IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CR for SCS related CIDs | | | | |
| Date: 2023-05-12 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Dibakar Das | Intel |  |  | Dibakar.das@intel.com |
|  |  |  |  |  |

Abstract

This submission proposes resolutions for following CIDs:

17775 15015 15017 16151 17140 15443 17139 16070 16071 16287 16288 16149 15814 15014 16072 16150 16152 15815 16709 17174 17171 16073 15587 15095 15586 16292 16074 17796 15816 15817 17172 16654 15818 16075 16153 16408 16289 17555 15362 16135 17774

Revisions:

* Rev 0: Initial version.

The changes are relative to 11be draft 3.1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Comment | Proposed Change | Resolution |
| 17775 | 9.6.18.3 | 316.11 | Worthwhile to identify that items in the SCS Status List and SCS Descriptor List are matched up by their mathcing SCSID values | Add requested clarification | **Revised.**  **Agree in principle.**  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17775 |
| 15015 | 9.6.18.3 | 316.12 | It is stated that an SCS Descriptor element might be included in an SCS Response frame when the Status code is SUCCESS.  However, while 35.17 describes usage of this element when the status code is REJECTED\_WITH\_SUGGESTED\_CHANGES, it does not seem to specify its usage when the Status code is success. | Either describe in 35.17 the usage of this element when status code is Success, or modify sentence in 9.6.18.3 to only refer to its inclusion with the REJECTED\_WITH\_SUGGESTED\_CHANGES status code | **Revised.**  **We delete the case of “SUCCESS”.**    **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15015 |
| 15017 | 35.17 | 653.13 | In two locations, the phrase "SCS Traffic Descriptor Support subfield" is used.  However the actual name of the subfield in 9.4.2.313.2 is SCS Traffic Description Support. | Change "Descriptor" to "Description" in two locations per comment | **Accept.** |
| 16151 | 35.17 | 654.13 | If the Status field set to SUCCESS and the QoS Characteristic element is included in the SCS Descriptor element of SCS Response frame, the four fields may different values in the requested SCS stream. In this case, does STA accept the different values in the received SCS Response frame without exception or transmit the SCS request for negotiation again? | Please clarify the case that the Status field value set to SUCCESS. | **Revised.**  **We delete the case of “SUCCESS”.**    **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15015 |
| 17140 | 35.17 | 653.13 | "containing SCS Descriptor element" missing article | As it says in the comment. Also line 15 | **Revised.**  **Added corresponding articles.**  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17140 |
| 15443 | 35.17 | 653.03 | The language in this clause is inconsistent with regard to MLO. It starts by describing how MLDs use the SCS procedure, then switches to STAs establishing streams, then indicates that the MLDs maintain the SCSIDs, then subsequently describes restrictions on SCS Request frames sent by non-AP STAs affiliated with non-AP MLDs. This inconsitency creates confusion about how the SCS procedure operates with regard to MLO. | Revise text to describe a consistent view of the operation of SCS at either the MLD or STA level. If the intent is to allow operation at both levels, depending on device capabilities, then clearly state that and describe which type of device (MLD or stand-alone EHT STA) is being addressed in each case. | **Reject.**  The clause describes SCS operation across the MLDs. The reference to STAs within this clause are limited to description of the signaling by each STA and the traffic description for direct links which is only valid for a given link. As such there is no ambiguity in SCS operation with respect to MLO. |
| 17139 | 35.17 | 653.08 | "establishes SCS stream" missing article | As it says in the comment | **Revised.**  **Added corresponding articles.**  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17139 |
| 16070 | 35.17 | 653.31 | Clarify that an AP MLD maintains SCS IDs specific to each non-AP MLD. | As in comment | **Revised.**  **Clarified that SCSIDs are maintained for each non-AP MLD.**  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16070 |
| 16071 | 35.17 | 653.43 | The SCS Request could indicate creation or modification of an SCS stream based on Request Type, not just creation of an SCS stream. | Modify to "...is interpreted as a request for creation or modification of an SCS stream that applies at the MLD level." | **Accept.** |
