
7	Antenna Type
8	Collocated Radio Type
9	Device Type
10	Certificate ID

7.3.2.70.3 Configuration Profile Report

The contents of the Diagnostic Information Subelements field of a Diagnostic Report element of type Configuration Profile Report is shown in Table 7-43aj. The corresponding Diagnostic Information subelements are defined in 7.3.2.69.5.

7.3.2.70.4 Association Diagnostic Report

The contents of the Diagnostic Information Subelements field of a Diagnostic Report element of type Association Diagnostic Report is shown in Table 7-43ak. The corresponding Diagnostic Information subelements are defined in 7.3.2.69.5.

7.3.2.70.5 IEEE 802.1X Authentication Diagnostic Report

The contents of the Diagnostic Information Subelements field of a Diagnostic Report element of type IEEE 802.1X Authentication Diagnostic Report is shown in Table 7-43al. The corresponding Diagnostic Information subelements are defined in 7.3.2.69.5.

7.3.2.70.6 Vendor Specific Diagnostic Report

The contents of the Diagnostic Information subelements field of a Diagnostic Report element of type Vendor Specific Diagnostic Report contains zero or more Vendor Specific subelements that have the same formats as Vendor Specific elements in 7.3.2.26.

Table 7-43aj—Configuration Profile Report contents

Order	Information Subelement
1	Profile ID
2	Supported Regulatory Classes
3	Tx Power
4	Cipher Suite
5	AKM Suite
6	EAP Method
7	Credential Type
8	SSID
9	Power Save Mode

Table 7-43ak—Association Diagnostic Report contents

Order	Information Subelement
1	AP Descriptor
2	Status Code

Table 7-43al—IEEE 802.1X Authentication Diagnostic Report contents

Order	Information Subelement
1	AP Descriptor
2	EAP Method
3	Credential Type
4	Status Code

7.3.2.71 Location Parameters element

7.3.2.71.1 Location Parameters definition

The Location Parameters information element is used for location services. The format of this information element is shown in Figure 7-95o77.

	Element ID	Length	Location Subelements
Octets:	1	1	variable

Figure 7-95o77—Location Parameters Information element format

The Element ID field is equal to the Location Parameters value in Table 7-26.

The value of the Length field is the length of the Location Subelements field.

The Location Subelements field contains one or more Location subelements described in Table 7-43am.

Table 7-43am—Location subelements

Identifier	Subelement name	Length (in octets)
1	Location Indication Parameters (see 7.3.2.71.2)	18
2	Location Indication Channels (see 7.3.2.71.3)	4–254
3	Location Status (see 7.3.2.71.4)	4
4	Radio Information (see 7.3.2.71.5)	7
5	Motion (see 7.3.2.71.6)	10
6	Location Indication Broadcast Data Rate (see 7.3.2.71.7)	4
7	Time Of Departure (see 7.3.2.71.8)	9
8	Location Indication Options (see 7.3.2.71.9)	4
9–220	Reserved	
221	Vendor Specific (see 7.3.2.26)	5–254
222–255	Reserved	

The Location Parameters element is included in Location Configuration Request frames, as described in 7.4.12.6, Location Configuration Response frames, as described in 7.4.12.7, and Location Track Notification frames, as described in 7.4.7.12. The use of the Location Parameters element is described in 11.22.4.

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26). Multiple Vendor Specific subelements can be included in the list of Optional subelements.

7.3.2.71.2 Location Indication Parameters subelement

The Location Indication Parameters subelement contains STA location reporting characteristics. The format of the Location Indication Parameters subelement is shown in Figure 7-95o78.

	Subelement ID	Length	Indication Multicast Address	Report Interval Units	Normal Report Interval	Normal Number of Frames per Channel
Octets:	1	1	6	1	2	1

	In-Motion Report Interval	In-Motion Number of Frames per Channel	Burst Inter-frame Interval	Tracking Duration	ESS Detection Interval
Octets:	2	1	1	1	1

Figure 7-95o78—Location Indication Parameters subelement

The Subelement ID field contains the value for Location Indication Parameters as defined in Table 7-43am.

The Length field is 16.

The Indication Multicast Address field specifies the destination address to which the Location Track Notification frames are sent to in a non-IBSS network. The value of this field is a locally administered multicast address formed according to the procedure defined in 11.22.4.1. The field is reserved when Location Track Notifications are transmitted in an IBSS.

The Report Interval Units field contains the units used for the Normal Report Interval field and In-Motion Report Interval field, as indicated in Table 7-43an.

Table 7-43an—Report Interval Units field

Report Interval Units	Description
0	Hours
1	Minutes
2	Seconds
3	Milliseconds
4–255	Reserved

The Normal Report Interval is the time interval, expressed in the units indicated in the Report Interval Units field, at which the reporting STA is expected to transmit one or more Location Track Notification frames if either dot11MgmtOptionMotionDetectionActivated is false or the STA is stationary. The STA will not transmit Location Track Notification frames when the Normal Report Interval is 0.

The Normal Number of Frames per Channel is the number of Location Track Notification frames per channel sent or expected to be sent by the STA at each Normal Report Interval.

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. Motion can be detected using one of the following criteria:

— Detection of speed that is greater or equal to 0.5 m/sec.
— Detection of movement or vibration, for example by a ball-in-tube sensor or accelerometer or other means.

The exact criteria and mechanism to detect motion is out of scope for this standard.

The In-Motion Report Interval is the time interval, expressed in the units indicated in the Report Interval Units field, at which the STA reports its location by sending a Location Track Notification frame when the reporting STA is in motion. If dot11MgmtOptionMotionDetectionActivated is false, this field is 0.

The In-Motion Number of Frames per Channel is the number of Location Track Notification frames per channel sent or expected to be sent by the STA at each In-Motion Report Interval. If dot11MgmtOptionMotionDetectionActivated is false, this field is 0.

The Burst Inter-frame Interval is the target time interval, expressed in milliseconds, between the transmissions of each of the Normal or In-Motion frames on the same channel. The Burst Inter-frame interval value is 0 to indicate that frames will be transmitted with no target inter-frame delay.

The Tracking Duration is the amount of time, in minutes, that a STA sends the Location Track Notification frames. The duration starts as soon as the STA sends a Location Configuration Response frame with a Location Status value of Success. If the Tracking Duration value is a non-zero value the STA will send Location Track Notification Frames, based on the Normal and In-Motion Report Interval field values, until the duration ends. If the Tracking Duration is 0 the STA will continuously send Location Track Notification frames as defined by Normal and In-Motion Report Interval field values until transmission is terminated based on the procedures detailed in 11.22.4.2.

The ESS Detection Interval is the periodicity, in minutes, that a STA checks for beacons transmitted by one or more APs belonging to the same ESS that configured the STA. If no beacons from the ESS are received for this period, the STA terminates transmission of Location Track Notification frames as described in the procedures detailed in 11.22.4.2. The ESS Detection Interval field is not used when the ESS Detection Interval field value is 0.

7.3.2.71.3 Location Indication Channels subelement

The Location Indication Channels subelement contains location reporting channel information. The format of the Location Indication Channels subelement format is shown in Figure 7-95o79.

			one or more entries
	Subelement ID	Length	Channel Entry
Octets:	1	1	2xn

Figure 7-95o79—Location Indication Channels subelement

The Subelement ID field contains the value for Location Indication Channels as defined in Table 7-43am.

The Length field is 2*n*, where *n* indicates the total number of Channel Entry subelements contained in the element.

The Channel Entry field includes one or more Regulatory Class and Channel pair. The format Channel Entry field is shown in Figure 7-95o80.

	Regulatory Class	Channel
Octets:	1	1

Figure 7-95o80—Channel Entry field format

The Regulatory Class field each indicates the frequency band 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.

The Channel field includes the channel numbers on which a STA sends or an ESS expects to receive Location Track Notification frames. Valid values of the Channel field are defined in Annex J.

7.3.2.71.4 Location Status subelement

The Location Status subelement provides the result of a Location Request or Location Configuration Request frame. The format of the Location Status subelement is shown in Figure 7-95o81.

	Subelement ID	Length	Config Subelement ID	Status
Octets:	1	1	1	1

Figure 7-95o81—Location Status subelement

The Subelement ID field contains the value for Location Status as defined in Table 7-43am.

The Length field is 2.

The Config Subelement ID field is a specific Location Parameters subelement ID transmitted in a Location Configuration Request frame as defined in Table 7-43am.

A Location Status subelement is included for each configuration subelement in the Location Configuration Request frame, except when all status values are the same. When all status values are the same, one Location Status subelement is included with the Config subelement ID set to 0 in the Location Configuration Response frame.

The Status field identifies the result of the Location Request frame and is one of the values in Table 7-43w.

7.3.2.71.5 Radio Information subelement

The Radio Information subelement contains radio information. The format of the Radio Information subelement is shown in Figure 7-95o82.

	Subelement ID	Length	Transmit Power	Antenna ID	Antenna Gain	RSNI	RCPI
Octets:	1	1	1	1	1	1	1

Figure 7-95o82—Radio Information subelement

The Subelement ID field contains the value for Radio Information as defined in Table 7-43am.

The Length field is 5.

The Transmit Power field is the transmit power used to transmit the current Location Track Notification frame containing the Location Parameters element with the Radio Information subelement and is a signed integer, one octet in length, reported in dBm. A value of –128 indicates that the transmit power is unknown. The tolerance for the transmit power value reported in the Radio Information subelement is ± 5 dB. This tolerance is defined as the maximum possible difference, in decibels, between the reported power value and the total transmitted power across all antennas of the STA, which are measured when transmitting Location Request frames.

The Antenna ID field is the identifying number for the antenna used to transmit the Location Request frame. The Antenna ID is defined in 7.3.2.40.

The Antenna Gain field is the antenna gain of the antenna (or group of antennas) over which the Location Track Notification frame is transmitted and is a signed integer, one octet in length, reported in dB. A value of –128 indicates that the antenna gain is unknown.

The RSNI field contains the RSNI value (dB) measured against the most recently received Location Configuration Request frame requesting that a Radio Information subelement be included in the Location Track Notification frame. The RSNI value is defined in 7.3.2.41. A value of 255 indicates that the RSNI value is unknown or is not used.

The RCPI field contains the RCPI value (dBm) measured against the most recently received Location Configuration Request frame requesting that a Radio Information subelement be included in the Location Track Notification frame. The RCPI value is defined 7.3.2.39. A value of 255 indicates that the RCPI value is unknown or is not used.

7.3.2.71.6 Motion subelement

The Motion subelement contains motion information. The format of the Motion subelement is shown in Figure 7-95o83.

The Subelement ID field contains the value for Motion as defined in Table 7-43am.

The Length field is 8.

	Subele-ment ID	Length	Motion Indicator	Bearing	Speed Units	Horizontal Speed	Vertical Speed
Octets:	1	1	1	2	1	2	2

Figure 7-95o83—Motion subelement

The Motion Indicator field is defined in Table 7-43ao. The mechanism that a STA uses to determine the value or transitions from one value to another of the Motion Indicator field is beyond the scope of the standard.

Table 7-43ao—Motion Indicator Field

Motion Indicator value	Description
0	Stationary: the device is stationary and not in motion.
1	Start of motion: the device was stationary and is now in motion.
2	In motion: the device is and has been in motion.
3	End of motion: the device was in motion and is now stationary.
4	Unknown: information related to motion is unknown.
5–255	Reserved

The Bearing field, defined by a 2-octet unsigned integer, specifies the direction that the STA is traveling with relation to true north, increasing clockwise, measured in degrees from 0 degree to 359 degrees. If the Bearing value is unknown, the field is 65535.

The Speed Units field contains the units for both Horizontal and Vertical Speed field, as defined in Table 7-43ap.

Table 7-43ap—Speed Units

Speed Units Value	Description
0	Centimeters per second
1	Meters per second
2–255	Reserved

The Horizontal Speed field contains the horizontal speed of the STA expressed in the units indicated in the Speed Units field. If the Horizontal Speed value is unknown, the field is 65535.

The Vertical Speed field is a 2's complement signed integer indicating the vertical speed of the STA expressed in the units indicated in the Speed Units field. If the Vertical Speed value is unknown or greater than 32766, the field is 32767. If the Vertical Speed value is less than –32767, the field is –32768.

The Motion subelement field values are valid at the time of transmission of the Location Track Notification frame containing the subelement.

7.3.2.71.7 Location Indication Broadcast Data Rate subelement

The Location Indication Broadcast Data Rate subelement contains location reporting transmission rate information. The format of the Location Indication Broadcast Data Rate subelement format is shown in Figure 7-95o84.

	Subelement ID	Length	Broadcast Target Data Rate
Octets:	1	1	4

Figure 7-95o84—Location Indication Broadcast Data Rate subelement

The Subelement ID field contains the value for Location Indication Broadcast Data Rate as defined in Table 7-43am.

The value of the Length field is 4.

The Broadcast Target Data Rate field specifies the target data rate at which the STA transmits Location Track Notification frames. The Broadcast Target Data Rate field format is specified by the Rate Identification field defined in 7.3.1.32. A value of 0 indicates the STA transmits Location Track Notification frames at a rate chosen by the STA transmitting the Location Track Notification frames.

7.3.2.71.8 Time Of Departure subelement

The Time of Departure subelement contains time of departure information for the Location Track Notification frame including the subelement. The format of the Time of Departure subelement is shown in Figure 7-95o85.

	Subelement ID	Length	TOD Timestamp	TOD RMS	TOD Clock Rate
Octets:	1	1	4	2	2

Figure 7-95o85—Time of Departure subelement

The Subelement ID field contains the value for Time of Departure as defined in Table 7-43am.

The value of the Length field is 8.

The TOD Timestamp field carried within a frame specifies when the first frame energy is sent by the transmitting port in units equal to 1/TOD Clock Rate, where the TOD Clock Rate is specified in the TOD Clock

Rate field. The reported TOD timestamp value is determined from the TIME_OF_DEPARTURE parameter within the PHY-TXSTART.confirm primitive.

The TOD RMS field specifies the RMS time of departure error in units equal to 1/TOD Clock Rate, where the TOD Clock Rate is specified in the TOD Clock Rate field, where the time of departure error equals the difference between the TOD Timestamp field and the time of departure measured by a reference entity using a clock synchronized to the start time and mean frequency of the local PHY entity's clock. TOD RMS field is determined from aTxPmdTxStartRMS in units equal to 1/TOD Clock Rate, where the TOD Clock Rate is specified in the TOD Clock Rate field.

The TOD Clock Rate field contains the clock rate used to generate the TOD timestamp value reported in the TOD Timestamp field, and it is specified in units of MHz.

7.3.2.71.9 Location Indication Options subelement

The Location Indication Options subelement contains the options for the STA when transmitting the Location Track Notification frame. The format of the Location Indication Options subelement is shown in Figure 7-95o86.

	Subelement ID	Length	Options Used	Indication Parameters
Octets:	1	1	1	variable

Figure 7-95o86—Location Indication Options subelement

The Subelement ID field contains the value for Location Indication Options as defined in Table 7-43am.

The Length field is 1 plus the length of each Indication Parameter included.

The Options Used field specifies which Indication Parameter fields in the Location Indication Options subelement are used. The format of the Options Used field is shown in Figure 7-95o87.

	B0	B1-B7
	Beacon Measurement Mode Used	Reserved
Bits:	1	7

Figure 7-95o87—Options Used field format

The Indication Parameters field defines a sequence of optional fields that are included in the Location Indication Options subelement based on the Options Used field value. The value of the Indication Parameters field is defined in Table 7-43aq.

7.3.2.72 Non-transmitted BSSID Capability element

The format of the Non-transmitted BSSID Capability element is shown in Figure 7-95o88.

The Element ID field is equal to the Non-transmitted BSSID Capability value in Table 7-26.

Table 7-43aq—Indication Parameter values

Order	Field Length	Field	Description
1	1	Beacon Measurement Mode	The Beacon Measurement Mode field is the mode of beacon measurement, as defined in Table 7-29e. The results of the beacon measurement are included in the Location Track Notification frame as described in 7.4.7.12 and 11.22.4.2.
2–8		Reserved	

	Element ID	Length	Non-transmitted BSSID Capability
Octets:	1	1	2

Figure 7-95o88—Non-transmitted BSSID Capability element format

The value of Length field is 2.

The Non-transmitted BSSID Capability field contains the Capability information field of the BSS.

The Non-transmitted BSSID Capability element is included in the Non-Transmitted BSSID profile subelement of the Multiple BSSID element defined in 7.3.2.46. The use of the Multiple BSSID element is described in 11.10.11 and Non-transmitted BSSID Advertisement procedures are described in 11.1.2.3a.

7.3.2.73 SSID List element

The format of the SSID List element is shown in Figure 7-95o89.

	Element ID	Length	SSID List
Octets:	1	1	variable

Figure 7-95o89—SSID List element format

The Element ID field is equal to the SSID List value in Table 7-26.

The value of Length field is the length of the SSID list (variable) in octets.

The SSID List field is a list of SSID information elements, each including the element ID, length field and SSID information field (see 7.3.2.1) for which the STA is requesting information.

The SSID List element is included in Probe Request frames, as described in 7.2.3.8. The use of the SSID List element and frames is described in 11.1.3.

7.3.2.74 Multiple BSSID-Index element

The format of the Multiple BSSID-Index element is shown in Figure 7-95o90.

	Element ID	Length	BSSID Index	DTIM Period (optional)	DTIM Count (optional)
Octets:	1	1	1	0 or 1	0 or 1

Figure 7-95o90—Multiple BSSID-Index element format

The Element ID field is equal to the Multiple BSSID-Index value in Table 7-26.

The value of Length field is one octet when the Multiple BSSID-Index element is included in the Probe Response frame and otherwise is three octets.

The BSSID Index field is a value between 1 and $2^n – 1$ that identifies the non-transmitted BSSID, where n is a non-zero, positive integer value.

The DTIM Period field is the DTIM period field for the BSSID. This field is not present when the Multiple BSSID-Index element is included in the Probe Response frame.

The DTIM Count field is the DTIM count field for the BSSID. This field is not present when the Multiple BSSID-Index element is included in the Probe Response frame.

The Multiple BSSID-index element is included in the non-transmitted BSSID profile element, as described in 11.1.2.3a. The use of the Multiple BSSID element and frames is described in 11.10.11.

7.3.2.75 FMS Descriptor element

The FMS Descriptor element defines information about group addressed frames buffered at the AP. It is present in the Beacon frames when dot11MgmtOptionFMSActivated is true. The format of the FMS Descriptor element is shown in Figure 7-95o91.

				zero or more FMS Counters	zero or more FMSIDs
	Element ID	Length	Number of FMS Counters	FMS Counters	FMSIDs
Octets:	1	1	1	*n*	*m*

Figure 7-95o91—FMS Descriptor element format

The Element ID field is equal to the FMS Descriptor value in Table 7-26.

The Length field is 1 if no FMS streams are accepted at the AP or is $1 + n + m$, where n is the number of FMS Counters present and m indicates the number of 1-octet FMSIDs present in the information element.

The Number of FMS Counters field defines the number of FMS Counters fields that are contained in the FMS Descriptor element.

The FMS Counters field contains zero or more FMS Counters. The format of the FMS Counter is shown in Figure 7-95o92. When one or more FMS streams are accepted at the AP, at least one FMS counter is present in the FMS Descriptor element. A maximum of eight FMS counters are permitted. The FMS counters are used by the non-AP STA to identify the DTIM beacon after which group addressed frames assigned to a particular delivery interval are transmitted. A single FMS Counter is shared by all FMS streams that use the same delivery interval.

	B0-B2	B3-B7
	FMS Counter ID	Current Count
Bits:	3	5

Figure 7-95o92—FMS Counter format

The FMS Counter ID field is a 3- bit value that represents the counter ID assigned by the AP for a particular FMS stream.

The Current Count field indicates how many DTIM Beacon frames (including the current one) appear before the next DTIM Beacon frame after which the group addressed frames assigned to a particular delivery interval are scheduled to be transmitted. The Current Count field is zero on transmission and ignored upon reception when the FMS Counter field is included in the FMS Status subelement.

The FMSIDs field contains zero or more FMSIDs. Each FMSID is a 1-octet identifier assigned by the AP.

Inclusion of an FMSID indicates the AP has buffered frames for the corresponding group addressed stream that is scheduled for transmission immediately after the DTIM Beacon frame.

The FMS Descriptor element is included in Beacon frames, as described in 7.2.3.1. The use of the FMS Descriptor element and frames is described in 11.2.1.4a.

7.3.2.76 FMS Request element

The FMS Request element defines information about the group addressed frames being requested by the non-AP STA. The format of FMS Request element is shown in Figure 7-95o93.

				One or more Request subelements
	Element ID	Length	FMS Token	Request subelements
Octets:	1	1	1	variable

Figure 7-95o93—FMS Request element format

The Element ID field is the FMS Request value in Table 7-26.

The value of the Length field is 1 + *n*, where *n* indicates the total length of all FMS subelements contained in the element.

The FMS Token field contains a unique identifier for the FMS Stream Set that is the set of FMS subelements specified in the request. If this is a new request, then the FMS Token value is 0. Otherwise, the FMS Token value is the value assigned by the AP in the FMS Response element. The FMS Token is fixed for the life-time of the FMS Stream Set.

The Request Subelements field contains one or more Request subelements described in Table 7-43ar.

Table 7-43ar—Request subelements

Identifier	Subelement name	Length (in octets)
0	Reserved	
1	FMS subelement	6 to 254
2–220	Reserved	
221	Vendor Specific subelement	5 to 254
222–255	Reserved	

The format of the FMS subelement is shown in Figure 7-95o94.

						One or more TCLAS Elements	
	Subelement ID	Length	Delivery Interval	Max Delivery Interval	Rate Identification	TCLAS Elements	TCLAS Processing Element (optional)
Octets:	1	1	1	1	4	variable	0 or 3

Figure 7-95o94—FMS Subelement format

The Subelement ID field is 1 to uniquely identify this subelement as the FMS subelement.

The value of the Length field is the sum of the lengths of the TCLAS element(s) plus 6 and the optional TCLAS Processing element, if present.

The Delivery Interval field defines the periodicity of stream transmission in units of DTIMs. The default value is 1. The value set to 0 indicates that requesting non-AP STA does not use the FMS stream identified by the TCLAS elements anymore.

The Max Delivery Interval field defines the maximum delivery interval the non-AP STA will support for the requested stream in units of DTIMs. The value set to 0 indicates that the non-AP STA is willing to accept any maximum delivery interval supported by the AP.

The Rate Identification field specifies the data rate as described in 7.3.1.32, at which the STA requests to receive group addressed frames. If the STA does not request a particular multicast rate, the Rate Identification field is 0.

The TCLAS Elements field contains one or more TCLAS information elements to specify the traffic filter as defined in 7.3.2.31. The number of TCLAS information elements is limited and the total size of the FMS Request element is less than or equal to 255 octets.

The TCLAS Processing Element field is optionally present and defines how multiple TCLAS information elements are processed as defined in 7.3.2.33.

The FMS Request element is included in FMS Request frames, as described in 7.4.12.11. The use of the FMS Request element and frames is described in 11.2.1.4a.

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26).

7.3.2.77 FMS Response element

The FMS Response element provides information about the delivery of group addressed frames. The format of the FMS Response element is shown in Figure 7-95o95.

				One or more Status Subelements
	Element ID	Length	FMS Token	Status Subelements
Octets:	1	1	1	variable

Figure 7-95o95—FMS Response element format

The Element ID field is the FMS Response value in Table 7-26.

The Length field is 1 + n, where n indicates the total length of all FMS Status subelements contained in the element.

The FMS Token field is assigned by the AP for the set of FMS streams that share the counter identified by the FMS Counter ID maintained in the AP.

The Status Subelements field contains one or more Status subelements described in Table 7-43as.

Table 7-43as—Status subelements

Identifier	Subelement name	Length (in octets)
0	Reserved	
1	FMS Status subelement	15 to 254
2	TCLAS Status subelement	6 to 254
3–220	Reserved	
221	Vendor Specific subelement	5 to 254
222–255	Reserved	

The FMS Status Subelements field contains one or more FMS Status subelements. The format of the FMS Status subelement is shown in Figure 7-95o96.

	Subelement ID	Length	Element Status	Delivery Interval	Max Delivery Interval	FMSID	FMS Counter	Rate Identification	Multicast Address
Octets:	1	1	1	1	1	1	1	4	6

Figure 7-95o96—FMS Status Subelement format

The Subelement ID field is 1 to uniquely identify this subelement as the FMS Status subelement.

The value of the Length field is 15.

The Element Status field indicates the status of STA's requested delivery interval, as indicated in Table 7-43at, provided by the AP.

Table 7-43at—FMS Element Status and TFS Response Status definition

Value	Description
0	Accept
1	Deny, due to request format error or ambiguous classifier.
2	Deny, due to lack of resources on AP.
3	Deny, due to requested classifier(s) matching 2 or more existing streams on different intervals.
4	Deny, by policy, requested stream or filter is not permitted to participate in the service.
5	Deny, reason unspecified.
6	Alternate Preferred, due to existing stream with different delivery interval.
7	Alternate Preferred, due to policy limits on AP.
8	Alternate Preferred, due to AP changed the delivery interval.
9	Alternate Preferred, due to AP multicast rate policy.
10	Terminate, due to AP policy change.
11	Terminate, due to lack of resources of AP.
12	Terminate, due to other FMS stream with higher priority.
13	Alternate Preferred, due to AP changed the maximum delivery interval.
14	Alternate Preferred, due to AP unable to provide requested TCLAS-based classifiers.
15–255	Reserved

The Delivery Interval field defines the minimum integer of DTIM periods between successive transmissions of frames for the stream corresponding to that FMSID.

The Max Delivery Interval field defines the maximum delivery interval the AP will use for the stream corresponding to FMSID. The value set to 0 indicates that the AP has no maximum delivery interval for the stream identified by FMSID.

The FMSID field is assigned by the AP and provides a unique identifier for this stream within the BSS.

The format of the FMS Counter field is shown in Figure 7-95o92.

The Rate Identification field specifies the data rate as described in 7.3.1.32 to be used for the multicast service. If the value of the Rate Identification field is 0 then the data rate is undefined.

The Multicast MAC Address field contains the MAC address of the multicast traffic to which this FMS response relates.

The format of the TCLAS Status subelement is shown in Figure 7-95o97.

				one or more TCLAS Elements	
	Subelement ID	Length	FMSID	TCLAS Elements	TCLAS Processing Element (optional)
Octets:	1	1	1	variable	0 or 3

Figure 7-95o97—TCLAS Status Subelement format

The Subelement ID field is 2 to uniquely identify this subelement as the TCLAS Status subelement.

The value of the Length field is one plus the sum of the lengths of the TCLAS element(s) plus the optional TCLAS Processing element, if present.

The FMSID field is assigned by the AP and provides a unique identifier for this stream within the BSS.

The TCLAS Elements field contains one or more TCLAS information elements to specify the traffic filter as defined in 7.3.2.31. The number of TCLAS information elements is limited and the total size of the FMS Response element is less than or equal to 255 octets.

The TCLAS Processing Element field is optionally present and defines how multiple TCLAS information elements are processed as defined in 7.3.2.33.

The FMS Response element is included in FMS Response frames, as described in 7.4.12.12. The use of the FMS Response element and frames is described in 11.2.1.4a.

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26).

7.3.2.78 QoS Traffic Capability element

The QoS Traffic Capability element provides information about types of traffic generated by a non-AP QoS STA, and is used by a QoS AP to indicate the access categories of associated non-AP QoS STAs. The format of the QoS Traffic Capability element is shown in Figure 7-95o98.

	Element ID	Length	QoS Traffic Capability Bitmask/Flags	AC STA Count List (optional)
Octets:	1	1	1	Total number of nonzero bits in Bits 0–1 of QoS Traffic Capability Bitmask/Flags field

Figure 7-95o98—QoS Traffic Capability Element format

The Element ID field is the QoS Traffic Capability value in Table 7-26.

The value of the Length field is 1 + *n*, where *n* equals the total number of nonzero bits in Bits 0–1 of the QoS Traffic Capability Bitmask/Flags field.

The format of QoS Traffic Capability Bitmask/Flags field is defined in Table 7-43au.

Table 7-43au—QoS Traffic Capability Bitmask/Flags definition

Bit (s)	Description
0	AC_VO
1	AC_VI
2	Reserved
3	Reserved
4	UP 4 Traffic
5	UP 5 Traffic
6	UP 6 Traffic
7	Reserved

Bits 0–1 serve as QoS Traffic Capability Bitmask. The bitmask indicates the AC values that have the station count specified in the following AC STA Count List. An AP sets the bit to 1 to indicate that the station count for the corresponding AC is present in the AC STA Count List field. An AP sets the bit to 0 to indicate that the station count for the corresponding AC is not present in the AC STA Count List field. A non-AP STA always sets Bits 0–1 to 0. An AP ignores Bits 0–1 on reception.

Bits 4–6 serve as QoS Traffic Capability Flags. Each of Bits 4–6 serves as a flag for a non-AP STA to indicate application requirements about the user priorities of the traffic it generates. A non-AP STA sets the bit to 1 to indicate the existence of an application that requires generation of traffic belonging to the corresponding user priority (UP). A non-AP STA sets the bit to 0 to indicate that such application does not exist. An AP always sets Bits 4–6 to 0. A non-AP STA ignores Bits 4–6 on reception.

Bits 2–3 and Bit 7 are reserved.

The AC STA Count List comprises a sequence of STA Count fields corresponding to the nonzero bits in the Bits 0–1 of the QoS Traffic Capability Bitmask/Flags field. The STA Count field is one octet long and contains an unsigned integer, encoded according to 7.1.1. The STA Count field specifies the number of associated QoS STAs that have indicated QoS Traffic Capability of the corresponding AC. If the number of STAs is greater than 255, the STA Count field is 255. The AC STA Count List field is present only when the QoS AP transmits the QoS Traffic Capability element.

The QoS Traffic Capability element is included in Beacon frames, as described in 7.2.3.1, Probe Response frames, as described in 7.3.2.9, Association Request frames, as described in 7.2.3.4, and Reassociation Request frames, as described in 7.2.3.6.

7.3.2.79 BSS Max Idle Period element

The BSS Max Idle Period element contains the time period a non-AP STA can refrain from transmitting frames to the AP before the AP disassociates the STA due to inactivity. The format of the BSS Max Idle Period element is shown in Figure 7-95o99.

	Element ID	Length	Max Idle Period	Idle Options
Octets:	1	1	2	1

Figure 7-95o99—BSS Max Idle Period element format

The Element ID field is the BSS Max Idle Period value in Table 7-26.

The value of the Length field is 3.

The Max Idle Period field indicates the time period during which a STA can refrain from transmitting frames to its associated AP without being disassociated. The Max Idle Period field is a 16-bit unsigned integer. The time period is specified in units of 1000 TUs. The value of 0 is reserved. A non-AP STA is considered inactive if the AP has not received a data frame or management frame of a frame exchange sequence initiated by the STA for a time period equal to or greater than the time specified by the Max Idle Period field value.

The Idle Options field indicates the options associated with the BSS Idle capability. The Idle Options field is shown in Figure 7-95o100.

	B0	B1-B7
	Protected Keep-Alive Required	Reserved
Bits:	1	7

Figure 7-95o100—Idle Options field

The Protected Keep-Alive Required bit set to 1 indicates that the STA sends an RSN protected frame to the AP to reset the Idle Timer at the AP for the STA, as defined in 11.22.12. If the Protected Keep-Alive Required bit is 0, the STA sends either an unprotected or a protected frame to the AP to reset the Idle Timer at the AP.

The BSS Max Idle Period element is included in Association Response frames, as described in 7.2.3.5, and Reassociation Response frames, as described in 7.2.3.7. The use of the BSS Max Idle Period element and frames is described in 11.22.12.

7.3.2.80 TFS Request element

The TFS Request element defines information about the traffic filters that are enabled at the AP for the requesting non-AP STA. The format of the TFS Request element is defined in Figure 7-95o101.

					One or more TFS Request subelements
	Element ID	Length	TFS ID	TFS Action Code	TFS Request subelements
Octets:	1	1	1	1	variable

Figure 7-95o101—TFS Request element format

The Element ID field is equal to the TFS Request value in Table 7-26.

The Length field is 2 + *n*, where *n* indicates the total length of all TFS subelements contained in the element.

The TFS ID field is assigned by the STA and provides a unique identifier for the set of traffic filters specified in the TFS subelements.

The TFS Action Code field defines the actions taken at the AP when a frame matches a traffic filter. The functions of the bits in this field are shown in Table 7-43av.

Table 7-43av—TFS Action Code field values

Bit(s)	Information	Notes
0	Delete after match	Setting this field to 1 indicates the traffic filter is to be deleted when a frame matches the traffic filter. A value of 0 for this field indicates no deletion of the traffic filter.
1	Notify	Setting this field to 1 indicates the STA is to be sent a TFS Notify frame when a frame matches the traffic filter. Setting this field to 0 indicates the AP does not send a TFS Notify frame to the requesting STA.
2–7	Reserved	All other bits are reserved, and are set to 0 on transmission and ignored on reception.

The TFS Request Subelements field contains one or more TFS Request subelements described in Table 7-43aw.

Table 7-43aw—TFS Request subelements

Identifier	Subelement name	Length (in octets)
1	TFS subelement	5 to 254
221	Vendor Specific subelement	5 to 254
0, 2 to 220, 222 to 255	Reserved	

The format of the TFS subelement is shown in Figure 7-95o102.

			One or more TCLAS Elements	
	Subelement ID	Length	TCLAS Elements	TCLAS Processing Element (optional)
Octets:	1	1	variable	0 or 3

Figure 7-95o102—TFS Subelement format

The Subelement ID field uniquely identifies this subelement to be the TFS subelement. The value of this field is 1.

The value of the Length field is the sum of the lengths of the TCLAS element(s) plus the optional TCLAS Processing element, if present.

The TCLAS Elements field contains one or more TCLAS information elements to specify the traffic filter as defined in 7.3.2.31.

The TCLAS Elements field contains one or more TCLAS information elements to specify the traffic filter as defined in 7.3.2.31. The number of TCLAS information elements is limited and the total size of the TFS Request element is less than 255 octets.

The TCLAS Processing Element field is optionally present and defines how multiple TCLAS information elements are processed as defined in 7.3.2.33.

The TFS Request element is included in TFS Request frames, as described in 7.4.12.15, and WNM-Sleep Mode Request frames, as described in 7.4.12.18. The use of the TFS Request element and frames is described in 11.22.11.

7.3.2.81 TFS Response element

The TFS Response element defines information about the status of the requested traffic filter. The format of the TFS Response element is defined in Figure 7-95o103.

The Element ID field is equal to the TFS Response value in Table 7-26.

The Length field is $4n$, where n indicates the total number of TFS Status subelements contained in the element.

The Status Subelement field contains one or more Status subelements described in Table 7-43ax.

			One or more Status subelements
	Element ID	Length	Status subelements
Octets:	1	1	4*n*

Figure 7-95o103—TFS Response element format

Table 7-43ax—Status subelements

Identifier	Subelement name	Length (in octets)
1	TFS Status subelement	4 to 254
2	TFS subelement	5 to 254
221	Vendor Specific subelement	5 to 254
0, 3 to 220, 222 to 255	Reserved	

The TFS Status Subelement field contains the information as defined in Figure 7-95o104.

	Subelement ID	Length	TFS Response Status	TFS ID
Octets:	1	1	1	1

Figure 7-95o104—TFS Status Subelement format

The Subelement ID field uniquely identifies this subelement to be the TFS Status subelement. The value of this field is 1.

The value of the Length field is 2.

The TFS Response Status field indicates the status returned by the AP responding to the STA's requested traffic filter, as indicated in Table 7-43at.

The TFS ID field indicates the unique ID for the TFS traffic filter set.

The TFS Response element is included in TFS Response frames, as described in 7.4.12.16, and WNM-Sleep Mode Response frames, as described in 7.4.12.19. The use of the TFS Response element and frames is described in 11.22.11.

7.3.2.82 WNM-Sleep Mode element

The WNM-Sleep Mode element is used to enter and exit the WNM-Sleep mode. The format of the WNM-Sleep Mode element is shown in Figure 7-95o105.

The Element ID field is equal to the WNM-Sleep Mode value in Table 7-26.

	Element ID	Length	Action Type	WNM-Sleep Mode Response Status	WNM-Sleep Interval
Octets:	1	1	1	1	2

Figure 7-95o105—WNM-Sleep Mode element format

The value of the Length field is 4.

The Action Type field is a number that identifies the type of WNM-Sleep mode request and response. The Action Types are shown in Table 7-43ay.

Table 7-43ay—Action Type definitions

Name	Action Type value
Enter WNM-Sleep Mode	0
Exit WNM-Sleep Mode	1
Reserved	2–255

The WNM-Sleep Mode Response Status field indicates the status returned by the AP responding to the non-AP STA's WNM-Sleep mode request as defined in Table 7-43az. This field is valid only in the WNM Sleep Mode element in a WNM-Sleep Mode Response frame and is reserved otherwise.

Table 7-43az—WNM-Sleep Mode Response Status definition

Value	Description
0	Enter/Exit WNM-Sleep Mode Accept.
1	Exit WNM-Sleep Mode Accept, GTK/IGTK update required.
2	Denied. The AP is unable to perform the requested action.
3	Denied temporarily. The AP is unable to perform the requested action at the current time. The request can be submitted again at a later time.
4	Denied. Due to the pending key expiration.
5	Denied. The requested action cannot be granted due to other WNM services in use by the requesting STA.
6–255	Reserved

The WNM-Sleep Interval field is reserved if the Action Type field is 1.

The WNM-Sleep Interval field indicates to the AP how often a STA in WNM-Sleep Mode wakes to receive Beacon frames, defined as the number of DTIM intervals. The value set to 0 indicates that the requesting non-AP STA does not wake up at any specific interval.

The WNM-Sleep Mode element is included in WNM-Sleep Mode Request frames, as described in 7.4.12.18, WNM-Sleep Mode Response frames as described in 7.4.12.19, Reassociation Request frames, as described in 7.2.3.6, and Reassociation Response frames, as described in 7.2.3.7. The use of the WNM-Sleep Mode element and frames is described in 11.2.1.16.

7.3.2.83 TIM Broadcast Request element

The TIM Broadcast Request element contains information about the periodic TIM broadcast being requested by the non-AP STA. The format of the TIM Broadcast Request element is shown in Figure 7-95o106.

	Element ID	Length	TIM Broadcast Interval
Octets:	1	1	1

Figure 7-95o106—TIM Broadcast Request element format

The Element ID field is equal to the TIM Broadcast Request value in Table 7-26.

The value of the Length field is 1.

The TIM Broadcast Interval field is the number of beacon periods between TIM frame transmissions. A value of 0 terminates the use of TIM Broadcast for the requesting station.

The TIM Broadcast Request element is included in TIM Broadcast Request frames, as described in 7.4.12.20, Association Request frames, as described in 7.2.3.4, and Reassociation Request frames, as described in 7.2.3.6. The use of the TIM Broadcast Request element and frames is described in 11.2.1.15.

7.3.2.84 TIM Broadcast Response element

The TIM Broadcast Response element contains information about the periodic TIM broadcast by the AP. The format of the TIM Broadcast Response element is shown in Figure 7-95o107.

	Element ID	Length	Status	TIM Broad-cast Interval (optional)	TIM Broad-cast Offset (optional)	High Rate TIM Rate (optional)	Low Rate TIM Rate (optional)
Octets:	1	1	1	0 or 1	0 or 4	0 or 2	0 or 2

Figure 7-95o107—TIM Broadcast Response element format

The Element ID field is equal to the TIM Broadcast Response value in Table 7-26.

The value of the Length field is 1 or 10, depending on the presence of a TIM Broadcast schedule (TIM Broadcast Interval, TIM Broadcast Offset, High Rate TIM Rate and Low Rate TIM Rate).

The Status field indicates the status of the AP responding to the STA's requested delivery interval, as indicated in Table 7-43ba.

Table 7-43ba—Status field values

Field value	Description
0	Accept
1	Accept, valid timestamp present in TIM frames
2	Denied
3	Overridden
4–255	Reserved

When the Status field is 0, 1, or 3, the TIM Broadcast Interval field, TIM Broadcast Offset field, High Rate TIM Rate field, and Low Rate TIM Rate field are included in the TIM Broadcast Response element.

The TIM Broadcast Interval field contains the number of beacon periods between scheduled TIM frame transmissions.

The TIM Broadcast Offset field contains the offset in microseconds with a tolerance of ± 4 microseconds relative to the TBTT for which a TIM frame is scheduled for transmission. The field contains a signed integer.

The High Rate TIM Rate field provides an indication of the rate that is used to transmit the high data rate TIM frame, in units of 0.5 Mb/s. A value of 0 indicates that the high rate TIM frame is not transmitted.

The Low Rate TIM Rate field provides an indication of the rate that is used to transmit the low data rate TIM frame, in units of 0.5 Mb/s. A value of 0 indicates that the low rate TIM frame is not transmitted.

The TIM Broadcast Response element is included in TIM Broadcast Response frames, as described in 7.4.12.21, Association Response frames, as described in 7.2.3.5, and Reassociation Response frames, as described in 7.2.3.7. The use of the TIM Broadcast Response element and frames is described in 11.2.1.15.

7.3.2.85 Collocated Interference Report element

The Collocated Interference Report element contains some characteristics of the reported collocated interference. The Collocated Interference Report element is defined in Figure 7-95o108.

The Element ID field is equal to the Collocated Interference Report value in Table 7-26.

The value of the Length field is 21.

The Report Period field contains an unsigned integer value in units of 200 TUs. If the Report Period field is a value that is greater than 0, then the reporting is periodic, and the field contains the period of sending the report. If the Report Period field is 0, then the reporting is not periodic, and a report is generated when the STA knows of a change in the collocated interference. See 11.22.8 for further details.

	Element ID	Length	Report Period	Interference Level	Interference Level Accuracy/ Interference Index
Octets:	1	1	1	1	1

	Interference Interval	Interference Burst Length	Interference Start Time/Duty Cycle	Interference Center Frequency	Interference Bandwidth
Octets	4	4	4	4	2

Figure 7-95o108— Collocated Interference Report element format

The Interference Level field is a 2's complement signed integer indicating the maximum level of the collocated interference power in units of dBm over all receive chains averaged over a 4 µs period during an interference period and across interference bandwidth. When the interference level is unknown, the field is +127 dBm. When the interference level is equal or greater than 126 dBm, the field is +126 dBm. If no collocated interference is present the field is –128 dBm. When the interference level is equal or lower than –127 dBm, the field is –127 dBm. The interference level is referenced to the antenna connector (see 3.174) used for reception, like RCPI.

The Interference Level Accuracy/Interference Index field is shown in Figure 7-95o109.

	B0-B3	B4-B7
	Expected Accuracy	Interference Index
Bits	4	4

Figure 7-95o109—Interference Level Accuracy/Interference Index field format

The Expected Accuracy field represents an unsigned integer indicating the expected accuracy of the estimate of interference in dB with 95% confidence interval. If the Interference Level field is X (dBm) and the expected accuracy field is Y (dB), the actual interference level is in the range of [X – Y, X +Y] with the probability of 95%. The range of expected accuracy is from 0 dB to 14 dB. If accuracy is unknown or greater than 14 dB, then the Expected Accuracy field is 15.

The Interference Index field indicates the interference index that is unique for each type of interference source. The field set to 0 indicates that no collocated interference is present. See 11.22.8 for further details.

The Interference Interval field indicates the interval between two successive periods of interference in microseconds. When the interval between two successive periods of interference is variable the field is 2^{32}– 1. When the interval between two successive periods of interference is equal or greater than 2^{32}– 2 the field is 2^{32}– 2. If no collocated interference is present, the field is 0.

The Interference Burst Length field indicates the duration of each period of interference in microseconds. When the duration of each period of interference is variable the field is 2^{32}– 1. When the duration of each period of interference is equal or greater than 2^{32}– 2 the field is 2^{32}– 2. If no collocated interference is present, the field is 0.

The Interference Start Time/Duty Cycle field contains the least significant 4 octets (i.e., B0–B31) of the TSF timer at the start of the interference burst. When either the Interference Interval or the Interference Burst Length fields are set to $2^{32}–1$, this field indicates the average duty cycle. The average duty cycle value is defined as follows:

$$\text{Average duty cycle} = \text{Round-to-Integer}\ ((2^{32} - 2) \times (T_B / T_I))$$

where

T_B is the average interference burst length

T_I is the average interference interval

When the interference is non-periodic or no collocated interference is present, the Interference Start Time field is 0.

The Interference Center Frequency field indicates the center frequency of interference in units of 5 kHz. When center frequency is unknown, the center frequency of the STA's operating channel is reported. If no collocated interference is present the field is 0.

The Interference Bandwidth field indicates the bandwidth in units of 5 kHz at the –3 dB roll-off point of the interference signal. When bandwidth of the interference signal is unknown, the field is 65535. When bandwidth of the interference signal is equal or greater than 65534 the field is 65534. If no collocated interference is present, the field is 0.

7.3.2.86 Channel Usage element

The Channel Usage element defines the channel usage information for non-infrastructure networks or an off channel TDLS direct link. The format of the Channel Usage element is shown in Figure 7-95o110.

				zero or more entries
	Element ID	Length (2*n*+1)	Usage Mode	Channel Entry
Octets:	1	1	1	2*n*

Figure 7-95o110—Channel Usage element format

The Element ID field is equal to the Channel Usage value in Table 7-26.

The Length field is $2n + 1$, where n indicates the total number of Channel Entry subelements contained in the element.

The Usage Mode field is a number that identifies the usage of the recommended channels listed in the Regulatory Class/Channel Number pair fields. The Usage Mode definitions are shown in Table 7-43bb.

The Channel Entry field includes zero or more Regulatory Class and Channel pairs. The format of Channel Entry field is shown in Figure 7-95o80.

The Channel Usage element may be included in Probe Request frames, as described in 7.2.3.8, Probe Response frames, as described in 7.2.3.9, Channel Usage Request frames, as described in 7.4.12.23, and Channel Usage Response frames, as described in 7.4.12.24. The use of the Channel Usage element and frames is described in 11.22.14.

Table 7-43bb—Usage Mode definitions

Value	Usage Mode
0	Non-infrastructure IEEE 802.11 network
1	Off-channel TDLS direct link
2–255	Reserved

7.3.2.87 Time Zone element

The Time Zone element contains the local time zone of the AP. The format of the Time Zone element is shown in Figure 7-95o111.

	Element ID	Length	Time Zone
Octets:	1	1	variable

Figure 7-95o111—Time Zone element format

The Element ID field is the Time Zone value in Table 7-26.

The value of the Length field is variable.

The format of the Time Zone field is as specified in 8.3 of IEEE Std 1003.1-2004:

stdoffset[dst[offset][,start[/time],end[/time]]]

The length of the field is no less than 4 octets and no more than TZNAME_MAX, as defined in IEEE Std 1003.1-2004. The Time Zone field represents the time zone at the AP's location. The encoding of the field is in ASCII characters as shown in the following Example-1.

Example-1: EST5

Example-2: EST5EDT4,M3.2.0/02:00,M11.1.0/02:00

In the Example-2, the string is interpreted as a time zone that is normally five hours behind UTC, and four hours behind UTC during DST, which runs from the second Sunday in March at 02:00 local time through the first Sunday in November at 02:00 local time. Normally, the time zone is abbreviated "EST" but during DST it is abbreviated "EDT".

7.3.2.88 DMS Request element

The DMS Request element defines information about the group addressed frames to be transmitted as individual addressed frames. The format of the DMS Request element is shown in Figure 7-95o112.

The Element ID field is the DMS Request value in Table 7-26.

The value of the Length field is the length of the DMS Descriptor List field.

	Element ID	Length	DMS Descriptor List
Octets:	1	1	variable

Figure 7-95o112—DMS Request element format

The DMS Descriptor List field contains one or more DMS Descriptors. The format of the DMS Descriptor is defined in Figure 7-95o113.

				zero or more TCLAS Elements			
	DMSID	DMS Length	Request Type	TCLAS Elements	TCLAS Processing Element (optional)	TSPEC Element (optional)	Optional Subelements
Octets:	1	1	1	variable	0 or 3	0 or 57	variable

Figure 7-95o113—DMS Descriptor

The DMSID field is set to 0 when the Request Type field is “Add” as defined in Table 7-43bc; otherwise, the DMSID field is set to the non-zero value assigned by the AP STA to identify the DMS traffic flow.

The DMS Length field is set to 1 + *n*, where *n* indicates the total length in octets of all the TCLAS Elements, optional TCLAS Processing Element, optional TSPEC Element, and Optional Subelements fields contained in the DMS Descriptor field.

The Request Type field identifies the type of DMS request. The Request Types are shown in Table 7-43bc.

Table 7-43bc—Request Type definitions

Description	Request Type Value
Add	0
Remove	1
Change	2
Reserved	3–255

When the Request Type field is set to “Add,” the TCLAS Elements field contains one or more TCLAS information elements to specify group addressed frames as defined in 7.3.2.31. When the Request Type field is set to any value other than “Add,” the TCLAS Elements field contains zero TCLAS elements.

When the Request Type field is set to “Add” and when there are two or more TCLAS information elements present, the TCLAS Processing Element field contains one TCLAS Processing information element to define how these TCLAS information elements are to be processed, as defined in 7.3.2.33. Otherwise, the TCLAS Processing Element field contains zero TCLAS Processing information elements.

When the Request Type field is set to “Add” or “Change,” the TSPEC Element field optionally contains one TSPEC information element to specify the characteristics and QoS expectations of the corresponding traffic flow as defined in 7.3.2.30. Otherwise, the TSPEC Element field contains zero TSPEC information elements.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-43bd. A Yes in the Extensible column of a subelement listed in Table 7-43bd indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-43bd—Optional Subelement IDs for DMS Descriptor

Subelement ID	Name	Length field (octets)	Extensible
0–220	Reserved		
221	Vendor Specific	3 to 248	
222–255	Reserved		

The DMS Request element is included in DMS Request frames, as described in 7.4.12.25, and Reassociation Request frames, as described in 7.2.3.6. The use of the DMS Request element and frames is described in 11.22.15.

7.3.2.89 DMS Response element

The DMS Response element provides the status information about the requested group addressed frames. The format of the DMS Response element is shown in Figure 7-95o114.

			one or more DMS Status field
	Element ID	Length	DMS Status List
Octets:	1	1	variable

Figure 7-95o114—DMS Response element format

The Element ID field is the DMS Response value in Table 7-26.

The value of the Length field is the total length of the DMS Status List field.

The DMS Status List field contains one or more DMS Status field. The format of the DMS Status field is defined in Figure 7-95o115.

	DMSID	DMS Length	Response Type	Last Sequence Control	TCLAS Elements (zero or more TCLAS Elements)	TCLAS Processing Element (optional)	TSPEC Element (optional)	Optional Subelements
Octets:	1	1	1	2	variable	0 or 3	0 or 57	variable

Figure 7-95o115—DMS Status field format

The DMSID field is assigned by the AP and provides a unique identifier within the BSS for the DMS traffic flow identified by the TCLAS Elements, TCLAS Processing Element, and TSPEC Element fields. The uniqueness of the identifier is independent of the ordering of the TCLAS elements.

The value of the DMS Length field is set to $3 + n$, where n indicates the total length in octets of all the TCLAS Elements, optional TCLAS Processing Element, optional TSPEC Element, and Optional Subelements fields contained in the DMS Status field. When the Response Type field is set to "Terminate," the value of the DMS Length field is set to 3.

The Response Type field indicates the response type returned by the AP responding to the non-AP STA's request, as indicated in Table 7-43be.

Table 7-43be—Response Type field values

Field value	Description	Notes
0	Accept	AP accepts the DMS request
1	Denied	AP rejects the DMS request
2	Terminate	AP terminates DMS previously accepted DMS request
3–255	Reserved	

When the Last Sequence Control field is not supported the Last Sequence Control field is set to 65535. When the Last Sequence Control field is supported and the Response Type field is set to a value that is not equal to "Terminate," the Last Sequence Control field is reserved.

When the Response Type field is "Terminate" and the Last Sequence Control field is supported, Bit 0 to Bit 3 of the Last Sequence Control field is 0, and Bit 4 to Bit 15 of the Last Sequence Control field contains the sequence number of the last group addressed frame that the AP converted to an individually addressed frame and sent successfully to the non-AP STA that is the recipient of the DMS Response Frame. If this last frame received by the non-AP STA prior to DMS termination has not also been sent using a group addressed frame, the Last Sequence Control field is set to 65534.

When the Response Type field is set to "Accept" or "Denied," the TCLAS Elements field contains one or more TCLAS information elements to specify group addressed frames as defined in 7.3.2.31. Otherwise, the TCLAS Elements field contains zero TCLAS information elements.

When the Response Type field is set to “Accept” or “Denied,” the TCLAS Processing Element field optionally contains one TCLAS Processing information element to define how these TCLAS information elements are to be processed, as defined in 7.3.2.33. When the Response Type field is set to “Terminate” or when there is only one TCLAS information element, the TCLAS Processing Element field contains zero TCLAS Processing elements.

When the Response Type field is set to “Accept” or “Denied,” the TSPEC Element field optionally contains one TSPEC information element to specify the characteristics and QoS expectations of the corresponding traffic flow as defined in 7.3.2.30. Otherwise, the TSPEC Element field contains zero TSPEC elements.

The Optional Subelements field contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-43bf. A Yes in the Extensible column of a subelement listed in Table 7-43bf indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-43bf—Optional Subelement IDs for DMS Status

Subelement ID	Name	Length field (octets)	Extensible
0–220	Reserved		
221	Vendor Specific	3 to 248	
222–255	Reserved		

The DMS Response element is included in DMS Response frames, as described in 7.4.12.26, and Reassociation Response frames, as described in 7.2.3.7. The use of the DMS Response element and frames is described in 11.22.15.

7.3.2.90 Destination URI element

The Destination URI element contains URI and ESS Detection Interval values from the requesting STA that the responding STA may use to deliver Event or Diagnostic Report frames. The format of the Destination URI element is given in Figure 7-95o116.

	Element ID	Length	ESS Detection Interval	URI
Octets:	1	1	1	1–253

Figure 7-95o116—DMS Response element format

The Element ID field is equal to the Destination URI value in Table 7-26.

The value of the Length field is 1 plus the length of the URI field.

The ESS Detection Interval field is defined in 7.3.2.71.2 and its use for Event and Diagnostic requests is described in 11.22.2 and 11.22.3.

The URI field specifies the destination URI for Event and Diagnostic reports using the format defined in IETF RFC 3986. The URI field value is limited to 253 octets.

The Destination URI element is included as the last element in an Event or Diagnostic Request frame.

The Destination URI element is included in Event Request frames as described in 7.4.12.2, or Diagnostic Request frames as described in 7.4.12.4.

Use of the Destination URI element in an Event Request frame is described in 11.22.2.1. Use of the Destination URI element in a Diagnostic Request frame is described in 11.22.3.1.

7.3.2.91 U-APSD Coexistence element

The U-APSD Coexistence provides the duration of requested transmission during a U-APSD service period. The format of the U-APSD Coexistence element is shown in Figure 7-95o117.

	Element ID	Length	TSF 0 Offset	Interval/ Duration	Optional Subelements
Octets:	1	1	8	4	variable

Figure 7-95o117—U-APSD Coexistence element format

The Element ID field is equal to the U-APSD Coexistence value in Table 7-26.

The value of the Length field is 12 plus the length of any additional subelements present.

A non-zero value of the TSF 0 Offset field is the number of microseconds since TSF time 0 when the non-AP STA knew the start of interference. The AP uses the TSF 0 Offset field together with the Interval/ Duration field to enqueue frames for transmission to the non-AP STA using the procedures as described in 11.2.1.4.2.

A TSF 0 Offset field value of 0 indicates the non-AP STA requests the AP transmit frames to the non-AP STA using the procedure described in 11.2.1.4.2 for the case where TSF 0 Offset is equal to 0.

The Interval/Duration field is defined as follows:

— When the TSF 0 Offset is 0, the Interval/Duration field is the number of microseconds during the U-APSD service period when the AP transmits frames to the non-AP STA as described in 11.2.1.4.2.
— When the TSF 0 Offset is non-zero, the Interval/Duration field is the number of microseconds between the start of consecutive interference bursts.

The Interval/Duration field value of 0 is reserved.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-43bg. A Yes in the Extensible column of a subelement listed in Table 7-43bg indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-43bg—Optional Subelement IDs for U-APSD Coexistence

Subelement ID	Name	Length field (octets)	Extensible
0–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

7.4 Action frame format details

7.4.2 QoS Action frame details

Change 7.4.2.1 as follows:

7.4.2.1 ADDTS Request frame format

The ADDTS frames are used to carry TSPEC and optionally TCLAS elements to set up and maintain TSs using the procedures defined in 11.4.

The frame body of the ADDTS Request frame contains the information shown in Table 7-46.

Table 7-46—ADDTS Request frame body

Order	Information
1	Category
2	Action
3	Dialog Token
4	TSPEC
5 – n	TCLAS (optional)
n + 1	TCLAS Processing (optional)
<u>n + 2</u>	<u>U-APSD Coexistence (optional)</u>

The Category field is set to 1 (representing QoS).

The Action field is set to 0 (representing ADDTS request).

The Dialog Token, TCLAS, and TCLAS Processing fields of this frame are contained in an MLMEADDTS.request primitive that causes the frame to be sent. Some of the TSPEC parameters are contained in the MLME-ADDTS.request primitive while the other parameters (i.e., Surplus Bandwidth Allowance, Minimum Service Interval, Maximum Service Interval, and Minimum PHY Rate) are generated within the MAC.

The TSPEC element, defined in 7.3.2.30, and the optional TCLAS element, defined in 7.3.2.31, contain the QoS parameters that define the TS. The TS is identified by the TSID and Direction fields within the TSPEC element. The TCLAS element is optional at the discretion of the non-AP STA that sends the ADDTS Request frame, regardless of the setting of the access policy (EDCA or HCCA). There may be one or more TCLAS elements in the ADDTS frame. The TCLAS Processing element is present when there are more than one TCLAS element and is defined in 7.3.2.33.

The U-APSD Coexistence element, defined in 7.3.2.91, contains the coexistence parameters requested by the non-AP STA when using the U-APSD Coexistence capability as described in 11.2.1.4.2. The U-APSD Coexistence element is optionally present.

7.4.7 Public Action frame details

7.4.7.1 Public Action frames

Insert the following rows to Table 7-57e:

Table 7-57e— Public Action field values

Action field value	Description
15	Location Track Notification
16–255	Reserved

Insert the following subclauses after 7.4.7.11:

7.4.7.12 Location Track Notification frame format

The Location Track Notification frame uses the Action frame body format and is transmitted by a STA to allow remote location determination to occur by another STA. The format of the Location Track Notification frame body is shown in Figure 7-101h9.

	Category	Action	Location Parameters Element	Measurement Report Element (optional)
Octets:	1	1	variable	variable

Figure 7-101h9—Location Track Notification frame format

The Category field is the value for Public Action defined Table 7-24.

The Action field is the value indicating Location Track Notification, as specified in Table 7-57e. The Location Parameters Element field contains the Location Parameters subelements, described in Table 7-43am.

Table 7-57f5 defines the allowed Location Parameters subelements for a Location Parameters element that is included in the frame.

Table 7-57f5—Location Parameters Element field for Location Track Notification frame

Allowed Subelements	Subelement ID	Notes
Location Indication Channels	2	The Location Indication Channels subelement is included in the Location Track Notification frame.
Radio Information	4	The Radio Information subelement is included in the Location Track Notification frame.
Motion	5	The Motion subelement is included in the Location Track Notification frame if dot11MgmtOptionMotionDetectionActivated is true.
Time Of Departure	7	The Time Of Departure subelement is included in the Location Track Notification frame if dot11MgmtOptionTODActivated is true.
Location Indication Options	8	The Location Indication Options subelement is included in the Location Track Notification frame if the successful Location Configuration Request frame that configured the STA included a Location Indication Options subelement.
Vendor Specific	221	The Vendor Specific subelement may be included in the Location Track Notification frame.

The Measurement Report Element field contains a Measurement Report element of type Beacon Report as defined in 7.3.2.22.6. The Measurement Report Element field is included in the Location Track Notification frame if the Location Parameters Element field contains a Location Indication Options subelement. The Measurement Report element Measurement Token field is set to the same value of the Dialog Token in the Location Configuration Request frame that configured the STA.

Insert the following after 7.4.11:

7.4.12 WNM Action details

7.4.12.1 WNM Action fields

Several Action frame formats are defined for Wireless Network Management (WNM) purposes. An Action field, in the octet field immediately after the Category field, differentiates the formats. The Action field values associated with each frame format are defined in Table 7-57v13.

Table 7-57v13—WNM Action field values

Action field value	Description
0	Event Request
1	Event Report
2	Diagnostic Request
3	Diagnostic Report
4	Location Configuration Request

Table 7-57v13—WNM Action field values *(continued)*

Action field value	Description
5	Location Configuration Response
6	BSS Transition Management Query
7	BSS Transition Management Request
8	BSS Transition Management Response
9	FMS Request
10	FMS Response
11	Collocated Interference Request
12	Collocated Interference Report
13	TFS Request
14	TFS Response
15	TFS Notify
16	WNM-Sleep Mode Request
17	WNM-Sleep Mode Response
18	TIM Broadcast Request
19	TIM Broadcast Response
20	QoS Traffic Capability Update
21	Channel Usage Request
22	Channel Usage Response
23	DMS Request
24	DMS Response
25	Timing Measurement Request
26	WNM-Notification Request
27	WNM-Notification Response
28-255	Reserved

7.4.12.2 Event Request frame format

The Event Request frame uses the Action frame body format and is transmitted by a STA to request another STA to report one or more events. The format of the frame is shown in Figure 7-101n1.

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Event Request frame, as specified in Table 7-57v13 in 7.4.12.1.

	Category	Action	Dialog Token	Event Request Elements	Destination URI Element (optional)
Octets:	1	1	1	variable	variable

Figure 7-101n1—Event Request frame body format

The Dialog Token field is a nonzero value chosen by the STA sending the event request to identify the request/report transaction.

The Event Request Elements field contains one or more of the Event Request elements described in 7.3.2.67.

The Destination URI element field contains zero or one Destination URI element described in 7.3.2.90.

7.4.12.3 Event Report frame format

The Event Report frame uses the Action frame body format and is transmitted by a STA in response to an Event Request frame, or autonomously. The format of the Event Report frame body is shown in Figure 7-101n2.

	Category	Action	Dialog Token	Event Report Elements
Octets:	1	1	1	variable

Figure 7-101n2—Event Report frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Event Report, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value of the corresponding Event Request frame. If the Event Report frame is being transmitted other than in response to an Event Request frame, then the Dialog token is zero.

The Event Report Elements field contains one or more of the Event Report elements described in 7.3.2.68.

7.4.12.4 Diagnostic Request frame format

The Diagnostic Request frame uses the Action frame body format and is transmitted by a STA requesting the receiving STA to execute a diagnostic test. The format of the frame is shown in Figure 7-101n3.

	Category	Action	Dialog Token	Diagnostic Request Elements	Destination URI Element (optional)
Octets:	1	1	1	variable	variable

Figure 7-101n3—Diagnostic Request frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Diagnostic Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a nonzero value chosen by the STA sending the Diagnostic request frame to identify the request/report transaction.

The Diagnostic Request Elements field contains one or more of the Diagnostic Request elements described in 7.3.2.69. The number and length of the Diagnostic Request elements in a Diagnostic Request frame is limited to 2304 octets.

The Destination URI element field contains zero or one Destination URI element described in 7.3.2.90.

7.4.12.5 Diagnostic Report frame format

The Diagnostic Report frame uses the Action frame body format transmitted by a STA in response to a Diagnostic Request frame. The format of the Diagnostic Report frame body is shown in Figure 7-101n4.

	Category	Action	Dialog Token	Diagnostic Report Elements
Octets:	1	1	1	variable

Figure 7-101n4—Diagnostic Report frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Diagnostic Report, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value in any corresponding Diagnostic Request frame.

The Diagnostic Report Elements field contains one or more of the Diagnostic Report elements described in 7.3.2.70. The number and length of the Diagnostic Report elements in a Diagnostic Report frame is limited to 2304 octets.

7.4.12.6 Location Configuration Request frame format

The Location Configuration Request frame uses the Action frame body format and is transmitted by a STA to configure another STA to send a Location Track Notification frame on a set of channels periodically for the purposes of determining location of the STA. The format of the Location Configuration Request frame body is shown in Figure 7-101n5.

	Category	Action	Dialog Token	Location Parameters Element
Octets:	1	1	1	variable

Figure 7-101n5—Location Configuration Request frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Location Configuration Request, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a nonzero value that is unique among the Location Configuration Request frames sent to each destination MAC address for which a corresponding Location Configuration Response frame has not been received.

The Location Parameters Element field contains the location parameters subelements, described in 7.3.2.71. Table 7-57v14 defines the allowed Location Parameters subelements for a Location Parameters element that is included in the Location Configuration Request frame.

Table 7-57v14—Location Parameters Element field for Location Configuration Request frame

Allowed Subelement fields	Subelement ID	Notes
Location Indication Parameters	1	The Location Indication Parameters subelement is included in the Location Configuration Request frame.
Location Indication Channels	2	The Location Indication Channels subelement is included in the Location Configuration Request frame.
Location Indication Broadcast Data Rate	6	The Location Indication Broadcast Data Rate subelement is included in the Location Configuration Request frame.
Location Indication Options	8	The Location Indication Options subelement may be included in the Location Configuration Request frame.
Vendor Specific Information	221	The Vendor Specific Information subelement may be included in the Location Configuration Request frame.

7.4.12.7 Location Configuration Response frame format

The Location Configuration Response frame uses the Action frame body format and is transmitted by a STA in response to the receipt of a Location Configuration Request frame. The format of the Location Configuration Response frame body is shown in Figure 7-101n6.

	Category	Action	Dialog Token	Location Parameters Element
Octets:	1	1	1	variable

Figure 7-101n6—Location Configuration Response frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Location Configuration Response, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value received in the Location Configuration Request frame to identify the request/response transaction.

The Location Parameters Element field contains the location parameters subelements, described in 7.3.2.71. Table 7-57v15 defines the allowed Location Parameters subelements for a Location Parameters element that is included in the Location Configuration Response frame.

Table 7-57v15—Location Parameters Element field for Location Configuration Response frame

Allowed Subelement Fields	Subelement ID	Notes
Location Indication Parameters	1	The Location Indication Parameters subelement may be included in the Location Configuration Response frame.
Location Indication Channels	2	The Location Indication Channels subelement may be included in the Location Configuration Response frame.
Location Indication Broadcast Data Rate	6	The Location Indication Broadcast Data Rate subelement may be included in the Location Configuration Response frame.
Location Indication Options	8	The Location Indication Options subelement may be included in the Location Configuration Response frame.
Location Status	3	The Location Status subelement is included in the Location Configuration Response frame. If all configuration of the subelements contained in a Location Configuration Request frame was successful, then a single Location Status subelement is included in the Location Configuration Response frame. For each subelement contained in the Location Configuration Request frame that is not successful a Location Status subelement is included in the Location Configuration Response frame that indicates the subelement ID and the unsuccessful status code for that subelement ID.
Vendor Specific Information	221	The Vendor Specific Information subelement may be included in the Location Configuration Response frame.

7.4.12.8 BSS Transition Management Query frame format

The BSS Transition Management Query frame uses the Action frame body format and is transmitted by a STA requesting or providing information on BSS transition candidate APs. The format of the BSS Transition Management Query frame body is shown in Figure 7-101n7.

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

	Category	Action	Dialog Token	BSS Transition Query Reason	BSS Transition Candidate List Entries (Optional)
Octets:	1	1	1	1	variable

Figure 7-101n7—BSS Transition Management Query frame body format

The Action field is the value indicating BSS Transition Management Query, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a nonzero value chosen by the STA sending the BSS Transition Management Query to identify the query/request/response transaction.

The BSS Transition Query Reason field contains the reason code for a BSS transition management query as defined in Table 7-43x.

The BSS Transition Candidate List Entries field contains zero or more Neighbor Report elements as described in 7.3.2.37. The Neighbor Report elements are collected by the STA as part of its scanning procedures and provided to the AP as described in 11.22.6.2. The length of the BSS Transition Candidate List Entries field in a BSS Transition Management Query frame is limited to 2304 octets.

7.4.12.9 BSS Transition Management Request frame format

The BSS Transition Management Request frame uses the Action frame body format and is transmitted by an AP STA in response to a BSS Transition Management Query frame, or autonomously. The format of the BSS Transition Management Request frame body is shown in Figure 7-101n8.

	Category	Action	Dialog Token	Request mode	Disassociation Timer
Octets:	1	1	1	1	2

	Validity Interval	BSS Termination Duration (optional)	Session Information URL (optional)	BSS Transition Candidate List Entries
Octets:	1	0 or 12	variable	variable

Figure 7-101n8—BSS Transition Management Request frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating BSS Transition Management Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value received in the BSS Transition Management Query frame if the BSS Transition Management Request frame is being transmitted in response to a BSS Transition Management Query frame. If the BSS Transition Management Request frame is being transmitted other than in response to a BSS Transition Management Query frame, then the Dialog Token field is a nonzero value chosen by the AP STA sending the BSS Transition Management Request frame to identify the request/ response transaction.

The Request mode field is defined in Figure 7-101n9.

	Preferred Candidate List Included	Abridged	Disassociation Imminent	BSS Termination Included	ESS Disassociation Imminent	Reserved
Bit:	0	1	2	3	4	5- 7

Figure 7-101n9—Request Mode field

— The Preferred Candidate List Included (bit 0) field indicates whether the BSS transition candidate list included in this frame is a preferred candidate list or a list of known BSS transition candidates. The Preferred Candidate List Included bit set to 0 indicates that the receiving STA may ignore the BSS Transition Candidate List Entries field. The Preferred Candidate List Included bit set to 1 indicates that the sender expects the receiving STA to process this frame.

— The Abridged (bit 1) field indicates to the recipient of the frame the intended treatment of all BSSIDs not listed in the BSS Transition Candidate List Entries field. The AP sets the Abridged bit in the Request Mode field to 1 when a preference value of 0 is assigned to all BSSIDs that do NOT appear in the BSS Transition Candidate List. The AP sets the Abridged bit in the Request Mode field to 0 when the AP has no recommendation for or against any BSSID not present in the BSS Transition Candidate List Entries field.

— The Disassociation Imminent (bit 2) field indicates whether the STA will be disassociated from the current AP. The Disassociation Imminent bit in the Request Mode field set to 1 indicates that STA is to be disassociated from the current AP. The Disassociation Imminent field set to 0 indicates that disassociation from the AP is not imminent.

— The BSS Termination Included (bit 3) field indicates that the BSS Termination Duration field is included, the BSS is shutting down and the STA will be disassociated. The AP sets the BSS Termination Included bit in the Request mode field to 1 to indicate that the BSS is shutting down. The BSS Termination Included bit is 0 if no BSS Termination Duration information is included in the BSS Transition Management Request frame.

— The ESS Disassociation Imminent (bit 4) field indicates that the Session Information URL field is included, and that the STA will be disassociated from the ESS. The ESS Disassociation Imminent bit in the Request Mode field set to 1 indicates that STA is to be disassociated from the ESS. When the ESS Disassociation Imminent bit is 1, a Session Information URL field is included in the BSS Transition Management Request frame. The ESS Disassociation Imminent field set to 0 indicates that disassociation from the ESS is not imminent.

The Disassociation Timer indicates the time after which the AP will issue a Disassociation frame to this STA. The Disassociation Timer field is the number of beacon transmission times (TBTTs) until the AP sends a Disassociation frame to this STA. A value of 0 indicates that the AP has not determined when it will send a Disassociation frame to this STA. If the Disassociation Imminent field is 0, the Disassociation Timer field is reserved. The format of the Disassociation Timer field is shown in Figure 7-101n10.

	B0-B15
	Disassociation Timer
Bits	16

Figure 7-101n10—Disassociation Timer field format

The Validity Interval field is the number of beacon transmission times (TBTTs) until the BSS transition candidate list is no longer valid. A value of 0 is reserved.

The BSS Termination Duration field contains the BSS Termination Duration subelement (see 7.3.2.37) for the current BSS and is present only when the BSS Termination Included field is 1 in the Request mode field.

The format of the optional Session Information URL field is shown in Figure 7-101n11. This field is present when the ESS Disassociation Imminent field is 1.

	URL Length	URL (optional)
Octets:	1	variable

Figure 7-101n11—Session Information URL field format

The URL Length field is the value of the length of the URL field. The URL Length field is 0 when the URL field is not present.

The URL field is a variable-length field formatted in accordance with IETF RFC 3986-2005.

The BSS Transition Candidate List Entries field contains one or more Neighbor Report elements described in 7.3.2.37. If the STA has no information in response to the BSS Transition Management Query frame, the Neighbor Report elements are omitted and the Preferred Candidate List Included bit is 0. The length of the BSS Transition Candidate List Entries in a BSS Transition Management Request frame is limited to 2304 octets.

7.4.12.10 BSS Transition Management Response frame format

The BSS Transition Management Response frame uses the Action frame body format and is optionally transmitted by a STA in response to a BSS Transition Management Request frame. The format of the BSS Transition Management Response frame body is shown in Figure 7-101n12.

	Category	Action	Dialog Token	Status code	BSS Termination Delay	Target BSSID (Optional)	BSS Transition Candidate List Entries (Optional)
Octets:	1	1	1	1	1	0 or 6	variable

Figure 7-101n12— BSS Transition Management Response frame body format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating BSS Transition Response, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the value in the corresponding BSS Transition Management Request frame. The BSS Transition Management Response frame is only transmitted in response to a BSS Transition Management Request frame.

The Status code field contains the status code in response to a BSS Transition Management Request frame as defined in Table 7-57v16. If the STA will transition to another BSS, then the status code is 0 (i.e., Accept). If the STA intends to retain the association with the current BSS, the status code is one of the “Reject” status codes.

Table 7-57v16—Status code definitions

Status Code	Status code description
0	Accept
1	Reject—Unspecified reject reason.
2	Reject—Insufficient Beacon or Probe Response frames received from all candidates.
3	Reject—Insufficient available capacity from all candidates.
4	Reject—BSS Termination undesired.
5	Reject—BSS Termination delay requested.
6	Reject—STA BSS Transition Candidate List provided.
7	Reject—No suitable BSS transition candidates.
8	Reject—Leaving ESS.
9–255	Reserved

The BSS Termination Delay field is the number of minutes that the responding STA requests the BSS to delay termination. This field is reserved if the Status code field value is not set to 5.

The Target BSSID field is the BSSID of the BSS that the non-AP STA transitions to. This field is not present if the STA does not transition or if no transition information is available.

The BSS Transition Candidate List Entries field contains zero or more Neighbor Report elements described in 7.3.2.37. The Neighbor Report elements are collected by the STA as part of its scanning procedures and provided to the AP as described in 11.22.6.4. The length of the BSS Transition Candidate List Entries field in a BSS Transition Management Response frame is limited to 2304 octets.

7.4.12.11 FMS Request frame format

The FMS Request frame is sent by a non-AP STA to the AP to request the specified FMS and to propose delivery intervals for a set of group addressed streams. The FMS Request frame is also sent by a non-AP STA to request a modification to a previous FMS Request. The format of the frame is shown in Figure 7-101n13.

	Category	Action	Dialog Token	FMS Request Element
Octets:	1	1	1	variable

Figure 7-101n13—FMS Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating FMS Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a nonzero value that is unique among the FMS Request frame sent to each destination MAC address for which a corresponding FMS Report frame has not been received.

The FMS Request Element field indicates the group addressed traffic streams that are requested by the non-AP STA. The FMS Request Element field contains one FMS Request element described in 7.3.2.76.

7.4.12.12 FMS Response frame format

The FMS Response frame is sent by an AP in response to an FMS Request frame, or sent by the AP to the STA to instruct the non-AP STA to change the delivery interval or data rate. The format of the frame is shown in Figure 7-101n14.

	Category	Action	Dialog Token	FMS Response Element
Octets:	1	1	1	variable

Figure 7-101n14—FMS Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating FMS Response frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value received in the FMS Request frame to identify the request/response transaction. If an FMS Response frame is being transmitted other than in response to an FMS Request frame, then the Dialog Token field is zero.

The FMS Response Element indicates the group addressed traffic streams that the AP supports and the corresponding delivery intervals. The FMS Response Element field contains one FMS Response elements, described in 7.3.2.77.

7.4.12.13 Collocated Interference Request frame format

The Collocated Interference Request frame uses the Action frame body format and is transmitted by a STA to request collocated interference reports, sent using Collocated Interference Report frames. The format of the Collocated Interference Request frame body is shown in Figure 7-101n15.

	Category	Action	Dialog Token	Request Info
Octets:	1	1	1	1

Figure 7-101n15—Collocated Interference Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Collocated Interference Request, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is any nonzero value to identify the request/response transaction.

The Request Info field is shown in Figure 7-101n16.

	B0-B1	B2-B7
	Automatic Report Enabled	Report Timeout
Bits:	2	6

Figure 7-101n16—Request Info field format

The Automatic Report Enabled subfield contains an unsigned integer value.

The Automatic Report Enabled subfield set to 0 indicates that the requesting STA cancels the previous requests so that the receiving STA stops sending collocated interference reports.

The Automatic Report Enabled subfield set to 1 indicates that the requesting STA requests the receiving STA to send a collocated interference report when the STA knows of a change in the collocated interference, subject to meeting the Report Timeout requirement.

The Automatic Report Enabled subfield set to 2 indicates that the requesting STA requests the receiving STA to send a collocated interference report periodically using the period included in the Report Period field in the Collocated Interference Report element, see 7.3.2.85.

The Automatic Report Enabled subfield set to 3 indicates that the requesting STA requests the receiving STA to send collocated interference reports periodically using the period included in the Report Period field in the Collocated Interference Report element, see 7.3.2.85, or send a collocated interference report when the STA knows of a change in the collocated interference, subject to meeting the Report Timeout requirement.

The Report Timeout field contains a value in units of 200 TUs and indicates the minimum duration between two consecutive Collocated Interference Report frames from the reporting STA. When the Automatic Report Enabled subfield is 0, the Report Timeout field is reserved.

7.4.12.14 Collocated Interference Report frame format

The Collocated Interference Report frame uses the Action frame body format and is transmitted in response to Collocated Interference Request frame. The format of the Collocated Interference Report frame body is shown in Figure 7-101n17.

	Category	Action	Dialog Token	Collocated Interference Report Elements
Octets:	1	1	1	variable

Figure 7-101n17—Collocated Interference Report frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Collocated Interference Report frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value received in the corresponding Collocated Interference Request frame to identify the request/response transaction.

The Collocated Interference Report Elements field contains one or more Collocated Interference Report elements to indicate the characteristics of the reported collocated interferences, as defined in 7.3.2.85.

7.4.12.15 TFS Request frame format

The TFS Request frame is sent by a non-AP STA to the AP to request the specified traffic filtering. The format of TFS Request frame is defined in Figure 7-101n18.

				One or more TFS Request elements
	Category	Action	Dialog Token	TFS Request Elements
Octets:	1	1	1	variable

Figure 7-101n18—TFS Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TFS Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a value chosen by the STA sending the TFS Request frame to identify the request/response transaction.

The TFS Request Elements field contains one or more TFS Request elements to specify the traffic filters that are requested by the non-AP STA, as defined in 7.3.2.80.

7.4.12.16 TFS Response frame format

The TFS Response frame is sent by an AP in response to a TFS Request frame. The format of the TFS Response frame is defined in Figure 7-101n19.

				One or more TFS Response elements
	Category	Action	Dialog Token	TFS Response Elements
Octets:	1	1	1	variable

Figure 7-101n19—TFS Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TFS Response frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the value in the corresponding TFS Request frame.

The TFS Response Elements field contains one or more TFS Response elements to indicate the traffic filters that the AP is configured to support, as defined in 7.3.2.81.

7.4.12.17 TFS Notify frame format

The TFS Notify frame is sent by an AP to a STA when a frame matching a traffic filter is encountered. The format of the TFS Notify frame is defined in Figure 7-101n20.

				One or more TFS IDs
	Category	Action	Number of TFS IDs	TFS ID List
Octets:	1	1	1	variable

Figure 7-101n20—TFS Notify frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TFS Notify frame, as specified in Table 7-57v13 in 7.4.12.1.

The Number of TFS IDs field indicates the number of 1-octet TFS IDs present in the TFS ID List field.

The TFS ID field indicates the traffic filter set containing the matched TCLAS information element.

7.4.12.18 WNM-Sleep Mode Request frame format

The WNM-Sleep Mode Request frame is sent by a non-AP STA to the AP to enter the WNM-Sleep Mode. The format of the WNM-Sleep Mode Request frame is defined in Figure 7-101n21.

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

					One or more TFS Request elements
	Category	Action	Dialog Token	WNM-Sleep Mode Element	TFS Request Elements
Octets:	1	1	1	variable	variable

Figure 7-101n21—WNM-Sleep Mode Request frame format

The Action field is the value indicating WNM-Sleep Mode Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a value chosen by the non-AP STA sending the WNM-Sleep Mode Request frame to identify the request/response transaction.

The WNM-Sleep Mode Element field contains a WNM-Sleep Mode element that is requested by a non-AP STA, as described in 7.3.2.82.

The TFS Request Elements field contains one or more TFS Request elements to specify the traffic filters that are requested by a non-AP STA, as defined in 7.3.2.80.

