

9.4.2.199 TWT element

Replace Figure 9-686 with the following figure:

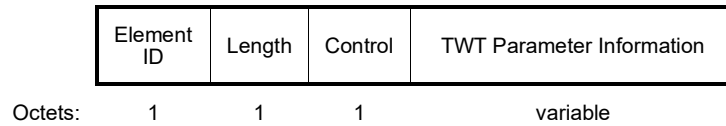


Figure 9-686—TWT element format

Change Figure 9-687 as follows:

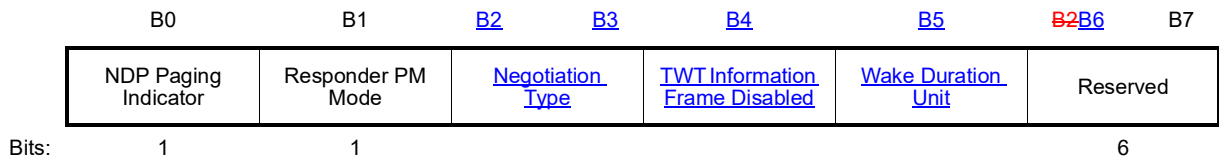


Figure 9-687—Control field format

Insert the following paragraphs, Table 9-296a, Figure 9-687a, and Figure 9-687b after the 5th paragraph (“The Responder PM Mode subfield...”) in 9.4.2.199:

The Negotiation Type subfield indicates whether the information included in the TWT element is for the negotiation of parameters of broadcast or individual TWT(s) or a Wake TBTT interval. The MSB of the Negotiation Type subfield is the Broadcast field.

The TWT Information Frame Disabled subfield is set to 1 to indicate that the reception of TWT Information frames is disabled by the STA; otherwise, it is set to 0.

The Wake Duration Unit subfield indicates the unit of the Nominal Minimum TWT Wake Duration field. The Wake Duration Unit subfield is set to 0 if the unit is 256 us and is set to 1 if the unit is a TU. A non-HE STA sets the Wake Duration Unit subfield to 0.

If the Broadcast field of the Negotiation Type subfield is 1, then one or more broadcast TWT parameter sets are contained in the TWT element (see Figure 9-687b (Broadcast TWT Parameter Set field format)). If the Broadcast field of the Negotiation Type subfield is 0, then only one Individual TWT parameter set is contained in the TWT element (see Figure 9-687a (Individual TWT Parameter Set field format)). An SIG STA sets the Negotiation Type subfield to 0.

A TWT element that has the Broadcast field in the Control field set to 1 is referred to as broadcast TWT element.

The Negotiation Type subfield determines the interpretation of the Target Wake Time, TWT Wake Interval Mantissa and TWT Wake Interval Exponent subfields of the TWT element as defined in Table 9-296a.

Table 9-296a—Interpretation of Negotiation Type subfield, Target Wake Time, TWT Wake Interval Mantissa and TWT Wake Interval Exponent fields

Column heading	Column heading	Column heading	Column heading
0	xxx	xxx	xxx
1	xxx	xxx	xxx
2	xxx	xxx	xxx
3	xxx	xxx	xxx

The TWT Parameter Information field contains a single Individual TWT Parameter Set field with format defined in Figure 9-687a if the Broadcast subfield in the Control field is 0 and contains one or more Broadcast TWT Parameter Set fields with format defined in Figure 9-687b if the Broadcast subfield of the Control field is 1. The number of Broadcast TWT Parameter Set fields present is determined by the values of the Last Broadcast Parameter Set subfields of the Request Type fields.

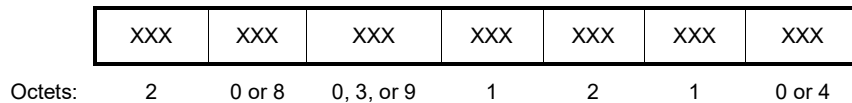


Figure 9-687a—Individual TWT Parameter Set field format

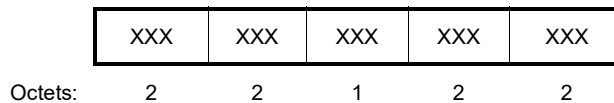


Figure 9-687b—Broadcast TWT Parameter Set field format

Change the following block of text (i.e., now 13th through 22nd paragraphs) (including changing Figure 9-688 and Table 9-297 and inserting Figure 9-688a and Table 9-297a) in 9.4.2.199 as shown:

The format of the Request Type field [of the Individual TWT Parameter Set field](#) is shown in Figure 9-688 [and of a Broadcast TWT Parameter Set field is shown in Figure 9-688a.](#)