| 16287 | 35.17 | 653.54 | The sentence says that the QoS Characteristics element, when direct link or uplink, shall not contain the Intra-Access Category Priority Element. This is detrimental to QoS, as an EHT STA is no longer able to apply (802.11aa) alternate queuing compared to legacy STA. EHT STA is less efficient as legacy STA. | Please modify the sentence by allowing use of Intra-Access Category Priority Element for Direct-link or Uplink. The use of such element has no impact for AP scheduling, but large impact on STAs if no longer allowed (by keeping alternate queueing, the STA can also indicate to its AP that it uses a dedicated classification for an UL or direct link stream). | **Reject.**  The commenter failed to identify the value of such signaling information to AP. |
| 16288 | 35.17 | 653.54 | It seems the sentence "QoS Characteristics element, when direct link or uplink, shall not contain the Intra-Access Category Priority Element" makes the Alternate AC queueing deprecated for EHT. EHT STAs have less QoS support than legacy STAs. This has to be explicitly said. | It is mandated to clarify this point : Either it is deprecated or not (if not, provide the reasoning of such limitation of having no Intra Access Category element, by example by a Note). | **Reject.**  The legacy STAs use Intra-AC Priority element for influencing DL scheduling at the AP. That behavior is not deprecated. |
| 16149 | 35.17 | 653.56 | There are no sentence about whether Intra-Access Category Priority Element is included in SCS Descriptor element when Direction subfield of QoS Characteristic element is equal downlink. (According to the definition for Intra-Access Category Priority Element in REVme(D3.0,P1162L15), the element is present in SCS Descriptor when Request Type is "Add" or "Change".) | Please add the following sentence:"Intra-Access Category Priority Element shall be included in SCS Descriptor element if the SCS Descriptor element contains a QoS Characteristic element in which the Direstion subfield is equal to downlink." | **Reject**  The following sentence in P658L29 already clarifies that the EHT SCS procedure includes baseline SCS procedures which include DL traffic prioritization using TCLAS and Intra-AC Priority elements. “ An EHT STA establishes SCS stream with an EHT AP, as defined in 11.25.2 (SCS procedures), subject tothe additional rules and restrictions defined in this subclause.” |
| 15814 | 35.17 | 653.60 | REQUEST\_TCLAS\_NOT\_SUPPORTED\_BY\_AP should be REQUESTED\_TCLAS\_NOT\_SUPPORTED\_BY\_AP | as in comment | **Accept.** |
| 15014 | 35.17 | 653.61 | In multiple locations in this subclause (and also 9.6.8.13), REJECTED\_WITH\_SUGGESTED\_CHANGES status code is referenced.  However, the "meaning" of this status code in REVme needs updating since it currently says a TSPEC is provided with the response.  Whereas in SCS case, a QoS Characteristics element is provided in the response. | See comment | **Revised.**  **Agree in principle. Revised the corresponding description in Table 9-78.**  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15014 |
| 16072 | 35.17 | 654.07 | Clarify the use case when AP would include a QoS Characteristics element in the SCS Response frame with the Status field value set to SUCCESS. | Add a Note to clarify per comment. | **Revised.**  **We delete the case of “SUCCESS”.**    **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15015 |
| 16150 | 35.17 | 654.07 | If the Status field is set to REJECTED\_WITH\_SUGGESTED\_CHANGES, then the QoS Characteristic element included in the SCS Descriptor element of the SCS Response frame indicates suggested parameters for the AP side. However, there is no reason if the Status field is set to SUCCESS, which means accepting all parameters in the SCS request frame. | Please clarify the case that the Status field value set to SUCCESS. | **Revised.**  **We delete the case of “SUCCESS”.**    **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15015 |
| 16152 | 35.17 | 654.16 | The four fields(Minimum Service Interval, Maximum Service Interval, Service Start Time, and Medium Time) in the QoS Characteristic element are set to different values in the SCS Response frame. There is better to describe why these four fields are selected and whether the other fields can have different values from the corresponding values in the requested SCS stream, which is that the Status field value is set to REJECD\_WITH\_SUGGESTED\_CHANGES. | As in the comment | **Revised.**  **We clarified that this fields are not sent when status code is “SUCCESS”.**    **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15015 |