7.4.12.19 WNM-Sleep Mode Response frame format

The WNM-Sleep Mode Response frame is sent by an AP in response to a WNM-Sleep Mode Request frame. The format of the WNM-Sleep Mode Response frame is defined in Figure 7-101n22.

	Category	Action	Dialog Token	Key Data Length	Key Data
Octets:	1	1	1	2	variable

		One or more TFS Response elements
	WNM-Sleep Mode Element	TFS Response Elements
Octets:	variable	variable

Figure 7-101n22—WNM-Sleep Mode Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating WNM-Sleep Mode Response frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the value in the corresponding WNM-Sleep Mode Request frame.

The Key Data Length field is the length of the Key Data field. If the Management Frame Protection is not used, this field is zero.

The Key Data field contains zero or more subelements that provide the current GTK and IGTK to the STA. The format of these subelements is given in Figure 7-101n23 and Figure 7-101n24. The Subelement IDs for these subelements are defined in Table 7-57v17. Each subelement starts with the ID and Length fields. The Length field in the subelement is the length of the contents of the subelement. When management frame protection is not used, the Key Data field is empty.

Table 7-57v17—WNM-Sleep Mode subelement IDs

Value	Contents of subelement
0	GTK
1	IGTK
2–255	Reserved

The GTK subelement contains the Group Key as shown in Figure 7-101n23.

	Subelement ID	Length	Key Info	Key Length	RSC	Key
Octets:	1	1	2	1	8	5 to 32

Figure 7-101n23—WNM-Sleep Mode GTK subelement format

The Subelement ID field is 0.

The value of the Length field is 16 or 43.

The Key Info field is defined in Figure 7-95v.

The Key Length field is the length of the Key field in octets.

The RSC field contains the receive sequence counter (RSC) for the GTK being installed. The RSC field gives the current message number for the GTK to allow a STA to identify replayed MPDUs. If the RSC field value is less than 8 octets in length, the remaining octets are set to 0. The least significant octet of the TSC or PN is in the first octet of the RSC field.

NOTE—The RSC field value for TKIP is the Transmit Sequence Counter (TSC), and is stored in the first 6 octets; for CCMP it is the Packet Number (PN), and is stored in the first 6 octets, see Table 8-3.

The IGTK subelement contains the Integrity GTK as shown in Figure 7-101n24.

	Subelement ID	Length	KeyID	PN	Key
Octets:	1	1	2	6	16

Figure 7-101n24—WNM-Sleep Mode IGTK subelement format

The Subelement ID field is 1.

The value of the Length field is 24.

The KeyID field indicates the value of the BIP key ID.

The PN field indicates the receive sequence counter for the IGTK being installed. The PN field gives the current message number for the IGTK, to allow a STA to identify replayed MPDUs.

The Key field is the IGTK being distributed.

NOTE 1—There may be multiple GTK and multiple IGTK subelements if a group rekeying is in process when the non-AP STA wakes up from WNM-Sleep mode.

NOTE 2—Management Frame Protection is used to provide confidentiality, replay, and integrity protection for GTK/IGTK update in WNM-Sleep Mode Response frames.

The WNM-Sleep Mode Element field contains a WNM-Sleep Mode element, as described in 7.3.2.82.

The TFS Response Elements field contains one or more TFS Response elements to specify the traffic filters, as defined in 7.3.2.81.

7.4.12.20 TIM Broadcast Request frame format

The format of the TIM Broadcast Request frame is shown in Figure 7-101n25.

	Category	Action	Dialog Token	TIM Broadcast Request Element
Octets:	1	1	1	3

Figure 7-101n25—TIM Broadcast Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TIM Broadcast Request frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a nonzero value chosen by the STA sending the TIM Broadcast Request frame to identify the request/response transaction.

The TIM Broadcast Request Element field contains a TIM Broadcast Request Element as specified in 7.3.2.83.

7.4.12.21 TIM Broadcast Response frame format

The format of the TIM Broadcast Response frame is shown in Figure 7-101n26.

	Category	Action	Dialog Token	TIM Broadcast Response Element
Octets:	1	1	1	3 or 12

Figure 7-101n26—TIM Broadcast Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TIM Broadcast Response frame, as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value of the corresponding TIM Broadcast Request frame. If the TIM Broadcast Response frame is being transmitted other than in response to a TIM Broadcast Request frame, then the Dialog token is zero.

The TIM Broadcast Response Element field contains a TIM Broadcast Response Element as specified in 7.3.2.84.

7.4.12.22 QoS Traffic Capability Update frame format

The QoS Traffic Capability Update frame is sent by a non-AP STA to the AP to update QoS Traffic Capability information. The format of the frame is shown in Figure 7-101n27.

	Category	Action	QoS Traffic Capability Flags
Octets:	1	1	1

Figure 7-101n27—QoS Traffic Capability Update frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating QoS Traffic Capability Update frame, as specified in Table 7-57v13 in 7.4.12.1.

The QoS Traffic Capability Flags field is defined in Table 7-57v18. The QoS Traffic Capability Flags field comprises one octet, with the bits 4–6 serving as QoS Traffic Capability Flags. Each of the bits 4–6 serves as a flag for one of the three user priorities, UP 4–6. The field is 1 to indicate the expectation of generating traffic belonging to the corresponding user priority (UP). The field is 0 to indicate that such expectation does not exist. The use of the QoS Traffic Capability Update frame is described in 11.22.9.

Table 7-57v18—QoS Traffic Capability Flags definition

Bit (s)	Description
0–3	Reserved
4	UP 4 Traffic
5	UP 5 Traffic
6	UP 6 Traffic
7	Reserved

7.4.12.23 Channel Usage Request frame format

The Channel Usage Request frame is sent by a non-AP STA to the AP to request the specified Channel Usage information. The format of the Channel Usage Request frame is defined in Figure 7-101n28.

	Category	Action	Dialog Token	Channel Usage Elements	Supported Regulatory Classes Element
Octets:	1	1	1	variable	variable

Figure 7-101n28—Channel Usage Request frame format

The Category field is the value indicating the WNM category, as specified in 7.3.1.11.

The Action field is the value indicating Channel Usage Request frame, as specified in 7.4.12.1.

The Dialog Token field is a non-zero value chosen by the non-AP STA sending the Channel Usage Request frame to identify the request/response transaction.

The Channel Usage Element field includes one or more Channel Usage elements described in 7.3.2.86 to identify the request Usage Mode.

The Supported Regulatory Classes Element field includes a Supported Regulatory Classes element to indicate the supported regulatory classes for the requested network type, consistent with the Country element advertised by the AP. The Supported Regulatory Classes is described in 7.3.2.54.

7.4.12.24 Channel Usage Response frame format

The Channel Usage Response frame is sent by an AP STA in response to a Channel Usage Request frame, or autonomously. The format of the Channel Usage Response frame is shown in Figure 7-101n29.

	Category	Action	Dialog Token	Channel Usage Elements	Country String	Power Constraint Element (optional)	EDCA Parameter Set Element (optional)
Octets:	1	1	1	variable	3	0 or 3	0 or 20

Figure 7-101n29—Channel Usage Response frame format

The Category field is the value indicating the WNM category, as specified in 7.3.1.11.

The Action field is the value indicating Channel Usage Response frame, as specified in 7.4.12.1.

The Dialog Token field is the nonzero value received in the Channel Usage Request frame if the Channel Usage Response frame is being transmitted in response to a Channel Usage Request frame. The Dialog Token field is zero if the Channel Usage Response frame is being transmitted other than in response to a Channel Usage Request frame.

The Channel Usage Element field includes zero or more Channel Usage elements described in 7.3.2.86.

The Country String field is the value contained in the dot11CountryString attribute.

The Power Constraint Element field includes zero or one Power Constraint elements described in 7.3.2.16. The use of the Power Constraint element included in the Power Constraint Element field is described in 11.22.14.

The EDCA Parameter Set Element field includes zero or one EDCA Parameter Set elements described in 7.3.2.29. The use of the EDCA Parameter Set element included in the EDCA Parameter Set Element field is described in 11.22.14.

7.4.12.25 DMS Request frame format

The DMS Request frame is sent by a non-AP STA to the AP to define information about a DMS request to the AP. The format of the DMS Request frame is defined in Figure 7-101n30.

	Category	Action	Dialog Token	DMS Request Element
Octets:	1	1	1	variable

Figure 7-101n30—DMS Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating DMS Request as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is a non-zero value chosen by the non-AP STA sending the DMS Request frame to identify the request/response transaction.

The DMS Request Element field contains a DMS Request element as specified in 7.3.2.88.

7.4.12.26 DMS Response frame format

The DMS Response frame is sent by an AP in response to a DMS Request frame, or autonomously to terminate a requested DMS stream. The format of the DMS Response frame is shown in Figure 7-101n31.

	Category	Action	Dialog Token	DMS Response Element
Octets:	1	1	1	variable

Figure 7-101n31—DMS Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating DMS Response as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is the nonzero value received in the DMS Request frame if the DMS Response frame is being transmitted in response to a DMS Request frame. The Dialog Token field is zero if the DMS Response frame is being transmitted autonomously, and not in response to a DMS Request frame.

The DMS Response Element field contains a DMS Response element as specified in 7.3.2.89.

7.4.12.27 Timing Measurement Request frame format

The format of the Timing Measurement Request frame is shown in Figure 7-101n32.

	Category	Action	Trigger
Octets:	1	1	1

Figure 7-101n32—Timing Measurement Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Timing Measurement Request frame as specified in Table 7-57v13 in 7.4.12.1.

The trigger field set to the value 1 indicates that the sending STA requests a Timing Measurement procedure at the receiving STA as defined in 11.22.5. The trigger field set to the value 0 indicates that the sending STA requests that the receiving STA stops sending Timing Measurement frames. Trigger field values 2–255 are reserved.

7.4.12.28 WNM-Notification Request frame format

The format of the WNM-Notification Request frame is shown in Figure 7-101n33.

	Category	Action	Dialog Token	Type	Optional Subelements
Octets:	1	1	1	1	variable

Figure 7-101n33—WNM-Notification Request frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating WNM-Notification Request frame as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is set to a nonzero value chosen by the STA sending the WNM-Notification request to identify the request/response transaction.

The Type field indicates the type of WNM-Notification, as defined in Table 7-57v19.

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

Table 7-57v19—WNM-Notification type

Value	Description
0	Firmware Update Notification
1–255	Reserved

The Subelement ID field values for the defined optional subelements are shown in Table 7-57v20. A Yes in the Extensible column of a subelement listed in Table 7-57v20 indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-57v20—Optional Subelement IDs for WNM-Notification Request

Subelement ID	Name	Length field (octets)	Extensible
0	AP Descriptor	10	
1	Firmware Version—Current	3 to 251	
2	Firmware Version—New	3 to 251	
3–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

When the Type field is 0, the AP Descriptor, Firmware Version—Current and Firmware Version—New optional subelements are included in the WNM-Notification Request frame. The AP descriptor field format is as defined in Figure 7-95o57. The Firmware Version—Current subelement contains the current firmware version, in the Firmware Version subelement format defined in Figure 7-95o63. The Firmware Version—New subelement contains the new firmware version, in the Firmware Version subelement format defined in Figure 7-95o63.

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26). Multiple Vendor Specific subelements can be included in the list of optional subelements.

7.4.12.29 WNM-Notification Response frame format

The format of the WNM-Notification Response frame is shown in Figure 7-101n34.

	Category	Action	Dialog Token	Response Status	Optional Subelements
Octets:	1	1	1	1	variable

Figure 7-101n34—WNM-Notification Response frame format

The Category field is the value indicating the WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating WNM-Notification Response frame as specified in Table 7-57v13 in 7.4.12.1.

The Dialog Token field is set to the nonzero value of the corresponding WNM-Notification Request frame.

The Response Status field indicates the Response Status value, as defined in Table 7-57v21.

Table 7-57v21—WNM-Notification Response Status

Value	Description
0	Notification Acknowledged
1–255	Reserved

The Optional Subelements field format contains zero or more subelements, each consisting of a one octet Subelement ID field, a one octet Length field and a variable length Data field, as shown in Figure 7-95p. The optional subelements are ordered by non-decreasing Subelement ID.

The Subelement ID field values for the defined optional subelements are shown in Table 7-57v22. A Yes in the Extensible column of a subelement listed in Table 7-57v22 indicates that the length of the subelement might be extended in future revisions or amendments of this standard. When the Extensible column of an element is Subelement, then the subelement might be extended in future revisions or amendments of this standard by defining additional subelements within the subelement. See 9.14.2.

Table 7-57v22—Optional Subelement IDs for WNM-Notification Response

Subelement ID	Name	Length field (octets)	Extensible
0–220	Reserved		
221	Vendor Specific	1 to 239	
222–255	Reserved		

The Vendor Specific subelements have the same format as their corresponding elements (see 7.3.2.26). Multiple Vendor Specific subelements can be included in the list of optional subelements.

7.4.13 Unprotected WNM Action details

7.4.13.1 Unprotected WNM Action fields

Unprotected WNM action frames are not encapsulated using mechanisms defined for Robust Management frames. An Action field, in the octet field immediately after the Category field, differentiates the formats. The Action field values associated with each frame format is defined in Table 7-57v23.

Table 7-57v23—Unprotected WNM Action field values

Action field value	Description
0	TIM
1	Timing Measurement
2–255	Reserved

7.4.13.2 TIM frame format

The format of the TIM frame is shown in Figure 7-101n35.

	Category	Action	Check Beacon	Timestamp	TIM Element
Octets:	1	1	1	8	6–257

Figure 7-101n35—TIM frame format

The Category field is the value indicating the Unprotected WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating TIM frame, as specified in Table 7-57v23 in 7.4.13.1.

The Check Beacon field is defined as an unsigned integer initialized to 0, that increments when a critical update to the Beacon frame has occurred, see 11.2.1.15.

The Timestamp field is defined in 7.3.1.10. The field contains a valid TSF timestamp when the TIM Broadcast Response frame contained a reason code “Accept, valid timestamp present in TIM frames”. The field is reserved otherwise.

The TIM Element field contains a TIM element as specified in 7.3.2.6. The bit corresponding to buffered group addressed frames is zero for all BSSIDs and ignored upon reception.

7.4.13.3 Timing Measurement frame format

The Timing Measurement frame is used to support the timing measurement procedure described in 11.22.5. The format of the Timing Measurement frame is shown in Figure 7-101n36.

	Category	Action	Dialog Token	Follow Up Dialog Token	TOD
Octets:	1	1	1	1	4

	TOA	Max TOD Error	Max TOA Error
Octets:	4	1	1

Figure 7-101n36—Timing Measurement frame format

The Category field is the value indicating the Unprotected WNM category, as specified in Table 7-24 in 7.3.1.11.

The Action field is the value indicating Timing Measurement as specified in Table 7-57v23 in 7.4.13.1.

The Dialog Token field is a non-zero value chosen by the sending STA to identify the Timing Measurement frame as the first of a pair, with the second or follow up Timing Measurement frame to be sent later. The Dialog Token is zero to indicate that the Timing Measurement frame will not be followed by a subsequent follow up Timing Measurement frame.

The Follow Up Dialog Token is the non-zero value of the Dialog Token field of the previously transmitted Timing Measurement frame to indicate that it is the follow up Timing Measurement frame and that the TOD, TOA, Max TOD Error and Max TOA Error fields contain the values of the timestamps captured with the first Timing Measurement frame of the pair. The Follow Up Dialog Token is zero to indicate that the Timing Measurement frame is not a follow up to a previously transmitted Timing Measurement frame. A zero value in this field also indicates that the TOD, TOA, Max TOD Error, and Max TOA Error fields are reserved. See 11.22.5.

The TOD, TOA, Max TOD Error, and Max TOA Error fields are expressed in units of 10 nanoseconds.

The TOD field contains a timestamp that represents the time at which the start of the preamble of the previously transmitted Timing Measurement frame appeared at the transmit antenna port.

The TOA field contains a timestamp that represents the time at which the start of the preamble of the ACK to the previously transmitted Timing Measurement frame arrived at the receive antenna port.

NOTE—The values specified in the TOD and TOA fields are described in 10.3.60.

The Max TOD Error field contains an upper bound for the error in the value specified in the TOD field. For instance, a value of 2 in the Max TOD Error field indicates that the value in the TOD field has a maximum error of ± 20 nanoseconds.

The Max TOA Error field contains an upper bound for the error in the value specified in the TOA field. For instance, a value of 2 in the Max TOA Error field indicates that the value in the TOA field has a maximum error of ± 20 nanoseconds.

A value of zero for the Max TOD Error or the Max TOA Error field indicates that the upper bound on the error in the corresponding TOD or TOA value is unknown. A value of 255 indicates that the upper bound on the error is greater than or equal to 2.55 microseconds.

8. Security

8.5 Keys and key distribution

8.5.6 RSNA Authenticator key management state machine

8.5.6.1 Authenticator state machine states

8.5.6.1.1 Authenticator state machine: 4-Way Handshake (per STA)

Replace Figure 8-40 with the following figure, which includes an addition into the SETKEYS state:

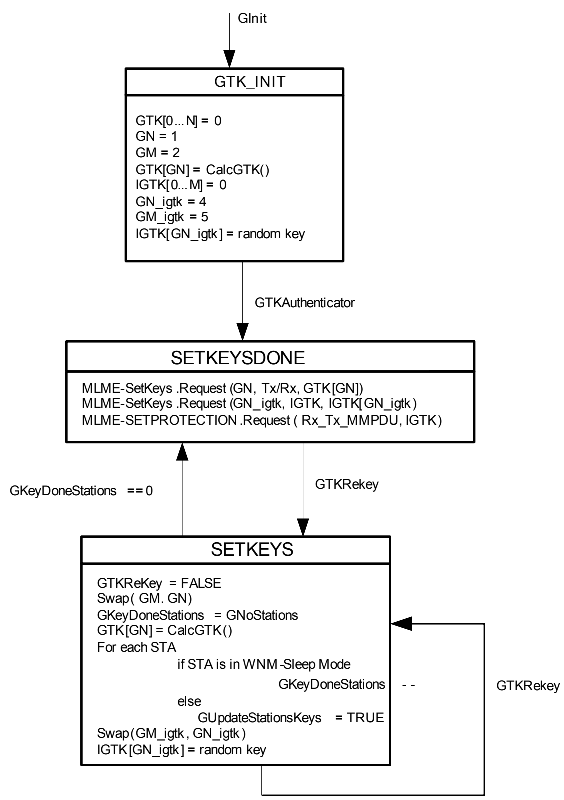

Figure 8-40—Authenticator state machines, part 4

Change 8.5.6.1.3 as follows:

8.5.6.1.3 Authenticator state machine: Group Key Handshake (global)

The following list summarizes the states the Authenticator state machine uses to coordinate a group key update of all STAs:

— GTK_INIT: This state is entered on system initialization.

— SETKEYS: This state is entered if the GTK is to be updated on all Supplicants.

— SETKEYSDONE: This state is entered if the GTK has been updated on all Supplicants.

NOTE—SETKEYSDONE calls SetGTK to set the GTK for all associated STAs that are not in WNM-Sleep Mode. If this fails, all communication via this key will fail, and the AP needs to detect and recover from this situation. A STA that is in WNM-Sleep Mode will not have the current GTK installed when it wakes up and will need to get new GTK as described in the WNM-Sleep Mode procedures in 11.2.1.16.

8.5.6.2 Authenticator state machine variables

Insert a new variable at the end of 8.5.6.2 as follows:

WNM-Sleep Mode—This variable is true when the non-AP STA is in the WNM-Sleep Mode, as described in 11.2.1.16. Otherwise, it is false.

9. MAC sublayer functional description

9.2 DCF

9.2.3 IFS

9.2.3.2 PIFS

Change 9.2.3.2 as follows:

The PIFS shall be used only by STAs operating under the PCF to gain priority access to the medium at the start of the CFP or by a STA to transmit a Channel Switch Announcement frame or a TIM frame. A STA using the PCF shall be allowed to transmit CF traffic after its CS mechanism (see 9.2.1) determines that the medium is idle at the TxPIFS slot boundary as defined in 9.2.10. A STA may also transmit a Channel Switch Announcement frame or a TIM frame after its CS mechanism (see 9.2.1) determines that the medium is idle at the TxPIFS slot boundary. The use of the PIFS by STAs operating under the PCF is described in 9.3. The use of PIFS by STAs transmitting a Channel Switch Announcement frame is described in 11.9. The use of PIFS by STAs transmitting a TIM frame is described in 11.2.1.15.

9.6.0d Rate selection for data and management frames

9.6.0d.1 Rate selection for non-STBC Beacon and non-STBC PSMP frames with a group address in the Address 1 field

Change 9.6.0d.1 as follows:

This subclause describes the rate selection rules for non-STBC Beacon and non-STBC PSMP frames with a group address in the Address 1 field that are not part of an FMS stream.

If the BSSBasicRateSet parameter is not empty, a non-STBC Beacon or a non-STBC PSMP frame with a group address in the Address 1 field shall be transmitted in a non-HT PPDU using one of the rates included in the BSSBasicRateSet parameter.

If the BSSBasicRateSet parameter is empty, the frame shall be transmitted in a non-HT PPDU using one of the mandatory PHY rates.

All non-STBC PSMP frames with a group address in the Address 1 field that are part of a FMS stream shall be transmitted using the rate chosen by the AP as described in 11.22.7.

9.6.0d.3 Rate selection for other group addressed data and management frames

Change 9.6.0d.3 as follows:

This subclause describes the rate selection rules for group addressed data and management frames, excluding:

— Non-STBC Beacon and non-STBC PSMP frames with a group address in the Address 1 field
— STBC group addressed data and management frames
— Data frames part of an FMS stream (see 11.22.7)

If the BSSBasicRateSet parameter is not empty, a data or management frame (excluding those frames listed above) with a group address in the Address 1 field shall be transmitted in a non-HT PPDU using one of the rates included in the BSSBasicRateSet parameter or the rate chosen by the AP, described in 11.22.7, if the data frames are part of a FMS stream.

If the BSSBasicRateSet parameter is empty and the BSSBasicMCSSet parameter is not empty, the frame shall be transmitted in an HT PPDU using one of the MCSs included in the BSSBasicMCSSet parameter. If both the BSSBasicRateSet parameter and the BSSBasicMCSSet parameter are empty (e.g., a scanning STA that is not yet associated with a BSS), the frame shall be transmitted in a non-HT PPDU using one of the mandatory PHY rates.

Insert the following after 9.6.0e:

9.6.0f Multiple BSSID Rate Selection

If the multiple BSSID capability is supported, Beacon frames shall be transmitted using any basic rate valid for all of the BSSs supported. If no such rate exists, then Beacon frames shall be transmitted using any mandatory PHY rate for any PHY type that all BSSs have in common.

10. Layer management

10.3 MLME SAP Interface

10.3.2 Scan

10.3.2.1 MLME-SCAN.request

10.3.2.1.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-SCAN.request(
BSSType,
BSSID,
SSID,
ScanType,
ProbeDelay,
ChannelList,
MinChannelTime,
MaxChannelTime,
RequestInformation,
SSID List,
ChannelUsage,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
SSID List	Octet string	Variable	A list of one or more SSID elements that may be present when dot11MgmtOptionSSIDListActivated is true.
ChannelUsage	A set of Channel Usage element	A set of Channel Usage element	Specifies request types for the Channel Usage request.

10.3.2.2 MLME-SCAN.confirm

10.3.2.2.2 Semantics of the service primitive

Insert the following new rows in the BSSDescription parameter table:

Name	Type	Valid range	Description
FMSDescriptor	FMS Descriptor element	As defined in frame format	The values from the FMS Descriptor information element if such an element was present in the Probe Response or Beacon frame, else null.
QoSTrafficCapability	QoS Traffic Capability element	As defined in frame format	The values from the QoS Traffic Capability information element if such an element was present in the Probe Response or Beacon frame, else null.
ChannelUsage	A set of Channel Usage element	A set of Channel Usage element	Specifies parameters for the Channel Usage.

Name	Type	Valid range	Description
TimeAdvertisement	Time Advertisement element	Time Advertisement element	The values from the Time Advertisement information element if such an element was present in the Probe Response or Beacon frame, else null.
TimeZone	Time Zone element	Time Zone element	The values from the Time Zone information element if such an element was present in the Probe Response or Beacon frame, else null.

Change 10.3.6 as follows:

10.3.6 Associate

10.3.6.1 MLME-ASSOCIATE.request

10.3.6.1.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-ASSOCIATE.request(
PeerSTAAddress,
AssociateFailureTimeout,
CapabilityInformation,
ListenInterval,
Supported Channels,
RSN,
QoSCapability,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
QoSTrafficCapability,
TIMBroadcastRequest,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
QoS Traffic Capability	As defined in the QoS Traffic Capability element	As defined in the QoS Traffic Capability element	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is optionally present if dot11MgmtOptionACStationCountActivated is true, and is not present otherwise.
TIMBroadcastRequest	As defined in the TIM Broadcast Request element	As defined in the TIM Broadcast Request element	Specifies the proposed service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true, and is not present otherwise.

10.3.6.2 MLME-ASSOCIATE.confirm

10.3.6.2.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-ASSOCIATE.confirm (
ResultCode,
CapabilityInformation,
AssociationID,
SupportedRates,
EDCAParameterSet,
RCPI.request,
RSNI.request,
RCPI.response,
RSNI.response,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
BSSMaxIdlePeriod,
TIMBroadcastResponse,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
BSSMaxIdlePeriod	As defined in BSS Max Idle Period element	As defined in BSS Max Idle Period element	Indicates the BSS Max idle period parameters of the AP. This parameter is present if the MIB attribute dot11WirelessManagementImplemented is true, and is not present otherwise.
TIMBroadcastResponse	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies the service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in corresponding Association Request frame, and is not present otherwise.

10.3.6.3 MLME-ASSOCIATE.indication

10.3.6.3.1 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-ASSOCIATE.indication(
PeerSTAAddress,
CapabilityInformation,
ListenInterval,
SSID,
Supported Rates,
RSN,
QoSCapability,
RCPI,
RSNI,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,

DSERegisteredLocation,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
QoSTrafficCapability,
TIMBroadcastRequest,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
QoS Traffic Capability	As defined in the QoS Traffic Capability element	As defined in the QoS Traffic Capability element	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is optionally present if dot11MgmtOptionACStationCountActivated is true, and is not present otherwise.
TIMBroadcastRequest	As defined in TIM Broadcast Request element	As defined in TIM Broadcast Request element	Specifies the proposed service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true, and is not present otherwise.

10.3.6.4 MLME-ASSOCIATE.response

10.3.6.4.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-ASSOCIATE.response(
PeerSTAAddress,
ResultCode,
CapabilityInformation,
AssociationID,
EDCAParameterSet,
RCPI,
RSNI,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements
SupportedRegulatoryClasses,
DSERegisteredLocation,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
BSSMaxIdlePeriod,
TIMBroadcastResponse,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
BSSMaxIdlePeriod	As defined in BSS Max Idle Period element	As defined in BSS Max Idle Period element	Indicates the BSS Max idle period parameters of the AP. This parameter is present if the MIB attribute dot11WirelessManagementImplemented is true, and is not present otherwise.
TIMBroadcastResponse	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies the service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in corresponding Association Request frame, and is not present otherwise.

Change 10.3.7 as follows:

10.3.7 Reassociate

10.3.7.1 MLME-REASSOCIATE.request

10.3.7.1.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-REASSOCIATE.request(
NewAPAddress,
ReassociateFailureTimeout,
CapabilityInformation,
ListenInterval,
Supported Channels,
RSN,
QoSCapability,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
QoSTrafficCapability,
TIMBroadcastRequest,
FMSRequest,
DMSRequest,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
QoS Traffic Capability	As defined in the QoS Traffic Capability element	As defined in the QoS Traffic Capability element	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is optionally present if dot11MgmtOptionACStationCountActivated is true, and is not present otherwise.
TIMBroadcastRequest	As defined in TIM Broadcast Request element	As defined in TIM Broadcast Request element	Specifies the proposed service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true, and is not present otherwise.
FMSREquest	As defined in FMS Request element	As defined in FMS Request element	Specifies the proposed multicast parameters for FMS Request. This parameter is optionally present if dot11MgmtOptionFMSActivated is true, and is not present otherwise.
DMSREquest	As defined in DMS Request element	As defined in DMS Request element	Specifies the proposed multicast parameters for DMS Request. This parameter is optionally present if dot11MgmtOptionDMSActivated is true, and is not present otherwise.

10.3.7.2 MLME-REASSOCIATE.confirm

10.3.7.2.2 Semantics of the service primitive

Change the primitive parameters as follows:

MLME-REASSOCIATE.confirm(
Resultcode,
CapabilityInformation,
AssoicationID,
SupportedRates,
EDCAParameterSet,
RCPI.request,
RSNI.request,
RCPI.response,
RSNI.response,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
BSSMaxIdlePeriod,
TIMBroadcastResponse,
FMSResponse,
DMSResponse,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
BSSMaxIdlePeriod	As defined in BSS Max Idle Period element	As defined in BSS Max Idle Period element	Indicates the BSS Max idle period parameters of the AP. This parameter is present if the MIB attribute dot11WirelessManagementImplemented is true, and is not present otherwise.
TIMBroadcastResponse	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies the service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in corresponding Association Request frame, and is not present otherwise.
FMSResponse	As defined in FMS Response element	As defined in FMS Response element	Specifies the multicast parameters for FMS REsponse. This parameter is optionally present if dot11MgmtOptionFMSActivated is true and the FMS Request element is present in corresponding Association Request frame, and is not present otherwise.
DMSResponse	As defined in DMS Response element	As defined in DMS Response element	Specifies the multicast parameters for DMS Response. This parameter is optionally present if dot11MgmtOptionDMSActivated is true and the DMS Request element is present in corresponding Association Request frame, and is not present otherwise.

10.3.7.3 MLME-REASSOCIATE.indication

10.3.7.3.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-REASSOCIATE.indication(
PeerSTAAddress,
CurrentAPAddress,
CapabilityInformation,
ListenInterval,
SSID,
SupportedRates,
RSN,
QoSCapability,
RCPI,
RSNI,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
DSERegisteredLocation,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
QoSTrafficCapability,
TIMBroadcastRequest,
FMSRequest,
DMSRequest,

VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
QoS Traffic Capability	As defined in the QoS Traffic Capability element	As defined in the QoS Traffic Capability element	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is optionally present if dot11MgmtOptionACStationCountActivated is true, and is not present otherwise.
TIMBroadcastRequest	As defined in TIM Broadcast Request element	As defined in TIM Broadcast Request element	Specifies the proposed service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true, and is not present otherwise.
FMSRequest	As defined in FMS Request element	As defined in FMS Request element	Specifies the proposed multicast parameters for FMS Request. This parameter is optionally present if dot11MgmtOptionFMSActivated is true, and is not present otherwise.
DMSRequest	As defined in DMS Request element	As defined in DMS Request element	Specifies the proposed multicast parameters for DMS Request. This parameter is optionally present if dot11MgmtOptionDMSActivated is true, and is not present otherwise.

10.3.7.4 MLME-REASSOCIATE.response

10.3.7.4.2 Semantics of the service primitive

Change the primitive parameter list as follows:

MLME-REASSOCIATE.response(
PeerSTAAddress,
ResultCode,
CapabilityInformation,
AssociationID,
EDCAParameterSet,
RCPI,
RSNI,
RRMEnabledCapabilities,
Content of FT Authentication Information Elements,
SupportedRegulatoryClasses,
DSERegisteredLocation,
HT Capabilities,
Extended Capabilities,
20/40 BSS Coexistence,
<u>BSSMaxIdlePeriod,</u>
<u>TIMBroadcastResponse,</u>
<u>FMSResponse,</u>
<u>DMSResponse,</u>
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
BSSMaxIdlePeriod	As defined in BSS Max Idle Period element	As defined in BSS Max Idle Period element	Indicates the BSS Max idle period parameters of the AP. This parameter is present if the MIB attribute dot11WirelessManagementImplemented is true, and is not present otherwise.
TIMBroadcastResponse	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies the service parameters for TIM Broadcast. This parameter is optionally present if dot11MgmtOptionTIMBroadcastActivated is true and the TIM Broadcast Request element is present in corresponding Association Request frame, and is not present otherwise.
FMSResponse	As defined in FMS Response element	As defined in FMS Response element	Specifies the multicast parameters for FMS REsponse. This parameter is optionally present if dot11MgmtOptionFMSActivated is true and the FMS Request element is present in corresponding Association Request frame, and is not present otherwise.
DMSResponse	As defined in DMS Response element	As defined in DMS Response element	Specifies the multicast parameters for DMS Response. This parameter is optionally present if dot11MgmtOptionDMSActivated is true and the DMS Request element is present in corresponding Association Request frame, and is not present otherwise.

10.3.10 Start

10.3.10.1 MLME-START.request

10.3.10.1.2 Semantics of the service primitive

Change the primitive parameter list in 10.3.10.1.2 as follows:

MLME-START.request(
SSID,
BSSType,
BeaconPeriod,
DTIMPeriod,
CF parameter set,
PHY parameter set,
IBSS parameter set,
ProbeDelay,
CapabilityInformation,
BSSBasicRateSet,
OperationalRateSet,
Country,
IBSS DFS Recovery Interval,
EDCAParameterSet,
DSERegisteredLocation,
HT Capabilities,
HT Operation,
BSSMembershipSelectorSet,
BSSBasicMCSSet,

HTOperationalMCSSet,

Extended Capabilities,

20/40 BSS Coexistence,

Overlapping BSS Scan Parameters,

MultipleBSSID,

VendorSpecificInfo
)

Insert the following new rows before the VendorSpecificInfo row in the primitive parameters table in 10.3.10.1.2:

Name	Type	Valid range	Description
MultipleBSSID	As defined in Multiple BSSID Element in 7.3.2.46	As defined in Multiple BSSID Element in 7.3.2.46	This element is optionally present when dot11RRMMeasurementPilotCapability is a value between 2 and 7 and the AP is a member of a Multiple BSSID Set (see 11.10.11) with two or more members, or if dot11MgmtOptionMultiBSSIDActivated is true.

10.3.24 TS management interface

10.3.24.1 MLME-ADDTS.request

10.3.24.1.2 Semantics of the service primitive

Change the paragraph starting with "The primitive parameter..." as follows:

The primitive parameters are as follows:

MLME-ADDTS.request (
DialogToken,
TSPEC,
TCLAS,
TCLASProcessing,
ADDTSFailureTimeout,
U-APSD Coexistence,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
U-APSD Coexistence	U-APSD Coexistence element	As defined in 7.3.2.91.	Indicates the coexistence parameters for requested transmission during a U-APSD service period.

10.3.24.2 MLME-ADDTS.confirm

10.3.24.2.2 Semantics of the service primitive

Change the entry "ResultCode" as follows:

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_PARAMETERS, REJECTED_WITH_SUGGESTED_CHANGES, REJECTED_FOR_DELAY_PERIOD, TIMEOUT, TRANSMISSION_FAILURE, REJECTED_WITH_SUGGESTED_BSS_TRANSITION, REQUESTED_TCLAS_NOT_SUPPORTED, TCLAS_RESOURCES_EXHAUSTED	Indicates the results of the corresponding MLME-ADDTS.request primitive.

Insert the following paragraph before the last paragraph of the clause:

In the case of REJECTED_WITH_SUGGESTED_BSS_TRANSITION, non-AP STA should retry TS setup process with the newly associated AP once the transition is done.

10.3.24.3 MLME-ADDTS.indication

10.3.24.3.2 Semantics of the service primitive

Change the paragraph starting with "The primitive parameters..." as follows:

The primitive parameters are as follows:

MLME-ADDTS.indication (
DialogToken,
TSPEC,
TCLAS,
TCLASProcessing,
U-APSD Coexistence,
VendorSpecificInfo
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Valid range	Description
U-APSD Coexistence	U-APSD Coexistence element	As defined in 7.3.2.91.	Indicates the coexistence parameters for requested transmission during a U-APSD service period.

10.3.24.4 MLME-ADDTS.response

10.3.24.4.2 Semantics of the service primitive

Change the entry "ResultCode" as follows:

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_PARAMETERS, REJECTED_WITH_SUGGESTED_CHANGES, REJECTED_FOR_DELAY_PERIOD,TIMEOUT, TRANSMISSION_FAILURE, REJECTED_WITH_SUGGESTED_BSS_TRANSITION, REQUESTED_TCLAS_NOT_SUPPORTED, TCLAS_RESOURCES_EXHAUSTED	Indicates the results of the corresponding MLME-ADDTS.indication primitive.

Insert the following paragraph at the end of the clause:

If the result code is REJECTED_WITH_SUGGESTED_BSS_TRANSITION, the non-AP STA should initiate a transition query as defined in 11.22.6. Once the transition is completed, the STA should retry TS setup process, as defined in 11.4.4.

Insert the following new clause after 10.3.51:

10.3.53 Event request

This set of primitives supports the exchange of Event Request and Event Report frames. The informative diagram shown in Figure 10-6f illustrates the Event Request and Event Report process, and is not meant to be exhaustive of all possible protocol uses.

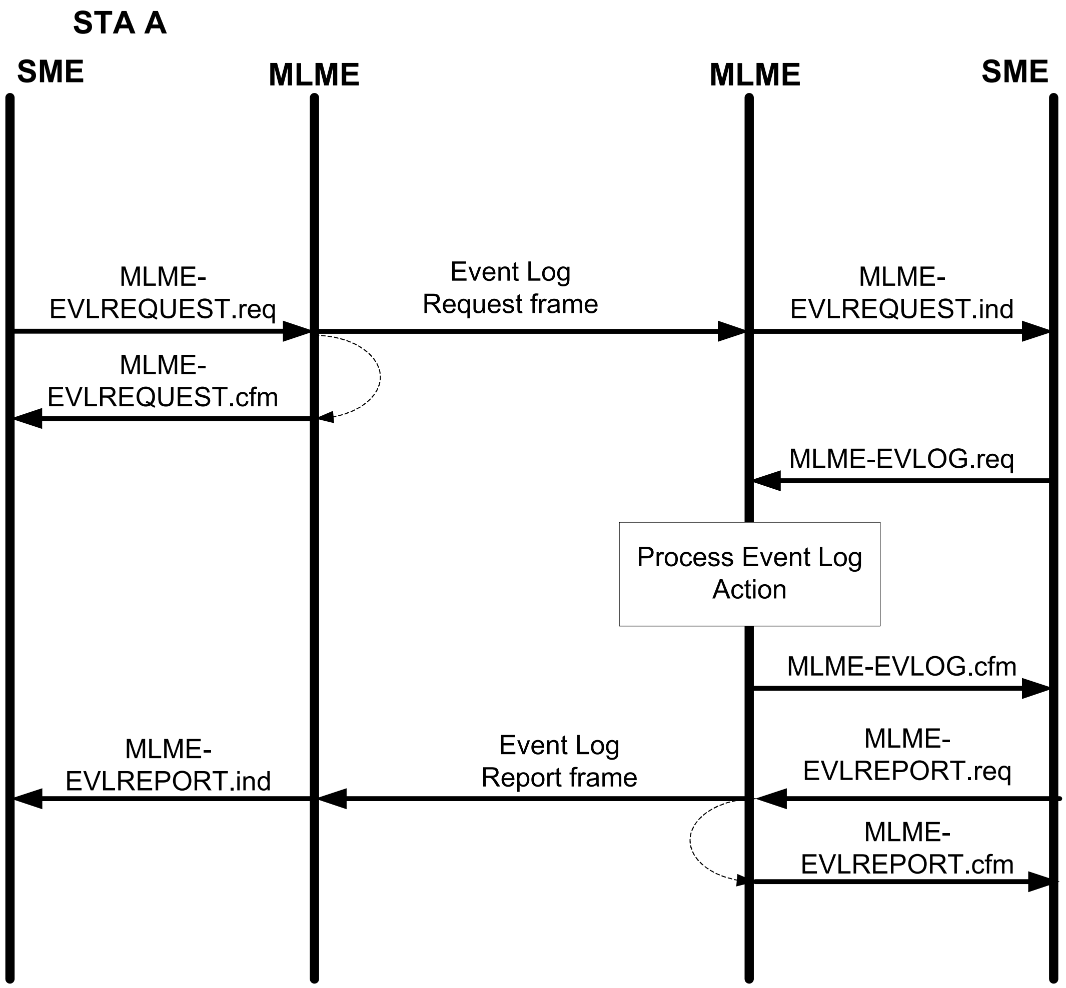

Figure 10-6f—Event Protocol Exchange

10.3.53.1 MLME-EVLREQUEST.request

10.3.53.1.1 Function

This primitive requests the transmission of an event request to a peer entity.

10.3.53.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLREQUEST.request(
Peer MAC Address,
Dialog Token,
Event Request Set,
Destination URI
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the event request is sent.
Dialog Token	Integer	1–255	The dialog token to identify the event transaction.
Event Request Set	Set of event elements	Set of event elements	A set of event elements describing the requested event.
Destination URI	Destination URI element	Destination URI element	The Destination URI element as defined in 7.3.2.90.

10.3.53.1.3 When generated

This primitive is generated by the SME to request that an Event Request frame be sent to a peer entity to initiate one or more transactions.

10.3.53.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs an Event Request frame containing the set of event elements specified. This frame is then scheduled for transmission.

10.3.53.2 MLME-EVLREQUEST.confirm

10.3.53.2.1 Function

This primitive reports the result of an event request.

10.3.53.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLREQUEST.confirm(
Dialog Token,
ResultCode
)

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the event transaction.
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send an Event Request frame.

10.3.53.2.3 When generated

This primitive is generated by the MLME when transmission of the Event Request frame is acknowledged, (re) transmission of the Event Request frame fails, the Event Request contains invalid parameters, or for unspecified failure reasons.

10.3.53.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.53.3 MLME-EVLREQUEST.indication

10.3.53.3.1 Function

This primitive indicates that an Event Request frame requesting an event transaction has been received.

10.3.53.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-EVLREQUEST.indication(
                    Peer MAC Address,
                    Dialog Token,
                    Event Request Set,
                    Destination URI
                    )
```

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the event request was received.
Dialog Token	Integer	1–255	The dialog token to identify the event transaction.
Event Request Set	Set of event elements	Set of event elements	A set of event elements describing the requested event.
Destination URI	Destination URI element	Destination URI element	The Destination URI element as defined in 7.3.2.90.

10.3.53.3.3 When generated

This primitive is generated by the MLME when a valid Event Request frame is received.

10.3.53.3.4 Effect of receipt

On receipt of this primitive, the SME either rejects the request or commences the event transaction.

10.3.54 Event report

This set of primitives supports the signaling of event reports.

10.3.54.1 MLME-EVLREPORT.request

10.3.54.1.1 Function

This primitive supports the signaling of event reports between peer SMEs.

10.3.54.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-EVLREPORT.request(
                    Peer MAC Address,
```


Dialog Token,
Event Report Set
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the event report is sent.
Dialog Token	Integer	1–255	The Dialog Token to identify the event transaction.
Event Report Set	Set of event elements	Set of event elements	A set of event elements describing the response to the event request.

10.3.54.1.3 When generated

This primitive is generated by the SME to request that an Event Report frame be sent to a peer entity to report the results of one or more transactions.

10.3.54.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs an Event Report frame containing the set of event elements. This frame is then scheduled for transmission.

10.3.54.2 MLME-EVLREPORT.confirm

10.3.54.2.1 Function

This primitive reports the result of an event report frame.

10.3.54.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLREPORT.confirm(
Dialog Token,
ResultCode
)

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the event transaction.
ResultCode	Enumeration	SUCCESS, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send an Event Report frame.

10.3.54.2.3 When generated

This primitive is generated by the MLME when the request to transmit an Event Report frame completes.

10.3.54.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.54.3 MLME-EVLREPORT.indication

10.3.54.3.1 Function

This primitive indicates that an Event Report frame has been received from a peer entity.

10.3.54.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLREPORT.indication(
    Peer MAC Address,
    Dialog Token,
    Event Report Set
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the event report was received.
Dialog Token	Integer	1–255	The Dialog Token to identify the event transaction.
Event Report Set	Set of event elements	Set of event elements	A set of event elements describing the response to the event request.

10.3.54.3.3 When generated

This primitive is generated by the MLME when a valid Event Report frame is received.

10.3.54.3.4 Effect of receipt

On receipt of this primitive, the event data can be made available for SME processes.

10.3.55 Event

This set of primitives supports the requesting and reporting of event data.

10.3.55.1 MLME-EVLOG.request

10.3.55.1.1 Function

This primitive is generated by the SME to request that the MLME identify specific events.

10.3.55.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLOG.request(
    Dialog Token,
    Event Request Set
)

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The Dialog Token to identify the event transaction.
Event Request Set	Set of event elements	Set of event elements	A set of event elements describing the response to the event request.

10.3.55.1.3 When generated

This primitive is generated by the SME to request that the MLME initiate the specified event.

10.3.55.1.4 Effect of receipt

On receipt of this primitive, the MLME commences the identification of events.

10.3.55.2 MLME-EVLOG.confirm

10.3.55.2.1 Function

This primitive reports the result of an event.

10.3.55.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-EVLOG.confirm(
Result Code,
Dialog Token,
Event Report Set
)

Name	Type	Valid range	Description
Result Code	Enumeration	SUCCESS, INVALID PARAMETERS, or UNSPECIFIED FAILURE	The outcome of the Event request.
Dialog Token	Integer	1–255	The dialog token to identify the event transaction.
Event Report Set	Set of event report elements	Set of event report elements	A set of event report elements describing the reported event.

10.3.55.2.3 When generated

This primitive is generated by the MLME to report the results when event identification completes.

10.3.55.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code and, if appropriate, stores the events pending communication to the requesting entity or for local use.

10.3.56 Diagnostic request

This set of primitives supports the initiation of diagnostics between peer SMEs. The informative diagram shown in Figure 10-6g depicts the diagnostic reporting process and is not meant to be exhaustive of all possible protocol uses.

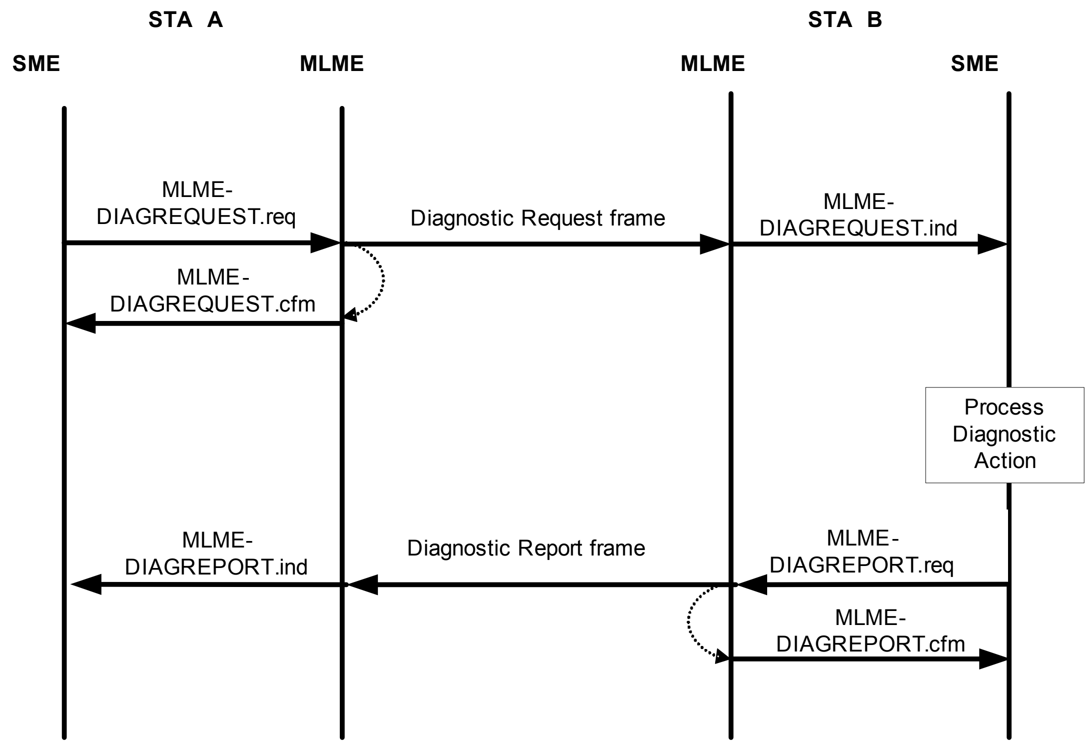

Figure 10-6g—Diagnostic Protocol Exchange

10.3.56.1 MLME-DIAGREQUEST.request

10.3.56.1.1 Function

This primitive requests the transmission of a Diagnostic Request frame to a peer entity.

10.3.56.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DIAGREQUEST.request(
Peer MAC Address,
Dialog Token,
Diagnostic Request Set,
Destination URI
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the diagnostic request is sent.
Dialog Token	Integer	1–255	The dialog token to identify the diagnostic transaction.
Diagnostic Request Set	Set of diagnostic elements	Set of diagnostic elements	A set of diagnostic elements describing the requested diagnostics.
Destination URI	Destination URI element	Destination URI element	The Destination URI element as defined in 7.3.2.90.

10.3.56.1.3 When generated

This primitive is generated by the SME to request that a Diagnostic Request frame be sent to a peer entity to initiate one or more diagnostic transactions.

10.3.56.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Diagnostic Request frame containing the set of diagnostic elements specified. This frame is then scheduled for transmission.

10.3.56.2 MLME-DIAGREQUEST.confirm

10.3.56.2.1 Function

This primitive reports the result of diagnostic request.

10.3.56.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-DIAGREQUEST.confirm(
                          Dialog Token,
                          ResultCode
                          )
```

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the diagnostic transaction.
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Diagnostic Request frame.

10.3.56.2.3 When generated

This primitive is generated by the MLME when transmission of the Diagnostic Request frame is acknowledged, (re)transmission of the Diagnostic Request frame fails, the Diagnostic Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.56.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.56.3 MLME-DIAGREQUEST.indication

10.3.56.3.1 Function

This primitive indicates that a Diagnostic Request frame requesting a Diagnostic transaction has been received.

10.3.56.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DIAGREQUEST.indication(
Peer MAC Address,
Dialog Token,
Diagnostic Request Set,
Destination URI
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the diagnostic request was received.
Dialog Token	Integer	1–255	The dialog token to identify the diagnostic transaction.
Diagnostic Request Set	Set of diagnostic elements	Set of diagnostic elements	A set of diagnostic elements describing the requested diagnostics.
Destination URI	Destination URI element	Destination URI element	The Destination URI element as defined in 7.3.2.90.

10.3.56.3.3 When generated

This primitive is generated by the MLME when a valid Diagnostic Request frame is received.

10.3.56.3.4 Effect of receipt

On receipt of this primitive, the SME either rejects the request or commences the diagnostic transaction.

10.3.57 Diagnostic report

10.3.57.1 MLME-DIAGREPORT.request

10.3.57.1.1 Function

This primitive supports the signaling of diagnostic reports between peer SMEs.

10.3.57.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DIAGREPORT.request(
Peer MAC Address,

Dialog Token,
Diagnostic Report Set
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the diagnostic report was received.
Dialog Token	Integer	1–255	The Dialog Token to identify the diagnostic transaction.
Diagnostic Report Set	Set of diagnostic elements	Set of diagnostic elements	A set of diagnostic elements describing the results of the requested diagnostics.

10.3.57.1.3 When generated

This primitive is generated by the SME to request that a Diagnostic Report frame be sent to a peer entity to report the results of one or more diagnostic transactions.

10.3.57.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Diagnostic Report frame containing the set of diagnostic elements. This frame is then scheduled for transmission.

10.3.57.2 MLME-DIAGREPORT.confirm

10.3.57.2.1 Function

This primitive reports the result of a diagnostic report frame.

10.3.57.2.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-DIAGREPORT.confirm(
Dialog Token,
ResultCode
)

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the diagnostic transaction.
ResultCode	Enumeration	SUCCESS, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Diagnostic Report frame.

10.3.57.2.3 When generated

This primitive is generated by the MLME when the request to transmit a Diagnostic Report frame completes.

10.3.57.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.57.3 MLME-DIAGREPORT.indication

10.3.57.3.1 Function

This primitive indicates that a Diagnostic Report frame has been received from a peer entity.

10.3.57.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-DIAGREPORT.indication(
                    Peer MAC Address,
                    Dialog Token,
                    Diagnostic Report Set
                    )
```

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the diagnostic report is sent.
Dialog Token	Integer	1–255	The Dialog Token to identify the diagnostic transaction.
Diagnostic Report Set	Set of diagnostic elements	Set of diagnostic elements	A set of diagnostic elements describing the results of the requested diagnostics.

10.3.57.3.3 When generated

This primitive is generated by the MLME when a valid Diagnostic Report frame is received.

10.3.57.3.4 Effect of receipt

On receipt of this primitive, the diagnostic data can be made available for SME processes.

10.3.58 Location Configuration request

This set of primitives supports the exchange of location configuration parameter information between peer SMEs. The informative diagram shown in Figure 10-6h depicts the location configuration request and response process, and is not meant to be exhaustive of all possible protocol uses.

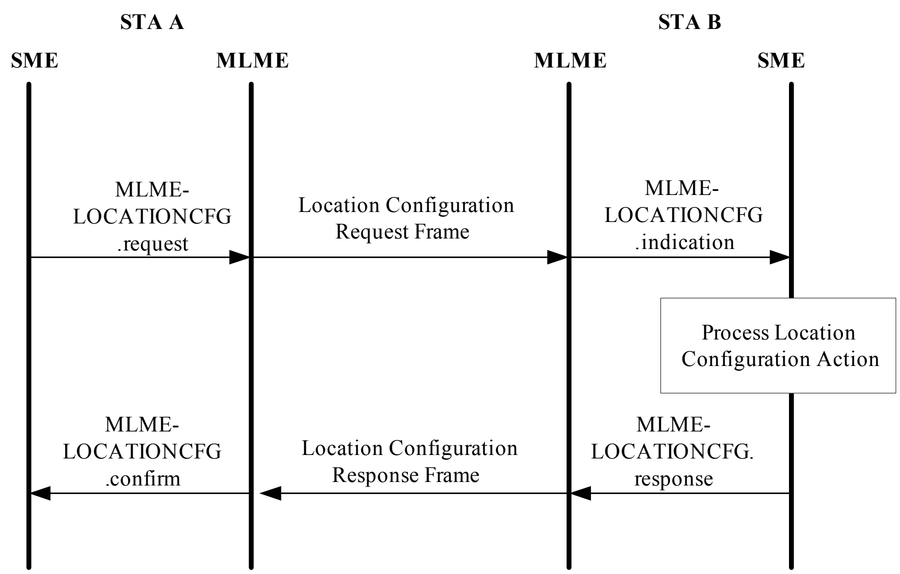

Figure 10-6h—Location Configuration Request and Response Protocol Exchange

10.3.58.1 MLME-LOCATIONCFG.request

10.3.58.1.1 Function

This primitive requests the transmission of location configuration request action frame to a peer entity.

10.3.58.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-LOCATIONCFG.request(
Peer MAC Address,
Dialog Token,
Location Parameters
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the location configuration request is sent.
Dialog Token	Integer	1–255	The dialog token to identify the location transaction.
Location Parameters	Location Parameters element	Location Parameters element	A Location Parameters element containing one or more subelements describing the STA location information. See 7.3.2.71.

10.3.58.1.3 When generated

This primitive is generated by the SME to request that a Location Configuration Request frame be sent to a peer entity to convey location configuration information.

10.3.58.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Location Configuration Request frame containing the set of Location Parameters elements specified. This frame is then scheduled for transmission.

10.3.58.2 MLME-LOCATIONCFG.confirm

10.3.58.2.1 Function

This primitive reports the result of a location configuration request.

10.3.58.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-LOCATIONCFG.confirm(
                         Dialog Token,
                         ResultCode,
                         Peer MAC Address,
                         Location Parameters
                         )
```

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the location transaction.
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Location Configuration Request frame.
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the location configuration response is sent.
Location Parameters	Location Parameters element	Location Parameters element	A Location Parameters element containing one or more subelements describing the STA location information. See 7.3.2.66.

10.3.58.2.3 When generated

This primitive is generated by the MLME when transmission of the Location Configuration Request frame is acknowledged, (re)transmission of the Location Configuration Request frame fails, the Location Configuration Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.58.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.58.3 MLME-LOCATIONCFG.indication

10.3.58.3.1 Function

This primitive indicates that a Location Configuration Request frame has been received requesting a location transaction.

10.3.58.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-LOCATIONCFG.indication(
Peer MAC Address,
Dialog Token,
Location Parameters
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the location configuration request was received.
Dialog Token	Integer	1–255	The dialog token to identify the location transaction.
Location Parameters	Location Parameters element	Location Parameters element	A Location Parameters element containing one or more subelements describing the STA location information. See 7.3.2.71.

10.3.58.3.3 When generated

This primitive is generated by the MLME when a valid Location Configuration Request frame is received.

10.3.58.3.4 Effect of receipt

On receipt of this primitive, the SME either rejects the request or commences the location transaction.

10.3.58.4 MLME-LOCATIONCFG.response

10.3.58.4.1 Function

This primitive requests the transmission of location information to a peer entity, in response to a received Location Configuration Request frame.

10.3.58.4.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-LOCATIONCFG.response (
Peer MAC Address,
Dialog Token,
Location Parameters
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the location request is sent.
Dialog Token	Integer	1–255	The dialog token to identify the location transaction.
Location Parameters	Location Parameters element	Location Parameters element	A location parameters element containing one or more subelements describing the STA location information. See 7.3.2.71.

10.3.58.4.3 When generated

This primitive is generated by the SME to request that a Location Configuration Response frame be sent to a peer entity to convey location configuration information.

10.3.58.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Location Configuration Response frame containing the set of location parameters elements specified. This frame is then scheduled for transmission.

10.3.59 Location Track Notification

This set of primitives supports the location track notification from one SME to one or more receiving SMEs. The informative diagram in Figure 10-6i depicts the location track notification process, is not meant to be exhaustive of all possible protocol uses.

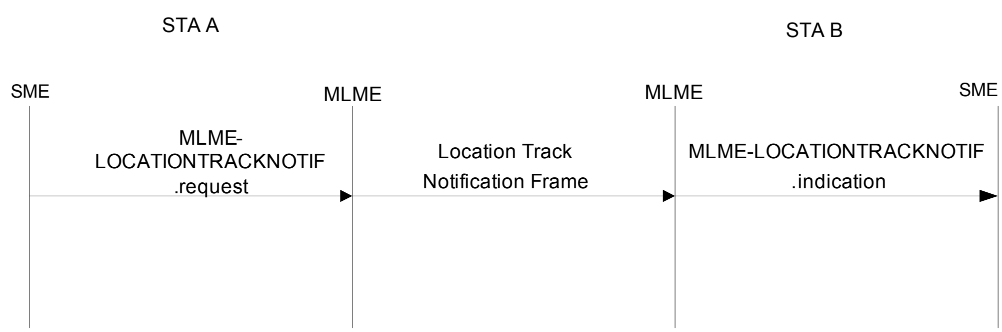

Figure 10-6i—Location Track Notification Protocol Exchange

10.3.59.1 MLME-LOCATIONTRACKNOTIF.request

10.3.59.1.1 Function

This primitive requests the transmission of location configuration request action frame to a peer entity.

10.3.59.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-LOCATIONTRACKNOTIF.request(
Peer MAC Address,
Location Parameters,

Measurement Report
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual or group addressed MAC Address	The address of the peer MAC entity to which the location track notification is sent.
Location Parameters	Location Parameters element	Location Parameters element	A location parameters element containing one or more subelements describing the STA location information. See 7.3.2.66.
Measurement Report	Measurement Report element	Measurement Report element	A Measurement Report element contains the beacon measurement information. See 7.3.2.22.

10.3.59.1.3 When generated

This primitive is generated by the SME to request that a Location Track Notification frame be sent to a peer entity to help convey location information.

10.3.59.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Location Track Notification frame containing the set of location parameters elements specified. This frame is then scheduled for transmission.

10.3.59.2 MLME-LOCATIONTRACKNOTIF.indication

10.3.59.2.1 Function

This primitive indicates that a Location Track Notification frame has been received.

10.3.59.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-LOCATIONTRACKNOTIF.indication(
Peer MAC Address,
Location Parameters,
Measurement Report
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual or group addressed MAC Address	The address of the peer MAC entity from which the location track notification was received.
Location Parameters	Location Parameters element	Location Parameters element	A location parameters element containing one or more subelements describing the STA location information. See 7.3.2.66.
Measurement Report	Measurement Report element	Measurement Report element	A Measurement Report element contains the beacon measurement information. See 7.3.2.22.

10.3.59.2.3 When generated

This primitive is generated by the MLME when a valid Location Track Notification frame is received.

10.3.59.2.4 Effect of receipt

On receipt of this primitive, the SME uses the information contained within the notification.

10.3.60 Timing Measurement

The following set of primitives supports exchange of timing measurement information from one SME to another. The informative diagram in Figure 10-6j depicts various points in time that are of interest to the timing measurement procedure.

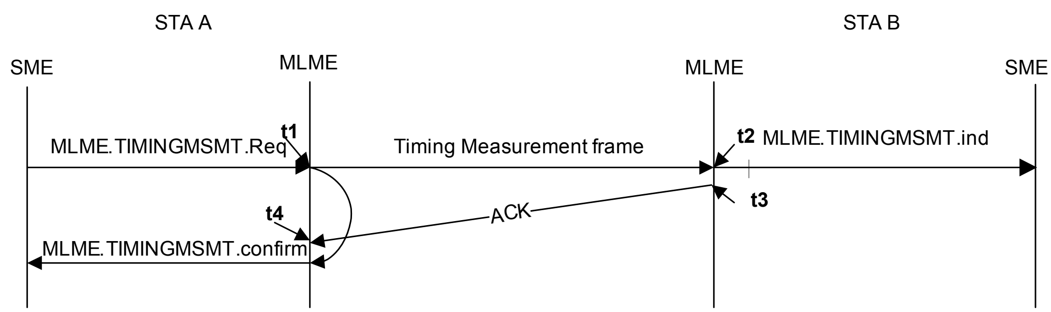

Figure 10-6j—Timing Measurement Primitives and Timestamps Capture

NOTE 1—In Figure 10-6j, t1 and t3 correspond to the point in time at which the start of the preamble for the transmitted frame appears at the transmit antenna port. An implementation may capture a timestamp during the transmit processing earlier or later than the point at which it actually occurs and offset the value to compensate for the time difference.

NOTE 2—In Figure 10-6j, t2 and t4 correspond to the point in time at which the start of the preamble for the incoming frame arrives at the receive antenna port. Because time is needed to detect the frame and synchronize with its logical structure, an implementation will necessarily determine when the start of the preamble for the incoming frame arrived at the receive antenna port by capturing a timestamp some time after it occurred and compensating for the delay by subtracting an offset from the captured value.

10.3.60.1 MLME-TIMINGMSMT.request

10.3.60.1.1 Function

This primitive requests the transmission of Timing Measurement frame to a peer entity.

10.3.60.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TIMINGMSMT.request(
Peer MAC Address,
Dialog Token,
Follow Up Dialog Token,
t1,

t4,
Max t1 Error,
Max t4 Error,
VendorSpecific
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual addressed MAC Address	The address of the peer MAC entity to which the Timing Measurement frame is sent.
Dialog Token	Integer	1–255	The dialog token to identify the Timing Measurement transaction.
Follow Up Dialog Token	Integer	0–255	The dialog token of a Timing Measurement frame which the current frame follows. See 11.22.5.
t1	Integer		Set to the value of t1 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t1 Error	Integer	0–255	Maximum error in the t1 value expressed in 10 nanosecond units, see 7.4.13.3.
t4	Integer		Set to the value of t4 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t4 Error	Integer	0–255	Maximum error in t4 value expressed in 10 nanosecond units.
VendorSpecific	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.60.1.3 When generated

This primitive is generated by the SME to request that a Timing Measurement frame be sent to a peer entity.

10.3.60.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Timing Measurement frame with the specified parameters. This frame is then scheduled for transmission.

10.3.60.2 MLME-TIMINGMSMT.confirm

10.3.60.2.1 Function

This primitive indicates that a Timing Measurement frame has been successfully received by the peer STA to which it was sent.

10.3.60.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TIMINGMSMT.confirm(

Peer MAC Address,
Dialog Token,
t1,
Max t1 Error,
t4,
Max t4 Error
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual addressed MAC Address	The address of the peer MAC entity to which acknowledges the receipt of the Timing Measurement frame.
Dialog Token	Integer	1–255	The dialog token to identify the Timing Measurement transaction.
t1	32 bit unsigned Integer	$0 – 2^{32}–1$	Set to the value of t1 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t1 Error	Integer	0–255	Maximum error in the t1 value expressed in 10 nanosecond units.
t4	32 bit unsigned Integer	$0 – 2^{32}–1$	Set to the value of t4 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t4 Error	Integer	0–255	Maximum error in t4 value expressed in 10 nanosecond units.

10.3.60.2.3 When generated

This primitive is generated by the MLME when an ACK corresponding to the Timing Measurement frame is received from the peer STA.

10.3.60.2.4 Effect of receipt

On receipt of this primitive, the SME uses the information contained within the notification.

10.3.60.3 MLME-TIMINGMSMT.indication

10.3.60.3.1 Function

This primitive indicates that a Timing Measurement frame has been received and the corresponding ACK has been transmitted.

10.3.60.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TIMINGMSMT.indication(
Peer MAC Address,
Dialog Token,
Follow Up Dialog Token,

t1,
Max t1 Error,
t4,
Max t4 Error,
t2,
Max t2 Error,
t3,
Max t3 Error,
VendorSpecific
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual addressed MAC Address	The address of the peer MAC entity from which the Timing Measurement frame was sent.
Dialog Token	Integer	1–255	The dialog token to identify the Timing Measurement transaction.
Follow Up Dialog Token	Integer	1–255	The dialog token of a Timing Measurement frame which the current frame follows. See 11.22.5.
t1	32-bit unsigned integer	$0 – 2^{32}–1$	Set to the value of t1 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t1 Error	Integer	0–255	Maximum error in the t1 value expressed in 10 nanosecond units.
t4	32-bit unsigned integer	$0 – 2^{32}–1$	Set to the value of t4 (see Figure 10-6j) expressed in 10 nanosecond units.
Max t4 Error	Integer	0–255	Maximum error in t4 value expressed in 10 nanosecond units.
t2	32-bit unsigned Integer	$0 – 2^{32}–1$	Set to the value of t2 (See Figure 10-6j) expressed in 10 nanosecond units.
Max t2 Error	Integer	0–255	Maximum error in t2 value expressed in 10 nanosecond units.
t3	32-bit unsigned integer	$0 – 2^{32}–1$	Set to the value of t3 (See Figure 10-6j) expressed in 10 nanosecond units.
Max t3 Error	Integer	0–255	Maximum error in t3 value expressed in 10 nanosecond units.
VendorSpecific	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.60.3.3 When generated

This primitive is generated by the MLME when a valid Timing Measurement frame is received.

10.3.60.3.4 Effect of receipt

On receipt of this primitive, the SME uses the information contained within the notification.

10.3.61 BSS Transition Management

10.3.61.1 BSS Transition Management procedure

The informative diagram shown in Figure 10-6k depicts the BSS Transition Management procedure and is not meant to be exhaustive of all possible protocol uses.

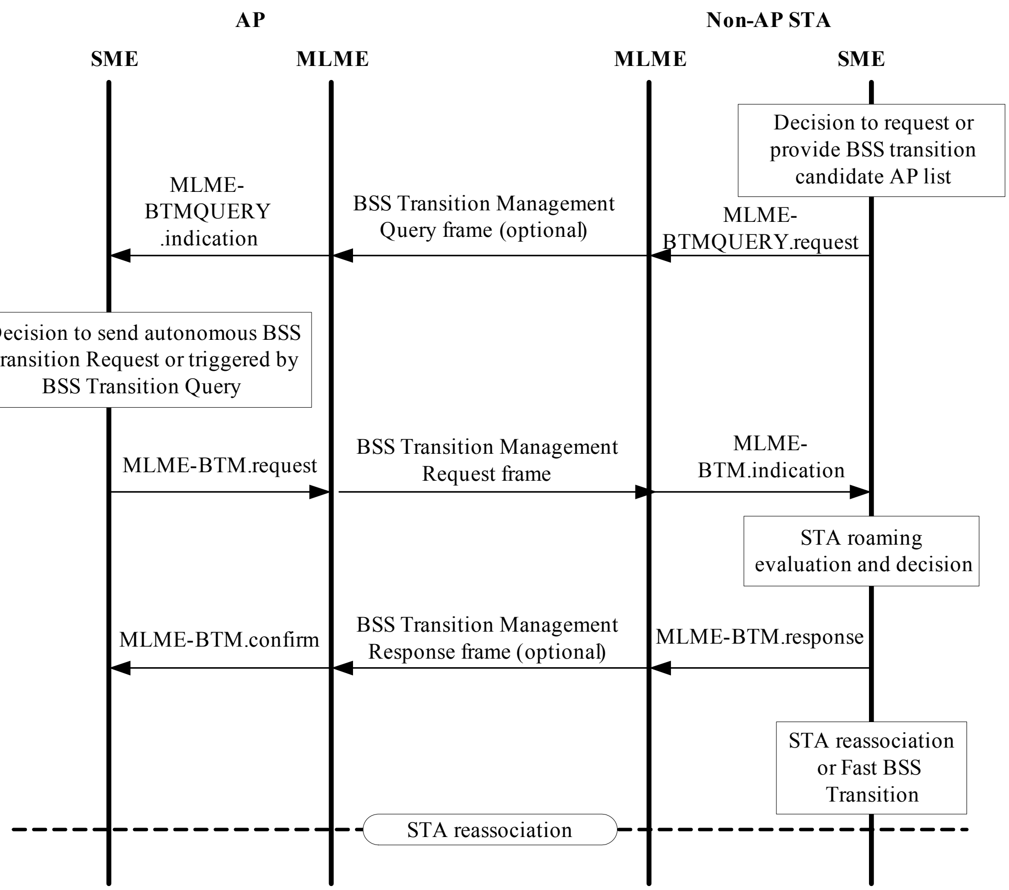

Figure 10-6k—BSS Transition Management request—accepted

10.3.61.2 MLME-BTMQUERY.request

This set of primitives supports the signaling of BSS Transition Management Query frames between non-AP STAs and an AP.

10.3.61.2.1 Function

This primitive requests transmission of a BSS Transition Management Query frame to the AP with which the STA is associated.

10.3.61.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-BTMQUERY.request(
Peer MAC Address,
DialogToken,
BSSTransitionQueryReason,
BSSTransitionCandidateListEntries
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the BSS Transition Management Query frame is sent.
DialogToken	Integer	1–255	The Dialog Token to identify this BSS Transition Management transaction.
BSSTransitionQuery Reason	Integer	0–255	As defined in 7.4.12.8.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the description of candidate BSS transition APs and their capabilities as described in 7.3.2.37.

10.3.61.2.3 When generated

This primitive is generated by the SME to request that a BSS Transition Management Query frame be sent to the AP with which the STA is associated to initiate a BSS Transition Management procedure.

10.3.61.2.4 Effect of receipt

On receipt of this primitive, the MLME constructs a BSS Transition Management Query management frame of action type. The STA then attempts to transmit the frame to the AP with which it is associated.

10.3.61.3 MLME-BTMQUERY.indication

10.3.61.3.1 Function

This primitive indicates that a BSS Transition Management Query frame was received from a non-AP STA.

10.3.61.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-BTMQUERY.indication(
Peer MAC Address,
DialogToken,
BSSTransitionQueryReason,

BSSTransitionCandidateListEntries
)

Name	Type	Valid range	Description
PeerMAC Address	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a BSS Transition Management Query frame was received.
DialogToken	Integer	1–255	The Dialog Token to identify the BSS Transition Management transaction received in the BSS Transition Management Query frame.
BSSTransitionQuery Reason	Integer	0–255	The BSS Transition Query Reason Code in the BSS Transition Management Query frame that was received.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the description of candidate BSS transition APs and their capabilities as described in 7.3.2.37.

10.3.61.3.3 When generated

This primitive is generated by the MLME when a valid BSS Transition Management Query frame is received.

10.3.61.3.4 Effect of receipt

On receipt of this primitive the SME shall operate according to the procedure in 11.22.6.

10.3.61.4 MLME-BTM.request

10.3.61.4.1 Function

This primitive requests transmission of a BSS Transition Management Request frame to a non-AP STA.

10.3.61.4.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-BTM.request(
Peer MAC Address
DialogToken,
RequestMode,
DisassociationTimer,
ValidityInterval,
BSSTerminationDuration,
SessionInformationURL,
BSSTransitionCandidateListEntries
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the BSS Transition Management Request frame is sent.

Name	Type	Valid range	Description
DialogToken	Integer	1–255	The Dialog Token to identify the BSS Transition Management transaction. Set to 0 for an autonomous BSS Transition Management Request frame.
RequestMode	Integer	As specified in 7.4.12.9	Contains RequestMode for the BSS Transition Management Request frame.
Disassociation Timer	Integer	0–65535	Specifies the number of TBTTs until the AP disassociates the non-AP STA. A value of 0 indicates time of disassociation has not yet been determined and a value of 1 indicates disassociation shall occur before the next TBTT.
ValidityInterval	Integer	1–255	Specifies the number of beacon transmission times (TBTTs) until this recommendation of this BSS transition candidate list is no longer valid.
BSSTerminationDuration	BSS Termination Duration subelement	BSS Termination Duration subelement	Contains the BSS Termination Duration subelement (see 7.3.2.37) for the current BSS and is present only when the BSS Termination Included field is 1 in the Request mode field.
SessionInformation-URL	URL	n/a	Optionally contains a URL formatted per RFC-3986 where additional information pertaining to the user's accounting session may be found.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the description of candidate BSS transition APs and their capabilities as described in 7.3.2.37.

10.3.61.4.3 When generated

This primitive is generated by the SME to request that a BSS Transition Management Request frame be sent to an associated non-AP STA. This request is sent either following the reception of a MLME-BTM-QUERY.indication or may be sent autonomously.

10.3.61.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a BSS Transition Management Request management frame of action type. The STA then attempts to transmit this frame to the indicated non-AP STA.

10.3.61.5 MLME-BTM.indication

10.3.61.5.1 Function

This primitive indicates that a BSS Transition Management Request frame was received from the AP with which the STA is associated.

10.3.61.5.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-BTM.indication(
                    ResultCode,
                    PeerMACAddress,
                    DialogToken,
```

RequestMode,
DisassociationTimer,
ValidityInterval,
BSSTerminationDuration,
SessionInformationURL,
BSSTransitionCandidateListEntries
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_ PARAMETERS, TIMEOUT, TRANSMISSION_FAILURE, UNSPECIFIED_ FAILURE	Indicates the result of the corresponding MLME-BTMQUERY.request. The ResultCode field is SUCCESS if the received BSS Transition Request frame is an unsolicited frame.
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the MAC entity from which a BSS Transition Management Request frame was received.
DialogToken	Integer	1–255	The Dialog Token to identity the BSS Transition Management transaction as received in the BSS Transition Management Request frame.
RequestMode	Integer	As specified in 7.4.12.9	Contains the RequestMode for the BSS Transition Management Request frame.
Disassociation Timer	Integer	0–65535	Specifies the number of TBTTs until the AP disassociates the non-AP STA. A value of 0 indicates time of disassociation has not been determined yet and a value of 1 indicates disassociation shall occur before the next TBTT.
ValidityInterval	Integer	1–255	Specifies the number of beacon transmission times (TBTTs) until this recommendation of this BSS transition candidate list is no longer valid.
BSSTerminationDuration	BSS Termination Duration subelement	BSS Termination Duration subelement	Contains the BSS Termination Duration subelement (see 7.3.2.37) for the current BSS and is present only when the BSS Termination Included field is 1 in the Request mode field.
SessionInformation-URL	URL	n/a	Optionally contains a URL formatted per RFC-3986 where additional information pertaining to the user's accounting session may be found.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the description of candidate BSS transition APs and their capabilities as described in 7.3.2.37.

10.3.61.5.3 When generated

This primitive is generated by the MLME when a valid BSS Transition Management Request frame is received. This primitive is also generated when the MLME-BTMQUERY.request contains invalid parameters and when a timeout or failure occurs.

10.3.61.5.4 Effect of receipt

On receipt of this primitive the SME shall operate according to the procedure in 11.22.6.

10.3.61.6 MLME-BTM.response

10.3.61.6.1 Function

This primitive requests transmission of a BSS Transition Management Response frame to the AP with which the STA is associated.

10.3.61.6.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-BTM.response(
                    Peer MAC Address
                    DialogToken,
                    StatusCode,
                    BSSTerminationDelay,
                    TargetBSSID,
                    BSSTransitionCandidateListEntries
                    )
```

Name	Type	Valid range	Description
PeerMAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the BSS Transition Management Query frame is sent.
DialogToken	Integer	1–255	The Dialog Token to identify the BSS Transition Management transaction.
StatusCode	Integer	0–255	As defined in 7.4.12.10.
BSSTerminationDelay	Integer	0–255	As defined in 7.4.12.10.
TargetBSSID	MACAddress	Any valid individual MAC Address	The BSSID of the BSS that the STA decided to transition to. Field shall be null if STA decided not to transition.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the description of candidate BSS transition APs and their capabilities as described in 7.3.2.37.

10.3.61.6.3 When generated

This primitive is generated by the SME to request that a BSS Transition Management Response frame be sent to the AP with which the STA is associated.

10.3.61.6.4 Effect of receipt

On receipt of this primitive, the MLME constructs a BSS Transition Management Response management frame of action type. The non-AP STA then attempts to transmit this to the AP with which it is associated.

10.3.61.7 MLME-BTM.confirm

10.3.61.7.1 Function

This primitive reports the results of a BSS Transition Management attempt with a specified peer MAC entity that is within an AP.

10.3.61.7.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-BTM.confirm(
                    ResultCode,
                    Peer MAC Address,
                    DialogToken,
                    BSSTransitionQueryReason,
                    StatusCode,
                    BSSTerminationDelay,
                    TargetBSSID,
                    BSSTransitionCandidateListEntries
                    )
```

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_PARAMETERS, TIMEOUT, TRANSMISSION_FAILURE, UNSPECIFIED_FAILURE	Indicates the result of the corresponding MLME-BTM.request.
Peer MAC Address	MAC Address	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a BSS Transition Management Response frame was received.
DialogToken	Integer	1–255	The Dialog Token to identify the BSS transition management transaction as received in the BSS Transition Management Response frame.
StatusCode	Integer	0–255	As defined in 7.4.12.10.
BSSTerminationDelay	Integer	0–255	As defined in 7.4.12.10.
TargetBSSID	MACAddress	Any valid individual MAC Address	The BSSID of the BSS that the STA indicated to transition to as received in the BSS Transition Management Response frame.
BSSTransition CandidateListEntries	Set of Neighbor Report Elements	Set of Neighbor Report Elements as defined in the Neighbor Report Element in 7.3.2.37	Contains the BSS Transition Candidate List Entries in the received BSS Transition Management Response frame.

10.3.61.7.3 When generated

This primitive is generated by the MLME when transmission of the BSS Transition Management Request frame is acknowledged, (re)transmission of the BSS Transition Management Request frame fails, the BSS Transition Management Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.61.7.4 Effect of receipt

On receipt of this primitive, the SME shall operate according to the procedure in 11.22.6.

10.3.62 FMS Setup

The following MLME primitives support the signaling of FMS Setup. The informative diagram shown in Figure 10-6l depicts the FMS setup process and is not meant to be exhaustive of all possible protocol uses.

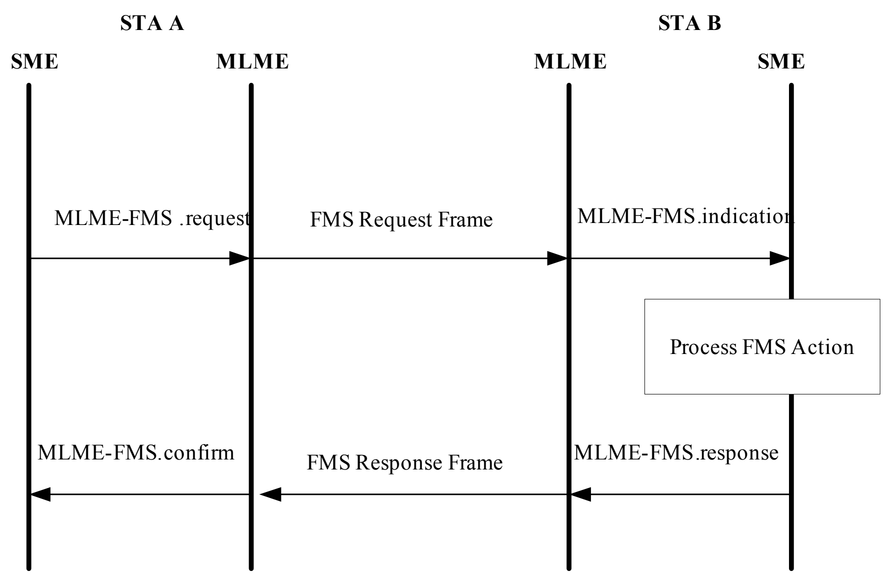

Figure 10-6l—FMS Setup Protocol Exchange

10.3.62.1 MLME-FMS.request

10.3.62.1.1 Function

This primitive requests that an FMS Request frame be sent to the AP with which the non-AP STA is associated.