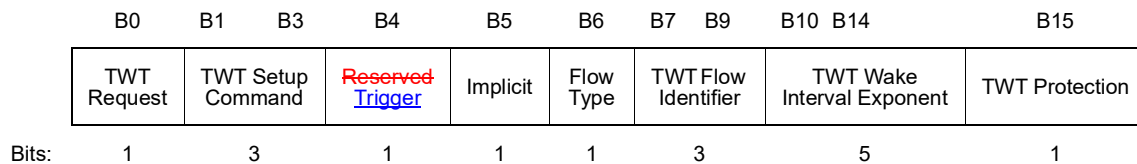


Figure 9-688—Request Type field format in [Individual TWT Parameter Set field](#)

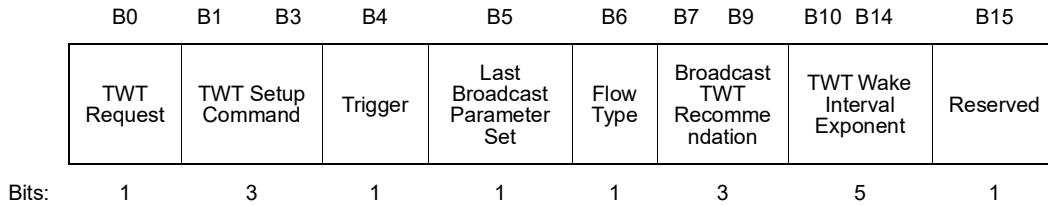


Figure 9-688a—Request Type field format in Broadcast TWT Parameter Set field

A STA that transmits a TWT element with the TWT Request subfield equal to 1 is a TWT requesting STA or TWT scheduled STA. Otherwise, it is a TWT responding STA or TWT scheduling STA.

The TWT Setup Command subfield values indicate the type of TWT command. The use of the TWT Setup Command field for the negotiation of individual and broadcast TWT is described, as shown in Table 9-297. The entries in the table apply to cases where the Negotiation Type subfield is not 1. For TWT Setup Command field use when the Negotiation Type subfield is 1, see 26.8.6.

Table 9-297—TWT Setup Command field values

TWT Setup Command field value	Command name	Description when transmitted by a TWT requesting STA	Description when transmitted by a TWT responding STA
0	Request TWT	The Target Wake Time field of the TWT element contains 0s as the TWT responding STA specifies the target wake time value for this case, other TWT parameters are suggested by the TWT requesting STA in the TWT request (see NOTE). A TWT requesting or TWT scheduled STA requests to join a TWT without specifying a target wake time. This command is valid if the TWT Request field is equal to 1; otherwise the command is not applicable.	N/A
1	Suggest TWT	TWT requesting STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup might still be accepted. A TWT requesting	N/A
2	Demand TWT	TWT requesting STA includes a set of TWT parameters such that if the requested target wake time value and/or other TWT parameters cannot be accommodated, then the TWT setup is not accepted. A TWT requesting	N/A
3	TWT Grouping	N/A A TWT responding STA	TWT responding STA suggests TWT group parameters that are different from the suggested or demanded TWT parameters of the TWT requesting STA

Table 9-297—TWT Setup Command field values (continued)

TWT Setup Command field value	Command name	Description when transmitted by a TWT requesting STA	Description when transmitted by a TWT responding STA
4	Accept TWT	N/A A TWT responding STA ...	TWT responding STA accepts the TWT request with the TWT parameters (See NOTE) indicated in the TWT element transmitted by the responding STA
5	Alternate TWT	N/A A TWT responding STA ...	TWT responding STA suggests TWT parameters that are different from TWT requesting STA suggested or demanded TWT parameters
6	Dictate TWT	N/A A TWT responding STA ...	TWT responding STA demands TWT parameters that are different from TWT requesting STA TWT suggested or demanded parameters
7	Reject TWT	N/A A TWT responding STA ...	TWT responding STA rejects TWT setup

NOTE—TWT Parameters are TWT, Nominal Minimum [TWT](#), Wake Duration, TWT Wake Interval, and TWT Channel subfield values indicated in the TWT element. [The Trigger subfield value indicated in the TWT element is also a TWT parameter for an HE STA.](#)

[The Trigger field indicates whether or not the TWT SP indicated by the TWT element includes triggering frames as defined in 26.8 \(TWT operation\). The Trigger field is set to 1 to indicate that at least one triggering frame is transmitted during the TWT SP. The Trigger field is set to 0 otherwise.](#)

~~When transmitted by a TWT requesting STA, the Implicit subfield is set to 1 to request indicate an implicit TWT and is set to 0 to indicate an explicit TWT.~~