| 15815 | 35.17 | 654.19 | The paragraph starting with "A non-AP EHT STA with dot11EHTTXOPSharingTFOptionImplemented equal to true.." currently applies only to STAs that support TXOP sharing mode 2. What about STAs with dot11EHTTXOPSharingTFOptionImplemented equal to false? Shall they not transmit SCS Request with QoS IE with direct link? Please clarify in the paragraph | as in comment | **Revised.**  We revised the text to clarify the intent is indeed to limit usage of this signaling when both AP and STA support TXS with Mode 2.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15815 |
| 16709 | 35.17 | 654.25 | QoS characteristics is the traffic profile maintained at the MLD level, but is used by the AP MLD and affiliated APs or non-AP MLD and affiliated STAs to schedule transmissions on corresponding enabled links. It needs to clarify that the scheduled transmission on each link should meet the requirement of QoS Characteristics. | The QoS Characteristics element is a reference for the EHT AP's scheduling transmission on the enabled links. An EHT AP should schedule transmission of downlink frames on one or more enabled links such that the delay bound and minimum data rate requested are met for the downlink Data frames if the Direction subfield of the QoS Characteristics element indicates downlink. An EHT AP should enable on one or more enabled links the transmission of uplink frames from the EHT STA with an interval that falls between the requested minimum and maximum service intervals and the requested minimum data rate is met requested if the Direction subfield of the QoS Characteristics element indicates uplink. | **Revised.**  We revised the text along the lines suggested by commenter.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16709 |
| 17174 | 35.17 | 654.25 | "An EHT AP should enable the transmission of uplink frames ..", "The transmission of uplink Data frames should be enabled by using Basic Trigger frames or alternatively by using MU-RTS TXS Trigger frames ...". STAs having latency sensitive traffic which characteristics which can be sent through the QoS Characteristics element should also be facilitated the uplnik transmission through R TWT intervals set according to these characteristics even when these STAs are not using triggered access. An option of non triggered r twt should be explictly mentioned in this context. | as in comment | **Reject**  The purpose of the text is to emphasize the usage of Trigger based mechanism to solicit UL or Direct Link frames. However, the text does not preclude other usages not involving Trigger frames using the information in QoS Characteristics element. |
| 17171 | 35.17 | 654.28 | "An EHT AP should enable the transmission of direct link frames from the EHT STA to another STA on the link specified in ...", "The transmission of uplink Data frames should be enabled by using Basic Trigger frames or alternatively by using MU-RTS TXS Trigger frames". It is actually more "facilitate" than "enable" as enable implies that the AP already has access to the channel, which cannot be guaranteed. | change "enable" to "facilitate" or add a formulation such as "subject to channel access rules". | **Revised.**  We revised the text to replace usage of “enable” with “facilitate”.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17171 |
| 16073 | 35.17 | 654.29 | There are two requirements for uplink scheduling captured in the same sentence (one for service interval and other for min data rate). The first requirement applies for the case when SCS traffic is not delivered in an R-TWT SP. Split these two requirements into separate requirement and modify the first requirement as indicated. | Split the requirement and modify the first part to "An EHT AP should enable the transmission of uplink frames from the EHT STA with an interval that falls between the requested minimum and maximum service intervals if the traffic is not served in R-TWT SPs." | **Revised.**    The interval in which AP schedules UL transmissions could overlap an r-TWT SP. As such there is no need to add any exception. However, fixed a minor typo.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16073 |
| 16662 | 35.17 | 654.32 | The AP's schedule for direct link traffic should gurantee the agreeed medium time under the reference BW in QoS Chracteristics element of SCS Response frame | As in comment |  |
| 15587 | 35.17 | 654.34 | Change: in the LinkID subfield of the Control Info field  To: in the LinkID subfield of the Control Info field of the QoS Characteristics element | As in comment | **Accept.** |