10.3.62.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-FMS.request(
                PeerSTAAddress,
                DialogToken,
                FMSRequest
                )
```


Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the FMS process.
Dialog Token	Integer	1–255	The dialog token to identify the FMS transaction.
FMSRequest	FMS Request element	FMS Request element	Specifies the proposed service parameters for the FMS.

10.3.62.1.3 When generated

This primitive is generated by the SME to request that an FMS Request frame be sent to the AP with which the STA is associated.

10.3.62.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs an FMS Request action management frame. The STA then attempts to transmit this to the AP with which it is associated.

10.3.62.2 MLME-FMS.confirm

10.3.62.2.1 Function

This primitive reports the result of an FMS procedure.

10.3.62.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME- FMS.confirm(
ResultCode,
Peer MAC Address,
Dialog Token,
FMSResponse
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Indicates the result of the corresponding MLME-FMS.request.
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the location response is sent.
Dialog Token	Integer	0–255	The dialog token to identify the FMS transaction.
FMSResponse	FMS Response element	FMS Response element	Specifies service parameters for the FMS.

10.3.62.2.3 When generated

This primitive is generated by the MLME as a result of an MLME-FMS.request and indicates the results of the request. This primitive is generated when the MLME-FMS.request contains invalid parameters, when a timeout or failure occurs, or when the STA receives a FMS Response frame from the AP.

10.3.62.2.4 Effect of receipt

On receipt of this primitive, the SME should operate according to the procedure in 11.2.1.4a.

10.3.62.3 MLME-FMS.indication

10.3.62.3.1 Function

This primitive indicates that an FMS Request frame was received from a non-AP STA.

10.3.62.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME- FMS.indication(
                    PeerSTAAddress,
                    DialogToken,
                    FMSRequest
                    )
```

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which an FMS Request frame was received.
Dialog Token	Integer	1–255	The dialog token to identify the FMS transaction.
FMSRequest	FMS Request element	FMS Request element	Specifies the proposed service parameters for the FMS.

10.3.62.3.3 When generated

This primitive is generated by the MLME when a valid FMS Request frame is received.

10.3.62.3.4 Effect of receipt

On receipt of this primitive, the SME should operate according to the procedure in 11.2.1.4a.

10.3.62.4 MLME-FMS.response

10.3.62.4.1 Function

This primitive is either generated in response to a received FMS Request frame or autonomously by the AP and requests the transmission of an FMS Response frame.

10.3.62.4.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-FMS.response(
PeerSTAAddress,
FMSResponse
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which an FMS Request frame was received.
Dialog Token	Integer	0–255	The dialog token to identify the FMS transaction.
FMSResponse	FMS Response element	FMS Response element	Specifies service parameters for the FMS.

10.3.62.4.3 When generated

This primitive is generated by the SME to request that an FMS Response frame be sent to a peer entity to convey FMS information.

10.3.62.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs an FMS Response frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.63 Collocated Interference request

This set of primitives supports the exchange of collocated interference information between peer SMEs. The informative diagram shown in Figure 10-6m depicts the Collocated Interference request and response process, and is not meant to be exhaustive of all possible protocol uses.

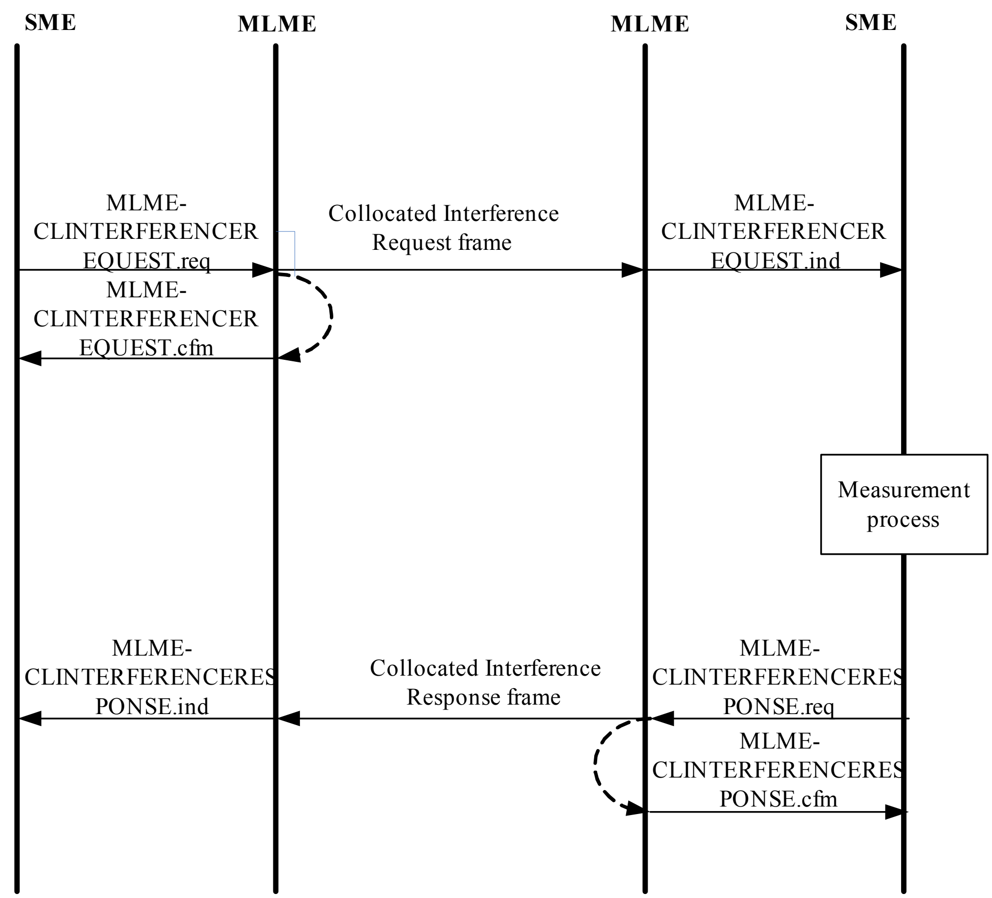

Figure 10-6m—Collocated Interference Protocol Exchange

10.3.63.1 MLME-CLINTERFERENCEREQUEST.request

10.3.63.1.1 Function

This primitive requests the transmission of collocated interference request action frame to a peer entity.

10.3.63.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-CLINTERFERENCEREQUEST.request(
                                   Peer MAC Address,
                                   Dialog Token,
                                   Request Info
                                   )
```

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address, or the group MAC address	The address of the peer MAC entity to which the collocated interference request is sent.

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the collocated interference transaction.
Request Info	Integer	As defined in the Collocated Interference Request frame	Specifies the requested information.

10.3.63.1.3 When generated

This primitive is generated by the SME to request that a Collocated Interference Request frame be sent to a peer entity.

10.3.63.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Collocated Interference Request frame. This frame is then scheduled for transmission.

10.3.63.2 MLME-CLINTERFERENCEREQUEST.confirm

10.3.63.2.1 Function

This primitive reports the result of a collocated interference request.

10.3.63.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-CLINTERFERENCEREQUEST.confirm(
                                   Dialog Token,
                                   ResultCode
                                   )
```

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the collocated interference transaction.
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Collocated Interference Request frame.

10.3.63.2.3 When generated

This primitive is generated by the MLME when transmission of the Collocated Interference Request frame is acknowledged, (re)transmission of the Collocated Interference Request frame fails, the Collocated Interference Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.63.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.63.3 MLME-CLINTERFERENCEREQUEST.indication

10.3.63.3.1 Function

This primitive indicates that a Collocated Interference Request frame has been received requesting a Collocated Interference report.

10.3.63.3.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-CLINTERFERENCEREQUEST.indication(
Peer MAC Address,
Dialog Token,
Request Info
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address or the group MAC address	The address of the peer MAC entity from which the Collocated Interference request was received.
Dialog Token	Integer	1–255	The dialog token to identify the collocated interference transaction.
Request Info	Integer	As defined in the Collocated Interference Request frame	Specifies the requested information.

10.3.63.3.3 When generated

This primitive is generated by the MLME when a valid Collocated Interference Request frame is received.

10.3.63.3.4 Effect of receipt

On receipt of this primitive, the SME either rejects the request or commences the Collocated Interference reporting procedure as described in 11.22.9.

10.3.64 Collocated Interference report

This set of primitives supports the exchange of collocated interference information between peer SMEs.

10.3.64.1 MLME-CLINTERFERENCEREPORT.request

10.3.64.1.1 Function

This primitive requests the transmission of Collocated Interference Report to a peer entity, in response to a received Collocated Interference Request frame.

10.3.64.1.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME- CLINTERFERENCEREPORT.request (
Peer MAC Address,

Dialog Token,
Collocated Interference Report
)

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity to which the Collocated Interference Report is sent.
Dialog Token	Integer	1–255	The dialog token to identify the collocated interference transaction.
Collocated Interference Report	Collocated Interference Report elements	As defined in 7.3.2.85	Specifies the collocated interference characteristics.

10.3.64.1.3 When generated

This primitive is generated by the SME to request that a Collocated Interference Report frame be sent to a peer entity to convey collocated interference information.

10.3.64.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Collocated Interference Report frame. This frame is then scheduled for transmission.

10.3.64.2 MLME-CLINTERFERENCEREPORT.confirm

10.3.64.2.1 Function

This primitive reports the result of a request to send a Collocated Interference Report action frame.

10.3.64.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME- CLINTERFERENCEREPORT.confirm(
Dialog Token,
ResultCode
)

Name	Type	Valid range	Description
Dialog Token	Integer	1–255	The dialog token to identify the collocated interference transaction.
ResultCode	Enumeration	SUCCESS, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Collocated Interference Report frame.

10.3.64.2.3 When generated

This primitive is generated by the MLME when the request to transmit a Collocated Interference Report frame completes.

10.3.64.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.64.3 MLME- CLINTERFERENCEREPORT.indication

10.3.64.3.1 Function

This primitive indicates that a Collocated Interference Report frame has been received.

10.3.64.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME- CLINTERFERENCEREPORT.indication(
                    Peer MAC Address,
                    Dialog Token,
                    Collocated Interference Report
                    )
```

Name	Type	Valid range	Description
Peer MAC Address	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the location response was received.
Dialog Token	Integer	1–255	The dialog token to identify the location transaction.
Collocated Interference Report	Collocated Interference Report elements	As defined in 7.3.2.85	Specifies the collocated interference characteristics.

10.3.64.3.3 When generated

This primitive is generated by the MLME when a valid Collocated Interference Report frame is received.

10.3.65 TFS Setup

This set of primitives supports the exchange of the signaling of TFS Setup between peer SMEs. The informative diagram shown in Figure 10-6n depicts the TFS request and response process, and is not meant to be exhaustive of all possible protocol uses.

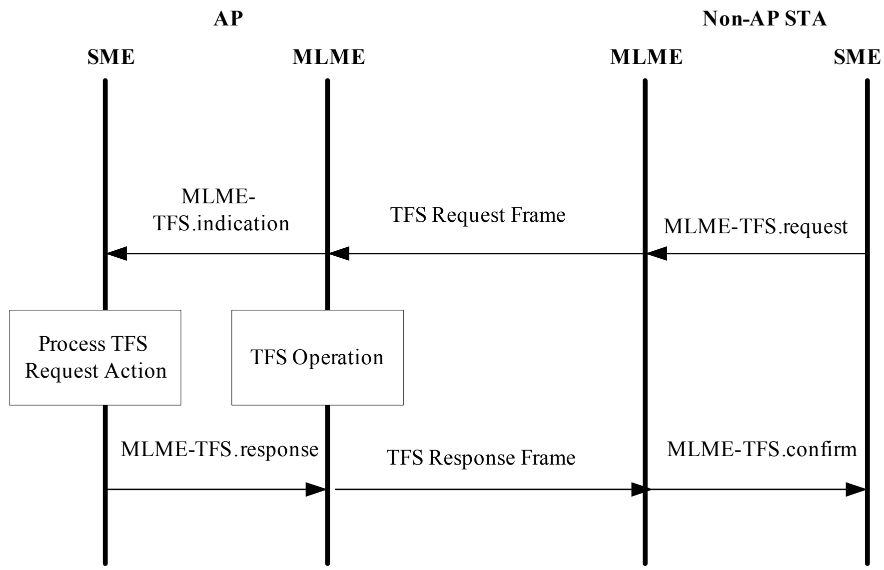

Figure 10-6n—TFS request and response exchange

10.3.65.1 MLME-TFS.request

10.3.65.1.1 Function

This primitive requests that a TFS Request frame be sent to the AP with which the STA is associated.

10.3.65.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TFS.request(
PeerSTAAddress,
DialogToken,
TFSRequest,
VendorSpecific
)

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity for TFS.
DialogToken	Integer	0–255	The Dialog Token to identify the TFS Request and Response transaction.
TFSRequest	A set of TFS Request elements	As defined in the TFS Request element	Specifies the proposed service parameters for the TFS. One or more TFS Request elements.

Name	Type	Valid range	Description
VendorSpecific	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.65.1.3 When generated

This primitive is generated by the SME to request that a TFS Request frame be sent to the AP with which the STA is associated.

10.3.65.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a TFS Request action management frame. The STA then attempts to transmit this to the AP with which it is associated.

10.3.65.2 MLME-TFS.confirm

10.3.65.2.1 Function

This primitive reports the result of a TFS procedure.

10.3.65.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TFS.confirm(
                    ResultCode,
                    PeerSTAAddress,
                    DialogToken,
                    TFSResponse,
                    VendorSpecific
                    )
```

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_PARAMETERS, TIMEOUT, TRANSMISSION_FAILURE, UNSPECIFIED_FAILURE	Indicates the result of the corresponding MLME-TFS.request.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity from which the TFS Response frame is received.
DialogToken	Integer	0–255	The Dialog Token to identify the TFS Request and Response transaction.
TFSResponse	A set of TFS Response elements	As defined in the TFS Response element	Specifies service parameters for the TFS. One or more TFS Response elements.
VendorSpecific	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.65.2.3 When generated

This primitive is generated by the MLME when transmission of the TFS Request frame is acknowledged, (re)transmission of the TFS Request frame fails, the TFS Request frame contains invalid parameters, for unspecified failure reasons or when the STA receives a TFS Response frame from the AP.

This primitive is also generated when the MLME-TFS.request contains invalid parameters and when a time-out or failure occurs.

10.3.65.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the ResultCode value and may use the reported data. The SME should operate according to the procedure in 11.22.11.

10.3.65.3 MLME-TFS.indication

10.3.65.3.1 Function

This primitive indicates that a TFS Request frame was received from a non-AP STA.

10.3.65.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TFS.indication(
PeerSTAAddress,
DialogToken,
TFSRequest,
VendorSpecific
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a TFS Request frame was received.
DialogToken	Integer	0–255	The Dialog Token to identify the TFS Request and Response transaction.
TFSRequest	A set of TFS Request elements	As defined in the TFS Request element	Specifies the proposed service parameters for the TFS. One or more TFS Request elements.
VendorSpecific	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.65.3.3 When generated

This primitive is generated by the MLME when a valid TFS Request action management frame is received.

10.3.65.3.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.11.

10.3.65.4 MLME-TFS.response

10.3.65.4.1 Function

This primitive is generated in response to an MLME-TFS.indication requesting a TFS Response frame be sent to a non-AP STA.

10.3.65.4.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-TFS.response(
PeerSTAAddress,
DialogToken,
TFSResponse,
VendorSpecific
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a TFS Request frame was received.
DialogToken	Integer	0–255	The Dialog Token to identify the TFS Request and Response transaction.
TFSResponse	A set of TFS Response elements	As defined in the TFS Response element	Specifies service parameters for the TFS. One or more TFS Response elements.
VendorSpecific	A set of information elements.	As defined in 7.3.2.26	Zero or more information elements.

10.3.65.4.3 When generated

This primitive is generated by the SME in response to an MLME-TFS.indication requesting a TFS Response be sent to a non-AP STA.

10.3.65.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a TFS Response action management frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.66 Sleep Mode request

This set of primitives supports the exchange of sleep mode parameter information between peer SMEs. The informative diagram shown in Figure 10-6o depicts the sleep mode request and response process, and is not meant to be exhaustive of all possible protocol uses.

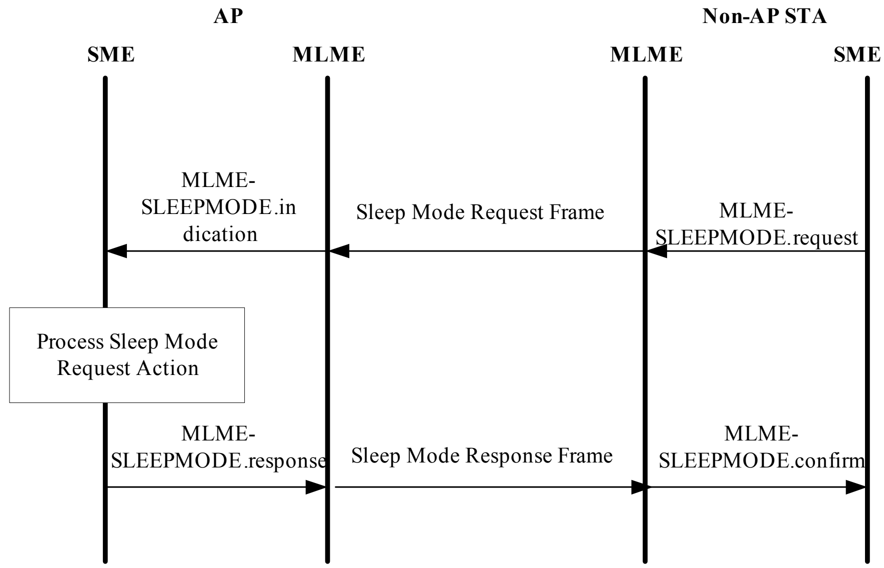

Figure 10-6o—Sleep Mode Request and Response Exchange

10.3.66.1 MLME-SLEEPMODE.request

10.3.66.1.1 Function

This primitive requests that a Sleep Mode Request frame be sent to the AP with which the STA is associated.

10.3.66.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-SLEEPMODE.request(
                        PeerSTAAddress,
                        DialogToken,
                        SleepMode,
                        TFSRequest,
                        VendorSpecificInfo
                        )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the Sleep Mode Request frame is to be sent.
DialogToken	Integer	0–255	The Dialog Token to identify the Sleep Mode Request and Response transaction.
SleepMode	As defined in the Sleep Mode element	As defined in the Sleep Mode element	Specifies the proposed sleep mode service parameters for the Sleep Mode Request frame.

Name	Type	Valid range	Description
TFSRequest	A set of TFS Request elements	As defined in the TFS Request element	Specifies the proposed TFS service parameters for the Sleep Mode Request frame.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.66.1.3 When generated

This primitive is generated by the SME to request that a Sleep Mode Request frame be sent to the AP with which the STA is associated.

10.3.66.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Sleep Mode Request action frame. The STA then attempts to transmit this to the AP with which it is associated.

10.3.66.2 MLME-SLEEPMODE.indication

10.3.66.2.1 Function

This primitive indicates that a Sleep Mode Request frame was received from a non-AP STA.

10.3.66.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-SLEEPMODE.indication(
                        PeerSTAAddress,
                        DialogToken,
                        SleepMode,
                        TFSRequest,
                        VendorSpecificInfo
                        )
```

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the peer MAC entity from which the Sleep Mode request frame is received.
DialogToken	Integer	0–255	The Dialog Token to identify the Sleep Mode Request and Response transaction.
SleepMode	As defined in the Sleep Mode element	As defined in the Sleep Mode element	Specifies the proposed sleep mode service parameters for the Sleep Mode Request frame.
TFSRequest	A set of TFS Request elements	As defined in the TFS Request element	Specifies the proposed TFS service parameters for the Sleep Mode Request frame.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.66.2.3 When generated

This primitive is generated by the MLME when a valid Sleep Mode Request frame is received.

10.3.66.2.4 Effect of receipt

On receipt of this primitive, the SME should operate according to the procedure in 11.2.1.16.

10.3.66.3 MLME-SLEEPMODE.response

10.3.66.3.1 Function

This primitive requests the transmission of Sleep Mode information to a peer entity, in response to a received Sleep Mode Request frame.

10.3.66.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-SLEEPMODE.response(
                PeerSTAAddress,
                DialogToken,
                SleepMode,
                TFSResponse,
                VendorSpecificInfo
                )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the Sleep Mode Response frame is to be sent.
DialogToken	Integer	0–255	The Dialog Token to identify the Sleep Mode Request and Response transaction.
SleepMode	As defined in the Sleep Mode element	As defined in the Sleep Mode element	Specifies the proposed sleep mode service parameters for the Sleep Mode Response frame.
TFSResponse	A set of TFS Request elements	As defined in the TFS Response element	Specifies the proposed TFS service parameters for the Sleep Mode Response frame.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.66.3.3 When generated

This primitive is generated by the SME to request that a Sleep Mode Response frame be sent to a peer entity to convey Sleep Mode information.

10.3.66.3.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Sleep Mode Response frame containing the Sleep Mode elements specified. This frame is then scheduled for transmission.

10.3.66.4 MLME-SLEEPMODE.confirm

10.3.66.4.1 Function

This primitive reports the result of a request to send a Sleep Mode Response action frame.

10.3.66.4.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-SLEEPMODE.confirm(
ResultCode,
PeerSTAAddress,
DialogToken,
SleepMode,
TFSResponse,
VendorSpecificInfo
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_PARAMETERS, TIMEOUT, TRANSMISSION_FAILURE, UNSPECIFIED_FAILURE	Indicates the result of the corresponding MLME-SleepMode.request.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity from which the Sleep Mode Response frame is received.
DialogToken	Integer	0–255	The Dialog Token to identify the Sleep Mode Request and Response transaction.
SleepMode	As defined in the Sleep Mode element	As defined in the Sleep Mode element	Specifies the proposed sleep mode service parameters for the Sleep Mode Response frame.
TFSResponse	A set of TFS Request elements	As defined in the TFS Response element	Specifies the proposed TFS service parameters for the Sleep Mode Response frame.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.66.4.3 When generated

This primitive is generated by the MLME when transmission of the Sleep Mode Request frame is acknowledged, (re)transmission of the Sleep Mode Request frame fails, the Sleep Mode Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.66.4.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.67 TIM Broadcast Setup

The following MLME primitives support the signaling of TIM Broadcast Setup. The informative diagram shown in Figure 10-6p depicts the TIM Broadcast setup process and is not meant to be exhaustive of all possible protocol uses.

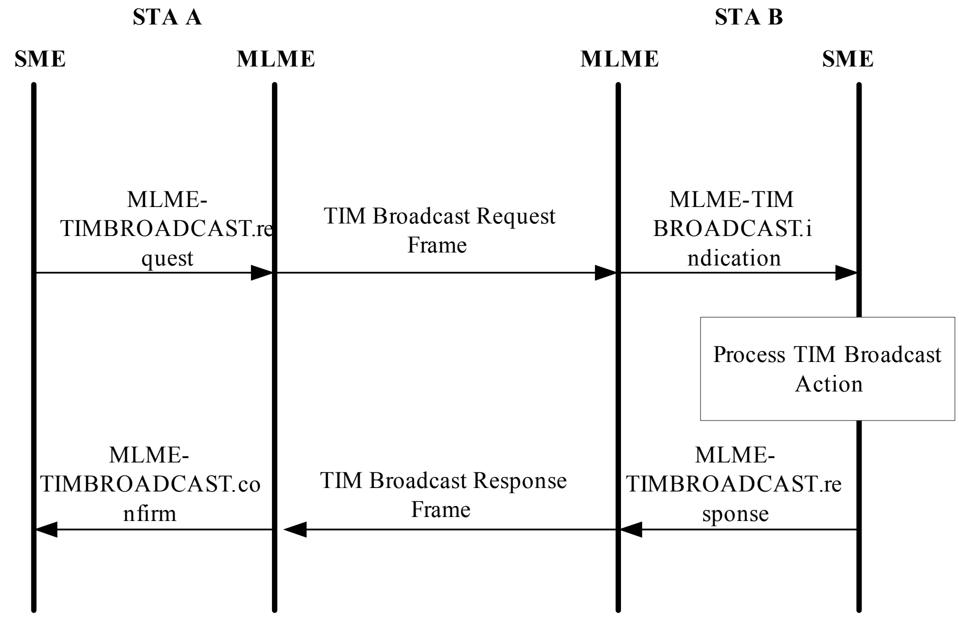

Figure 10-6p—TIM Broadcast Setup Protocol Exchange

10.3.67.1 MLME-TIMBROADCAST.request

10.3.67.1.1 Function

This primitive requests that a TIM Broadcast Request frame be sent to the AP with which the non-AP STA is associated.

10.3.67.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TIMBROADCAST.request(
                                PeerSTAAddress,
                                Dialog Token,
                                TIMBroadcastRequest
                                )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the TIM Broadcast process.
Dialog Token	Integer	1–255	The Dialog Token to identify the TIM Broadcast request and response transaction.
TIMBroadcastRequest	As defined in TIM Broadcast Request element	As defined in TIM Broadcast Request element	Specifies the proposed service parameters for the TIM Broadcast.

10.3.67.1.3 When generated

This primitive is generated by the SME to request that a TIM Broadcast Request frame be sent to the AP with which the STA is associated.

10.3.67.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a TIM Broadcast Request action management frame. The STA then attempts to transmit this to the AP with which it is associated.

10.3.67.2 MLME-TIMBROADCAST.confirm

10.3.67.2.1 Function

This primitive reports the result of a TIM Broadcast procedure.

10.3.67.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TIMBROADCAST.confirm(
                ResultCode,
                PeerSTAAddress,
                Dialog Token,
                TIMBroadcastResponse
                )
```

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, TRANSMISSION_FAILURE, REQUESTED INTERVAL TOO LONG, or OVERRIDDEN DUE TO LACK OF RESOURCES	Reports the outcome of a request to send a TIM Broadcast Request frame.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the TIM Broadcast process.
Dialog Token	Integer	0–255	The Dialog Token to identify the TIM Broadcast request and response transaction.
TIMBroadcast-Response	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies service parameters for the TIM Broadcast.

10.3.67.2.3 When generated

This primitive is generated by the MLME when transmission of the TIM Broadcast Request frame is acknowledged, (re)transmission of the TIM Broadcast Request frame fails, the TIM Broadcast Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.67.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the Status in the TIMBroadcastResponse element and may use the reported data.

10.3.67.3 MLME-TIMBROADCAST.indication

10.3.67.3.1 Function

This primitive indicates that a TIM Broadcast Request frame was received from a non-AP STA.

10.3.67.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-TIMBROADCAST.indication(
PeerSTAAddress,
Dialog Token,
TIMBroadcastRequest
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a TIM Broadcast Request frame was received.
Dialog Token	Integer	1–255	The Dialog Token to identify the TIM Broadcast request and response transaction.
TIMBroadcast-Request	As defined in TIM Broadcast Request element	As defined in TIM Broadcast Request element	Specifies the proposed service parameters for the TIM Broadcast.

10.3.67.3.3 When generated

This primitive is generated by the MLME when a valid TIM Broadcast Request frame is received.

10.3.67.3.4 Effect of receipt

On receipt of this primitive, the SME should operate according to the procedure in 11.2.1.15.

10.3.67.4 MLME-TIMBROADCAST.response

10.3.67.4.1 Function

This primitive is generated in response to an MLME-TIMBROADCAST.indication requesting a TIM Broadcast Response frame is sent to a non-AP STA.

10.3.67.4.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-TIMBROADCAST.response(
PeerSTAAddress,
Dialog Token,

TIMBroadcastResponse
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a TIM Broadcast Request frame was received.
Dialog Token	Integer	0–255	The Dialog Token to identify the TIM Broadcast request and response transaction.
TIM Broadcast Response	As defined in TIM Broadcast Response element	As defined in TIM Broadcast Response element	Specifies service parameters for the TIM Broadcast.

10.3.67.4.3 When generated

This primitive is generated by the SME in response to an MLME-TIMBROADCAST.indication requesting a TIM Broadcast Response be sent to a non-AP STA.

10.3.67.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a TIM Broadcast Response frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.68 QoS Traffic Capability Update

10.3.68.1 MLME-QOSTRAFFICCAPUPDATE.request

10.3.68.1.1 Function

This primitive requests that a QoS Traffic Capability Update frame be sent to the AP with which the STA is associated. The informative diagram shown in Figure 10-6q depicts the QoS Traffic Capability Update process and is not meant to be exhaustive of all possible protocol uses.

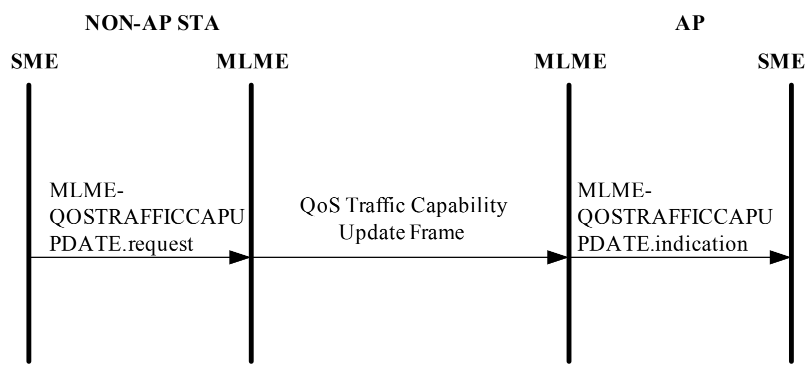

Figure 10-6q—QoS Traffic Capability Update Protocol Exchange

10.3.68.1.2 Semantics of the service primitive

The primitive parameters are as follows:
MLME-QOSTRAFFICCAPUPDATE.request(
QoSTrafficCapability
)

Name	Type	Valid range	Description
QoS Traffic Capability	Bit field as defined in 7.4.12.22	As defined in 7.4.12.22	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is present if dot11WirelessManagementImplemented is true and dot11MgmtOptionQoSTrafficCapabilityActivated is true, and is not present otherwise.

10.3.68.1.3 When generated

This primitive is generated by the SME to request that a QoS Traffic Capability Update frame be sent to the AP with which the STA is associated.

10.3.68.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a QoS Traffic Capability Update action management frame. The STA then attempts to transmit this to the AP with which it is associated.

10.3.68.2 MLME-QOSTRAFFICCAPUPDATE.indication

10.3.68.2.1 Function

This primitive indicates that a QoS Traffic Capability Update frame was received from a non-AP STA.

10.3.68.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-QOSTRAFFICCAPUPDATE.indication(
                                        PeerSTAAddress,
                                        QoS Traffic Capability
                                        )
```

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a QoS Traffic Capability Update frame was received.
QoS Traffic Capability	Bit field as defined in 7.4.12.22	As defined in 7.4.12.22	Specifies the QoS Traffic Capability flags of the non-AP STA. This parameter is present if dot11WirelessManagementImplemented is true and dot11MgmtOptionQoSTrafficCapabilityActivated is true, and is not present otherwise.

10.3.68.2.3 When generated

This primitive is generated by the MLME when a valid QoS Traffic Capability Update action management frame is received.

10.3.68.2.4 10.3.63.2.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.9.

10.3.69 Channel Usage request

The following MLME primitives support the signaling of Channel Usage request. Figure 10-6m depicts the Channel Usage request process. The figure illustrates the basic protocol and is only an example and therefore is not meant to be exhaustive of all possible protocol uses.

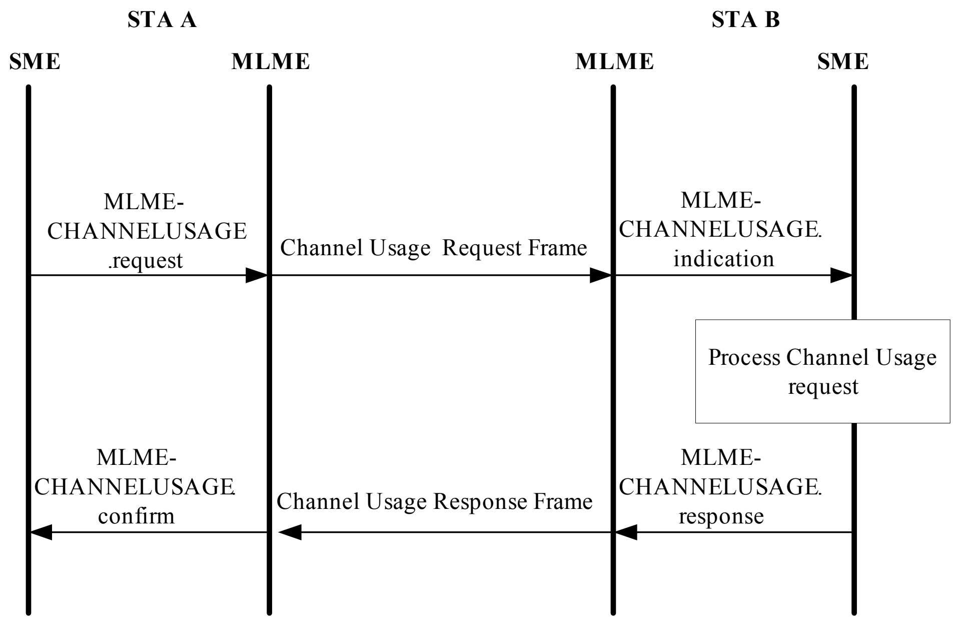

Figure 10-6r—Channel Usage Request Protocol Exchange

10.3.69.1 MLME-CHANNELUSAGE.request

10.3.69.1.1 Function

This primitive requests the transmission of a Channel Usage Request frame be sent to an AP.

10.3.69.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-CHANNELUSAGE.request(
                    PeerSTAAddress,
                    Dialog Token,
                    ChannelUsage,
                    SSID,
                    SupportedRegulatoryClasses,
                    VendorSpecificInfo
                    )
```


Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the Channel Usage process.
Dialog Token	Integer	1–255	The Dialog Token to identify the Channel Usage request and response transaction.
ChannelUsage	A set of Channel Usage element	A set of Channel Usage element	Specifies request types for the Channel Usage request.
SSID	Octet string	0–32 octets	Specifies the desired SSID or the wildcard SSID.
SupportedRegulatoryClasses	As defined in Supported Regulatory Classes element	As defined in Supported Regulatory Classes element	Specifies the Supported Regulatory Classes information for the Channel Usage Request.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.69.1.3 When generated

This primitive is generated by the SME to request that a Channel Usage Request frame be sent to the BSS which is advertising the SSID passed down in this primitive.

10.3.69.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Channel Usage Request action management frame. The STA then attempts to transmit this to the BSS which is advertising the SSID included in this primitive request. When wild card SSID is passed down, the MLME-CHANNELREQUEST.request shall be transmitted to all BSSs in the current scan list as determined by the most recent MLME-SCAN.request.

10.3.69.2 MLME-CHANNELUSAGE.confirm

10.3.69.2.1 Function

This primitive reports the result of a Channel Usage procedure.

10.3.69.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-CHANNELUSAGE.confirm(
                    ResultCode,
                    PeerSTAAddress,
                    Dialog Token,
                    ChannelUsage,
                    SSID,
                    Country String,
                    Power Constraint,
```

VendorSpecificInfo
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID PARAMETERS, or UNSPECI-FIED FAILURE	Reports the outcome of a request to send a Channel Usage Request frame.
PeerSTAAddress	MAC Address	Any valid individ-ual MAC Address	Specifies the address of the peer MAC entity with which to perform the Channel Usage process.
Dialog Token	Integer	1–255	The Dialog Token to identify the Channel Usage request and response transaction.
ChannelUsage	A set of Channel Usage element	A set of Channel Usage element	Specifies parameters for the Channel Usage.
SSID	Octet string	0–32 octets	Specifies the SSID or the wildcard SSID used in the request.
Country String	Octet string	3 octets	Specifies Country strings.
Power Constraint	An information element	As defined in 7.3.2.16	Zero or one Power Constraint information element.
VendorSpecificInfo	A set of informa-tion elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.69.2.3 When generated

This primitive is generated by the MLME as a result of an MLME-CHANNELUSAGE.request and indicates the results of the request.

This primitive is generated when the MLME-CHANNELUSAGE.request contains invalid parameters, when a timeout or failure occurs, or when the STA receives a Channel Usage Response frame from the AP.

10.3.69.2.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.14.

10.3.69.3 MLME-CHANNELUSAGE.indication

10.3.69.3.1 Function

This primitive indicates that a Channel Usage Request frame was received from a non-AP STA.

10.3.69.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-CHANNELUSAGE.indication(
PeerSTAAddress,
Dialog Token,
ChannelUsage,
SSID,
SupportedRegulatoryClasses,
VendorSpecificInfo
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a Channel Usage Request frame was received.
Dialog Token	Integer	0–255	The Dialog Token to identify the Channel Usage request and response transaction.
ChannelUsage	A set of Channel Usage element	A set of Channel Usage element	Specifies request types for the Channel Usage request.
SSID	Octet string	0–32 octets	Specifies the desired SSID or the wildcard SSID.
SupportedRegulatoryClasses	As defined in Supported Regulatory Classes element	As defined in Supported Regulatory Classes element	Specifies the Supported Regulatory Classes information for the Channel Usage Request.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.69.3.3 When generated

This primitive is generated by the MLME when a valid Channel Usage Request frame is received.

10.3.69.3.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.14.

10.3.69.4 MLME-CHANNELUSAGE.response

10.3.69.4.1 Function

This primitive is generated in response to an MLME-CHANNELUSAGE.indication requesting a Channel Usage Response frame is sent to a non-AP STA.

10.3.69.4.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-CHANNELUSAGE.response(
PeerSTAAddress,
Dialog Token,

ChannelUsage,
SSID,
Country String,
Power Constraint,
VendorSpecificInfo
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a Channel Usage Request frame was received.
Dialog Token	Integer	0–255	The Dialog Token to identify the Channel Usage request and response transaction.
ChannelUsage	A set of Channel Usage elements	A set of Channel Usage elements	Specifies parameters for the Channel Usage.
SSID	Octet string	0–32 octets	Specifies the desired SSID or the wildcard SSID.
Country String	Octet string	3 octets	Specifies Country strings.
Power Constraint	An information element	As defined in 7.3.2.16	Zero or one Power Constraint information element.
VendorSpecificInfo	A set of information elements	As defined in 7.3.2.26	Zero or more information elements.

10.3.69.4.3 When generated

This primitive is generated by the SME in response to an MLME-CHANNELUSAGE.indication requesting a Channel Usage Response be sent to a non-AP STA.

10.3.69.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Channel Usage Response frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.70 DMS request and response procedure

The following MLME primitives support the signaling of DMS request and response procedure. The informative diagram shown in Figure 10-6s depicts the DMS request and response process and is not meant to be exhaustive of all possible protocol uses.

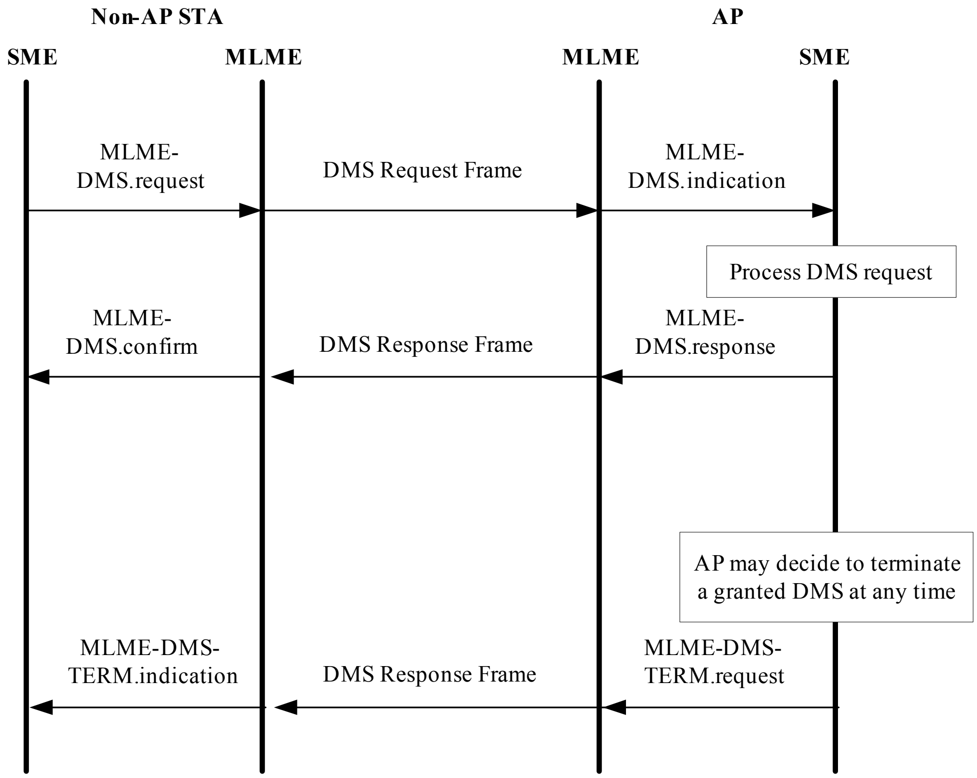

Figure 10-6s—DMS Setup Protocol Exchange

10.3.70.1 MLME-DMS.request

10.3.70.1.1 Function

This primitive requests the transmission of a DMS Request frame be sent to an AP.

10.3.70.1.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DMS.request(
PeerSTAAddress,
Dialog Token,
DMSRequest
)

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the DMS process.
Dialog Token	Integer	1–255	The Dialog Token to identify the DMS request and response transaction.
DMSRequest	DMS Request element	DMS Request element	Specifies group addressed frames for the requested DMS stream.

10.3.70.1.3 When generated

This primitive is generated by the SME to request that a DMS Request frame be sent to the AP with which the STA is associated.

10.3.70.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a DMS Request action management frame. The STA then attempts to transmit this to the AP with which the STA is associated.

10.3.70.2 MLME-DMS.confirm

10.3.70.2.1 Function

This primitive reports the result of a DMS procedure.

10.3.70.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-DMS.confirm(
                    ResultCode,
                    PeerSTAAddress,
                    Dialog Token,
                    DMSResponse
                    )
```

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, MAL-FORMED REQUEST, REQUESTED INTERVAL TOO LONG, or OVER-RIDDEN DUE TO LACK OF RESOURCES	Reports the outcome of a request to send a DMS Request frame.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the DMS process.
Dialog Token	Integer	1–255	The Dialog Token to identify the DMS request and response transaction.
DMSResponse	DMS Response element	DMS Response element	Specifies the status returned by the AP responding to the STA's requested DMS stream.

10.3.70.2.3 When generated

This primitive is generated by the MLME as a result of an MLME-DMS.request and indicates the results of the request.

This primitive is generated when the MLME-DMS.request contains invalid parameters, when a timeout or failure occurs, or when the STA receives a DMS Response frame from the AP.

10.3.70.2.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.15.

10.3.70.3 MLME-DMS.indication

10.3.70.3.1 Function

This primitive indicates that a DMS Request frame was received from a non-AP STA.

10.3.70.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DMS.indication(
PeerSTAAddress,
Dialog Token,
DMSRequest)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a DMS Request frame was received.
Dialog Token	Integer	1–255	The Dialog Token to identify the DMS request and response transaction.
DMSRequest	DMS Request element	DMS Request element	Specifies group addressed frames for the requested DMS stream.

10.3.70.3.3 When generated

This primitive is generated by the MLME when a valid DMS Request frame is received.

10.3.70.3.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.15.

10.3.70.4 MLME-DMS.response

10.3.70.4.1 Function

This primitive is generated in response to an MLME-DMS.indication requesting a DMS Response frame is sent to a non-AP STA.

10.3.70.4.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-DMS.response(
PeerSTAAddress,
Dialog Token,
DMSResponse
)

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a DMS Request frame was received.
Dialog Token	Integer	1–255	The Dialog Token to identify the DMS request and response transaction.
DMSResponse	DMS Response element	DMS Response element	Specifies the status returned by the AP responding to the STA's requested DMS stream.

10.3.70.4.3 When generated

This primitive is generated by the SME in response to an MLME-DMS.indication requesting a DMS Response be sent to a non-AP STA.

10.3.70.4.4 Effect of receipt

On receipt of this primitive, the MLME constructs a DMS Response frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.70.5 MLME-DMS-TERM.request

10.3.70.5.1 Function

This primitive requests the transmission of a DMS Response frame to non-AP STAs to terminate a granted DMS.

10.3.70.5.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-DMS-TERM.request(
                    PeerSTAAddress,
                    Dialog Token,
                    DMSResponse
                    )
```

Name	Type	Valid range	Description
PeerSTAAddress	MACAddress	Any valid individual MAC Address	The address of the non-AP STA MAC entity from which a DMS Request frame was received.
Dialog Token	Integer	0	Set to 0 for an autonomous DMS Response frame.
DMSResponse	DMS Response element	DMS Response element	Specifies the requested DMS stream that is cancelled by the AP.

10.3.70.5.3 When generated

This primitive is generated by the SME to terminate DMS.

10.3.70.5.4 Effect of receipt

On receipt of this primitive, the MLME constructs a DMS Response frame. The STA then attempts to transmit this to the non-AP STA indicated by the PeerSTAAddress parameter.

10.3.70.6 MLME-DMS-TERM.indication

10.3.70.6.1 Function

This primitive is generated by the MLME when a valid unsolicited DMS Response frame is received.

10.3.70.6.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-DMS-TERM.indication(
                ResultCode,
                PeerSTAAddress,
                Dialog Token,
                DMSResponse
                )
```

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, MALFORMED REQUEST, REQUESTED INTERVAL TOO LONG, or OVERRIDDEN DUE TO LACK OF RESOURCES	Reports the outcome of a request to send a DMS Request frame.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	Specifies the address of the peer MAC entity with which to perform the DMS process.
Dialog Token	Integer	0	Set to 0 for an autonomous DMS Response frame.
DMSResponse	DMS Response element	DMS Response element	Specifies the requested DMS stream that is cancelled by the AP.

10.3.70.6.3 When generated

This primitive is generated when the STA receives an unsolicited DMS Response frame from the AP.

10.3.70.6.4 Effect of receipt

On receipt of this primitive the SME should operate according to the procedure in 11.22.15.

10.3.71 Timing Measurement Request

The following set of primitives supports triggering a Timing Measurement procedure or stopping an ongoing Timing Measurement procedure.

10.3.71.1 MLME-TIMINGMSMTRQ.request

10.3.71.1.1 Function

This primitive requests the transmission of a Timing Measurement Request frame to a peer entity.

10.3.71.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TIMINGMSMTRQ.request(
                    Peer MAC Address,
                    Trigger
                    )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the Timing Measurement Request frame is sent.
Trigger	Integer	0–1	The trigger to identify the action.

10.3.71.1.3 When generated

This primitive is generated by the SME to request that a Timing Measurement Request frame be sent to a peer entity.

10.3.71.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a Timing Measurement Request frame with the specified parameters. This frame is then scheduled for transmission.

10.3.71.2 MLME-TIMINGMSMTRQ.confirm

10.3.71.2.1 Function

This primitive indicates that a Timing Measurement Request frame has been successfully received by the peer STA to which it was sent.

10.3.71.2.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TIMINGMSMTRQ.confirm(
                    Result Code,
                    Peer MAC Address
                    )
```


Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a Timing Measurement Request frame.
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the Timing Measurement Request frame was sent.

10.3.71.2.3 When generated

This primitive is generated by the MLME when transmission of the Timing Measurement Request frame is acknowledged, (re)transmission of the Timing Measurement Request frame fails, the Timing Measurement Request contains invalid parameters, or for unspecified failure reasons.

10.3.71.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.71.3 MLME-TIMINGMSMTRQ.indication

10.3.71.3.1 Function

This primitive indicates that a Timing Measurement Request frame has been received and the corresponding ACK has been transmitted.

10.3.71.3.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-TIMINGMSMTRQ.indication(
                Peer MAC Address,
                Trigger
                )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the Timing Measurement Request frame is sent.
Trigger	Integer	0–1	The trigger to identify the action.

10.3.71.3.3 When generated

This primitive is generated by the MLME when a valid Timing Measurement Request frame is received.

10.3.71.3.4 1 Effect of receipt

On receipt of this primitive, the SME uses the information contained within the notification.

10.3.72 WNM-Notification request

This set of primitives supports the exchange of WNM-Notification Request and Response frames between peer SMEs.

10.3.72.1 MLME-WNMNOTIFICATIONREQUEST.request

10.3.72.1.1 Function

This primitive requests the transmission of a WNM-Notification Request frame to a peer entity.

10.3.72.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME-WNMNOTIFICATIONREQUEST.request(
                                Peer MAC Address,
                                Dialog Token,
                                Type,
                                Optional Subelements
                                )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the WNM-Notification Request frame is sent.
Dialog Token	Integer	1–255	The dialog token to identify the WNM-Notifica-tion transaction.
Type	Integer	1–255	The type of WNM-Notification.
Optional Subelements	Set subelements	Set of subelements	A set of subelements describing the notification.

10.3.72.1.3 When generated

This primitive is generated by the SME to request that a WNM-Notification Request frame be sent to a peer entity to initiate a WNM-Notification.

10.3.72.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a WNM-Notification Request frame containing the elements specified. This frame is then scheduled for transmission.

10.3.72.2 MLME- WNMNOTIFICATIONREQUEST.confirm

10.3.72.2.1 Function

This primitive reports the result of the WNM-Notification request.

10.3.72.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-WNMNOTIFICATIONREQUEST.confirm(
ResultCode
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a WNM-Notification Request frame.

10.3.72.2.3 When generated

This primitive is generated by the MLME when transmission of the WNM-Notification Request frame is acknowledged, (re)transmission of the WNM-Notification Request frame fails, the WNM-Notification Request frame contains invalid parameters, or for unspecified failure reasons.

10.3.72.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.72.3 MLME- WNMNOTIFICATIONREQUEST indication

10.3.72.3.1 Function

This primitive indicates that a WNM-Notification Request frame has been received.

10.3.72.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME- WNMNOTIFICATIONREQUEST.indication(
Peer MAC Address,
Dialog Token,
Type,
Optional Subelements
)

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity from which the WNM-Notification request was received.
Dialog Token	Integer	1–255	The dialog token to identify the WNM-Notification transaction.
Type	Integer	1–255	The type of WNM-Notification Request.
Optional Subelements	Set subelements	Set of subelements	A set of subelements comprising the notification.

10.3.72.3.3 When generated

This primitive is generated by the MLME when a valid WNM-Notification Request frame is received.

10.3.72.3.4 Effect of receipt

On receipt of this primitive, the SME replies to the request.

10.3.73 WNM-Notification response

10.3.73.1 MLME-WNMNOTIFICATIONRESPONSE.request

10.3.73.1.1 Function

This primitive supports the signaling of the WNM-Notification Response frame between peer SMEs.

10.3.73.1.2 Semantics of the service primitive

The primitive parameters are as follows:

