**IEEE P802.11  
Wireless LANs**

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| **802.11**  **CR 2693 Mirrored SCS** | | | | |
| **Date:** 2019-03-11 | | | | |
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**Abstract**

This document provides comment resolutions for REVmd letter ballot CID 2693, by defining a Mirrored SCS capability. The document is based on REVmd D2.1.

R0: Initial draft

**Addressed Comments**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Comment** | **Page number** | **Subclause** | **Line number (wrt D4.0)** | **Proposed Change by commenter** | **Resolution** |
| 2693 | When non-AP STA sends SCS Request to AP in order to request the AP to assign a specified UP to certain MSDUs it transmits (e.g. downstream packet stream to that STA), the STA needs to specify one or more TCLAS classifiers (e.g. IP 5-tuples), which can be complex for STA to determine - e.g. a mobile app may interact with multiple internet/web servers with dynamic IPs/ports | 2418 | 11.26.2 | 58 | Allow SCS to support a "reflective" mode where the TCLAS defines just the Classifier Type and Classifier Mask. Example: the AP categorizes upstream SCS streams based on that mask, and derives the UP for each corresponding downstream SCS stream from the UP of the upstream | Resolve in the direction of the commenter’s proposal, per amendments in this document. |

**Discussion**

Stream Classification Service (SCS) enables a non-AP STA to request to its associated AP that specific QoS treatment (setting of UP, alternate EDCA queue and/or drop eligibility) is applied to unicast MSDUs classified as a particular stream, where that stream comprises MSDUs that are incoming to the AP (and after processing, will be outgoing) that match parameters specified in one or more TCLAS elements.

SCS can be used in both LAN-based use cases (e.g. streaming from a local media server to a video endpoint) and WAN-based (e.g. internet, enterprise WAN) use cases. For example, an audio-visual or gaming mobile app on a non-AP STA might identify a QoS-sensitive AV or metadata internet stream based on IP layer classification parameters (e.g. source/destination IP address, port), and request the AP to apply specific QoS treatment to that stream from the AP to the STA. (The non-AP STA can apply QoS treatment for the uplink direction of its own accord). Note that, for downlink Internet traffic, it is often the case that layer-3 QoS markings (e.g. DSCP/TOS) that may be applied by the source server are stripped/overwritten by intermediate routers, and therefore local QoS assignment at ingress to the local network is often necessary.

However, in some mainstream use cases, it is challenging for a non-AP STA to identify the parameters needed to classify a stream with SCS. In the example above, the application layer might only be aware of the FQDN of the internet server (which is the source of the stream for which QoS treatment is required); its IP address might dynamically change due to DNS load balancing and the STA might not have suitable framework APIs to obtain/correlate this information across the stack. Further, the application might dynamically establish multiple sessions with multiple (server) endpoints in real-time, e.g. as certain features are used within the application (e.g. chat, presence, AR/VR features, multi-stream video, etc), and requesting SCS treatment for new streams - using parameters that may not be available until the stream is about to commence - can be burdensome and insufficiently responsive.

The Traffic Stream (TS) operation features (11.4) provide additional and/or complementary capabilities compared to SCS (e.g. resource reservation), however they have the same issues as SCS in terms of stream classification definition.

Therefore, this document introduces a variant of SCS called Mirrored SCS (MSCS) to address these use cases. MSCS, as is the case for SCS, is initiated by a non-AP STA that requests the AP to apply QoS treatment (setting of UP) to unicast MSDUs (destined to that non-AP STA) based on classification parameters. The differences between MSCS and SCS are as follows:

* In SCS, a single SCS Descriptor corresponds to a request to the AP to classify a single stream (identified by an SCSID) based on specific classification values (e.g. source IP=50.1.1.1 port=443); whereas in MSCS, the MSCS Descriptor specifies the set of classification parameters (e.g. source IP, port - reusing the classifier types and masks defined for TCLAS element), not the actual values of those parameters. Therefore, in general, MSCS results in the AP identifying and tracking multiple streams (which do not have explicit identifiers), where the MSDUs comprising each stream have identical values for the specified parameters
* In SCS, the QoS to be assigned to classified MSDUs of a given stream is explicitly specified by the non-AP STA (e.g. UP=6, AltEDCAQueue=0, DE=0); whereas in MSCS, the QoS (UP) to be assigned to MSDUs for each of the streams identified by the AP is implicitly derived from the UP of MSDUs sent in the corresponding reverse stream from the non-AP STA to the AP
* In SCS the streams are not necessarily bound to the link between the requesting non-AP STA and the AP; whereas in MSCS the derivation of UP from the reverse stream dictates that classification is bound to streams between the AP and the requesting non-AP STA