| 15095 | 35.17 | 654.37 | EHT is yet missing a non-TB access variant. | Please add an EDCA variant in which a STA may access the channel without being triggered before. For example, the STA may be part of a non-trigger-enabled R-TWT or TWT which aligns to the signaled service intervals. (The commenter may assist in comment resolution) | **Reject**  The purpose of the text is to emphasize the usage of Trigger based mechanism to solicit UL or Direct Link frames at a TXOP level. However, the text does not preclude other usages not involving Trigger frames using the information in QoS Characteristics element. |
| 15586 | 35.17 | 654.39 | Change: An EHT AP should enable the transmission of direct link frames from the EHT STA to another STA  To: An EHT AP should enable the transmission of direct link frames from the EHT STA to another EHT STA | As in comment | **Reject.**  The peer STA need not be an EHT STA. |
| 16292 | 35.17 | 654.44 | The chapter deals with EHT STA operating as a TWT scheduled STA or TWT requesting STA. The sentence further mentions "there are  negotiated TWT SPs for the TID specified in the QoS Characteristics element". This seems erroneous as TID are not considered by TWT (only R-TWT considers TIDs). | Clarify the scenario envisaged by the sentence. | **Revised.**  Removed reference to TID in that sentence.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16292 |
| 16074 | 35.17 | 654.45 | This requirement is related to TWT SPs for which TID does not apply. | Remove mention of TID from this requirement. | **Revised.**  Removed reference to TID in that sentence.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16292 |
| 17796 | 35.17 | 654.46 | The TWT operation in 26.8 does not allow the indication of specific TIDs for a TWT schedule hence its better to revise this sentence to indicate that the negotiated TWT SPs should be aligned with the service intervals specified in the QoS Characteristics element | As in the comment | **Revised.**  Removed reference to TID in that sentence.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16292 |
| 15816 | 35.17 | 654.47 | "the EHT AP should ensure that the service interval aligns with negotiated TWT wake intervals": sevice interval aligns with -> service intervals align with | as in comment | **Accept.** |
| 15817 | 35.17 | 654.49 | Two places in this paragraph only mention TID specified in QoS Char IE. Direction should also be mentioned as R-TWT TIDs may be different for UL vs DL direction. Also "trigger-enabled R-TWT" -> "trigger-enabled R-TWT SPs" | as in comment | **Revised**  Added clarification about Direction and added “SPs”.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15817 |
| 17172 | 35.17 | 654.49 | "If the EHT STA is an R-TWT scheduled STA (see 35.8 (Restricted TWT (R-TWT))) and there are negotiated R-TWT SPs for the TID specified in the QoS Characteristics element then the EHT AP should use these .." The cases that EHT STA has Restricted TWT Supported = 1 but an R TWT SP has not been negotiated or the EHT STA is not a member of an R TWT SP with TID specified are not covered. | describe behaviour for the case mentioned. | **Reject.**  For the case mentioned by commenter, it is covered in P659L49-P660L2. |
| 16290 | 35.17 | 654.53 | The sentence "If negotiated R-TWT SPs for the TID specified in the QoS Characteristics element are trigger-enabled R-TWT" is strange.  This is because the R-TWT setup procedure (35.8.2.2) requests the AP to set the Trigger field. | replace "if negotiated R-TWT SPs" by "As negotiated R-TWT SPs". |  |
| 16654 | 35.17 | 654.53 | "trigger frames" in the text (P654,L53) should be replaced by "Trigger frames". | Change the wording of "trigger frames" to "Trigger frames". | **Accept.** |
| 15818 | 35.17 | 655.03 | "the AP shall process subsequent incoming individually addressed MSDUs": this should be "the APs affiliated with the AP MLD shall process.." since SCS applies at MLD level | as in comment | **Revised.**  Clarified that this sentence applies to AP MLD.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #15818 |
| 16075 | 35.17 | 655.08 | Status field is set to Status Code and there is no "Terminate" status code defined. | Clarify which status code is referred to here. | **Revised.**  **Revised the text to clarify that the status code for rejection is same as that in baseline SCS procedure i.e., “**TCLAS\_PROCESSING\_TERMINATED”.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16075 |