```
MLME- WNMNOTIFICATIONRESPONSE.request(
                                        Peer MAC Address,
                                        Dialog Token,
                                        Response Status,
                                        Optional Subelements
                                        )
```

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	The address of the peer MAC entity to which the WNM-Notification Response frame is sent.
Dialog Token	Integer	1–255	The dialog token to identify the WNM-Notification transaction.
Response Status	Integer	1–255	The response status of the WNM-Notification.
Optional Subelements	Set subelements	Set of subelements	A set of subelements describing the results of the WNM-Notification.

10.3.73.1.3 When generated

This primitive is generated by the SME to request that a WNM-Notification Response frame be sent to a peer entity to report the results of the WNM-Notification.

10.3.73.1.4 Effect of receipt

On receipt of this primitive, the MLME constructs a WNM-Notification Response frame containing the indicated fields. This frame is then scheduled for transmission.

10.3.73.2 MLME- WNMNOTIFICATIONRESPONSE.confirm

10.3.73.2.1 Function

This primitive reports the result of the requested transmission of the WNM-Notification Response frame.

10.3.73.2.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME-WNMNOTIFICATIONRESPONSE.confirm(
ResultCode
)

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, TRANSMISSION FAILURE, INVALID PARAMETERS, or UNSPECIFIED FAILURE	Reports the outcome of a request to send a WNM-Notification Response frame.

10.3.73.2.3 When generated

This primitive is generated by the MLME when the request to transmit a WNM-Notification Response frame completes.

10.3.73.2.4 Effect of receipt

On receipt of this primitive, the SME evaluates the result code.

10.3.73.3 MLME-WNMNOTIFICATIONRESPONSE.indication

10.3.73.3.1 Function

This primitive indicates that a WNM-Notification Response frame has been received from a peer entity.

10.3.73.3.2 Semantics of the service primitive

The primitive parameters are as follows:

MLME- WNMNOTIFICATIONRESPONSE.indication(
Peer MAC Address,
Dialog Token,
Response Status,
Optional Subelements
)

Name	Type	Valid range	Description
PeerSTAAddress	MAC Address	Any valid individual MAC Address	AddressThe address of the peer MAC entity from which the WNM-Notification Response frame was received.
Dialog Token	Integer	1–255	The dialog token to identify the WNM-Notification transaction.

Response Status	Integer	1–255	The response status of the WNM-Notification.
Optional Subelements	Set subelements	Set of subelements	A set of subelements describing the results of the WNM-Notification.

10.3.73.3.3 When generated

This primitive is generated by the MLME when a valid WNM-Notification Response frame is received.

10.3.73.3.4 Effect of receipt

On receipt of this primitive, the WNM-Notification can be made available for SME processes.

10.4 PLME SAP interface

10.4.3 PLME-CHARACTERISTICS.confirm

10.4.3.2 Semantics of the service primitive

Change the primitive parameter list as follows:

PLME-CHARACTERISTICS.confirm(
aSlotTime,
aSIFSTime,
aCCATime,
aPHY-RX-START-Delay,
aRxTxTurnaroundTime,
aTxPLCPDelay,
aRxPLCPDelay,
aRxTxSwitchTime,
aTxRampOnTime,
aTxRampOffTime,
aTxRFDelay,
aRxRFDelay,
aAirPropagationTime,
aMACProcessingDelay,
aPreambleLength,
aPLCPHeaderLength,
aMPDUDurationFactor,
aMPDUMaxLength,
aCWmin,
aCWmax,
aMaxCSIMatricesReportDelay,
aMaxTODError,
aMaxTOAError,
aTxPmdTxStartRFDelay,
aTxPmdTxStartRMS
)

Insert the following new rows before VendorSpecificInfo in the parameter table:

Name	Type	Description
aMaxTODError	Integer	An estimate of the maximum error (in 10 nanosecond units) in the TX_START_OF_FRAME_OFFSET value in the PHY-TXSTART.confirm(TXSTATUS) primitive. The estimated maximum error includes any error due to implementation component and environmental (including temperature) variability.
aMaxTOAError	Integer	An estimate of the maximum error (in 10 nanosecond units) in the RX_START_OF_FRAME_OFFSET value in the PHY-RXSTART.indicate(RXVECTOR) primitive. The estimated maximum error includes any error due to implementation component and environmental (including temperature) variability.
aTxPmdTxStartRFDelay	Integer	The delay (in units of 0.5 nanoseconds) between PMD_TXSTART.request being issued and the first frame energy sent by the transmitting port, for the current channel.
aTxPmdTxStartRMS	Integer	The RMS time of departure error (in units of 0.5 nanoseconds), where the time of departure error equals the difference between TIME_OF_DEPARTURE and the time of departure measured by a reference entity using a clock synchronized to the start time and mean frequency of the local PHY entity's clock.

11. MLME

11.1 Synchronization

11.1.2 Maintaining synchronization

11.1.2.3 Beacon reception

Change the second paragraph of 11.1.2.3 as follows:

STAs in an infrastructure network shall only use other information in received Beacon frames, if the BSSID field is equal to the MAC address currently in use by the STA contained in the AP of the BSS. Non-AP STAs in an infrastructure network that support the Multiple BSSID capability shall only use other information in received Beacon frames if the BSSID field of a non-AP STA is equal to the MAC address currently in use by the STA contained in the AP of the BSS corresponding to the transmitted BSSID or, if the BSSID field of a non-AP STA is equal to one of the non-transmitted BSSIDs.

Insert the following as a new paragraph at the end of 11.1.2.3:

When dot11MgmtOptionMultiBSSIDActivated is true and the non-AP STA is associated to the BSS corresponding to the non-transmitted BSSID, a non-AP STA shall support frame filtering for up to two BSSIDs, one for the transmitted BSSID and one for the non-transmitted BSSID, where the non-AP STA shall discard all data frames and management frames except Beacon, Probe Response, and TIM broadcast frames that use the transmitted BSSID as the transmit address.

Insert the following as a new clause immediately following 11.1.2.3:

11.1.2.3a Multiple BSSID procedure

Implementation of the Multiple BSSID capability is optional for a WNM STA. A STA that implements the Multiple BSSID capability has the MIB attribute dot11MgmtOptionMultiBSSIDImplemented set to true. When dot11MgmtOptionMultiBSSIDImplemented is true, dot11WirelessManagementImplemented shall be set true. A STA that has a value of true for the MIB attribute dot11MgmtOptionMultiBSSIDActivated is defined as a STA that supports the Multiple BSSID capability. A STA for which the MIB attribute dot11MgmtOptionMultiBSSIDActivated is true shall set the Multiple BSSID field of the Extended Capabilities information element to 1.

The non-transmitted BSSID profile shall include the SSID element (see 7.3.2.1) and Multiple BSSID-Index element (see 7.3.2.74) for each of the supported BSSIDs. The AP may optionally include all other elements in the non-transmitted BSSID profile. The AP may include two or more Multiple BSSID elements containing elements for a given BSSID index in one Beacon frame. If two or more are given, the profile is considered to be the complete set of all elements given in all such Multiple BSSID elements sharing the same BSSID index. Since the Multiple BSSID element is also present in Probe Response frames, an AP may choose to advertise the complete or a partial profile of a BSS corresponding to a non-transmitted BSSID only in the Probe Response frames. In addition, the AP may choose to only include a partial list of non-transmitted BSSID profiles in the Beacon frame or to include different sets of non-transmitted BSSID profiles in different Beacon frames.

When a station receives a Beacon frame with a Multiple BSSID element that consists of a non-transmitted BSSID profile with only the mandatory elements, it may inherit the complete profile from a previously received Beacon frame or Probe Response frame, or send a Probe Request frame to obtain the complete BSSID profiles. Each Beacon element not transmitted in a non-transmitted BSSID subelement is inherited from previous Beacon or Probe Response in which the element is present, except for the Quiet element, which shall take effect only in the Beacon frame that contains it and not carry forward as a part of the inheritance. An AP is not required to include all supported non-transmitted BSSID profiles in a Probe Response frame, and may choose to only include a subset based on any criteria. When a non-transmitted BSSID profile is present in the Multiple BSSID element of the Probe Response frame, the AP shall include all information elements that are specific to this BSS. If any of the optional elements are not present in a non-transmitted BSSID profile, the corresponding values are the element values of the transmitted BSSID.

A non-AP STA derives its non-transmitted BSSID value according to 7.3.2.46 and 7.3.2.74.

The Partial Virtual Bitmap field in the transmitted BSSID Beacon frame shall indicate the presence or absence of traffic to be delivered to all stations associated to a transmitted or non-transmitted BSSID. The first 2^n bits of the bitmap are reserved for the indication of group addressed frame for the transmitted and all non-transmitted BSSIDs. The AID space is shared by all BSSs and the lowest AID value that shall be assigned to a station is 2^n (see 7.3.2.6).

If the Contention Free Period is supported and if more than one BSS's CFPCount becomes 0 in the same Beacon frame, the AP shall concatenate the Contention Free Periods of all CFPs that coincide and shall not transmit a CF-End or CF-End+Ack until the end of the concatenated CFP, indicated with a single CF-End or CF-End+Ack, if required. The CF Parameter Set in the transmitted BSSID contains times that are an aggregate of CFP times of the non-transmitted BSSIDs.

Multiple BSSID rate selection is defined in 9.6.0f.

11.1.2.4 TSF timer accuracy

Insert the following sentence as a new paragraph at the end of 11.1.2.4:

When an STA is associated to a BSS with a non-transmitted BSSID, it shall use the TSF from the transmitted BSSID beacon frame.

11.1.3 Acquiring synchronization, scanning

Change the third paragraph of 11.1.3 as follows:

Upon receipt of the MLME-SCAN.request primitive, a STA shall perform scanning. The SSID parameter indicates the SSID for which to scan. The SSID List parameter indicates one or more SSIDs for which to scan. To become a member of a particular ESS using passive scanning, a STA shall scan for Beacon frames containing that ESS's SSID, returning all Beacon frames matching the desired SSID in the BSSDescriptionSet parameter of the corresponding MLME-SCAN.confirm primitive with the appropriate bits in the Capabilities Information field indicating whether the Beacon frame came from an infrastructure BSS or IBSS. To actively scan, the STA shall transmit Probe Request frames containing the desired SSID or one or more SSID List elements. When the SSID List element is present in the Probe Request frame, one or more of the SSID elements may include a wildcard SSID (see 7.3.2.1). The exact procedure for determining the SSID or SSID List values in the MLME-SCAN.request primitive is not specified in this standard. When a STA scans for a BSS whose AP does not support the SSID List element, or for a BSS for which AP support of the SSID List element is unknown, the SSID element with an SSID or wildcard SSID shall be included in the MLME-Scan.request primitive. Upon completion of scanning, an MLME-SCAN.confirm is issued by the MLME indicating all of the BSS information received.

11.1.3.2 Active scanning

11.1.3.2.1 Sending a probe response

Change the first paragraph of 11.1.3.2.1 as follows:

STAs, subject to criteria below, receiving Probe Request frames shall respond with a probe response only if

a) The SSID in the probe request is the wildcard SSID, the SSID in the probe request is ~~or~~ the specific SSID of the STA, or the specific SSID of the STA is included in the SSID List element,
b) The BSSID field in the probe request is the wildcard BSSID or the BSSID of the STA, and
c) The DA field in the probe request is the broadcast address or the specific MAC address of the STA.

Change the fourth paragraph of 11.1.3.2.1 as follows:

STAs receiving Probe Request frames shall respond with a probe response when the SSID in the probe request is the wildcard SSID, ~~or~~ matches the specific SSID of the STA, or the specific SSID of the STA is included in the SSID List element. Probe Response frames shall be sent as directed frames to the address of the STA that generated the probe request. The probe response shall be sent using normal frame transmission rules. An AP shall respond to all probe requests meeting the above criteria. In an IBSS, the STA that generated the last Beacon frame shall be the STA that responds to a probe request. The SSID List element shall not be included in a Probe Request frame in an IBSS.

Change list item c) in 11.1.3.2.2 as follows:

c) Send a probe request to the broadcast destination address, with the SSID and BSSID from the MLME-SCAN.request primitive. When the SSID List is present in the MLME-SCAN.request primitive, send one or more probe request frames, each with an SSID indicated in the SSID List and the BSSID from the MLME-SCAN.request primitive.

11.2 Power management

11.2.1 Power management in an infrastructure network

Insert the following sentence at the end of 11.2.1:

A STA may use both WNM-Sleep mode and PS mode simultaneously.

11.2.1.4 Power management with APSD

Insert a new subclause heading at the beginning of 11.2.1.4 as follows:

11.2.1.4.1 Power Management with APSD procedures

Insert following paragraphs at the end of 11.2.1.4:

11.2.1.4.2 U-APSD Coexistence

A non-AP STA that uses U-APSD may not be able to receive all AP transmitted frames during the service period due to interference observed at the non-AP STA. Although the AP may not observe the same interference, it is able to determine that the frames were not received correctly by the non-AP STA. The U-APSD Coexistence capability enables the non-AP STA to indicate a requested transmission duration to the

AP for use during U-APSD service periods. Use of the transmission duration enables the AP to transmit frames during the service period and improve the likelihood that the non-AP STA receives the frames when the non-AP STA is experiencing interference. The U-APSD Coexistence capability reduces the likelihood that the AP transmits frames during the service period that are not received successfully.

A STA that has a value of true for the MIB attribute dot11MgmtOptionUAPSDCoexistenceActivated is defined as a STA that supports U-APSD Coexistence. A STA for which the MIB attribute dot11MgmtOptionUAPSDCoexistenceActivated is set to true shall set the U-APSD Coexistence field of the Extended Capabilities information element to 1, set to 0 otherwise.

A non-AP STA that is associated to an AP where both have previously advertised support for the U-APSD Coexistence capability may transmit ADDTS Request frames including the U-APSD Coexistence element to the AP.

The content of the ADDTS Request frame excluding the U-APSD Coexistence element is referred to in subsequent text as the Base ADDTS Request. Upon successful reception of the ADDTS Request frame, the AP shall process the content of the Base ADDTS Request frame as described in 11.2.1.4. If the AP determines that the Base ADDTS Request cannot be granted it shall respond as described in 11.2.1.4, without processing the U-APSD Coexistence element. If the AP determines the Base ADDTS Request can be granted, it shall process the U-APSD Coexistence element. If the AP supports transmission of frames during the U-APSD service period for the duration value specified in the U-APSD Coexistence element Interval/Duration field, it shall grant the ADDTS Request as described in 11.2.1.4. Otherwise, it shall deny the ADDTS Request.

If the AP has previously granted an ADDTS Request with U-APSD Coexistence, a non-AP STA that continues using QoS services provided by an ADDTS Request frame without U-APSD coexistence may terminate the use of U-APSD Coexistence by transmitting an ADDTS Request frame without the U-APSD Coexistence element. If the non-AP STA wants to terminate use of all QoS services provided by an ADDTS Request frame including U-APSD Coexistence, it may transmit a DELTS Request frame to the AP.

The non-AP STA may transmit multiple ADDTS Request frames to the AP where the last successfully received ADDTS Request frame will override any previously received ADDTS Request frame.

An AP that supports U-APSD Coexistence and accepts an ADDTS request limits the U-APSD Coexistence Service Period according to the parameters specified in the ADDTS frame U-APSD Coexistence element, and shall transmit frames to the requesting non-AP STA according to the rules in 9.9.1 and the following rules:

— If the non-AP STA specified a non-zero TSF 0 Offset value in the U-APSD Coexistence element, the AP should not transmit frames to the non-AP STA outside of the U-APSD Coexistence Service Period, which begins when the AP receives the U-APSD trigger frame and ends after the transmission period specified by the result of the following calculation:

  End of transmission period = T + (Interval – ((T – TSF 0 Offset) mod Interval))

  where

  T is the time the U-APSD trigger frame was received at the AP
  Interval is the UAPSD Coexistence element Duration/Interval field value (see 7.3.2.91)

  or upon the successful transmission of a frame with EOSP bit set to 1, whichever is earlier.

— If the non-AP STA specified a zero TSF 0 Offset value in the U-APSD Coexistence element, the AP should not transmit frames to the non-AP STA outside of the U-APSD Coexistence Service Period, which begins when the AP receives a U-APSD trigger frame and ends after the transmission period specified by the result of the following calculation:

  End of transmission period = T + Duration where

T is the time the U-APSD trigger frame was received at the AP

Duration is the UAPSD Coexistence element Duration/Interval field value (see 7.3.2.91)

or upon the successful transmission of a frame with EOSP bit set to 1, whichever is earlier.

Throughout the U-APSD Coexistence Service Period, the AP shall set the More bit to 1 if it has more frames to be transmitted and it can determine the frame might be received successfully before the service period expires.

The AP should set the EOSP bit to 1 in the frame that it expects to be the last frame transmitted to the non-AP STA during the U-APSD Coexistence duration. If the last frame expected to be transmitted cannot be successfully transmitted to the non-AP STA before the termination of the U-APSD SP, the AP should transmit a QoS null frame with the EOSP bit set to 1.

The non-AP STA may enter Doze State at the end of the U-APSD Coexistence Service Period.

Insert the following new subclauses after 11.2.1.4:

11.2.1.4a FMS power management

Implementation of FMS is optional for a WNM STA. A STA that has a value of true for the MIB attribute dot11MgmtOptionFMSActivated is defined as a STA that supports FMS. A STA for which the MIB attribute dot11MgmtOptionFMSActivated is true shall set the FMS field of the Extended Capabilities information element to 1.

11.2.1.4a.1 FMS general procedures

When dot11MgmtOptionFMSActivated is true at the AP, the AP shall include the FMS Descriptor element in every Beacon frame. The FMS Descriptor indicates the FMS group addressed buffered frames at the AP. If there are no buffered frames for FMS streams accepted by the AP, the AP shall set the Length field in the FMS Descriptor element to one. The AP shall include the FMS Descriptor element for a non-transmitted BSSID in the Multiple BSSID element sent in a Beacon frame.

When dot11MgmtOptionFMSActivated is true at the AP, the AP shall support from one to eight different FMS Stream delivery intervals for any number of FMS streams. Corresponding to these eight delivery intervals are eight FMS counters. More than one FMSID may have the same delivery interval and therefore will share the same FMS Counter. An FMS Counter corresponds to each unique delivery interval of one or more FMS Streams.

Each FMS counter decrements once per DTIM beacon and when the FMS counter reaches zero, buffered group addressed frames assigned to that particular interval are scheduled for delivery immediately following the next Beacon frame containing the DTIM transmission. After transmission of the buffered group addressed frames, the AP shall reset the FMS counter to the delivery interval for the FMS streams associated with that FMS counter.

A non-AP STA that does not use FMS wakes every DTIM interval and follows group addressed frame reception rules as defined in 11.2.1.7.

A STA that supports FMS shall be capable of supporting a delivery interval of 1 for any stream.

11.2.1.4a.2 FMS Request procedures

A non-AP STA that supports FMS may request use of FMS by sending an FMS Request frame or Reassociation Request frame that includes one or more FMS Request elements to an AP that supports FMS. Each FMS Request element includes one or more FMS subelements. Each FMS subelement identifies an FMS stream, the requested delivery interval and the maximum delivery interval for that stream. The FMS delivery interval shall be an integer multiple of the DTIM period.

Upon reception of an FMS Request frame or Reassociation Request frame, the AP shall transmit a corresponding single FMS Response frame or Reassociation Response frame that contains a corresponding FMS Response element for each FMS Request element in the same order received. Each FMS Response element shall contain an FMS Status subelement and zero or more other subelements drawn from Table 7-43as that corresponds to each FMS subelement in the FMS Request element, in the same order.

For each FMS subelement, the following rules apply:

If the AP accepts the FMS subelement and the requested delivery interval, the Element Status in the corresponding FMS Status subelement shall be set to Accept and the FMSID is assigned to a non-zero value. In addition:

— If the FMS stream identified in the FMS subelement matches a delivery interval already in use at the AP, the AP shall assign the FMS stream to use the FMS Counter ID assigned for that delivery interval.
— When an FMS Stream is accepted by the AP, the Current Count value for that FMS Stream is decremented by 1 for each DTIM Beacon frame in which the Current Count field appears.
— The AP may reschedule transmission of the FMS Stream identified by an FMSID to align the transmission time of the FMS stream to the transmission time of other FMS streams that the STA is already receiving at the same delivery interval. The AP has the following two options:
    1) Notify the STAs using that FMS Stream. The AP shall keep the non-zero Current Count value the same across two consecutive Beacon frames in which the Current Count field appears. The algorithm by which the AP chooses to align or offset the different FMS counters is unspecified.
    2) Transmit an unsolicited FMS Response frame to the group address included in the original FMS Response frame for the stream with the updated Delivery Interval field when the Current Count field value reaches zero. Since the AP transmits this FMS Response frame as a group addressed frame, the frame will be scheduled for delivery at the appropriate DTIM interval when all non-AP STAs are awake to receive the frame.
— An AP may terminate the use of FMS and resume default (non-FMS) transmission rules for any FMS stream identified by FMSID for any reason. To terminate the FMS stream, the AP shall send an unsolicited FMS Response frame to the group address included in the original FMS Response frame with Delivery Interval set to 0 and the Element Status in the FMS Status Subelement set to "Terminate".
— If the FMS subelement contained a non-zero delivery interval and the non-AP STA specified a maximum delivery interval as part of the FMS request, the AP shall not modify the delivery interval for the stream greater than the maximum delivery interval specified by the non-AP STA.
— An AP shall transmit MSDUs belonging to the same FMSID in the same order that they were received at the MAC Data SAP. MSDUs belonging to the different FMSIDs are transmitted by the AP at the appropriate DTIM in the order received at the MAC data SAP based on the interval configured for the FMS stream.

If the AP denies the FMS subelement for any reason, including requested delivery interval, maximum delivery interval and TCLAS, the Element Status in the corresponding FMS Status subelement shall be set to Deny.

If the AP selects an alternate delivery interval or alternate maximum delivery interval from the value specified in the FMS Request, the FMS Status subelement shall be set to Alternate Preferred, and the FMS subelement shall indicate the AP selected value(s).

To terminate the use of FMS for an FMS Stream identified by FMSID, the non-AP STA shall transmit a FMS Request frame with a FMS Request element and FMS subelement with the FMSID matching the FMS stream and the delivery interval set to 0.

The AP shall respond to a malformed FMS Request frame or Reassociation Request frame with a FMS Response frame or Reassociation Response frame that denies all FMS Request elements by including a FMS Status code “Deny, due to request format error or ambiguous classifier” in the Element Status field in each FMS Status subelement in the FMS Response element.

11.2.1.4a.3 FMS Response procedures

Upon reception of a FMS Response element in a frame that has a value in Address1 that matches its MAC address or that is a group address corresponding to a group of which it is a member and that was transmitted by the AP with which it is associated, a non-AP STA that supports FMS shall use the following procedures, based on the value of the Element Status value in FMS Status subelement in the received FMS Response element.

- If the Element Status value in FMS Status subelement is Accept:
  - The AP has accepted the FMS subelement contained within the FMS Request element. If the FMS Request element specified a non-zero delivery interval, the AP will deliver the requested streams at the delivery interval as specified by the non-AP STA in the FMS Request element.
  - After receiving the FMS Response element, the non-AP STA shall be awake for the next DTIM beacon so that the non-AP STA can synchronize with the FMS Current Count for the requested FMS Stream. Once synchronized with the FMS Current Count, the non-AP STA need not wake up at every DTIM interval to receive group addressed frames.
- If the Element Status value in FMS Status subelement is Deny:
  - The AP will not deliver the requested streams at the delivery interval as specified by the non-AP STA in the FMS Request element. If the AP denies the usage of FMS for a particular stream, the stream is transmitted at every DTIM interval.
- If the Element Status value in FMS Status subelement is Alternate Preferred due to AP changed the maximum delivery interval:
  - The AP does not deliver the requested streams at the delivery interval as specified by the non-AP STA in the FMS Request element. The delivery interval specified in the FMS Status subelement specifies a delivery interval that the AP is willing to accept for the specified streams if the non-AP STA sends another FMS Request with that delivery interval specified.
  - The non-AP STA may submit a new FMS Request that includes the delivery interval value received from the AP. If the AP accepts this new FMS Request, it shall respond as described in 11.2.1.4a.1.
- If the Element Status value in FMS Status subelement is Alternate Preferred due to AP unable to provide requested TCLAS-based classifiers:
  - The AP does not deliver the requested streams at the delivery interval as specified by the non-AP STA in the FMS Request element. The TCLAS element(s) or TCLAS Processing element in the TCLAS Status subelement contains one or more fields or subfields whose values have been modified by the AP. The AP may include fewer TCLAS elements in the FMS Response element than were present in the request; when the AP’s response includes a single TCLAS element, it does not include a TCLAS processing element. If the AP changes a TCLAS element’s Classifier Type field in the FMS Response element but is unable to suggest a value for the Classifier Mask field, it shall set that field to zero. If the AP changes a TCLAS element’s

Classifier Type field or Classifier Mask field in the FMS Response element but is unable to suggest values for one or more Classifier Parameter subfields, it shall set those fields to zero.

— A non-AP STA receiving a modified TCLAS element having a Classifier Mask field set to zero or Classifier Parameter subfields set to zero shall interpret these values as meaning that no suggested value has been provided by the AP.

11.2.1.5 AP operation during the CP

Change bullet c) in 11.2.1.5 as follows:

c) At every beacon interval, the AP shall assemble the partial virtual bitmap containing the buffer status per destination for STAs in the PS mode and shall send this out in the TIM field of the Beacon frame. At every beacon interval, the APSD-capable AP shall assemble the partial virtual bitmap containing the buffer status of nondelivery-enabled ACs (if there exists at least one nondeliveryenabled AC) per destination for non-AP STAs in PS mode and shall send this out in the TIM field of the Beacon frame. When all ACs are delivery-enabled, the APSD-capable AP shall assemble the partial virtual bitmap containing the buffer status for all ACs per destination for non-AP STAs. If FMS is enabled, the AP shall include the FMS Descriptor information element in every Beacon frame. The FMS Descriptor information element shall indicate all FMS group addressed frames that the AP buffers.

Change bullet f) in 11.2.1.5 as follows:

f) When dot11MgmtOptionFMSActivated is false, ~~Im~~ the AP shall transmit all buffered group addressed MSDUs immediately after every DTIM.

When dot11MgmtOptionFMSActivated is true and the AP has established an FMS delivery interval for a multicast stream, the AP shall transmit all group addressed frames belonging to particular FMS stream immediately after the DTIM that has the Current Count field value of the FMS Counter field set to 0 for that particular FMS stream.

The More Data field of each group addressed frame shall be set to 1 to indicate the presence of further buffered group addressed MSDUs. If the AP is unable to transmit all of the buffered group addressed MSDUs before the TBTT following the DTIM, the AP shall ~~indicate that it will continue to deliver the group addressed MSDUs by setting~~ set the bit for AID 0 (zero) in the ~~bit map control field of the TIM element of every Beacon frame~~TIM element to 1 for a single BSSID or set the corresponding group address bit to 1 for multiple BSSIDs, as defined in 7.3.2.6, and when dot11MgmtOptionFMSActivated is true, shall set the appropriate bits in the FMS Descriptor information element as described in 7.3.2.75 to indicate for which group addresses there are still buffered frames, until all buffered group addressed frames have been transmitted.

When the AP transmits an STBC DTIM or TIM Beacon frame, the AP shall retransmit all group addressed frames that were transmitted following the non-STBC DTIM or TIM Beacon frame except that they are transmitted using the basic STBC MCS. It may be the case that a complete set of buffered group addressed frames is sent over a period of time during which non-STBC and STBC transmissions are interleaved, but the transition from non-STBC group addressed transmissions to STBC group addressed transmissions shall be preceded by the transmission of an STBC Beacon frame and the transition from STBC group addressed transmissions to non-STBC group addressed transmissions shall be preceded by the transmission of a non-STBC Beacon frame.

Change bullet k) in 11.2.1.5 as follows:

k) An AP can delete buffered frames for implementation-dependent reasons, including the use of an aging function and availability of buffers. The AP may base the aging function on the listen interval specified by the non-AP STA in the (Re)Association Request frame or the WNM-Sleep Interval specified by the non-AP STA in the WNM-Sleep Mode Request frame.

11.2.1.6 AP operation during the CFP

Change bullet e) in 11.2.1.6 as follows:

e) When dot11MgmtOptionFMSActivated is false, the AP shall transmit all buffered group addressed frames immediately after every DTIM (Beacon frame with DTIM Count field of the TIM element equal to zero).

When dot11MgmtOptionFMSActivated is true and the AP has set up an FMS delivery interval for a multicast stream, the AP shall send all group addressed frames belonging to a particular FMS stream immediately after the DTIM with the Current Count field value of the FMS Counter field set to 0 for that particular FMS stream.

The More Data field shall be set to indicate the presence of further buffered group addressed MSDUs. If the AP is unable to transmit all of the buffered group addressed MSDUs before the non-STBC or STBC TBTT following the DTIM, AP shall ~~indicate that it shall continue to deliver the multicast MSDUs by setting~~ set the bit for AID 0 in the ~~bit map control field of the of the TIM element in every Beacon frame~~TIM element to 1 for a single BSSID or set the corresponding group addressed bit to 1 for multiple BSSIDs, as defined in 7.3.2.6, and when dot11MgmtOptionFMSActivated is true, shall set the appropriate bits in the FMS Descriptor information element as described in 7.3.2.75 to indicate for which group addresses there are still buffered frames, until all buffered group addressed frames have been transmitted.

When the AP transmits an STBC DTIM or TIM Beacon frame, the AP shall re-transmit all group addressed frames that were transmitted following the non-STBC DTIM or TIM Beacon frame except that they are transmitted using the basic STBC MCS. It may be the case that a complete set of buffered group addressed frames is sent over a period of time during which non-STBC and STBC transmissions are interleaved, but the transition from non-STBC group addressed transmissions to STBC group addressed transmissions shall be preceded by the transmission of a STBC Beacon frame and the transition from STBC group addressed transmissions to non-STBC group addressed transmissions shall be preceded by the transmission of a non-STBC Beacon frame.

11.2.1.7 Receive operation for STAs in PS mode during the CP

Change bullet e) in 11.2.1.7 as follows:

e) When dot11MgmtOptionFMSActivated is false and ReceiveDTIMs is true, the STA shall wake up early enough to be able to receive at least every non-STBC DTIM or at least every STBC DTIM sent by the AP of the BSS.

When dot11MgmtOptionFMSActivated is true and ReceiveDTIMs is true and the STA has been granted by the AP an alternate delivery interval for a multicast stream, the STA shall wake up before the non-STBC DTIM or STBC DTIM having Current Count of FMS Counter field set to 0 for that particular FMS stream.

A STA that stays awake to receive group addressed MSDUs shall elect to receive at least all primary (non-STBC frame) group addressed transmissions or at least all secondary group addressed transmissions, and shall remain awake until the More Data field of the appropriate type (primary or secondary) of group addressed MSDUs indicates there are no further buffered group addressed MSDUs of that type, or until a TIM is received indicating there are no more buffered group addressed MSDUs of that type or until an FMS Descriptor information element is received indicating that there are no further buffered group addressed frames for which the STA has previously received an FMS Response element in a frame that has a value in address1 that matches its MAC address or that has an address1 value that is a group address corresponding to a group of which it is a member and that was transmitted by the AP with which it is associated and which had an Element Status value in FMS Status subelement of Accept.

If a non-AP STA receives a QoS +CF-Ack frame from its AP with the More Data bit set to 1, then the STA shall operate exactly as if it received a TIM with its AID bit set. If a non-AP STA has set the More Data Ack subfield in QoS Capability information element to 1, then if it receives an ACK frame from its AP with the More Data bit set to 1, the STA shall operate exactly as if it received a TIM with its AID bit set. For example, a STA that is using the PS-Poll delivery method shall issue a PS-Poll frame to retrieve a buffered frame. See also 9.2.7.

11.2.1.8 Receive operation for STAs in PS mode during the CFP

Change bullet b) in 11.2.1.8 as follows:

b) To receive broadcast/multicast MSDUs, the STA shall wake up early enough to be able to receive every DTIM that may be sent during the CFP. A STA receiving broadcast/multicast MSDUs shall remain awake until the More Data field of the broadcast/multicast MSDUs indicates there are no further buffered broadcast/multicast MSDUs, or until a TIM is received indicating there are no more broadcast/multicast MSDUs buffered or until an FMS Descriptor information element is received indicating that there are no further buffered group addressed frames for which the STA has previously received an FMS Response element in a frame that has an address1 value that matches its MAC address or that has an address1 value that is a group address corresponding to a group of which it is a member and that was transmitted by the AP with which it is associated and which had an Element Status value in FMS Status subelement of Accept.

Insert the following subclauses after 11.2.1.14:

11.2.1.15 TIM Broadcast

Implementation of TIM Broadcast is optional for a WNM STA. A STA that implements TIM Broadcast has the MIB attribute dot11MgmtOptionTIMBroadcastImplemented set to true. When dot11MgmtOptionTIMBroadcastImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionTIMBroadcastActivated is defined as a STA that supports TIM Broadcast. A STA for which the MIB attribute dot11MgmtOptionTIMBroadcastActivated is true shall set the TIM Broadcast field of the Extended Capabilities information element to 1. This subclause describes TIM Broadcast procedures for STAs that have dot11MgmtOptionTIMBroadcastActivated set to true.

TIM frames have shorter duration than Beacon frames and are potentially transmitted at a higher data rate. TIM Broadcast allows a non-AP STA to receive a TIM element without receiving a Beacon frame that may reduce the required wake time in a power save mode. The shorter receive time will reduce the power consumption for non-AP STAs in a power save mode. The shorter receive time may reduce the power consumption for stations in a standby mode.

A non-AP STA may activate the TIM Broadcast service by including a TIM Broadcast Request element in a TIM Broadcast Request frame, Association Request frame or Reassociation Request frame that is transmitted to the AP, which specifies the requested interval between TIM frame transmissions (the TIM

Broadcast Interval). On receipt of a properly formatted TIM Broadcast Request element in a TIM Broadcast Request frame, Association Request frame or Reassociation Request frame, the AP shall include a TIM Broadcast Response element in the corresponding TIM Broadcast Response frame, Association Response frame or Reassociation Response frame, when dot11MgmtOptionTIMBroadcastActivated is true. When the requested TIM Broadcast Interval is acceptable, the AP shall include a TIM Broadcast Response element specifying the requested TIM Broadcast Interval and a Status field indicating "accept" when no valid TSF timestamp is present in the TIM frames, or "accept, valid timestamp present in TIM frames" when a valid TSF timestamp is present in the TIM frames. When the AP overrides the request, it shall include a TIM Broadcast Response element with a Status field indicating "Overridden", and include in the TIM Broadcast Response element the smallest TIM Broadcast Interval that is currently active. Otherwise, the AP shall include a TIM Broadcast Response element with a Status field indicating "denied". The Status field in a TIM Broadcast Response element that is included in an Association Response frame or Reassociation Response frame has implications only for the TIM Broadcast negotiation.

An AP transmitting a TIM frame with a valid TSF timestamp shall set the value of the TIM frame timestamp as defined in 11.1.2, for the Beacon frame timestamp.

If the AP accepted at least one TIM Broadcast Request with a nonzero TIM Broadcast Interval, and at least one non-AP STA in PS mode still associated with the AP received in its latest TIM Broadcast Response a status field value equal to 0 (Accepted) in response to a TIM Broadcast Request with a nonzero TIM Broadcast Interval, the AP shall transmit one or two TIM frames per TIM Broadcast Interval. The AP shall not transmit TIM frames otherwise. When TIM Broadcast Intervals overlap, a transmitted TIM frame serves both intervals and does not need to be duplicated.

If the AP transmits two TIM frames per TIM Broadcast Interval, the AP shall transmit the high data rate TIM frame first, followed by the low data rate TIM frame.

The AP shall transmit the low data rate TIM frame at the same data rate or MCS as the Beacon frame. The AP shall transmit the high data rate TIM frame at a higher data rate or using an MCS that corresponds to a higher data rate. For Clause 19 and Clause 20 PHYs, if the Beacon frame is transmitted using ERP-DSSS/CCK, the AP shall transmit the high data rate TIM frame using ERP-OFDM, and its transmission is mandatory. Otherwise, transmitting the high data rate TIM frame is optional. If the high data rate TIM is not transmitted, the AP shall set the High Data Rate TIM field to 0 in the TIM Broadcast Response element.

The TIM Broadcast Interval from the latest received TIM Broadcast Response element together with the dot11BeaconPeriod define a series of TTTTs TIM Broadcast Interval × dot11BeaconPeriod TUs apart. Time zero is a TTTT. Non-AP STAs may use the information in the High Rate TIM Rate and Low Rate TIM Rate fields to determine which of the two TIM frames they will be receiving. The first TIM frame per TIM Broadcast Interval is scheduled to be transmitted at the TTTT plus the indicated TIM Broadcast Offset. The offset may have a negative value that allows the TIM frame(s) to be transmitted before the TBTT. The value of the offset shall not be changed as long as an associated non-AP STA is using the TIM Broadcast service.

The AP should accept new TIM Broadcast Interval requests if this implies transmitting TIM frames more frequently. For instance, if the AP currently transmits TIM frames every fourth beacon period and it receives a new request for every 3 beacon periods, then the AP should accept the new request and transmit TIM frames both every 3 and every 4 beacon periods. The AP may override incongruent requests once available resources (such as counters) have been depleted. An incongruent request is a request that contains an interval that is not an integer divide or a multiple of a currently active TIM Broadcast interval.

The AP shall accept a TIM Broadcast Interval of 1.

The AP shall increase the value (modulo 256) of the Check Beacon field in the next transmitted TIM frame(s) when a critical update occurs to any of the information elements inside the Beacon frame. The following events shall classify as a critical update:

a) Inclusion of a Channel Switch Announcement
b) Inclusion of an Extended Channel Switch Announcement
c) Modification of the EDCA parameters
d) Inclusion of a Quiet element
e) Modification of the DS Parameter Set
f) Modification of the CF Parameter Set
g) Modification of the FH Parameter Set
h) Modification of the HT Information Element

An AP may classify other changes in the Beacon frame as critical updates.

The non-AP STA shall attempt to receive the next Beacon frame when it receives a Check Beacon field that contains a value that is different from the previously received Check Beacon field.

When dot11MgmtOptionMultiBSSIDActivated is true, the bitmap of the TIM element is interpreted as specified in 7.3.2.6.

When dot11MgmtOptionMultiBSSIDActivated is true, the A1 field of the TIM frame is the Broadcast address, the A2 field and the A3 field are set to the transmitted BSSID.

11.2.1.16 WNM-Sleep mode

11.2.1.16.1 WNM-Sleep mode capability

Implementation of the WNM-Sleep mode capability is optional for a WNM STA. A STA that implements WNM-Sleep mode has the MIB attribute dot11MgmtOptionWNMSleepModeImplemented set to true. When dot11MgmtOptionWNMSleepModeImplemented is true, dot11WirelessManagementImplemented shall be true. A STA where the MIB attribute dot11MgmtOptionWNMSleepModeActivated is true is defined as a STA that supports WNM-Sleep mode. A STA supporting WNM-Sleep mode shall set the WNM-Sleep Mode field of the Extended Capabilities information element to 1. When dot11MgmtOptionWNMSleepModeActivated is true, dot11MgmtOptionTFSActivated shall be true.

A STA with a value of true for the MIB attribute dot11MgmtOptionWNMSleepModeActivated may send a WNM-Sleep Mode Request or WNM-Sleep Mode Response frame to a STA within the same infrastructure BSS whose last received Extended Capabilities information element contained a value of 1 for the WNM-Sleep Mode bit in the Capabilities field. WNM-Sleep mode is a service that may be provided by an AP to its associated STAs. The WNM-Sleep mode is not supported in an IBSS.

WNM-Sleep Mode enables an extended power save mode for non-AP STAs in which a non-AP STA need not listen for every DTIM Beacon frame, and need not perform GTK/IGTK updates. The non-AP STA can sleep for extended periods as indicated by the WNM-Sleep Interval.

11.2.1.16.2 WNM-Sleep mode non-AP STA operation

To use the WNM-Sleep mode service, the non-AP STAs SME shall issue an MLME-SLEEPMODE.request primitive to send a WNM-Sleep Mode Request frame. The MLME-SLEEPMODE.request primitive shall include a valid SleepMode parameter with a WNM-Sleep Mode element. The Action Type field in the WNM-Sleep Mode element shall be set to “Enter WNM-Sleep Mode”, and the Sleep Interval field shall be included. The Sleep Interval field shall be less than the BSS Max idle period (see 11.22.12). The MLME-SLEEPMODE.request primitive shall also include a valid TFSRequest parameter as defined in the TFS Request information element that the AP shall use as triggers to set the STA’s TIM bit.

When a traffic filter for group addressed frames is enabled at the AP, the STA may request a notification frame (see 11.22.11.2) be sent when requesting the establishment of the traffic filter.

The receipt of an MLME-SLEEPMODE.confirm primitive with a valid SleepMode parameter indicates to the STA's SME that the AP has processed the corresponding WNM-Sleep Mode Request frame. The content of the WNM-Sleep mode parameter in the WNM-Sleep Mode Response frame provides the status of WNM-Sleep Mode information elements processed by the AP. If RSN is used without management frame protection, the non-AP STA shall delete the GTKSA if the response indicates success.

While in WNM-Sleep mode, the non-AP STA need not wake up every DTIM interval for group addressed frames.

The STA wakes up every Sleep interval to check whether the corresponding TIM bit is set or group addressed traffic is pending. The non-AP STA does not participate in GTK/IGTK updates.

To exit WNM-Sleep mode, the non-AP STA's SME shall issue an MLME-SLEEPMODE.request primitive to send a WNM-Sleep Mode Request frame with an Action Type field in the WNM-Sleep Mode element set to "Exit WNM-Sleep Mode".

11.2.1.16.3 WNM-Sleep mode AP operation

When an AP's SME receives an MLME-SLEEPMODE.indication primitive with a valid SleepMode parameter and an Action Type in the WNM-Sleep Mode element of "Enter WNM-Sleep Mode", it shall issue an MLME-SLEEPMODE.response primitive with SleepMode parameters indicating the status of the request.The value of the Action Type field of the WNM-Sleep Mode element in the WNM-Sleep Mode Response frame shall be set to "Enter WNM-Sleep Mode".

When WNM-Sleep mode is enabled for an associated STA, the AP shall stop sending all individually addressed MPDUs to the non-AP STA. The AP may disassociate or deauthenticate the STA at any time for any reason while the non-AP STA is in WNM-Sleep mode. An AP shall perform the TFS AP operation, as specified in 11.22.11 for non-AP STAs for which it has received TFS Request elements. The AP shall set the TIM bit corresponding to the AID of the associated STA for which the AP has queued either a TFS Notify frame or matching frame. An AP shall not perform GTK/IGTK updates for the STAs in WNM-Sleep Mode.

When an AP's SME receives an MLME-SLEEPMODE.indication primitive with a valid SleepMode parameter and an Action Type in the WNM-Sleep Mode element of "Exit WNM-Sleep Mode", the AP shall disable WNM-Sleep mode service for the requesting STA, and the AP's SME shall issue an MLME-SLEEPMODE.response primitive with a SleepMode parameter indicating the status of the associated request. If RSN is used with Management Frame Protection and a valid PTK is configured for the STA, the current GTK and IGTK shall be included in the WNM-Sleep Mode Response frame. If a GTK/IGTK update is in progress, the pending GTK and IGTK shall be included in the WNM-Sleep Mode Response frame.

If RSN is used with Management Frame Protection and a valid PTK is configured for the STA, the current GTK and IGTK shall be included in the WNM-Sleep Mode Response frame. If a GTK/IGTK update is in progress, the pending GTK and IGTK shall be included in the WNM-Sleep Mode Response frame. If RSN is used without Management Frame Protection and a valid PTK is configured for the STA, the current GTK shall be sent to the STA in a GTK update following the WNM-Sleep Mode Response frame.

11.4 TS operation

11.4.4 TS setup

Insert new rows into Table 11-2 as follows:

Table 11-2—Encoding of ResultCode to Status Code field value

ResultCode	Status code
REQUESTED_TCLAS_NOT_SUPPORTED	80
TCLAS_RESOURCES_EXHAUSTED	81
REJECTED_WITH_SUGGESTED_BSS_TRANSITION	82

Change the fifth paragraph as follows:

The SME in the HC decides whether to admit the TSPEC with its associated TCLAS element(s) (if present) and TCLAS processing element (if present), as specified, refuse the TSPEC, or not admit but suggest an alternative TSPEC or TCLAS element(s) or TCLAS processing element. The SME then generates an MLME-ADDTS.response primitive containing the TSPEC, zero or more TCLAS element(s) (only if present in the request) and TCLAS processing element (only if present in the request) and a ResultCode value. The contents of the TSPEC, TCLAS element(s) (if present), TCLAS processing element (if present) and Status fields contain values specified in 10.3.24.4.2. The SME may include fewer TCLAS elements in the MLME-ADDTS.response primitive than were present in the request; when the SME's response includes a single TCLAS element, it shall not include a TCLAS processing element. If the SME changes a TCLAS element's Classifier Type field in the MLME-ADDTS.response primitive but is unable to suggest a value for the Classifier Mask field, it shall set that field to zero. If the SME changes a TCLAS element's Classifier Type field or Classifier Mask field in the MLME-ADDTS.response primitive but is unable to suggest values for one or more Classifier Parameter subfields, it shall set those subfields to zero.

Change the seventh paragraph as follows:

The non-AP STA SME decides whether the response meets its needs. How it does this is beyond the scope of this standard. If the result code is SUCCESS, the TS enters into an active state. If the result code is REJECTED_WITH_SUGGESTED_BSS_TRANSITION, the non-AP STA may try to transition to other BSSs. Otherwise the whole process using the same TSID and direction and a modified TSPEC until the non-AP STA SME decides that the granted TXOP is adequate or inadequate and cannot be improved. In case that the non-AP STA is recommended to transition to other BSSs, it should do so according to the process defined in 11.22.6. Once the transition is completed, it should proceed with a TS setup process with the new HC.

Change the eighth paragraph as follows:

The non-AP STA's SME decides whether the response meets its needs. How it does this is beyond the scope of this standard. A non-AP STA's SME receiving a modified TCLAS element having a Classifier Mask field set to zero or Classifier Parameter subfields set to zero should regard these values as meaning that no suggested value has been provided by the HC. If the result code is SUCCESS, the TS enters into an active state. Otherwise, the whole process can be repeated using the same TSID and direction and a modified TSPEC, optional TCLAS element(s) and an optional TCLAS processing element until the non-AP STA SME decides that the granted ~~TXOP~~ medium time is adequate or inadequate and cannot be improved.

11.10 Radio measurement procedures

11.10.7 Triggered autonomous reporting

Change the third paragraph of 11.10.7 as follows:

Triggered autonomous reporting is defined ~~only~~ for the Transmit Stream/Category Measurement measurement type – see 11.10.8.8. When dot11MgmtOptionMulticastDiagnosticsActivated is true, triggered autonomous reporting is used for Multicast Diagnostics (11.10.16). When dot11MgmtOptionTriggerSTAStatisticsActivated is true, triggered autonomous reporting is used for STA Statistics Reports (11.10.8.5).

Insert the following at the end of 11.10.7:

A number of triggered measurements may run concurrently at a non-AP STA. The number of simultaneous triggered measurements supported is outside the scope of the standard. Each triggered measurement is logically separate; reporting conditions such as Trigger Timeout periods shall only apply to the measurement for which they are established.

11.10.8 Specific measurement usage

11.10.8.5 STA statistics report

Insert the following at the end of 11.10.8.5:

A STA may request that a STA Statistics report be sent when statistics of interest reach a threshold as defined in the Measurement Request element of the STA Statistics Request frame (see 7.3.2.21.8). This is termed a triggered STA Statistics measurement. Implementation of Triggered STA Statistics Reporting is optional for a WNM STA. A STA that implements Triggered STA Statistics Reporting has the MIB attribute dot11MgmtOptionTriggerSTAStatisticsImplemented set to true. When dot11MgmtOptionTriggerSTAStatisticsImplemented is true, dot11WirelessManagementImplemented shall be true.

A triggered STA Statistic measurement shall be requested by setting the Enable and Report bits to 1 within a Measurement Request element containing the STA Statistics Measurement Type. The Measurement Request field shall contain a STA Statistics Request with the trigger conditions specified in the Triggered Reporting subelement, as defined in 7.3.2.21.8. One or more trigger conditions shall be set with specified thresholds. See 11.10.7. To prevent generation of too many triggered reports, the value of the Trigger Timeout field shall be set to a value greater or equal to the value of dot11MinTriggerTimeout. If the value of the Trigger Timeout field is less than the value of dot11MinTriggerTimout, the STA shall reject the measurement request and respond with a report where the Measurement Report Mode field is “Incapable”.

A STA accepting a triggered STA Statistics measurement shall measure the requested statistics. If a trigger condition occurs, the measuring STA shall send a STA Statistics measurement report to the requesting STA. The measuring STA shall not send further triggered STA Statistics reports for that trigger condition to the requesting STA until the Trigger Timeout period specified in the request frame has expired. The STA Statistics measurement report is defined in 7.3.2.22.8. If the number of MPDUs or MSDUs indicated in the Measurement Count field are transmitted or received without any of the counted statistics meeting the corresponding trigger threshold then the measuring STA shall restart measuring for another measurement count window.

If a STA receives a STA Statistics measurement request from the same STA for which a triggered STA Statistics measurement is in progress, the in progress triggered measurement shall be terminated.

STA Statistics reported in a triggered STA Statistics report shall be the values accumulated over the number of transmitted or received MSDUs or MPDUs before the trigger condition is met. Measurement duration shall not be specified when requesting a triggered STA statistics measurement and the Measurement Duration field in the corresponding Measurement Request shall be set to 0.

All triggered STA Statistics measurements shall be terminated at a measuring STA by receiving a STA Statistics measurement request with the Enable bit set to 1 and the Report bit set to 0. A STA requesting a triggered STA Statistics measurement may update the trigger conditions by sending a STA Statistics measurement request specifying the new trigger conditions.

Once accepted by a measuring STA, a triggered STA Statistics measurement continues to be active until the measurement request is superseded by a STA Statistics measurement request from the requesting STA or the measuring STA disassociates or reassociates.

11.10.8.6 Location configuration information report

Change the fourth paragraph of 11.10.8.6 as follows:

An LCI request shall indicate a location request for the requesting STA, ~~or~~ the reporting STA, or a third STA with the MAC address specified in the Target MAC Address subelement, by setting the LCI request Location Subject field to indicate a Local, a ~~or~~ Remote or a third party request, respectively. Local LCI Measurement Request is used by the requesting STA to obtain its own location by asking “Where am I?”. Remote LCI Measurement Request is used by requesting STA to obtain location of reporting STA by asking “Where are you?”. Third party Location request is used by requesting STA to obtain location of a STA with the MAC address specified in the Target MAC Address subelement.

Insert the following paragraphs after the sixth paragraph of 11.10.8.6:

If dot11RRM3rdPartyMeasurementActivated is false, a STA shall reject any LCI Request that includes a LCI Request with the Location Subject field set to 2 and shall respond with a Radio Measurement Report frame including an Radio Measurement Report element with the incapable bit set to 1.

It is optional for a STA to support an LCI Request and an LCI Report with the Location Subject field set to 2. If dot11RRM3rdPartyMeasurementActivated is true and a STA supports LCI Request and LCI Report, the following procedure shall be followed:

- When a non-AP STA requests the geospatial location of a STA with the MAC address specified in the Target MAC address field, it shall also include its own MAC address in the Originator Requesting STA MAC address field. When an AP STA receives an LCI Request with the Location Subject field value set to 2, the AP STA shall generate an LCI Request to the STA with the MAC address specified in the Target MAC address field. If the AP does not have an association with the STA with the MAC address specified in the Target MAC address field, the AP STA shall reject the received LCI Request and shall respond with a LCI Report where the Incapable bit is set in the MeasurementReport Mode field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the request from the received LCI request.
- When a STA receives an LCI Request with the Location Subject field value set to 2, the STA shall only generate an LCI Report if the MAC address in the Target MAC address field is its own MAC address. When an LCI Report is generated, the reporting STA shall include its MAC address into the Target MAC address field and the MAC address present in the Originator Requesting STA MAC address field of the corresponding LCI Request into the Originator Requesting STA MAC address field. When an AP STA receives an LCI Report with an Originator Requesting STA MAC address field present, the AP STA shall generate an LCI Report to the associated STA with the MAC address specified in the Originator Requesting MAC address field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the LCI report being transmitted to the originating requesting STA.

Insert the following at the end of 11.10.8.6:

If dot11RRMLCIMeasurementEnabled is true and a STA has its own location configured in LCI format, it shall set the Geospatial Location field to 1 in the Extended Capabilities information element (see 7.3.2.27).

NOTE—User Applications should not send location information to other stations without the express permission of the user. User agents acquire permission through a user interface, unless they have prearranged trust relationships with users. Those permissions that are acquired through the user interface and that are preserved beyond the current browsing session (i.e., beyond the time when the BSS connection is terminated) are revocable and receiving stations should respect revoked permissions. Some user applications may have prearranged trust relationships that do not require such user interfaces. For example, while a social networking application might present a user interface when a friend performs a location request, a VOIP telephone might not present any user interface when using location information to perform an E911 function.

Insert the following subclauses after 11.10.8.8:

11.10.8.9 Location Civic report

If dot11RRMCivicMeasurementActivated is true and civic location information is not available, the STA shall reject a Location Civic Request and shall respond with a Measurement Report frame including a Measurement Report element with the incapable bit set to 1. If dot11RRMCivicMeasurementActivated is true and civic location information is available, the STA shall respond with a Measurement Report frame including one Location Civic Report element.

A Location Civic Request shall indicate a location request for the requesting STA, the reporting STA, or a third STA with the MAC address specified in the Target MAC address field, by setting the Location Civic request Location Subject field to indicate a Local, a Remote, or a third party request respectively. Local Location Civic Measurement Request is used by requesting STA to obtain its own location by asking “Where am I?”. Remote Location Civic Measurement Request is used by requesting STA to obtain location of the reporting STA by asking “Where are you?”. Third party Location request is used by requesting STA to obtain location of a STA with the MAC address specified in the Target MAC address field.

If dot11RRMCivicMeasurementActivated is false, a STA shall reject the received Location Civic Measurement Request and shall respond with a Location Civic Report where the Incapable bit is set in the Measurement Report Mode field.

If dot11RRM3rdPartyMeasurementActivated is false, a STA shall reject any LCI Request that includes a LCI Request with the Location Subject field set to 2 and shall respond with a Radio Measurement Report frame including an Radio Measurement Report element with the incapable bit set to 1.

It is optional for a STA to support a Location Civic Request and a Location Civic Report with the Location Subject field set to 2. If dot11RRM3rdPartyMeasurementActivated is true and a STA supports Location Civic Request and Location Civic Report, the following procedure shall be followed:

— When a non-AP STA requests the civic location of a STA with the MAC address specified in the Target MAC address field, it shall also include its own MAC address in the Originator Requesting STA MAC address field. When an AP STA receives a Location Civic Request with the Location Subject field value set to 2, the AP STA shall generate a Location Civic Request to the STA with the MAC address specified in the Target MAC address field. If the AP does not have an association with the STA with the MAC address specified in the Target MAC address field, the AP STA shall reject the received Location Civic Measurement Request and shall respond with a Location Civic Report where the Incapable bit is set in the Measurement Report Mode field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the request from the received Location Civic Request.

— When a STA receives a Location Civic Request with the Location Subject field value set to 2, the STA shall only generate a Location Civic Report if the MAC address in the Target MAC address field is its own MAC address. When a Location Civic Report is generated, the reporting STA shall include its MAC address into the Target MAC address field and the MAC address present in the Originator Requesting STA MAC address field of the corresponding Location Civic Request into the Originator Requesting STA MAC address field. When an AP STA receives a Location Civic Report with an Originator Requesting STA MAC address field present, the AP STA shall generate a Location Civic Report to the associated STA with the MAC address specified in the Originator Requesting MAC address field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the Location Civic Report being transmitted to the originating requesting STA.

When a STA receives a Location Civic Request with the subject field set to 2, but does not support third party location, it shall respond with a Radio Measurement Report frame including a Radio Measurement Report element with the incapable bit set to 1.

If dot11RRMCivicMeasurementActivated is true and a STA has its own location configured in Civic format, it shall set the Civic Location field to 1 in the Extended Capabilities information element.

If dot11RRMCivicMeasurementActivated is true and a STA has its own location available in one or more location formats, as defined in Table 7-29r, and includes Civic Location Type Value 0, indicating "RFC4776-2006", it shall set the Civic Location field to 1 in the Extended Capabilities information element.

NOTE—User Applications should not send location information to other stations without the express permission of the user. User agents acquire permission through a user interface, unless they have prearranged trust relationships with users. Those permissions that are acquired through the user interface and that are preserved beyond the current browsing session (i.e., beyond the time when the BSS connection is terminated) are revocable and receiving stations should respect revoked permissions. Some user applications may have prearranged trust relationships that do not require such user interfaces. For example, while a social networking application might present a user interface when a friend performs a location request, a VOIP telephone may not present any user interface when using location information to perform an E911 function.

If the Location Civic Report contains the Location Reference and Location Shape subelements, the receiving STA may use the information specified in those subelements in combination with the Civic Location field value for additional granularity on the position reported in the Civic Location field.

If the Location Civic Report contains the Map Image subelement, the receiving STA's SME may retrieve the floor plan specified by the Map URL field. The method to retrieve the floor plan specified by the Map URL field is out of scope of this document.

11.10.8.10 Location Identifier Report

The Location Identifier Report provides the ability for a STA to receive an indirect URI reference and forward that reference to an external agent for the purposes of that agent gathering the STA's location value. The protocol used to query for a location report based on the Public Identifier URI provided in the Location Identifier Report is beyond the scope of this standard.

If dot11RRMIdentifierMeasurementActivated is true and location information is not available, the STA shall reject any Location Identifier Request and shall respond with a Measurement Report frame including a Measurement Report element with the incapable bit set to 1. If dot11RRMIdentifierMeasurementActivated is true and location information is available, the STA shall respond with a Measurement Report frame including one Location Identifier Report element.

A Location Identifier Request shall indicate a location request for the requesting STA, the reporting STA, or a third party STA with the MAC address specified in the Target MAC address field, by setting the Location Identifier request Location Subject field to indicate a Local, a Remote, or a Third party request respectively. Local Location Identifier Request is used by requesting STA to obtain its own location by asking "Where am I?". Remote Location Civic Measurement Request is used by requesting STA to obtain location of the reporting STA by asking “Where are you?”. Third party Location request is used by requesting STA to obtain location of a STA with the MAC address specified in the Target MAC address field.

If dot11RRM3rdPartyMeasurementActivated is false, a STA shall reject any LCI Request that includes a LCI Request with the Location Subject field set to 2 and shall respond with a Radio Measurement Report frame including an Radio Measurement Report element with the incapable bit set to 1.

It is optional for a STA to support a Location Identifier Request and a Location Identifier Report with the Location Subject field set to 2. If dot11RRM3rdPartyMeasurementActivated is true and a STA supports Location Identifier Request and Location Identifier Report, the following procedure shall be followed:

— When a non-AP STA requests the location identifier of a STA with the MAC address specified in the Target MAC address field, it shall also include its own MAC address in the Originator Requesting STA MAC address field. When an AP STA receives a Location Identifier Request with the Location Subject field value set to 2, the AP STA shall generate a Location Identifier Request to the STA with the MAC address specified in the Target MAC address field. If the AP does not have an association with the STA with the MAC address specified in the Target MAC address field, the AP STA shall reject the received Location Identifier Request and shall respond with a Location Identifier Report where the Incapable bit is set in the Measurement Report Mode field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the request from the received Location Identifier Request.
— When a STA receives a Location Identifier Request with the Location Subject field value set to 2, the STA shall only generate a Location Identifier Report if the MAC address in the Target MAC address field is its own MAC address. When a Location Identifier Report is generated, the reporting STA shall include its MAC address into the Target MAC address field and the MAC address present in the Originator Requesting STA MAC address field of the corresponding Location Identifier Request into the Originator Requesting STA MAC address field. When an AP STA receives a Location Identifier Report with an Originator Requesting STA MAC address field present, the AP STA shall generate a Location Identifier Report to the associated STA with the MAC address specified in the Originator Requesting MAC address field. The AP STA shall copy the Originator Requesting STA MAC address and Target MAC address fields into the Location Identifier Report being transmitted to the originating requesting STA.

When a STA receives an Location Identifier Request with the subject field set to 2, but does not support third party location, it shall respond with a Radio Measurement Report frame including a Radio Measurement Report element with the incapable bit set to 1.

If dot11RRMIdentifierMeasurementActivated is false, a STA shall reject the received Location Identifier Request and shall respond with a Location Identifier Report where the Incapable bit is set in the Measurement Report Mode field.

If dot11RRMIdentifierMeasurementActivated is true and a STA has its own location available in one or more location formats, as defined in Table 7-29r, and includes Civic Location Type Value 0, indicating “RFC4776-2006” or Geospatial format that can be referenced by a location identifier, it shall set the Identifier Location field to 1 in the Extended Capabilities information element.

NOTE—User Applications should not send location information to other stations without the express permission of the user. User agents acquire permission through a user interface, unless they have prearranged trust relationships with users. Those permissions that are acquired through the user interface and that are preserved beyond the current browsing session (i.e., beyond the time when the BSS connection is terminated) are revocable and receiving stations should respect revoked permissions. Some user applications may have prearranged trust relationships that do not require such user interfaces. For example, while a social networking application might present a user interface when a friend performs a location request, a VOIP telephone may not present any user interface when using location information to perform an E911 function.

11.10.11 Multiple BSSID set

Insert a sentence at the end of 11.10.11 as follows:

A single Beacon frame may contain elements for the Multiple BSSID Set members, see 11.1.2.3a.

Insert following new subclauses after 11.10.15:

11.10.16 Multicast diagnostic reporting

Multicast diagnostic reporting enables an AP to collect statistics on group addressed traffic at associated STAs. The method an AP uses to determine the multicast groups to which an associated STA is a member of is outside the scope of the standard, and is typically performed by higher layer protocols. The Multicast Diagnostic Request and Multicast Diagnostic Report fields are defined in 7.3.2.21.12 and 7.3.2.22.11, respectively.

A STA that has a value of true for the MIB attribute dot11MgmtOptionMulticastDiagnosticsActivated is defined as a STA that supports multicast diagnostics reporting. A STA for which the MIB attribute dot11MgmtOptionMulticastDiagnosticsActivated is true shall set the Multicast Diagnostics field of the Extended Capabilities information element to 1. When the Multicast Diagnostics field in the Extended Capabilities field is 1, the Incapable bit in the Measurement Report Mode field of a Multicast Diagnostic Report shall not be set to 1.

Multicast diagnostic reporting may use the triggered autonomous reporting capability described in 11.10.7.

The Measurement Start Time field of a triggered diagnostic report shall contain the value of the STA TSF Timer at the time the trigger condition started to occur to an accuracy of ±1 TU.

An AP may send a Multicast diagnostic request consisting of one or more Multicast Diagnostic Request fields in a Radio Measurement Request frame to a non-AP STA that has indicated support of the multicast diagnostic capability or to a multicast group address if all associated non-AP STAs support the multicast diagnostic capability. If the STA accepts the request it shall count the number of received MSDUs with the specified group address and the STA shall record the maximum observed PHY data rate of the frames that contained these MSDUs during the requested Measurement Duration. These two values shall be returned in a Multicast Diagnostic Report Measurement Report in a Radio Measurement Report frame, as defined in 7.3.2.22.11. A non-AP STA shall not transmit a Radio Measurement Request frame containing a Multicast Diagnostic Request. A STA shall not respond to a Radio Measurement Request frame containing a Multicast Diagnostic Request received from a STA other than the AP with which it is associated.

An AP may request that triggered Multicast Diagnostic reporting be enabled at associated non-AP STAs that have indicated support of the multicast diagnostic capability. To enable Multicast Diagnostic reporting, the AP shall send a Measurement Request element containing a Multicast Diagnostic Request Type and with the Enable and Report bits set to 1 within a Radio Measurement Request frame. See 11.10.7. For triggered Multicast Diagnostic reporting, the Multicast MAC Address and trigger conditions for diagnostic reporting shall be specified in the request.

Multicast Diagnostic reporting may be requested for broadcast traffic by setting the Multicast MAC Address field to the broadcast address.

A non-AP STA accepting a request for triggered multicast diagnostic reporting shall send a Multicast Diagnostic Report to the requesting STA if the specified trigger condition occurs. The measuring non-AP STA shall not send further triggered Multicast Diagnostic Reports until the period specified in the Re-activation Delay field in the Multicast Diagnostic Request has expired, or the non-AP STA receives a revised trigger condition from a Multicast Diagnostic Request. To prevent generation of too many triggered reports, the minimum value of the Re-activation Delay field shall be set to a value greater or equal to the value of dot11MinTriggerTimeout.

Once accepted, Multicast Diagnostic reporting continues to be active for the specified Multicast MAC address until one of the following occurs:

— The STA receives a Measurement Request element containing a Multicast Diagnostic Request Type and with the Enable bit set to 1 and the Report bits set to 0 within a Radio Measurement Request frame.
— Receipt of a Measurement Request element containing a Multicast Diagnostic Request Type, with the Enable and Report bits set to 1, but with no trigger conditions.
— The STA leaves the Multicast Group or disassociates.
— The STA sends a Measurement Report element with the Measurement Result bit set to 1.

The STA shall maintain an inactivity timer for every multicast diagnostic request accepted by the STA in which the Inactivity Timeout Request field is 1. When a timeout of the inactivity timer is detected, the STA shall send a multicast diagnostic report with the inactivity Timeout Trigger field in the Multicast Reporting Reason field set to 1. The inactivity timer at a recipient is reset when MSDUs corresponding to the monitored group address are received.

A STA that declines a request for triggered multicast diagnostic reporting sends a Measurement Report element (as described in 7.3.2.22) in a Radio Measurement Report frame (as described in 7.4.1.2) with the Measurement Report Mode field set appropriately to indicate the reason for a failed or rejected request.

Change 11.20 as follows:

11.20 Time Advertisement

11.20.1 Introduction

A STA that sends a Timing Advertisement frame shall maintain a TSF Timer in order to set the Timestamp field in this frame. When a STA transmits the Timing Advertisement, Probe Response, or Beacon frame, the Timestamp shall be set to the value of the STA's TSF timer at the time that the data symbol containing the first bit of the Timestamp is transmitted to the PHY plus the transmitting STA's delays through its local PHY from the MAC-PHY interface to its interface with the WM [e.g., antenna, light emitting diode (LED) emission surface].

A STA can advertise a time standard by transmitting a Timing Advertisement, Probe Response or Beacon frame, which includes the Time Advertisement information element. As defined in 7.3.2.61 the Time Advertisement information element contains two estimates. The Time Value field contains an estimate of the difference between a time standard and the timestamp included in the same frame. The Time Error field contains an estimate of the standard deviation of the error in the estimate in the Time Value field. The time standard can be derived from an external time source. A STA with an external time source can implement an estimator in a variety of ways, which are beyond the scope of this standard.

11.20.2 Timing Advertisement Frame procedures

The SME provides the Time Advertisement information element to the MLME when it requests the MLME to send a Timing Advertisement frame. When a Timing Advertisement frame is received by a STA its MLME reports the Timestamp, Local Time, Time Advertisement information element, and estimates of propagation delay to the SME. For a STA that maintains a TSF Timer and receives a Timing Advertisement frame, Local Time is the value of the STA's TSF timer at the start of reception of the first octet of the Timestamp field of the frame. Otherwise, the Local Time is unspecified. The receiving STA's SME can use the Timestamp, Local Time, and Time Advertisement information element to align its estimate of the time standard to the transmitting STA's estimate of the corresponding time standard.

11.20.3 UTC TSF Offset procedures

When dot11MgmtOptionUTCTSFOffsetActivated is true, the Time Advertisement and Time Zone elements shall be included in all Probe Response frames, and the Time Advertisement element shall be included in the Beacon frame every dot11TimeAdvertisementDTIMInterval DTIMs. When the dot11MgmtOptionUTCTSFOffsetActivated is false, the Time Advertisement and Time Zone elements shall not be included in Beacon and Probe Response frames.

The AP should periodically synchronize to a UTC reference clock 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.

Insert the following after 11.21:

11.22 Wireless network management procedures

11.22.1 Wireless network management dependencies

When dot11WirelessManagementImplemented is true, the STA is a WNM STA and dot11ExtendedChannelSwitchEnabled and dot11RadioMeasurementEnabled shall be true. This subclause describes WNM procedures for requesting and reporting WNM capabilities between STAs that support WNM procedures.

When dot11WirelessManagementImplemented is true, and one or more of bit 7 to bit 27 in the Extended Capabilities information element are set to 1, the Extended Capabilities information element shall be included in Beacon frames, Association Request and Response frames, Reassociation Request and Response frames, and Probe Request and Response frames. When dot11WirelessManagementImplemented is true, for each bit 7 to bit 27 in the received Extended Capabilities information element that is 0, a STA shall not request the corresponding feature from the sending STA. A WNM STA receiving a request for a WNM feature from another STA shall reject the request if the receiving WNM STA has not advertised support for the corresponding WNM feature.

11.22.2 Event request and report procedures

11.22.2.1 Event request and event report

The Event Request and Event Report frames enable network real-time diagnostics. A STA that has a value of true for the MIB attribute dot11MgmtOptionEventsActivated is defined as a STA that supports event requests and reports. A STA for which the MIB attribute dot11MgmtOptionEventsActivated is true shall set the Event field of the Extended Capabilities information element to 1. If dot11MgmtOptionEventsActivated is true, a STA shall log all Transition, RSNA, Peer-to-Peer, and WNM Log events, including the corresponding TSF, UTC Offset and Event Time Error.

The STA log of events shall not be cleared as a result of BSS transitions. However, if the STA moves to a different ESS or IBSS, the STA shall delete all event log entries.

A STA that supports event reporting shall only send an Event Request or Event Report frame to a STA within the same infrastructure BSS or the same IBSS whose last received Extended Capabilities information element contained a value of 1 for the Event bit in the Capabilities field. If the STA receives an Event

Request frame without error and it supports event reporting, it shall respond with an Event Report frame that includes the Dialog Token that matches the one in the Event Request frame.

The permitted source and destination STAs for an Event Request frame are shown in Table 11-14.

An AP may include zero or more Event Request elements in an Event Request frame. Each Event Request element contains an Event Token that associates this Event Request with any subsequent Event Report elements. When sending Event Report elements, a STA shall use the same Event Token that was included in the original request.

Only a single Event Request frame from a STA is outstanding at a given STA at any time. If a STA that supports event reporting receives a subsequent Event Request frame with a different Dialog Token before completing the Event Report for the previous request from the requesting STA, the receiving STA shall only respond to the most recent request frame.

Upon a BSS transition, the STA shall cancel any event requests in the latest Event Request frame.

The Event Request elements can contain conditions that specify events to be reported and conditions that establish event reporting when a STA experiences problems or failures. A STA sends an Event Request frame containing one or more Event Request elements, each of which contains zero or more subelements. Subelements are defined for each event type. A STA shall include in the corresponding Event Report element only those events that meet the specified event conditions within the current ESS or IBSS.

In each Event Report element, a STA shall include a Status field that indicates the result of the event request/ report transaction. If the STA is able to return one or more Event Report elements, then the STA shall return a value of “Successful” in the Event Report element. If the STA has no logged events of the requested type, the STA shall return a value of Successful in the Event Report element without an event included in the Event Report field. If the STA is unable to process the request at that time, the STA shall return a value of “Request failed” in the Event Report element. If a STA refuses an event request, the STA shall return a value of “Request refused” in the Event Report element. The reasons for refusing an event request are outside the scope of this standard but may include reduced quality of service, unacceptable power consumption, measurement scheduling conflicts, or other significant factors. If the STA is incapable of generating an Event Report of the type specified in the Event Request frame, the STA shall return a value of “Request incapable” indicating that the requester should not request again.

If the Event Report elements do not fit into a single MMPDU, the reporting STA shall send the remaining elements in additional Event Report frames until all Event Report elements have been returned to the requesting STA. In any subsequent Event Report frame and for all remaining Event Report elements a reporting STA shall include the same Dialog Token and Event Token, respectively, that was sent in the corresponding Event Request frame. When multiple MMPDUs are required, the non-AP STA shall include complete Event Report elements and shall not fragment an element across multiple MMPDUs.

A STA shall transmit both the Event Request frame and the Event Report frame only with an individually addressed destination address. In an infrastructure BSS, only an AP shall transmit an Event Request frame to a non-AP STA. An AP that supports event reporting shall discard received Event Request frames.

When a STA transmits an Event Request frame to another STA it shall indicate the types of events requested by setting the Event Type field and shall indicate the maximum number of logged events to report by using the Event Response Limit field in each included Event Request element. If the number of available logged events of the requested type exceeds the Event Response Limit, the STA shall only report an Event Response Limit number of the most recent events. If there are no available logged events of the type specified in the Event Request frame, the STA shall send the Event Report frame without any Event Report element. The reporting STA shall send all available Event Report elements for the requested Event Type when the Event Request field is not present in the Event Request element.

A STA may include a Destination URI element in the Event Request frame. The AP includes the URI in the Destination URI element that the reporting non-AP STA may use to send Event Reports, upon the loss or interruption of connectivity to the BSS.

On receipt of an Event Request frame with an Destination URI element, the reporting non-AP STA SME may send the Event Report to the AP using the Destination URI with another network interface (if available). The non-AP STA SME shall only send the Event Report to the URI contained in the Destination URI element after detecting loss of BSS connection.

The non-AP STA shall determine loss of connection to the AP that issued the Event Request frame when it has not detected any Beacon frames from the AP for a period no less than the ESS Detection Interval.

If the BSS connection is re-established to the AP that transmitted the Event Request frame, the non-AP STA shall transmit the corresponding Event Report frame to the AP without using the Destination URI.

When the non-AP STA uses the Destination URI mechanism, it shall transport the payload of the Event Report frame using the URI given in the Destination URI Element. An example use of the Destination URI is given in Annex W.

11.22.2.2 Transition event request and report

The Transition Event report provides information on the previous transition events for a given non-AP STA. The Transition Event request and report are only permitted in the Infrastructure BSS.

Each STA supporting the Transition Event shall log up to and including the last five Transition events occurring since the STA associated to the ESS. A STA may log more than five of the most recent Transition events.

Upon receipt of an Event Request frame containing an Event Request element including a Transition Event request, the non-AP STA shall respond with an Event Report frame that includes available Event Report elements within the current ESS for the Transition event type.

Transition Event Request subelements are used to specify conditions for reporting of transition events. If any Transition Event Request subelements are present in the Event Request frame, the reporting non-AP STA shall include in the Event Report frame only those available Transition Event Report elements that meet the transition event reporting condition(s) specified in the Event Request frame. If no transition event subelements are present in the Event Request field, the reporting STA shall include all available Transition Event Report elements. A STA that encounters an unknown subelement ID value in a transition event request received without error shall ignore that subelement and shall parse remaining Event Request fields for additional information subelements with recognizable subelement ID values.

A Frequent Transition subelement in an Event Request frame defines conditions for frequent transition. Frequent transition occurs when the number of BSS transitions exceeds the value of the Frequent Transition Count Threshold within the indicated Time Interval value as defined in the Frequent Transition subelement in 7.3.2.67.2. A STA that receives a Frequent Transition subelement shall, at each BSS transition, apply the conditions for frequent transition to the log of transition events. If the logged transition events meet the conditions for frequent transition, the STA shall send an Event Report frame including a Transition Event Report element with Event Report Status set to Detected Frequent Transition and include in that Event Report element the last logged transition event.

For transition logging and reporting purposes, the transition time is defined as the time difference between the starting time and the ending time of a transition between APs, even if the transition results in remaining on the same AP.

The starting time is one of the following items:

— The start of a search for an AP, when the transition reason is 4 (first association to WLAN).
— The latest time that a frame could have been transmitted or received on the source BSS.
— The start of a search for an AP, after determination that a transition has failed.

The ending time is one of the following items:

— The earliest time that a data frame can be transmitted or received on the target BSS, after completion of RSN, IEEE 802.1X, or other authentication and key management transmissions, when such are required by the target BSS.
— The time that a determination is made that the transition has failed.

11.22.2.3 RSNA event request and report

The RSNA Event Report provides authentication events for a given non-AP STA. The RSNA Event Request and Report are only permitted in an Infrastructure BSS.

Each STA supporting the RSNA Event shall log up to and including the last five RSNA events occurring since the STA associated to the ESS. A STA may log more than five of the most recent RSNA events.

Upon receipt of an Event Request frame containing an Event Request element including an RSNA Event request, the non-AP STA shall respond with an Event Report frame that includes available Event Report elements within the current ESS for the RSNA event type.

If an RSNA Event Request subelement is present in the Event Request field, the reporting non-AP STA shall include available Event Report elements that meet the specified condition for the RSNA event type. If no RSNA Event Request subelement is present in the Event Request field, the reporting STA shall include all available RSNA Event Report elements. A STA that encounters an unknown subelement ID value in an RSNA event request received without error shall ignore that subelement and shall parse remaining Event Request fields for additional information subelements with recognizable subelement ID values.

11.22.2.4 Peer-to-Peer Link event request and report

The Peer-to-Peer Link event report provides peer-to-peer connectivity events for a given non-AP STA. A Peer-to-Peer event occurs when a Peer-to-Peer link is initiated or terminated.

Each STA supporting the Peer-to-Peer event shall log up to and including the last five Peer-to-Peer events occurring since the STA associated to the ESS or IBSS. A STA may log more than five of the most recent Peer-to-Peer events. When a link is initiated, a STA shall log and record the TSF time of the Peer-to-Peer event without a connection time. When a Peer-to-Peer link is terminated, a STA shall log the Peer-to-Peer Link event including the connection time for the terminated link and shall delete from the log any initiation event for the same Peer-to-Peer link.

Upon receipt of an Event Request frame containing an Event Request element including a Peer-to-Peer Link event request, the non-AP STA shall respond with an Event Report frame that includes available Event Report elements within the current ESS or IBSS for the Peer-to-Peer event type. When a STA includes a Peer-to-Peer event report element for a link initiation, the STA shall include a connection time for the event report element which indicates the time difference from the event timestamp to the current time.

If a Peer-to-Peer Link Event Request subelement is present in the Event Request field, the reporting non-AP STA shall include available Event Report elements that meet the specified condition for the Peer-to-Peer event type. If no Peer-to-Peer Link Event Request subelements are present in the Event Request field, the reporting STA shall include all available Peer-to-Peer Event Report elements. A STA that encounters an unknown subelement ID value in a Peer-to-Peer event request received without error shall ignore that subelement and shall parse remaining Event Request fields for additional information subelements with recognizable subelement ID values.

11.22.2.5 WNM Log event request and report

The WNM Log event report is intended to capture PHY and MAC layer events related to the operation of those layers in vendor specific, human readable (ASCII text) form. The WNM Log is a general reporting mechanism that can apply to configuration or monitoring behavior for PHY and MAC. The WNM log is particularly useful for logging success or failure events across areas such as driver status, IEEE 802.11 or IEEE 802.1X authentication, authorization, status changes while associated or unassociated.

For example:

<0>Oct 03 17:47:00 00:01:02:03:04:05 Adapter DLL Service initialized
<1>Oct 03 17:48:40 00:01:02:03:04:05 Authentication started
<1>Oct 03 17:48:46 00:01:02:03:04:05 802.1X Authentication Failed, credential failure
<1>Oct 03 17:49:00 00:01:02:03:04:05 Authentication success

A non-AP STA that supports event reporting may be queried at any time for its current set of WNM Log messages. The WNM Log messages returned by the non-AP STA may provide insight into the trouble being experienced by non-AP STA.

Upon receipt of an Event Request frame containing an Event Request element including a WNM Log Event request, the non-AP STA shall respond with an Event Report frame that includes WNM Log Event Report elements.

11.22.2.6 Vendor Specific event request and report

The procedures for use of the Vendor Specific Event Request and Report are vendor specific and are not part of this standard.

11.22.3 Diagnostic request and report procedures

11.22.3.1 Diagnostic request and diagnostic report

The Diagnostic Request and Diagnostic Report protocol provides a tool to diagnose and debug complex network issues. A STA that has a value of true for the MIB attribute dot11MgmtOptionDiagnosticsActivated is defined as a STA that supports diagnostics reporting. A STA for which the MIB attribute dot11MgmtOptionDiagnosticsActivated is true shall set the Diagnostics field of the Extended Capabilities information element to 1.

A STA that supports diagnostics reporting shall only send a Diagnostics Request or Diagnostics Report frame to a STA within the same infrastructure BSS or the same IBSS whose last received Extended Capabilities information element contained a value of 1 for the Diagnostics bit in the Capabilities field.

The Diagnostic Request frame contains a unique Dialog Token. A Dialog Token value of zero is a reserved value and shall not be used. The source and destination of a Diagnostic Request frame shall both be members of the same BSS. The permitted source and destination STAs for a Diagnostic Request frame are shown in Table 11-14. A STA may include one or more Diagnostic Request elements in a Diagnostic Request frame. Each Diagnostic Request element contains a unique Diagnostic Token that identifies the element within the Diagnostic Request frame.

If a STA that supports diagnostic reporting receives a Diagnostic Request frame without error, the STA shall respond with a Diagnostic Report frame that includes the Dialog Token that matches the one in the

Diagnostic Request frame. Each Diagnostic Report element that corresponds to the Diagnostic Request element shall contain the same Diagnostic Token that was included in the original request.

Only a single Diagnostic Request frame from a STA is outstanding at a given STA at any time. If a STA receives a subsequent Diagnostic Request frame with a different Dialog Token before completing the Diagnostic Report for the previous request from the requesting STA, the STA shall only respond to the most recent Request frame. The STA need not send a Diagnostic Report frame for the previous Diagnostic Request frame.

All outstanding diagnostic requests, as indicated by received MLME-DIAGREQUEST.ind primitives, are cancelled upon a BSS transition, except when the BSS transition occurs as a result of responding to or initiating a diagnostic request. All outstanding diagnostic requests, as indicated by received MLME-DIAGREQUEST.indication primitives, are cancelled after the time indicated in the Diagnostic Timeout field, in the Diagnostic Request frame. When a STA that supports diagnostic reporting receives a Diagnostic Request frame with a Diagnostic Request Type of Cancel Diagnostic Request, the STA cancels all outstanding diagnostic requests, and discards all pending diagnostic reports, as indicated by received MLME-DIAGREQUEST.indication primitives.

All Diagnostic Report elements shall include a Status field that indicates the overall result of the transaction. If the STA is able to complete the diagnostic request made in the Diagnostic Request element, then a value of “Successful” shall be returned. If the STA is unable to process the request at that time a value of “Fail” shall be returned. If the STA is incapable of generating a report of the type specified, it shall return a value of “Incapable”. If the STA cannot support the request for any other reason, the value of Refused shall be returned.

A STA shall only transmit both the Diagnostic Request frame and the Diagnostic Report frame with an individually addressed destination address.

A STA may include a Destination URI element in the Event Request frame. The AP includes the URI in the Destination URI element that the reporting non-AP STA may use to send Diagnostic Reports, upon the loss or interruption of connectivity to the BSS.

On receipt of an Diagnostic Request frame with an Destination URI element, the reporting non-AP STA SME may send the Diagnostic Report to the AP using the Destination URI with another network interface (if available). The non-AP STA SME shall only send the Diagnostic Report to the URI contained in the Destination URI element after detecting loss of BSS connection.

The non-AP STA shall determine loss of connection to the AP that issued the Diagnostic Request frame when it has not detected any Beacon frames from the AP for a period no less than the ESS Detection Interval.

If the BSS connection is re-established to the AP that transmitted the Diagnostic Request frame, the non-AP STA shall transmit the corresponding Diagnostic Report frame to the AP without using the Destination URI.

When the non-AP STA uses the Destination URI mechanism, it shall transport the payload of the Diagnostic Report frame using the URI given in the Destination URI Element. An example use of the Destination URI is given in Annex W.

If a non-AP STA that receives an Destination URI subelement in an Diagnostic Request fails to detect any Beacon frames, belonging to the AP that issued the Diagnostic Report request, for the period specified by the ESS detection interval, it may use the URI specified in the Destination URI subelement to transport the Diagnostic Report to the AP.

If the Diagnostic Report elements do not fit into a single MMPDU, the reporting STA shall send the remaining elements in additional frames until all Diagnostic Report elements have been returned to the requesting STA. A STA shall include the same Dialog Token and Diagnostic Token that was transmitted in the corresponding Diagnostic Request frame in each subsequent Diagnostic Report frame and Diagnostic Report elements. When multiple MMPDUs are required, the STA shall include complete Diagnostic Report elements and shall not fragment an element across multiple MMPDUs.

A STA that supports diagnostic reporting may cancel a previously sent Diagnostic Request frame for which it has not yet received a Diagnostic Report frame by sending a Diagnostic Request frame with the Diagnostic Request Type field value of 0, indicating “Cancelled”, to the STA to which it previously sent the Diagnostic Request frame. A STA that supports diagnostic reporting shall inform a STA from which it has previously received a Diagnostic Request frame that the request has been locally cancelled by sending a Diagnostic Report frame with the Diagnostic Status field set to a value of 4, indicating “Cancelled”, to the requesting STA. In a Diagnostic Request frame with the Diagnostic Request Type field value of 0, and a Diagnostic Report frame with the Diagnostic Status field set to a value of 4, no Diagnostic Information subelements are included in the Diagnostic Request or Response element.

11.22.3.2 Configuration Profile report

The Configuration Profile report enables an AP to discover the current profile in use for an associated device, and additional profiles for the current ESS. A non-AP STA that supports diagnostic reporting and receives a Configuration Profile report request type shall respond with a Diagnostic Report frame that includes all available Diagnostic Information elements allowed for the type.

Devices that support multiple configuration profiles for an ESS may include multiple Diagnostic Report elements in a single Diagnostic Report frame (or multiple frames if required). Each Diagnostic Report element shall contain a Profile ID element that uniquely identifies the configuration profile(s) for the current ESS that are available on the device.

11.22.3.3 Manufacturer information STA report

The Manufacturer Information STA Report enables an AP to discover static manufacturer specific data about an associated STA device. A non-AP STA that supports diagnostic reporting and receives a Manufacturer Information STA Report request type shall respond with a Diagnostic Report frame that includes all available Diagnostic Information elements allowed for the type.

When more than one Antenna Type/Antenna Gain pair is enabled, multiple Antenna Type subelements, shall be included in the Manufacturer Information STA Report Diagnostic Report element.

When more than one Collocated Radio Type, or Device Type is supported, multiple Collocated Radio Type subelements, or Device Type subelements shall be included in the Manufacturer Information STA Report Diagnostic Report element. If the existence or the type of collocated radio is unknown, no Collocated Radio Type subelements shall be included.

11.22.3.4 Association diagnostic

The purpose of the association diagnostic is to determine that a STA is able to associate with a designated BSS. This test directs an association to be completed with a specific AP.

To initiate the test, an AP that supports diagnostic reporting shall send a Diagnostic Request frame containing a Diagnostic Request Type field set to 3 (i.e., Association Diagnostic) to a STA that supports diagnostic reporting. The AP shall not send an association diagnostic request with a designated BSS that is not part of the ESS and the STA receiving an association diagnostic request shall reject requests to perform diagnostics on a BSS that is not part of the ESS. All parameters required to complete the association are included in the Diagnostic Request element.

Upon receipt of the Diagnostic Request frame containing a Diagnostic Request element specifying an Association request, the STA determines whether or not to accept the request. If the STA declines the request, it shall send a Diagnostic Report frame with the Status field of a Diagnostic Report element set to Refused. If the STA accepts the request, it shall cause an authentication to occur to the AP indicated in the Diagnostic Request element and the STA's SME shall issue an MLME-DIAGREPORT.request primitive, indicating the results of the diagnostic.

One means to cause an authentication to occur is for the STA's SME to issue an MLME-DEAUTHENTICATE.request primitive to deauthenticate from the current AP, and an MLME-AUTHENTICATE.request primitive to authenticate to the AP indicated in the Diagnostic Request element. If successful, the STA shall issue an MLME-(RE)ASSOCIATE.request to associate to the AP indicated in the Diagnostic Request element. If successful, the STA's SME shall then issue an MLME-DEAUTHENTICATE.request to deauthenticate from the AP indicated in the Diagnostic Request element, reassociate to the AP from which it received the Diagnostic Request, and issue an MLME-DIAGREPORT.request primitive, indicating the results of the diagnostic

11.22.3.5 IEEE 802.1X authentication diagnostic

The purpose of the IEEE 802.1X authentication diagnostic is to determine that the STA is able to complete an IEEE 802.1X authentication with a designated BSS. This test directs an association and IEEE 802.1X authentication to be completed with a specific AP. If a STA that supports diagnostic reporting also supports RSN, the STA shall support the IEEE 802.1X authentication diagnostic.

To initiate the test, an AP that supports diagnostic reporting shall send a Diagnostic Request frame containing a Diagnostic Request Type field set to 4 (i.e., IEEE 802.1X Authentication Diagnostic) to a STA that supports diagnostic reporting. A STA that supports diagnostic reporting in an IBSS or an AP that supports diagnostic reporting shall not send an IEEE 802.1X authentication diagnostic request with a designated BSS that is not part of the ESS, or IBSS and a STA that supports diagnostic reporting which receives a diagnostic request shall reject requests to perform diagnostics on other networks. The AP, EAP method and credential type values included in the AP Descriptor, EAP Method and Credential Type subelements in the Diagnostic Request element shall be used to complete the association and IEEE 802.1X authentication.