To use MSCS, the non-AP STA sends an MSCS Request with a specified list of classification parameters, a bitmask of UPs for which UP assignment in the reverse stream is to be performed, and a UP limit value. When the STA communicates bidirectionally with various LAN/WAN endpoints, the AP will classify MSDUs destined for the STA into streams (where the MSDUs in each stream have identical masked values for the list of classification parameters). When the AP receives an upstream MSDU from the non-AP STA, if the UP of that MSDU is indicated in the UP bitmask in the request, the AP will set the UP of MSDUs in the corresponding stream (downstream to the non-AP STA) to be equal to the UP of that upstream MSDU (or to the UP Limit value, if it is lower than the MSDU’s UP).

Example:

* (1) Non-AP STA sends MSCS Request with Classifier Type = 1 (TCP/UDP IP parameters), Classifier Mask = 0xa0 (Source IP Address + Source Port), UP bitmask = [6 7], UP limit = 7.
* (2) The AP accepts the request, and begins inspecting incoming unicast MSDUs to/from the requesting non-AP STA, including inspection of the IP headers of these MSDUs.
* (3) The non-AP STA initiates HTTPS connections with two different internet servers with IP addresses 50.1.1.1 and 50.2.2.2 on port 443; the former is for a QoS-sensitive stream, while the latter is for bulk non-QoS-sensitive data. The non-AP STA sends MSDUs to server 50.1.1.1 using UP=6 (voice), and sends MSDUs to server 50.2.2.2 using UP=0 (best effort). The internet servers send packets in response to the requests from the non-AP STA.
* (4) As the AP inspects the incoming unicast MSDUs, it identifies two distinct streams according to the tuple parameters in the classifier mask: stream1={SrcIP=50.1.1.1, SrcPort=443}, stream2={SrcIP=50.2.2.2, SrcPort=443}.
  + For stream1, since the most recently received MSDU in the reverse stream (i.e. {DstIP=50.1.1.1, DstPort=443} has UP=6 and UP 6 is in the UP bitmask, the AP applies UP 6 to MSDUs of stream1 as they are sent to the non-AP STA.
  + For stream2, since no MSDUs have been received in the reverse stream {DstIP=50.2.2.2, DstPort=443} with a UP that is in the UP bitmask (since all the MSDUs sent in the reverse stream so far have UP=0}), the AP’s MSCS service does not apply any UP to these MSDUs
* (5) Some time goes by and the load on the channel increases due to additional in-BSS and OBSS traffic, and the AP determines that continuing to set the UP of stream1 (which has quite heavy traffic) to 6 (VO) is starting to have an unacceptable impact on network efficiency and/or collision probability. Therefore, the AP sends an MSCS Response to the STA indicating a change of UP Limit to 5. From that time on, the AP will assign UP 5 (i.e. min(6, 5)) to stream1 packets.
* (6) Some further time goes by and the channel load and traffic continues to increase to the point. The AP could either further reduce the UP Limit or teardown the MSCS to return to default QoS treatment - in this case it chooses the latter and sends MSCS response with the appropriate status code.

***Instruct the editor to add the following section:***

**4.3.24.2a Mirrored stream classification service (MSCS)**

MSCS enables the establishment of classification using layer 2 and/or layer 3 signaling to classify incoming unicast MSDUs into streams. Once classified, unicast MSDUs in each stream are assigned to a user priority based on the user priority of MSDUs matching the stream in the reverse direction.

* **Extended Capabilities element**

***Instruct the editor to add the following row to Extended Capabilities table as follows:***

|  |  |  |
| --- | --- | --- |
| (#1284)82 | SAE Password Identifiers Used Exclusively | The AP sets the SAE Password Identifiers Used Exclusively field(Ed) to 1 when every password in the dot11RSNAConfigPasswordValueTable(Ed) has a password identifier and sets it to 0 otherwise. See 12.4.3 (Representation of a password). |
| ANA | Mirrored SCS | The STA sets the Mirrored SCS field to 1 when dot11MSCSActivated is true and sets it to 0 otherwise. |
| (11ai)(Ed)~~83~~ANA–*n* | Reserved |  |

***Instruct the editor to add the following section, and add the element to Element ID table:***

**9.4.2.xxx** **TCLAS Mask element**

The TCLAS Mask element contains a set of parameters necessary to classify incoming MSDUs into streams based on a classifier mask. The structure of this element is shown in Figure 9-302 (TCLAS Mask element format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Element ID | | Length | Element ID Extension | Frame Classifier |
| Octets: | 1 | | 1 | 1 | variable |
| **Table 9-xx** | | **TCLAS Mask element format** | | | |

The Element ID, Length and Element ID Extension fields are defined in 9.4.2.1 (General).