| 16153 | 35.17 | 655.08 | "Terminate" doesn't exist in the Status code based on REVme and 11be spec. | Please change to an appropriate status code | **Revised.**  Revised the text to clarify that the status code for rejection is same as that in baseline SCS procedure i.e., “TCLAS\_PROCESSING\_TERMINATED”.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16075 |
| 16413 | 35.17 | 654.29 | Whether to meet the requirement of delay bound for uplink transmission specified by QoS Characteristics element for a request is unclear. | Suggest to add a rule that an EHT AP should schedule transmission of uplink frames such that the delay bound requested is met for the uplink data frames if the Direction subfield of the QoS Characteristics element indicates uplink. |  |
| 16408 | 35.17 | 654.44 | "If the EHT STA is a TWT scheduled STA or TWT requesting STA (see 26.8 (TWT operation)) and there are negotiated TWT SPs for the TID specified in the QoS Characteristics element with the EHT AP, the EHT AP should ensure that the service interval aligns with negotiated TWT wake intervals." seems to be incomplete. Firstly the direction is not considerred. Secondly if the TWT is not limited to R-TWT SPs, why TID is related with the SPs? | Please clarify how to consider the TID and direction specified in the QoS Characteristics element together and whether TWT SPs are limited to R-TWT SPs. | **Revised.**  Removed reference to TID in that sentence.  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #16292 |
| 16410 | 35.17 | 654.44 | If the QoS Data frames of the R-TWT TID delivered during the R-TWT SPs corresponds to a traffic flow specified by a QoS Characteristics element with delay bound for the uplink or downlink direction, the further rule needed to meet the requirement of delay bound is unclear. | Suggest to add a rule that "if the QoS Data frames of the R-TWT TID delivered during the R-TWT SPs corresponds to a traffic flow specified by a QoS Characteristics element with delay bound for the uplink or downlink direction, the delay bound for the uplink or downlink direction corresponding to the QoS Data frames of the R-TWT TID should be met". |  |
| 16289 | 9.4.2.121 | 235.46 | The SCS is used in the context of a particular non-AP EHT STA. Therefore, the STA has to report when it uses alternate queueing : " Intra-Access Category Priority Element field is present when Request Type field is equal to "Add" or "Change" "(REVme D2.1).  The sentence in 802.11be D3.0 p653/l54, that says "QoS Characteristics element, when direct link or uplink, shall not contain the Intra-Access Category Priority Element", makes the Alternate AC queueing deprecated for EHT. EHT STAs have less QoS support than legacy STAs. This is unconsistent with REVme | Harmonize the 2 sections. | **Reject.**  The sentence does not deprecate usage of intra-AC Priority element in DL case which is the only traffic direction covered in baseline SCS. |
| 17555 | 9.4.2.121 | 235.50 | "Zero or one XX element" reads badly ro the case of "Zero XX elements" | 3x in the subclause. Try "Zero or one XX element(s)" or "Zero XX elements or one XX element" | **Revised.**  **Replaced those occurrences with “** Zero or one XX element(s)"  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17555 |
| 15362 | 9.4.2.121 | 236.04 | Nouns following zero should be plural, but doing so in this sentence would be confusing: "The QoS Characteristics Element field contains zero or one QoS Characteristics element..." | Rephrase as "The QoS Characteristics Element field contains at most one QoS Characteristics element to describe the traffic characteristics and QoS expectations of traffic flows that belong to this SCS stream, as defined in 9.4.2.316 (QoS Characteristics element). At most one QoS Characteristics element is present | **Revised.**  Replaced occurrences of “"Zero or one XX element" with “ Zero or one XX element(s)"  **TGbe editor:** please implement changes as shown in doc 11-23/0609 tagged as #17555 |
| 16135 | 9.6.18.3 | 315.56 | Figure 9-1176 (SCS Response frame Action field format) doesn't include Count field showed in P1658L1 of REVme D2.0. | The figure of SCS Response frame add Count field between Dialog Token field and SCS Status List field. | **Revised.**  **TGbe editor:** please update Figure 9-1183 in 11be draft to reflect the format in REVme draft 3.0 plus the changes introduced in 11be draft 3.1. |
| 17774 | 9.6.18.3 | 316.06 | Probably unintendedly ambiguous antecedent (It => "another MLD") | Try "If present, the SCS Descriptor List field ..." | **Accept.** |