Upon receipt of the Diagnostic Request frame containing a Diagnostic Request element specifying an IEEE 802.1X Authentication Diagnostic request, the STA determines whether or not to accept the request. If the STA declines the request, it shall send a Diagnostic Report frame with the Status field of a Diagnostic Report element set to Refused. If the STA accepts the request, it shall cause an IEEE 802.1X authentication to occur to the AP indicated in the Diagnostic Request element and the STA's SME shall issue an MLME-DIAGREPORT.request primitive indicating the results of the diagnostic.

One means to cause an authentication to occur is for the STA's SME to issue an MLME-DEAUTHENTICATE.request to deauthenticate from the current AP, and an MLME-AUTHENTICATE.request to authenticate to the AP indicated in the Diagnostic Request element. If successful, the STA shall issue an MLME-(RE)ASSOCIATE.request to the AP indicated in the Diagnostic Request element. If (re)association succeeds, the STA shall try to complete IEEE 802.1X authentication using parameters specified in the Diagnostic Request element. The STA shall then issue an MLME-DEAUTHENTICATE.request to deauthenticate from the AP indicated in the Diagnostic Request element, would reassociate to the AP from which it received a diagnostic request, and issue an MLME-DIAGREPORT.request primitive, indicating the results of the diagnostic.

11.22.4 Location track procedures

11.22.4.1 Location track configuration procedures

A STA that has a value of true for the MIB attribute dot11MgmtOptionLocationTrackingActivated is defined as a STA that supports location. A STA for which the MIB attribute dot11MgmtOptionLocationTrackingActivated is true shall set the Location field of the Extended Capabilities information element to 1.

In an infrastructure BSS, a non-AP STA shall not transmit Location Configuration Request frames.

A STA that supports location may configure another STA to transmit Location Track Notification frames for the purpose of tracking the receiving STA's location by sending Location Indication Channels, Location Indication Interval and Location Indication Broadcast Data Rate subelements in a Location Parameters information element in a Location Configuration Request frame. The minimum Normal and In-Motion Report Interval in a Location Configuration Request frame is 500 ms.

A STA may transmit the Location Configuration Request frame as a broadcast or individually addressed frame. A STA that supports location and receives a broadcast Location Configuration Request frame shall only send a Location Configuration Response frame if the STA does not accept the parameters included in the Location Configuration Request.

A STA that supports location and receives an individually addressed Location Configuration Request shall respond with a Location Configuration Response frame. Upon successful reception of a new Location Configuration Request frame, the STA shall override any previously received Location Configuration Request frame with the new frame. If all Location Parameter subelements included in the Location Configuration Request are successfully configured on the receiving STA, then the STA shall include in the Location Configuration Response frame a single Location Status subelement indicating success. Upon successful configuration, the receiving STA shall start transmitting the Location Track Notification frames based on the Location Configuration Request Frame parameters, as described in 11.21.4.2. If one or more Location Parameter subelements are unsuccessfully configured, then the STA shall include in the Location Configuration Response frame a Location Status subelement for each failed subelement indicating the subelement ID, the status value and the corresponding Location Parameter subelement as described in the paragraphs that follow.

The Location Status subelement has four possible status values: Success, Fail, Refused and Incapable. When the requesting STA receives a Location Configuration Response frame with Location Status indicating anything other than Success, the requesting STA shall assume the original request was not processed and no configuration took effect on the receiving STA and the requesting STA should take appropriate action based on the status value returned.

For Location Status Fail:

- If the receiving STA has been configured successfully prior to the current Location Configuration Request and continues to transmit Location Track Notification frames based on those parameters, the STA shall respond with its current Location Parameters subelements values.
- If the STA has no previously configured value, the STA shall respond with its minimum Location Parameters subelements that it is capable of supporting.
- The configuring STA may either retry the original request or send an alternate request.

For Location Status Incapable:

- The STA responding to the configuration request may include the minimum Location Parameters subelements that it is capable of supporting.

— The configuring STA shall not send another configuration request matching the previous configuration request while the reporting STA is associated to the same BSS.

— The configuring STA may send an alternate request.

For Location Status Refuse:

— The STA responding to the configuration request may include the minimum Location Parameters subelements that it is capable of supporting.

— The configuring STA may send an alternate request.

The location configuration methods, from highest to lowest precedence, are as follows: 1) an individually addressed Location Configuration Request frame, 2) broadcast Location Configuration Request frame. When a STA receives a new Location Configuration frame at the same or higher precedence than the previous it shall cancel the previous configuration and begin using the newest configuration.

The Location Indication Broadcast Data Rate subelement included in Location Configuration Request frames indicates the target data rate at which the STA shall transmit Location Track Notification frames. The Location Indication Broadcast Data Rate included in the Location Configuration Request frame should be a data rate defined in the basic data rate set.

The Indication Multicast Address field configured in the Location Indication Parameters subelement shall be a multicast locally administered IEEE MAC address as defined in IEEE Std 802 that is shared across all APs in the same ESS. The STA shall transmit Location Track Notification frames to the Indication Multicast Address with the BSSID field set to the wildcard BSSID. APs shall discard Location Track Notification frames that are not addressed to the Indication Multicast Address field configured for the ESS.

A non-AP STA shall terminate the transmission of Location Track Notification frames for any of the following reasons:

— The non-AP STA receives a Location Configuration Request frame from the STA to which it is currently associated that includes a Location Parameters information element with a Location Indication Parameters subelement specifying an interval of zero.

— The non-AP STA fails to detect any Beacon frames, belonging to the same ESS that originally configured the non-AP STA, for the period specified by the essDetectionInterval value included in the Location Parameters information element transmitted in the Location Configuration Request frame.

— The dot11MgmtOptionLocationTrackingActivated MIB attribute for the STA is false.

— The non-AP STA is disassociated for any reason from the ESS that configured it, including power off, or is configured by a different ESS.

— In an IBSS, when the STA detects that it is no longer connected to the other STA that formed the IBSS.

NOTE 1—All public action frames, including the Location Track Notification frames, are Class 1 frames and the treatment of public action frames upon reception by STAs is defined in 11.3.

NOTE 2—User Applications should not send location information to other stations without the express permission of the user. User agents acquire permission through a user interface, unless they have prearranged trust relationships with users. Those permissions that are acquired through the user interface and that are preserved beyond the current browsing session (i.e., beyond the time when the BSS connection is terminated) are revocable and receiving stations should respect revoked permissions. Some user applications may have prearranged trust relationships that do not require such user interfaces. For example, while a social networking application might present a user interface when a friend performs a location request, a VOIP telephone may not present any user interface when using location information to perform an E911 function.

11.22.4.2 Location track notification procedures

Implementation of Location Track Notification is optional for a WNM STA. A STA that implements Location Track Notification has the MIB attribute dot11MgmtOptionLocationTrackingImplemented set to true. When dot11MgmtOptionLocationTrackingImplemented is true, dot11WirelessManagementImplemented shall be true. A STA with a value of true for the MIB attribute dot11MgmtOptionLocationTrackingActivated is defined as a STA that supports Location Track Notification. When Location Track Notification is supported, a STA configured by another STA as described in the previous subclause shall transmit Location Track Notification frames as shown in the informative diagram in Figure 11-22.

Implementation of Motion Detection or the Time of Departure reporting is optional for a WNM STA. A STA that implements Motion Detection has the MIB attribute dot11MgmtOptionMotionDetectionImplemented set to true. When dot11MgmtOptionMotionDetectionImplemented is true, dot11WirelessManagementImplemented shall be true. A STA with a value of true for the MIB attribute dot11MgmtOptionMotionDetectionActivated is defined as a STA that supports Motion Detection. A STA that implements Time of Departure has the MIB attribute dot11MgmtOptionMotionTODImplemented set to true. When dot11MgmtOptionTODImplemented is true, dot11WirelessManagementImplemented shall be true. A STA with a value of true for the MIB attribute dot11MgmtOptionTODActivated is defined as a STA that supports Time of Departure for location tracking.

The STA transmits Location Track Notification frames based on the following parameters and procedures described in 11.22.4.1:

a) Location Indication Channels
   1) This subelement indicates the channels on which the STA shall transmit Location Track Notification frames.
b) Indication Multicast Address
   1) For non-IBSS networks, the STA shall transmit the Location Track Notification frames to the Indication Multicast Address field in the Location Indication Parameters subelement configured by the Location Configuration Request frame.
   2) An AP shall discard any Location Track Notification frame received from a STA that does not match the Indication Multicast Address field value for the AP's ESS.
   3) For IBSS networks, the STA shall transmit the Location Track Notification frames to the destination address of the STA that configured the STA using Location Configuration Request frames.
c) Location Indication Interval
   1) When the STA is stationary or dot11MgmtOptionMotionDetectionActivated is false, the STA shall transmit a sequence of groups of Location Track Notification frames on each channel. Each group of frames shall contain Normal Number of Frames Per Channel field frames. The first frame in each group of Location Track Notification frames shall be separated from the first frame in the previous group of Location Track Notification frames by a minimum time duration indicated by the value of the Normal Report Interval times the value of the Normal Report Interval Units field.
   2) When the STA is in motion and dot11MgmtOptionMotionDetectionActivated is true, the STA shall transmit a sequence of groups of Location Track Notification frames on each channel. Each group of frames shall contain In-Motion Number of Frames Per Channel field frames. The first frame in each group of Location Track Notification frames shall be separated from the first frame in the previous group of Location Track Notification frames by a minimum time duration indicated by the value of the In-Motion Report Interval times the value of the In-Motion Report Interval Units field.
   3) If a STA is configured to transmit on multiple channels, the STA shall transmit the frames on a single channel before continuing onto the next channel in the configured list of channels.

4) All Location Track Notification frames transmitted on a single channel shall be transmitted with a minimum gap specified by the Burst Interframe Interval field.

5) A STA can never be stationary and in-motion at the same time, and therefore only the Normal Interval field or the In-Motion Interval field apply at any given moment.

d) Tracking Duration

1) The STA shall transmit Location Track Notification frames until the Tracking Duration duration is reached.

2) The duration starts as soon as the STA sends a Configuration Location Response frame with a Location Status value of Success.

3) If the Tracking Duration is a non-zero value the STA shall transmit Location Track Notification frames, based on the Normal and In-Motion Report Interval field values, until the duration ends or is configured to terminate transmission as described in 11.22.4.1.

4) If the Tracking Duration is 0 the STA shall continuously transmit Location Track Notification frames as defined by Normal and In-Motion Report Interval field values until configured to terminate transmission as described 11.22.4.1.

e) ESS Detection

1) The ESS Detection Interval field is specified in the Location Indication Parameters subelement configured by the Location Configuration Request frame. The ESS Detection Interval defines how often the STA should check for beacons transmitted by one or more APs belonging to the same ESS that configured the STA.

2) If no beacons from the ESS are received during this interval, the STA shall terminate transmission of Location Track Notification frames.

f) Location Indication Options

1) The RRM Enabled Capabilities element contained in (Re)Association Request frames indicates the STA's ability to perform radio measurements as described in 7.3.2.45. The Location Indication Options subelement Options Used field Beacon Measurement Mode Used bit shall be set to 0 by the AP when the RRM Enabled Capabilities element bits (defined in Table 7-43e), Beacon Passive Measurement capability enabled, Beacon Active Measurement capability enabled and Beacon Table Measurement capability enabled are all set to 0. If any of RRM Enabled Capabilities element bits Beacon Passive Measurement capability enabled, Beacon Active Measurement capability enabled or Beacon Table Measurement capability enabled are set to 1 then the Location Indication Options subelement Options Used field Beacon Measurement Mode Used bit may be set to 1.

2) If the Location Indication Options subelement is included and the Options Used field with the Beacon Measurement Mode Used bit set to 1 in the most recently received Location Configuration Request frame, the STA shall include in the Location Track Notification frames, the result of the most recent successful beacon measurement that was performed using the requested Beacon Measurement Mode contained in the Location Indications Options subelement.

3) If the STA has never performed a successful beacon measurement using the requested Beacon Measurement Mode prior to transmission of the Location Track Notification frame, the STA shall perform the beacon measurement using the requested Beacon Measurement Mode and include the results of that measurement in Location Track Notification frames.

4) After a successful Location Configuration Request that included the Location Indication Options subelement and Options Used field with Beacon Measurement Mode Used bit set to 1, a STA should continue to perform beacon measurement as defined by the Beacon Measurement Mode periodically. How often and under what circumstances the STA performs this measurement is out of scope of this standard.

5) Whenever a STA includes the beacon measurement in the Location Track Notification frames, the STA shall set the Measurement Token field in the Measurement Report element to the same

value as the Dialog Token field in the Location Configuration Request frame that initiated the transmission of the location track notification frames by the STA.

6) If the Location Indication Options subelement is not included in the most recently received Location Configuration Request frame or the Location Indication Options subelement is included with the Options Used field with Beacon Measurement Mode Used bit set to 0, the STA shall not include any beacon measurements in the Location Track Notification frame

g) Location Indication Broadcast Data Rate

1) The STA shall transmit Location Track Notification frames at the data rate specified in this subelement.

h) Time of Departure

1) If dot11MgmtOptionTODActivated is true, the STA shall transmit this subelement in the Location Track Notification frame.

2) For all location tracking frames transmitted by a STA following a successful configuration, the Time of Departure subelement TOD Clock Rate field shall be set to the same value.

3) If the STA has multiple antennas, it shall transmit using an approximation to an omni-directional pattern.

NOTE—The values of the fields in the Time of Departure subelement are measured by the PHY in real-time, then passed without real-time requirements to the MAC via the TXSTATUS parameter of the PHY-TXSTATUS.confirm primitive.

The diagram in Figure 11-22 shows an example of Location Track Notification frame transmission, for a STA configured to transmit on three channels, with three frames per channel. In this example, a Normal Transmit Interval and Normal number of frames per channel are shown. When a STA is capable of motion detection and is in motion, the In-Motion Report Interval and In-Motion number of frames per channel would apply.

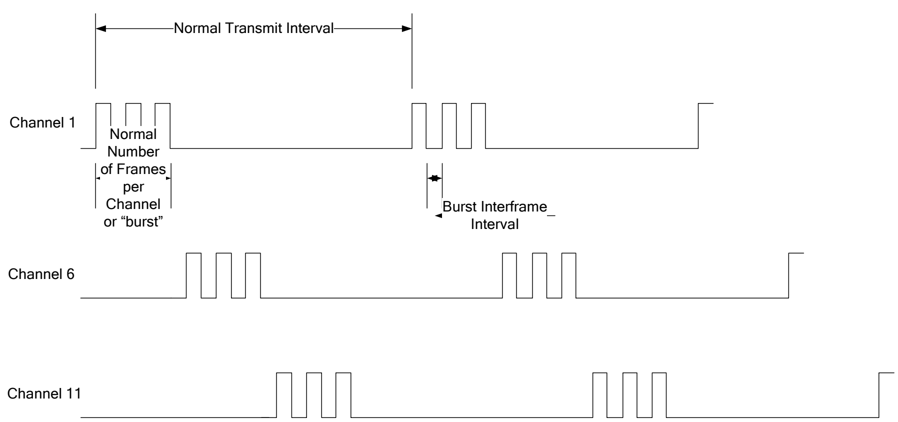

Figure 11-22—STA transmission on three channels, three frames per channel with Normal Report Interval

11.22.5 Timing measurement procedure

Implementation of Timing Measurement is optional for a WNM STA. A STA that has a value of true for the MIB attribute dot11MgmtOptionTimingMsmtImplemented is defined as a STA that supports timing measurement. A STA for which the MIB attribute dot11MgmtOptionTimingMsmtImplemented is true shall set the Timing Measurement field of the Extended Capabilities information element to 1.

If dot11MgmtOptionTimingMsmtActivated is true, the Timing Measurement field in the Extended Capabilities information element shall be set to 1 and the STA supports the timing measurement procedure. If dot11MgmtOptionTimingMsmtActivated is false the STA shall set the Timing Measurement field in the Extended Capabilities information element to 0 and STA does not support the timing measurement procedure. A STA that does not support the timing measurement procedure shall ignore a received Timing Measurement frame.

A STA that supports the timing measurement procedure may transmit a Timing Measurement Request frame to a peer STA to request it to initiate or to stop an ongoing Timing Measurement procedure, depending on the value of the Trigger field in the request frame.

A STA that supports the timing measurement procedure may transmit Timing Measurement frames addressed to a peer STA that also supports the timing measurement procedure. One higher-layer protocol for synchronizing a local clock time between STAs using this feature is specified in IEEE Std 802.1AS.

A sending STA transmits Timing Measurement action frames in overlapping pairs. The first Timing Measurement action frame of a pair contains a non-zero Dialog Token. The follow up Timing Measurement action frame contains a Follow Up Dialog Token set the value of the Dialog Token in the first frame of the pair. With the first Timing Measurement action frame, both STAs capture timestamps. The sending STA captures the time at which the Timing Measurement frame is transmitted (t1). The receiving STA captures the time at which the Timing Measurement frame arrives (t2) and the time at which the ACK response is transmitted (t3). The sending STA captures the time at which the ACK arrives (t4). See Figure 10-6j in 10.3.59. In the follow up Timing Measurement action frame, the sending STA transfers the timestamp values it captured (t1 and t4) to the receiving STA.

NOTE—A Timing Measurement action frame may contain non-zero values in both the Dialog Token and Follow Up Dialog Token fields, meaning that the action frame contains follow up information from a previous measurement, and new Timestamp values are captured to be sent in a future follow up Timing Measurement action frame.

The offset of the clock at the receiving STA with respect to the clock at the sending STA is calculated using the equation that follows(assuming a symmetric wireless channel). See Figure 10-6j in 10.3.60.

Clock offset at receiving STA relative to sending STA = [(t2 – t1) – (t4 – t3)]/2

NOTE—An example of state machines and other computations for synchronizing a local clock time between IEEE 802.11 stations using the values of t1, t2, t3, and t4 provided by the Timing Measurement feature is found in Clause 12 of IEEE P802.1AS.

The acknowledgement procedure for Timing Measurement action frames is the same as that for regular management frames (see 9.2.8). If the ACK for a transmitted Timing Measurement frame is not received, the sending STA may retransmit the frame. The sending STA shall capture a new set of timestamps for the retransmitted frame and its ACK.

On receiving a Timing Measurement action frame with a Dialog Token for which timestamps have previously been captured, the receiving STA shall discard previously captured timestamps and capture a new set of timestamps.

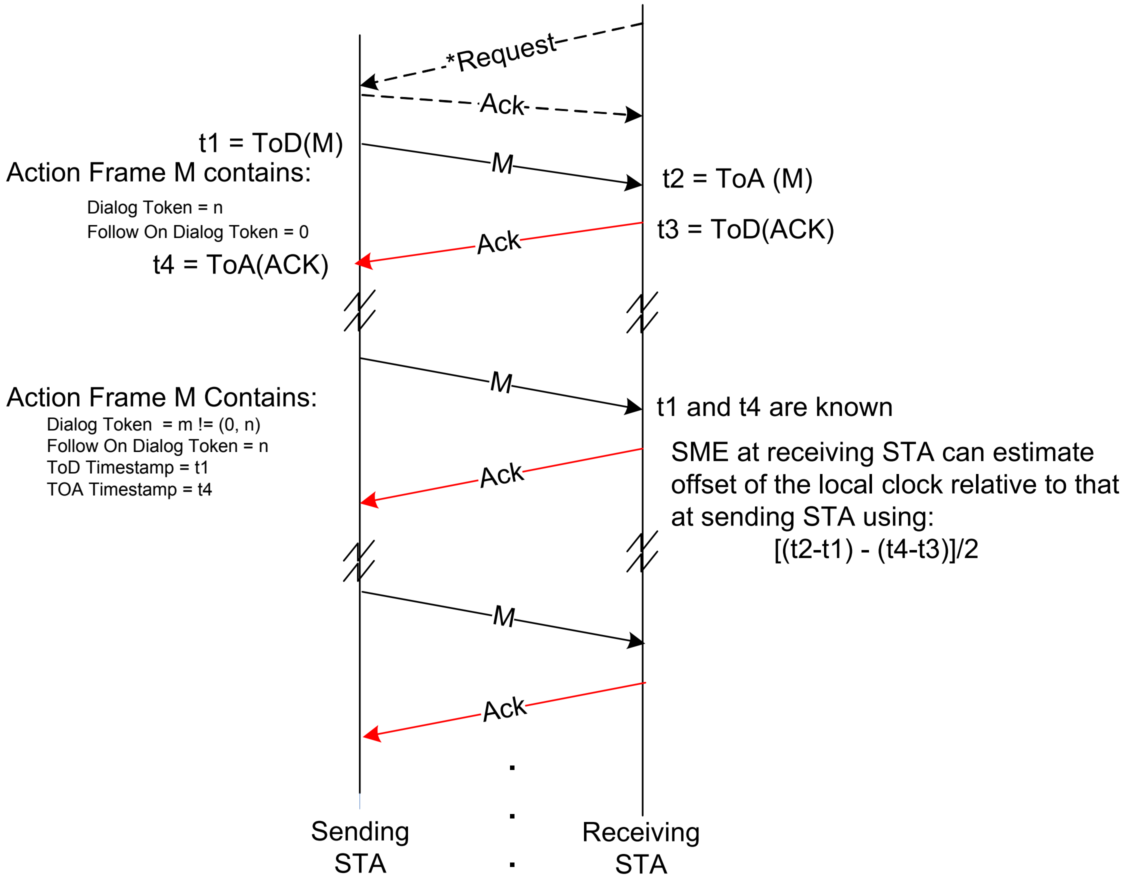

Figure 11-23—Timing Measurement procedure

11.22.6 BSS transition management for network load balancing

11.22.6.1 BSS Transition capability

The BSS Transition capability can enable the improved throughput, effective data rate and/or QoS for the aggregate of STAs in a network by shifting (via transition) individual STA traffic loads to more appropriate points of association within the ESS. In addition, the BSS Transition capability can provide accounting session control information to a non-AP STA which can be used to provide an alert to the non-AP STA's user that their session is almost over and the STA will be disassociated from the ESS.

The BSS Transition Management Query, BSS Transition Management Request, BSS Transition Management Response frames provide a means and a protocol to exchange the information needed to enable an AP to inform associated STAs that the BSS will be terminated and to enable a network to manage BSS loads by influencing STA transition decisions. A STA may provide neighbor report information to its associated AP for BSSs that it considers to be transition targets. This information can enable the AP to request that the STA transition to a BSS that the STA also prefers.

Implementation of BSS Transition Management is optional for a WNM STA. A STA that implements BSS Transition Management has the MIB attribute dot11MgmtOptionBSSTransitionImplemented set to true.

When dot11MgmtOptionBSSTransitionImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionBSSTransitionManagementActivated is defined as a STA that supports BSS transition management. A STA for which the MIB attribute dot11MgmtOptionBSSTransitionActivated is true shall set the BSS Transition field of the Extended Capabilities information element to 1.

The provisions in this clause for BSS transition management and network load balancing do not apply in an IBSS.

11.22.6.2 BSS transition management query

A non-AP STA supporting BSS transition management may request a BSS Transition Candidate list by sending a BSS Transition Management Query frame to its associated AP if the associated AP indicates that it supports the BSS Transition Capability in the Extended Capabilities information element. A non-AP STA should include the BSS Transition Candidate List Entries field in the BSS Transition Management Query frame to indicate the non-AP STA's transition preferences. If the non-AP STA transmits a BSS Transition Query frame only to provide transition preferences to the AP, then the BSS Transition Query Reason field of the BSS Transition Management Query frame shall be set to a value of 19, indicating "Preferred BSS Transition Candidate List Included".

The BSS Transition Candidate List Entries field of a BSS Transition Management Query frame contains zero or more Neighbor Report elements describing the non-AP STA's preferences for target BSS candidates. The Preference field value of a Neighbor Report element used in a BSS Transition Management Query frame shall be between 1 and 255. The value of 0 is reserved. The values between 1 and 255 provide the indication of order, with 255 indicating the most preferred BSS within the given candidate list, decreasing numbers representing decreasing preference relative only to entries with lower values of the Preference field, and equal numbers representing equal preference.

11.22.6.3 BSS transition management request

An AP that supports BSS transition management shall respond to a BSS Transition Management Query frame with a BSS Transition Management Request frame. The AP may send an unsolicited BSS Transition Management Request frame to a non-AP STA at any time if the non-AP STA indicates that it supports the BSS Transition Management capability in the Extended Capabilities information element. The AP may transmit a group addressed BSS Transition Management Request frame to associated non-AP STAs if all associated non-AP STAs support the BSS Transition Management capability. When the BSS Transition Management Request frame is transmitted as a group addressed frame, a receiving non-AP STA shall not respond with a BSS Transition Management Response frame. A non-AP STA that supports BSS transition management shall respond to an individually addressed BSS Transition Management Request frame with a BSS Transition Management Response frame.

The AP shall include the BSS Transition Candidate List Entries field in the BSS Transition Management Request frame if the AP has information in response to the BSS Transition Management Query frame. The BSS Transition Candidate List Entries field contains one or more Neighbor Report elements describing the preferences for target BSS candidates. A Preference field value of 0 indicates that the BSS listed is an excluded BSS. The STA should refrain from associating to an AP corresponding to an excluded BSS. The Preference field values are used to establish the relative order of entries within the given list at the given time, and for the given AP.

The values between 1 and 255 provide the indication of order, with 255 indicating the most preferred BSS within the given candidate list, decreasing numbers representing decreasing preference relative only to entries with lower values of the Preference field, and equal numbers representing equal preference. The Preference field value is only valid before the Validity Interval has expired. The AP may include zero or more subelements in the BSS Transition Candidate List Entries field.

Upon successful reception of a BSS Transition Management Query frame or BSS Transition Response frame from a non-AP STA that contains a non-empty BSS Transition Candidate List Entries field, the AP should include at least one BSS candidate from that list with a non-zero Preference field value in the BSS Transition Candidate List Entries field of any subsequent BSS Transition Management Request frame with the Preferred Candidate List Included field set to 1 transmitted to the non-AP STA. The AP shall evaluate the BSSs indicated in the BSS Transition Candidate List Entries field in the latest BSS Transition Management Query frame or BSS Transition Management Response frame received from the non-AP STA as BSS transition candidate(s) for the non-AP STA. The means by which the AP evaluates and determines BSS transition candidates is outside the scope of this specification.

A non-AP STA that receives the Abridged bit with a value of 1 shall treat any BSSID in the current ESS that does not appear in the BSS Transition Candidate List as if it were present in the BSS Transition Candidate List with a Preference value of 0.

The AP may include one BSS Termination Duration subelement for each BSS in the BSS Transition Candidate List Entry field, including the BSS Termination Duration value and a BSS Termination TSF value. The BSS Termination Duration value may be different for each BSS.

When the AP transmits a BSS Transition Management Request frame with the Disassociation Imminent field set to 1 to a non-AP STA, the Disassociation Timer field in the BSS Transition Management Request frame shall be set to 0 or set to the number of TBTTs that will occur prior to the AP disassociating the non-AP STA. The AP shall start a timer for the non-AP STA with the initial timer value set to the Disassociation Timer field value. The AP shall decrement the timer by one after transmitting each Beacon frame until the timer has value of 0. In subsequent BSS Transition Management Request frames that the AP transmits to the non-AP STA, the Disassociation Timer field shall be set to the value of the timer.

If the most recent BSS Transition Management Request frame that an AP has transmitted to a non-AP STA has the Disassociation Imminent field set to 1, then the AP shall not transmit a Disassociation frame to the non-AP STA unless the timer for the non-AP STA has value of 0.

An AP's SME may have accounting session control information, such as a notice of session expiry. The means by which the AP's SME obtains accounting session control information is out of scope of this specification. Accounting session control information can include a time duration after which the non-AP STA will be disassociated from the ESS and an optional session information URL at which information may be obtained to extend the accounting session. When an AP's SME has accounting session control information, it shall issue an MLME-BTM.request to the AP's MLME and shall encode the time to session expiry in the Disassociation Timer parameter and shall encode the URL, if available, in the SessionInformationURL parameter. A non-AP STA's SME receiving an MLME-BTM.indication forwards the MLME-BTM.indication parameters to the appropriate entity within the device (e.g., web-browser) to inform the end-user; the means and protocol by which the SME accomplishes this is outside the scope of this specification.

A STA's SME receiving an MLME-BTM.indication primitive containing the BSS Transition Candidate List Entries field should use this list of candidates, with individual transition preference values, to make BSS transition decisions. Upon receiving an MLME-BTM.indication primitive, the STA's SME shall disregard any previous MLME-BTM.indication primitive received from the same AP. The STA shall not use the corresponding BSS Transition Candidate List Entries field information after the indicated Validity Interval. The STA may send a BSS Transition Management Query frame at any time to obtain an updated BSS Transition Candidate List Entries field or to indicate the STA's BSS transition candidates.

A STA's SME receiving an MLME-BTM.indication primitive containing a non-zero value of the Disassociation Timer field should attempt to find a suitable AP with which to re-associate before the indicated disassociation time.

11.22.6.4 BSS transition management response

When the STA's SME receives an MLME-BTM.indication primitive, it may issue an MLME-BTM.response primitive.

The STA's SME may include the result of its BSS transition decision in the Target BSSID field and Status Code field in the MLME-BTM.response primitive. A Status Code set to a value of 0 (i.e., Accept) indicates the STA will transition from the current BSS. The STA's SME receiving an MLME-BTM.indication primitive may issue an MLME-BTM.response primitive with a valid nonzero status code indicating rejection if it is unable to comply with this BSS transition management request.

When a non-AP STA's SME receives an MLME-BTM.indication primitive with the BSS Termination Included field in the Request Mode field set to 1 it may issue an MLME-BTM.response primitive with the Status code set to one of the following values:

- 0 - Accept. Accept the BSS Termination request.
- 4 - Reject, BSS Termination Undesired. Request for deferral of BSS Termination, interval not specified.
- 5 - Reject, BSS Termination Delay. Request for deferral of BSS Termination interval specified in the BSS Termination Delay field in the BSS Transition Management Response frame.

The AP's SME may terminate or delay BSS Termination based on policies that are out of the scope of this standard. The MLME-RESET.request primitive is invoked to terminate the BSS. The AP shall disassociate all STAs immediately prior to termination of the BSS.

When a non-AP STA's SME receives an MLME-BTM.indication primitive with both the Disassociation Imminent and Preferred Candidate List Included fields set to 0, the non-AP STA's SME shall issue a MLME-BTM.response primitive with the Status code set to one of the following values:

- 0 - Accept.
- 2 - Reject, Insufficient Beacon or Probe Response frames received from all candidates.
- 3 - Reject, Insufficient available capacity from all candidates.
- 6 - Reject, STA BSS Transition Candidate List provided.
- 7 - Reject, No suitable BSS transition candidates.
- 8 - Reject, Leaving ESS.

When an AP's SME receives an MLME-BTM.confirm primitive with the Status code field set to a value of 2, indicating "Reject, Insufficient Beacon or Probe Response frames received from all candidates", the AP's SME should generate an MLME-BTM.request primitive with both the Disassociation Imminent and Preferred Candidate List Included fields set to 0 after providing sufficient time for the non-AP STA to perform its scanning procedures.

If the Status code field is a value of 6, indicating "Reject, STA BSS Transition Candidate List provided", the non-AP STA shall include a non-empty BSS Transition Candidate List Entries field in the BSS Transition Management Response frame to indicate the non-AP STA's transition preferences. The Status code field is a value of 8, indicating "Reject, Leaving ESS" if the non-AP STA intends to disassociate from the ESS.

The BSS Transition Candidate List Entries field of a BSS Transition Management Response frame contains zero or more Neighbor Report elements describing the non-AP STA's preferences for target BSS candidates. The Preference field value of a Neighbor Report element used in a BSS Transition Management Response frame shall be between 1 and 255. The value of 0 is reserved. The values between 1 and 255 provide the indication of order, with 255 indicating the most preferred BSS within the given candidate list, decreasing numbers representing decreasing preference relative only to entries with lower values of the

Preference field, and equal numbers representing equal preference. The non-AP STA should not list any BSS that is not considered as a target BSS candidate.

When a non-AP STA receives a BSS Transition Management Request frame that has both the Disassociation Imminent and Preferred Candidate List Included fields set to 1 and a non-empty BSS Transition Candidate List Entries field, if the non-AP STA transmits a BSS Transition Management Response frame to the AP with the Status Code field set to 0 (Accept), then the non-AP STA shall disassociate from the AP and attempt to re-associate with an AP corresponding to one of the non-excluded BSSs in the BSS Transition Candidate List Entries field of the received BSS Transition Management Request frame.

Prior to transitioning to an excluded BSS listed in the BSS Transition Candidate List Entries field of a received BSS Transition Management Request frame, the non-AP STA shall transmit a BSS Transition Management Response frame to the AP indicating the reject reason.

11.22.7 FMS multicast rate processing

An AP that supports FMS indicates its ability to deliver multicast frames at alternate delivery intervals by its advertisement of the FMS capability. A STA that supports FMS includes the FMS Request information element in FMS request frames to indicate a request to use the FMS service, including use of a higher multicast rate. The AP selects the multicast rate to use with the STA and indicates the rate and multicast address in the FMS Response information element in the FMS Response frame. The AP shall not select a rate that is higher than the lowest rate value provided by the currently associated STAs requesting FMS service from the AP for the same FMS stream identified by FMSID.

The STA's SME may request membership in a multicast group or changes in multicast data rate by issuing an MLME-FMS.request primitive. Upon receipt of an FMS Request frame at the AP’s SME as indicated by reception of the MLME-FMS.indication primitive the AP’s SME shall issue an MLME-FMS.response primitive, indicating the FMS Request information element, including the multicast address. The AP may send an FMS Response action frame to the STA to change the STA’s multicast rate. When the AP sends an FMS Response frame to the STA with an Element Status field value of 8, indicating “Alternate Preferred, due to AP multicast rate policy”, the STA shall not send further FMS Request frames to request a change in the multicast rate while the STA is associated to the AP.

11.22.8 Collocated interference reporting

Collocated interference may cause degradation of IEEE 802.11 STA performance either periodically or continuously. Collocated interference reporting allows a requesting STA to receive information concerning the collocated interference being experienced by another STA that is operating on the same channel as the requesting STA. Such interference may be due to an interaction between radios where a reporting STA is collocated with another radio device. Collocated interference information can be used by the requesting STA to manage communication to the reporting STA such that the effect of the interference may be limited.

Implementation of Collocated interference reporting is optional for a WNM STA. A STA that implements Collocated Interference reporting has the MIB attribute dot11MgmtOptionCoLocIntfReportingImplemented set to true. When dot11MgmtOptionCoLocIntfReportingImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionCoLocIntfReportingActivated is defined as a STA that supports collocated interference reporting. A STA for which the MIB attribute dot11MgmtOptionCoLocIntfReportingActivated is true shall set the Collocated Interference Reporting field of the Extended Capabilities information element to 1.

A requesting STA may request that collocated interference reporting is enabled at another STA that has indicated support for the interference reporting capability. To enable collocated interference reporting, the STA shall send a Collocated Interference Request frame with Automatic Response Enabled bit set to the value representing the requested reporting type, see 7.4.12.13. A STA accepting a request for collocated interference reporting shall send the first report when it has knowledge of collocated interference.

Subsequently, a STA accepting a request with the Automatic Response Enabled subfield set to 1 shall send a collocated interference report when the temporal characteristics of the interference or the level of the interference caused by collocated interferer significantly change to provide updated information, subject to meeting the Report Timeout requirement. A STA accepting a request with the Automatic Response Enabled subfield set to 2 or 3 shall send the collocated interference reports periodically using the period included in the Report Period field in the Collocated Interference Reporting element in the report frames. In addition to sending reports periodically, a STA accepting a request with the Automatic Response Enabled filed set to 3 shall send a collocated interference report when the temporal characteristics of the interference or the level of the interference caused by collocated interferer significantly change, subject to meeting the Report Timeout requirement.

The criteria a reporting STA uses for determining significant changes are internal to the reporting STA and outside the scope of this standard. When the reporting STA sends a collocated interference report, it shall restart the Report Period timer for periodic reporting. For either periodic reporting or reporting due to the changes in collocated interference, the reporting STA shall not generate collocated interference reports more frequently than indicated by the Report Timeout field in Interference Request field in the Collocated Interference Request frame.

The requesting STA can disable reporting by sending a Collocated Interference Request frame with the Automatic Response Enabled subfield set to 0. The collocated interference reporting shall be terminated on receipt of a Collocated Interference Request frame with the Automatic Response Enabled subfield set to 0. All outstanding collocated interference requests are cancelled upon a BSS transition and/or channel switch. A new collocated interference request included in the new collocated Interference Request frame supersedes any previously received requests sent by the same STA.

A STA that supports collocated interference reporting may send a Collocated Interference Request frame to another STA that supports collocated interference reporting immediately after they are associated, so that the reporting STA can send a collocated interference report as soon as it has knowledge of collocated interference. The Dialog Token field is the nonzero value received in the corresponding Collocated Interference Request frame which was used to enable reporting.

The reporting STA shall use the Interference Index field in the Collocated Interference Report frame to indicate different types of interference. The reporting STA shall select unique Interference Index value for each collocated interference source. For example if the reporting STA has knowledge of collocated interference originating from two interference sources the reporting STA shall report both type of interference using separate Collocated Interference Report elements having separate Interference Index field. Both Collocated Interference Report elements can be sent in the same Collocated Interference Report frame and both can have the same report period. A report with the Interference Index field in the Collocated Interference Report element set to 0 indicates that no collocated interference is present.

The characteristics of the interference are known a priori without requiring interference detection, measurement, and characterization by the IEEE 802.11 STA. The methods used by a reporting STA to know the periodicity, level of interference, accuracy of the reported interference level, interference center frequency and interference bandwidth are outside the scope of this standard.

11.22.9 QoS Traffic capability procedure

Implementation of the QoS Traffic capability is optional for a WNM STA. A STA that implements QoS Traffic capability has the MIB attribute dot11MgmtOptionQoSTrafficCapabilityImplemented set to true. When dot11MgmtOptionQoSTrafficCapabilityImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is defined as a STA that supports QoS Traffic Capability. A STA for which the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is true shall set the QoS Traffic Capability field of the Extended Capabilities information element to 1.

If the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is true, a QoS AP may use the QoS Traffic Capability field values received from a non-AP QoS STA as one of the factors when determining association, reassociation, and the BSS transition of the STA. A non-AP STA with a value of true for the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated may send an Association Request, a Reassociation Request or QoS Traffic Capability Update frame to an AP whose last received Extended Capabilities information element contained a value of 1 for the QoS Traffic Capability bit in the Capabilities field.

If the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is true, a non-AP QoS shall construct the QoS Traffic Capability Flags as specified in 7.3.2.78 and 7.4.12.22. QoS Traffic Capability Flags are constructed at the SME of the non-AP QoS STA, from application requirements supplied to the SME. The QoS Traffic Capability Flags are constructed from two application requirements: whether generation of traffic is required for applications and whether a specific UP is required for the generated traffic. If such requirements are supplied to the SME, the SME shall set the flag corresponding to the specific UP to 1.

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

Unless application requirements for a specific UP are supplied to the SME, the SME shall set the flag corresponding to the UP to 0.

If the MIB attribute dot11MgmtOptionQoSTrafficCapabilityActivated is true, a non-AP QoS STA shall include the QoS 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 Traffic Capability Flags while associated with an AP, the non-AP STA shall send a QoS Traffic Capability Update frame (see 7.4.12.22) including the updated QoS Traffic Capability Flags to the AP.

11.22.10 AC Station Count

Implementation of AC Station Count is optional for a WNM STA. A STA that implements AC Station Count has the MIB attribute dot11MgmtOptionACStationCountImplemented set to true. When dot11MgmtOptionACStationCountImplemented is true, dot11WirelessManagementImplemented and dot11MgmtOptionQoSTrafficCapabilityImplemented shall be true. When dot11MgmtOptionACStationCountActivated is true, the STA shall set the AC Station Count field to 1 in the Extended Capabilities information element to indicate that the STA supports the AC Station Count capability. When dot11MgmtOptionACStationCountActivated is false, the STA shall set the AC Station Count field in the Extended Capabilities information element to 0 to indicate that the STA does not support this capability.

If the MIB attribute dot11MgmtOptionACStationCountActivated is true, a QoS AP shall construct the QoS Traffic Capability Bitmask and AC STA Count list as specified in 7.3.2.78. The AP shall construct the STA Count List value based on the UP-to-AC mappings as defined in Table 9-1, the QoS Traffic Capability Bitmask/Flags of the non-AP STAs that are currently associated with it, and additional information. If the MIB attribute dot11MgmtOptionACStationCountActivated is true, a QoS AP shall include the QoS Traffic Capability element in a Probe Response frame and in a Beacon frame.

If the MIB attribute dot11MgmtOptionACStationCountActivated is true, a non-AP QoS STA may use the STA Count field values as one of the factors when determining association, reassociation, and the BSS transition. If the MIB attribute dot11MgmtOptionACStationCountActivated is false, a non-AP QoS STA shall not use the STA Count field values as one of the factors when determining association, reassociation, and the BSS transition.

11.22.11 TFS procedures

11.22.11.1 TFS capability

Implementation of the TFS capability is optional for a WNM STA. A STA that implements TFS has the MIB attribute dot11MgmtOptionTFSImplemented set to true. When dot11MgmtOptionTFSImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionTFSActivated is defined as a STA that supports TFS. A STA for which the MIB attribute dot11MgmtOptionTFSActivated is true shall set the TFS field of the Extended Capabilities information element to 1.

A STA with a value of true for the MIB attribute dot11MgmtTFSEnabled may send a TFS Request, TFS Response or TFS Notify frame to a STA within the same infrastructure BSS whose last received Extended Capabilities information element contained a value of 1 for the TFS bit in the Capabilities field. The Traffic Filtering service is not supported in an IBSS.

A traffic filter is established using the TFS Request information element and the patterns to be matched specified in one or more enclosed TFS subelements. A frame matches the traffic filter when at least one TCLAS based classifier matches the frame. Using multiple TFS subelements in a TFS Request information element is the equivalent to a logical OR operation on the match conditions of each TFS subelement. Using multiple TCLAS information elements in a TFS subelement is the equivalent to a logical AND operation on the match condition of each TCLAS information element. An AP may propose an alternative TCLAS-based classifier by returning a TFS subelement in the TFS response (see 11.22.11.3).

The TFS may be requested for both data and management frames. A single TCLAS subelement within a TFS Request element shall apply to either MSDU filtering or management frame filtering, but not both.

When a traffic filter for group addressed frames is enabled at the AP, the broadcast and multicast frames are still delivered, without regard to the frames matching the traffic filter, since other associated STAs may also receive these frames. Because a STA using TFS can be in power save mode for an extended period of time, broadcast and multicast frames that match the traffic filter can be delivered, before the STA is aware that the traffic filter has been matched. It is likely (but not guaranteed) that the STA does not receive those broadcast and multicast frames matching the traffic filter at the scheduled broadcast and multicast delivery time. To prevent this from happening, the STA can request a notification frame be sent when requesting the establishment of the traffic filter. If negotiated with the AP, the frames that do match at least one of the set of specified traffic filters are indicated to the non-AP STA via a notification frame.

11.22.11.2 TFS non-AP STA operation

To use the TFS, the non-AP STA's SME that supports TFS shall issue an MLME-TFS.request primitive to send a TFS Request frame. The MLME-TFS.request primitive shall include a valid TFSRequest parameter as defined in the TFS Request information elements that the AP uses as triggers for the non-AP STA.

If the non-AP STA requests TFS Notify frames to be sent by the AP, the Notify bit field of the TFS Action code field shall be set to 1 in the TFS Request element.

The receipt of an MLME-TSF.confirm primitive with a valid TFSResponse parameter indicates to the STA's SME that the AP has processed the corresponding TFS request. The content of the TFSResponse parameter provides the status of each of the TFS information elements processed by the AP. A TFSResponse parameter containing a TFS subelement may contain a modified TCLAS element having a Classifier Mask field set to zero or having one or more Classifier Parameter subfields set to zero. If so, the non-AP STA shall interpret these (sub)fields to mean that no suggested value has been provided by the AP.

The non-AP STA may indicate that it is no longer using a particular TFS element by transmitting a TFS Request frame without that TFS element. The AP shall send a TFS Response frame with the Response element Status field value set to Accept, upon receipt of the TFS Request frame.

The non-AP STA may choose to terminate use of the TFS service by sending a TFS Request frame with no TFS elements in the request thereby canceling all traffic filters at the AP.

11.22.11.3 TFS AP operation

When an AP's SME receives an MLME-TFS.indication primitive with a valid TFSRequest parameter, it shall establish one or more traffic filters for the requesting STA and issue an MLME-TFS.response primitive with a TFSResponse parameter indicating the status of the associated request. When the AP establishes any filters for a requesting STA, the AP shall establish a traffic filter that matches individually addressed EAPOL-Key messages addressed to the requesting STA, with bits 0 and 1 of the TFS Action Code field set to 0.

When an AP's SME receives an MLME-TFS.indication primitive with a valid TFSRequest parameter having a requested TCLAS-based classifier which it is unable to provide, the SME shall issue an MLME-TFS.response primitive indicating the status of the corresponding request and may include a TFSResponse parameter having a suggested TCLAS-based classifier.

When TFS is enabled for an associated STA, the AP shall discard all individually addressed frames destined for the non-AP STA until a frame is found that matches one or more traffic filters established by the STA. When a frame is found that matches one or more of the traffic filters enabled at the STA (a matching frame), the AP shall perform the following actions, in order.

If bit 1 of the TFS Action Code field is set for any of the traffic filters that matched the matching frame, a TFS Notify frame shall be queued for transmission to the STA.

For an incoming individually addressed frame, the AP shall send the matching frame to the destination STA.

If bit 0 of the TFS Action Code field is set for a traffic filter that matched the matching frame, the AP shall delete the traffic filter.

NOTE—Due to the operation of multicast frame delivery, a multicast frame that matches a traffic filter can result in the STA receiving indication of the multicast frame either before or after the multicast frame is transmitted by the AP, if the TFS Notify frame is queued in the STA's power save queue. This can result in the STA receiving the multicast frame in some cases and not receiving it in other cases.

Upon receiving an MLME-TFS.indication primitive, the AP's SME shall disregard any previous MLME-TFS.indication primitive received from the same STA.

The AP shall terminate any TFS operation for a STA when no traffic filters remain for a STA or if the AP's SME receives an MLME-TFS.indication primitive with a null TFSRequest.

11.22.12 BSS Max idle period management

If dot11MaxIdlePeriod is a non-zero, the STA shall include the BSS Max Idle Period element in the Association Response frame or the Reassociation Response frame. Otherwise, the STA shall not include the BSS Max Idle Period element in the Association Response frame or the Reassociation Response frame. STAs may send security protocol protected or unprotected keep-alive frames, as indicated in the Idle Options field.

If the Idle Options field requires security protocol protected keep-alive frames, then the AP shall disassociate the STA if no protected frames are received from the STA for a period of duration BSS Max idle period. If the Idle Options field allows unprotected or protected keep-alive frames, then the AP shall disassociate the STA if no protected or unprotected frames are received from the STA for a period of duration BSS Max idle period.

NOTE—The AP may disassociate or deauthenticate the STA at any time for other reasons even if the STA satisfies the keep-alive frame transmission requirements.

11.22.13 Proxy ARP (including Proxy Neighbor Discovery) service

Implementation of the Proxy ARP Service is optional for a WNM STA. A STA that implements the Proxy ARP Service has the MIB attribute dot11MgmtOptionProxyARPImplemented set to true. When dot11MgmtOptionProxyARPImplemented is true, dot11WirelessManagementImplemented shall be true. When dot11MgmtOptionProxyARPActivated is true, the Proxy ARP Service bit in the Extended Capabilities field shall be set to 1 to indicate that the AP supports the Proxy ARP Service. When dot11MgmtOptionProxyARPActivated is false, the Proxy ARP Service bit shall be set to 0 to indicate that the AP does not support the Proxy ARP Service.

When the AP sets the Proxy ARP field to 1 in the Extended Capabilities information element, the AP shall maintain a Hardware Address to Internet Address mapping for each associated station, and shall update the mapping when the Internet Address of the associated station changes. When the IPv4 address being resolved in the ARP request packet is used by a non-AP STA currently associated to the BSS, the Proxy ARP service shall respond to the request on behalf of the non-AP STA (IETF RFC 925).

When an AP receives an ARP Request from one associated STA or from the DS with a Target IP Address that corresponds to a second associated STA, the AP shall insert the second STA MAC address as the Sender’s MAC Address in the ARP Response packet.

When an IPv6 address is being resolved, the Proxy Neighbor Discovery service shall respond to an Internet Control Message Protocol version 6 (ICMPv6) Neighbor Solicitation Message (Section 4.3, IETF RFC 4861) with a Neighbor Advertisement Message (Section 4.4, IETF RFC 4861) on behalf of an associated STA. When MAC address mappings change, the AP may send unsolicited Neighborhood Advertisement Messages on behalf of a STA.

11.22.14 Channel usage procedures

Channel Usage information is a set of channels provided by an AP to non-AP STAs for operation of a non-infrastructure network or an off-channel TDLS direct link. The Channel Usage information provided by the AP to the non-AP STA is to advise the STA on how to co-exist with the infrastructure network.

Implementation of Channel Usage is optional for a WNM STA. A STA that implements Channel Usage has the MIB attribute dot11MgmtOptionChannelUsageImplemented set to true. When dot11MgmtOptionChannelUsageImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionChannelUsageActivated is defined as a STA that supports Channel Usage. A STA for which the MIB attribute dot11MgmtOptionChannelUsageActivated is true shall set the Channel Usage field of the Extended Capabilities information element to 1.

A non-AP STA that supports Channel Usage and is not associated to an AP prior to using a non-infrastructure network or an off channel TDLS direct link may transmit a Probe Request frame including both Supported Regulatory Classes and Channel Usage elements. A non-AP STA supporting Channel Usage may send a Channel Usage Request frame at any time after association to the AP that supports the use of Channel Usage to request the Channel Usage information for supported regulatory classes.

Upon the receipt of Channel Usage element in the Probe Request frame, the AP supporting Channel Usage shall send a Probe Response frame including one or more Channel Usage elements. Upon receiving a

Channel Usage Request frame, the AP supporting Channel Usage shall send a Channel Usage Response frame including one or more Channel Usage elements. Channel Usage elements shall only include channels that are valid for the regulatory domain in which the AP transmitting the element is operating and consistent with the Country element in the Beacon or Probe Response frame. When the Channel Usage element in a received Probe Request or Channel Usage Request frame includes one or more Regulatory Class/Channel Pair fields, the Regulatory Class/Channel Pair field(s) indicate(s) the requested non-AP STA regulatory class/channels for the usage mode indicated in the frame.

The AP may send an unsolicited group addressed or individually addressed Channel Usage Response frame to the STAs that have requested Channel Usage information if the corresponding Channel Usage information needs to be updated. The Country information element shall be included in the unsolicited and/or group addressed Channel Usage Response frame. The AP may include the Power Constraint information and EDCA Parameter in the Channel Usage Response frame. The values of the fields in the Power Constraint and EDCA Parameter Set information elements included in the Channel Usage Response frame shall be the same values of the fields in the Power Constraint and EDCA Parameter Set information elements that are transmitted by the AP.

On the receipt of Channel Usage element in the Probe Response or Channel Usage Response frame, the receiving STA may use the following:

— The channel usage information as part of channel selection processing to start a non-infrastructure network or an off-channel TDLS direct link.
— The Power Constraint element, if present, as part of determining its maximum transmit power for transmissions for the non-infrastructure network or an off-channel TDLS direct link.
— The EDCA Parameter Set element, if present, as part of determining its EDCA parameters for transmissions for the non-infrastructure network or an off-channel TDLS direct link.

If either a recommended regulatory class, or a recommended channel, or both are not supported or understood by the recipient, or if the operating country of the sender is unknown, the recipient shall discard the corresponding channel usage recommendation. A STA that has not requested Channel Usage information shall discard an unsolicited group addressed Channel Usage Response frame.

11.22.15 DMS procedures

The Directed Multicast Service (DMS) is a service that may be provided by an AP to its associated non-AP STAs that support the DMS service, where the AP transmits group addressed MSDUs as individually addressed A-MSDUs.

Implementation of DMS is optional for a WNM STA. A STA that implements DMS has the MIB attribute dot11MgmtOptionDMSImplemented set to true. When dot11MgmtOptionDMSImplemented is true, dot11WirelessManagementImplemented and dot11HighThroughputOptionImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionDMSActivated is defined as a STA that supports Directed Multicast. A STA for which the MIB attribute dot11MgmtOptionDMSActivated is true shall set the DMS field of the Extended Capabilities information element to 1.

A non-AP STA that supports DMS may request use of DMS of one or more flows by sending a DMS Request frame or Reassociation Request frame that includes a DMS Request element containing one or more DMS Descriptors with the Request Type field set to “Add” per flow. Each DMS Descriptor field in the DMS Request element identifies group addressed frames that shall be transmitted to the requesting non-AP STA as individually addressed frames in addition to the group address frame transmission. In the TCLAS element, the Classifier Type subfield shall be set to the value 0, 1, or 4, and the Destination Address or Destination IP Address subfield shall be set to the multicast address of the flow that the STA requests to receive as individually addressed frames. In the TSPEC information element, the STA may define the characteristics and QoS expectations of the corresponding traffic flow.

Upon receipt of a DMS Request frame or Reassociation Request frame from a non-AP STA, the AP shall respond with a corresponding DMS Response frame or Reassociation Response frame. If the AP accepts a DMS request identified by a DMS Descriptor, the Response Type field of the corresponding DMS Status field in the DMS Response element shall be set to "Accept" and a non-zero DMSID is assigned. A Response Type value of "Deny" shall be set in the corresponding Response Type field of the DMS Status field in the DMS Response element when the AP denies a DMS request identified by a DMS Descriptor, and the DMSID shall be set to zero. If the Response Type field is set to "Accept" or "Denied", then the TCLAS Elements, TCLAS Processing Element, TSPEC Element and Optional Subelements fields of a DMS Status field in a DMS Response element shall be copied from the respective TCLAS Elements, TCLAS Processing Element, TSPEC Element and Optional Subelements fields of the corresponding DMS request. When one or more STAs send a DMS request to an AP, containing a DMS descriptor with a set of TCLAS element and TCLAS processing elements that are identical irrespective of ordering to another successfully received DMS request that is not yet terminated, the AP shall assign the same DMSID as was assigned to the previous DMS request.

When the AP denies the DMS Request, it may suggest an alternative TCLAS-based classifier by including one or more TCLAS elements and an optional TCLAS Processing element. The AP may include fewer TCLAS elements in the DMS Response element than were present in the request; when the AP's response includes a single TCLAS element, it shall not include a TCLAS processing element. If the AP changes a TCLAS element's Classifier Type field in the DMS Response element but is unable to suggest a value for the Classifier Mask field, it shall set that field to zero. If the AP changes a TCLAS element's Classifier Type field or Classifier Mask field in the DMS Response element but is unable to suggest values for one or more Classifier Parameter subfields, it shall set those subfields to zero.

A non-AP STA receiving a DMS Response frame containing a modified TCLAS element having a Classifier Mask field set to zero or having one or more Classifier Parameter subfields set to zero shall interpret the zero values to mean that no suggested value has been provided by the AP.

If the requested DMS is accepted by the AP, the AP shall send subsequent group addressed MSDUs that match the frame classifier specified in the DMS Descriptors to the requesting STA as A-MSDU subframes within an individually addressed A-MSDU frame (see 7.2.2.2 and 9.7c). The A-MSDU shall be formatted as specified in 7.2.2.2 which includes the A-MSDU subframe headers' DA address set to the multicast address for the corresponding MSDUs. The AP shall continue to transmit the matching frames as group addressed frames (see 9.2.7.1, 9.2.7.2, and 11.2.1.4a) if at least one associated STA has not requested DMS for these frames.

A non-AP STA may request modification of the traffic characteristics or attributes of one or more accepted DMS traffic flows by sending a DMS Request frame or Reassociation Request frame containing one or more DMS Descriptors with the Request Type set to "Change" and with the DMSIDs that identify the DMS traffic flows to be modified. If the Request Type of a DMS Descriptor is set to "Change", then the values of at least one of the TSPEC Element and Optional Subelement fields shall be different from those of the accepted DMS traffic flow corresponding to the DMSID.

If the AP accepts a DMS change request identified by a DMS Descriptor, the Response Type field of the corresponding DMS Status field in the DMS Response element shall be set to "Accept" and the DMSID shall be set to that of the DMS Descriptor. If the AP denies a DMS change request identified by a DMS Descriptor, the Response Type field of the corresponding DMS Status field in the DMS Response element shall be set to "Deny" and the DMSID shall be set to that of the DMS Descriptor. When the AP denies a DMS change request identified by a DMS Descriptor, the existing DMS traffic flow of the corresponding DMSID shall remain unchanged.

The non-AP STA may request removal of one or more accepted DMS traffic flows by sending a DMS Request frame or Reassociation Request frame that includes a DMS Request element containing one or more DMS Descriptors with the Request Type set to "Remove" and the DMSID field set to that the DMSID of the accepted DMS traffic flow to be removed. The DMS Length field in this DMS Descriptor is set to 1. The TLCAS Elements, TCLAS Processing Element TSPEC Element and Optional Subelements fields shall not be included in the DMS Descriptor if the Request Type is set to “Remove”. The AP shall terminate individually addressed frame delivery for the requested group addressed frames identified by the DMSID for the requesting non-AP STA upon receipt of a DMS Request frame or Reassociation Request frame with the Request Type field set to “Remove”. The AP shall respond to the termination request by sending a DMS Response frame including the corresponding DMSID and a Response Type value of “Terminate” in the Response Type field of the corresponding DMS Status field. The DMS Length field in this DMS Status field is set to 3. The TLCAS Elements, TCLAS Processing Element, TSPEC Element and Optional Subelement fields shall not be included in the DMS Status field if the Response Type field is set to “Terminate”.

The AP may send an unsolicited DMS Response frame at any time to cancel a granted DMS identified by the DMSID by including the DMSID and a Response Type value of “Terminate” in the DMS Status field. The AP may decide to reject a new DMS or cancel a granted DMS at any time based on network condition, for example the number of associated STAs and channel load.

The non-AP STA shall keep a list of group addresses for which the non-AP STA has requested DMS and that have been accepted by the AP. The requesting STA shall discard group addressed frames that match a group address in this list until the DMS has been terminated. When the DMS is terminated, and if the sequence number value is provided in the Last Sequence Control field in the DMS response frame, using the value of the Last Sequence Control field, the non-AP STA shall discard the group addressed frames that are the duplicates of the individually addressed frames.

NOTE—When the Last Sequence Control field in the DMS response frame is not supported at the AP (i.e., the sequence number value is not provided in the field), and a multicast MSDU that has sent using both unicast addressed and group addressed frame transmission, termination of the DMS stream by the AP may result in a non-AP STA receiving undetectable duplicate MSDUs that are not filtered out by MAC

If the length of the DMS Descriptors exceeds 255 octets, then multiple DMS Request elements shall be included, each containing only those DMS Descriptors that are completely contained within 255 octets. If the length of the DMS status fields exceeds 255 octets, then multiple DMS Response elements shall be included, each containing only those DMS Status fields that are completely contained within the first 255 octets.

If the non-AP STA supports both DMS and FMS, the non-AP STA shall not request both services for the same group addressed frames simultaneously. The non-AP STA may request the different service (DMS vs. FMS) for different group addressed frames.

If the AP supports both DMS and TFS, the AP shall first apply TFS to the frame and then apply DMS.

11.22.16 WNM-Notification

Implementation of the WNM-Notification capability is optional for a WNM STA. A STA that implements the WNM-Notification capability has the MIB attribute dot11MgmtOptionWNMNotificationImplemented set to true. When dot11MgmtOptionWNMNotificationImplemented is true, dot11WirelessManagementImplemented shall be true. A STA that has a value of true for the MIB attribute dot11MgmtOptionWNMNotificationActivated is defined as a STA that supports WNM-Notification. A STA for which the MIB attribute dot11MgmtOptionWNMNotificationActivated is set to true shall set the WNM-Notification Enabled field of the Extended Capabilities information element to 1.

A STA that supports WNM-Notification reporting shall only send a WNM-Notification Request or Response frame to a STA within the same infrastructure BSS or the same IBSS whose last received Extended Capabilities information element contained a value of 1 for the WNM-Notification bit in the Capabilities field.

A STA shall only transmit both the WNM-Notification Request frame and the WNM-Notification Response frame with an individually addressed destination address.

The WNM-Notification capability enables a STA to indicate management information, including information about its firmware to a peer STA. Use of the information provided is outside the scope of this standard. A non-AP STA that supports WNM-Notification and receives a WNM-Notification request frame with the Type field set to 0 shall respond with a WNM-Notification Response frame with the Response Status field set to 0.

12. PHY service specification

12.3.4.3 PHY-SAP service primitives parameters

Insert the following entries at the end of Table 12-3:

Table 12-3—PHY-SAP service primitive parameters

Parameter	Associated primitive	Value
TXSTATUS	PHY-TXSTART.confirm	A set of parameters

12.3.5.5 PHY-TXSTART.confirm

Change 12.3.5.5 as follows:

12.3.5.5.1 Function

This primitive is issued by the PHY to the local MAC entity to confirm the start of a transmission <u>and to indicate parameters related to the start of the transmission</u>. The PHY will issue this primitive in response to every PHY-TXSTART.request primitive issued by the MAC sublayer.

12.3.5.5.2 Semantics of the service primitive

The semantics of the primitive are as follows:

PHY-TXSTART.confirm<u>(TXSTATUS)</u>

<u>The TXSTATUS represents a list of parameters that the local PHY entity provides to the MAC sublayer related to the transmission of an MPDU. This vector contains both PLCP and PHY operational parameters. The required PHY parameters are listed in 12.3.4.3.</u>

~~This primitive has no parameters.~~

12.3.5.5.3 When generated

This primitive will be issued by the PHY to the MAC entity <u>once all of the following conditions are met:</u>

— The PHY has received a PHYTXSTART. request from the MAC entity.

<u>— The PLCP has issued PMD.TX STATUS.request if the MIB variable dot11MgmtOptionTODActivated is true and the TXVECTOR parameter TIME_OF_DEPARTURE_REQUESTED in PHY-TXSTART.request(TXVECTOR) is true.</u>

— <u>The PHY</u> is ready to begin accepting outgoing data octets from the MAC.

12.3.5.5.4 Effect of receipt

The receipt of this primitive by the MAC entity will cause the MAC to start the transfer of data octets. <u>Parameters in the TXSTATUS vector may be included in transmitted frames so that recipients on multiple channels can compensate for differences in the transmit time of the frames, and so to determine the time differences of air propagation times between transmitter and pairs of recipients and hence to compute the location of the transmitter via multilateration. See Annex V. In addition, the TXSTATUS vector may include the TX_START_OF_FRAME_OFFSET.</u>

15. DSSS PHY specification for the 2.4 GHz band designated for ISM applications

15.2 DSSS PLCP sublayer

Change 15.2.6 as follows:

15.2.6 Transmit PLCP

Replace Figure 15-6 with the following:

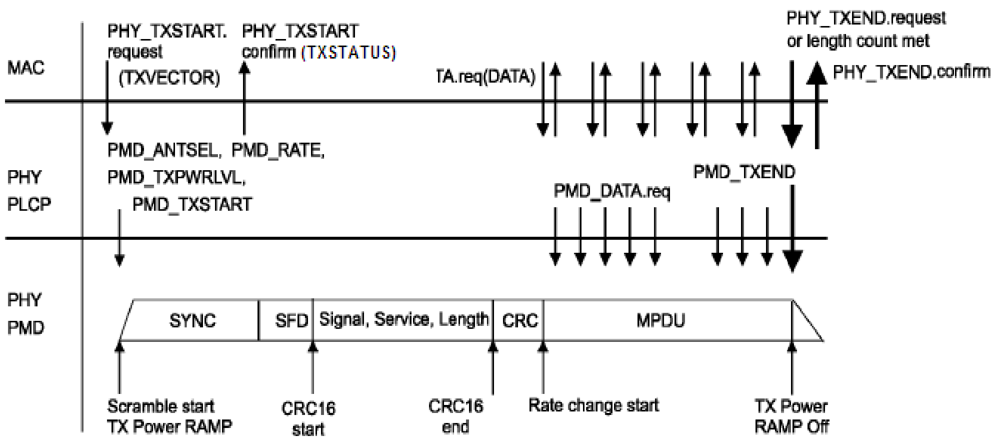

Figure 15-6—Transmit PLCP

Change the third and fourth paragraphs of 15.2.6 as follows:

Based on the status of CCA indicated by PHY-CCA.indicate, the MAC will assess that the channel is clear. A clear channel shall be indicated by PHY-CCA.indicate(IDLE). If the channel is clear, transmission of the PPDU shall be initiated by issuing the PHY-TXSTART.request(TXVECTOR) primitive. The TXVECTOR elements for the PHY-TXSTART.request are the PLCP header parameters SIGNAL (DATARATE), SERVICE, and LENGTH, and the PMD parameters of TX_ANTENNA, ~~and~~ TXPWR_LEVEL and TIME_OF_DEPARTURE_REQUESTED. The PLCP header parameter LENGTH is calculated from the TXVECTOR element by multiplying by 8 for 1 Mb/s and by 4 for 2 Mb/s.

The PLCP shall issue PMD_ANTSEL, PMD_RATE, and PMD_TXPWRLVL primitives to configure the PHY. The PLCP shall then issue a PMD_TXSTART.request and the PHY entity shall immediately initiate data scrambling and transmission of the PLCP preamble based on the parameters passed in the PHYTXSTART.request primitive. The time required for transmit power-on ramp described in 15.4.7.7 shall be included in the PLCP SYNC field. If the MIB variables dot11MgmtOptionTODImplemented and dot11MgmtOptionTODActivated are set to true and the TXVECTOR parameter TIME_OF_DEPARTURE_REQUESTED is true then the PLCP shall issue a PHY_TXSTART.confirm(TXSTATUS) primitive to the MAC, forwarding the TIME_OF_DEPARTURE corresponding to the time when the first frame energy is sent by the transmitting port, and the TIME_OF_DEPARTURE_ClockRate parameters within the TXSTATUS vector. If the MIB variable dot11MgmtOptionTimingMsmtActivated is true then the PLCP shall forward the value of TX_START_OF_FRAME_OFFSET in TXSTATUS vector.

Replace Figure 15-7 with the following:

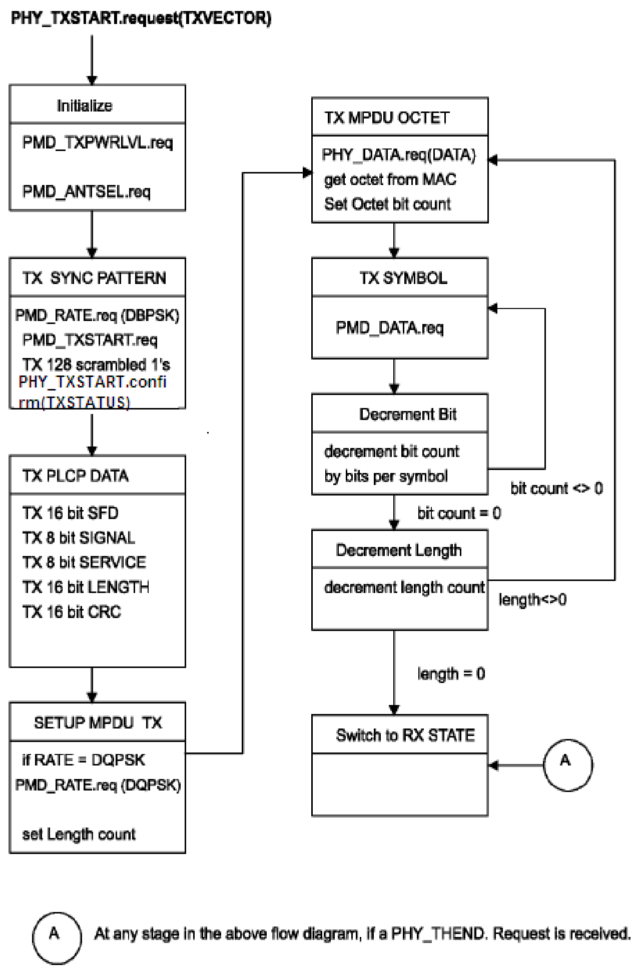

Figure 15-7—PLCP transmit state machine

15.2.7 Receive PLCP

Change the paragraph starting with sentence "If the PLCP header reception is successful..." as follows:

If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued. <u>If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, the PLCP shall do the following:</u>

— <u>Complete receiving the PLCP header and verify the validity of the PLCP Header.</u>

— <u>If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued and RX_START_OF_FRAME_OFFSET parameter within the RXVECTOR shall be forwarded (see 15.4.4.2).</u>

NOTE—The RX_START_OF_FRAME_OFFSET value is used as described in 10.3.51 in order to estimate when the start of the preamble for the incoming frame was detected on the medium at the receive antenna port.

The RXVECTOR associated with this primitive includes the SIGNAL field, the SERVICE field, the MPDU length in octets (calculated from the LENGTH field in microseconds), the antenna used for receive (RX_ANTENNA), RSSI, and SQ.

15.4.4.2 PMD_SAP Peer-to-Peer service primitive parameters

Insert the following new rows at the end of Table 15-4:

Table 15-4—DSSS PMD_SAP Peer-to-Peer service primitives

Parameter	Associated primitive	Value
TIME_OF_DEPARTURE_REQUESTED	PHY-TXSTART.request(TXVECTOR)	False, true. When true, the MAC entity requests that the PHY PLCP entity measures and reports time of departure parameters corresponding to the time when the first frame energy is sent by the transmitting port; when false, the MAC entity requests that the PHY PLCP entity neither measures nor reports time of departure parameters.
TIME_OF_DEPARTURE	PHY-TXSTART.confirm(TXSTATUS)	0 to 2^{32}–1. The locally-measured time when the first frame energy is sent by the transmitting port, in units equal to 1/TIME_OF_DEPARTURE_ClockRate. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TX_START_OF_FRAME_OFFSET	PHY-TXSTART.confirm(TXSTATUS)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the frame was transmitted at the transmit antenna port to the point in time at which this primitive is issued to the MAC.
TIME_OF_DEPARTURE_ClockRate	PHY-TXSTART.confirm(TXSTATUS)	0 to 2^{16}–1. The clock rate, in units of MHz, is used to generate the TIME_OF_DEPARTURE value. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
RX_START_OF_FRAME_OFFSET	PHY-RXSTART.Indicate(RXVECTOR)	0 to 2^{32}–1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC.

15.4.7 PMD transmit specifications

Insert the following new subclause after 15.4.7.9:

15.4.7.10 Time of Departure accuracy

The Time of Departure accuracy test evaluates TIME_OF_DEPARTURE against aTxPmdTxStartRMS and aTxPmdTxStartRMS against TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH as defined Annex V with the following test parameters:

— MULTICHANNEL_SAMPLING_RATE is $22 \times 10^6 \left(1 + \left\lceil \frac{f_H - f_L}{22\ \text{MHz}} \right\rceil \right)$ sample/s where f_H is the nominal center frequency in Hz of the highest channel in the channel set, f_L is the nominal center frequency in Hz of the lowest channel in the channel set, the channel set is the set of channels upon which frames providing measurements are transmitted, the channel set comprises channels uniformly spaced across $f_H - f_L \geq 50$ MHz, and $\lceil x \rceil$ equals the smallest integer equal to or larger than x.

— FIRST_TRANSITION_FIELD is the SYNC field.

— SECOND_TRANSITION_FIELD is the SFD field.

— TRAINING_FIELD is the concatenation of the SYNC and SFD fields, using a chip pulse that should approximate a rectangular pulse of duration 1/ 11 MHz convolved with a brick-wall low pass filter of bandwidth 11 MHz

— TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH is 80 ns.

NOTE—The indicated chip pulse applies to the time of departure accuracy test equipment, and not the transmitter or receiver.

17. Orthogonal frequency division multiplexing (OFDM) PHY specification for the 5 GHz band

17.2 OFDM PHY specific service parameter list

17.2.2 TXVECTOR parameters

Insert one new row at the end of Table 17-1 as follows:

Table 17-1—TXVECTOR parameters

Parameter	Associate primitive	Value
TIME_OF_DEPARTURE_REQUESTED	PHY-TXSTART.request(TXVECTOR)	False, true. When true, the MAC entity requests that the PHY PLCP entity measures and reports time of departure parameters corresponding to the time when the first frame energy is sent by the transmitting port; when false, the MAC entity requests that the PHY PLCP entity neither measures nor reports time of departure parameters.

17.2.3 RXVECTOR parameters

Insert one new row at the end of Table 17-2 as follows:

Table 17-2—RXVECTOR parameters

Parameter	Associated primitive	Value
RX_START_OF_FRAME_OFFSET	PHY-RXSTART.Indicate(RXVECTOR)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC.

Insert a new subclause after 17.2.2.5 as follows:

17.2.3.6 TIME_OF_DEPARTURE_REQUESTED

The allowed values are false or true. A parameter value of true indicates that the MAC sublayer is requesting that the PLCP entity provides measurement of when the first frame energy is sent by the transmitting port and reporting within the PHY-TXSTART.confirm(TXSTATUS) primitive. A parameter value of false indicates that the MAC sublayer is requesting that the PLCP entity not provide time of departure measurement nor reporting in the PHY-TXSTART.confirm(TXSTATUS) primitive.

Insert a new subclause after 17.2.3 as follows:

17.2.4 TXSTATUS parameters

The parameters listed in Table 17-2a are defined as part of the TXSTATUS parameter list in the PHY-TXSTART.confirm service primitive.

Table 17-2a—TXSTATUS parameters

Parameter	Associate primitive	Value
TIME_OF_DEPARTURE	TXSTART.confirm(TXSTATUS)	0 to 2^{32}– 1. The locally-measured time when the first frame energy is sent by the transmitting port, in units equal to 1/ TIME_OF_DEPARTURE_ClockRate. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TIME_OF_DEPARTURE_ClockRate	TXSTART.confirm(TXSTATUS)	0 to 2^{16}– 1. The clock rate, in units of MHz, is used to generate the TIME_OF_DEPARTURE value. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TX_START_OF_FRAME_OFFSET	PHY-TXSTART.confirm(TXSTATUS)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the frame was transmitted at the transmit antenna port to the point in time at which this primitive is issued to the MAC.

17.2.4.1 TXSTATUS TIME_OF_DEPARTURE

The allowed values for the TIME_OF_DEPARTURE parameter are integers in the range of 0 to 2^{32}– 1. This parameter is used to indicate when the first frame energy is sent by the transmitting port in units equal to 1/ TIME_OF_DEPARTURE_ClockRate. TIME_OF_DEPARTURE may be included in the transmitted frame 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.

17.2.4.2 TXSTATUS TIME_OF_DEPARTURE_ClockRate

TIME_OF_DEPARTURE_ClockRate indicates the clock rate used for TIME_OF_DEPARTURE.

17.3 OFDM PLCP sublayer

17.3.9 PMD transmit specifications

Insert a new subclause after 17.3.9.7 as follows:

17.3.9.8 Time of Departure accuracy

The Time of Departure accuracy test evaluates TIME_OF_DEPARTURE against aTxPmdTxStartRMS and aTxPmdTxStartRMS against TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH as defined Annex V with the following test parameters:

— MULTICHANNEL_SAMPLING_RATE is $20 \times 10^6\left(1 + \left\lceil \frac{f_H - f_L}{20\text{ MHz}} \right\rceil\right)$ sample/s where f_H is the nominal center frequency in Hz of the highest channel in the channel set, f_L is the nominal center frequency in Hz of the lowest channel in the channel set, the channel set is the set of channels upon which frames providing measurements are transmitted, the channel set comprises channels uniformly spaced across $f_H - f_L \geq 50$ MHz, and $\lceil x \rceil$ equals the smallest integer equal to or larger than x.

— FIRST_TRANSITION_FIELD is the Short symbols.
— SECOND_TRANSITION_FIELD is the Long symbols.
— TRAINING_FIELD is the Long symbols windowed in a manner which should approximate the windowing described in 17.3.2.4 with T_{TR} = 100 ns for 20 MHz channel spacing, T_{TR} = 200 ns for 10 MHz channel spacing and T_{TR} = 400 ns for 5 MHz channel spacing.
— TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH is 80 ns.

NOTE—The indicated windowing applies to the time of departure accuracy test equipment, and not the transmitter or receiver.

17.3.11 Transmit PLCP

Change the second and third paragraphs of 17.3.11 as follows:

A clear channel shall be indicated by PHY-CCA.indicate(IDLE). The MAC considers this indication before issuing the PHY-TXSTART.request. Transmission of the PPDU shall be initiated after receiving the PHYTXSTART.request(TXVECTOR) primitive. The TXVECTOR elements for the PHY-TXSTART.request are the PLCP header parameters DATARATE, SERVICE, and LENGTH, ~~and the~~ PMD parameters TXPWR_LEVEL, and TIME_OF_DEPARTURE_REQUESTED.

The PLCP shall issue PMD_TXPWRLVL and PMD_RATE primitives to configure the PHY. The PLCP shall then issue a PMD_TXSTART.request, and transmission of the PLCP preamble and PLCP header, based on the parameters passed in the PHY-TXSTART.request primitive, shall be immediately initiated. If the MIB variables dot11MgmtOptionTODImplemented and dot11MgmtOptionTODActivated are set to true or if dot11MgmtOptionTimingMsmtActivated is true and the TXVECTOR parameter TIME_OF_DEPARTURE_REQUESTED is true, then the PLCP shall issue a PHY_TXSTART.confirm(TXSTATUS) primitive to the MAC, forwarding the TIME_OF_DEPARTURE corresponding to the time when the first frame energy is sent by the transmitting port and the TIME_OF_DEPARTURE_ClockRate parameter within the TXSTATUS vector. If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, then the PLCP shall forward the value of TX_START_OF_FRAME_OFFSET in TXSTATUS vector.

Replace Figure 17-14 with the following:

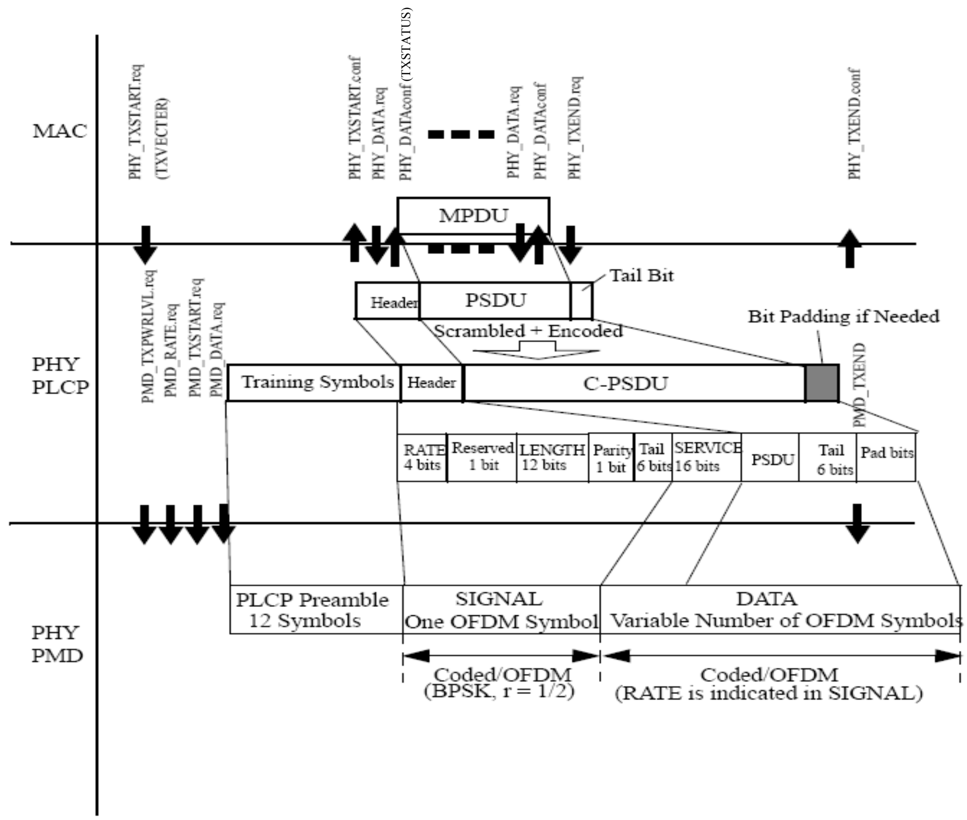

Figure 17-14—Transmit PLCP

Replace Figure 17-15 with the following:

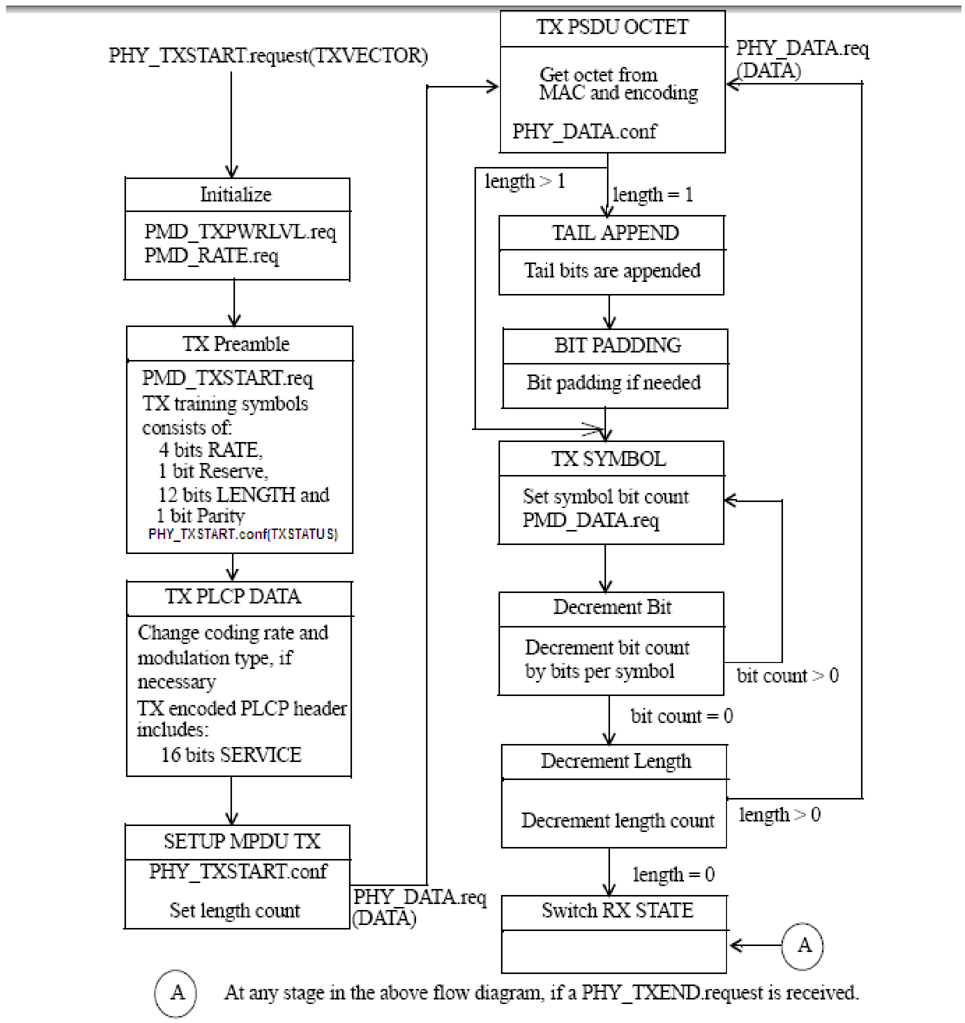

Figure 17-15—PLCP transmit state machine

17.3.12 Receive PLCP

Change the paragraph starting with sentence "If the PLCP header reception is successful..." as follows:

If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued. If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, the PLCP shall do the following:

— Complete receiving the PLCP header and verify the validity of the PLCP Header.

— If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued and RX_START_OF_FRAME_OFFSET parameter within the RXVECTOR shall be forwarded (see 17.2.3).

NOTE—The RX_START_OF_FRAME_OFFSET value is used as described in 10.3.51 in order to estimate when the start of the preamble for the incoming frame was detected on the medium at the receive antenna port.

The RXVECTOR associated with this primitive includes the SIGNAL field, the SERVICE field, the PSDU length in octets, and the RSSI. Also, in this case, the OFDM PHY will ensure that the CCA shall indicate a busy medium for the intended duration of the transmitted frame, as indicated by the LENGTH field.

18. High Rate direct sequence spread spectrum (HR/DSSS) PHY specification

18.2 High Rate PLCP sublayer

18.2.5 Transmit PLCP

Change the fifth paragraph of 18.2.5 as follows:

The PLCP shall issue PMD_ANTSEL, PMD_RATE, and PMD_TXPWRLVL primitives to configure the PHY. The PLCP shall then issue a PMD_TXSTART.request, and the PHY entity shall immediately initiate data scrambling and transmission of the PLCP preamble based on the parameters passed in the PHY-TXSTART.request primitive. The time required for transmit power-on ramp, described in 18.4.7.6, shall be included in the PLCP SYNC field. <u>If the MIB variables dot11MgmtOptionTODImplemented and dot11MgmtOptionTODActivated are set to true or if dot11MgmtOptionTimingMsmtActivated is true and the TXVECTOR parameter TIME_OF_DEPARTURE_REQUESTED is true, then the PLCP shall issue a PHY_TXSTART.confirm(TXSTATUS) primitive to the MAC, forwarding the TIME_OF_DEPARTURE corresponding to the time when the first frame energy is sent by the transmitting port and TIME_OF_DEPARTURE_ClockRate parameter within the TXSTATUS vector. If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, then the PLCP shall forward the value of TX_START_OF_FRAME_OFFSET in TXSTATUS vector.</u>

Replace Figure 18-7 with the following:

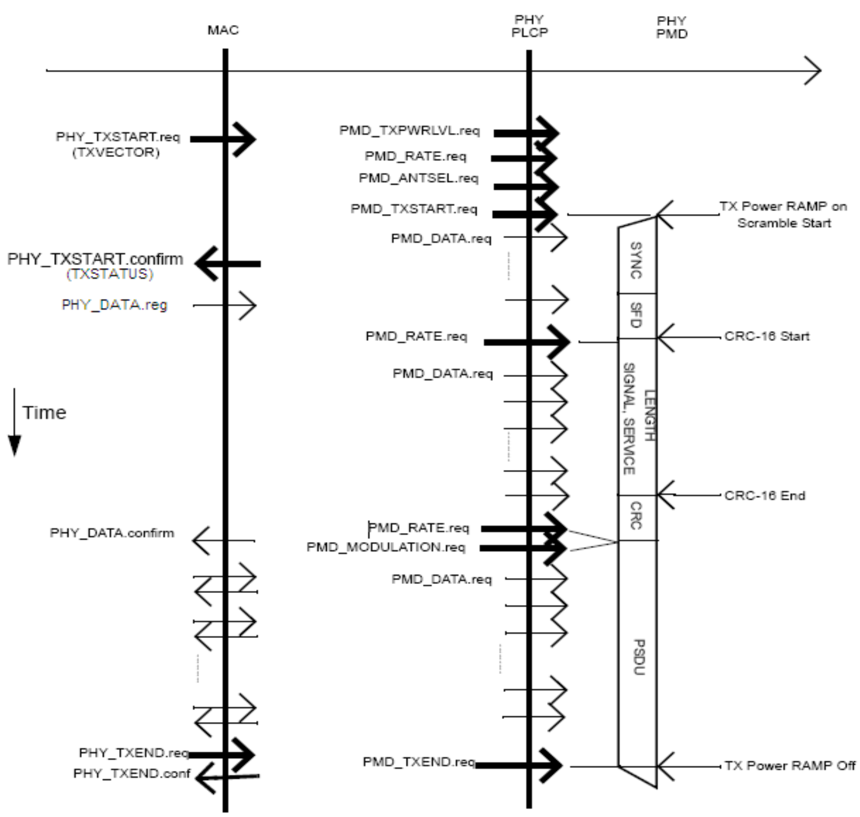

Figure 18-7—Transmit PLCP

Replace Figure 18-8 with the following:

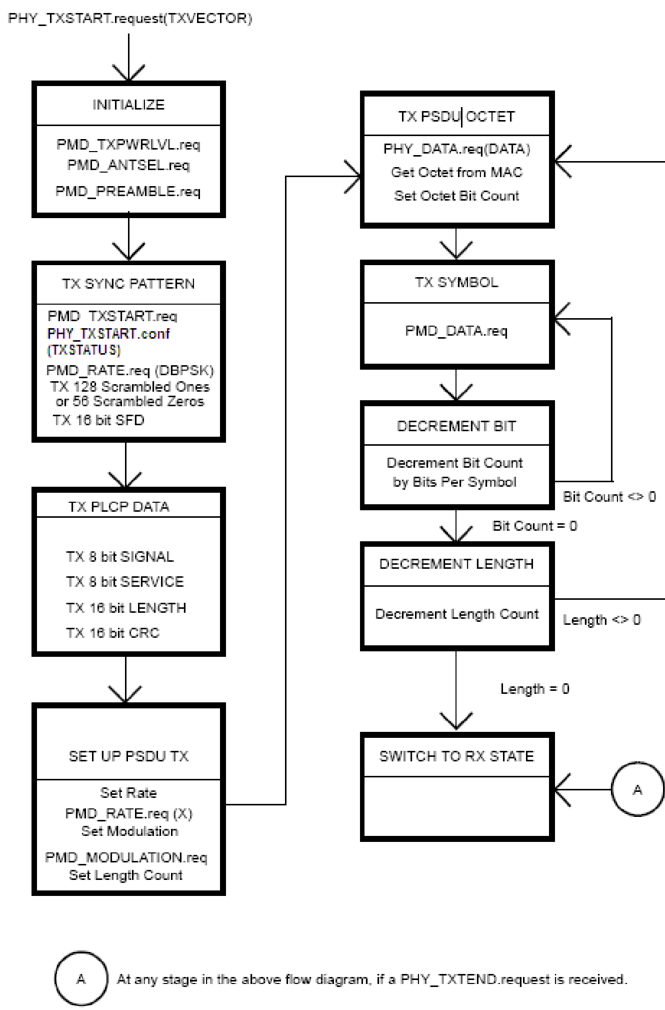

Figure 18-8—PLCP transmit state machine

18.2.6 Receive PLCP

Insert a new paragraph before the paragraph starting with sentence "The received PSDU bits are assembled into octets..." as follows:

If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, the PLCP shall do the following:

— Complete receiving the PLCP header and verify the validity of the PLCP Header.

— If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued and RX_START_OF_FRAME_OFFSET parameter within the RXVECTOR shall be forwarded (see 18.3.5).

NOTE—The RX_START_OF_FRAME_OFFSET value is used as described in 10.3.51 in order to estimate when the start of the preamble for the incoming frame was detected on the medium at the receive antenna port.

18.3 High Rate PLME

18.3.5 Vector descriptions

Insert new rows at the end of Table 18-6 as follows:

Table 18-6—Parameter vectors

Parameter	Associated vector	Value
TIME_OF_DEPARTURE_REQUESTED	TXVECTOR	false, true. When true, the MAC entity requests that the PHY PLCP entity measures and reports time of departure parameters corresponding to the time when the first frame energy is sent by the transmitting port; when false, the MAC entity requests that the PHY PLCP entity neither measures nor reports time of departure parameters.
TIME_OF_DEPARTURE	TXSTATUS	0 to 2^{32}– 1. The time when the first frame energy is sent by the transmitting port, measured by the local PHY entity, in units equal to 1/TIME_OF_DEPARTURE_ClockRate. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TIME_OF_DEPARTURE_ClockRate	TXSTATUS	0 to 2^{16}– 1. The clock rate, in units of MHz, is used to generate the TIME_OF_DEPARTURE value. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TX_START_OF_FRAME_OFFSET	PHY-TXSTART.confirm(TXSTATUS)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the frame was transmitted at the transmit antenna port to the point in time at which this primitive is issued to the MAC.
RX_START_OF_FRAME_OFFSET	PHY-RXSTART.Indicate(RXVECTOR)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC.

18.4 High Rate PMD sublayer

18.4.7 PMD transmit specifications

Insert a new subclause after 18.4.7.8 as follows:

18.4.7.9 Time of Departure accuracy

The Time of Departure accuracy test evaluates TIME_OF_DEPARTURE against aTxPmdTxStartRMS and aTxPmdTxStartRMS against TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH as defined in Annex V with the following test parameters:

— MULTICHANNEL_SAMPLING_RATE is $22 \times 10^6\left(1 + \left\lceil \frac{f_H - f_L}{22\ \text{MHz}} \right\rceil\right)$ sample/s where f_H is the nominal center frequency in Hz of the highest channel in the channel set, f_L is the nominal center frequency in Hz of the lowest channel in the channel set, the channel set is the set of channels upon which frames providing measurements are transmitted, the channel set comprises channels uniformly spaced across $f_H - f_L \geq 50$ MHz, and $\lceil x \rceil$ equals the smallest integer equal to or larger than x.

— FIRST_TRANSITION_FIELD is the SYNC field.

— SECOND_TRANSITION_FIELD is the SFD field.

— TRAINING_FIELD is the concatenation of the appropriate short or long SYNC and SFD fields, using a chip pulse which should approximate a rectangular pulse of duration 1/ 11 MHz convolved with a brick-wall low pass filter of bandwidth 11 MHz.

— TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH is 80 ns.

NOTE—The indicated chip pulse applies to the time of departure accuracy test equipment, and not the transmitter or receiver.

19. ERP specification

19.2 PHY-specific service parameter list

Change the first paragraph of 19.2 as follows:

The architecture of the IEEE 802.11 MAC is intended to be PHY independent. Some PHY implementations require PHY-dependent MAC state machines running in the MAC sublayer in order to meet certain PMD requirements. The PHY-dependent MAC state machine resides in a sublayer defined as the MLME. In certain PMD implementations, the MLME may need to interact with the PLME as part of the normal PHY SAP primitives. These interactions are defined by the PLME parameter list currently defined in the PHY service primitives as TXVECTOR, TXSTATUS, and RXVECTOR. The list of these parameters and the values they may represent are defined in the specific PHY specifications for each PMD. This subclause addresses the TXVECTOR, TXSTATUS, and RXVECTOR for the ERP. The service parameters for ~~R~~TXVECTOR, TXSTATUS, and ~~T~~RXVECTOR shall follow 17.2.2, 17.2.4, and 17.2.3, respectively.

Insert a new row at the end of Table 19-1 as follows:

Table 19-1—TXVECTOR parameters

Parameter	Value
TIME_OF_DEPARTURE_REQUESTED	False, true. When true, the MAC entity requests that the PHY PLCP entity measures and reports time of departure parameters corresponding to the time when the first frame energy is sent by the transmitting port; when false, the MAC entity requests that the PHY PLCP entity neither measures nor reports time of departure parameters.

Insert the following after the third paragraph of 19.2:

The parameters in Table 19-1a are defined as part of the TXSTATUS parameter list in the PHYTXSTART. confirm service primitive.

Table 19-1a—TXSTATUS parameters

Parameter	Value
TIME_OF_DEPARTURE	0 to 2^{32}– 1. The locally-measured time when the first frame energy is sent by the transmitting port, in units equal to 1/ TIME_OF_DEPARTURE_ClockRate. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TIME_OF_DEPARTURE_ClockRate	0 to 2^{16}–1. The clock rate, in units of MHz, is used to generate the TIME_OF_DEPARTURE value. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.

Table 19-1a—TXSTATUS parameters *(continued)*

Parameter	Value
TX_START_OF_FRAME_OFFSET	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the frame was transmitted at the transmit antenna port to the point in time at which this primitive is issued to the MAC.

Insert a new row at the end of Table 19-2 as follows:

Table 19-2—RXVECTOR parameters

Parameter	Associated primitive	Value
RX_START_OF_FRAME_OFFSET	PHY-RXSTART.Indicate(RXVECTOR)	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC.

19.4 ERP PMD operating specifications (general)

19.4.7 PMD transmit specifications

Change 19.4.7 as follows:

The PMD transmit specifications shall follow 17.3.9 with the exception of the transmit power level (17.3.9.1), the transmit center frequency tolerance (17.3.9.4), ~~and~~ the symbol clock frequency tolerance (17.3.9.5), and the time of departure accuracy (17.3.9.8). Regulatory requirements may have an effect on the combination of maximum transmit power and spectral mask if the resulting signals violate restricted band emission limits.

Insert a new subclause after* 19.4.7.3 *as follows:

19.4.7.4 Time of Departure accuracy

The time of departure specifications shall follow 17.3.9.8 for PPDUs transmitted using ERP-OFDM format and 18.4.7.9 for PPDUs transmitted using ERP-DSSS/CCK, ERP-PBCC, and DSSS-OFDM formats.

20. High Throughput (HT) PHY specification

20.2 HT PHY service interface

20.2.1 Introduction

Change 20.2.1 as follows:

The PHY interfaces to the MAC through the TX_VECTOR, TXSTATUS, RX_VECTOR, and the PHYCONFIG_VECTOR. The TX_VECTOR supplies the PHY with per packet transmit parameters. Status of the transmission is reported from PHY to MAC by parameters within TXSTATUS. Using the RX_VECTOR, the PHY informs the MAC of the received packet parameters. Using the PHYCONFIG_VECTOR, the MAC configures the PHY for operation, independent of frame transmission or reception.

20.2.2 TXVECTOR and RXVECTOR parameters

Insert new rows at the end of Table 20-1 as follows:

Table 20-1—TXVECTOR and RXVECTOR parameters

TIME_OF_DEPARTURE_REQUESTED	Enumerated type: true indicates that the MAC entity requests that the PHY PLCP entity measures and reports time of departure parameters corresponding to the time when the first frame energy is sent by the transmitting port. false indicates that the MAC entity requests that the PHY PLCP entity neither measures nor reports time of departure parameters.	O	N
RX_START_OF_FRAME_OFFSET	0 to $2^{32}-1$. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the incoming frame arrived at the receive antenna port to the point in time at which this primitive is issued to the MAC.	N	Y

20.2.4 Support for NON_HT formats

Insert a row immediately before the last row (i.e., Note row) of Table 20-3 as follows:

Table 20-3—Mapping of the HT PHY parameters for NON_HT operation

TIME_OF_DEPARTURE_REQUESTED	TIME_OF_DEPARTURE_REQUESTED	TIME_OF_DEPARTURE_REQUESTED	TIME_OF_DEPARTURE_REQUESTED	TIME_OF_DEPARTURE_REQUESTED

Insert new subclause after 20.2.4 as follows:

20.2.5 TXSTATUS parameters

The parameters listed in Table 20-3a are defined as part of the TXSTATUS parameter list in the PHY-TXSTART.confirm(TXSTATUS) service primitive.

Table 20-3a—TXSTATUS parameter

Parameter	Value
TIME_OF_DEPARTURE	0 to 2^{32}– 1. The locally-measured time when the first frame energy is sent by the transmitting port, in units equal to 1/ TIME_OF_DEPARTURE_ClockRate. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TIME_OF_DEPARTURE_ClockRate	0 to 2^{16}– 1. The clock rate, in units of MHz, is used to generate the TIME_OF_DEPARTURE value. This parameter is present only if TIME_OF_DEPARTURE_REQUESTED is true in the corresponding request.
TX_START_OF_FRAME_OFFSET	0 to 2^{32}– 1. An estimate of the offset (in 10 nanosecond units) from the point in time at which the start of the preamble corresponding to the frame was transmitted at the transmit antenna port to the point in time at which this primitive is issued to the MAC.

20.3 HT PLCP sublayer

20.3.21 PMD transmit specification

Insert a new subclause after 20.3.21.7 as follows:

20.3.21.8 Time of Departure accuracy

The Time of Departure accuracy test evaluates TIME_OF_DEPARTURE against aTxPmdTxStartRMS and aTxPmdTxStartRMS against TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH as defined in Annex V with the following test parameters:

— MULTICHANNEL_SAMPLING_RATE is $20 \times 10^6\left(1 + \left\lceil \frac{f_H - f_L}{20\text{ MHz}} \right\rceil\right)$ sample/s (for a CH_BANDWIDTH parameter equal to HT_CBW20) or $40 \times 10^6\left(1 + \left\lceil \frac{f_H - f_L}{40\text{ MHz}} \right\rceil\right)$ sample/s (for a CH_BANDWIDTH parameter equal to HT_CBW40) where f_H is the nominal center frequency in Hz of the highest channel in the channel set, f_L is the nominal center frequency in Hz of the lowest channel in the channel set, the channel set is the set of channels upon which frames providing measurements are transmitted, the channel set comprises channels uniformly spaced across $f_H - f_L \geq 50$ MHz, and $\lceil x \rceil$ equals the smallest integer equal to or larger than x.

— FIRST_TRANSITION_FIELD is L-STF (for HT-mixed format) or HT-GF-STF (for HT-greenfield format)

— SECOND_TRANSITION_FIELD is L-LTF (for HT-mixed format) or HT-GF-LTF1 (for HT-greenfield format)

— TRAINING_FIELD is L-LTF (for HT-mixed format) or HT-LTF1 (for HT-greenfield format) windowed in a manner which should approximate the windowing described in 17.3.2.4 with T_{TR} = 100 ns.

— TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH is 80 ns (for a CH_BANDWIDTH parameter equal to HT_CBW20) or 80 ns (for a CH_BANDWIDTH parameter equal to HT_CBW40).

NOTE—The indicated windowing applies to the time of departure accuracy test equipment, and not the transmitter or receiver.

20.3.23 Transmit PLCP

Change the fifth paragraph of 20.3.23 as follows:

The PLCP shall then issue a PMD_TXSTART.request, and transmission of the PLCP preamble may start if TIME_OF_DEPARTURE_REQUESTED is false, and shall start immediately if TIME_OF_DEPARTURE_REQUESTED is true, based on the parameters passed in the PHY-TXSTART.request primitive. If the MIB variables dot11MgmtOptionTODImplemented and dot11MgmtOptionTODActivated are set to true or if dot11MgmtOptionTimingMsmtActivated is true and the TXVECTOR parameter TIME_OF_DEPARTURE_REQUESTED is true, then the PLCP shall issue a PHY_TXSTART.confirm(TXSTATUS) primitive to the MAC, forwarding the TIME_OF_DEPARTURE corresponding to the time when the first frame energy is sent by the transmitting port and the TIME_OF_DEPARTURE_ClockRate parameter within the TXSTATUS vector. If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, then the PLCP shall forward the value of TX_START_OF_FRAME_OFFSET in TXSTATUS vector.

Replace Figure 20-20 with the following:

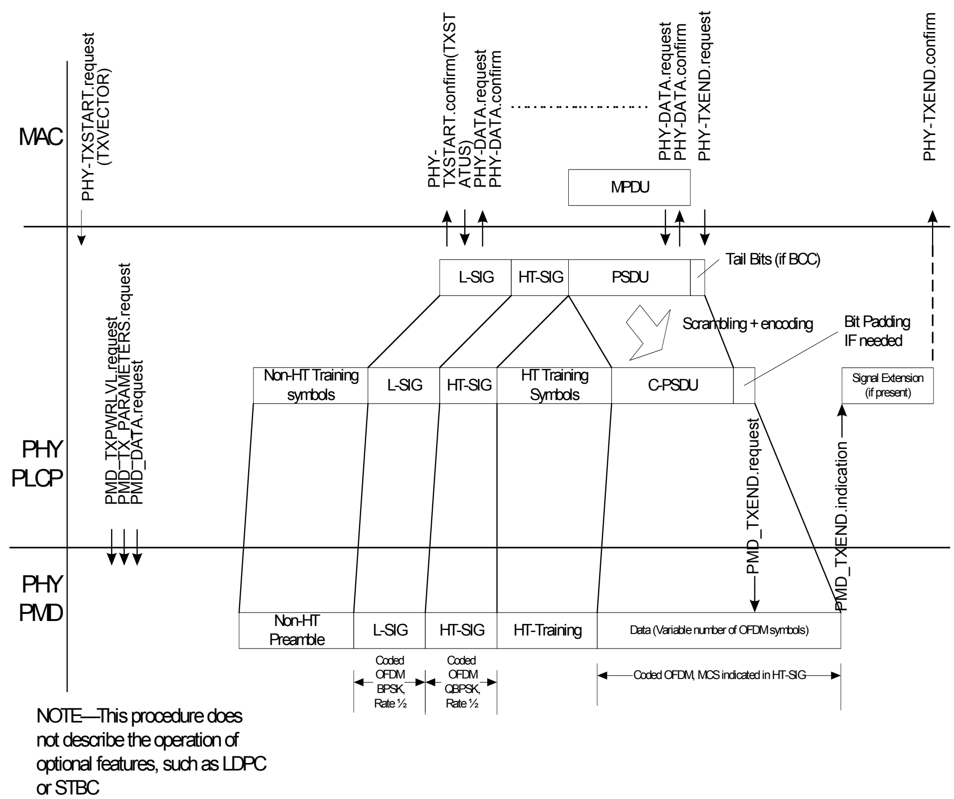

Figure 20-20—PLCP transmit procedure (HT-mixed format PPDU)

Replace Figure 20-21 with the following:

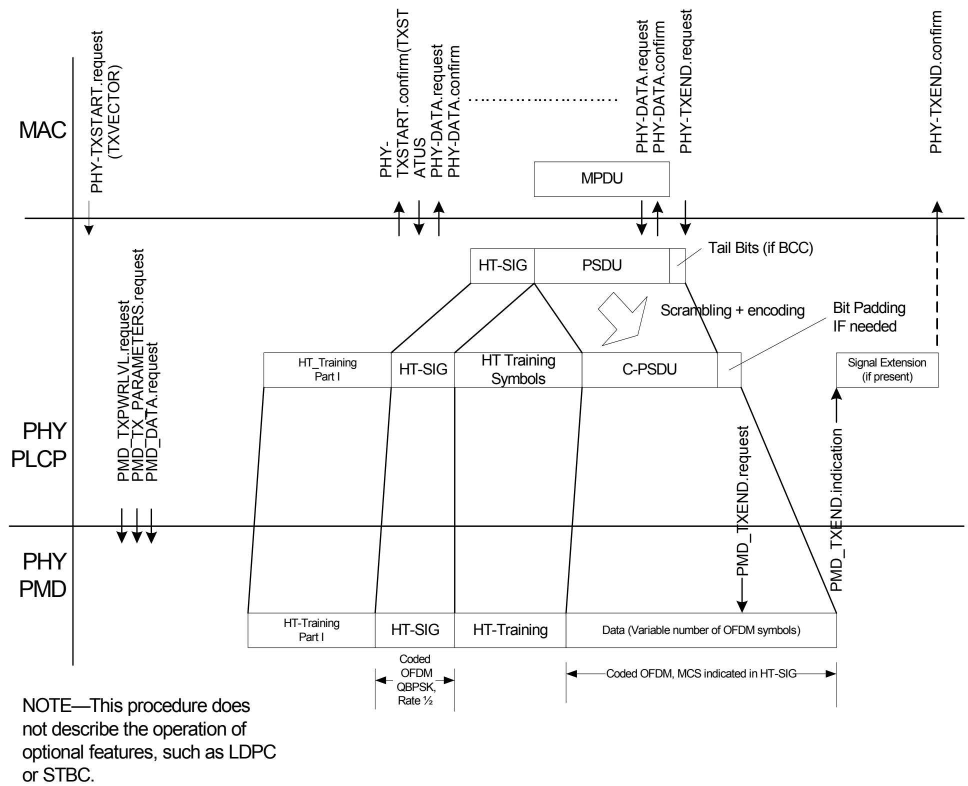

Figure 20-21—PLCP transmit procedure (HT-greenfield format PPDU)

Replace Figure 20-22 with the following:

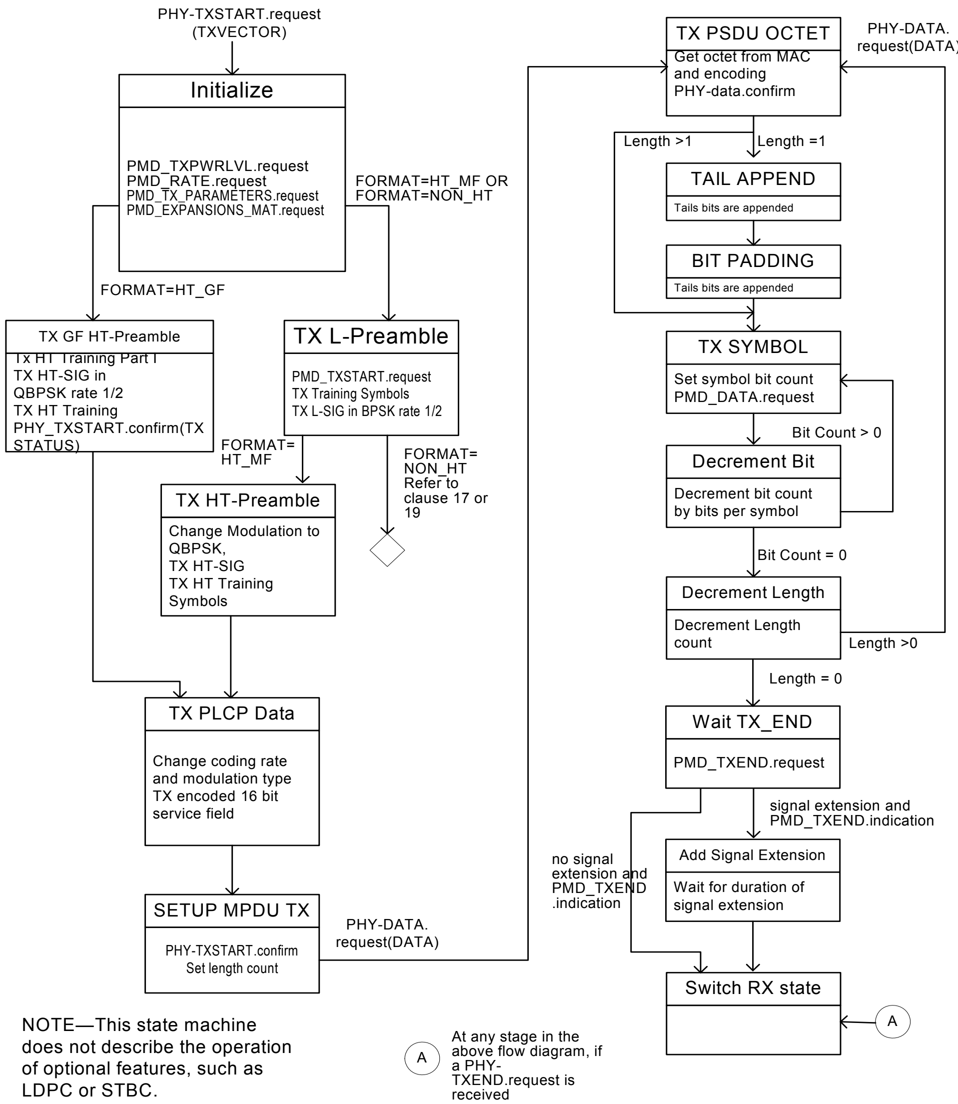

Figure 20-22—PLCP transmit state machine

20.3.24 PLCP receive procedure

Change the paragraph starting with sentence "Subsequent to an indication of a valid HT-SIG CRC..." as follows:

Subsequent to an indication of a valid HT-SIG CRC, a PHY-RXSTART.indication(RXVECTOR) shall be issued. <u>If the MIB variable dot11MgmtOptionTimingMsmtActivated is true, the PLCP shall do the following:</u>

— <u>Complete receiving the PLCP header and verify the validity of the PLCP Header.</u>

— <u>If the PLCP header reception is successful (and the SIGNAL field is completely recognizable and supported), a PHY-RXSTART.indication(RXVECTOR) shall be issued and</u>

RX_START_OF_FRAME_OFFSET parameter within the RXVECTOR shall be forwarded (see 20.2.2).

NOTE—The RX_START_OF_FRAME_OFFSET value is used as described in 10.3.51 in order to estimate when the start of the preamble for the incoming frame was detected on the medium at the receive antenna port.

The RXVECTOR associated with this primitive includes the parameters specified in Table 20-1. Upon reception of a GF preamble by an HT STA that does not support GF, the FORMAT field of RXVECTOR is HT_GF and the remaining fields may be empty, and the PHY shall issue the error condition PHY-RXEND.indication(FormatViolation). If the HT-SIG indicates an unsupported mode or Reserved HTSIG Indication the PHY shall issue the error condition PHY-RXEND.indication(UnsupportedRate).

Annex A

(normative)

Protocol Implementation Conformance Statement (PICS) proforma

A.2 Abbreviations and special symbols

A.2.2 General abbreviations for Item and Support columns

Insert one new list item at the end of A.2.2 as follows:

WNM wireless network management

A.4 PICS proforma—IEEE Std 802.11-2007[2]

A.4.3 IUT configuration

Insert the following entry to the end of the IUT configuration table:

Item	IUT configuration	References	Status	Support
*CF18	Is WNM supported?		(CF8 & CF11 & CF13 & CF15 & DSE5 & DSE6 & DSE7 & DSE8 & DSE9):O	Yes ☐ No ☐ N/A ☐

[2]*Copyright release for PICS proforma:* Users of this standard may freely reproduce the PICS proforma in this annex so that it can be used for its intended purpose and may further publish the completed PICS.

A.4.17 Radio Resource Management extensions

Insert a new row after RRM 9.1.1 as follows:

Item	Protocol capability	References	Status	Support
RRM9.1.1.1	Location Subject third party	7.3.2.21.9	CF13:O	Yes ☐ No ☐ N/A ☐

Insert the following new subclause after A.4.20:

A.4.21 WNM extensions

Item	Protocol capability	References	Status	Support
WNM1	Extended Capabilities information element	7.3.2.27	CF18:M	Yes ☐ No ☐ N/A ☐
WNM2	STA Statistics (Triggered) and Multicast Diagnostics	11.10.7	CF18:M	Yes ☐ No ☐ N/A ☐
WNM2.1	Protocol for Triggered Measurements	11.10.7	CF18:M	Yes ☐ No ☐ N/A ☐
WNM2.2	Triggered STA Statistics	7.3.2.21.8, 7.3.2.22.8, 7.4.6.1,7.4.6.2, 11.10.8.5	CF18:O	Yes ☐ No ☐ N/A ☐
WNM2.3	Multicast Diagnostics	7.3.2.21.12, 7.3.2.22.11, 7.4.6.1,7.4.6.2, 11.10.16	CF18:M	Yes ☐ No ☐ N/A ☐
WNM3	Event	11.22.2	CF18:M	Yes ☐ No ☐ N/A ☐
WNM3.1	Event Request frame	7.3.2.67, 7.4.12.2	(CF18 & CF1):M	Yes ☐ No ☐ N/A ☐
WNM3.2	Event Report frame	7.3.2.68, 7.4.12.3	(CF18 & CF2):M	Yes ☐ No ☐ N/A ☐
WNM4	Diagnostic	11.22.3	CF18:M	Yes ☐ No ☐ N/A ☐
WNM4.1	Diagnostic Request frame	7.3.2.69, 7.4.12.4	(CF18 & CF1):M	Yes ☐ No ☐ N/A ☐
WNM4.2	Diagnostic Report frame	7.3.2.70, 7.4.12.5	(CF18 & CF2):M	Yes ☐ No ☐ N/A ☐
WNM4.3	Configuration Profile Diagnostic Type	7.3.2.70.3, 11.22.3.2	CF18:M	Yes ☐ No ☐ N/A ☐
WNM4.4	Manufacturer Information STA Report Diagnostic Type	7.3.2.70.2, 11.22.3.3	CF18:M	Yes ☐ No ☐ N/A ☐
WNM4.5	Association Diagnostic Type	7.3.2.69.2, 7.3.2.70.4, 11.22.3.4	CF18:M	Yes ☐ No ☐ N/A ☐
WNM4.6	IEEE 802.1X Authentication Diagnostic Type	7.3.2.69.3, 7.3.2.70.5, 11.22.3.5	(CF18 & PC34):M	Yes ☐ No ☐ N/A ☐

WNM5	Location	11.22.4, 7.3.2.71	CF18:M	Yes ☐ No ☐ N/A ☐
WNM5.1	Location Civic Request/Report	11.10.8.9	CF18:M	Yes ☐ No ☐ N/A ☐
WNM5.2	Location Identifier Request/Report	11.10.8.10	CF18:M	Yes ☐ No ☐ N/A ☐
WNM5.3	Location Track Notification	11.22.4,7.4.7.12	CF18:O	Yes ☐ No ☐ N/A ☐
WNM5.3.1	Time Of Departure Notifications	11.22.4,7.3.2.71	CF18:O	
WNM5.3.2	Motion Detection Notifications	11.22.4,7.3.2.71	CF18:O	
WNM5.4	Location Configuration Request frame	7.4.12.6,7.3.2.71	CF18:M	Yes ☐ No ☐ N/A ☐
WNM5.4.1	Normal Indication	7.4.12.6,7.3.2.71	CF18:O	Yes ☐ No ☐ N/A ☐
WNM5.4.2	Motion Indication	7.4.12.6,7.3.2.71	CF18:O	Yes ☐ No ☐ N/A ☐
WNM5.5	Location Configuration Response frame	7.4.12.7,7.3.2.71	CF18:M	Yes ☐ No ☐ N/A ☐
*WNM6	Multiple BSSID Support	11.1.2.3a, 11.1.3, 11.10.11	CF18:O	Yes ☐ No ☐ N/A ☐
WNM6.1	Multiple BSSID element	7.3.2.46	WNM6:M	Yes ☐ No ☐ N/A ☐
WNM6.2	Multiple BSSID-index element	7.3.2.74	WNM6:M	Yes ☐ No ☐ N/A ☐
WNM7	BSS Transition Management	11.22.6	CF18:O	Yes ☐ No ☐ N/A ☐
WNM7.1	Neighbor Report element	7.3.2.37	(CF18 & CF1):M	Yes ☐ No ☐ N/A ☐
WNM7.2	BSS Transition Management Query frame	7.4.12.8	(CF18 & CF1):M	Yes ☐ No ☐ N/A ☐
WNM7.3	BSS Transition Management Request frame	7.4.12.9	(CF18 & CF2):M	Yes ☐ No ☐ N/A ☐
WNM7.4	BSS Transition Management Response frame	7.4.12.10	(CF18 & CF2):M	Yes ☐ No ☐ N/A ☐
*WNM8	FMS	11.2.1.4a	CF18:O	Yes ☐ No ☐ N/A ☐
WNM8.1	FMS Request frame	7.4.12.11	(CF2 & WNM8):M	Yes ☐ No ☐ N/A ☐
WNM8.2	FMS Response frame	7.4.12.12	(CF1 & WNM8):M	Yes ☐ No ☐ N/A ☐
WNM9	Proxy ARP	11.22.13	CF18:O	Yes ☐ No ☐ N/A ☐
*WNM10	Collocated Interference Reporting	11.22.9	CF18:O	Yes ☐ No ☐ N/A ☐
WNM10.1	Collocated Interference Request frame	7.4.12.13	WNM10:M	Yes ☐ No ☐ N/A ☐
WNM10.2	Collocated Interference Report frame	7.4.12.14	WNM10:M	Yes ☐ No ☐ N/A ☐
*WNM11	BSS Max idle period	11.22.12	CF18:M	Yes ☐ No ☐ N/A ☐

WNM11.1	BSS Max Idle Period element	7.3.2.79	WNM11:M	Yes ☐ No ☐ N/A ☐
*WNM12	TFS	11.22.11	CF18:O	Yes ☐ No ☐ N/A ☐
WNM12.1	TFS Request frame	7.3.2.80, 7.4.12.15	WNM12:M	Yes ☐ No ☐ N/A ☐
WNM12.2	TFS Response frame	7.3.2.81, 7.4.12.16	WNM12:M	Yes ☐ No ☐ N/A ☐
WNM12.3	TFS Notify frame	7.4.12.17	(CF1 & WNM12):M, (CF2 & WNM12):O	Yes ☐ No ☐ N/A ☐
*WNM13	WNM-Sleep Mode	11.2.1.16	WNM12:O	Yes ☐ No ☐ N/A ☐
WNM13.1	WNM-Sleep Mode Request frame	7.3.2.82, 7.4.12.18	WNM13:M	Yes ☐ No ☐ N/A ☐
WNM13.2	WNM-Sleep Mode Response frame	7.3.2.82, 7.4.12.19	WNM13:M	Yes ☐ No ☐ N/A ☐
*WNM14	TIM Broadcast	11.2.1.13	CF18:O	Yes ☐ No ☐ N/A ☐
WNM14.1	TIM Broadcast Request frame	7.3.2.83, 7.4.12.20,	WNM14:M	Yes ☐ No ☐ N/A ☐
WNM14.2	TIM Broadcast Response frame	7.3.2.84, 7.4.12.21	WNM14:M	Yes ☐ No ☐ N/A ☐
WNM14.3	TIM Broadcast frame	7.4.13.2	WNM14:M	Yes ☐ No ☐ N/A ☐
*WNM15	QoS Traffic Capability	11.22.9	(CF18 & CF2):O	Yes ☐ No ☐ N/A ☐
WNM15.1	QoS Traffic Capability element	7.3.2.78	WNM15:M	Yes ☐ No ☐ N/A ☐
WNM15.2	QoS Traffic Capability update frame	7.4.12.22	WNM15:M	Yes ☐ No ☐ N/A ☐
WNM16	AC Station Count	11.22.10	(CF18 & CF2):O	Yes ☐ No ☐ N/A ☐
WNM17	Timing Measurement	11.22.5	CF18:O	Yes ☐ No ☐ N/A ☐
WNM17.1	Timing Measurement Request	7.4.12.27	WNM17:M	Yes ☐ No ☐ N/A ☐
WNM17.2	Timing Measurement	7.4.13.3	WNM17:M	Yes ☐ No ☐ N/A ☐
*WNM18	Channel Usage	11.22.14	CF18:O	Yes ☐ No ☐ N/A ☐
WNM18.1	Channel Usage Request frame	7.3.2.86, 7.4.12.23	WNM18:M	Yes ☐ No ☐ N/A ☐
WNM18.2	Channel Usage Response frame	7.3.2.86, 7.4.12.24	WNM18:M	Yes ☐ No ☐ N/A ☐
*WNM19	DMS	11.22.15	(CF18 & CF16):O	Yes ☐ No ☐ N/A ☐
WNM19.1	DMS Request frame	7.3.2.88, 7.4.12.25	WNM19:M	Yes ☐ No ☐ N/A ☐

WNM19.2	DMS Response frame	7.3.2.89, 7.4.12.26	WNM19:M	Yes ☐ No ☐ N/A ☐
WNM20	UTC TSF Offset	11.20.3, 7.3.2.61, 7.3.2.87	CF18:O	Yes ☐ No ☐ N/A ☐
WNM21	U-APSD Coexistence	7.3.2.91, 11.2.1.4.2	CF18:O	Yes ☐ No ☐ N/A ☐
WNM22	WNM-Notification	11.22.16	(CF18 & CF16):O	Yes ☐ No ☐ N/A ☐
WNM22.1	WNM-Notification Request frame	7.4.12.28	WNM21:M	Yes ☐ No ☐ N/A ☐
WNM22.2	WNM-Notification Response frame	7.4.12.29	WNM21:M	Yes ☐ No ☐ N/A ☐

Annex D

(normative)

ASN.1 encoding of the MAC and PHY MIB