~~When transmitted by a TWT requesting STA, the Implicit subfield is set to 0 to request an explicit TWT.~~

[The Last Broadcast Parameter Set subfield is set to 0 to indicate that another broadcast TWT Parameter set follows this set. The Last Broadcast Parameter Set subfield is set to 1 to indicate that this is the last broadcast TWT Parameter set in the broadcast TWT element.](#)

The Flow Type subfield indicates the type of interaction between the TWT requesting STA [xxxxx](#) and the TWT responding STA [xxxxx](#) at a TWT. Setting the Flow Type subfield to 0 indicates an announced TWT in which the TWT requesting STA [xxxxx](#) will send a PS-Poll or an APSD trigger frame (see 11.2.3.5) to signal its awake state to the TWT responding STA [xxxxx](#) before a frame [xxxxx](#) is sent from the TWT responding STA [xxxxx](#) to the TWT requesting STA [xxxxx](#). Setting the Flow Type subfield to 1 indicates an unannounced TWT in which the TWT responding STA [xxxxx](#) will send a frame to the TWT requesting STA [xxxxx](#) at TWT without waiting to receive a PS-Poll or an APSD trigger frame from the TWT requesting STA [xxxxx](#).

[NOTE—The TWT requesting STA is expected to send the PS-Poll or APSD trigger frame if the TWT is a trigger-enabled TWT.](#)

The TWT Flow Identifier subfield contains a 3-bit value, ~~which~~ [that](#) identifies the specific information for this TWT request uniquely from other requests made between the same TWT requesting STA and TWT responding STA pair.

The Broadcast TWT Recommendation subfield contains a value that indicates recommendations on the types of frames that are transmitted by TWT scheduled STAs and scheduling AP during the broadcast TWT SP, encoded according to the Broadcast TWT Recommendation field for a broadcast TWT element as defined in Table 9-297a. The Broadcast TWT Recommendation is reserved if transmitted by a TWT scheduled STA.

Table 9-297a—Broadcast TWT Recommendation field for a broadcast TWT element

<u>Broadcast TWT Recommendation field value</u>	<u>Description when transmitted by a broadcast TWT element</u>
<u>0</u>	<u>xxx</u>
<u>1</u>	<u>xxx</u>
<u>2</u>	<u>xxx</u>
<u>3</u>	<u>xxx</u>
<u>4-7</u>	<u>Reserved</u>

In a TWT element transmitted by a TWT requesting xxxxx STA, the TWT wake interval is equal to the average time that the ~~TWT requesting~~ STA expects to elapse between successive TWT SPs xxxxx. In a TWT element transmitted by a TWT responding STA xxxxx, the TWT wake interval is equal to the average time that the ~~TWT responding~~ STA expects to elapse between successive TWT SPs xxxxx. In a TWT ... (see 26.8.6). The TWT Wake Interval Exponent subfield is set to the value of the exponent of the TWT wake interval value in microseconds, base 2. The TWT wake interval of the requesting STA is equal to (TWT Wake Interval Mantissa) $\times 2^{(\text{TWT Wake Interval Exponent})}$.

~~If When~~ transmitted by a TWT requesting STA xxxxx, the Target Wake Time field contains ~~a positive xxx~~ integer corresponding to a TSF time at which the STA requests to wake, ~~or 0 when the TWT Setup Command subfield contains the value corresponding to the command "Request TWT"~~. If transmitted ... TSF value. ~~If When~~ a TWT responding STA with dot11TWTGroupingSupport equal to 0 transmits a TWT element to the TWT requesting STA, the TWT element contains a value in the Target Wake Time field corresponding to a TSF time at which the TWT responding STA requests the TWT requesting STA to wake xxxxx and it does not contain the TWT Group Assignment field.

Change the following block of text (i.e., now 31st through 40th paragraphs) (including inserting Figure 9-689a) in 9.4.2.199 as shown:

The Nominal Minimum TWT Wake Duration field indicates the minimum amount of time, in the units indicated by the Wake Duration Unit subfield ~~of 256 μ s~~, that the TWT requesting STA xxxxx ~~expects that it needs~~ to be awake in order to complete the frame exchanges ~~associated with the TWT flow identifier~~ for the period of TWT wake interval, where TWT wake interval is the average time that the TWT requesting STA xxxxx expects to elapse between successive TWT SPs.

The TWT Wake Interval Mantissa subfield is set to the value of the mantissa of the TWT wake interval value in microseconds, base 2.

The Broadcast TWT Info subfield is defined in Figure 9-689a.

