IEEE P802.11
Wireless LANs

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| CR for SCS related CIDs |
| Date: 2022-07-25 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Dibakar Das | Intel |  |  | dibakar.das@intel.com |
| Dave Cavalcanti |  |  |  |  |
| Necati Canpolat |  |  |  |  |
| Laurent Cariou |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission addressed the following CIDs relative to 11be draft 2.1.1:

12710 13751 13752 13491 13250 12335 10430 13429 10767 12333 13430 13431 10423 12278 13432 10431 10768 14041 10432 13433 10258 12717 12073 13249 13248 13111 12433 13822 12279 13823 11955 11956 11957 11958 10388

Revisions

* Rev 0: initial version incorporating comments esp. from Binita, Alfred.

| **CID** | **Page** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 12710 | 200.29 | 200.29 | SCS procedure can also be used to classify locally incoming individual MSDUs by the non-AP STA. Alternate queuing is an existing and easy way to separate traffic flows (latency sensitive compared to non-latency sensitive) | As stated by 4.3.26.3 Stream classification service (SCS), the Intra-access category element allows MSDUs matching the classification to be assigned to the primary or alternate EDCA transmit queues so that finer grained prioritization can be applied.Update 9.4.2.120 text with routing latency sensitive traffic onto an alternate queue. | **Reject.** The commenter failed to identify a specific issue that’s not already covered in baseline spec’s 11.25.2 SCS procedures regarding use of Intra-Access Category Priority element with SCS.  |
| 13751 | 200.38 | 9.4.2.121 | Elements should be Element | Change "Elements" to "Element" | **Revised.** Made corresponding change. **TGbe editor:** Apply the changes tagged with #13751 in this document |
| 13752 | 200.43 | 9.4.2.121 | The field name should be "QoS Characteristics Element" because at most one such element can be present | Change "QoS Characteristics Elements" to "QoS Characteristics Element" | **Accepted.**  |
| 13491 | 265.22 | 9.6.18.3 | SCS negotiation is MLD level negotiation. | update the text per the comment | **Revised.**Clarified that the exchange is between two STAs affiliated with an MLD. **TGbe editor:** Apply the changes tagged with #13491 in this document |
| 13250 | 265.27 | 9.6.18.3 | For the Status code "REJECTED\_WITH\_SUGGESTED\_CHANGES", one SCS Descriptor element must be present for the corresponding SCSID with the QoS Characteristics element with suggested changes. Text implies that in this case 'zero' SCS Descriptor element may be present. Fix text to address this. | As in comment | **Reject.**The text in clause 9 does not describe the complete conditions determining presence of a field. This sentence is clarified in clase 35 P488L48 in draft 2.1.1: “If the SCS Request frame with an SCS Description element containing a QoS Characteristics element isrejected 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 SCSResponse frame signaling the suggested QoS characteristics parameters for this SCS stream.” |
| 12335 | 476 | 35.3.22 | Based on the current TID space (0-7) used in the SCS mechanism, the SCS mechanism cannot prioritize a particular SCS stream. Please fix this issue or add a note to clarify this limitation for the 11be defined SCS mechanism. | As in comment | **Reject.**  The SCS mechanism, even the baseline version, allows prioritization of QoS flows through classification see P2971L48 in REVme draft 1.2:“The classification allows the UP, drop eligibility, and EDCA transmit queue to be selected for all MSDUsmatching the classification.”  |
|  |  |  |  |  |  |
| 10430 | 476.47 | 35.3.22 | Since SCS procedure is at MLD levelï¼Œit can not meet the requirement of low lantency when the AP MLD use another link to exchange frames corresponding to the TID specified in the SCS procedure and the STA operating on the link is in the power save mode;Because the STA may in the doze state when the AP intends to transmit frames,the AP has to buffer the frames,which may cause the unacceptable lantency(e.g. AP1 and STA1 operate on link1 for frame exchanges specified in the prior SCS procedure,then AP MLD uses AP2 on link2 to assist the low lantency transmission.But the STA2 on link2 is in power save mode and the AP2 has to buffer the corresponding transmission)We need a method to prevent the corresponding STA from being in the doze state when the relevant frames come | as the comment | **Reject.** The SCS procedure is about providing application-level traffic stream information exchange. This is distinct from other power-save and scheduling tools (e.g., TWT, PS signaling). The comment is about incorrect PS setting which stems from a wrong implementation-specific choice rather a inefficiency of the SCS mechanism.  |
| 13429 | 476.49 | 35.3.22 | SCS is related to MLD level processing. | Change the text per the comment. | **Revised.** Modified the first sentence in the section to clarify this. The later text in the section clarifies that MLDs maintain SCSIDs at MLD level but at the same time SCS could also be used to exchange information about a direct link traffic characteristics on one of links in a MLD.**TGbe editor:** Apply the changes tagged with #13751 in this document |