```
-- **********************************************************************

-- * dotStationConfig TABLE

-- **********************************************************************
```

Change the end of the "Dot11StationConfigEntry" of the "dotStationConfig TABLE" as follows:

```
      dot11TDLSACDeterminationInterval          INTEGER,
      dot11WirelessManagementImplemented        TruthValue,
      dot11BssMaxIdlePeriod                     INTEGER,
      dot11BssMaxIdlePeriodOptions              OCTET STRING,
      dot11TIMBroadcastInterval                 INTEGER,
      dot11TIMBroadcastOffset                   INTEGER,
      dot11TIMBroadcastHighRateTIMRate          INTEGER,
      dot11TIMBroadcastLowRateTIMRate           INTEGER,
      dot11StatsMinTriggerTimeout               INTEGER,
      dot11RRMCivicMeasurementActivated         TruthValue,
      dot11RRMIdentifierMeasurementActivated    TruthValue,
      dot11TimeAdvertisementDTIMInterval        INTEGER,
      dot11TimeAdvertisementTimeError           OCTET STRING,
      dot11TimeAdvertisementTimeValue           OCTET STRING,
      dot11RRM3rdPartyMeasurementActivated      TruthValue}
```

Insert the following elements at the end of the dot11StationConfigTable element definitions:

```
dot11WirelessManagementImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This attribute, when true, indicates that the station implementation is capable
          of supporting one or more Wireless Network Management services."
          ::= { dot11StationConfigEntry 106}

dot11BssMaxIdlePeriod OBJECT-TYPE
          SYNTAX INTEGER (1..65535)
          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 indicates that the number of 1000 TUs that pass before an AP
          disassociates an inactive non-AP STA. This value is transmitted in the
          Association Response and Reassociation Response frames."
          ::= { dot11StationConfigEntry 107}

dot11BssMaxIdlePeriodOptions OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(1))
          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 indicates the options associated with the BSS Max Idle capability.
        This value is transmitted in the Association Response and Reassociation Response
        frames.”
        ::= { dot11StationConfigEntry 108}

dot11TIMBroadcastInterval OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        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 indicates the number of beacon periods between TIM frame
        transmissions. A value of 0 disables TIM Broadcast for the requesting station.”
        DEFVAL { 0 }
        ::= { dot11StationConfigEntry 109}

dot11TIMBroadcastOffset OBJECT-TYPE
        SYNTAX INTEGER (-2147483648..2147483647)
        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 indicates the offset in microseconds with a tolerance of +/- 4
        microseconds relative to the TBTT for which a TIM frame is scheduled for
        transmission. The field contains a signed integer.”
        DEFVAL { 0 }
        ::= { dot11StationConfigEntry 110}

dot11TIMBroadcastHighRateTIMRate OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "0.5mbps"
        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 indicates the rate used to transmit the high data rate
        TIM frame, in units of 0.5 Mb/s. A value of 0 indicates that the high rate TIM
        frame is not transmitted."
        DEFVAL { 0 }
        ::= { dot11StationConfigEntry 111}

dot11TIMBroadcastLowRateTIMRate OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "0.5mbps"
        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 indicates the rate used to transmit the low data rate
        TIM frame, in units of 0.5 Mb/s. A value of 0 indicates that the low rate TIM
        frame is not transmitted."
        DEFVAL { 0 }
        ::= { dot11StationConfigEntry 112}


dot11StatsMinTriggerTimeout OBJECT-TYPE
        SYNTAX INTEGER (10..7200)
        UNITS "seconds"
        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 indicates the minimum allowable value for Triggered Timeout. A
          Triggered STA Statistics report is generated by the STA after the timeout if none
          of the trigger conditions are satisfied."
          DEFVAL { 10 }
          ::= { dot11StationConfigEntry 113 }

dot11RRMCivicMeasurementActivated 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 dot11RadioMeasurementEnabled is true
          and that the station capability for Location Civic Measurement is enabled. false
          indicates the station has no Location Civic Measurement capability or that the
          capability is present but is disabled."
          DEFVAL { false }
          ::= { dot11StationConfigEntry 114 }

dot11RRMIdentifierMeasurementActivated 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 dot11RadioMeasurementEnabled is true
          and that the station capability for Location Identifier Measurement is enabled.
          false indicates the station has no Location Identifier Measurement capability or
          that the capability is present but is disabled."
          DEFVAL { false }
          ::= { dot11StationConfigEntry 115 }

dot11TimeAdvertisementDTIMInterval OBJECT-TYPE
          SYNTAX INTEGER (1..255)
          UNITS "dtims"
          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 indicates the interval in number of DTIMS when the Time
          Advertisement element is included in beacon frames."
          DEFVAL { 1 }
          ::= { dot11StationConfigEntry 116 }


dot11TimeAdvertisementTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          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 indicates the Time Error value as defined in the Time
          Advertisement IE Time Error field when the Time Capabilities field is set to 2.
          This field is included in the Time Advertisement element in Beacon and Probe
          Response frames."
          DEFVAL { 0 }
          ::= { dot11StationConfigEntry 131 }

dot11TimeAdvertisementTimeValue OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          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 indicates the TimeAdvertisement Time Value as defined in the Time
          Advertisement IE Time Value field when the Time Capabilities field is set to 2.
          The format is defined in Table 7-43r and is included in the Time Advertisement
          element in Beacon and Probe Response frames."
          ::= { dot11StationConfigEntry 132 }


dot11RRM3rdPartyMeasurementActivated 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 dot11RadioMeasurementEnabled is true
          and that the station capability for Third Party Location Measurement is enabled.
          false indicates the station has no Third Party Location Measurement capability or
          that the capability is present but is disabled."
          DEFVAL { false }
          ::= { dot11StationConfigEntry 133 }


--**********************************************************
--*       dotCounters TABLE
--**********************************************************
```

Change the end of the "dot11CountersEntry" of the "dotCounters TABLE" as follows:

```
                    dot11PBACErrors                                  Counter32,
                    dot11DeniedAssociationCounterDueToBSSLoad         Counter32}
```

Insert the following elements at the end of the dot11Counters table definitions:

```
dot11DeniedAssociationCounterDueToBSSLoad OBJECT-TYPE
          SYNTAX Counter32
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a status variable.
          It is written by the SME when the condition described below occurs.

          This counter, available at a WNM AP, shall increment when an association or re-
          association request is denied because the AP has insufficient bandwidth to handle
          the additional STA."
          ::= { dot11CountersEntry 59}
```

Insert the following elements at the end of the list of child objects for dot11smt object identifier:

```
--**********************************************************
--*Wireless Network Management
--**********************************************************
-- dot11WirelessMgmtOptionsTable::= { dot11smt 18}
-- dot11LocationServicesNextIndex::= { dot11smt 19}
-- dot11LocationServicesTable::= { dot11smt 20}
-- dot11WirelessMGTEventTable::= { dot11smt 21}
-- dot11WirelessNetworkManagement::= { dot11smt 22}
```

Insert the following text at the end of the Station management MIB:

```
-- ********************************************************************
-- * dot11WirelessMgmtOptions TABLE
-- ********************************************************************
dot11WirelessMgmtOptionsTable OBJECT-TYPE
          SYNTAX SEQUENCE OF Dot11WirelessMgmtOptionsEntry
          MAX-ACCESS not-accessible
          STATUS current
          DESCRIPTION
          "Wireless Management attributes. In tabular form to allow for multiple instances
          on an agent. This table only applies to the interface if
```

```
          dot11WirelessManagementImplemented is set to true in the
          dot11StationConfigTable. Otherwise this table should be ignored.”
          ::= { dot11smt 18 }

dot11WirelessMgmtOptionsEntry OBJECT-TYPE
          SYNTAX Dot11WirelessMgmtOptionsEntry
          MAX-ACCESS not-accessible
          STATUS current
          DESCRIPTION
          "An entry in the dot11WirelessMgmtOptionsTable. For all Wireless Management
          features, an Activated MIB variable is used to activate/enable or deactivate/
          disable the corresponding feature. An Implemented MIB variable is used for an
          optional feature to indicate whether the feature is implemented. A mandatory
          feature does not have a corresponding Implemented MIB variable. It is possible
          for there to be multiple IEEE 802.11 interfaces on one agent, each with its
          unique MAC address. The relationship between an IEEE 802.11 interface and an
          interface in the context of the Internet-standard MIB is one-to-one. As such, the
          value of an ifIndex object instance can be directly used to identify
          corresponding instances of the objects defined herein. ifIndex - Each IEEE 802.11
          interface is represented by an ifEntry. Interface tables in this MIB module are
          indexed by ifIndex."
          INDEX { ifIndex }
          ::= { dot11WirelessMgmtOptionsTable 1 }

Dot11WirelessMgmtOptionsEntry ::=
SEQUENCE {
          dot11MgmtOptionLocationActivated        TruthValue,
          dot11MgmtOptionFMSImplemented           TruthValue,
          dot11MgmtOptionFMSActivated             TruthValue,
          dot11MgmtOptionEventsActivated          TruthValue,
          dot11MgmtOptionDiagnosticsActivated     TruthValue,
          dot11MgmtOptionMultiBSSIDImplemented    TruthValue,
          dot11MgmtOptionMultiBSSIDActivated      TruthValue,
          dot11MgmtOptionTFSImplemented           TruthValue,
          dot11MgmtOptionTFSActivated             TruthValue,
          dot11MgmtOptionWNMSleepModeImplemented  TruthValue,
          dot11MgmtOptionWNMSleepModeActivated    TruthValue,
          dot11MgmtOptionTIMBroadcastImplemented  TruthValue,
          dot11MgmtOptionTIMBroadcastActivated    TruthValue,
          dot11MgmtOptionProxyARPImplemented      TruthValue,
          dot11MgmtOptionProxyARPActivated        TruthValue,
          dot11MgmtOptionBSSTransitionImplemented TruthValue,
          dot11MgmtOptionBSSTransitionActivated   TruthValue,
          dot11MgmtOptionQoSTrafficCapabilityImplemented    TruthValue,
          dot11MgmtOptionQoSTrafficCapabilityActivated      TruthValue,
          dot11MgmtOptionACStationCountImplemented          TruthValue,
          dot11MgmtOptionACStationCountActivated  TruthValue,
          dot11MgmtOptionCoLocIntfReportingImplemented      TruthValue,
          dot11MgmtOptionCoLocIntfReportingActivated        TruthValue,
          dot11MgmtOptionMotionDetectionImplemented         TruthValue,
          dot11MgmtOptionMotionDetectionActivated TruthValue,
          dot11MgmtOptionTODImplemented           TruthValue,
          dot11MgmtOptionTODActivated             TruthValue,
          dot11MgmtOptionTimingMsmtImplemented    TruthValue,
          dot11MgmtOptionTimingMsmtActivated      TruthValue,
          dot11MgmtOptionChannelUsageImplemented  TruthValue,
          dot11MgmtOptionChannelUsageActivated    TruthValue,
          dot11MgmtOptionTriggerSTAStatisticsActivated      TruthValue,
          dot11MgmtOptionSSIDListImplemented                TruthValue,
          dot11MgmtOptionSSIDListActivated TruthValue,
          dot11MgmtOptionMulticastDiagnosticsActivated      TruthValue,
          dot11MgmtOptionLocationTrackingImplemented        TruthValue,
          dot11MgmtOptionLocationTrackingActivated          TruthValue,
          dot11MgmtOptionDMSImplemented           TruthValue,
          dot11MgmtOptionDMSActivated             TruthValue,
          dot11MgmtOptionUAPSDCoexistenceImplemented        TruthValue,
          dot11MgmtOptionUAPSDCoexistenceActivated TruthValue,
          dot11MgmtOptionWNMNotificationImplemented                   TruthValue,
          dot11MgmtOptionWNMNotificationActivated TruthValue,
          dot11MgmtOptionUTCTSFOffsetImplemented  TruthValue,
          dot11MgmtOptionUTCTSFOffsetActivated    TruthValue}


dot11MgmtOptionLocationActivated 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 the capability of the station to
    provide location is enabled. The capability is disabled, otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 1 }

dot11MgmtOptionFMSImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation
    is capable of supporting FMS when the dot11WirelessManagementImplemented is set to
    true."
        ::= { dot11WirelessMgmtOptionsEntry 2 }

dot11MgmtOptionFMSActivated 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 the capability of the station to
    provide FMS is enabled. The capability is disabled, otherwise"
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 3 }


dot11MgmtOptionEventsActivated 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 the capability of the station to
    provide Event Reporting is enabled. The capability is disabled, otherwise"
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 4 }

dot11MgmtOptionDiagnosticsActivated 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 the capability of the station to
    provide Diagnostic Reporting is enabled. The capability is disabled, otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 5 }

dot11MgmtOptionMultiBSSIDImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.
```



```
        This attribute, when true, indicates that the station implementation is capable
    of supporting Multiple BSSID when the dot11WirelessManagementImplemented is set to
    true."
        ::= { dot11WirelessMgmtOptionsEntry 6 }

dot11MgmtOptionMultiBSSIDActivated 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 the capability of the station to
    provide Multi BSSID is enabled. The capability is disabled, otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 7 }

dot11MgmtOptionTFSImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting TFS when the dot11WirelessManagementImplemented is set to true."
    ::= { dot11WirelessMgmtOptionsEntry 8 }

dot11MgmtOptionTFSActivated 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 TFS is enabled. TFS is disabled
    otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 9 }

dot11MgmtOptionWNMSleepModeImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting WNMSleep Mode when the dot11WirelessManagementImplemented is set to
    true."
        ::= { dot11WirelessMgmtOptionsEntry 10 }

dot11MgmtOptionWNMSleepModeActivated 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 WNMSleep Mode is enabled. WNMSleep Mode
    is disabled otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 11 }
```



```
dot11MgmtOptionTIMBroadcastImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This attribute, when true, indicates that the station implementation is capable
      of supporting TIM Broadcast when the dot11WirelessManagementImplemented is set to
      true."
       ::= { dot11WirelessMgmtOptionsEntry 12}


dot11MgmtOptionTIMBroadcastActivated 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 TIM broadcast is enabled. TIM broadcast
      is disabled otherwise."
          DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 13}


dot11MgmtOptionProxyARPImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This attribute, when true, indicates that the station implementation is capable
      of supporting the Proxy ARP service, when the dot11WirelessManagementImplemented is
      set to true."
          ::= { dot11WirelessMgmtOptionsEntry 14 }


dot11MgmtOptionProxyARPActivated 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 the capability of the AP to provide the
      Proxy ARP service is enabled. The capability is disabled, otherwise."
          DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 15 }

dot11MgmtOptionBSSTransitionImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This is a capability variable. Its value is determined by device capabilities.
      This attribute, when true, indicates that the station implementation is capable of
      supporting BSS Transition Management, when the dot11WirelessManagementImplemented is
      set to true."
          ::= { dot11WirelessMgmtOptionsEntry 16 }


dot11MgmtOptionBSSTransitionActivated 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 the capability of the station to
    provide BSS Transition is enabled. The capability is disabled, otherwise. "
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 17 }

dot11MgmtOptionQoSTrafficCapabilityImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting QoS Traffic Capability when the dot11WirelessManagementImplemented is
    set to true."
        ::= { dot11WirelessMgmtOptionsEntry 18 }

dot11MgmtOptionQoSTrafficCapabilityActivated 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 the capability of the station to
    provide QoS Traffic Capability is enabled. QoS Traffic Capability is disabled
    otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 19 }

dot11MgmtOptionACStationCountImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting AC Station Count when the dot11WirelessManagementImplemented is set to
    true."
        ::= { dot11WirelessMgmtOptionsEntry 20 }


dot11MgmtOptionACStationCountActivated 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 the capability of the station to
    provide AC Station Count is enabled. AC Station Count is disabled otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 21 }

dot11MgmtOptionCoLocIntfReportingImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting Colocated Interference Reporting. The capability is disabled,
    otherwise."
        ::= { dot11WirelessMgmtOptionsEntry 22 }

dot11MgmtOptionCoLocIntfReportingActivated 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 the capability of the station to
    support Colocated Interference Reporting is enabled. The capability is disabled,
    otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 23 }

dot11MgmtOptionMotionDetectionImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting motion detection when the dot11WirelessManagementImplemented is set to
    true. "
        ::= { dot11WirelessMgmtOptionsEntry 24 }

dot11MgmtOptionMotionDetectionActivated 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 the capability to support motion
    detection is enabled."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 25 }

dot11MgmtOptionTODImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting Time Of Departure for transmitted Clause 15, 17, 18, 19 and 20 frames
    when the dot11WirelessManagementImplemented is set to true."
        ::= { dot11WirelessMgmtOptionsEntry 26 }

dot11MgmtOptionTODActivated 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 the capability to support Time Of
    Departure frames for transmitted Clause 15, 17, 18, 19 and 20 frames is enabled."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 27 }

dot11MgmtOptionTimingMsmtImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting Timing Measurement capability when the
    dot11WirelessManagementImplemented is set to true."
        ::= { dot11WirelessMgmtOptionsEntry 28 }
```

```
dot11MgmtOptionTimingMsmtActivated 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 the station capability for Timing
      Measurement is enabled. false indicates the station has no Timing Measurement
      capability or that the capability is present but is disabled."
          DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 29 }

dot11MgmtOptionChannelUsageImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This attribute, when true, indicates that the station implementation is capable
      of supporting Channel Usage when the dot11WirelessManagementImplemented is set to
      true."
      ::= { dot11WirelessMgmtOptionsEntry 30 }

dot11MgmtOptionChannelUsageActivated 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 Channel Usage is enabled. Channel Usage
      is disabled otherwise."
          DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 31 }

dot11MgmtOptionTriggerSTAStatisticsActivated 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 the capability of the station to
      provide triggered STA statistics is enabled. The capability is disabled otherwise"
          DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 32 }

dot11MgmtOptionSSIDListImplemented OBJECT-TYPE
          SYNTAX TruthValue
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This is a capability variable.
          Its value is determined by device capabilities.

          This attribute, when true, indicates that the station implementation is capable
      of supporting the SSID List capability when the dot11WirelessManagementImplemented
      is true."
          ::= { dot11WirelessMgmtOptionsEntry 33 }

dot11MgmtOptionSSIDListActivated 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 the capability of the station to
    support the SSID List capability is enabled. The capability is disabled, otherwise"
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 34 }

dot11MgmtOptionMulticastDiagnosticsActivated 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 the capability of the station to
    provide Multicast Diagnostic Reporting is enabled. The capability is disabled,
    otherwise."
        DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 35 }

dot11MgmtOptionLocationTrackingImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting Location Track when the dot11WirelessManagementImplemented is true."
        ::= { dot11WirelessMgmtOptionsEntry 36 }

dot11MgmtOptionLocationTrackingActivated 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 the capability of the station to
    provide Location Track is enabled. The capability is disabled otherwise."
             DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 37 }

dot11MgmtOptionDMSImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
    of supporting DMS when the dot11WirelessManagementImplemented is true."
        ::= { dot11WirelessMgmtOptionsEntry 38 }

dot11MgmtOptionDMSActivated 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 DMS is enabled. DMS is disabled
    otherwise."
             DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 39 }

dot11MgmtOptionUAPSDCoexistenceImplemented OBJECT-TYPE
```

```
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the Station implementation is capable
        of supporting U-APSD Coexistence when the dot11WirelessManagementImplemented is
        set to true."
        ::= { dot11WirelessMgmtOptionsEntry 40}

dot11MgmtOptionUAPSDCoexistenceActivated 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 U-APSD Coexistence is enabled. U-APSD
        Coexistence is disabled, otherwise."
             DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 41}

dot11MgmtOptionWNMNotificationImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the station implementation is capable
        of supporting WNM-Notification when the dot11WirelessManagementImplemented is
        set to true."
        ::= { dot11WirelessMgmtOptionsEntry 42}

dot11MgmtOptionWNMNotificationActivated 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 the capability of the station to
        provide WNM-Notification is enabled. The capability is disabled, otherwise."
             DEFVAL { false}
        ::= { dot11WirelessMgmtOptionsEntry 43}

dot11MgmtOptionUTCTSFOffsetImplemented OBJECT-TYPE
        SYNTAX TruthValue
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
        "This is a capability variable.
        Its value is determined by device capabilities.

        This attribute, when true, indicates that the Station implementation is capable
    of supporting UTC TSF Offset advertisement when the
    dot11WirelessManagementImplemented is set to true."
        ::= { dot11WirelessMgmtOptionsEntry 44}

dot11MgmtOptionUTCTSFOffsetActivated 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 UTC TSF Offset advertisement is enabled
      at the station. The capability is disabled, otherwise."
               DEFVAL { false}
          ::= { dot11WirelessMgmtOptionsEntry 45}


 -- ********************************************************************
 -- * dot11LocationServices TABLE
 -- ********************************************************************

dot11LocationServicesNextIndex OBJECT-TYPE
         SYNTAX Unsigned32 (0..4294967295)
         MAX-ACCESS read-only
         STATUS current
         DESCRIPTION
            "Identifies a hint for the next value of dot11LocationServicesIndex to be used
      in a row creation attempt for dot11LocationServicesTable. If no new rows can be
      created for some reason, such as memory, processing requirements, etc, the SME shall
      set this attribute to 0. It shall update this attribute to a proper value other than
      0 as soon as it is capable of receiving new measurement requests. The nextIndex is
      not necessarily sequential nor monotonically increasing."
    ::= { dot11smt 19 }


dot11LocationServicesTable OBJECT-TYPE
         SYNTAX SEQUENCE OF Dot11LocationServicesEntry
         MAX-ACCESS not-accessible
         STATUS current
         DESCRIPTION
             "Group contains conceptual table of attributes for
             WNM LocationServices."
    ::= { dot11smt 20 }

dot11LocationServicesEntry OBJECT-TYPE
        SYNTAX Dot11LocationServicesEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
        "An entry in the dot11LocationServicesTable
        Indexed by dot11LocationServicesIndex."
    INDEX { dot11LocationServicesIndex }
    ::= { dot11LocationServicesTable 1 }

Dot11LocationServicesEntry ::=
    SEQUENCE {
          dot11LocationServicesIndex Unsigned32,
          dot11LocationServicesMACAddress MacAddress,
          dot11LocationServicesLocationIndicationParamsIndicationMulticastAddress
      MacAddress,
          dot11LocationServicesLocationIndicationParamsReportIntervalUnits INTEGER,
          dot11LocationServicesLocationIndicationParamsNormalReportInterval INTEGER,
          dot11LocationServicesLocationIndicationParamsNormalFramesperChannel INTEGER,
          dot11LocationServicesLocationIndicationParamsInMotionReportInterval INTEGER,
          dot11LocationServicesLocationIndicationParamsInMotionFramesperChannel INTEGER,
          dot11LocationServicesLocationIndicationParamsBurstInterframeInterval INTEGER,
          dot11LocationServicesLocationIndicationParamsTrackingDuration         INTEGER,
          dot11LocationServicesLocationIndicationParamsEssDetectionInterval INTEGER,
          dot11LocationServicesLocationIndicationChannelList          OCTET STRING,
          dot11LocationServicesLocationIndicationBroadcastDataRate    Unsigned32,
          dot11LocationServicesLocationIndicationOptionsUsed          OCTET STRING,
          dot11LocationServicesLocationIndicationIndicationParameters OCTET STRING,
          dot11LocationServicesLocationStatus INTEGER}

dot11LocationServicesIndex OBJECT-TYPE
        SYNTAX Unsigned32 (1..4294967295)
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "This attribute contains an auxiliary index into the
      dot11LocationServicesTable."
    ::= { dot11LocationServicesEntry 1 }
```



```
dot11LocationServicesMACAddress OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute is the MAC address of the STA reporting location information."
    ::= { dot11LocationServicesEntry 2 }

dot11LocationServicesLocationIndicationParamsIndicationMulticastAddress OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute is the destination address to which the Location Track
Notification frames are sent in a non-IBSS network, See 7.3.2.71.2 and 11.22.4.1."
    ::= { dot11LocationServicesEntry 3 }

dot11LocationServicesLocationIndicationParamsReportIntervalUnits OBJECT-TYPE
        SYNTAX INTEGER {
               hours(0),
               minutes(1),
               seconds(2),
               milliseconds(3)
               }
         MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute contains the Location Indication Parameters Report Interval
      Units value."
    ::= { dot11LocationServicesEntry 4 }

dot11LocationServicesLocationIndicationParamsNormalReportInterval OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
           "This attribute contains the time interval, expressed in the units indicated in
      the Report Interval Units field, at which the reporting STA is expected to transmit
      one or more Location Track Notification frames if either
      dot11MgmtOptionMotionDetectionActivated is false or the STA is stationary. The STA
      will not transmit Location Track Notification frames when the Normal Report Interval
      is 0."
    ::= { dot11LocationServicesEntry 5 }

dot11LocationServicesLocationIndicationParamsNormalFramesperChannel OBJECT-TYPE
      SYNTAX INTEGER (0..255)
      MAX-ACCESS read-create
      STATUS current
      DESCRIPTION
         "This attribute contains the number of Location Track Notification frames per
      channel sent or expected to be sent by the STA at each Normal Report Interval."
      ::= { dot11LocationServicesEntry 6 }

dot11LocationServicesLocationIndicationParamsInMotionReportInterval OBJECT-TYPE
      SYNTAX INTEGER (0..65535)
      MAX-ACCESS read-create
      STATUS current
      DESCRIPTION
         "This attribute contains the time interval, expressed in the units indicated in
      the Report Interval Units field, at which the STA reports its location by sending a
      Location Track Notification frame when the reporting STA is in motion. If
      dot11MgmtOptionMotionDetectionActivated is false, this field is set to 0."
      ::= { dot11LocationServicesEntry 7}

dot11LocationServicesLocationIndicationParamsInMotionFramesperChannel OBJECT-TYPE
      SYNTAX INTEGER (0..255)
      MAX-ACCESS read-create
      STATUS current
         DESCRIPTION
```



```
            "This attribute contains the number of Location Track Notification frames per
        channel sent or expected to be sent by the STA at each In-Motion Report Interval. If
        dot11MgmtOptionMotionDetectionActivated is false, this field is set to 0."
    ::= { dot11LocationServicesEntry 8 }

dot11LocationServicesLocationIndicationParamsBurstInterframeInterval OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute contains the target time interval, expressed in milliseconds,
        between the transmissions of each of the Normal or In-Motion frames on the same
        channel. The Burst Inter-frame interval value is set to 0 to indicate that frames
        will be transmitted with no target inter-frame delay."
    ::= { dot11LocationServicesEntry 9 }


dot11LocationServicesLocationIndicationParamsTrackingDuration OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute contains the amount of time, in minutes, that a STA sends the
        Location Track Notification frames. The duration starts as soon as the STA sends a
        Location Configuration Response frame with a Location Status value of Success. If
        the Tracking Duration value is a non-zero value the STA will send Location Track
        Notification Frames, based on the Normal and In-Motion Report Interval field values,
        until the duration ends. If the Tracking Duration is 0 the STA will continuously send
        Location Track Notification frames as defined by Normal and In-Motion Report
        Interval field values until transmission is terminated based on 11.22.4.2
        procedures."
    ::= { dot11LocationServicesEntry 10}

dot11LocationServicesLocationIndicationParamsEssDetectionInterval OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
           "This attribute contains the interval, in minutes, that a STA checks for beacons
        transmitted by one or more APs belonging to the same ESS that configured the STA. If
        no beacons from the ESS are received for this period, the STA terminates transmission
        of Location Track Notification frames as described in 11.22.4.2 procedures. The ESS
        Detection Interval field is not used when the ESS Detection Interval field value is
        set to 0."
    ::= { dot11LocationServicesEntry 11}

dot11LocationServicesLocationIndicationChannelList OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE (2..254))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute contains one or more Regulatory Class and Channel octet pairs."
    ::= { dot11LocationServicesEntry 12}

dot11LocationServicesLocationIndicationBroadcastDataRate OBJECT-TYPE
        SYNTAX Unsigned32 (0..4294967295)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute specifies the target data rate at which the STA transmits
        Location Track Notification Frames. The Broadcast Target Data Rate field format is
        specified by the Rate Identification field defined in 7.3.1.32. A value of 0
        indicates the STA transmits Location Track Notification frames at a rate chosen by
        the STA transmitting the Location Track Notification frames."
        DEFVAL { 0 }
    ::= { dot11LocationServicesEntry 13}

dot11LocationServicesLocationIndicationOptionsUsed OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates the location configuration options used for
        transmitting Location Track Notification Frames."
    ::= { dot11LocationServicesEntry 14}

dot11LocationServicesLocationIndicationIndicationParameters OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE (1..255))
        MAX-ACCESS read-create
        STATUS current
```



```
        DESCRIPTION
            "This attribute indicates the location Indication Parameters used for
      transmitting Location Track Notification Frames."
    ::= { dot11LocationServicesEntry 15}

dot11LocationServicesLocationStatus OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute contains the Location Status value as indicated in Table 7-43w,
      Event Report Status."
    ::= { dot11LocationServicesEntry 16 }

-- *******************************************************************
 -- * End of dot11LocationServices TABLE
 -- *******************************************************************


 -- *******************************************************************
 -- * dot11WirelessMGTEvent TABLE
 -- *******************************************************************
 dot11WirelessMGTEventTable OBJECT-TYPE
         SYNTAX SEQUENCE OF Dot11WirelessMGTEventEntry
         MAX-ACCESS not-accessible
         STATUS current
         DESCRIPTION
            "Group contains the current list of WIRELESS Management reports that have been
             received by the MLME. The report tables shall be maintained as FIFO to
             preserve freshness, thus the rows in this table can be deleted for memory
             constraints or other implementation constraints determined by the vendor.
             New rows shall have different RprtIndex values than those deleted within the
             range limitation of the index. One easy way is to monotonically increase
             the EventIndex for new reports being written in the table."
    ::= { dot11smt 21 }

dot11WirelessMGTEventEntry OBJECT-TYPE
        SYNTAX Dot11WirelessMGTEventEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
        "An entry in the dot11WirelessMGTEventTable
        Indexed by dot11WirelessMGTEventIndex."
    INDEX { dot11WirelessMGTEventIndex }
    ::= { dot11WirelessMGTEventTable 1 }

Dot11WirelessMGTEventEntry ::=
    SEQUENCE {
        dot11WirelessMGTEventIndex                          Unsigned32,
        dot11WirelessMGTEventMACAddress                     MacAddress,
        dot11WirelessMGTEventType                           INTEGER,
        dot11WirelessMGTEventStatus                         INTEGER,
        dot11WirelessMGTEventTSF                            TSFType,
        dot11WirelessMGTEventUTCOffset                      OCTET STRING,
        dot11WirelessMGTEventTimeError                      OCTET STRING,
        dot11WirelessMGTEventTransitionSourceBSSID          MacAddress,
        dot11WirelessMGTEventTransitionTargetBSSID          MacAddress,
        dot11WirelessMGTEventTransitionTime                 INTEGER,
        dot11WirelessMGTEventTransitionReason               INTEGER,
        dot11WirelessMGTEventTransitionResult               INTEGER,
        dot11WirelessMGTEventTransitionSourceRCPI           INTEGER,
        dot11WirelessMGTEventTransitionSourceRSNI           INTEGER,
        dot11WirelessMGTEventTransitionTargetRCPI           INTEGER,
        dot11WirelessMGTEventTransitionTargetRSNI           INTEGER,
        dot11WirelessMGTEventRSNATargetBSSID                MacAddress,
        dot11WirelessMGTEventRSNAAuthenticationType         OCTET STRING,
        dot11WirelessMGTEventRSNAEAPMethod                  OCTET STRING,
        dot11WirelessMGTEventRSNAResult                     INTEGER,
        dot11WirelessMGTEventRSNARSNElement                 OCTET STRING,
        dot11WirelessMGTEventPeerSTAAddress                 MacAddress,
        dot11WirelessMGTEventPeerRegulatoryClass            INTEGER,
        dot11WirelessMGTEventPeerChannelNumber              INTEGER,
        dot11WirelessMGTEventPeerSTATxPower                 INTEGER,
        dot11WirelessMGTEventPeerConnectionTime             INTEGER,
        dot11WirelessMGTEventPeerPeerStatus                 INTEGER,
        dot11WirelessMGTEventWNMLog                         OCTET STRING}

dot11WirelessMGTEventIndex OBJECT-TYPE
        SYNTAX Unsigned32 (1..4294967295)
        MAX-ACCESS read-only
        STATUS current
```



```
        DESCRIPTION
            "This attribute contains an auxiliary index into the
      dot11WirelessMGTEventTable."
    ::= { dot11WirelessMGTEventEntry 1 }

dot11WirelessMGTEventMACAddress OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute is the MAC address of the STA providing the Event Report."
    ::= { dot11WirelessMGTEventEntry 2 }

dot11WirelessMGTEventType OBJECT-TYPE
        SYNTAX INTEGER {
               transition(0),
               rsna(1),
               peerToPeer(2),
               wnmLog(3),
               vendorSpecific(221)
               }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the request type of this WNM Event request."
          ::= { dot11WirelessMGTEventEntry 3 }

dot11WirelessMGTEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
               successful(0),
               requestFailed(1),
               requestRefused(2),
               requestIncapable(3),
               detectedFrequentTransition(4)
          }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the status value included in the Event Report."
    ::= { dot11WirelessMGTEventEntry 4 }

dot11WirelessMGTEventTSF OBJECT-TYPE
          SYNTAX TSFType
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the value of the Event timestamp field."
    ::= { dot11WirelessMGTEventEntry 5 }

dot11WirelessMGTEventUTCOffset OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute indicates the UTC Offset Time Value optionally included in the
      Event Report."
     ::= { dot11WirelessMGTEventEntry 6}


dot11WirelessMGTEventTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute contains the value of the Event Time Error field optionally
      included in the Event Report."
      ::= { dot11WirelessMGTEventEntry 7}

dot11WirelessMGTEventTransitionSourceBSSID OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Source BSSID field in a Transition
      event report."
    ::= { dot11WirelessMGTEventEntry 8}

dot11WirelessMGTEventTransitionTargetBSSID OBJECT-TYPE
```



```
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Target BSSID field in a Transition
      event report."
    ::= { dot11WirelessMGTEventEntry 9}


dot11WirelessMGTEventTransitionTime OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "TUs"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the transition time for the reported transition event
      in TUs. The Transition time is defined as the time difference between the starting
      time and the ending time of a transition between APs, even if the transition results
      in remaining on the same AP. Start and end times for a transition event are defined
      in 11.22.2.2"
    ::= { dot11WirelessMGTEventEntry 10}

dot11WirelessMGTEventTransitionReason OBJECT-TYPE
        SYNTAX INTEGER {
               unspecified(0),
               excessiveFrameLossRatesPoorConditions(1),
               excessiveDelayForCurrentTrafficStreams(2),
               insufficientQosCapacityForCurrentTrafficStreams(3),
               firstAssociationToEss(4),
               loadBalancing(5),
               betteApFound(6),
               deauthenticatedDisassociatedFromPreviousAp(7),
               certificateToken(8),
               apFailedIeee8021XEapAuthentication(9),
               apFailed4wayHandshake(10),
               excessiveDataMICFailures(11),
               exceededFrameTransmissionRetryLimit(12),
               ecessiveBroadcastDisassociations(13),
               excessiveBroadcastDeauthentications(14),
               previousTransitionFailed(15)
               }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the reason for the reported BSS Transition event. The
      format for this list of reasons is further detailed in 7.3.2.68.2."
           ::= { dot11WirelessMGTEventEntry 11}

dot11WirelessMGTEventTransitionResult OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the result of the attempted transition and is set to
      one of the status codes specified in Table 7-23."
    ::= { dot11WirelessMGTEventEntry 12 }

dot11WirelessMGTEventTransitionSourceRCPI OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the received channel power of the most recently
      measured frame from the Source BSSID before the STA reassociates to the Target BSSID.
      The Source RCPI is reported in dBm, as defined in the RCPI measurement clause for the
      PHY Type."
    ::= { dot11WirelessMGTEventEntry 13 }

dot11WirelessMGTEventTransitionSourceRSNI OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the received signal-to-noise indication of the most
      recently measured frame from the Source BSSID before the STA reassociates to the
      Target BSSID. The Source RSNI is reported in dB, as defined in 7.3.2.41."
    ::= { dot11WirelessMGTEventEntry 14 }
```

```
dot11WirelessMGTEventTransitionTargetRCPI OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the received channel power of the first measured frame
      just after STA reassociates to the Target BSSID. If association with target BSSID
      failed, the Target RCPI field indicates the received channel power of the most
      recently measured frame from the Target BSSID. The Target RCPI is reported in dBm, as
      defined in the RCPI measurement clause for the PHY Type."
    ::= { dot11WirelessMGTEventEntry 15 }

dot11WirelessMGTEventTransitionTargetRSNI OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the received signal-to-noise indication of the first
      measured frame just after STA reassociates to the Target BSSID. If association with
      target BSSID failed, the Target RCPI field indicates the received signal-to-noise
      indication of the most recently measured frame from the Target BSSID. The Target RSNI
      is reported in dB, as defined in 7.3.2.41."
    ::= { dot11WirelessMGTEventEntry 16 }

dot11WirelessMGTEventRSNATargetBSSID OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute contains the value of the Target BSSID field in an RSNA event
      report."
    ::= { dot11WirelessMGTEventEntry 17 }

dot11WirelessMGTEventRSNAAuthenticationType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE (4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates the AKM suite, as defined in Table 7-34. The
              first three octets indicate the OUI. The last octet indicates the suite
              type."
          ::= { dot11WirelessMGTEventEntry 18 }

dot11WirelessMGTEventRSNAEAPMethod OBJECT-TYPE
        SYNTAX OCTET STRING(SIZE (1..8))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates a value that identifies the EAP Method. When the
      Authentication Type field is set to the value of either 00-0F-AC:1 (Authentication
      negotiated over IEEE 802.1X or using PMKSA caching as defined in 8.4.6.2) or 00-0F-
      AC:3 (AKM suite selector for Fast BSS Transition as defined in 8.5.1.5), the EAP
      Method field contains the IANA assigned EAP type defined at http://www.iana.org/
      assignments/eap-numbers. The EAP type contains either the legacy type (1 octet) or
      the expanded type (1 octet type = 254, 3-octet Vendor ID, 4-octet Vendor-Type). The
      EAP Method field is set to 0 otherwise."
          ::= { dot11WirelessMGTEventEntry 19 }

dot11WirelessMGTEventRSNAResult OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the result of the RSNA event and is set to one of the
      status codes specified in Table 7-23."
          ::= { dot11WirelessMGTEventEntry 20}

dot11WirelessMGTEventRSNARSNElement OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..257))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
          "This attribute contains the entire contents of the negotiated RSN information
      element at the time of the authentication attempt. The format of the RSN information
      element is defined in 7.3.2.25."
          ::= { dot11WirelessMGTEventEntry 21}

dot11WirelessMGTEventPeerSTAAddress OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
```

```
        STATUS current
        DESCRIPTION
           "This attribute indicates the MAC address of the peer STA or IBSS BSSID is equal
      to the indicated MAC address. If this event is for a Peer-to-Peer link in an
      infrastructure BSS, this field contains the MAC address of the peer STA. If this
      event is for a Peer-to-Peer link in an IBSS, this field contains the BSSID of the
      IBSS."
          ::= { dot11WirelessMGTEventEntry 22 }

dot11WirelessMGTEventPeerRegulatoryClass OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the channel set for this Peer-to-Peer Event report.
      Country, Regulatory Class, and Channel Number together specify the channel frequency
      and spacing for this measurement request. Valid values of Regulatory Class are shown
      in Annex J."
          ::= { dot11WirelessMGTEventEntry 23 }


dot11WirelessMGTEventPeerChannelNumber OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the current operating channel for this Peer-to-Peer
      Event report. The Channel Number is only defined within the indicated Regulatory
      Class as shown in Annex J."
    ::= { dot11WirelessMGTEventEntry 24 }


dot11WirelessMGTEventPeerSTATxPower OBJECT-TYPE
        SYNTAX INTEGER (-128..127)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "This attribute indicates the STA transmit power used for the Peer-to-Peer link.
          The STA Tx Power field indicates the target transmit power at the antenna in dBm
          with a tolerance of +/-5 dB for the lowest basic rate of the reporting STA. A
          value of -128 indicates that the value is unknown."
    ::= { dot11WirelessMGTEventEntry 25 }


dot11WirelessMGTEventPeerConnectionTime OBJECT-TYPE
        SYNTAX INTEGER (0..16777215)
         UNITS "seconds"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates a value representing the connection time for the
      reported Peer-to-Peer event. If the Peer Status is 0, this field indicates the
      duration of the Direct Link. If the Peer Status is 1, this field indicates the time
      difference from the time the Direct Link was established to the time at which the
      reporting STA generated the event report. If the Peer Status is 2, this field
      indicates the duration of the IBSS membership. If the Peer Status is 3, this field
      indicates the time difference from the time the STA joined the IBSS to the time at
      which the reporting STA generated the event report. See 11.22.2.4."
    ::= { dot11WirelessMGTEventEntry 26 }

dot11WirelessMGTEventPeerPeerStatus OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the Peer link connection status as indicated in
      Table 7-43y. See 7.3.2.68.4."
    ::= { dot11WirelessMGTEventEntry 27 }

dot11WirelessMGTEventWNMLog OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..2284))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute contains the entire syslog message, consisting of the PRI,
               HEADER, and MSG portion of a WNM Log message as described in IETF RFC 3164-
               2001. The TAG field of the MSG portion of the message is a 17 octet string
               containing the ASCII representation of the STA MAC address using hexadeci-
               mal notation with colons between octets. The octet containing the individ-
```



```
               ual/group bit occurs last,   and that bit is in the least significant
               position within that octet. See 11.22.2.5."
          ::= { dot11WirelessMGTEventEntry 28 }


 -- ********************************************************************
 -- * End of dot11WirelessMGTEvent TABLE
 -- ********************************************************************
```

Change the dot11Compliance MODULE-COMPLIANCE of the Compliance Statements as follows:

```
dot11Compliance MODULE-COMPLIANCE
          STATUS current
          DESCRIPTION
          "The compliance statement for SNMPv2 entities that implement The IEEE 802.11
      MIB."
          MODULE -- this module
          MANDATORY-GROUPS {
          dot11SMTbase~~10~~11, dot11MACbase2, dot11CountersGroup2,
          dot11SmtAuthenticationAlgorithms, dot11ResourceTypeID,
          dot11PhyOperationComplianceGroup }
```

Change the "OPTIONAL-GROUPS" of the "Compliance Statements" as follows:

```
-- OPTIONAL-GROUPS { dot11SMTprivacy, dot11MACStatistics,
-- dot11PhyAntennaComplianceGroup, dot11PhyTxPowerComplianceGroup,
-- dot11PhyRegDomainsSupportGroup,
-- dot11PhyAntennasListGroup, dot11PhyRateGroup,
-- dot11SMTbase3, dot11MultiDomainCapabilityGroup,
-- dot11PhyFHSSComplianceGroup2, dot11RSNAadditions,
-- dot11RegulatoryClassesGroup, dot11Qosadditions,
-- dot11RRMCompliance,dot11FTComplianceGroup,
-- dot11PhyAntennaComplianceGroup2,
-- dot11HTMACadditions,
-- dot11PhyMCSGroup,
-- dot11TransmitBeamformingGroup,
-- dot11WNMCompliance}
--
::= { dot11Compliances 1 }
```

Change the "dot11SMTbase10" of the "Groups - units of conformance" as follows:

```
dot11SMTbase10 OBJECT-GROUP
          OBJECTS { dot11MediumOccupancyLimit,
                    dot11CFPollable,
                    dot11CFPPeriod,
                    dot11CFPMaxDuration,
                    dot11AuthenticationResponseTimeOut,
                    dot11PrivacyOptionImplemented,
                    dot11PowerManagementMode,
                    dot11DesiredSSID, dot11DesiredBSSType,
                    dot11OperationalRateSet,
                    dot11BeaconPeriod, dot11DTIMPeriod,
                    dot11AssociationResponseTimeOut,
                    dot11DisassociateReason,
                    dot11DisassociateStation,
                    dot11DeauthenticateReason,
                    dot11DeauthenticateStation,
                    dot11AuthenticateFailStatus,
                    dot11AuthenticateFailStation,
                    dot11MultiDomainCapabilityImplemented,
                    dot11MultiDomainCapabilityEnabled,
                    dot11CountryString,
                    dot11SpectrumManagementImplemented,
                    dot11SpectrumManagementRequired,
                    dot11RSNAOptionImplemented,
                    dot11RegulatoryClassesImplemented,
                    dot11RegulatoryClassesRequired,
                    dot11QosOptionImplemented,
                    dot11ImmediateBlockAckOptionImplemented,
                    dot11DelayedBlockAckOptionImplemented,
                    dot11DirectOptionImplemented,
                    dot11APSDOptionImplemented,
                    dot11QAckOptionImplemented,
```

```
                dot11QBSSLoadOptionImplemented,
                dot11QueueRequestOptionImplemented,
                dot11TXOPRequestOptionImplemented,
                dot11MoreDataAckOptionImplemented,
                dot11AssociateinNQBSS,
                dot11DLSAllowedinQBSS,
                dot11DLSAllowed,
                dot11SMTRRMRequest,
                dot11SMTRRMReport,
                dot11SMTRRMConfig,
                dot11AssociateStation,
                dot11AssociateID,
                dot11AssociateFailStation,
                dot11AssociateFailStatus,
                dot11ReassociateStation,
                dot11ReassociateID,
                dot11ReassociateFailStation,
                dot11ReassociateFailStatus,
                dot11RadioMeasurementCapable,
                dot11RadioMeasurementEnabled,
                dot11RRMMeasurementProbeDelay,
                dot11RRMMeasurementPilotPeriod,
                dot11RRMLinkMeasurementEnabled,
                dot11RRMNeighborReportEnabled,
                dot11RRMParallelMeasurementsEnabled,
                dot11RRMRepeatedMeasurementsEnabled,
                dot11RRMBeaconPassiveMeasurementEnabled,
                dot11RRMBeaconActiveMeasurementEnabled,
                dot11RRMBeaconTableMeasurementEnabled,
                dot11RRMBeaconMeasurementReportingConditionsEnabled,
                dot11RRMFrameMeasurementEnabled,
                dot11RRMChannelLoadMeasurementEnabled,
                dot11RRMNoiseHistogramMeasurementEnabled,
                dot11RRMStatisticsMeasaurementEnabled,
                dot11RRMLCIMeasurementEnabled,
                dot11RRMLCIAzimuthEnabled,
                dot11RRMTransmitStreamCategoryMeasurementEnabled,
                dot11RRMTriggeredTransmitStreamCategoryMeasurementEnabled,
                dot11RRMAPChannelReportEnabled,
                dot11RRMMIBEnabled,
                dot11RRMMaxMeasurementDuration,
                dot11RRMNonOperatingChannelMaxMeasurementDuration,
                dot11RRMMeasurementPilotTransmissionInformationEnabled,
                dot11RRMMeasurementPilotCapability,
                dot11RRMNeighborReportTSFOffsetEnabled,
                dot11RRMRCPIMeasurementEnabled,
                dot11RRMRSNIMeasurementEnabled,
                dot11RRMBSSAverageAccessDelayEnabled,
                dot11RRMBSSAvailableAdmissionCapacityEnabled,
                dot11RRMAntennaInformationEnabled,
                dot11FastBSSTransitionImplemented,
                dot11LCIDSEImplemented,
                dot11LCIDSERequired,
                dot11DSERequired,
                dot11ExtendedChannelSwitchEnabled,
                dot11HighThroughputOptionImplemented }
          STATUS currentdeprecated
          DESCRIPTION
          "The SMTbase8 object class provides the necessary support at the STA to manage
      the processes in the STA so that the STA may work cooperatively as a part of an IEEE
      802.11 network, when the STA is capable of multidomain operation. This object group
      should be implemented when the multidomain capability option is implemented."
::= { dot11Groups 51 }
```

Insert the following at the end of the "Groups - units of conformance":

```
-- ******************************************************************
-- * Compliance Statements - WNM
-- ******************************************************************
dot11WNMCompliance MODULE-COMPLIANCE
          STATUS current
          DESCRIPTION
                " This object class provides the objects from the IEEE 802.11
                MIB required to manage Wireless Network Management
                functionality. Note that additional objects for managing this
                functionality are located in the IEEE 802.11 WNM MIB."
          OBJECTS
          {
                dot11WirelessNetworkManagementImplemented
```



```
          }
          ::= { dot11Groups 52}

dot11SMTbase11 OBJECT-GROUP
          OBJECTS { dot11MediumOccupancyLimit,
                    dot11CFPollable,
                    dot11CFPPeriod,
                    dot11CFPMaxDuration,
                    dot11AuthenticationResponseTimeOut,
                    dot11PrivacyOptionImplemented,
                    dot11PowerManagementMode,
                    dot11DesiredSSID, dot11DesiredBSSType,
                    dot11OperationalRateSet,
                    dot11BeaconPeriod, dot11DTIMPeriod,
                    dot11AssociationResponseTimeOut,
                    dot11DisassociateReason,
                    dot11DisassociateStation,
                    dot11DeauthenticateReason,
                    dot11DeauthenticateStation,
                    dot11AuthenticateFailStatus,
                    dot11AuthenticateFailStation,
                    dot11MultiDomainCapabilityImplemented,
                    dot11MultiDomainCapabilityEnabled,
                    dot11CountryString,
                    dot11SpectrumManagementImplemented,
                    dot11SpectrumManagementRequired,
                    dot11RSNAOptionImplemented,
                    dot11RegulatoryClassesImplemented,
                    dot11RegulatoryClassesRequired,
                    dot11QosOptionImplemented,
                    dot11ImmediateBlockAckOptionImplemented,
                    dot11DelayedBlockAckOptionImplemented,
                    dot11DirectOptionImplemented,
                    dot11APSDOptionImplemented,
                    dot11QAckOptionImplemented,
                    dot11QBSSLoadOptionImplemented,
                    dot11QueueRequestOptionImplemented,
                    dot11TXOPRequestOptionImplemented,
                    dot11MoreDataAckOptionImplemented,
                    dot11AssociateinNQBSS,
                    dot11DLSAllowedinQBSS,
                    dot11DLSAllowed,
                    dot11SMTRRMRequest,
                    dot11SMTRRMReport,
                    dot11SMTRRMConfig,
                    dot11AssociateStation,
                    dot11AssociateID,
                    dot11AssociateFailStation,
                    dot11AssociateFailStatus,
                    dot11ReassociateStation,
                    dot11ReassociateID,
                    dot11ReassociateFailStation,
                    dot11ReassociateFailStatus,
                    dot11RadioMeasurementCapable,
                    dot11RadioMeasurementEnabled,
                    dot11RRMMeasurementProbeDelay,
                    dot11RRMMeasurementPilotPeriod,
                    dot11RRMLinkMeasurementEnabled,
                    dot11RRMNeighborReportEnabled,
                    dot11RRMParallelMeasurementsEnabled,
                    dot11RRMRepeatedMeasurementsEnabled,
                    dot11RRMBeaconPassiveMeasurementEnabled,
                    dot11RRMBeaconActiveMeasurementEnabled,
                    dot11RRMBeaconTableMeasurementEnabled,
                    dot11RRMBeaconMeasurementReportingConditionsEnabled,
                    dot11RRMFrameMeasurementEnabled,
                    dot11RRMChannelLoadMeasurementEnabled,
                    dot11RRMNoiseHistogramMeasurementEnabled,
                    dot11RRMStatisticsMeasaurementEnabled,
                    dot11RRMLCIMeasurementEnabled,
                    dot11RRMLCIAzimuthEnabled,
                    dot11RRMTransmitStreamCategoryMeasurementEnabled,
                    dot11RRMTriggeredTransmitStreamCategoryMeasurementEnabled,
                    dot11RRMAPChannelReportEnabled,
                    dot11RRMMIBEnabled,
                    dot11RRMMaxMeasurementDuration,
                    dot11RRMNonOperatingChannelMaxMeasurementDuration,
                    dot11RRMMeasurementPilotTransmissionInformationEnabled,
                    dot11RRMMeasurementPilotCapability,
                    dot11RRMNeighborReportTSFOffsetEnabled,
                    dot11RRMRCPIMeasurementEnabled,
```

```
                  dot11RRMRSNIMeasurementEnabled,
                  dot11RRMBSSAverageAccessDelayEnabled,
                  dot11RRMBSSAvailableAdmissionCapacityEnabled,
                  dot11FastBSSTransitionImplemented,
                  dot11LCIDSEImplemented,
                  dot11LCIDSERequired,
                  dot11DSERequired,
                  dot11ExtendedChannelSwitchEnabled,
                  dot11HighThroughputOptionImplemented,
                  dot11WirelessNetworkManagementImplemented}
          STATUS current
          DESCRIPTION
          "The SMTbase11 object class provides the necessary support at the STA to manage
      the processes in the STA so that the STA may work cooperatively as a part of an IEEE
      802.11 network, when the STA is capable of multidomain operation. This object group
      should be implemented when the multidomain capability option is implemented."
::= { dot11Groups 53 }
```

Annex L

(informative)

An example of encoding a TIM virtual bit map

L.2 Examples

Change the first sentence in L.2 as follows:

The following examples help clarify the use of TIM values, both with and without the Multiple BSSID capability.

Insert the following text and figures at the end of L.2:

The three examples listed above describe the construction of the TIM Virtual Bitmap when the Multiple-BSSID capability is not supported. The following three examples demonstrate how to construct the TIM Virtual Bitmap, when Multiple-BSSID is supported.

The first example with Multiple BSSID is one in which there are eight BSSIDs and the lowest possible AID that can be assigned to any STA in this example is 8. There are no group addressed frames buffered in the AP for any of the eight BSSIDs. However, STAs with AID 9 and AID 11 have unicast frame buffered in the AP. Figure L.4 shows the values of the Bitmap Control and Partial Virtual Bitmap fields that would be part of the TIM information element for this example when either Method A or Method B is used. It is noted that Method B reduces to Method A in this example.

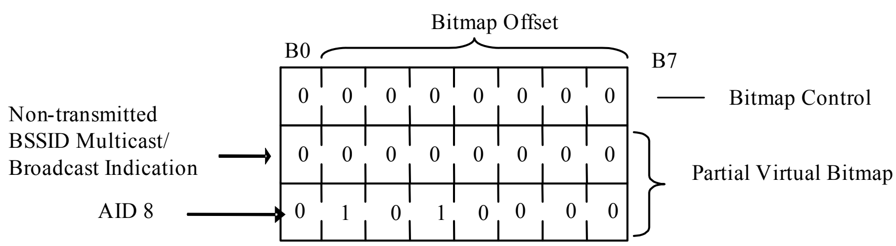

Figure L.4—Virtual Bitmap Example #4, Method A and Method B

In the next example, there are eight BSSIDs and the lowest possible AID that can be assigned to any STA in this example is 8. There are group addressed frames buffered at the AP for the transmitted BSSID, and the DTIM Count field in the TIM IE of the transmitted BSSID is zero. The non-transmitted BSSID with BSSID Index 3 also has the DTIM Count field set to zero and has buffered group addressed frames. All other non-transmitted BSSIDs have no buffered group addressed frames. In addition, STAs with AID 12, AID 17, AID 22 and AID 24 have data buffered at the AP. Figure L.5 shows the values of the Bitmap Control and Partial Virtual Bitmap fields that would be part of the TIM information element for this example when either Method A or Method B is used. It is noted that Method B reduces to Method A in this example.

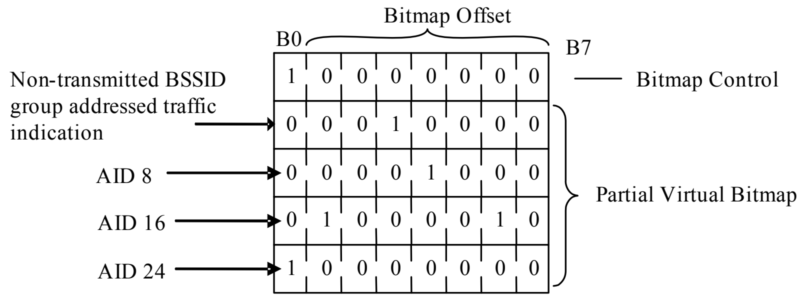

Figure L.5—Virtual Bitmap Example #5, Method A or Method B

In the third example, there are sixteen BSSIDs and the lowest possible AID that can be assigned to any STA is 16. There are no group addressed frames buffered at the AP for the transmitted BSSID, and the DTIM Count field in the TIM IE of the transmitted BSSID is zero. The non-transmitted BSSID Index 3 also has the DTIM Count field set to zero and has group addressed frames buffered at the AP. All other non-transmitted BSSIDs have no buffered group addressed frames. In addition, STA with AID 39 has unicast frames buffered at the AP. Figure L.6 and Figure L.7 show the values of the Bitmap Control and Partial Virtual Bitmap fields that would be part of the TIM information element for this example when Method A and Method B are used, respectively.

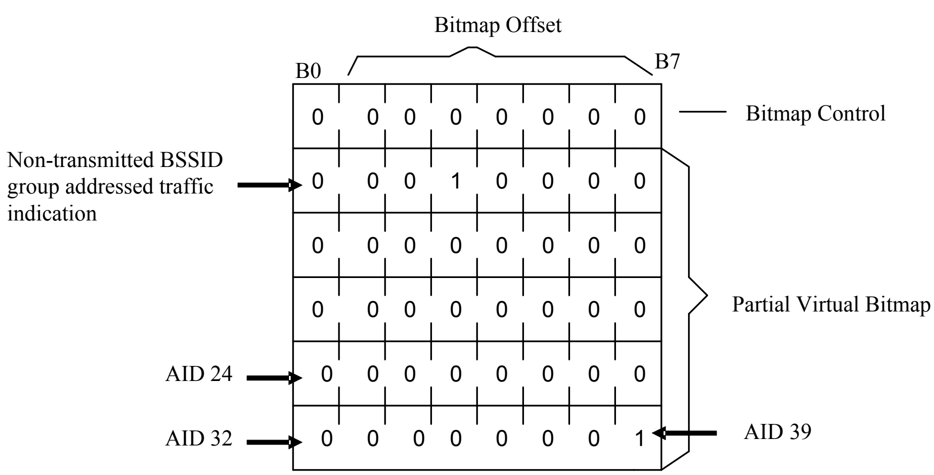

Figure L.6—Virtual Bitmap Example #5, Method A

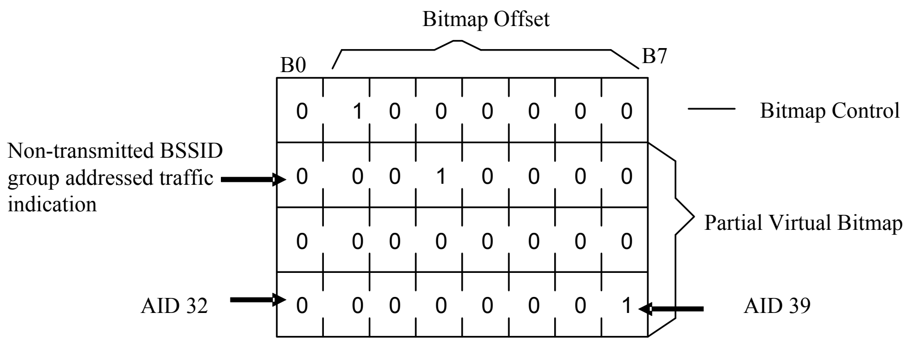

Figure L.7—Virtual Example #5, Method B

L.3 Sample C code

Replace the sample code in L.3 with the following:

```
#include <stdio.h>
#include <limits.h>

#define ADD_TIM_BIT     0
#define REMOVE_TIM_BIT  1

#define TIM_ELEMENT_ID  5
#define TIM_BASE_SIZE   3       /* size of TIM fixed fields */

#define AID_SIZE        2008    /* valid AIDs are numBssids thru 2007 */
#define VBM_SIZE        251     /* size of VBM array = 2008/8 = 251 */
#define MAX_BSSIDS      128     /* maximum possible number of BSSIDs per AP, is a power of 2 */

typedef unsigned char UINT8;
typedef unsigned short int UINT16;

struct _tim
   {
   UINT8 Element_id;
   UINT8 IELength;
   UINT8 DtimCount;
   UINT8 DtimPeriod;
   UINT8 BitMapControl;
   UINT8 PartialVirtualBitMap [VBM_SIZE];
   };

UINT8 virtualBitMap [VBM_SIZE];

UINT8 mcast_pending [MAX_BSSIDS] = {0};
UINT8 dtimCount [MAX_BSSIDS] = {0};
```



```
UINT8 dtimPeriod [MAX_BSSIDS] = {5};

void
Build_TIM (struct _tim *Tim, char TIM_method, UINT16 numBssids)
   {
   UINT8 octetIndex = 0;
   UINT8 octetIndex0 = 0;
   UINT8 octetIndex1 = 0;
   UINT8 offset = 0;
   UINT8 lengthOfPartialVirtualBitMap = 0;
   UINT8 bcast_octet = 0;
   UINT8 bcast_bit = 0;
   UINT8 max_bcast_octetIndex = 0;
   UINT16 bssidIndex = 0;
   UINT16 N2 = 0;

   /* Compute the largest octet_index for bcast indication */
   max_bcast_octetIndex = (numBssids - 1) / 8;

   /* Initialize PartialVirtualBitMap */
   for (octetIndex = 0;  octetIndex < VBM_SIZE;  octetIndex++)
      Tim->PartialVirtualBitMap [octetIndex] = 0;
   octetIndex = 0;
   if (numBssids == 1)
      {
      /* Find the first nonzero octet in the virtual bit map */
      for (octetIndex = 0;  ((virtualBitMap [octetIndex] == 0) && (octetIndex < VBM_SIZE));
          octetIndex++)
         /* empty */ ;
      if (octetIndex < VBM_SIZE)
         offset = octetIndex & 0xFE;

      /* Find the last nonzero octet in the virtual bit map */
      for (octetIndex = (VBM_SIZE - 1);  ((virtualBitMap [octetIndex] == 0) && (octetIndex > 0));
          octetIndex--)
         /* empty */ ;
      lengthOfPartialVirtualBitMap = octetIndex - offset + 1;
      Tim->IELength = lengthOfPartialVirtualBitMap + TIM_BASE_SIZE;
      Tim->BitMapControl = offset;