***Please revise the following entry in P757L14 of REVme draft 3.0******as follows:***

**Table 9-78—Status codes**

|  |  |  |
| --- | --- | --- |
| **Status code** | **Name** | **Meaning** |
| 39 | REJECTED\_WITH\_SUGGESTED\_CHANGES | The allocation or TS (or SCS stream) has not been created because the request cannot be honored; however, a suggested TSPEC/DMG TSPEC (or QoS Characteristics) is provided so that the initiating STA can attempt to set another allocation or TS (or SCS stream) with the suggested changes to the TSPEC/DMG TSPEC (or QoS Characteristics) (#15014). |

***Please revise Figure 9-603 and the text starting in P236L5 of 11b draft 3.1******as follows:***

zero or zero or one QoS   
 more Characteristics   
 TCLAS Element (s) (#17555) (#13751)  
 Elements

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | SCSID | Request Type | Intra-Access Category Priority Element (optional) | TCLAS Elements (optional) | TCLAS Processing Element (optional) | QoS Characteristics Element (optional) | Optional Subelements |

**Figure 9-603—SCS Descriptor element format**

The QoS Characteristics Element field contains zero or one QoS Characteristics element(s) (#17555) to describe the traffic characteristics and QoS expectations of traffic flows that belong to this SCS stream, as defined in 9.4.2.316 (QoS Characteristics element). Zero or one QoS Characteristics element(s) (#17555) is present when the Request Type field is equal to “Add” or “Change” and no QoS Characteristics element is present when the Request Type field is equal to “Remove”.

***TGbe editor: Please revise the paragraph starting in P317L5 of draft 3.1******as follows:***

The SCS Descriptor List field is optionally present when the SCS Response frame is sent from a STA affiliated with an MLD to a STA affiliated with another MLD. If present, the SCS Descriptor List field (#17774) contains zero or more SCS Descriptor elements, as defined in 9.4.2.121 (SCS Descriptor element). Each SCS Descriptor element contains a QoS Characteristics element to describe the traffic characteristics and QoS expectations of traffic flows that belong to this SCS stream identified by the SCSID field value in the same SCS Descriptor element. For each SCS Status duple in the SCS Status List field with Status subfield value equal to “REJECTED\_WITH\_SUGGESTED\_CHANGES”, zero or one SCS Descriptor element is present whose SCSID field value matches the value of the SCSID subfield value in the SCS Status duple and no SCS Descriptor element is present otherwise. (#17775, 15015)

***TGbe editor: Please revise 35.17 of draft 3.1******as follows:***

**35.17 EHT SCS procedure**

The SCS procedure is used by a non-AP MLD to request an AP MLD to classify incoming individually addressed MSDUs based on parameters provided by the non-AP MLD and/or describe its traffic characteristics to an AP MLD.

An EHT STA establishes an (#17139) SCS stream with an EHT AP, as defined in 11.25.2 (SCS procedures), subject to the additional rules and restrictions defined in this subclause.

