IEEE P802.11
Wireless LANs

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| CR for CIDs related to MSCS and SCS |
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Abstract

This document proposes resolution to the following CC36 CIDs in 35.2.1.3 (changes relative to draft 1.1):4812, 5888, 5889. 5890

Rev0: initial version

Rev1: update the container to QoS Characteristics element

Rev2: address offline comments from Binita, Kumail and Duncan.

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4812 |  |  | 11.25.3 | The MSCS procedure should be at MLD level and not STA level for 11be. | Clarify that the MSCS Req/Response frames are exchanged at MLD level for EHT STAs that are affiliated with an MLD resulting in the mirroring of UPs happening also at MLD level. | **Revised.** Added text to clarify the same**TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-21-1511-03-00be-CR-for-MSCS-SCS-clarification.docx. |
| 5888 | 51 | 1 | 6.3.82.5.2 | the MLME-SCS.response/confirm should be updated according to the SCS response frame | add SCS descriptor element | **Revised.** Agree with the commenter. However, this is already added in draft 1.1**TGbe editor:** no further action needed. |
| 5889 | 154 | 46 | 9.6.18.3 | Both SCS status and SCS descriptor has SCSID fields in SCS response frame, which are unnecesary repeated. | merge SCS descriptor to SCS status for the same SCSID. | **Reject.**SCS Status List field is already defined in REVme and to avoid incorrect parsing should not be changed. Moreover, SCS Descriptor is not present in every SCS Response frame.  |
| 5890 | 154 | 46 | 9.6.18.3 | Some fields, such as medium time, in the TSPEC element shall be set by AP according to the TS operation. Then, in SCS setup procedure with TSPEC element, why only the SCS request frame carries the TSPEC element? | The SCS response frame shall carries TSPEC element in the SCS response frame in order to respond a SCS request frame carrying TSPEC element. | **Revised.** It may be good for an AP to confirm the parameters it is able to accommodate which can be slightly different from what was requested by the STA (e.g., a different Minimum Service Interval field value in QoS Characteristics element).**TGbe editor:** make the changes identified below in https://mentor.ieee.org/802.11/dcn/21/11-21-1511-03-00be-CR-for-MSCS-SCS-clarification.docx. |

***TGbe editor: add the following subclause in 35.3*:**

**35.3.22 Multi-link MSCS procedure (#4812)**

The MSCS procedures, including setting up, updating of parmaeters 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.

All STAs affiliated with an MLD shall indicate the same support for MSCS procedure.

***TGbe editor: Revise the following text in P214L22 of 11be draft 1.3*:**

**9.6.18.3 SCS Response frame format**

The SCS Descriptor List field is optionally present when the SCS Response frame is sent from an EHT STA to another EHT STA. If present, it 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 the SCS stream identified by the SCSID field value in the same SCS Descriptor element. Zero or one SCS Descriptor element is present for an SCSID included in the SCS Status List field when the Status Code field value for that SCSID is equal to “Success” or “REJECTED\_WITH\_SUGGESTED\_CHANGES” and no SCS Descriptor element is present otherwise **(#5890)**.

**11.25 Robust AV streaming**

 **11.25.2 SCS procedures**

***TGbe editor: Add the following text in P69L5 of 11be draft 1.3*:**

An SCS Response frame transmitted by a non-EHT STA does not contain any SCS Descriptor List field(#5890).

***TGbe editor: Revise the following text in P373L46 of 11be draft 1.3*:**

**35.3.21 Multi-link SCS procedure(#5890)**

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

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 (#4918)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 Description element with a (#4918)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
(#4918)QoS Characteristics element if the Request Type field in the frame is set to “Add” or “Change”. The
(#4918)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
(#4918)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 (#4918)QoS Characteristics element in which the Direction subfield is set to uplink or
downlink(#4918) 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 (#4918)QoS Characteristics element in which the Direction
subfield is equal to downlink(#4918), 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, describes 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 TSPEC subelement is present
and the Direction subfield in the (#4918)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 with an SCS Descriptor 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 (#4918)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’s 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, Medium Time.

(#4918)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.

(#4918)The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should
schedule for transmission 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.
(#4918)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.
(#4918)If the EHT STA is a TWT scheduled STA or TWT requesting STA (see 26.8 (TWT operation)) and
there are negotiated TWT service periods for the TID specified in the QoS Characteristics element with the
EHT AP, the EHT AP should ensure that the selected interval aligns with negotiated TWT wake intervals.
(#4918)If the EHT STA is an r-TWT scheduled STA (see 35.7 (Restricted TWT)) and the negotiated r-TWT
service periods for the TID specified in the QoS Characteristics element are trigger-enabled r-TWTs, the
EHT AP should ensure that the trigger frames are scheduled at the start of the TWT service periods.
(#4918)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.

(#4918)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 and the SCS Descriptor element either did not contain a
(#4918)QoS Characteristics element or contained a QoS Characteristics element in which the Direction subfield is equal
to downlink(#4918), 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 (#4918)QoS Characteristics element.