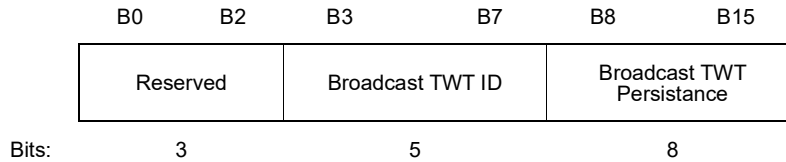


Figure 9-689a—Broadcast TWT Info subfield format

Within a TWT element that includes a TWT setup command value of Request TWT, Suggest TWT, or Demand TWT, the Broadcast TWT ID, if present, indicates a specific Broadcast TWT in which the transmitting STA is requesting to participate. Within a TWT element that includes a TWT setup command value of Accept TWT, Alternate TWT, Dictate TWT, or Reject TWT, the Broadcast TWT ID, if present, indicates a specific Broadcast TWT for which the transmitting STA is providing TWT parameters. Within a TWT element that includes a TWT setup command value of TWT Grouping, the Broadcast subfield is 0 and the Broadcast TWT ID, is not present. The value 0 in the Broadcast TWT ID subfield indicates the broadcast TWT whose membership corresponds to all STAs that are members of the BSS corresponding to the BSSID of the Management frame carrying the TWT element and that is permitted to contain Trigger frames with RA-RUs for unassociated STAs.

The Broadcast TWT Persistence subfield indicates the number of TBTTs during which the Broadcast TWT SPs corresponding to this broadcast TWT Parameter set are present. The number of beacon intervals during which the Broadcast TWT SPs are present is equal to the value in the Broadcast TWT Persistence subfield plus 1 except that the value 255 indicates that the Broadcast TWT SPs are present until explicitly terminated.

~~When transmitted by a TWT requesting STA that is negotiating SST operation, the TWT Channel field contains a bitmap indicating the channel the STA requests to use as a temporary primary channel during a TWT SP. When transmitted by a TWT responding STA that is negotiating SST operation, the TWT Channel field contains a bitmap indicating which channel the TWT requesting STA is allowed to use as a temporary channel during the TWT SP. When transmitted by a STA that is not negotiating SST operation, the TWT Channel field is reserved.~~

The TWT Channel field includes a bitmap that provides the channel that is being negotiated by a STA as a temporary channel during a TWT SP. Each bit in the bitmap corresponds to one minimum width channel for the band in which the TWT responding STA's associated BSS is currently operating, with the least significant bit corresponding to the lowest numbered channel of the operating channels of the BSS. ~~xxxxx~~ The minimum width channel is equal to the SST Channel Unit field of the SST Operation element if such an element has been previously received or is equal to 1 MHz for a BSS with a BSS primary channel width of 1 MHz and 2 MHz for a BSS with a BSS primary channel width of 2 MHz if no such element has been previously received from the AP to which the SST STA is associated. ~~xxxxx~~. Setting a position in the bitmap transmitted to 1 by a TWT requesting STA means that operation with that channel as the ~~temporary primary~~ channel is requested during a TWT SP. Setting a position in the bitmap transmitted to 1 by a TWT responding STA means that operation with that channel as the primary channel is allowed during the TWT SP. The TWT Channel field is used by an SIG STA as defined in 10.53 and is used by an HE STA as defined in 26.8.7. If the TWT channel field is 0 then the STA operates as define in 10.47 or 26.8.2.

A TWT requesting STA sets the TWT Protection subfield to 1 to request the TWT responding STA to provide protection of the set of TWT SPs corresponding to the requested TWT flow identifier by

- Allocating RAW(s) that restrict access to the medium during the TWT SP(s) for ~~the that(those)~~ TWTs ~~that are set up within an SIG BSS~~.
- Enabling NAV protection during the TWT SP(s) for the TWTs that are set up within an HE BSS

A TWT requesting STA sets the TWT Protection subfield to 0 if TWT protection ~~by RAW allocation~~ is not requested for the corresponding TWT(s).

~~When transmitted by a TWT responding STA that is an AP, the TWT Protection subfield indicates whether the TWT SP(s) identified in the TWT element will be protected. A TWT responding STA ~~or TWT scheduling AP~~ sets the TWT~~

Protection subfield to 1 to indicate that the TWT SP(s) corresponding to the TWT flow identifier(s) of the TWT element will be protected by

- ~~Allocating RAW(s) that restrict access to the medium during the TWT SP(s) for the that(those) TWT(s) where the TWT responding STA is an S1G STA.~~
- Enabling NAV protection during the TWT SP(s) for the TWTs that are set up within an HE BSS

A TWT responding STA sets the TWT Protection subfield to 0 to indicate that the TWT SP(s) identified in the TWT element might not be protected ~~from S1G STAs in TIM mode by allocating RAW(s).~~