A non-AP EHT STA with dot11SCSActivated equal to true that supports transmission of SCS Request frames containing an (#17140) SCS Descriptor element with a QoS Characteristics element shall set the SCS Traffic Description(#15017) Support subfield value in the EHT Capabilities element that it transmits to 1. An EHT AP with dot11SCSActivated equal to true that supports transmission of SCS Response frames containing an (#17140) SCS Descriptor element with a QoS Characteristics element shall set the SCS Traffic Description(#15017) Support subfield value in the EHT Capabilities element that it transmits to 1. All STAs affiliated with an MLD shall set the SCS Traffic Description Support subfield of the EHT Capabilities element that they transmit to the same value.

A non-AP EHT STA may transmit an SCS Request frame with SCS Descriptor element(s) containing a QoS Characteristics element if the Request Type field in the frame is set to “Add” or “Change”. The QoS Characteristics element describes the traffic characteristics of the requested SCS stream. A non-AP EHT STA shall not transmit an SCS Request frame with SCS Descriptor element(s) containing a QoS Characteristics element to an AP from which it has not received an EHT Capabilities element with the SCS Traffic Description Support field equal to 1.

The MLDs maintain SCSIDs for each non-AP MLD(#16070) at MLD level, i.e., the SCSID used by a non-AP STA affiliated with a non-AP MLD in an SCS Request frame transmitted to an AP affiliated with an AP MLD is unique across all STAs affiliated with the non-AP MLD.

All STAs affiliated with an MLD shall set the SCS field of the Extended Capabilities element that they transmit to the same value. The SCSID is used by a non-AP MLD to request creation, modification, or deletion of an SCS stream. The SCSID is used by an AP MLD to identify an SCS stream in SCS responses.

An SCS Request frame sent by a non-AP STA affiliated with a non-AP MLD to the AP of an AP MLD that contains a QoS Characteristics element in which the Direction subfield is set to uplink or downlink or one that does not contain a QoS Characteristics element is interpreted as a request for creation or modification (#16071) of an SCS stream that applies at the MLD level.

If the SCS Descriptor element contains a QoS Characteristics element in which the Direction subfield is equal to downlink, then the TCLAS Elements field shall be included in the SCS Descriptor element and the TCLAS Processing Element field may be included in the SCS Descriptor element. The TCLAS Elements and the TCLAS Processing Element fields, if present, describe the traffic classification the non-AP STA requests the AP to apply to the corresponding stream.

An SCS Descriptor element contained in an SCS Request frame in which the QoS Characteristics subelement is present and the Direction subfield in the QoS Characteristics element is equal to direct link or uplink shall not contain the Intra-Access Category Priority Element, TCLAS Element, and TCLAS Processing Element fields.

A value of REQUEST\_DECLINED, REQUESTED\_TCLAS\_NOT\_SUPPORTED\_BY\_AP (#15814), REJECTED\_WITH\_SUGGESTED\_CHANGES, or INSUFFICIENT\_TCLAS\_PROCESSING\_RESOURCES shall be set in the corresponding SCS Status field of the SCS status duple in the SCS Response frame when an EHT AP denies the SCS request for the requested SCSID.

If the SCS Request frame with an SCS Description element containing a QoS Characteristics element is rejected by an EHT AP by setting the Status field value to REJECTED\_WITH\_SUGGESTED\_CHANGES, the AP shall include an SCS Descriptor element containing a QoS Characteristics element in the SCS Response frame signaling the suggested QoS characteristics parameters for this SCS stream. An AP shall include an SCS Descriptor element containing a QoS Characteristics element in an SCS Response frame with the Status field value set to (#15015)REJECTED\_WITH\_SUGGESTED\_CHANGES only if the SCS Descriptor element in the corresponding SCS Request frame contained a QoS Characteristics element.