      /* Copy the virtual bit map octets that are nonzero */
      /* Note: A NULL virtualBitMap will still add a single octet of zero */
      for (octetIndex = 0;  octetIndex < lengthOfPartialVirtualBitMap;  octetIndex++)
         Tim->PartialVirtualBitMap [octetIndex] = virtualBitMap [offset + octetIndex];
      }
   if (numBssids > 1)
      {
      /* Update the broadcast/multicast bits, when numBssids > 1 */
      for (bssidIndex = 1;  bssidIndex < numBssids;  bssidIndex++)
         {
         bcast_octet = (UINT8) (bssidIndex >> 3);
         bcast_bit = (UINT8) (0x01 << (bssidIndex & 0x07));
         if (mcast_pending [bssidIndex])
            virtualBitMap [bcast_octet] |= bcast_bit;
```



```
        else
            virtualBitMap [bcast_octet] &= ~bcast_bit;
        }
    for (octetIndex0 = 0;
         (octetIndex0 < VBM_SIZE) && (virtualBitMap [octetIndex0] == 0);
         octetIndex0++)
        /* empty */ ;

    /* PVB contains neither bcast nor buffered ucast traffic, PVB is a single all-0 byte */
    if (octetIndex0 == VBM_SIZE)
        {
        lengthOfPartialVirtualBitMap = 1;
        offset = 0;
        Tim->IELength = lengthOfPartialVirtualBitMap + TIM_BASE_SIZE;
        Tim->BitMapControl = offset;
        Tim->PartialVirtualBitMap [0] = virtualBitMap [0];
        }
    for (octetIndex1 = (max_bcast_octetIndex + 1);
         ((octetIndex1 < VBM_SIZE) && (virtualBitMap [octetIndex1] == 0));
         octetIndex1++)
        /* empty */ ;

    /* PVB only contains bcast indication, no buffered ucast traffic */
    if ((octetIndex1 == VBM_SIZE) && (octetIndex0 < VBM_SIZE))
        {
        lengthOfPartialVirtualBitMap = max_bcast_octetIndex + 1;
        offset = 0;
        Tim->IELength = lengthOfPartialVirtualBitMap + TIM_BASE_SIZE;
        Tim->BitMapControl = offset;
        for (octetIndex = 0;  octetIndex < (max_bcast_octetIndex + 1);  octetIndex++)
            /* empty */ ;
        Tim->PartialVirtualBitMap [octetIndex] = virtualBitMap [octetIndex];
        }

    /* PVB contains ucast indication with or without buffered bcast traffic */
    for (octetIndex = 0;  octetIndex < (max_bcast_octetIndex + 1);  octetIndex++)
        Tim->PartialVirtualBitMap [octetIndex] = virtualBitMap [octetIndex];
    if ((octetIndex1 < VBM_SIZE) && (octetIndex0 < VBM_SIZE))
        {
        if (TIM_method == 'A')
            {
            offset = 0;
            for (octetIndex = (VBM_SIZE - 1);
                 (virtualBitMap [octetIndex] == 0) && (octetIndex > (max_bcast_octetIndex + 1));
                 octetIndex--)
                /* empty */ ;
            N2 = octetIndex;
            lengthOfPartialVirtualBitMap = N2 - offset + 1;
            for (octetIndex = (max_bcast_octetIndex + 1);  (octetIndex <= N2);  octetIndex++)
                Tim->PartialVirtualBitMap [octetIndex] = virtualBitMap [octetIndex];
            Tim->IELength = lengthOfPartialVirtualBitMap + TIM_BASE_SIZE;
            Tim->BitMapControl = offset;
            }
        if (TIM_method == 'B')
```

```
            {
            offset = octetIndex1 - (max_bcast_octetIndex + 1);
            offset = offset & 0xFE;
            /* The result of (max_bcast_octetIndex + 1) + offset is equal to N1 that is described in 7.3.2.6 for
the TIM element. */
            for (octetIndex = (VBM_SIZE - 1);
                ((virtualBitMap [octetIndex] == 0) && (octetIndex > (max_bcast_octetIndex + 1)));
                octetIndex--)
               /* empty */ ;
            N2 = octetIndex;
            lengthOfPartialVirtualBitMap = N2 - offset + 1;
            for (octetIndex = (max_bcast_octetIndex + 1);
                octetIndex <= (lengthOfPartialVirtualBitMap - 1);
                octetIndex++)
               Tim->PartialVirtualBitMap [octetIndex] = virtualBitMap [offset + octetIndex];
            Tim->IELength = lengthOfPartialVirtualBitMap + TIM_BASE_SIZE;
            Tim->BitMapControl = offset;
            }
         }
      }
   Tim->Element_id = TIM_ELEMENT_ID;
   Tim->DtimCount = dtimCount [0];
   Tim->DtimPeriod = dtimPeriod [0];

   /* Update broadcast/ multicast indication bit for transmitted BSSID if necessary */
   if ((Tim->DtimCount == 0) && mcast_pending [0])
      Tim->BitMapControl |= 0x01;
   }

void
Update_VirtualBitMap (UINT16 station_id, UINT8 Action)
   {
   UINT16 aid = station_id;
   UINT8 aid_octet;
   UINT8 aid_bit;

   if ((aid > 0) && (aid < AID_SIZE))
      {
      /* Get aid position in Virtual Bit Map. */
      aid_octet = (UINT8) (aid >> 3);
      aid_bit = (UINT8) (0x01 << (aid & 0x07));
      if (Action == REMOVE_TIM_BIT)
         virtualBitMap [aid_octet] &= ~aid_bit;
      else
         virtualBitMap [aid_octet] |= aid_bit;
      }
   }

int
main (void)
   {
   struct _tim Tim;
   UINT8 ExampleCase;
   UINT16 count = 0;
```

```
char TIM_method;
UINT16 numBssids = 1;

/* The value of ExampleCase depends on the test case, allowed values are 1 through 22 */
ExampleCase = 1;

/* The value of TIM_method depends on the method to use, allowed values are 'A' and 'B' */
TIM_method = 'A';

switch (ExampleCase)
  {
  /* Nine examples with numBssids = 1, no difference between Method A and B */
  case 1:
    mcast_pending [0] = 0;
    Update_VirtualBitMap (2, ADD_TIM_BIT);
    Update_VirtualBitMap (7, ADD_TIM_BIT);
    break;
  case 2:
    mcast_pending [0] = 1;
    Update_VirtualBitMap (2, ADD_TIM_BIT);
    Update_VirtualBitMap (7, ADD_TIM_BIT);
    Update_VirtualBitMap (22, ADD_TIM_BIT);
    Update_VirtualBitMap (24, ADD_TIM_BIT);
    break;
  case 3:
    mcast_pending [0] = 1;
    Update_VirtualBitMap (24, ADD_TIM_BIT);
    break;
  case 4:
    mcast_pending [0] = 0;
    Update_VirtualBitMap (3, ADD_TIM_BIT);
    Update_VirtualBitMap (37, ADD_TIM_BIT);
    Update_VirtualBitMap (43, ADD_TIM_BIT);
    break;
  case 5:
    mcast_pending [0] = 0;
    Update_VirtualBitMap (35, ADD_TIM_BIT);
    break;
  case 6:
    mcast_pending [0] = 0;
    Update_VirtualBitMap (43, ADD_TIM_BIT);
    break;
  case 7:
    mcast_pending [0] = 0;
    Update_VirtualBitMap (35, ADD_TIM_BIT);
    Update_VirtualBitMap (35, REMOVE_TIM_BIT);
    break;
  case 8:
    mcast_pending [0] = 1;
    Update_VirtualBitMap (13, ADD_TIM_BIT);
    Update_VirtualBitMap (43, ADD_TIM_BIT);
    Update_VirtualBitMap (63, ADD_TIM_BIT);
    Update_VirtualBitMap (73, ADD_TIM_BIT);
    break;
```



```
case 9:
    mcast_pending [0] = 1;
    Update_VirtualBitMap (2007, ADD_TIM_BIT);
    break;


/* Thirteen examples with numBssids > 1, TIM_method = 'A' or 'B' */
case 10:
    numBssids = 8;
    Update_VirtualBitMap (9, ADD_TIM_BIT);
    Update_VirtualBitMap (11, ADD_TIM_BIT);
    break;
case 11:
    numBssids = 8;
    mcast_pending [0] = 1;
    mcast_pending [3] = 1;
    Update_VirtualBitMap (12, ADD_TIM_BIT);
    Update_VirtualBitMap (17, ADD_TIM_BIT);
    Update_VirtualBitMap (22, ADD_TIM_BIT);
    Update_VirtualBitMap (24, ADD_TIM_BIT);
    break;
case 12:
    numBssids = 16;
    mcast_pending [3] = 1;
    Update_VirtualBitMap (39, ADD_TIM_BIT);
    break;
case 13:
    numBssids = 8;
    mcast_pending [5] = 1;
    mcast_pending [7] = 1;
    Update_VirtualBitMap (23, ADD_TIM_BIT);
    break;
case 14:
    numBssids = 8;
    mcast_pending [2] = 1;
    mcast_pending [7] = 1;
    Update_VirtualBitMap (10, ADD_TIM_BIT);
    break;
case 15:
    numBssids = 15;
    mcast_pending [5] = 1;
    mcast_pending [7] = 1;
    Update_VirtualBitMap (2007, ADD_TIM_BIT);
    break;
case 16:
    numBssids = 15;
    mcast_pending [5] = 1;
    mcast_pending [7] = 1;
    Update_VirtualBitMap (1997, ADD_TIM_BIT);
    Update_VirtualBitMap (1999, ADD_TIM_BIT);
    break;
case 17:
    numBssids = 32;
    for (count = 0;  count < numBssids;  count += 2)
```



```
            mcast_pending [count] = 1;
          Update_VirtualBitMap (32, ADD_TIM_BIT);
          Update_VirtualBitMap (33, ADD_TIM_BIT);
          Update_VirtualBitMap (39, ADD_TIM_BIT);
          break;
      case 18:
          numBssids = 14;
          mcast_pending [5] = 1;
          mcast_pending [7] = 1;
          break;
      case 19:
          numBssids = 14;
          mcast_pending [0] = 1;
          mcast_pending [12] = 1;
          break;
      case 20:
          numBssids = 15;
          Update_VirtualBitMap (38, ADD_TIM_BIT);
          break;
      case 21:
          numBssids = 15;
          mcast_pending [0] = 1;
          Update_VirtualBitMap (44, ADD_TIM_BIT);
          break;
      case 22:
          numBssids = 16;
          break;
      default:
          break;
      }
   Build_TIM (&Tim, TIM_method, numBssids);

   printf ("\nCase = %d, method %c.\n", ExampleCase, TIM_method);
   printf ("numBssids = %d.\n", numBssids);
   printf ("Element_id = %d.\n", Tim.Element_id);
   printf ("IELength = %d.\n", Tim.IELength);
   printf ("DtimCount = %d.\n", Tim.DtimCount);
   printf ("DtimPeriod = %d.\n", Tim.DtimPeriod);
   printf ("BitMapControl = 0x%02X\n", Tim.BitMapControl);
   if (Tim.IELength - TIM_BASE_SIZE > 0)
      {
      int octetIndex;

      for (octetIndex = 0;  octetIndex < Tim.IELength - TIM_BASE_SIZE;  octetIndex++)
          printf ("PartialVirtualBitMap [%d] = 0x%02X\n", octetIndex,
                  Tim.PartialVirtualBitMap [octetIndex]);
      }
   return 0;
   }
/* The End. */
```


Annex P

(informative)

Bibliography

Insert the following new reference into the bibliography in proper alphanumerical order:

[Bxx] ITU-R Recommendation TF.460-6 (2002), Standard-Frequency and Time-Signal Emissions.

Annex Q

(normative)

Change Annex Q as follows:

ASN.1 encoding of the RRM and WNM MIB

```
-- *******************************************************************
-- * IEEE 802.11 RRM and WNM MIB
-- *******************************************************************
-- *~~The primary interface to the Radio Resource Measurements is meant to be~~
~~-- * real-time information obtained through the request/response mechanisms of~~
~~-- * RRM. A secondary interface to the measurements is through retention of~~
~~-- * information in the MIB. The information, meant to be retained for later~~
~~-- * access, includes the MIB entries of Annex Q. Non-SNMP requests for infor-~~
~~-- * mation are obtained via object IDs (OIDs) through the NDIS or “wireless”~~
~~-- * interfaces in the operating systems. SNMP requests for information are~~
~~-- * obtained via SNMP SETs and GETs.~~
-- * The primary interface to the Radio Resource Measurements and Wireless
-- * Network Management functions is meant to be real-time information
-- * obtained through the request/response mechanisms of RRM and WNM.
-- * A secondary interface to the measurements is through retention of
-- * information in this MIB.  The information, meant to be retained for
-- * later access, includes the MIB entries of Annex Q.  Non-SNMP requests
-- * for information are obtained via object IDs (OIDs) through the NDIS
-- * or wireless interfaces in the operating systems.  SNMP requests for
-- *  information are obtained via SNMP SETs and GETs.


-- *******************************************************************
-- * Radio Resource Measurement
-- *******************************************************************

dot11RadioResourceMeasurement OBJECT IDENTIFIER ::= { dot11smt 14 }
-- *******************************************************************
-- *  dot11RRMRequest and dot11RRMReport Usage
-- *
-- * The dot11RRMRequest and dot11RRMReport portions of the RRM MIB
-- * provide access to the Radio Measurement service. By performing
-- * SET operations on the various dot11RRMRequest MIB objects,
-- * radio measurements may be initiated directly on the local STA or
-- * on any peer station within the same BSS. Subsequently, by
-- * performing GET operations on the various dot11RRMReport MIB
-- * objects the results of the requested measurements may be
-- * retrieved.
-- *
-- * In the diagram below, a radio measurement could be initiated
-- * for STA x by performing a MIB.set operation on the RRM MIB of
-- * STA x and specifying the MAC address of STA x in
-- * dot11RRMRqstTargetAdd. Additionally, it is possible to have STA x
-- * request a measurement from STA y by performing a MIB.set operation
-- * on the SME MIB of STA x and specifying the MAC address of STA y in
-- * dot11RRMRqstTargetAdd. In both cases the result of the measurements
-- * can be retrieved by performing a MIB.get operation on the RRM MIB
-- * of STA x upon completion of the measurement.
```

```
-- *
-- *
-- *          MIB.Set                                        MIB.Set
-- *            or                                             or
-- *          MIB.Get                                        MIB.Get
-- *    +--------|---------+                           +--------|---------+
-- *    | SME    |         |                           | SME    |         |
-- *    |       \ /        |                           |       \ /        |
-- *    |   +---------+    |                           |   +---------+    |
-- *    |   | RRM and |    |                           |   | RRM and |    |
-- *    |   | WNM MIB |    |                           |   | WNM MIB |    |
-- *    |   |         |    |                           |   |         |    |
-- *    |   +---------+    |                           |   +---------+    |
-- *    |                  |                           |                  |
-- *    |   / \            |                           |   / \            |
-- *    |    |   MREQUEST  |                           |    |   MREQUEST  |
-- *    +----+-------------+                           +----+-------------+
-- *    |    |   MREPORT   |                           |    |   MREPORT   |
-- *    |   \ /  MEASURE   |      Action Frames        |   \ /  MEASURE   |
-- *    |                  | <--Measurement Request--> |                  |
-- *    |                  | <--Measurement Report---> |                  |
-- *    | MLME             |                           | MLME             |
-- *    +------------------+                           +------------------+
-- *        STA x                                STA y
-- *
-- *
-- * Each STA maintains a single dot11RRMRequestTable in the SME MIB
-- * used to initiate RM Measurement Requests. Each dot11RRMRequestEntry
-- * in the table represents an individual Measurement Request that
-- * makes up a complete Measurement Request Action frame.
-- * Multiple Measurement Requests may be concatenated into a single
-- * Measurement Request Action frame by setting the same
-- * dot11RRMRqstToken value into multiple dot11RRMRequestEntrys.
-- *
-- * Each row, dot11RRMRequestEntry, of the dot11RRMRequestTable
-- * provides read-create access for the initiation of a measurement
-- * request. The dot11RRMRequestNextIndex object can be used to
-- * determine which is the next row available. Each row corresponding to
-- * one measurement in the sequence is created with a dot11RRMRqstRowStatus
-- * set to notInService. Once the dot11RRMRequestEntry(s) have been
-- * created for a desired measurement sequence the corresponding
-- * dot11RRMRqstRowStatus(s) objects are set to active to indicate that
-- * the SME can trigger the appropriate MLME primitives. Upon processing
-- * the request, the SME returns the corresponding dot11RRMRqstRowStatus(s)
-- * object to notInService and are now available for additional
-- * measurement requests.
-- *
-- * After a radio measurement is complete the RRM populates the RRMReport
-- * objects with the results of the measurement. Each STA maintains a set
-- * of RRMReport tables, one for each corresponding measurement type. The
-- * results of the entire measurement sequence are spread across the tables
-- * based on what types of measurements were requested. Each xxxReportEntry
-- * within a xxxReportTable contains a xxxRprtRqstToken that corresponds
-- * to the original dot11RRMRqstToken in the measurement request. So the
-- * results of the measurement can be collected by searching the appropriate
-- * xxxReportTables and retrieve any reports with the matching request
-- * token.
-- *
-- *
-- * Similar structures and mechanisms are used for WNM
-- * Request and Reports. The WNM MIB definitions follow the RRM MIB definitions
-- * in this Annex.
```

Change the "Dot11RRMRequestEntry" as follows:

```
Dot11RRMRequestEntry ::=
        SEQUENCE {
                dot11RRMRqstIndex                                   Unsigned32,
                dot11RRMRqstRowStatus                               RowStatus,
                dot11RRMRqstToken                                   OCTET STRING,
                dot11RRMRqstRepetitions                             INTEGER,
```

```
dot11RRMRqstIfIndex                                   InterfaceIndex,
dot11RRMRqstType                                      INTEGER,
dot11RRMRqstTargetAdd                                 MacAddress,
dot11RRMRqstTimeStamp                                 TimeTicks,
dot11RRMRqstChanNumber                                INTEGER,
dot11RRMRqstRegulatoryClass                           INTEGER,
dot11RRMRqstRndInterval                               Unsigned32,
dot11RRMRqstDuration                                  Unsigned32,
dot11RRMRqstParallel                                  TruthValue,
dot11RRMRqstEnable                                    TruthValue,
dot11RRMRqstRequest                                   TruthValue,
dot11RRMRqstReport                                    TruthValue,
dot11RRMRqstDurationMandatory                         TruthValue,
dot11RRMRqstBeaconRqstMode                            INTEGER,
dot11RRMRqstBeaconRqstDetail                          INTEGER,
dot11RRMRqstFrameRqstType                             INTEGER,
dot11RRMRqstBssid                                     MacAddress,
dot11RRMRqstSSID                                      OCTET STRING,
dot11RRMRqstBeaconReportingCondition                  INTEGER,
dot11RRMRqstBeaconThresholdOffset                     INTEGER,
dot11RRMRqstSTAStatRqstGroupID                        INTEGER,
dot11RRMRqstLCIRqstSubject                            INTEGER,
dot11RRMRqstLCILatitudeResolution                     INTEGER,
dot11RRMRqstLCILongitudeResolution                    INTEGER,
dot11RRMRqstLCIAltitudeResolution                     INTEGER,
dot11RRMRqstLCIAzimuthType                            INTEGER,
dot11RRMRqstLCIAzimuthResolution                      INTEGER,
dot11RRMRqstPauseTime                                 INTEGER,
dot11RRMRqstTransmitStreamPeerQSTAAddress             MacAddress,
dot11RRMRqstTransmitStreamTrafficIdentifier           INTEGER,
dot11RRMRqstTransmitStreamBin0Range                   INTEGER,
dot11RRMRqstTrigdQoSAverageCondition                  TruthValue,
dot11RRMRqstTrigdQoSConsecutiveCondition              TruthValue,
dot11RRMRqstTrigdQoSDelayCondition                    TruthValue,
dot11RRMRqstTrigdQoSAverageThreshold                  INTEGER,
dot11RRMRqstTrigdQoSConsecutiveThreshold              INTEGER,
dot11RRMRqstTrigdQoSDelayThresholdRange               INTEGER,
dot11RRMRqstTrigdQoSDelayThreshold                    INTEGER,
dot11RRMRqstTrigdQoSMeasurementCount                  INTEGER,
dot11RRMRqstTrigdQoSTimeout                           INTEGER,
dot11RRMRqstChannelLoadReportingCondition             INTEGER,
dot11RRMRqstChannelLoadReference                      INTEGER,
dot11RRMRqstNoiseHistogramReportingCondition          INTEGER,
dot11RRMRqstAnpiReference                             INTEGER,
dot11RRMRqstAPChannelReport                           OCTET STRING,
dot11RRMRqstSTAStatPeerSTAAddress                     MacAddress,
dot11RRMRqstFrameTransmitterAddress                   MacAddress,
dot11RRMRqstVendorSpecific                            OCTET STRING,
dot11RRMRqstSTAStatTrigMeasCount                      Unsigned32,
dot11RRMRqstSTAStatTrigTimeout                        INTEGER,
dot11RRMRqstSTAStatTrigCondition                      OCTET STRING,
dot11RRMRqstSTAStatTrigSTAFailedCntThresh             Unsigned32,
dot11RRMRqstSTAStatTrigSTAFCSErrCntThresh             Unsigned32,
dot11RRMRqstSTAStatTrigSTAMultRetryCntThresh          Unsigned32,
dot11RRMRqstSTAStatTrigSTAFrameDupeCntThresh          Unsigned32,
dot11RRMRqstSTAStatTrigSTARTSFailCntThresh            Unsigned32,
dot11RRMRqstSTAStatTrigSTAAckFailCntThresh            Unsigned32,
dot11RRMRqstSTAStatTrigSTARetryCntThresh              Unsigned32,
dot11RRMRqstSTAStatTrigQoSTrigCondition               OCTET STRING,
dot11RRMRqstSTAStatTrigQoSFailedCntThresh             Unsigned32,
dot11RRMRqstSTAStatTrigQoSRetryCntThresh              Unsigned32,
dot11RRMRqstSTAStatTrigQoSMultRetryCntThresh          Unsigned32,
dot11RRMRqstSTAStatTrigQoSFrameDupeCntThresh          Unsigned32,
dot11RRMRqstSTAStatTrigQoSRTSFailCntThresh            Unsigned32,
dot11RRMRqstSTAStatTrigQoSAckFailCntThresh            Unsigned32,
dot11RRMRqstSTAStatTrigQoSDiscardCntThresh            Unsigned32,
dot11RRMRqstSTAStatTrigRsnaTrigCondition              OCTET STRING,
dot11RRMRqstSTAStatTrigRsnaCMACICVErrCntThresh        Unsigned32,
dot11RRMRqstSTAStatTrigRsnaCMACReplayCntThresh        Unsigned32,
dot11RRMRqstSTAStatTrigRsnaRobustCCMPReplayCntThresh Unsigned32,
dot11RRMRqstSTAStatTrigRsnaTKIPICVErrCntThresh        Unsigned32,
dot11RRMRqstSTAStatTrigRsnaTKIPReplayCntThresh        Unsigned32,
```

```
        dot11RRMRqstSTAStatTrigRsnaCCMPDecryptErrCntThresh   Unsigned32,
        dot11RRMRqstSTAStatTrigRsnaCCMPReplayCntThresh       Unsigned32 }
```

Change the definition of "dot11RRMRqstSTAStatRqstGroupID" as follows:

```
dot11RRMRqstSTAStatRqstGroupID OBJECT-TYPE
        SYNTAX INTEGER {
                dot11CountersTable(0),
                dot11MacStatistics(1),
                dot11QosCountersTableforUP0(2),
                dot11QosCountersTableforUP1(3),
                dot11QosCountersTableforUP2(4),
                dot11QosCountersTableforUP3(5),
                dot11QosCountersTableforUP4(6),
                dot11QosCountersTableforUP5(7),
                dot11QosCountersTableforUP6(8),
                dot11QosCountersTableforUP7(9),
                bSSAverageAccessDelays(10),
                dot11RSNAStatsTable(16)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "The attribute indicates the group identity for this Measurement Request
                element. This attribute is only valid if the dot11RRMRqstType is 7, indi-
                cating a statistics request, and is ignored otherwise."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 25 }
```

Insert the following text after the text defining "dot11RRMRqstVendorSpecific":

```
dot11RRMRqstSTAStatTrigMeasCount OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the number of MSDUs or MPDUs over which the trig-
                ger criterion is applied. This attribute is only valid if dot11RRMRqstType
                is 7 (STA Statistics) and if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 53 }

dot11RRMRqstSTAStatTrigTimeout OBJECT-TYPE
        SYNTAX INTEGER(0..65535)
        UNITS "100 TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the interval during which a measuring STA does
                not generate further triggered STA Statistics Reports after a trigger con-
                dition has been met. This attribute is only valid if dot11RRMRqstType is 7
                (STA Statistics)."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 54 }

dot11RRMRqstSTAStatTrigCondition OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(2))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the trigger values used when requesting trig-
                gered STA Statistics
                reporting. The format of the STA Counter Trigger Condition field is shown
                in Figure 7-62h2."
        ::= { dot11RRMRequestEntry 55 }

dot11RRMRqstSTAStatTrigSTAFailedCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
```



```
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
               "This attribute indicates that a STA Statistics Report should be generated
               (triggered) when the dot11FailedCount value has increased more than the
               threshold value indicated here. The counter increase is measured over the
               last n MSDUs or MPDUs, where n is the value of
               dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
               dot11RRMRqstType is 7 (STA Statistics), and if
               dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
               of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 56 }

dot11RRMRqstSTAStatTrigSTAFCSErrCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
               "This attribute indicates that a STA Statistics Report should be generated
               (triggered) when the dot11FCSErrorCount value has increased more than the
               threshold value indicated here. The counter increase is measured over the
               last n MSDUs or MPDUs, where n is the value of
               dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
               dot11RRMRqstType is 7 (STA Statistics), and if
               dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
               of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 57 }

dot11RRMRqstSTAStatTrigSTAMultRetryCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
               "This attribute indicates that a STA Statistics Report should be generated
               (triggered) when the dot11MultipleRetryCount value has increased more than
               the threshold value indicated here. The counter increase is measured over
               the last n MSDUs or MPDUs, where n is the value of
               dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
               dot11RRMRqstType is 7 (STA Statistics), and if
               dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
               of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 58 }

dot11RRMRqstSTAStatTrigSTAFrameDupeCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
               "This attribute indicates that a STA Statistics Report should be generated
               (triggered) when the dot11FrameDuplicateCount value has increased more than
               the threshold value indicated here. The counter increase is measured over
               the last n MSDUs or MPDUs, where n is the value of
               dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
               dot11RRMRqstType is 7 (STA Statistics), and if
               dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
               of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 59 }

dot11RRMRqstSTAStatTrigSTARTSFailCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
               "This attribute indicates that a STA Statistics Report should be generated
               (triggered) when the dot11RTSFailureCount value has increased more than the
               threshold value indicated here. The counter increase is measured over the
               last n MSDUs or MPDUs, where n is the value of
               dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
```



```
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
            of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 60 }

dot11RRMRqstSTAStatTrigSTAAckFailCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11ACKFailureCount value has increased more than the
            threshold value indicated here. The counter increase is measured over the
            last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
            of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 61 }

dot11RRMRqstSTAStatTrigSTARetryCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11RetryCount value has increased more than the
            threshold value indicated here. The counter increase is measured over the
            last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 0 (dot11CountersTable) and if the value
            of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 62 }

dot11RRMRqstSTAStatTrigQoSTrigCondition OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(2))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates the trigger values used when requesting trig-
            gered QoS STA Statistics
            reporting. The format of the STA Counter Trigger Condition field is shown
            in Figure 7-62h4."
        ::= { dot11RRMRequestEntry 63 }

dot11RRMRqstSTAStatTrigQoSFailedCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosFailedCount value has increased more than the
            threshold value indicated here. The counter increase is measured over the
            last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 64 }

dot11RRMRqstSTAStatTrigQoSRetryCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosRetryCount value has increased more than the
```



```
            threshold value indicated here. The counter increase is measured over the
            last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 65 }

dot11RRMRqstSTAStatTrigQoSMultRetryCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosMultipleRetryCount value has increased more
            than the threshold value indicated here. The counter increase is measured
            over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 66 }

dot11RRMRqstSTAStatTrigQoSFrameDupeCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosFrameDuplicateCount value has increased more
            than the threshold value indicated here. The counter increase is measured
            over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 67 }

dot11RRMRqstSTAStatTrigQoSRTSFailCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosRTSFailureCount value has increased more than
            the threshold value indicated here. The counter increase is measured over
            the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 68 }

dot11RRMRqstSTAStatTrigQoSAckFailCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11QosACKFailureCount value has increased more than
            the threshold value indicated here. The counter increase is measured over
            the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
            if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 69 }
```

```
dot11RRMRqstSTAStatTrigQoSDiscardCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates that a STA Statistics Report should be generated
                (triggered) when the dot11QosDiscardedFrameCount value has increased more
                than the threshold value indicated here. The counter increase is measured
                over the last n MSDUs or MPDUs, where n is the value of
                dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
                dot11RRMRqstType is 7 (STA Statistics), and if
                dot11RRMRqstSTAStatRqstGroupID is 2 through 9 (dot11QosCountersTable) and
                if the value of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 70 }

dot11RRMRqstSTAStatTrigRsnaTrigCondition OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(2))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the trigger values used when requesting trig-
                gered RSNA STA Statistics
                reporting. The format of the STA Counter Trigger Condition field is shown
                in Figure 7-62h6."
        ::= { dot11RRMRequestEntry 71 }

dot11RRMRqstSTAStatTrigRsnaCMACICVErrCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates that a STA Statistics Report should be generated
                (triggered) when the dot11RSNAStatsCMACICVErrors value has increased more
                than the threshold value indicated here. The counter increase is measured
                over the last n MSDUs or MPDUs, where n is the value of
                dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
                dot11RRMRqstType is 7 (STA Statistics), and if
                dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
                of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 72 }

dot11RRMRqstSTAStatTrigRsnaCMACReplayCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates that a STA Statistics Report should be generated
                (triggered) when the dot11RSNAStatsCMACReplays value has increased more
                than the threshold value indicated here. The counter increase is measured
                over the last n MSDUs or MPDUs, where n is the value of
                dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
                dot11RRMRqstType is 7 (STA Statistics), and if
                dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
                of the attribute is not equal to 0."
        DEFVAL { 0 }
        ::= { dot11RRMRequestEntry 73 }

dot11RRMRqstSTAStatTrigRsnaRobustCCMPReplayCntThresh OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates that a STA Statistics Report should be generated
                (triggered) when the dot11RSNAStatsRobustMgmtCCMPReplays value has
                increased more than the threshold value indicated here. The counter
                increase is measured over the last n MSDUs or MPDUs, where n is the value
                of dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
                dot11RRMRqstType is 7 (STA Statistics), and if
                dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
```



```
            of the attribute is not equal to 0."
    DEFVAL { 0 }
    ::= { dot11RRMRequestEntry 74 }

dot11RRMRqstSTAStatTrigRsnaTKIPICVErrCntThresh OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11RSNAStatsTKIPICVErrors value has increased more
            than the threshold value indicated here. The counter increase is measured
            over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
            of the attribute is not equal to 0."
    DEFVAL { 0 }
    ::= { dot11RRMRequestEntry 75 }

dot11RRMRqstSTAStatTrigRsnaTKIPReplayCntThresh OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11RSNAStatsTKIPReplays value has increased more
            than the threshold value indicated here. The counter increase is measured
            over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
            of the attribute is not equal to 0."
    DEFVAL { 0 }
    ::= { dot11RRMRequestEntry 76 }

dot11RRMRqstSTAStatTrigRsnaCCMPDecryptErrCntThresh OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11RSNAStatsCCMPDecryptErrors value has increased
            more than the threshold value indicated here. The counter increase is mea-
            sured over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
            of the attribute is not equal to 0."
    DEFVAL { 0 }
    ::= { dot11RRMRequestEntry 77 }

dot11RRMRqstSTAStatTrigRsnaCCMPReplayCntThresh OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
            "This attribute indicates that a STA Statistics Report should be generated
            (triggered) when the dot11RSNAStatsCCMPReplays value has increased more
            than the threshold value indicated here. The counter increase is measured
            over the last n MSDUs or MPDUs, where n is the value of
            dot11RRMRqstSTAStatTrigMeasCount. This attribute is only valid if
            dot11RRMRqstType is 7 (STA Statistics), and if
            dot11RRMRqstSTAStatRqstGroupID is 16 (dot11RSNAStatsTable) and if the value
            of the attribute is not equal to 0."
    DEFVAL { 0 }
    ::= { dot11RRMRequestEntry 78 }
```

Change "Dot11STAStatisticsReportEntry" as follows:

```
Dot11STAStatisticsReportEntry ::=
        SEQUENCE {
                dot11STAStatisticsReportIndex                     Unsigned32,
                dot11STAStatisticsReportToken                     OCTET STRING,
                dot11STAStatisticsIfIndex                         InterfaceIndex,
                dot11STAStatisticsSTAAddress                      MacAddress,
                dot11STAStatisticsMeasurementDuration             Unsigned32,
                dot11STAStatisticsGroupID                         INTEGER,
                dot11STAStatisticsTransmittedFragmentCount        Counter32,
                dot11STAStatisticsMulticastTransmittedFrameCount  Counter32,
                dot11STAStatisticsFailedCount                     Counter32,
                dot11STAStatisticsRetryCount                      Counter32,
                dot11STAStatisticsMultipleRetryCount              Counter32,
                dot11STAStatisticsFrameDuplicateCount             Counter32,
                dot11STAStatisticsRTSSuccessCount                 Counter32,
                dot11STAStatisticsRTSFailureCount                 Counter32,
                dot11STAStatisticsACKFailureCount                 Counter32,
                dot11STAStatisticsQosTransmittedFragmentCount     Counter32,
                dot11STAStatisticsQosFailedCount                  Counter32,
                dot11STAStatisticsQosRetryCount                   Counter32,
                dot11STAStatisticsQosMultipleRetryCount           Counter32,
                dot11STAStatisticsQosFrameDuplicateCount          Counter32,
                dot11STAStatisticsQosRTSSuccessCount              Counter32,
                dot11STAStatisticsQosRTSFailureCount              Counter32,
                dot11STAStatisticsQosACKFailureCount              Counter32,
                dot11STAStatisticsQosReceivedFragmentCount        Counter32,
                dot11STAStatisticsQosTransmittedFrameCount        Counter32,
                dot11STAStatisticsQosDiscardedFrameCount          Counter32,
                dot11STAStatisticsQosMPDUsReceivedCount           Counter32,
                dot11STAStatisticsQosRetriesReceivedCount         Counter32,
                dot11STAStatisticsReceivedFragmentCount           Counter32,
                dot11STAStatisticsMulticastReceivedFrameCount     Counter32,
                dot11STAStatisticsFCSErrorCount                   Counter32,
                dot11STAStatisticsTransmittedFrameCount           Counter32,
                dot11STAStatisticsAPAverageAccessDelay            INTEGER,
                dot11STAStatisticsAverageAccessDelayBestEffort    INTEGER,
                dot11STAStatisticsAverageAccessDelayBackground    INTEGER,
                dot11STAStatisticsAverageAccessDelayVideo         INTEGER,
                dot11STAStatisticsAverageAccessDelayVoice         INTEGER,
                dot11STAStatisticsStationCount                    INTEGER,
                dot11STAStatisticsChannelUtilization              INTEGER,
                dot11STAStatisticsVendorSpecific                  OCTET STRING,
                dot11STAStatisticsRprtMeasurementMode             INTEGER,
                dot11STAStatisticsRSNAStatsCMACICVErrors          Counter32,
                dot11STAStatisticsRSNAStatsCMACReplays            Counter32,
                dot11STAStatisticsRSNAStatsRobustMgmtCCMPReplays  Counter32,
                dot11STAStatisticsRSNAStatsTKIPICVErrors          Counter32,
                dot11STAStatisticsRSNAStatsTKIPReplays            Counter32,
                dot11STAStatisticsRSNAStatsCCMPDecryptErrors      Counter32,
                dot11STAStatisticsRSNAStatsCCMPReplays            Counter32,
                dot11STAStatisticsReportingReasonSTACounters      OCTET STRING,
                dot11STAStatisticsReportingReasonQosCounters      OCTET STRING,
                dot11STAStatisticsReportingReasonRsnaCounters     OCTET STRING}
```

Change the definition of "dot11STAStatisticsGroupID" as follows:

```
dot11STAStatisticsGroupID OBJECT-TYPE
        SYNTAX INTEGER {
                dot11CountersTable(0),
                dot11MacStatistics(1),
                dot11QosCountersTableforUP0(2),
                dot11QosCountersTableforUP1(3),
                dot11QosCountersTableforUP2(4),
                dot11QosCountersTableforUP3(5),
                dot11QosCountersTableforUP4(6),
                dot11QosCountersTableforUP5(7),
                dot11QosCountersTableforUP6(8),
                dot11QosCountersTableforUP7(9),
```

```
                bSSAverageAccessDelays(10),
                dot11RSNAStatsTable(16)
                }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the value of dot11RRMRqstSTAStatRqstGroupID
                returned from the STA in this STA Statistics Report."
        ::= { dot11STAStatisticsReportEntry 6 }
```

Insert the following text after the text defining "dot11STAStatisticsRprtMeasurementMode":

```
dot11STAStatisticsRSNAStatsCMACICVErrors OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
                cates the value of dot11RSNAStatsCMACICVErrors returned from the STA in
                this STA Statistics Report. If dot11STAStatisticsMeasurementDuration indi-
                cates a non-zero value, this attribute indicates the difference in the ref-
                erenced dot11 variable over the indicated duration. This attribute is only
                valid if the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 42 }

dot11STAStatisticsRSNAStatsCMACReplays OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
                cates the value of dot11RSNAStatsCMACReplays returned from the STA in this
                STA Statistics Report. If dot11STAStatisticsMeasurementDuration indicates a
                non-zero value, this attribute indicates the difference in the referenced
                dot11 variable over the indicated duration. This attribute is only valid if
                the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 43 }

dot11STAStatisticsRSNAStatsRobustMgmtCCMPReplays OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
                cates the value of dot11RSNAStatsRobustMgmtCCMPReplays returned from the
                STA in this STA Statistics Report. If dot11STAStatisticsMeasurementDuration
                indicates a non-zero value, this attribute indicates the difference in the
                referenced dot11 variable over the indicated duration. This attribute is
                only valid if the dot11STAStatisticsGroupID is 16, and is ignored other-
                wise."
        ::= { dot11STAStatisticsReportEntry 44 }

dot11STAStatisticsRSNAStatsTKIPICVErrors OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
                cates the value of dot11RSNAStatsTKIPICVErrors returned from the STA in
                this STA Statistics Report. If dot11STAStatisticsMeasurementDuration indi-
                cates a non-zero value, this attribute indicates the difference in the ref-
                erenced dot11 variable over the indicated duration. This attribute is only
                valid if the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 45 }

dot11STAStatisticsRSNAStatsTKIPReplays OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
```

```
        DESCRIPTION
               "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
               cates the value of dot11RSNAStatsTKIPReplays returned from the STA in this
               STA Statistics Report. If dot11STAStatisticsMeasurementDuration indicates a
               non-zero value, this attribute indicates the difference in the referenced
               dot11 variable over the indicated duration. This attribute is only valid if
               the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 46 }

dot11STAStatisticsRSNAStatsCCMPDecryptErrors OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
               cates the value of dot11RSNAStatsCCMPDecryptErrors returned from the STA in
               this STA Statistics Report. If dot11STAStatisticsMeasurementDuration indi-
               cates a non-zero value, this attribute indicates the difference in the ref-
               erenced dot11 variable over the indicated duration. This attribute is only
               valid if the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 47 }

dot11STAStatisticsRSNAStatsCCMPReplays OBJECT-TYPE
        SYNTAX Counter32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "If dot11STAStatisticsMeasurementDuration is zero, this attribute indi-
               cates the value of dot11RSNAStatsCCMPReplays returned from the STA in this
               STA Statistics Report. If dot11STAStatisticsMeasurementDuration indicates a
               non-zero value, this attribute indicates the difference in the referenced
               dot11 variable over the indicated duration. This attribute is only valid if
               the dot11STAStatisticsGroupID is 16, and is ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 48 }

dot11STAStatisticsReportingReasonSTACounters OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..1))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the trigger reason(s) for this Statistics Report.
               Eash bit indicates a different trigger condition. When the bit is set to 1,
               it indicates that the listed trigger threshold has been exceeded:
               B0: dot11Failed,
               B1: dotFCSError,
               B2: dot11MultipleRetry,
               B3: dot11FrameDuplicate,
               B4: dot11RTSFailure,
               B5: dot11ACKFailur,
               B6: dot11Retry,
               B7: Reserved.
               This attribute is only valid if the dot11STAStatisticsGroupID is 0, and is
               ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 49 }

dot11STAStatisticsReportingReasonQosCounters OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..1))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the trigger reason(s) for this Statistics Report.
               Eash bit indicates a different trigger condition. When the bit is set to 1,
               it indicates that the listed trigger threshold has been exceeded:
               B0: dot11QoSFailed,
               B1: dotQoSRetry,
               B2: dot11QoSMultipleRetry,
               B3: dot11QoSFrameDuplicate,
               B4: dot11QoSRTSFailure,
               B5: dot11QoSACKFailur,
               B6: dot11QoSDiscarded,eB7: Reserved.
               This attribute is only valid if the dot11STAStatisticsGroupID is 2-9, and
               is ignored otherwise."
```



```
        ::= { dot11STAStatisticsReportEntry 50 }

dot11STAStatisticsReportingReasonRsnaCounters OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..1))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the trigger reason(s) for this Statistics Report.
                Each bit indicates a different trigger condition. When the bit is set to 1,
                it indicates that the listed trigger threshold has been exceeded:
                B0: dot11RSNAStatsCMACICVErrors,
                B1: dotRSNAStatsCMACReplays,
                B2: dot11RSNAStatsRobustMgmtCCMPReplays,
                B3: dot11RSNAStatsTKIPICVErrors,
                B4: dot11RSNAStatsCCMPReplays,
                B5: dot11RSNAStatsCCMPDecryptErrors,
                B6: dot11RSNAStatsCCMPReplays,
                B7: Reserved.
                This attribute is only valid if the dot11STAStatisticsGroupID is 16, and is
                ignored otherwise."
        ::= { dot11STAStatisticsReportEntry 51 }
```

Change the end of the "Dot11RRMNeighborReportEntry" as follows:

```
Dot11RRMNeighborReportEntry ::=
        SEQUENCE {
                dot11RRMNeighborReportExtCapServiceIntervalGranularity Unsigned32,
                dot11RRMNeighborReportBSSTransitCandPreference      INTEGER,
                dot11RRMNeighborReportBSSTerminationTSF             TSFType,
                dot11RRMNeighborReportBSSTerminationDuration        INTEGER}
```

Insert the following text after the text defining "dot11RRMNeighborReportRowStatus":

```
dot11RRMNeighborReportBSSTransitCandPreference OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the network preference for BSS transition to the
                BSS listed in this BSS Transition Candidate List Entries field in the BSS
                Transition Management Request frame, BSS Transition Management Query frame
                and BSS Transition Management Response frame. The Preference field value is
                a number ranging from 0 to 255 indicating an ordering of preferences for
                the BSS transition candidates for this STA. The value 0 indicates an
                excluded BSS. The values 1-255 the preferred relative ordering of BSSs,
                with 255 indicating the most preferred candidate and 1 indicating the least
                preferred candidate. Additional details describing use of the Preference
                field are provided in 11.22.6.3."
        ::= { dot11RRMNeighborReportEntry 94 }

dot11RRMNeighborReportBSSTerminationTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the value of the TSF counter when the BSS termi-
                nation will occur in the future. A BSS Termination TSF field value of 0
                indicates that termination of the BSS will occur imminently. Prior to ter-
                mination of the BSS, all associated STAs are disassociated by the AP."
        ::= { dot11RRMNeighborReportEntry 95 }

dot11RRMNeighborReportBSSTerminationDuration OBJECT-TYPE
        SYNTAX INTEGER (1..65535)
        UNITS "minutes"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the number of minutes for which the BSS is not
                present. The Duration field value of 0 is reserved. The Duration field
```

```
                value is set to 65535 when the BSS is terminated for a period longer than
                or equal to 65535 minutes."
        ::= { dot11RRMNeighborReportEntry 96 }
```

Insert the following text at the end of Annex Q:

```
-- ********************************************************************
-- * Wireless Network Management (WNM)
-- ********************************************************************

dot11WirelessNetworkManagement OBJECT IDENTIFIER ::= { dot11smt 22 }

-- ********************************************************************
-- * Wireless Network Management Requests
-- ********************************************************************

dot11WNMRequest OBJECT IDENTIFIER ::= { dot11WirelessNetworkManagement 1 }

-- ********************************************************************
-- * dot11WNMRequest TABLE
-- ********************************************************************
dot11WNMRequestNextIndex OBJECT-TYPE
        SYNTAX Unsigned32(0..4294967295)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "Identifies a hint for the next value of dot11WNMRqstIndex to be used in a
                row creation attempt for dot11WNMRequestTable. If no new rows can be cre-
                ated for some reason, such as memory, processing requirements, etc, the SME
                shall set this attribute to 0. It shall update this attribute to a proper
                value other than 0 as soon as it is capable of receiving new measurement
                requests. The nextIndex is not necessarily sequential nor monotonically
                increasing."
        ::= { dot11WNMRequest 1 }

dot11WNMRequestTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMRequestEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "This group contains the current list of requests for WNM reports to be
                issued and have been issued until removed. A network manager adds a WNM
                request by creating a row with createAndWait row status and then filling in
                the request parameters/attributes. The request becomes active to be issued
                when the row status is set to Active. The columnar objects or attributes
                other than the rowStatus shall not be written if the rowStatus is Active.
                The request rows can be deleted, if commanded by a network manager via
                changing the value of dot11WNMRqstRowStatus to Destroy. This may leave
                orphaned rows if a manager crashes and forgets which rows are being used by
                it. One recommended way to manage orphaned or finished rows is to delete
                rows if their dot11WNMRqstRowStatus remains other than Active for longer
                than a period (recommend at least 5 minutes, RFC 2579). Or another recom-
                mended way is to delete older rows as needed based on their
                dot11WNMRqstTimeStamp values. This can be done by the agent as well as the
                manager."
        ::= { dot11WNMRequest 2 }

dot11WNMRequestEntry OBJECT-TYPE
        SYNTAX Dot11WNMRequestEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMRequestTable Indexed by dot11WNMRqstIndex."
                INDEX { dot11WNMRqstIndex }
        ::= { dot11WNMRequestTable 1 }

Dot11WNMRequestEntry ::=
```

```
        SEQUENCE {
                dot11WNMRqstIndex                                    Unsigned32,
                dot11WNMRqstRowStatus                                RowStatus,
                dot11WNMRqstToken                                    OCTET STRING,
                dot11WNMRqstIfIndex                                  InterfaceIndex,
                dot11WNMRqstType                                     INTEGER,
                dot11WNMRqstTargetAdd                                MacAddress,
                dot11WNMRqstTimeStamp                                TimeTicks,
                dot11WNMRqstRndInterval                              Unsigned32,
                dot11WNMRqstDuration                                 Unsigned32,
                dot11WNMRqstMcstGroup                                MacAddress,
                dot11WNMRqstMcstTrigCon                              OCTET STRING,
                dot11WNMRqstMcstTrigInactivityTimeout                INTEGER,
                dot11WNMRqstMcstTrigReactDelay                       INTEGER,
                dot11WNMRqstLCRRqstSubject                           INTEGER,
                dot11WNMRqstLCRIntervalUnits                         INTEGER,
                dot11WNMRqstLCRServiceInterval                       INTEGER,
                dot11WNMRqstLIRRqstSubject                           INTEGER,
                dot11WNMRqstLIRIntervalUnits                         INTEGER,
                dot11WNMRqstLIRServiceInterval                       INTEGER,
                dot11WNMRqstEventToken                               INTEGER,
                dot11WNMRqstEventType                                INTEGER,
                dot11WNMRqstEventResponseLimit                       INTEGER,
                dot11WNMRqstEventTargetBssid                         MacAddress,
                dot11WNMRqstEventSourceBssid                         MacAddress,
                dot11WNMRqstEventTransitTimeThresh                   INTEGER,
                dot11WNMRqstEventTransitMatchValue                   OCTET STRING,
                dot11WNMRqstEventFreqTransitCountThresh              INTEGER,
                dot11WNMRqstEventFreqTransitInterval                 INTEGER,
                dot11WNMRqstEventRsnaAuthType                        OCTET STRING,
                dot11WNMRqstEapType                                  INTEGER,
                dot11WNMRqstEapVendorId                              OCTET STRING,
                dot11WNMRqstEapVendorType                            OCTET STRING,
                dot11WNMRqstEventRsnaMatchValue                      OCTET STRING,
                dot11WNMRqstEventPeerMacAddress                      MacAddress,
                dot11WNMRqstRegulatoryClass                          INTEGER,
                dot11WNMRqstChanNumber                               INTEGER,
                dot11WNMRqstDiagToken                                INTEGER,
                dot11WNMRqstDiagType                                 INTEGER,
                dot11WNMRqstDiagTimeout                              INTEGER,
                dot11WNMRqstDiagBssid                                MacAddress,
                dot11WNMRqstDiagProfileId                            INTEGER,
                dot11WNMRqstDiagCredentials                          INTEGER,
                dot11WNMRqstLocConfigLocIndParams                    OCTET STRING,
                dot11WNMRqstLocConfigChanList                        OCTET STRING,
                dot11WNMRqstLocConfigBcastRate                       INTEGER,
                dot11WNMRqstLocConfigOptions                         OCTET STRING,
                dot11WNMRqstBssTransitQueryReason                    INTEGER,
                dot11WNMRqstBssTransitReqMode                        OCTET STRING,
                dot11WNMRqstBssTransitDisocTimer                     INTEGER,
                dot11WNMRqstBssTransitSessInfoURL                    OCTET STRING,
                dot11WNMRqstBssTransitCandidateList                  OCTET STRING,
                dot11WNMRqstColocInterfAutoEnable                    TruthValue,
                dot11WNMRqstColocInterfRptTimeout                    INTEGER,
                dot11WNMRqstVendorSpecific                           OCTET STRING }

dot11WNMRqstIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for WNM Request elements in dot11WNMRequestTable, greater than 0."
        ::= { dot11WNMRequestEntry 1 }

dot11WNMRqstRowStatus OBJECT-TYPE
        SYNTAX RowStatus
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "The Row Status column of the current row, used for tracking status of an
                individual request. When this attribute is set to Active, AND a measure-
                ment request can be unambiguously created based on the parameters in the
```

```
            row, then the MLME may proceed to issue the request to its intended tar-
            gets when appropriate. If not, this attribute may be set to Not-ready imme-
            diately to indicate parametric errors. However, it is the network managers
            responsibility to correct the error. If the request is successfully issued
            to the target STA, then the rowStatus is set to notInService."
        ::= { dot11WNMRequestEntry 2 }

dot11WNMRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates a unique string to identify this request. To
            guarantee the uniqueness of this token across multiple network managers, it
            is recommended that this token be prefixed with the IP address of the net-
            work manager creating this row. This token is not necessarily equivalent to
            the measurement tokens in WNM request frames."
        ::= { dot11WNMRequestEntry 3 }


dot11WNMRqstIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "The ifIndex for this row of WNM Request to be issued on."
        ::= { dot11WNMRequestEntry 4 }

dot11WNMRqstType OBJECT-TYPE
        SYNTAX INTEGER {
            mcastDiagnostics(0),
            locationCivic(1),
            locationIdentifier(2),
            event(3),
            dignostic(4),
            locationConfiguration(5),
            bssTransitionQuery(6),
            bssTransitionRqst(7),
            fms(8),
            colocInterference(9)
            }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "This attribute indicates the request type of this WNM request row."
        ::= { dot11WNMRequestEntry 5 }

dot11WNMRqstTargetAdd OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
            "The MAC address of STA for this row of WNM Request is to be issued to. If
            this attribute matches the MAC address of the dot11WNMRqstIfIndex, then
            measurement request is for this STA itself to carry out."
        ::= { dot11WNMRequestEntry 6 }

dot11WNMRqstTimeStamp OBJECT-TYPE
        SYNTAX TimeTicks
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the SysUpTime Value the last time when the
            dot11WNMRqstRowStatus is set to active or when this row is created the
            first time. This attribute shall be set by this STA or AP automatically,
            not by an SNMP manager."
        ::= { dot11WNMRequestEntry 7 }

dot11WNMRqstRndInterval OBJECT-TYPE
        SYNTAX Unsigned32
        UNITS "TUs"
        MAX-ACCESS read-create
```

```
        STATUS current
        DESCRIPTION
                "This attribute indicates the upper bound of the random delay to be used
                prior to making the measurement, expressed in units of TUs. See 11.10.2."
        DEFVAL { 0 }
        ::= { dot11WNMRequestEntry 8 }

dot11WNMRqstDuration OBJECT-TYPE
        SYNTAX Unsigned32
        UNITS "TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the preferred or mandatory measurement duration
                for this Measurement Request."
        DEFVAL { 0 }
        ::= { dot11WNMRequestEntry 9 }

dot11WNMRqstMcstGroup OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "Multicast Group address indicates the MAC address of the multicast group
                for which diagnostics are requested. The BSSID shall be set to the wild-
                card BSSID when the measurement is to be performed on any mulicast group
                on the operating channel. This attribute is only valid if the
                dot11WNMRqstType is 10, indicating a multicast diagnostic request, and is
                ignored otherwise."
        DEFVAL { 'FFFFFFFFFFFF'H }
        ::= { dot11WNMRequestEntry 10 }

dot11WNMRqstMcstTrigCon OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the trigger condition for the Multicast Diagnos-
                tic request."
        ::= { dot11WNMRequestEntry 11 }

dot11WNMRqstMcstTrigInactivityTimeout OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        UNITS "100 TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the time interval value in units of 100 TU to be
                use as the threshold value for Trigger Inactivity Timeout trigger condi-
                tion."
        ::= { dot11WNMRequestEntry 12 }

dot11WNMRqstMcstTrigReactDelay OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        UNITS "100 TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the time interval value in units of 100 TU dur-
                ing which a measuring STA does not generate further Multicast Triggered
                Reports after a trigger condition has been met."
        ::= { dot11WNMRequestEntry 13 }

dot11WNMRqstLCRRqstSubject OBJECT-TYPE
        SYNTAX INTEGER {
                local(0),
                remote(1)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "The attribute indicates the subject of the Location Civic Request."
```

```
                DEFVAL { 0 }
        ::= { dot11WNMRequestEntry 14 }

dot11WNMRqstLCRIntervalUnits OBJECT-TYPE
        SYNTAX INTEGER {
                seconds(0),
                minutes(1),
                hours(2),
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the units used in the Location Civic Request Ser-
                vice Interval."
        ::= { dot11WNMRequestEntry 15 }

dot11WNMRqstLCRServiceInterval OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the periodic interval requested for periodic
                reporting of Location Civic Reports."
        ::= { dot11WNMRequestEntry 16 }


dot11WNMRqstLIRRqstSubject OBJECT-TYPE
        SYNTAX INTEGER {
                local(0),
                remote(1)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "The attribute indicates the subject of the Location Identifier Request."
                DEFVAL { 0 }
        ::= { dot11WNMRequestEntry 17 }

dot11WNMRqstLIRIntervalUnits OBJECT-TYPE
        SYNTAX INTEGER {
                seconds(0),
                minutes(1),
                hours(2),
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the units used in the Location Identifier Request
                Service Interval."
        ::= { dot11WNMRequestEntry 18 }

dot11WNMRqstLIRServiceInterval OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the time interval, expressed in the units indi-
                cated in the Location Service Interval Units field, at which the STA
                requests to receive Location Identifier Reports. A Location Service Inter-
                val of 0 indicates that only a single Location Identifier Report is
                requested."
        ::= { dot11WNMRequestEntry 19 }

dot11WNMRqstEventToken OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a unique string to identify this request."
        ::= { dot11WNMRequestEntry 20 }

dot11WNMRqstEventType OBJECT-TYPE
```



```
        SYNTAX INTEGER {
                transition(0),
                rsna(1),
                peerToPeer(2),
                wnmLog(3),
                vendorSpecific(221)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the request type of this WNM Event request."
        ::= { dot11WNMRequestEntry 21 }

dot11WNMRqstEventResponseLimit OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the maximum number of requested Event Reports to
                be included in the Event Report element. A value of 0 indicates that no
                limit is set on the number of Event Reports to be included in the Event
                Report element."
        ::= { dot11WNMRequestEntry 22 }

dot11WNMRqstEventTargetBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that a Transition or RSNA Event Report
                includes the event entry when the target BSSID is equal to the indicated
                BSSID. A transition event is a STA movement or attempted movement from one
                BSS (the source BSS) in one ESS to another BSS (the target BSS) within the
                same ESS. The BSSID shall be set to the wildcard BSSID when the transi-
                tions to any BSSID is requested."
        DEFVAL { 'FFFFFFFFFFFF'H }
        ::= { dot11WNMRequestEntry 23 }

dot11WNMRqstEventSourceBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that a Transition Event Report includes
                the transition event entry when the source BSSID is equal to the indicated
                BSSID. A transition event is a STA movement or attempted movement from one
                BSS (the source BSS) in one ESS to another BSS (the target BSS) within the
                same ESS. The BSSID shall be set to the wildcard BSSID when the transi-
                tions from any BSSID is requested."
        DEFVAL { 'FFFFFFFFFFFF'H }
        ::= { dot11WNMRequestEntry 24 }

dot11WNMRqstEventTransitTimeThresh OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a value representing the transition time to be
                used as the threshold value for the Transition Time condition in TUs. The
                Transition Time is defined in 11.22.2.2"
        ::= { dot11WNMRequestEntry 25 }

dot11WNMRqstEventTransitMatchValue OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a request for the specified transition results
                that match the bit descriptions of this field. b0 indicates match when
                transition is successful. b1 indicates match when transition fails."
        ::= { dot11WNMRequestEntry 26 }
```



```
dot11WNMRqstEventFreqTransitCountThresh OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the minimum number of matching transitions
                detected in the measurement duration to generate a Transition Event
                Report."
        ::= { dot11WNMRequestEntry 27 }

dot11WNMRqstEventFreqTransitInterval OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "TUs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the sliding window time interval, in TUs, during
                which the STA detects matching transitions to determine if the Frequent
                Transition Count Threshold is exceeded in order to generate a Transition
                Event Report."
        ::= { dot11WNMRequestEntry 28 }

dot11WNMRqstEventRsnaAuthType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(4))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that an RSNA Event Report include the
                event entry when its RSNA Authentication Type matches the indicated RSNA
                authentication type value."
        ::= { dot11WNMRequestEntry 29 }

dot11WNMRqstEapType OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that an RSNA Event Report include the
                event entry when its EAP Type matches the indicated EAP type value. Valid
                EAP Type numbers are assigned by IANA and are defined at http://
                www.iana.org/assignments/eap-numbers."
        ::= { dot11WNMRequestEntry 30 }

dot11WNMRqstEapVendorId OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..3))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that an RSNA Event Report include the
                event entry when its EAP Vendor ID matches the indicated vendor ID value.
                The EAP Vendor ID field is included when the EAP Type field is set to 254,
                and is excluded otherwise."
        ::= { dot11WNMRequestEntry 31 }

dot11WNMRqstEapVendorType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..4))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that an RSNA Event Report include the
                event entry when its EAP Vendor Type matches the indicated EAP vendor type
                value. The EAP Vendor ID field is included when the EAP Type field is set
                to 254, and is excluded otherwise."
        ::= { dot11WNMRequestEntry 32 }

dot11WNMRqstEventRsnaMatchValue OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a request for the specified transition results
```



```
                that match the bit descriptions of this field.   b0 indicates match when
                RSNA is successful. b1 indicates match when RSNA fails."
        ::= { dot11WNMRequestEntry 33 }

dot11WNMRqstEventPeerMacAddress OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute is used to request that a Peer-to-Peer Event Report
                includes the transition event entry when the MAC address of the peer STA or
                IBSS BSSID is equal to the indicated MAC address. The MAC address shall be
                set to the wildcard BSSID when the transitions from any peer STA or IBSS
                BSSID is requested."
        DEFVAL { 'FFFFFFFFFFFF'H }
        ::= { dot11WNMRequestEntry 34 }

dot11WNMRqstRegulatoryClass OBJECT-TYPE
        SYNTAX INTEGER(1..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the channel set for this WNM request. Country,
                Regulatory Class and Channel Number together specify the channel frequency
                and spacing for this measurement request. Valid values of Regulatory Class
                are shown in Annex J."
        ::= { dot11WNMRequestEntry 35 }

dot11WNMRqstChanNumber OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the current operating channel for this WNM
                request. The Channel Number is only defined within the indicated Regula-
                tory Class as shown in Annex J."
        ::= { dot11WNMRequestEntry 36 }

dot11WNMRqstDiagToken OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a unique string to identify this request."
        ::= { dot11WNMRequestEntry 37 }

dot11WNMRqstDiagType OBJECT-TYPE
        SYNTAX INTEGER {
                cancelRequest(0),
                manufacturerInfoStaRep(1),
                configurationProfile(2),
                associationDiag(3),
                ieee8021xAuthDiag(4),
                vendorSpecific(221)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the request type of this WNM Diagnostic request."
        ::= { dot11WNMRequestEntry 38 }

dot11WNMRqstDiagTimeout OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "seconds"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a value representing the time interval after a
                Diagnostic Report is generated during which no additional Diagnostic
                Reports shall be sent."
        ::= { dot11WNMRequestEntry 39 }
```



```
dot11WNMRqstDiagBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a request for a Diagnostic Report from the indi-
                cated BSSID. The BSSID shall be set to the wildcard BSSID when diagnostics
                from any BSSID is requested."
        DEFVAL { 'FFFFFFFFFFFF'H }
        ::= { dot11WNMRequestEntry 40 }

dot11WNMRqstDiagProfileId OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates a unique identifier for referencing a configura-
                tion profile available on a device. The value of the identifier can be any
                arbitrary value, as long as it is uniquely associated to a single configu-
                ration profile on the device sending the identifier."
        ::= { dot11WNMRequestEntry 41 }

dot11WNMRqstDiagCredentials OBJECT-TYPE
        SYNTAX INTEGER {
                none(0),
                pre-sharedKey(1),
                usernamePassword(2),
                x509Certificate(3),
                otherCertificate(4),
                oneTimePassword(5),
                token(6)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the type of credential used for the IEEE 802.1X
                authentication."
        ::= { dot11WNMRequestEntry 42 }

dot11WNMRqstLocConfigLocIndParams OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(16))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates STA Location reporting characteristics. The for-
                mat of these Location Indication Parameters are detailed in 7.3.2.71.2."
        ::= { dot11WNMRequestEntry 43 }

dot11WNMRqstLocConfigChanList OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..252))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute lists location reporting channel information for this Loca-
                tion Configuration request. Zero length is the null default for this attri-
                bute. Each pair of octets indicates a different regulatory class and
                channel number for this request. The detailed format for this list of chan-
                nels is described in 7.3.2.71.3."
        DEFVAL { ''H }
        ::= { dot11WNMRequestEntry 44 }

dot11WNMRqstLocConfigBcastRate OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "0.5Mbps"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the target data rate, in 0.5Mb/s units, at which
                the STA transmits Location Track Notification frames. A value of 0 indi-
                cates the STA transmits Location Track Notification frames at a rate cho-
                sen by the STA transmitting the Location Track Notification frames."
        ::= { dot11WNMRequestEntry 45 }
```



```
dot11WNMRqstLocConfigOptions OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the location track indication options used, see
                7.3.2.71.9."
        DEFVAL { ''H }
        ::= { dot11WNMRequestEntry 46 }

dot11WNMRqstBssTransitQueryReason OBJECT-TYPE
        SYNTAX INTEGER {
                unspecified(0),
                excessiveFrameLossRatesPoorConditions(1),
                excessiveDelayForCurrentTrafficStreams(2),
                insufficientQosCapacityForCurrentTrafficStreams(3),
                firstAssociationToEss(4),
                loadBalancing(5),
                betterApFound(6),
                deauthenticatedDisassociatedFromPreviousAp(7),
                apFailedIeee8021XEapAuthentication(8),
                apFailed4wayHandshake(9),
                receivedTooManyReplayCounterFailures(10),
                receivedTooManyDataMICFailures(11),
                exceededMaxNumberOfRetransmissions(12),
                receivedTooManyBroadcastDisassociations(13),
                receivedTooManyBroadcastDeauthentications(14),
                previousTransitionFailed(15),
                lowRSSI(16)
                }
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the reason for the BSS Transition Query. The
                format for this list of reasons is further detailed in 7.3.2.68.2."
        ::= { dot11WNMRequestEntry 47 }

dot11WNMRqstBssTransitReqMode OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the type of BSS request transition. b0 indicates
                the Preferred Candidate list is included in this frame. b1 indicates an
                abridged format for all BSSIDs not listed in this frame. b2 indicates that
                the STA will be disassociated for the current AP. b3 indicates the BSS is
                shutting down and that the STA will be disassociated. b4 indicates that the
                will be disassociated from the ESS. The format for this field is detailed
                in 7.4.12.9."
        ::= { dot11WNMRequestEntry 48 }

dot11WNMRqstBssTransitDisocTimer OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "TBTTs"
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute indicates the number of beacon transmission times (TBTTs)
                until the serving AP sends a Disassociation frame to this STA. Value zero
                indicates unknown. If the Disassociation Imminent bit of the Request Mode
                field is set to 0, this field is ignored."
        ::= { dot11WNMRequestEntry 49 }

dot11WNMRqstBssTransitSessInfoURL OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-create
        STATUS current
        DESCRIPTION
                "This attribute contains a variable-length field formatted in accordance
                with IETF RFC 3986-2005."
        ::= { dot11WNMRequestEntry 50 }
```

```
dot11WNMRqstBssTransitCandidateList OBJECT-TYPE
       SYNTAX OCTET STRING (SIZE(0..2304))
       MAX-ACCESS read-create
       STATUS current
       DESCRIPTION
              "This attribute lists one or more Neighbor Report elements described in
              7.3.2.37. If the STA has no Transition Candidate information in response to
              the BSS Transition Management Query frame, the candidate list size is set
              to 0. "
       ::= { dot11WNMRequestEntry 51 }

dot11WNMRqstColocInterfAutoEnable OBJECT-TYPE
       SYNTAX TruthValue
       MAX-ACCESS read-create
       STATUS current
       DESCRIPTION
              "This attribute, when true, indicates that the requesting STA requests the
              receiving STA to send the Collocated Interference Response frames periodi-
              cally with the Report Period interval, as defined in 7.4.12.13, or when the
              STA detects a change in the collocated interference."
       ::= { dot11WNMRequestEntry 52 }

dot11WNMRqstColocInterfRptTimeout OBJECT-TYPE
       SYNTAX INTEGER (0..127)
       UNITS "100 TUs"
       MAX-ACCESS read-create
       STATUS current
       DESCRIPTION
              "This attribute indicates the minimum duration between two consecutive Col-
              located Interference Response frames from the reporting STA."
       ::= { dot11WNMRequestEntry 53 }

dot11WNMRqstVendorSpecific OBJECT-TYPE
       SYNTAX OCTET STRING (SIZE(0..255))
       MAX-ACCESS read-create
       STATUS current
       DESCRIPTION
              "This attribute provides an envelope for any optional vendor specific sub-
              elements that may be included in a WNM request element. Zero length is the
              null default for this attribute."
       DEFVAL { ''H }
       ::= { dot11WNMRequestEntry 54}

-- **********************************************************************
-- * End of dot11WNMRequest TABLE
-- **********************************************************************

-- ********************************************************************
-- * Wireless Network Management Reports:
-- * Report tables contain WNM reports received by this STA or
-- * results of WNM requests performed by this STA.
-- ********************************************************************

dot11WNMReport OBJECT IDENTIFIER ::= { dot11WirelessNetworkManagement 2 }

-- ********************************************************************
-- * dot11WNMVendorSpecificReport TABLE
-- ********************************************************************
       dot11WNMVendorSpecificReportTable OBJECT-TYPE
       SYNTAX SEQUENCE OF Dot11WNMVendorSpecificReportEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
              "Group contains the current list of Vendor Specific reports that have been
              received by the MLME. The report tables shall be maintained as FIFO to pre-
              serve freshness, thus the rows in this table can be deleted for memory con-
              straints or other implementation constraints determined by the vendor. New
              rows shall have different RprtIndex values than those deleted within the
              range limitation of the index. One easy way is to monotonically increase
              RprtIndex for new reports being written in the table."
       ::= { dot11WNMReport 1 }
```



```
dot11WNMVendorSpecificReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMVendorSpecificReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMVendorSpecificReportTable Indexed by
                dot11WNMVendorSpecificRprtIndex."
        INDEX { dot11WNMVendorSpecificRprtIndex }
        ::= { dot11WNMVendorSpecificReportTable 1 }

Dot11WNMVendorSpecificReportEntry ::=
        SEQUENCE {
                dot11WNMVendorSpecificRprtIndex                 Unsigned32,
                dot11WNMVendorSpecificRprtRqstToken             OCTET STRING,
                dot11WNMVendorSpecificRprtIfIndex               InterfaceIndex,
                dot11WNMVendorSpecificRprtContent               OCTET STRING }

dot11WNMVendorSpecificRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Vendor Specific Report elements in
                dot11WNMVendorSpecificReportTable, greater than 0."
        ::= { dot11WNMVendorSpecificReportEntry 1 }

dot11WNMVendorSpecificRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMVendorSpecificReportEntry 2 }

dot11WNMVendorSpecificRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMVendorSpecific Report has been received
                on."
        ::= { dot11WNMVendorSpecificReportEntry 3 }

dot11WNMVendorSpecificRprtContent OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute provides an envelope for all the vendor specific subele-
                ments that may be included in a WNM Vendor Specific request element. Zero
                length is the null default for this attribute."
        ::= { dot11WNMVendorSpecificReportEntry 4 }

-- ******************************************************************
-- * End of dot11WNMVendorSpecificReport TABLE
-- ******************************************************************

-- ******************************************************************
-- * dot11WNMMulticastDiagnosticReport TABLE
-- ******************************************************************
        dot11WNMMulticastDiagnosticReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMMulticastDiagnosticReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Multicast Diagnostic reports that have
                been received by the MLME. The report tables shall be maintained as FIFO to
```



```
        preserve freshness, thus the rows in this table can be deleted for memory
        constraints or other implementation constraints determined by the vendor.
        New rows shall have different RprtIndex values than those deleted within
        the range limitation of the index. One easy way is to monotonically
        increase RprtIndex for new reports being written in the table."
    ::= { dot11WNMReport 2 }

dot11WNMMulticastDiagnosticReportEntry OBJECT-TYPE
    SYNTAX Dot11WNMMulticastDiagnosticReportEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the dot11WNMMulticastDiagnosticReportTable Indexed by
        dot11WNMMulticastDiagnosticRprtIndex."
    INDEX { dot11WNMMulticastDiagnosticRprtIndex }
    ::= { dot11WNMMulticastDiagnosticReportTable 1 }

Dot11WNMMulticastDiagnosticReportEntry ::=
    SEQUENCE {
        dot11WNMMulticastDiagnosticRprtIndex              Unsigned32,
        dot11WNMMulticastDiagnosticRprtRqstToken          OCTET STRING,
        dot11WNMMulticastDiagnosticRprtIfIndex            InterfaceIndex,
        dot11WNMMulticastDiagnosticRprtMeasurementTime    TSFType,
        dot11WNMMulticastDiagnosticRprtDuration           Unsigned32,
        dot11WNMMulticastDiagnosticRprtMcstGroup          MacAddress,
        dot11WNMMulticastDiagnosticRprtReason             OCTET STRING,
        dot11WNMMulticastDiagnosticRprtRcvdMsduCount      Unsigned32,
        dot11WNMMulticastDiagnosticRprtFirstSeqNumber     INTEGER,
        dot11WNMMulticastDiagnosticRprtLastSeqNumber      INTEGER,
        dot11WNMMulticastDiagnosticRprtMcstRate           INTEGER }

dot11WNMMulticastDiagnosticRprtIndex OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Index for Multicast Diagnostic Report elements in
        dot11WNMMulticastDiagnosticReportTable, greater than 0."
    ::= { dot11WNMMulticastDiagnosticReportEntry 1 }

dot11WNMMulticastDiagnosticRprtRqstToken OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the request token that was indicated in the WNM
        request that generated this measurement report. This should be an exact
        match to the original dot11WNMRqstToken attribute. Note that there may be
        multiple entries in the table that match this value since a single request
        may generate multiple WNM reports."
    ::= { dot11WNMMulticastDiagnosticReportEntry 2 }

dot11WNMMulticastDiagnosticRprtIfIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The ifIndex for this row of WNMMulticastDiagnostic Report has been
        received on."
    ::= { dot11WNMMulticastDiagnosticReportEntry 3 }

dot11WNMMulticastDiagnosticRprtMeasurementTime OBJECT-TYPE
    SYNTAX TSFType
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the value of the STA TSF timer at the time the
        measurement started. For a triggered Multicast Diagnostics report, this is
        the TSF value at the reporting STA when the trigger condition was met. When
        the reason for sending the report is Performance Measurement and the Multi-
        cast Received MSDU Count is nonzero, the Measurement Time field is set to
        the value of the STA TSF timer at the time of the first multicast MSDU
```



```
            received during the measurement interval."
        ::= { dot11WNMMulticastDiagnosticReportEntry 4 }

dot11WNMMulticastDiagnosticRprtDuration OBJECT-TYPE
        SYNTAX Unsigned32
        UNITS "TUs"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the period over which the Multicast Diagnostic
            Report was generated, expressed in units of TUs."
        ::= { dot11WNMMulticastDiagnosticReportEntry 5 }

dot11WNMMulticastDiagnosticRprtMcstGroup OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "Multicast Group address indicates the MAC address of the multicast group
            for this report element."
        ::= { dot11WNMMulticastDiagnosticReportEntry 6 }

dot11WNMMulticastDiagnosticRprtReason OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the reason why the measuring STA sent the Multi-
            cast Diagnostics report.   b0 indicates Inactivity Timeout Trigger. b1
            indicates the measurement result from the completed measurement. These are
            defined further in 7.3.2.22.11."
        ::= { dot11WNMMulticastDiagnosticReportEntry 7 }

dot11WNMMulticastDiagnosticRprtRcvdMsduCount OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the total number of multicast MSDUs with the
            indicated Multicast MAC Address that were received during the Measurement
            Duration. For a triggered multicast diagnostics measurement this is the
            total number of MSDUs received between the acceptance of the multicast
            diagnostics measurement request and the occurrence of the trigger condi-
            tion for MSDUs with the indicated Multicast MAC Address."
        ::= { dot11WNMMulticastDiagnosticReportEntry 8 }

dot11WNMMulticastDiagnosticRprtFirstSeqNumber OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the twelve least significant bits of the First
            Sequence Number field. When the LSB of the first octet of the Multicast MAC
            address field in the multicast diagnostic request is set to 1, the twelve
            LSBs of the First Sequence Number field contain the sequence number of the
            first frame received with destination address equal to the value in the
            Multicast MAC address field during the measurement period. When the LSB of
            the first octet of the Multicast MAC address field in the multicast diag-
            nostic request is set to 0, the twelve LSBs of the First Sequence Number
            field contain the sequence number of the first group addressed frame, that
            does not have the broadcast MAC address as its destination, received dur-
            ing the measurement period. The four most significant bits of the First
            Sequence Number field are set to zero. This field is set to 0 if the Multi-
            cast Received MSDU Count is 0."
        ::= { dot11WNMMulticastDiagnosticReportEntry 9 }

dot11WNMMulticastDiagnosticRprtLastSeqNumber OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the twelve least significant bits of the Last
```

```
            Sequence Number field. When the LSB of the first octet of the Multicast MAC
            address field in the multicast diagnostic request is set to 1, the twelve
            LSBs of the Last Sequence Number field contain the sequence number of the
            last frame received with destination address equal to the value in the Mul-
            ticast MAC address field during the measurement period. When the LSB of the
            first octet of the Multicast MAC address field in the multicast diagnostic
            request is 0, the twelve LSBs of the Last Sequence Number field contain the
            sequence number of the last group addressed frame, that does not have the
            broadcast MAC address as its destination, received during the measurement
            period. The four most significant bits of the Last Sequence Number field
            are set to zero. This field is set to 0 if the Multicast Received MSDU
            Count is 0."
        ::= { dot11WNMMulticastDiagnosticReportEntry 10 }

dot11WNMMulticastDiagnosticRprtMcstRate OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "0.5Mbps"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the highest data rate, in 0.5 Mb/s units, at
            which the STA has received a group addressed frame with a valid FCS during
            the measurement period.The Multicast Rate field is encoded with the MSB set
            to 1 to indicate that the data rate is in the basic rate set, and set to 0
            to indicate that the data rate is not in the basic rate set. The remaining
            15 bit value is multiplied by 0.5 Mb/s to indicate the data rate. The Mul-
            ticast Rate field is set to 0 by the STA to indicate that it has not
            received a group addressed frame with a valid FCS during the measurement
            period."
        ::= { dot11WNMMulticastDiagnosticReportEntry 11 }


-- **********************************************************************
-- * End of dot11WNMMulticastDiagnosticReport TABLE
-- **********************************************************************

-- **********************************************************************
-- * dot11WNMLocationCivicReport TABLE
-- **********************************************************************
        dot11WNMLocationCivicReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMLocationCivicReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "Group contains the current list of Location Civic reports that have been
            received by the MLME. The report tables shall be maintained as FIFO to pre-
            serve freshness, thus the rows in this table can be deleted for memory con-
            straints or other implementation constraints determined by the vendor. New
            rows shall have different RprtIndex values than those deleted within the
            range limitation of the index. One easy way is to monotonically increase
            RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 3 }

dot11WNMLocationCivicReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMLocationCivicReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "An entry in the dot11WNMLocationCivicReportTable Indexed by
            dot11WNMLocationCivicRprtIndex."
        INDEX { dot11WNMLocationCivicRprtIndex }
        ::= { dot11WNMLocationCivicReportTable 1 }

Dot11WNMLocationCivicReportEntry ::=
        SEQUENCE {
            dot11WNMLocationCivicRprtIndex                  Unsigned32,
            dot11WNMLocationCivicRprtRqstToken              OCTET STRING,
            dot11WNMLocationCivicRprtIfIndex                InterfaceIndex,
            dot11WNMLocationCivicRprtCivicLocation          OCTET STRING }

dot11WNMLocationCivicRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
```



```
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Location Civic Report elements in
                dot11WNMLocationCivicReportTable, greater than 0."
        ::= { dot11WNMLocationCivicReportEntry 1 }

dot11WNMLocationCivicRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMLocationCivicReportEntry 2 }

dot11WNMLocationCivicRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMLocationCivic Report has been received on."
        ::= { dot11WNMLocationCivicReportEntry 3 }

dot11WNMLocationCivicRprtCivicLocation OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates a variable octet field and contains a list of
                civic address elements in TLV format as defined in IETF RFC 4776-2006."
        ::= { dot11WNMLocationCivicReportEntry 4}

-- ********************************************************************
-- * End of dot11WNMLocationCivicReport TABLE
-- ********************************************************************

-- ********************************************************************
-- * dot11WNMLocationIdentifierReport TABLE
-- ********************************************************************
        dot11WNMLocationIdentifierReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMLocationIdentifierReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Location Identifier reports that have
                been received by the MLME. The report tables shall be maintained as FIFO to
                preserve freshness, thus the rows in this table can be deleted for memory
                constraints or other implementation constraints determined by the vendor.
                New rows shall have different RprtIndex values than those deleted within
                the range limitation of the index. One easy way is to monotonically
                increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 4 }

dot11WNMLocationIdentifierReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMLocationIdentifierReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMLocationIdentifierReportTable Indexed by
                dot11WNMLocationIdentifierRprtIndex."
        INDEX { dot11WNMLocationIdentifierRprtIndex }
        ::= { dot11WNMLocationIdentifierReportTable 1 }

Dot11WNMLocationIdentifierReportEntry ::=
        SEQUENCE {
                dot11WNMLocationIdentifierRprtIndex                 Unsigned32,
                dot11WNMLocationIdentifierRprtRqstToken             OCTET STRING,
                dot11WNMLocationIdentifierRprtIfIndex               InterfaceIndex,
```

```
            dot11WNMLocationIdentifierRprtExpirationTSF         TSFType,
            dot11WNMLocationIdentifierRprtPublicIdUri           OCTET STRING }

dot11WNMLocationIdentifierRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Location Identifier Report elements in
                dot11WNMLocationIdentifierReportTable, greater than 0."
        ::= { dot11WNMLocationIdentifierReportEntry 1 }

dot11WNMLocationIdentifierRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMLocationIdentifierReportEntry 2 }

dot11WNMLocationIdentifierRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMLocationIdentifier Report has been received
                on."
        ::= { dot11WNMLocationIdentifierReportEntry 3 }

dot11WNMLocationIdentifierRprtExpirationTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the value of the STA TSF timer when the Public
                Identifier URI field value is no longer valid. The Expiration TSF field set
                to 0 indicates the Public Identifier URI does not expire."
        ::= { dot11WNMLocationIdentifierReportEntry 4 }

dot11WNMLocationIdentifierRprtPublicIdUri OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates a value in URI format that points to a location
                object. It can be used to return the location value for the requesting STA.
                The format of the location value returned when the URI is dereferenced is
                dependent on the provider of the URI and is beyond the scope of this docu-
                ment. The Public Identifier URI confirms the validity of the location esti-
                mate to an external agent when a STA forwards a location estimate to that
                agent. The protocol used to query the infrastructure for a location report
                based on the Public Identifier URI is beyond the scope of this standard."
        ::= { dot11WNMLocationIdentifierReportEntry 5}