| 10767 | 476.54 | 35.3.22 | When an EHT STA establishes an SCS stream, an SCSID is also generated. The stream may share a TID with other streams or other traffic from the EHT AP. On the EHT STA side, there is no way to differentiate multiple traffic streams (SCS or non-SCS) because they are sharing the TID. This may cause the head-of-line blocking problem delaying the SCS stream requiring higher QoS. | Adding signaling of the SCSID to the MSDU (A-MSDU) carrying the SCS stream while some other streams are sharing the same TID so that the receiver can do traffic prioritation accordingly. | **Reject.**The head-of-line blocking problem potentially arises only when there are multiple SCS flows that get mapped to same TID at the same time. However, this can be resolved largely by implementation-specific MSDU prioritization at the sender side.  |
| 12333 | 476.54 | 478.10 | Based on the current text and the TID space (0-7), it is possible that multiple SCS streams are mapped to the same TID. For example, SCS stream #1 without a QoS Characteristic element and SCS stream #2 with a QoS Characteristic element are mapped to TID 7. In this case, it is meaningless to use the QoS Characteristics element as a reference for the AP's scheduling. | Please fix this issue | **Reject.** The commenter is hinting at a potential Head-of-line blocking problem. However, this can be resolved largely by implementation specific MSDU prioritization at the sender side. |
| 13430 | 476.58 | 35.3.22 | A non-AP EHT STA with dot11SCSActivated equal to true will always supports transmission of SCS Request frames containing SCS Descriptor element. The sentence means that a non-AP EHT STA with dot11SCSActivated equal to true may support the transmission of SCS Request frames containing SCS Descriptor element. | delete "that supports transmission of SCS Request frames containing SCS Descriptor element with a QoS Characteristics element" from the sentence. | **Reject.**A STA that has dot11SCSActivated equal to true need not support ability to send QoS Characteristics element within the SCS Request frame.  |
| 13431 | 476.60 | 35.3.22 | An EHT AP with dot11SCSActivated equal to true will always supports transmission of SCS Response frames containing SCS Descriptor element. The sentence means that an EHT AP with dot11SCSActivated equal to true may support the transmission of SCS Response frames containing SCS Descriptor element. | delete "that supports transmission of SCS Request frames containing SCS Descriptor element with a QoS Characteristics element" from the sentence. | **Reject.**A STA that has dot11SCSActivated equal to true need not support ability to send QoS Characteristics element within the SCS Request frame. |
| 10423 | 476.62 | 35.3.22 | An EHT AP with dot11SCSActivated equal to true that supports transmission of SCS Response frames containing SCS Description element with a QoS Characteristics element'.The term should be change to 'SCS Descriptor element' | as the comment | **Revised.** Fixed the typo. **TGbe editor:** Apply the changes tagged with #10423 in this document |
| 12278 | 476.62 | 35.3.22 | "..frames containing SCS Description element with a...", replace 'SCS Description element' with 'SCS Descriptor element' | As in comment. | **Revised.** Fixed the typo. **TGbe editor:** Apply the changes tagged with #12278 in this document |
| 13432 | 477.04 | 35.3.22 | change the sentence to "A non-AP EHT STA may transmit an SCS Request frame with SCS Descriptor element(s) containing a QoS Characteristics element with the Request Type field in the frame set to "Add" or "Change"." | As in comment | **Revised.** Fixed the typo. **TGbe editor:** Apply the changes tagged with #13432 in this document |
| 10431 | 477.06 | 35.3.22 | The sentence is incomplete. | if the Request Type field in the frame is set to "Add" or "Change". | **Revised.** Fixed the typo. **TGbe editor:** Apply the changes tagged with #13432 in this document |
| 10768 | 477.23 | 35.3.22 | Whiling negotiating the SCS, in additon to carrying the QoS requirements, the STA shall be able to carry other signaling such as TID sharing policy so that AP can accommodate the SCS request accordingly. Such policy indicator can the help AP to arrange the TID mapping and to choose satisfying the SCS request or rejecting the request. | Adding signaling to indicate the TID sharing policy in the SCS request frame. The signaling can indicate either that the SCS stream does not intend to share the TID with other SCS/non-SCS streams or that the SCS stream can accept the TID sharing, and provide more information of what the sharing policy it wants. AP may reject the SCS request if it cannot satisfying the TID sharing request. | **Reject.** While the AP can take into account the traffic flow information signaled during SCS frame exchanges in determining TID-to-link mapping, the commenter failed to identify the specific issue in not merging the signaling for the two orthogonal features.  |
| 14041 | 477.23 | 35.3.22 | Is it true that an SCS Request frame sent by a non-AP STA affiliated with a non-AP MLD to the AP of an AP MLD is a request for creation of an SCS stream that applies at the MLD level, except Direct link? Rephase the sentence to make it clear. | As in comment. | **Reject.**The current text seems to already clarify that the SCS Request frame is for creation of SCS stream that applies at MLD level except for the Direct Link case.  |
| 10432 | 477.33 | 35.3.22 | Typo | 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. | **Revised.** Fixed the typo. **TGbe editor:** Apply the changes tagged with #10432 in this document |