The SCS Descriptor element that is included in an SCS Response frame shall not contain any Intra-Access Category Priority element, TCLAS Elements field or TCLAS Processing Element field. The Request Type field value in the corresponding SCS Descriptor element is reserved. The following fields in the QoS Characteristics element included in the corresponding SCS Descriptor element in the SCS Response frame may differ from the corresponding values in the requested SCS stream: Minimum Service Interval, Maximum Service Interval, Service Start Time, and Medium Time.

A non-AP EHT STA with dot11EHTTXOPSharingTFOptionImplemented equal to true may send an SCS request that contains a QoS Characteristics element whose Direction field is set to 2 (Direct Link) only if both the STA and the associated EHT AP set the Triggered TXOP Sharing Mode 2 Support subfield in the EHT Capabilities element that they transmit to 1(#15815).

The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should schedule transmission of downlink frames on enabled links (#16709) such that the delay bound and minimum data rate requested are met for the downlink Data frames if the Direction subfield of the QoS Characteristics element indicates downlink. An EHT AP should facilitated (#17171) the transmission of uplink frames on enabled links (#16709) from the EHT STA within (#16073) an interval that falls between the requested minimum and maximum service intervals and the AP should meet the minimum data rate requested if the Direction subfield of the QoS Characteristics element indicates uplink. An EHT AP should facilitated (#17171) the transmission of direct link frames from the EHT STA to another STA on the link specified in the LinkID subfield of the Control Info field of the QoS Characteristics element (#15587) with an interval that falls between the requested minimum and maximum service intervals.

The transmission of uplink Data frames should be facilitated (#17171) by using Basic Trigger frames or alternatively by using MU-RTS TXS Trigger frames if both EHT STAs have dot11EHTTXOPSharingTFOptionImplemented equal to true. The transmission of direct link frames should be facilitated (#17171) by using MU-RTS TXS Trigger frames if both EHT STAs have set the Triggered TXOP Sharing Mode 2 Support field in their transmitted EHT Capabilities elements to 1.

If the EHT STA is a TWT scheduled STA or TWT requesting STA (see 26.8 (TWT operation)) and there are negotiated TWT SPs (#16292), the EHT AP should ensure that the service intervals align(#15816) with negotiated TWT wake intervals.

If the EHT STA is an R-TWT scheduled STA (see 35.8 (Restricted TWT (R-TWT))) and there are negotiated R-TWT SPs for the TID specified in the QoS Characteristics element in the same direction (UL or DL) as indicated by the Direction subfield in the QoS Characteristics element then the EHT AP should use these R-TWT SPs to serve traffic corresponding to the TID and specified direction in the QoS Characteristics element. If negotiated R-TWT SPs for the TID specified in the QoS Characteristics element are trigger-enabled R-TWT SPs (#15817), then the EHT AP should ensure that the Trigger(#16654) frames are scheduled at the start of the R-TWT SPs.

The EHT AP may discard a downlink data frame if the lifetime of the frame has exceeded the value specified by the MSDU Lifetime field.

NOTE—A QoS Characteristics element provided by a non-AP EHT STA is used by a receiving EHT AP to facilitate the creation of a schedule for contention based channel access (EDCA) or MU operation. How the AP uses the information provided by the non-AP STA QoS Characteristics element that do not have corresponding normative requirements is beyond the scope of the standard.

If the requested SCS is accepted by an EHT AP MLD and the SCS Descriptor element either did not contain a QoS Characteristics element or contained a QoS Characteristics element in which the Direction subfield is equal to downlink, the AP MLD (#15818) shall process subsequent incoming individually addressed MSDUs from the DS or WM that match the TCLAS Elements field and optional TCLAS Processing Element field specified in the SCS Descriptor element as described in 11.25.2 (SCS procedures).

An SCS Response frame transmitted by an EHT AP that contains a value of “TCLAS\_PROCESSING\_TERMINATED”(#16075) in the Status field of an SCS status duple shall not contain a QoS Characteristics element.