-- ******************************************************************
-- * End of dot11WNMLocationIdentifierReport TABLE
-- ******************************************************************

-- ******************************************************************
-- * dot11WNMEventTransitReport TABLE
-- ******************************************************************
        dot11WNMEventTransitReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMEventTransitReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Transition Event reports that have been
                received by the MLME. The report tables shall be maintained as FIFO to pre-
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```
        serve freshness, thus the rows in this table can be deleted for memory con-
        straints or other implementation constraints determined by the vendor. New
        rows shall have different RprtIndex values than those deleted within the
        range limitation of the index. One easy way is to monotonically increase
        RprtIndex for new reports being written in the table."
    ::= { dot11WNMReport 5 }

dot11WNMEventTransitReportEntry OBJECT-TYPE
    SYNTAX Dot11WNMEventTransitReportEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "An entry in the dot11WNMEventTransitReportTable Indexed by
        dot11WNMEventTransitRprtIndex."
    INDEX { dot11WNMEventTransitRprtIndex }
    ::= { dot11WNMEventTransitReportTable 1 }

Dot11WNMEventTransitReportEntry ::=
    SEQUENCE {
        dot11WNMEventTransitRprtIndex               Unsigned32,
        dot11WNMEventTransitRprtRqstToken           OCTET STRING,
        dot11WNMEventTransitRprtIfIndex             InterfaceIndex,
        dot11WNMEventTransitRprtEventStatus         INTEGER,
        dot11WNMEventTransitRprtEventTSF            TSFType,
        dot11WNMEventTransitRprtUTCOffset           OCTET STRING,
        dot11WNMEventTransitRprtTimeError           OCTET STRING,
        dot11WNMEventTransitRprtSourceBssid         MacAddress,
        dot11WNMEventTransitRprtTargetBssid         MacAddress,
        dot11WNMEventTransitRprtTransitTime         INTEGER,
        dot11WNMEventTransitRprtTransitReason       INTEGER,
        dot11WNMEventTransitRprtTransitResult       INTEGER,
        dot11WNMEventTransitRprtSourceRCPI          INTEGER,
        dot11WNMEventTransitRprtSourceRSNI          INTEGER,
        dot11WNMEventTransitRprtTargetRCPI          INTEGER,
        dot11WNMEventTransitRprtTargetRSNI          INTEGER }

dot11WNMEventTransitRprtIndex OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Index for Transition Event Report elements in
        dot11WNMEventTransitReportTable, greater than 0."
    ::= { dot11WNMEventTransitReportEntry 1 }

dot11WNMEventTransitRprtRqstToken OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the request token that was indicated in the WNM
        request that generated this measurement report. This should be an exact
        match to the original dot11WNMRqstToken attribute. Note that there may be
        multiple entries in the table that match this value since a single request
        may generate multiple WNM reports."
    ::= { dot11WNMEventTransitReportEntry 2 }

dot11WNMEventTransitRprtIfIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The ifIndex for this row of WNMEventTransit Report has been received on."
    ::= { dot11WNMEventTransitReportEntry 3 }

dot11WNMEventTransitRprtEventStatus OBJECT-TYPE
    SYNTAX INTEGER {
        successful(0),
        requestFailed(1),
        requestRefused(2),
        requestIncapable(3),
        detectedFrequentTransition(4)
```



```
                }
MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMEventTransitReportEntry 4 }

dot11WNMEventTransitRprtEventTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Event timestamp field."
        ::= { dot11WNMEventTransitReportEntry 5 }

dot11WNMEventTransitRprtUTCOffset OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute indicates the UTC Offset Time Value optionally included in the
      Event Report."
        ::= { dot11WNMEventTransitReportEntry 6 }

dot11WNMEventTransitRprtTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute contains the value of the Event Time Error field optionally
      included in the Event Report."
        ::= { dot11WNMEventTransitReportEntry 7 }

dot11WNMEventTransitRprtSourceBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the source BSSID for the reported transition
                event."
        ::= { dot11WNMEventTransitReportEntry 8 }

dot11WNMEventTransitRprtTargetBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the target BSSID for the reported transition
                event."
        ::= { dot11WNMEventTransitReportEntry 9 }

dot11WNMEventTransitRprtTransitTime OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "TUs"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the transition time for the reported transition
                event in TUs. The Transition time is defined as the time difference between
                the starting time and the ending time of a transition between APs, even if
                the transition results in remaining on the same AP. Start and end times for
                a transition event are defined in 11.22.2.2"
        ::= { dot11WNMEventTransitReportEntry 10 }

dot11WNMEventTransitRprtTransitReason OBJECT-TYPE
        SYNTAX INTEGER {
                unspecified(0),
                excessiveFrameLossRatesPoorConditions(1),
                excessiveDelayForCurrentTrafficStreams(2),
                insufficientQosCapacityForCurrentTrafficStreams(3),
                firstAssociationToEss(4),
                loadBalancing(5),
                betterApFound(6),
                deauthenticatedDisassociatedFromPreviousAp(7),
                apFailedIeee8021XEapAuthentication(8),
```

```
                apFailed4wayHandshake(9),
                receivedTooManyReplayCounterFailures(10)
                receivedTooManyDataMICFailures(11),
                exceededMaxNumberOfRetransmissions(12),
                receivedTooManyBroadcastDisassociations(13),
                receivedTooManyBroadcastDeauthentications(14),
                previousTransitionFailed(15),
                lowRSSI(16)
                }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the reason for the reported BSS Transition event.
                The format for this list of reasons is further detailed in 7.3.2.68.2."
        ::= { dot11WNMEventTransitReportEntry 11 }

dot11WNMEventTransitRprtTransitResult OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the result of the attempted transition and is set
                to one of the status codes specified in Table 7-23 in 7.3.1.9."
        ::= { dot11WNMEventTransitReportEntry 12 }

dot11WNMEventTransitRprtSourceRCPI OBJECT-TYPE
        SYNTAX INTEGER(0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the received channel power of the most recently
                measured frame from the Source BSSID before the STA reassociates to the
                Target BSSID. The Source RCPI is reported in dBm, as defined in the RCPI
                measurement clause for the PHY Type."
        ::= { dot11WNMEventTransitReportEntry 13 }

dot11WNMEventTransitRprtSourceRSNI OBJECT-TYPE
        SYNTAX INTEGER(0..255)
        UNITS "0.5 dB"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the received signal-to-noise indication of the
                most recently measured frame from the Source BSSID before the STA reassoci-
                ates to the Target BSSID. The Source RSNI is reported in dB, as defined in
                7.3.2.41."
        ::= { dot11WNMEventTransitReportEntry 14 }

dot11WNMEventTransitRprtTargetRCPI OBJECT-TYPE
        SYNTAX INTEGER(0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the received channel power of the first measured
                frame just after STA reassociates to the Target BSSID. If association with
                target BSSID failed, the Target RCPI field indicates the received channel
                power of the most recently measured frame from the Target BSSID. The Tar-
                get RCPI is reported in dBm, as defined in the RCPI measurement clause for
                the PHY Type."
        ::= { dot11WNMEventTransitReportEntry 15 }

dot11WNMEventTransitRprtTargetRSNI OBJECT-TYPE
        SYNTAX INTEGER(0..255)
        UNITS "0.5 dB"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the received signal-to-noise indication of the
                first measured frame just after STA reassociates to the Target BSSID. If
                association with target BSSID failed, the Target RCPI field indicates the
                received signal-to-noise indication of the most recently measured frame
                from the Target BSSID. The Target RSNI is reported in dB, as defined in
```

```
            7.3.2.41."
        ::= { dot11WNMEventTransitReportEntry 16 }

-- ********************************************************************
-- * End of dot11WNMEventTransitReport TABLE
-- ********************************************************************

-- ********************************************************************
-- * dot11WNMEventRsnaReport TABLE
-- ********************************************************************
        dot11WNMEventRsnaReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMEventRsnaReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "Group contains the current list of RSNA Event reports that have been
            received by the MLME. The report tables shall be maintained as FIFO to pre-
            serve freshness, thus the rows in this table can be deleted for memory con-
            straints or other implementation constraints determined by the vendor. New
            rows shall have different RprtIndex values than those deleted within the
            range limitation of the index. One easy way is to monotonically increase
            RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 6 }

dot11WNMEventRsnaReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMEventRsnaReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "An entry in the dot11WNMEventRsnaReportTable Indexed by
            dot11WNMEventRsnaRprtIndex."
        INDEX { dot11WNMEventRsnaRprtIndex }
        ::= { dot11WNMEventRsnaReportTable 1 }

Dot11WNMEventRsnaReportEntry ::=
        SEQUENCE {
            dot11WNMEventRsnaRprtIndex                  Unsigned32,
            dot11WNMEventRsnaRprtRqstToken              OCTET STRING,
            dot11WNMEventRsnaRprtIfIndex                InterfaceIndex,
            dot11WNMEventRsnaRprtEventStatus            INTEGER,
            dot11WNMEventRsnaRprtEventTSF               TSFType,
            dot11WNMEventRsnaRprtUTCOffset              OCTET STRING,
            dot11WNMEventRsnaRprtTimeError              OCTET STRING,
            dot11WNMEventRsnaRprtTargetBssid            MacAddress,
            dot11WNMEventRsnaRprtAuthType               OCTET STRING,
            dot11WNMEventRsnaRprtEapMethod              OCTET STRING,
            dot11WNMEventRsnaRprtResult                 INTEGER,
            dot11WNMEventRsnaRprtRsnElement             OCTET STRING }

dot11WNMEventRsnaRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "Index for RSNA Event Report elements in dot11WNMEventRsnaReportTable,
            greater than 0."
        ::= { dot11WNMEventRsnaReportEntry 1 }

dot11WNMEventRsnaRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the request token that was indicated in the WNM
            request that generated this measurement report. This should be an exact
            match to the original dot11WNMRqstToken attribute. Note that there may be
            multiple entries in the table that match this value since a single request
            may generate multiple WNM reports."
        ::= { dot11WNMEventRsnaReportEntry 2 }

dot11WNMEventRsnaRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
```

```
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMEventRsna Report has been received on."
        ::= { dot11WNMEventRsnaReportEntry 3 }

dot11WNMEventRsnaRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
                successful(0),
                requestFailed(1),
                requestRefused(2),
                requestIncapable(3),
                detectedFrequentTransition(4)
                }
MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMEventRsnaReportEntry 4 }

dot11WNMEventRsnaRprtEventTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Event timestamp field."
        ::= { dot11WNMEventRsnaReportEntry 5 }

dot11WNMEventRsnaRprtUTCOffset OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute indicates the UTC Offset Time Value optionally included in the
      Event Report."
        ::= { dot11WNMEventRsnaReportEntry 6 }

dot11WNMEventRsnaRprtTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute contains the value of the Event Time Error field optionally
      included in the Event Report."
          ::= { dot11WNMEventRsnaReportEntry 7 }

dot11WNMEventRsnaRprtTargetBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the BSSID of the AP accepting the authorization
                attempt."
        ::= { dot11WNMEventRsnaReportEntry 8 }

dot11WNMEventRsnaRprtAuthType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the AKM suite, as defined in Table 7-34 in
                7.3.2.25.2. The first three octets indicate the OUI. The last octet indi-
                cates the suite type."
        ::= { dot11WNMEventRsnaReportEntry 9 }

dot11WNMEventRsnaRprtEapMethod OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1..8))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates a value that identifies the EAP Method. When the
                Authentication Type field is set to the value of either 00-0F-AC:1 (Authen-
                tication negotiated over IEEE 802.1X or using PMKSA caching as defined in
                8.4.6.2) or 00-0F-AC:3 (AKM suite selector for Fast BSS Transition as
                defined in 8.5.1.5), the EAP Method field contains the IANA assigned EAP
```



```
            type defined at http://www.iana.org/assignments/eap-numbers. The EAP type
            contains either the legacy type (1 octet) or the expanded type (1 octet
            type = 254, 3-octet Vendor ID, 4-octet Vendor-Type). The EAP Method field
            is set to 0 otherwise."
        ::= { dot11WNMEventRsnaReportEntry 10 }

dot11WNMEventRsnaRprtResult OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the result of the RSNA event and is set to one of
            the status codes specified in Table7-23 in 7.3.1.9."
        ::= { dot11WNMEventRsnaReportEntry 11 }

dot11WNMEventRsnaRprtRsnElement OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the entire contents of the negotiated RSN informa-
            tion element at the time of the authentication attempt. The maximum length
            of the RSN Element field is less than the maximum length of an RSN informa-
            tion element, as defined in 7.3.2.25. If the length of the RSN information
            element included here exceeds the maximum length of the RSN Element field,
            the RSN information element shall be truncated to the maximum length
            allowed for the RSN Element field."
        ::= { dot11WNMEventRsnaReportEntry 12 }

-- ******************************************************************
-- * End of dot11WNMEventRsnaReport TABLE
-- ******************************************************************

-- ******************************************************************
-- * dot11WNMEventPeerReport TABLE
-- ******************************************************************
        dot11WNMEventPeerReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMEventPeerReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "Group contains the current list of Peer-to-Peer Event reports that have
            been received by the MLME. The report tables shall be maintained as FIFO to
            preserve freshness, thus the rows in this table can be deleted for memory
            constraints or other implementation constraints determined by the vendor.
            New rows shall have different RprtIndex values than those deleted within
            the range limitation of the index. One easy way is to monotonically
            increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 7 }

dot11WNMEventPeerReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMEventPeerReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "An entry in the dot11WNMEventPeerReportTable Indexed by
            dot11WNMEventPeerRprtIndex."
        INDEX { dot11WNMEventPeerRprtIndex }
        ::= { dot11WNMEventPeerReportTable 1 }

Dot11WNMEventPeerReportEntry ::=
        SEQUENCE {
            dot11WNMEventPeerRprtIndex                      Unsigned32,
            dot11WNMEventPeerRprtRqstToken                  OCTET STRING,
            dot11WNMEventPeerRprtIfIndex                    InterfaceIndex,
            dot11WNMEventPeerRprtEventStatus                INTEGER,
            dot11WNMEventPeerRprtEventTSF                   TSFType,
            dot11WNMEventPeerRprtUTCOffset                  OCTET STRING,
            dot11WNMEventPeerRprtTimeError                  OCTET STRING,
            dot11WNMEventPeerRprtPeerMacAddress             MacAddress,
            dot11WNMEventPeerRprtRegulatoryClass            INTEGER,
            dot11WNMEventPeerRprtChanNumber                 INTEGER,
```

```
                dot11WNMEventPeerRprtStaTxPower                     INTEGER,
                dot11WNMEventPeerRprtConnTime                       INTEGER,
                dot11WNMEventPeerRprtPeerStatus                     INTEGER }

dot11WNMEventPeerRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Peer-to-Peer Event Report elements in
                dot11WNMEventPeerReportTable, greater than 0."
        ::= { dot11WNMEventPeerReportEntry 1 }

dot11WNMEventPeerRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMEventPeerReportEntry 2 }

dot11WNMEventPeerRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMEventPeer Report has been received on."
        ::= { dot11WNMEventPeerReportEntry 3 }

dot11WNMEventPeerRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
                successful(0),
                requestFailed(1),
                requestRefused(2),
                requestIncapable(3),
                detectedFrequentTransition(4)
                }
MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMEventPeerReportEntry 4 }

dot11WNMEventPeerRprtEventTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Event timestamp field."
        ::= { dot11WNMEventPeerReportEntry 5 }

dot11WNMEventPeerRprtUTCOffset OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute indicates the UTC Offset Time Value optionally included in the
      Event Report."
        ::= { dot11WNMEventPeerReportEntry 6 }

dot11WNMEventPeerRprtTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute contains the value of the Event Time Error field optionally
      included in the Event Report."
        ::= { dot11WNMEventPeerReportEntry 7 }

dot11WNMEventPeerRprtPeerMacAddress OBJECT-TYPE
        SYNTAX MacAddress
```



```
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the MAC address of the peer STA or IBSS BSSID. If
               this event is for a Peer-to-Peer link in an infrastructure BSS, this field
               contains the MAC address of the peer STA. If this event is for a Peer-to-
               Peer link in an IBSS, this field contains the BSSID of the IBSS."
        ::= { dot11WNMEventPeerReportEntry 8 }

dot11WNMEventPeerRprtRegulatoryClass OBJECT-TYPE
        SYNTAX INTEGER(1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the channel set for this Peer-to-Peer Event
               report. Country, Regulatory Class and Channel Number together specify the
               channel frequency and spacing for this measurement request. Valid values of
               Regulatory Class as shown in Annex J."
        ::= { dot11WNMEventPeerReportEntry 9 }

dot11WNMEventPeerRprtChanNumber OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the current operating channel for this Peer-to-
               Peer Event report. The Channel Number is only defined within the indicated
               Regulatory Class as shown in Annex J."
        ::= { dot11WNMEventPeerReportEntry 10 }

dot11WNMEventPeerRprtStaTxPower OBJECT-TYPE
        SYNTAX INTEGER (-128..127)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the STA transmit power used for the Peer-to-Peer
               link. The STA Tx Power field indicates the target transmit power at the
               antenna in dBm with a tolerance of +/-5dB for the lowest basic rate of the
               reporting STA."
        ::= { dot11WNMEventPeerReportEntry 11 }

dot11WNMEventPeerRprtConnTime OBJECT-TYPE
        SYNTAX INTEGER (0..16777215)
        UNITS "seconds"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates a value representing the connection time for the
               reported Peer-to-Peer event. If the Peer Status is 0, this field indicates
               the duration of the Direct Link. If the Peer Status is 1, this field indi-
               cates the time difference from the time the Direct Link was established to
               the time at which the reporting STA generated the event report. If the Peer
               Status is 2, this field indicates the duration of the IBSS membership. If
               the Peer Status is 3, this field indicates the time difference from the
               time the STA joined the IBSS to the time at which the reporting STA gener-
               ated the event report. See 11.22.2.4."
        ::= { dot11WNMEventPeerReportEntry 12 }

dot11WNMEventPeerRprtPeerStatus OBJECT-TYPE
        SYNTAX INTEGER {
               directLinkTerminated(0),
               directLinkActive(1),
               ibssMembershipTerminated(2),
               ibssMembershipActive(3)
               }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the peer link connection status."
        ::= { dot11WNMEventPeerReportEntry 13 }

-- ********************************************************************
```

```
-- * End of dot11WNMEventPeerReport TABLE
-- **********************************************************************

-- **********************************************************************
-- * dot11WNMEventWNMLogReport TABLE
-- **********************************************************************
        dot11WNMEventWNMLogReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMEventWNMLogReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of WNMLog Event reports that have been
                received by the MLME. The report tables shall be maintained as FIFO to pre-
                serve freshness, thus the rows in this table can be deleted for memory con-
                straints or other implementation constraints determined by the vendor. New
                rows shall have different RprtIndex values than those deleted within the
                range limitation of the index. One easy way is to monotonically increase
                RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 8 }

dot11WNMEventWNMLogReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMEventWNMLogReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMEventWNMLogReportTable Indexed by
                dot11WNMEventWNMLogRprtIndex."
        INDEX { dot11WNMEventWNMLogRprtIndex }
        ::= { dot11WNMEventWNMLogReportTable 1 }

Dot11WNMEventWNMLogReportEntry ::=
        SEQUENCE {
                dot11WNMEventWNMLogRprtIndex                    Unsigned32,
                dot11WNMEventWNMLogRprtRqstToken                OCTET STRING,
                dot11WNMEventWNMLogRprtIfIndex                  InterfaceIndex,
                dot11WNMEventWNMLogRprtEventStatus              INTEGER,
                dot11WNMEventWNMLogRprtEventTSF                 TSFType,
                dot11WNMEventWNMLogRprtUTCOffset                OCTET STRING,
                dot11WNMEventWNMLogRprtTimeError                OCTET STRING,
                dot11WNMEventWNMLogRprtContent                  OCTET STRING }

dot11WNMEventWNMLogRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for WNMLog Event Report elements in dot11WNMEventWNMLogReportTable,
                greater than 0."
        ::= { dot11WNMEventWNMLogReportEntry 1 }

dot11WNMEventWNMLogRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMEventWNMLogReportEntry 2 }

dot11WNMEventWNMLogRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMEventWNMLog Report has been received on."
        ::= { dot11WNMEventWNMLogReportEntry 3 }

dot11WNMEventWNMLogRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
```

```
                successful(0),
                requestFailed(1),
                requestRefused(2),
                requestIncapable(3),
                detectedFrequentTransition(4)
                }
MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMEventWNMLogReportEntry 4 }

dot11WNMEventWNMLogRprtEventTSF OBJECT-TYPE
        SYNTAX TSFType
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the value of the Event timestamp field."
        ::= { dot11WNMEventWNMLogReportEntry 5 }

dot11WNMEventWNMLogRprtUTCOffset OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(10))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute indicates the UTC Offset Time Value optionally included in the
      Event Report."
        ::= { dot11WNMEventWNMLogReportEntry 6 }

dot11WNMEventWNMLogRprtTimeError OBJECT-TYPE
          SYNTAX OCTET STRING (SIZE(5))
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
          "This attribute contains the value of the Event Time Error field optionally
      included in the Event Report."
        ::= { dot11WNMEventWNMLogReportEntry 7 }

dot11WNMEventWNMLogRprtContent OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..2284))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute contains the entire syslog message, consisting of the PRI,
               HEADER, and MSG portion of a WNM Log message as described in IETF RFC 3164-
               2001. The TAG field of the MSG portion of the message is a 17 octet string
               containing the ASCII representation of the STA MAC address using hexadeci-
               mal notation with colons between octets. The octet containing the individ-
               ual/group bit occurs last,   and that bit is in the least significant
               position within that octet. See 11.22.2.5."
        ::= { dot11WNMEventWNMLogReportEntry 8 }

-- ********************************************************************
-- * End of dot11WNMEventWNMLogReport TABLE
-- ********************************************************************

-- ********************************************************************
-- * dot11WNMDiagMfrInfoReport TABLE
-- ********************************************************************
        dot11WNMDiagMfrInfoReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMDiagMfrInfoReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
               "Group contains the current list of Manufacturer Information STA reports
               that have been received by the MLME. The report tables shall be maintained
               as FIFO to preserve freshness, thus the rows in this table can be deleted
               for memory constraints or other implementation constraints determined by
               the vendor. New rows shall have different RprtIndex values than those
               deleted within the range limitation of the index. One easy way is to mono-
               tonically increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 9 }

dot11WNMDiagMfrInfoReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMDiagMfrInfoReportEntry
```

```
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMDiagMfrInfoReportTable Indexed by
                dot11WNMDiagMfrInfoRprtIndex."
        INDEX { dot11WNMDiagMfrInfoRprtIndex }
        ::= { dot11WNMDiagMfrInfoReportTable 1 }

Dot11WNMDiagMfrInfoReportEntry ::=
        SEQUENCE {
                dot11WNMDiagMfrInfoRprtIndex                        Unsigned32,
                dot11WNMDiagMfrInfoRprtRqstToken                    OCTET STRING,
                dot11WNMDiagMfrInfoRprtIfIndex                      InterfaceIndex,
                dot11WNMDiagMfrInfoRprtEventStatus                  INTEGER,
                dot11WNMDiagMfrInfoRprtMfrOi                        OCTET STRING,
                dot11WNMDiagMfrInfoRprtMfrIdString                  OCTET STRING,
                dot11WNMDiagMfrInfoRprtMfrModelString               OCTET STRING,
                dot11WNMDiagMfrInfoRprtMfrSerialNumberString        OCTET STRING,
                dot11WNMDiagMfrInfoRprtMfrFirmwareVersion           OCTET STRING,
                dot11WNMDiagMfrInfoRprtMfrAntennaType               OCTET STRING,
                dot11WNMDiagMfrInfoRprtCollocRadioType              INTEGER,
                dot11WNMDiagMfrInfoRprtDeviceType                   INTEGER,
                dot11WNMDiagMfrInfoRprtCertificateID                OCTET STRING}

dot11WNMDiagMfrInfoRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Manufacturer Information STA Report elements in
                dot11WNMDiagMfrInfoReportTable, greater than 0."
        ::= { dot11WNMDiagMfrInfoReportEntry 1 }

dot11WNMDiagMfrInfoRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMDiagMfrInfoReportEntry 2 }

dot11WNMDiagMfrInfoRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMDiagMfrInfo Report has been received on."
        ::= { dot11WNMDiagMfrInfoReportEntry 3 }

dot11WNMDiagMfrInfoRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
                successful(0),
                requestFailed(1),
                requestRefused(2),
                requestIncapable(3),
                detectedFrequentTransition(4)
                }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMDiagMfrInfoReportEntry 4}

dot11WNMDiagMfrInfoRprtMfrOi OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..5))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
```



```
                "This attribute indicates the Manufacturer OI for the reported Manufac-
                turer Information STA Diagnostic. The OUI attribute contains an Organiza-
                tional Unique Identification, the first 24-bits of the network connected
                device that indicate the specific vendor for that device."
        ::= { dot11WNMDiagMfrInfoReportEntry 5 }

dot11WNMDiagMfrInfoRprtMfrIdString OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Manufacturer ID string for the reported Manu-
                facturer Information STA Diagnostic. The ID attribute contains an ASCII
                string indicating the manufacturer identifier of the wireless network adap-
                tor. This string is not null terminated."
        ::= { dot11WNMDiagMfrInfoReportEntry 6 }

dot11WNMDiagMfrInfoRprtMfrModelString OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Manufacturer model string for the reported
                Manufacturer Information STA Diagnostic. The model attribute contains an
                ASCII string indicating the model of the wireless network adaptor. This
                string is not null terminated."
        ::= { dot11WNMDiagMfrInfoReportEntry 7 }

dot11WNMDiagMfrInfoRprtMfrSerialNumberString OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Manufacturer serial number string for the
                reported Manufacturer Information STA Diagnostic. The serial number attri-
                bute contains an ASCII string indicating the serial number of the wireless
                network adaptor. This string is not null terminated."
        ::= { dot11WNMDiagMfrInfoReportEntry 8 }

dot11WNMDiagMfrInfoRprtMfrFirmwareVersion OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Manufacturer firmware version string for the
                reported Manufacturer Information STA Diagnostic. The firmware version
                attribute contains an ASCII string identifying the version of firmware cur-
                rently installed on the wireless network adaptor. This string is not null
                terminated."
        ::= { dot11WNMDiagMfrInfoReportEntry 9 }

dot11WNMDiagMfrInfoRprtMfrAntennaType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Manufacturer antenna type string for the
                reported Manufacturer Information STA Diagnostic. The first octet of this
                string indicates the antenna count, and the second octet indicates the
                antenna gain. The antenna gain indicates the peak gain in dBi of the
                antenna connected to the wireless network adaptor. The remaining octets
                contain an ASCII string indicating the type of antenna connected to the
                wireless network adaptor."
        ::= { dot11WNMDiagMfrInfoReportEntry 10 }

dot11WNMDiagMfrInfoRprtCollocRadioType OBJECT-TYPE
        SYNTAX INTEGER {
                reserved(0),
                cellular(1),
                cordless(2),
                gps(3),
                ieee80211(4),
```

```
                ieee80215(5),
                ieee80216(6),
                ieee80220(7),
                ieee80222(8),
                digitalAudioBroadcasting(9),
                digitalVideoBroadcasting(10)
                }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the type of the collocated radio."
        ::= { dot11WNMDiagMfrInfoReportEntry 11 }

dot11WNMDiagMfrInfoRprtDeviceType OBJECT-TYPE
        SYNTAX INTEGER {
                reserved(0),
                referenceDesign(1),
                accessPointWirelessRouterSoho(2),
                enterpriseAccessPoint(3),
                broadbandGateway(4),
                digitalStillCamera(5),
                portableVideoCamera(6),
                networkedWebCamera(7),
                digitalAudioStationary(8),
                digitalAudioPortable(9),
                setTopBoxMediaServer(10),
                tvMonitorDigitalPictureFrame(11),
                gameConsoleGameAdaptor(12),
                gamingDevice(13),
                mediaServerMediaAdaptor(14),
                networkStorageDevice(15),
                externalCard(16),
                internalCard(17),
                ultraMobilPc(18),
                notebookComputer(19),
                personalDigitalAssistant(20),
                printerPrintServer(21),
                phoneDualMode(22),
                phoneSingleMode(23),
                smartphoneDualMode(24),
                smartphoneSingleMode(25),
                otherDevices(221),
                }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute indicates the type of device in which the IEEE 802.11 STA
       resides."
        ::= { dot11WNMDiagMfrInfoReportEntry 12 }

dot11WNMDiagMfrInfoRprtCertificateID OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..251))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the Certificate ID for the
                reported Manufacturer Information STA Diagnostic."
        ::= { dot11WNMDiagMfrInfoReportEntry 13 }

-- ********************************************************************
-- * End of dot11WNMDiagMfrInfoReport TABLE
-- ********************************************************************

-- ********************************************************************
-- * dot11WNMDiagConfigProfReport TABLE
-- ********************************************************************
        dot11WNMDiagConfigProfReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMDiagConfigProfReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Configuration Profile reports that have
                been received by the MLME. The report tables shall be maintained as FIFO to
```

```
            preserve freshness, thus the rows in this table can be deleted for memory
            constraints or other implementation constraints determined by the vendor.
            New rows shall have different RprtIndex values than those deleted within
            the range limitation of the index. One easy way is to monotonically
            increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 10 }

dot11WNMDiagConfigProfReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMDiagConfigProfReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "An entry in the dot11WNMDiagConfigProfReportTable Indexed by
            dot11WNMDiagConfigProfRprtIndex."
        INDEX { dot11WNMDiagConfigProfRprtIndex }
        ::= { dot11WNMDiagConfigProfReportTable 1 }

Dot11WNMDiagConfigProfReportEntry ::=
        SEQUENCE {
            dot11WNMDiagConfigProfRprtIndex                     Unsigned32,
            dot11WNMDiagConfigProfRprtRqstToken                 OCTET STRING,
            dot11WNMDiagConfigProfRprtIfIndex                   InterfaceIndex,
            dot11WNMDiagConfigProfRprtEventStatus               INTEGER,
            dot11WNMDiagConfigProfRprtProfileId                 INTEGER,
            dot11WNMDiagConfigProfRprtSupportedRegClasses       OCTET STRING,
            dot11WNMDiagConfigProfRprtTxPowerMode               INTEGER,
            dot11WNMDiagConfigProfRprtTxPowerLevels             OCTET STRING,
            dot11WNMDiagConfigProfRprtCipherSuite               OCTET STRING,
            dot11WNMDiagConfigProfRprtAkmSuite                  OCTET STRING,
            dot11WNMDiagConfigProfRprtEapType                   INTEGER,
            dot11WNMDiagConfigProfRprtEapVendorID               OCTET STRING,
            dot11WNMDiagConfigProfRprtEapVendorType             OCTET STRING,
            dot11WNMDiagConfigProfRprtCredentialType            INTEGER,
            dot11WNMDiagConfigProfRprtSSID                      OCTET STRING,
            dot11WNMDiagConfigProfRprtPowerSaveMode             INTEGER }

dot11WNMDiagConfigProfRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
            "Index for Configuration Profile Report elements in
            dot11WNMDiagConfigProfReportTable, greater than 0."
        ::= { dot11WNMDiagConfigProfReportEntry 1 }

dot11WNMDiagConfigProfRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute indicates the request token that was indicated in the WNM
            request that generated this measurement report. This should be an exact
            match to the original dot11WNMRqstToken attribute. Note that there may be
            multiple entries in the table that match this value since a single request
            may generate multiple WNM reports."
        ::= { dot11WNMDiagConfigProfReportEntry 2 }

dot11WNMDiagConfigProfRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "The ifIndex for this row of WNMDiagConfigProf Report has been received
            on."
        ::= { dot11WNMDiagConfigProfReportEntry 3 }

dot11WNMDiagConfigProfRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
            successful(0),
            requestFailed(1),
            requestRefused(2),
            requestIncapable(3),
```



```
              detectedFrequentTransition(4)
              }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMDiagConfigProfReportEntry 4}

dot11WNMDiagConfigProfRprtProfileId OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates a unique identifier for referencing a configura-
              tion profile available on a device. The value of the identifier can be any
              arbitrary value, as long as it is uniquely associated to a single configu-
              ration profile on the device sending the identifier."
        ::= { dot11WNMDiagConfigProfReportEntry 5 }

dot11WNMDiagConfigProfRprtSupportedRegClasses OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates the current Regulatory Class followed by a list
              of each Supported Regulatory Class, as defined in 7.3.2.54. Each octet con-
              tains an integer representing a regulatory class. Regulatory Classes are
              defined in Annex J. Zero length is the null default for this attribute."
        ::= { dot11WNMDiagConfigProfReportEntry 6 }

dot11WNMDiagConfigProfRprtTxPowerMode OBJECT-TYPE
        SYNTAX INTEGER {
              fixedPowerMode(0),
              automaticPowerMode(1)
              }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates the power mode of the STA."
        ::= { dot11WNMDiagConfigProfReportEntry 7 }

dot11WNMDiagConfigProfRprtTxPowerLevels OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute lists the power levels for the STA. Each octet contains an
              integer representing a power level encoded as a 2's complement value in
              dBm, rounded to the nearest integer. If the Power Mode is automatic, the
              list contains only the minimum and the maximum power levels for the STA. If
              the Power Mode is fixed, the list contains one or more fixed power level
              settings available at this STA, arranged in increasing numerical order."
        ::= { dot11WNMDiagConfigProfReportEntry 8 }

dot11WNMDiagConfigProfRprtCipherSuite OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates the cipher suite, as defined in Table 7-32. The
              first three octets indicate the OUI. The last octet indicates the suite
              type."
        ::= { dot11WNMDiagConfigProfReportEntry 9 }

dot11WNMDiagConfigProfRprtAkmSuite OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
              "This attribute indicates the AKM suite, as defined in Table 7-34 in
              7.3.2.25.2. The first three octets indicate the OUI. The last octet indi-
              cates the suite type."
```



```
        ::= { dot11WNMDiagConfigProfReportEntry 10 }

dot11WNMDiagConfigProfRprtEapType OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the single EAP method used by the STA. Valid EAP
                Type numbers are assigned by IANA and are defined at http://www.iana.org/
                assignments/eap-numbers."
        ::= { dot11WNMDiagConfigProfReportEntry 11 }

dot11WNMDiagConfigProfRprtEapVendorID OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..3))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the EAP Vendor ID number for the EAP method used
                by the STA. The EAP Vendor ID field is included when the EAP Type field is
                set to 254, and is excluded otherwise."
        ::= { dot11WNMDiagConfigProfReportEntry 12 }

dot11WNMDiagConfigProfRprtEapVendorType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the EAP Vendor Type number for the EAP method
                used by the STA. The EAP Vendor Type field is included when the EAP Type
                field is set to 254, and is excluded otherwise."
        ::= { dot11WNMDiagConfigProfReportEntry 13 }

dot11WNMDiagConfigProfRprtCredentialType OBJECT-TYPE
        SYNTAX INTEGER {
                none(0),
                preSharedKey(1),
                userNamePassword(2),
                x509Certificate(3),
                otherCertificate(4),
                oneTimePassword(5),
                token(6)
                }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the type of IEEE 802.1X credentials used by the
                STA for this authentication diagnostic."
        ::= { dot11WNMDiagConfigProfReportEntry 14 }

dot11WNMDiagConfigProfRprtSSID OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(1..32))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the SSID for the diagnostic report, as defined in
                7.3.2.1."
        ::= { dot11WNMDiagConfigProfReportEntry 15 }

dot11WNMDiagConfigProfRprtPowerSaveMode OBJECT-TYPE
        SYNTAX INTEGER {
                unknownMode(0),
                none(1),
                psDtims1Mode(2),
                psDtims0Mode(3),
                uapsdMode(4),
                sapsdMode(5),
                upsmpMode(6),
                spsmpMode(7),
                smpsMode(8),
                wnmSleepMode(9),
                fmsMode(10),
                timBroadcastMode(11),
```



```
                tfsMode(12),
                tdlsPeerUapsdMode(13),
                tdlsPeerPsmMode(14)
                }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the power save mode in use by the STA, as defined
                in Table 7-v14."
        ::= { dot11WNMDiagConfigProfReportEntry 16 }

-- ********************************************************************
-- * End of dot11WNMDiagConfigProfReport TABLE
-- ********************************************************************

-- ********************************************************************
-- * dot11WNMDiagAssocReport TABLE
-- ********************************************************************
        dot11WNMDiagAssocReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMDiagAssocReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Association Diagnostic reports that
                have been received by the MLME. The report tables shall be maintained as
                FIFO to preserve freshness, thus the rows in this table can be deleted for
                memory constraints or other implementation constraints determined by the
                vendor. New rows shall have different RprtIndex values than those deleted
                within the range limitation of the index. One easy way is to monotonically
                increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 11 }

dot11WNMDiagAssocReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMDiagAssocReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMDiagAssocReportTable Indexed by
                dot11WNMDiagAssocRprtIndex."
        INDEX { dot11WNMDiagAssocRprtIndex }
        ::= { dot11WNMDiagAssocReportTable 1 }

Dot11WNMDiagAssocReportEntry ::=
        SEQUENCE {
                dot11WNMDiagAssocRprtIndex                      Unsigned32,
                dot11WNMDiagAssocRprtRqstToken                  OCTET STRING,
                dot11WNMDiagAssocRprtIfIndex                    InterfaceIndex,
                dot11WNMDiagAssocRprtEventStatus                INTEGER,
                dot11WNMDiagAssocRprtBssid                      MacAddress,
                dot11WNMDiagAssocRprtRegulatoryClass            INTEGER,
                dot11WNMDiagAssocRprtChannelNumber              INTEGER,
                dot11WNMDiagAssocRprtStatusCode                 INTEGER }

dot11WNMDiagAssocRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Association Diagnostic Report elements in
                dot11WNMDiagAssocReportTable, greater than 0."
        ::= { dot11WNMDiagAssocReportEntry 1 }

dot11WNMDiagAssocRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
```

```
        ::= { dot11WNMDiagAssocReportEntry 2 }

dot11WNMDiagAssocRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMDiagAssoc Report has been received on."
        ::= { dot11WNMDiagAssocReportEntry 3 }

dot11WNMDiagAssocRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
                successful(0),
                requestFailed(1),
                requestRefused(2),
                requestIncapable(3),
                detectedFrequentTransition(4)
                }
          MAX-ACCESS read-only
          STATUS current
          DESCRIPTION
            "This attribute contains the status value included in the Event Report."
        ::= { dot11WNMDiagAssocReportEntry 4 }

dot11WNMDiagAssocRprtBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the BSSID for the target AP for this Association
                Diagnostic Report."
        ::= { dot11WNMDiagAssocReportEntry 5 }

dot11WNMDiagAssocRprtRegulatoryClass OBJECT-TYPE
        SYNTAX INTEGER(1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the channel set for the target AP for this Asso-
                ciation Diagnostic Report. Country, Regulatory Class and Channel Number
                together specify the channel frequency and spacing for this measurement
                request. Valid values of Regulatory Class as shown in Annex J."
        ::= { dot11WNMDiagAssocReportEntry 6 }

dot11WNMDiagAssocRprtChannelNumber OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the operating channel of the target AP for this
                Association Diagnostic Report. The Channel Number is only defined within
                the indicated Regulatory Class as sown in Annex J."
        ::= { dot11WNMDiagAssocReportEntry 7 }

dot11WNMDiagAssocRprtStatusCode OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the result of the association diagnostic and is
                set to one of the status codes specified in Table7-23 in 7.3.1.9."
        ::= { dot11WNMDiagAssocReportEntry 8 }

-- *******************************************************************
-- * End of dot11WNMDiagAssocReport TABLE
-- *******************************************************************

-- *******************************************************************
-- * dot11WNMDiag8021xAuthReport TABLE
-- *******************************************************************
        dot11WNMDiag8021xAuthReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMDiag8021xAuthReportEntry
```



```
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of IEEE 802.1X Authentication Diagnostic
                reports that have been received by the MLME. The report tables shall be
                maintained as FIFO to preserve freshness, thus the rows in this table can
                be deleted for memory constraints or other implementation constraints
                determined by the vendor. New rows shall have different RprtIndex values
                than those deleted within the range limitation of the index. One easy way
                is to monotonically increase RprtIndex for new reports being written in the
                table."
        ::= { dot11WNMReport 12 }

dot11WNMDiag8021xAuthReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMDiag8021xAuthReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMDiag8021xAuthReportTable Indexed by
                dot11WNMDiag8021xAuthRprtIndex."
        INDEX { dot11WNMDiag8021xAuthRprtIndex }
        ::= { dot11WNMDiag8021xAuthReportTable 1 }

Dot11WNMDiag8021xAuthReportEntry ::=
        SEQUENCE {
                dot11WNMDiag8021xAuthRprtIndex                  Unsigned32,
                dot11WNMDiag8021xAuthRprtRqstToken              OCTET STRING,
                dot11WNMDiag8021xAuthRprtIfIndex                InterfaceIndex,
                dot11WNMDiag8021xAuthRprtEventStatus            INTEGER,
                dot11WNMDiag8021xAuthRprtBssid                  MacAddress,
                dot11WNMDiag8021xAuthRprtRegulatoryClass        INTEGER,
                dot11WNMDiag8021xAuthRprtChannelNumber          INTEGER,
                dot11WNMDiag8021xAuthRprtEapType                INTEGER,
                dot11WNMDiag8021xAuthRprtEapVendorID            OCTET STRING,
                dot11WNMDiag8021xAuthRprtEapVendorType          OCTET STRING,
                dot11WNMDiag8021xAuthRprtCredentialType         INTEGER,
                dot11WNMDiag8021xAuthRprtStatusCode             INTEGER }

dot11WNMDiag8021xAuthRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for IEEE 802.1X Authentication Diagnostic Report elements in
                dot11WNMDiag8021xAuthReportTable, greater than 0."
        ::= { dot11WNMDiag8021xAuthReportEntry 1 }

dot11WNMDiag8021xAuthRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMDiag8021xAuthReportEntry 2 }

dot11WNMDiag8021xAuthRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMDiag8021xAuth Report has been received on."
        ::= { dot11WNMDiag8021xAuthReportEntry 3 }

dot11WNMDiag8021xAuthRprtEventStatus OBJECT-TYPE
        SYNTAX INTEGER {
                successful(0),
                requestFailed(1),
                requestRefused(2),
```

```
            requestIncapable(3),
            detectedFrequentTransition(4)
            }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
          "This attribute contains the status value included in the Event Report."
      ::= { dot11WNMDiag8021xAuthReportEntry 4 }

dot11WNMDiag8021xAuthRprtBssid OBJECT-TYPE
        SYNTAX MacAddress
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the BSSID for the target AP for this Authentica-
                tion Diagnostic Report."
        ::= { dot11WNMDiag8021xAuthReportEntry 5 }

dot11WNMDiag8021xAuthRprtRegulatoryClass OBJECT-TYPE
        SYNTAX INTEGER(1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the channel set for the target AP for this
                Authentication Diagnostic Report. Country, Regulatory Class and Channel
                Number together specify the channel frequency and spacing for this measure-
                ment request. Valid values of Regulatory Class as shown in Annex J."
        ::= { dot11WNMDiag8021xAuthReportEntry 6 }

dot11WNMDiag8021xAuthRprtChannelNumber OBJECT-TYPE
        SYNTAX INTEGER (1..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the operating channel of the target AP for this
                Authentication Diagnostic Report. The Channel Number is only defined within
                the indicated Regulatory Class as shown in Annex J."
        ::= { dot11WNMDiag8021xAuthReportEntry 7 }

dot11WNMDiag8021xAuthRprtEapType OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the single EAP method used by the STA. Valid EAP
                Type numbers are assigned by IANA and are defined at http://www.iana.org/
                assignments/eap-numbers."
        ::= { dot11WNMDiag8021xAuthReportEntry 8 }

dot11WNMDiag8021xAuthRprtEapVendorID OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..3))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the EAP Vendor ID number for the EAP method used
                by the STA. The EAP Vendor ID field is included when the EAP Type field is
                set to 254, and is excluded otherwise."
        ::= { dot11WNMDiag8021xAuthReportEntry 9 }

dot11WNMDiag8021xAuthRprtEapVendorType OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..4))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the EAP Vendor Type number for the EAP method
                used by the STA. The EAP Vendor Type field is included when the EAP Type
                field is set to 254, and is excluded otherwise."
        ::= { dot11WNMDiag8021xAuthReportEntry 10 }

dot11WNMDiag8021xAuthRprtCredentialType OBJECT-TYPE
        SYNTAX INTEGER {
                none(0),
```

```
               preSharedKey(1),
               userNamePassword(2),
               x509Certificate(3),
               otherCertificate(4),
               oneTimePassword(5),
               token(6)
               }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the type of IEEE 802.1X credentials used by the
               STA for this authentication diagnostic."
        ::= { dot11WNMDiag8021xAuthReportEntry 11 }

dot11WNMDiag8021xAuthRprtStatusCode OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
               "This attribute indicates the result of the authentication diagnostic and
               is set to one of the status codes specified in Table7-23."
        ::= { dot11WNMDiag8021xAuthReportEntry 12 }

-- **********************************************************************
-- * End of dot11WNMDiag8021xAuthReport TABLE
-- **********************************************************************

-- **********************************************************************
-- * dot11WNMLocConfigReport TABLE
-- **********************************************************************
        dot11WNMLocConfigReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMLocConfigReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
               "Group contains the current list of Location Configuration reports that
               have been received by the MLME. The report tables shall be maintained as
               FIFO to preserve freshness, thus the rows in this table can be deleted for
               memory constraints or other implementation constraints determined by the
               vendor. New rows shall have different RprtIndex values than those deleted
               within the range limitation of the index. One easy way is to monotonically
               increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 13 }

dot11WNMLocConfigReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMLocConfigReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
               "An entry in the dot11WNMLocConfigReportTable Indexed by
               dot11WNMLocConfigRprtIndex."
        INDEX { dot11WNMLocConfigRprtIndex }
        ::= { dot11WNMLocConfigReportTable 1 }

Dot11WNMLocConfigReportEntry ::=
        SEQUENCE {
               dot11WNMLocConfigRprtIndex                        Unsigned32,
               dot11WNMLocConfigRprtRqstToken                    OCTET STRING,
               dot11WNMLocConfigRprtIfIndex                      InterfaceIndex,
               dot11WNMLocConfigRprtLocIndParams                 OCTET STRING,
               dot11WNMLocConfigRprtLocIndChanList               OCTET STRING,
               dot11WNMLocConfigRprtLocIndBcastRate              INTEGER,
               dot11WNMLocConfigRprtLocIndOptions                OCTET STRING,
               dot11WNMLocConfigRprtStatusConfigSubelemId        INTEGER,
               dot11WNMLocConfigRprtStatusResult                 INTEGER,
               dot11WNMLocConfigRprtVendorSpecificRprtContent    OCTET STRING }

dot11WNMLocConfigRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
```

```
                "Index for Location Configuration Report elements in
                dot11WNMLocConfigReportTable, greater than 0."
        ::= { dot11WNMLocConfigReportEntry 1 }

dot11WNMLocConfigRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMLocConfigReportEntry 2 }

dot11WNMLocConfigRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "The ifIndex for this row of WNMLocConfig Report has been received on."
        ::= { dot11WNMLocConfigReportEntry 3 }

dot11WNMLocConfigRprtLocIndParams OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(16))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates STA Location reporting characteristics. The for-
                mat of these Location Indication Parameters are detailed in 7.3.2.71.2."
        ::= { dot11WNMLocConfigReportEntry 4 }

dot11WNMLocConfigRprtLocIndChanList OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..254))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute lists location indication reporting channel information for
                this Location Configuration Report. Zero length is the null default for
                this attribute. Each pair of octets indicates a different regulatory class
                and channel number for this request. The detailed format for this list of
                channels as described in 7.3.2.71.3."
        ::= { dot11WNMLocConfigReportEntry 5 }

dot11WNMLocConfigRprtLocIndBcastRate OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "0.5Mbps"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the data rate, in 0.5Mb/s units, at which the STA
                broadcasts its Location Track Notification frames."
        ::= { dot11WNMLocConfigReportEntry 6 }

dot11WNMLocConfigRprtLocIndOptions OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the location track indication options used, see
                7.3.2.71.9."
::= { dot11WNMLocConfigReportEntry 7}

dot11WNMLocConfigRprtStatusConfigSubelemId OBJECT-TYPE
        SYNTAX INTEGER {
                multipleSubelemIds(0),
                locationIndicationParams(1),
                locationIndicationChannels(2),
                locationStatus(3),
                radioInformation(4),
                motion(5),
```



```
                locationIndicationBcastDataRate(6),
                timeOfDeparture(7),
                vendorSpecific(8)
                }
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute is set to a specific Location Parameters subelement ID
                transmitted in a Location Configuration Request frame. If the following
                StatusResult attribute field value applies to more than one subelement then
                the Config subelement ID is set to 0. If the Status field value applies to
                one subelement, then a Location Status subelement may be included in the
                Location Configuration Response for each configuration subelement that has
                a non-Success Status value."
        ::= { dot11WNMLocConfigReportEntry 8 }

dot11WNMLocConfigRprtStatusResult OBJECT-TYPE
        SYNTAX INTEGER (0..255)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
            "This attribute contains the resulting status of the Location Configuration
      Request frame for the indicated Location Parameter subelement ID, as listed in Table
      7-43v, Event Report Status."
    ::= { dot11WNMLocConfigReportEntry 9 }

dot11WNMLocConfigRprtVendorSpecificRprtContent OBJECT-TYPE
        SYNTAX OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute provides an envelope for all the vendor specific subele-
                ments that may be included in Location Configuration Report element. Zero
                length is the null default for this attribute."
        ::= { dot11WNMLocConfigReportEntry 10 }

-- **********************************************************************
-- * End of dot11WNMLocConfigReport TABLE
-- **********************************************************************

-- **********************************************************************
-- * dot11WNMBssTransitReport TABLE
-- **********************************************************************
        dot11WNMBssTransitReportTable OBJECT-TYPE
        SYNTAX SEQUENCE OF Dot11WNMBssTransitReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of BSS Transition Management reports that
                have been received by the MLME. The report tables shall be maintained as
                FIFO to preserve freshness, thus the rows in this table can be deleted for
                memory constraints or other implementation constraints determined by the
                vendor. New rows shall have different RprtIndex values than those deleted
                within the range limitation of the index. One easy way is to monotonically
                increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 14 }

dot11WNMBssTransitReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMBssTransitReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMBssTransitReportTable Indexed by
                dot11WNMBssTransitRprtIndex."
        INDEX { dot11WNMBssTransitRprtIndex }
        ::= { dot11WNMBssTransitReportTable 1 }

Dot11WNMBssTransitReportEntry ::=
        SEQUENCE {
                dot11WNMBssTransitRprtIndex                         Unsigned32,
                dot11WNMBssTransitRprtRqstToken                     OCTET STRING,
                dot11WNMBssTransitRprtIfIndex                       InterfaceIndex,
                dot11WNMBssTransitRprtStatusCode                    INTEGER,
```



```
        dot11WNMBssTransitRprtBSSTerminationDelay          INTEGER,
        dot11WNMBssTransitRprtTargetBssid                  MacAddress }

dot11WNMBssTransitRprtIndex OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Index for BSS Transition Management Report elements in
        dot11WNMBssTransitReportTable, greater than 0."
    ::= { dot11WNMBssTransitReportEntry 1 }

dot11WNMBssTransitRprtRqstToken OBJECT-TYPE
    SYNTAX OCTET STRING
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the request token that was indicated in the WNM
        request that generated this measurement report. This should be an exact
        match to the original dot11WNMRqstToken attribute. Note that there may be
        multiple entries in the table that match this value since a single request
        may generate multiple WNM reports."
    ::= { dot11WNMBssTransitReportEntry 2 }

dot11WNMBssTransitRprtIfIndex OBJECT-TYPE
    SYNTAX InterfaceIndex
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The ifIndex for this row of WNMBssTransit Report has been received on."
    ::= { dot11WNMBssTransitReportEntry 3 }

dot11WNMBssTransitRprtStatusCode OBJECT-TYPE
    SYNTAX INTEGER {
        accept(0),
        rejectUnspecified(1),
        rejectInsufficientBeacons(2),
        rejectInsufficientCapacity(3)
        }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the status of this BSS Transition report."
    ::= { dot11WNMBssTransitReportEntry 4 }

dot11WNMBssTransitRprtBSSTerminationDelay OBJECT-TYPE
    SYNTAX INTEGER (1..255)
    UNITS “minutes”
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the number of minutes that the responding STA
        requests the BSS to delay termination. This attribute is included only if
        the Status Code field value is set to 5."
    ::= { dot11WNMBssTransitReportEntry 5 }

dot11WNMBssTransitRprtTargetBssid OBJECT-TYPE
    SYNTAX MacAddress
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This attribute indicates the target BSSID for this BSS Transition Report."
    ::= { dot11WNMBssTransitReportEntry 6 }

-- *******************************************************************
-- * End of dot11WNMBssTransitReport TABLE
-- *******************************************************************

-- *******************************************************************
-- * dot11WNMColocInterfReport TABLE
-- *******************************************************************
    dot11WNMColocInterfReportTable OBJECT-TYPE
```



```
        SYNTAX SEQUENCE OF Dot11WNMColocInterfReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Group contains the current list of Collocated Interference reports that
                have been received by the MLME. The report tables shall be maintained as
                FIFO to preserve freshness, thus the rows in this table can be deleted for
                memory constraints or other implementation constraints determined by the
                vendor. New rows shall have different RprtIndex values than those deleted
                within the range limitation of the index. One easy way is to monotonically
                increase RprtIndex for new reports being written in the table."
        ::= { dot11WNMReport 16 }

dot11WNMColocInterfReportEntry OBJECT-TYPE
        SYNTAX Dot11WNMColocInterfReportEntry
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "An entry in the dot11WNMColocInterfReportTable Indexed by
                dot11WNMColocInterfRprtIndex."
        INDEX { dot11WNMColocInterfRprtIndex }
        ::= { dot11WNMColocInterfReportTable 1 }

Dot11WNMColocInterfReportEntry ::=
        SEQUENCE {
                dot11WNMColocInterfRprtIndex                    Unsigned32,
                dot11WNMColocInterfRprtRqstToken                OCTET STRING,
                dot11WNMColocInterfRprtIfIndex                  InterfaceIndex,
                dot11WNMColocInterfRprtPeriod                   INTEGER,
                dot11WNMColocInterfRprtInterfLevel              INTEGER,
                dot11WNMColocInterfRprtInterfAccuracy           INTEGER,
                dot11WNMColocInterfRprtInterfIndex              INTEGER,
                dot11WNMColocInterfRprtInterfInterval           Integer32,
                dot11WNMColocInterfRprtInterfBurstLength        Integer32,
                dot11WNMColocInterfRprtInterfStartTime          Integer32,
                dot11WNMColocInterfRprtInterfCenterFreq         Integer32,
                dot11WNMColocInterfRprtInterfBandwidth          INTEGER }

dot11WNMColocInterfRprtIndex OBJECT-TYPE
        SYNTAX Unsigned32
        MAX-ACCESS not-accessible
        STATUS current
        DESCRIPTION
                "Index for Collocated Interference Report elements in
                dot11WNMColocInterfReportTable, greater than 0."
        ::= { dot11WNMColocInterfReportEntry 1 }

dot11WNMColocInterfRprtRqstToken OBJECT-TYPE
        SYNTAX OCTET STRING
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the request token that was indicated in the WNM
                request that generated this measurement report. This should be an exact
                match to the original dot11WNMRqstToken attribute. Note that there may be
                multiple entries in the table that match this value since a single request
                may generate multiple WNM reports."
        ::= { dot11WNMColocInterfReportEntry 2 }

dot11WNMColocInterfRprtIfIndex OBJECT-TYPE
        SYNTAX InterfaceIndex
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
           "The ifIndex for this row of WNMColocInterf Report has been received on."
           ::= { dot11WNMColocInterfReportEntry 3 }

dot11WNMColocInterfRprtPeriod OBJECT-TYPE
        SYNTAX INTEGER(0..255)
        UNITS "100 TU"
        MAX-ACCESS read-only
        STATUS current
```

```
        DESCRIPTION
                "This attribute indicates how often the STA periodically reports the collo-
                cated interference. The field is in units of 100 TUs. If the Report Period
                field is set to 0, then the reporting is not periodic, and a report is gen-
                erated when the STA detects a change in the collocated interference. See
                11.22.8 for further details."
        ::= { dot11WNMColocInterfReportEntry 4 }

dot11WNMColocInterfRprtInterfLevel OBJECT-TYPE
        SYNTAX INTEGER(-128..127)
        UNITS "dBm"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute contains a signed integer indicating the maximum level of
                the collocated interference power in units of dBm over all receive chains
                averaged over a 4 s period during an interference period and across inter-
                ference bandwidth. When the interference level is unknown, the field is set
                to +127 dBm. When the interference level is equal or greater than 126 dBm,
                the field is set to +126 dBm. If no collocated interference is present the
                field is set to -128 dBm. When the interference level is equal or lower
                than -127 dBm, the field is set to -127 dBm. The interference level is ref-
                erenced to the antenna connector (see definition 3.174) used for recep-
                tion, like RCPI."
        ::= { dot11WNMColocInterfReportEntry 5 }

dot11WNMColocInterfRprtInterfAccuracy OBJECT-TYPE
        SYNTAX INTEGER(0..15)
        UNITS "dB"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates an unsigned integer indicating the expected accu-
                racy of the estimate of interference in dB with 95% confidence interval. If
                the Interference Level field is X (dBm) and the expected accuracy field is
                Y (dB), the actual interference level is in the range of [X - Y, X +Y] with
                the probability of 95%. If the accuracy is unknown then the Expected Accu-
                racy field is set to 15."
        ::= { dot11WNMColocInterfReportEntry 6 }

dot11WNMColocInterfRprtInterfIndex OBJECT-TYPE
        SYNTAX INTEGER(0..15)
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the interference index that is unique for each
                type of interference source. The field set to 0 indicates that no collo-
                cated interference is present. See 11.22.8 for further details."
        ::= { dot11WNMColocInterfReportEntry 7 }

dot11WNMColocInterfRprtInterfInterval OBJECT-TYPE
        SYNTAX Integer32
        UNITS "microseconds"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the interval between two successive periods of
                interference in microseconds. When the interval between two successive
                periods of interference is variable the field is set to 2E32-1. When the
                interval between two successive periods of interference is equal or greater
                than 2E32-2 the field is set to 2E32-2. If no collocated interference is
                present the field is set to 0."
        ::= { dot11WNMColocInterfReportEntry 8 }

dot11WNMColocInterfRprtInterfBurstLength OBJECT-TYPE
        SYNTAX Integer32
        UNITS "microseconds"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the duration of each period of interference in
                microseconds. When the duration of each period of interference is variable
```

```
                the field is set to 2E32-1). When the duration of each period of interfer-
                ence is equal or greater than 2E32-2, the field is set to 2E32-2. If no
                collocated interference is present the field is set to 0."
        ::= { dot11WNMColocInterfReportEntry 9 }

dot11WNMColocInterfRprtInterfStartTime OBJECT-TYPE
        SYNTAX Integer32
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute contains the least significant 4 octets (i.e. B0-B31) of
                the TSF timer at the start of the interference burst. When either the
                Interference Interval or the Interference Burst Length fields are set to
                2E32-1, this field indicates the average duty cycle. The average duty cycle
                value is defined as Round-to-Integer ((2E32-2)[average interference burst
                length (microsecond)]/[average interference interval (microsecond)]). When
                the interference is non-periodic the Interference Start Time field is set
                to 0. If no collocated interference is present the field is set to 0."
        ::= { dot11WNMColocInterfReportEntry 10 }

dot11WNMColocInterfRprtInterfCenterFreq OBJECT-TYPE
        SYNTAX Integer32
        UNITS "5 kHz"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates center frequency of interference in units of 5
                kHz. When center frequency is unknown, the center frequency of the STA's
                operating channel is reported. If no collocated interference is present the
                field is set to 0."
        ::= { dot11WNMColocInterfReportEntry 11 }

dot11WNMColocInterfRprtInterfBandwidth OBJECT-TYPE
        SYNTAX INTEGER (0..65535)
        UNITS "5 kHz"
        MAX-ACCESS read-only
        STATUS current
        DESCRIPTION
                "This attribute indicates the bandwidth at the -3dB roll-off point of the
                interference signal in 5 kHz. When bandwidth of the interference signal is
                unknown, the field is set to 65535. When bandwidth of the interference sig-
                nal is equal or greater than 65534 the field is set to 65534. If no collo-
                cated interference is present the field is set to 0."
        ::= { dot11WNMColocInterfReportEntry 12 }

-- ********************************************************************
-- * End of dot11WNMColocInterfReport TABLE
-- ********************************************************************


dot11SMTWNMRequest OBJECT-GROUP
        OBJECTS { dot11WNMRqstIndex,
                dot11WNMRqstRowStatus,
                dot11WNMRqstToken,
                dot11WNMRqstIfIndex,
                dot11WNMRqstType,
                dot11WNMRqstTargetAdd,
                dot11WNMRqstTimeStamp,
                dot11WNMRqstRndInterval,
                dot11WNMRqstDuration,
                dot11WNMRqstMcstGroup,
                dot11WNMRqstMcstTrigCon,
                dot11WNMRqstMcstRprtTimeout,
                dot11WNMRqstMcstTrigTimeout,
                dot11WNMRqstLCRRqstSubject,
                dot11WNMRqstLCRIntervalUnits,
                dot11WNMRqstLCRServiceInterval,
                dot11WNMRqstLIRRqstSubject,
                dot11WNMRqstLIRIntervalUnits,
                dot11WNMRqstLIRServiceInterval,
                dot11WNMRqstEventToken,
                dot11WNMRqstEventType,
```

```
            dot11WNMRqstEventResponseLimit,
            dot11WNMRqstEventTargetBssid,
            dot11WNMRqstEventSourceBssid,
            dot11WNMRqstEventTransitTimeThresh,
            dot11WNMRqstEventTransitMatchValue,
            dot11WNMRqstEventFreqTransitCountThresh,
            dot11WNMRqstEventFreqTransitInterval,
            dot11WNMRqstEventRsnaAuthType,
            dot11WNMRqstEapType,
            dot11WNMRqstEapVendorId,
            dot11WNMRqstEapVendorType,
            dot11WNMRqstEventRsnaMatchValue,
            dot11WNMRqstEventPeerMacAddress,
            dot11WNMRqstRegulatoryClass,
            dot11WNMRqstChanNumber,
            dot11WNMRqstDiagToken,
            dot11WNMRqstDiagType,
            dot11WNMRqstDiagTimeout,
            dot11WNMRqstDiagBssid,
            dot11WNMRqstDiagProfileId,
            dot11WNMRqstDiagCredentials,
            dot11WNMRqstLocConfigLocIndParams,
            dot11WNMRqstLocConfigChanList,
            dot11WNMRqstLocConfigBcastRate,
            dot11WNMRqstLocConfigOptions,
            dot11WNMRqstBssTransitQueryReason,
            dot11WNMRqstBssTransitReqMode,
            dot11WNMRqstBssTransitDisocTimer,
            dot11WNMRqstBssTransitSessInfoURL,
            dot11WNMRqstBssTransitCandidateList,
            dot11WNMRqstColocInterfAutoEnable,
            dot11WNMRqstColocInterfRptTimeout,
            dot11WNMRqstVendorSpecific }
    STATUS current
    DESCRIPTION
            "The SMTWNMRequest package is a set of attributes that shall be present
            if the STA supports the WNM service."
    ::= { dot11Groups 54 }


dot11SMTWNMReport OBJECT-GROUP
    OBJECTS { dot11WNMVendorSpecificRprtIndex,
            dot11WNMVendorSpecificRprtRqstToken,
            dot11WNMVendorSpecificRprtIfIndex,
            dot11WNMVendorSpecificRprtContent,
            dot11WNMMulticastDiagnosticRprtIndex,
            dot11WNMMulticastDiagnosticRprtRqstToken,
            dot11WNMMulticastDiagnosticRprtIfIndex,
            dot11WNMMulticastDiagnosticRprtMeasurementTime,
            dot11WNMMulticastDiagnosticRprtDuration,
            dot11WNMMulticastDiagnosticRprtMcstGroup,
            dot11WNMMulticastDiagnosticRprtReason,
            dot11WNMMulticastDiagnosticRprtRcvdMsduCount,
            dot11WNMMulticastDiagnosticRprtFirstSeqNumber,
            dot11WNMMulticastDiagnosticRprtLastSeqNumber,
            dot11WNMMulticastDiagnosticRprtMcstRate,
            dot11WNMLocationCivicRprtIndex,
            dot11WNMLocationCivicRprtRqstToken,
            dot11WNMLocationCivicRprtIfIndex,
            dot11WNMLocationCivicRprtCivicLocation,
            dot11WNMLocationIdentifierRprtIndex,
            dot11WNMLocationIdentifierRprtRqstToken,
            dot11WNMLocationIdentifierRprtIfIndex,
            dot11WNMLocationIdentifierRprtExpirationTSF,
            dot11WNMLocationIdentifierRprtPublicIdUri,
            dot11WNMEventTransitRprtIndex,
            dot11WNMEventTransitRprtRqstToken,
            dot11WNMEventTransitRprtIfIndex,
            dot11WNMEventTransitRprtEventStatus,
            dot11WNMEventTransitRprtEventTSF,
            dot11WNMEventTransitRprtUTCOffset,
            dot11WNMEventTransitRprtTimeError,
```

```
dot11WNMEventTransitRprtSourceBssid,
dot11WNMEventTransitRprtTargetBssid,
dot11WNMEventTransitRprtTransitTime,
dot11WNMEventTransitRprtTransitReason,
dot11WNMEventTransitRprtTransitResult,
dot11WNMEventTransitRprtSourceRCPI,
dot11WNMEventTransitRprtSourceRSNI,
dot11WNMEventTransitRprtTargetRCPI,
dot11WNMEventTransitRprtTargetRSNI,
dot11WNMEventRsnaRprtIndex,
dot11WNMEventRsnaRprtRqstToken,
dot11WNMEventRsnaRprtIfIndex,
dot11WNMEventRsnaRprtEventStatus,
dot11WNMEventRsnaRprtEventTSF,
dot11WNMEventRsnaRprtUTCOffset,
dot11WNMEventRsnaRprtTimeError,
dot11WNMEventRsnaRprtTargetBssid,
dot11WNMEventRsnaRprtAuthType,
dot11WNMEventRsnaRprtEapMethod,
dot11WNMEventRsnaRprtResult,
dot11WNMEventRsnaRprtRsnElement,
dot11WNMEventPeerRprtIndex,
dot11WNMEventPeerRprtRqstToken,
dot11WNMEventPeerRprtIfIndex,
dot11WNMEventPeerRprtEventStatus,
dot11WNMEventPeerRprtEventTSF,
dot11WNMEventPeerRprtUTCOffset,
dot11WNMEventPeerRprtTimeError,
dot11WNMEventPeerRprtPeerMacAddress,
dot11WNMEventPeerRprtRegulatoryClass,
dot11WNMEventPeerRprtChanNumber,
dot11WNMEventPeerRprtStaTxPower,
dot11WNMEventPeerRprtConnTime,
dot11WNMEventPeerRprtPeerStatus,
dot11WNMEventWNMLogRprtIndex,
dot11WNMEventWNMLogRprtRqstToken,
dot11WNMEventWNMLogRprtIfIndex,
dot11WNMEventWNMLogRprtEventStatus,
dot11WNMEventWNMLogRprtEventTSF,
dot11WNMEventWNMLogRprtUTCOffset,
dot11WNMEventWNMLogRprtTimeError,
dot11WNMEventWNMLogRprtContent,
dot11WNMDiagMfrInfoRprtIndex,
dot11WNMDiagMfrInfoRprtRqstToken,
dot11WNMDiagMfrInfoRprtIfIndex,
dot11WNMDiagMfrInfoRprtEventStatus,
dot11WNMDiagMfrInfoRprtMfrOi,
dot11WNMDiagMfrInfoRprtMfrIdString,
dot11WNMDiagMfrInfoRprtMfrModelString,
dot11WNMDiagMfrInfoRprtMfrSerialNumberString,
dot11WNMDiagMfrInfoRprtMfrFirmwareVersion,
dot11WNMDiagMfrInfoRprtMfrAntennaType,
dot11WNMDiagMfrInfoRprtCollocRadioType,
dot11WNMDiagMfrInfoRprtDeviceType,
dot11WNMDiagMfrInfoRprtCertificateID,
dot11WNMDiagConfigProfRprtIndex,
dot11WNMDiagConfigProfRprtRqstToken,
dot11WNMDiagConfigProfRprtIfIndex,
dot11WNMDiagConfigProfRprtEventStatus,
dot11WNMDiagConfigProfRprtProfileId,
dot11WNMDiagConfigProfRprtSupportedRegClasses,
dot11WNMDiagConfigProfRprtTxPowerMode,
dot11WNMDiagConfigProfRprtTxPowerLevels,
dot11WNMDiagConfigProfRprtCipherSuite,
dot11WNMDiagConfigProfRprtAkmSuite,
dot11WNMDiagConfigProfRprtEapType,
dot11WNMDiagConfigProfRprtEapVendorID,
dot11WNMDiagConfigProfRprtEapVendorType,
dot11WNMDiagConfigProfRprtCredentialType,
dot11WNMDiagConfigProfRprtSSID,
dot11WNMDiagConfigProfRprtPowerSaveMode,
dot11WNMDiagAssocRprtIndex,
```

```
        dot11WNMDiagAssocRprtRqstToken,
        dot11WNMDiagAssocRprtIfIndex,
        dot11WNMDiagAssocRprtEventStatus,
        dot11WNMDiagAssocRprtBssid,
        dot11WNMDiagAssocRprtRegulatoryClass,
        dot11WNMDiagAssocRprtChannelNumber,
        dot11WNMDiagAssocRprtStatusCode,
        dot11WNMDiag8021xAuthRprtIndex,
        dot11WNMDiag8021xAuthRprtRqstToken,
        dot11WNMDiag8021xAuthRprtIfIndex,
        dot11WNMDiag8021xAuthRprtEventStatus,
        dot11WNMDiag8021xAuthRprtBssid,
        dot11WNMDiag8021xAuthRprtRegulatoryClass,
        dot11WNMDiag8021xAuthRprtChannelNumber,
        dot11WNMDiag8021xAuthRprtEapType,
        dot11WNMDiag8021xAuthRprtEapVendorID,
        dot11WNMDiag8021xAuthRprtEapVendorType,
        dot11WNMDiag8021xAuthRprtCredentialType,
        dot11WNMDiag8021xAuthRprtStatusCode,
        dot11WNMLocConfigRprtIndex,
        dot11WNMLocConfigRprtRqstToken,
        dot11WNMLocConfigRprtIfIndex,
        dot11WNMLocConfigRprtLocIndParams,
        dot11WNMLocConfigRprtLocIndChanList,
        dot11WNMLocConfigRprtLocIndBcastRate,
        dot11WNMLocConfigRprtLocIndOptions,
        dot11WNMLocConfigRprtStatusConfigSubelemId,
        dot11WNMLocConfigRprtStatusResult,
        dot11WNMLocConfigRprtVendorSpecificRprtContent,
        dot11WNMBssTransitRprtIndex,
        dot11WNMBssTransitRprtRqstToken,
        dot11WNMBssTransitRprtIfIndex,
        dot11WNMBssTransitRprtStatus,
        dot11WNMBssTransitRprtBSSTerminationDelay,
        dot11WNMBssTransitRprtTargetBssid,
        dot11WNMColocInterfRprtIndex,
        dot11WNMColocInterfRprtRqstToken,
        dot11WNMColocInterfRprtIfIndex,
        dot11WNMColocInterfRprtPeriod,
        dot11WNMColocInterfRprtInterfLevel,
        dot11WNMColocInterfRprtInterfAccuracy,
        dot11WNMColocInterfRprtInterfIndex,
        dot11WNMColocInterfRprtInterfInterval,
        dot11WNMColocInterfRprtInterfBurstLength,
        dot11WNMColocInterfRprtInterfStartTime,
        dot11WNMColocInterfRprtInterfCenterFreq,
        dot11WNMColocInterfRprtInterfBandwidth }
STATUS current
DESCRIPTION
        "The SMTWNMReport package is a set of attributes that shall be present if
        the STA supports the WNM service."
::= { dot11Groups 55 }
```


Insert two new annexes at the end of the standard as follows:

Annex V

(informative)

Location and Time Difference accuracy test

V.1 Location via Time Difference of arrival

The location of a device may be determined in multiple methods, including the following:
- Signal strength at different sensors
- Time of flight between the device and different sensors
- Time difference of arrival between the device and pairs of sensors

A typical implementation of the time difference of arrival method requires that the sensors are co-channel, have synchronized clocks, and receive the same transmission from the device. The sensor's time of arrival measurements are shared, and the device location is determined via multilateration, i.e., each pair of sensor measurements provides a time difference of arrival measurement that represents a hyperbola in 2D space of most likely candidate locations, and the overlap of the multiple hyperbola from multiple pairs of sensors leads to the location estimate. The single time of departure is not relevant in this typical multilateration implementation as it is canceled out when time differences of arrival are computed.

When the sensors are on different channels, such as APs in a typical multi-channel deployment, the device transmits on each channel and thus with multiple times of departure. In this environment it is necessary for the device to advertise each time of departure so that it can be subtracted from the times of arrivals measured by sensors on different channels. Furthermore, the device's clock frequency typically does not match the clock frequency of the synchronized sensors, and so the device should transmit on the same channel multiple widely spaced times in order for the sensors to estimate the device's clock frequency relative to themselves and to be able to suitably scale the device's advertised times of departure.

An example transmission sequence comprises frames transmitted on channels 1, 6, 11, 1 at 2.4 GHz. From this, the device's clock frequency can be determined relative to the synchronized APs on channel 1, and all APs on channels 1, 6, and 11 can measure a time of arrival. These four transmissions enable a single location calculation. The Time of Departure Accuracy test in V.2 is designed to measure errors within such a transmission sequence that would degrade a multi-channel time difference of arrival location scheme.

V.2 Time Difference of departure accuracy test

The Time Difference of Departure accuracy test is an informative description of how time difference of departure accuracy can be measured for any parameterizable PHY waveform. This accuracy test does not apply when the Time of Departure timestamps are exclusively used for timing measurement (see 11.22.5).

The Time Difference of Departure accuracy test is parameterized by the following test parameters:
- TIME_OF_DEPARTURE(j,i), $1 \leq j \leq 500$, $1 \leq i \leq I$ (scalar entries)
- MULTICHANNEL_SAMPLING_RATE (scalar)
- FIRST_TRANSITION_FIELD(j,i), $1 \leq j \leq 500$, $1 \leq i \leq I$ (waveform entries)

— SECOND_TRANSITION_FIELD(j,i), $1 \le j \le 500$, $1 \le i \le I$ (waveform entries)
— TRAINING_FIELD(j,i), $1 \le j \le 500$, $1 \le i \le I$ (waveform entries)
— TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH (scalar)

TIME_OF_DEPARTURE(j,i) is exposed externally through the TOD Timestamp field in the Time of Departure subelement in Location Track Notification frames.

The Time Difference of Departure accuracy test is performed as follows or in an equivalent or more accurate manner.

The Time Difference of Departure accuracy test is performed by instrumentation capable of converting signals transmitted on one or more channels into a stream of complex samples at f_s sample/s or more, with sufficient accuracy in terms of I/Q arm amplitude and phase balance, dc offsets, phase noise, etc, and at a fixed delay from the transmitter. The minimum sampling rate is MULTICHANNEL_SAMPLING_RATE sample/s respectively. A possible embodiment of such a setup is converting the signal to a low IF frequency with a cabled microwave synthesizer, sampling the signal with a digital oscilloscope and decomposing it digitally into quadrature components. The sampled signal is processed in a manner similar to an actual time of arrival processor, according to the following steps:

a) Repeat steps b) to j) indexed by j = 1, … , 500
b) Repeat steps c) to i) indexed by i = 1, … , I
c) Start of frame is detected.
d) Channel number, coarse and fine frequency offsets are estimated.
e) The packet is derotated according to estimated frequency offsets.
f) The transition from FIRST_TRANSITION_FIELD(j,i) to SECOND_TRANSITION_FIELD(j,i) is detected; and fine timing (with one sample resolution) is established.
g) The TRAINING_FIELD(j,i) 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 of at least 1 GHz.
h) The up-sampled signal is cross-correlated with a reference waveform of the TRAINING_FIELD(j,i)
i) The measured time of departure $x_{j,i}$ is determined from the time of the peak of the magnitude of the cross-correlation.

NOTE—The time of the peak of the magnitude of the cross-correlation is actually a time of arrival measurement that equals the time of departure up to a fixed delay. Since the fixed delay is removed within step j), the fixed need not be known or explicitly compensated for.

j) Having repeated steps c) to i) I times, the (j,i)th time of departure error $e_{j,i}$ is calculated as TIME_OF_DEPARTURE(j,i) minus the synchronized time of departure. Defining $x_j = [x_{j,1},..,x_{j,I}]^T$ as the I measured times of departure, y = [TIME_OF_DEPARTURE(j,1), … TIME_OF_DEPARTURE(j,I)]^T, $e_j = [e_{j,1},\ e_{j,I}]^T$ are the I time of departure errors and $X_j = [1_{Ix1}, x_j]$, where 1_{Ix1} is an Ix1 matrix of ones, then the relative clock intercept, rci_j, and slope, rcs_j, between device and instrumentation are determined as the linear least squares line of best fit: i.e., $[rci_j, rcs_j]^T = (X_j^T X_j)^{-1} X_j^T y^j$. With these definitions and calculations, the synchronized time of departure $s_j = [s_{j,1},..,s_{j,I}]^T$ equals $rcs_j \times x_j + rci_j \times 1_{Ix1}$, and so the I time of departure errors equal $e_j = y_j - s_j$.
k) Having repeated steps b) to j) 500 times, there are 500 × I values of the time of departure errors $e = [e_{1,1}, e_{500,I}]$
l) The Time of Departure accuracy test is passed if
    1) The RMS value of e is less than aTxPmdTxStartRMS, and
    2) aTxPmdTxStartRMS is less than TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH, where the units of e, aTxPmdTxStartRMS, and TIME_OF_DEPARTURE_ACCURACY_TEST_THRESH are properly accounted for.

NOTE 1—One possible implementation of a time of departure measurement system is a free-running oscillator clocking (a) the digital-to-analog converter(s) used to transmit the packet, (b) a 32-bit continuously-counting counter and (c) a hardware finite state machine such that PMD_TXSTART.request causes a transition within the FSM that in turn causes frame transmission at the DACs a fixed number of cycles later; where the time of departure is recorded as the value of the counter at that transition minus aTxPmdTxStartRFDelay (using TIME_OF_DEPARTURE_ClockRate), where aTxPmdTxStartRFDelay can vary by channel. In this implementation, the principal source of time of departure error is short term oscillator imperfection (e.g., phase noise) and RF group delay variation across channels uncompensated by aTxPmdTxStartRFDelay.

NOTE 2—1 ns of time of departure error corresponds to approximately 0.3 m of distance error, so high location accuracy depends upon a tight time of departure standard deviation.

Annex W

(informative)

Example use of the Destination URI for Event and Diagnostic Reports

W.1 Destination URI payload

An example of the payload used to transmit Event and Diagnostic reports shown in Table W.1. The protocol used to transport the Destination URI payload is beyond the scope of this standard. An example use of the Destination URI is given in W.2.

Table W.1—Destination URI payload

Size (octets)	Information
6	BSSID
6	Reporting STA Address
variable	Event or Diagnostic Report frame contents

W.2 Use of HTTP (or HTTPS) for Destination URI of Event and Diagnostic Reports

Under certain conditions, a non-AP STA may need to send Event and Diagnostic reports to an AP using the Destination URI advertised by the AP in the request frame. A suitable higher layer protocol that could be used to transport the Event or Diagnostic report is HTTP or HTTPS.

For example, consider the following:

1) IT is investigating a WLAN coverage problem and uses a non-AP STA with a WLAN and Ethernet adapters to collect some additional information.
2) The non-AP STA with MAC 00:ff:fd:00:00:01 has received a Diagnostic Report request from AP 00:ff:fe:00:00:10 and is in fringe coverage. The non-AP STA has an Ethernet adapter that is connected.
3) The AP includes an Alternate Destination URI of http://www.myserver.mycompany.com in the Diagnostic Report frame.
4) The non-AP STA loses WLAN connectivity while trying to transmit a Diagnostic Report frame to the AP and the non-AP STA's SME determines that it can use the Alternate Transport URI to send the Diagnostic Report frame using the Ethernet link.
5) The non-AP STA POSTs the Diagnostic Report as follows:

   POST /wnm/msg/00-ff-fd-00-00-01/msg1 HTTP/1.1

   Host: http://www.myserver.mycompany.com

   Content-Type: application/octet-stream

   Content-Encoding-Type: base64

Content-Length: ?? (length of data as specified in Table 11.14d)
<encoded data = 00 ff fe 00 00 10 00 ff fd 00 00 01 …>

In the HTTPS case, the non-AP STA would need to be provisioned with credentials to establish the TLS connection prior to posting the message over HTTP. The HTTP post would work as described previously.