| 13433 | 478.01 | 35.3.22 | This "shall" requirement should be decided by whether non trigger-enabled r-TWT is allowed by 11be or not. | As in comment | **Reject.****The comment fails to identify a technical issue.**  |
| 10258 | 478.07 | 35.3.22 | Text provides normative requirements on AP's scheduling behavior. When scheduling downlink traffic or allocating uplink transmissions, an AP should give preference to PDUs to/from STAs affiliated with non-AP MLDs with EPCS enabled. | Add requirements indicating the APs should give preference in scheduling for non-AP MLDs with EPCS enabled | **Rejected.**An AP has already given high priority to EPCS STAs by allowing them to access with higher EDCA parameters compared to non-EPCS STAs. EPCS STAs are also free to use any of the additional mechanisms if they like to get additional prioritization (scheduling wise) from the AP (such as SCS, R-TWTs and so on, because unless the AP knows their traffic patterns the AP cant prioritize further as scheduling needs some prior information provided by the STA (via SCS and so on). |
| 12717 | 478.07 | 35.3.22 | The transmission of direct link frames shouldbe enabled by using MU-RTS TXS Trigger frames in an r-TWT period. In that case, the EHT STA is an r-TWT scheduled STA having specified a QoS Characteristics element accordingly. Issue is that P2P recipient is not aware of such negociations, and may be in doze state for TWT SP it is not member of (initiating P2P STA is member of). There is high risk of lost TWT/TXS resource (not used) | Make the recipient P2P STA aware of the TWT membership. It thus can be awake for the service periods to come in this rTWT schedule, hence be available for P2P communication with the initiator peer STA. | Rejected –The STA that negotiates the R-TWT SPs with the AP can also negotiate TWT SPs with the peer STA so that these service periods coincide with each other, and hence both STAs can be awake during these SPs. Another case is that the peer STA is always in active mode and need not be in doze state. |
| 12073 | 478.08 | 35.3.22 | There are a missed preposition "of" between "transmission" and "downlink". | Please change "transmission downlink frames" to "transmission of downlink frames". | **Revised.****Fixed the typo.** **TGbe editor:** Apply the changes tagged with #12073 in this document |
| 13249 | 478.26 | 35.3.22 | This req is applicable for TWT scheduled STA or TWT requesting STA, not for rTWT scheduled STA. Hence the text needs to be updates to remove the TID reference, since TIDs are specified only for the rTWT setup. | As in comment | **Revised.** Removed reference to the TID from the corresponding sentence. **TGbe editor:** Apply the changes tagged with #13249 in this document |
| 13248 | 478.30 | 35.3.22 | Need to clarify the behavior for the EHT AP when an rTWT scheduled STA sends a QoS Characteristics element in an SCS request and an rTWT schedule is already established for the TID indicated in the QoS Characteristics element in the indicated direction (UL or DL). The EHT AP should use the rTWT SP for transmission of that TID traffic. | Add relevant text to clarify as per comment. | **Revised.** Added new text to clarify this behavior. **TGbe editor:** Apply the changes tagged with #13248 in this document |
| 13111 | 478.30 | 35.3.22 | Need to clarify the behavior for the EHT AP when an rTWT scheduled STA sends a QoS Characteristics element and an rTWT schedule is already established for the TID indicated in the QoS Characteristics element in the indicated direction. The EHT AP should use the rTWT SP for transmission of that TID traffic. | Clarify text as in comment. | **Revised.** Added new text to clarify this behavior. **TGbe editor:** Apply the changes tagged with #13111 in this document |
| 12433 | 35.3.22 | 478.33 | the EHT AP cannot ensure that the trigger frames are transmitted at the start of the TWT SPs if there are legacy STAs or EHT STAs that disregard r-TWT SP | Delete this sentence | **Reject.** The sentence only says that such Trigger frames should be scheduled and not transmitted. It is implied that because of inherent unpredictable nature of wireless communication guaranteeing successful transmission of such frames is not always possible, including at the start of the TWT SP.   |
| 13822 | 35.3.22 | 478.34 | "TWT SPs" should be "r-TWT SPs" | Change "TWT SPs" to "r-TWT SPs" | **Revised.**  **TGbe editor:** Apply the changes tagged with #13822 in this document |
| 12279 | 35.3.23 | 478.58 | "and setting the UP of those MSDUs", what does UP mean? Please add description in subclause 3.4 | As in comment. | **Reject.** UP is already defined in P205L13 of REVme draft 1.2:“user priority (UP): A value associated with an medium access control (MAC) service data unit (MSDU)that indicates how the MSDU is to be handled. The UP is assigned to an MSDU in the layers above theMAC.” |
| 13823 | 35.3.23 | 35.3.23 | This sentence is covered by the previous paragraph. | Either delete this sentence, or make some wording change to make it more accurate. E.g., "All STAs affiliated with an MLD shall set the Mirrored SCS field of the Extended Capabilities elements that they transmit to the same value" | **Revised.**The sentence is indeed redundant and hence deleted. **TGbe editor:** Apply the changes tagged with #13823 in this document |
| 11955 | 477.64 | 35.3.22 | How STA uses SCS with QoS Characteristics element to increase triggering rate or to lower triggering rate? Is there any guidance how STA should transmit these requests? | Please add normative text how STA may request to change the min/max service interval of the SCS stream. An example would be good to clarify how AP should interpret min and max service interval changes and what it is expected to do for the stream QoS | **Reject.** The rasoninge behind how a STA fills in the parameters of the QoS Characteristics element is implementation-specific, both during the initial SCS stream establishment as well as any updates to the stream and need not be described in the spec. Note that similar update mechanisms are provided in other Mg-frame based setups (e.g., TWT setup).  |
| 11956 | 477.64 | 35.3.22 | In QoS Cahracteristics element (9.4.2.316) clause, the Min Service Interval and Max Service interval suggest to control the DL TXOP start times. These rules are not considered in 35.3.22. If the Min and Max service interval fields are not in use for DL fransmissions, then 9.4.2.316 should mark these fields as reserved for DL. If the fields are considred, then it would be good to clarify how STA sets these values, if the STA allows AP to send immediately the DL packet to the STA. | Please clarify how the min and max service interval should be used to allow immediate DL frame transmission in a SCS stream, or mark these fields reserved for DL SCS streams in the clause 9.4.2.316. | **Reject.** The current definition of Min and Max SI along with the definition of SP in REVme clarifies that immediate DL frame transmissions are not affected since a SP can consist of multiple TXOPs. **From REVme draft 1.3:****“service period (SP):** A period of time during which one or more downlink individually addressed framesare transmitted to a quality-of-service (QoS) station (STA) and/or one or more transmission opportunities(TXOPs) are granted to the same STA. SPs are either scheduled or unscheduled.”**From 11be draft 2.1P256L22:**“If the Direction subfield is set to 1 (Downlink), the Minimum Service Interval field contains anunsigned integer that specifies the minimum interval, in microseconds, between the start of two consecutive SPs that are allocated for DL frame exchange sequences and the value 0 indicates that thisparameter is unspecified.” |
| 11957 | 477.64 | 35.3.22 | The Min Service Interval and Max Service interval suggest to control the DL TXOP start times. The AP TXOPs may be long and in a TXOP the same STA may receive a DL MPDU multiple times (in the begining and at the end of the TXOP). Currently the minimum service interval is only considering minimum DL TXOP start times that carry frames to the SCS stream. It would be good to clarify how minimum and maximum service intervals consider cases where a TXOP carries multiple MPDUs to SCS stream. | Please clarify, how min and max service intervals consider DL TXOPs that transmit multiple MPDUs belonging to the SCS stream in a TXOP. Why the initiation of the TXOPs is considered only in DL transmissions, not the DL frames transmisson within a TXOP?Or as an alternative solution, mark these fields reserved for DL SCS streams in the clause 9.4.2.316. | **Reject.** The current definition of Min and Max SI along with the definition of SP in REVme clarifies that immediate DL frame transmissions are not affected since a SP can consist of multiple TXOPs. **From REVme draft 1.3:****“service period (SP):** A period of time during which one or more downlink individually addressed framesare transmitted to a quality-of-service (QoS) station (STA) and/or one or more transmission opportunities(TXOPs) are granted to the same STA. SPs are either scheduled or unscheduled.”**From 11be draft 2.1P256L22:**“If the Direction subfield is set to 1 (Downlink), the Minimum Service Interval field contains anunsigned integer that specifies the minimum interval, in microseconds, between the start of two consecutive SPs that are allocated for DL frame exchange sequences and the value 0 indicates that thisparameter is unspecified.” |
| 11958 | 477.64 | 35.3.22 | How AP sets the min service interval field value of a DL SCS stream, if the AP uses long TXOPs or has OBSS that uses long TXOPs? Should the min service interval be set to expected minimum TXOP duration the AP? | Please clarify, whether AP should consider its TXOP lengths and OBSS TXOP durations when it defines Mininimum Service Interval value for an SCS stream.Or as an alternative solution, mark these fields reserved for DL SCS streams in the clause 9.4.2.316. | **Reject.** The Min SI and Max SI simply indicates the SP periodicity parameters in UL and DL and measured from the start of the two SPs. For example, see **11be draft 2.1P256L22:**“If the Direction subfield is set to 1 (Downlink), the Minimum Service Interval field contains anunsigned integer that specifies the minimum interval, in microseconds, between the start of two consecutive SPs that are allocated for DL frame exchange sequences and the value 0 indicates that thisparameter is unspecified.”  |
| 10388 |  | 35.3.22 | SCS procedure is not Multi-Link specific. Suggest to bring this section outside of MLO specific subclause | As in the comment | **Revised.** **TGbe editor:** **TGbe editor:** Apply the changes tagged with #10388 in this document |

***TGbe editor: revise the following sentence in P202L38 of 11be draft 2.1 as follows*:**

 zero or zero or one QoS
 more Characteristics
 TCLAS Element(#13751, 13752)
 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**

***TGbe editor: revise the following sentence in P268L22 of 11be draft 2.1 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 aSTA affiliated with another MLD(#13491).

***TGbe editor: Move, re-name the section starting in P487L48 of 11be draft 2.1 and revise the following paragraphs as follows*:**

**35.18 EHT (#10388) 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 anAP MLD (#13429).

An EHT STA establishes 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 SCS Descriptor element with a QoS Characteristics element shall set the SCS Traffic
Description 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 SCS
Descriptor(#10423,12278) element with a QoS Characteristics element shall set the SCS Traffic Descriptor 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 (#13432, 10431) 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 at MLD level, i.e., the SCSID used by a 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 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(#10432) 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 TCLAS Elements and the TCLAS Processing Element fields.

A value of REQUEST\_DECLINED, REQUEST\_TCLAS\_NOT\_SUPPORTED\_BY\_AP,
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 SUCCESS or 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 the
EHT AP sets the Triggered TXOP Sharing Mode 2 Support subfield in the EHT Capabilities element it
transmits to 1.

The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should schedule
transmission of (#12073) downlink frames 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 the transmission of uplink frames from the EHT STA with 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 enable 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 with an interval that falls between the requested minimum
and maximum service intervals.

The transmission of uplink Data frames should be enabled 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 enabled 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 with the EHT AP, the EHT
AP should ensure that the negotiated service interval aligns with negotiated TWT wake intervals(#13249).

If the EHT STA is an (#11109)R-TWT scheduled STA (see 35.9 (Restricted TWT (R-TWT)(#11109))) and there are negotiated R-TWT SPs for the TID specified 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 RTWT then the EHT AP should ensure that the trigger frames are scheduled at the start of the R-TWT(#13822) SPs. (#13248, 13111)

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 2—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 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 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 “Terminate” in the Status field
of an SCS status duple shall not contain a QoS Characteristics element.

***TGbe editor: Move, re-name the section starting in P490L6 of 11be draft 2.1 and revise the following paragraphs as follows*:**

**35.19 EHT(#10388) MSCS procedure**

The MSCS procedures, including setting up, updating of parameters and termination of an MSCS,
classification of MSDUs addressed to a non-AP EHT STA, and setting the UP of those MSDUs, defined in
11.25.3 (MSCS procedures) is performed at the MLD level and apply to all the STAs affiliated with the
MLD.

An MLD that implements MSCS procedure shall have each STA affiliated with that MLD set
dot11MSCSActivated to true, and shall indicate its capability by having each STA affiliated with that MLD
set the Mirrored SCS field of the Extended Capabilities elements that the STA transmits to 1.

(#13823)

***TGbe editor: Re-name all instances of the term “Multi-link MSCS procedure” in 11be draft 2.1 with the term “EHT MSCS procedure” (#10388).***

***TGbe editor: Re-name all instances of the term “Multi-link SCS procedure” in 11be draft 2.1 with the term “EHT SCS procedure” (#10388).***