The Frame Classifier field specifies the parameters that are used to classify incoming MSDUs into streams. The field is defined in 9.4.2.30 (TCLAS element) (see Figure 9-303 (Frame Classifier field)), except that, in the Classifier Parameters subfield, all subfields other than the following (if present) are reserved:

* Filter Offset subfield
* Filter Mask subfield(s) (including MAC Header Filters in Match Specification subfields)
* Previous Protocol Number of Next Header subfield

***Instruct the editor to add the following section, and add the element to Element ID table:***

**9.4.2.xxx MSCS Descriptor element**

The MSCS Descriptor element defines information about the parameters used to classify streams using the procedures defined in 11.26.3 (MSCS procedures). The format of the MSCS Descriptor element is shown in Figure 9-xxx (MSCS Descriptor element format).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | Request Type | User Priority Control | TCLAS Mask Elements (optional) | Optional Subelements |
| Octets: | 1 | 1 | 1 | 1 | 2 | variable | variable |

**Figure 9-XXX MSCS Descriptor element format**

The Element ID, Length and Element ID Extension fields are defined in 9.4.2.1 (General).

The Request Type field is as defined in 9.4.2.121 (SCS Descriptor element).

The User Priority Control field is shown in Figure 9-330 (User Priority Control field).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B10 | B11 | B12 B15 |
|  | User Priority Bitmap | User Priority Limit | No Reduction | Reserved |
| Bits: | 8 | 3 | 1 | 4 |
| Figure 9-XXX User Priority Control field | | | | |

The User Priority Bitmap subfield is one octet in length. Each bit in the bitmap corresponds to a user priority (UP), with the least significant bit corresponding to UP value of 0, and the most significant bit corresponding to UP value of 7. A value of 1 in a bit position in the bitmap indicates that the corresponding UP is used when assigning a UP to streams classified by the MSCS service.

The User Priority Limit subfield is 3 bits in length and has a value between 0 and 7; it defines the maximum limit for the User Priority that is assigned to incoming MSDUs in the streams classified by the MSCS service.

The No Reduction subfield is 1 bit in length; when set to 1 it indicates that MSCS processing will not result in reduction of the UP assigned to an MSDU; when set to 0 it indicates that MSCS processing might result in reduction of the UP.

The TCLAS Mask Elements field contains zero or more TCLAS Mask elements to specify how incoming MSDUs are classified into streams in the MSCS service, as defined in 9.4.2.xxx (TCLAS Mask element). One or more TCLAS Mask elements are present when Request Type field is equal to “Add” or “Change,” and no TCLAS Mask elements are present when Request Type field is equal to “Remove.”

The Optional Subelements field is as defined in 9.4.2.121 (SCS Descriptor element).

The MSCS Descriptor element is included in MSCS Request frames, as described in 9.6.18.6 (MSCS Request frame format), and in certain MSCS Response frames, as described in 9.6.18.7 (MSCS Response frame format). The use of the MSCS Descriptor element is described in 11.26.3 (MSCS procedures).

* **Robust AV Streaming Action frame details**
* **General**

***Instruct the editor to modify as follows***

Several Action frame formats are defined to support robust AV streaming. The Robust Action field values associated with each frame format within the robust AV streaming category are defined in Table 9-454 (Robust AV streaming Robust Action field values). The frame formats are defined in 9.6.18.2 (SCS Request frame format) to ~~9.6.18.5 (Group Membership Response frame format).~~9.6.18.7 (MSCS Response frame format).

|  |  |
| --- | --- |
| * **Robust AV streaming Robust Action field values** | |
| **Robust Action field value** | **Meaning** |
| 0 | SCS Request |
| 1 | SCS Response |
| 2 | Group Membership Request |
| 3 | Group Membership Response |
| 4 | MSCS Request |
| 5 | MSCS Response |
| 6~~4~~–255 | Reserved |

***Instruct the editor to add the following sections, and also to add the following entries to Table 9-52 (Status Codes):***

***Name: “TCLAS\_PROCESSING\_TERMINATED\_INSUFFICIENT\_QOS”; Description: “Requested TCLAS processing has been terminated by the AP due to insufficient QoS capacity”***

***Name: “SUCCESS\_MSCS\_MODIFIED\_UP\_LIMIT”; Description: “Success, the MSCS UP Limit has been modified”***

* + - 1. **MSCS Request frame format**

MSCS Request frames are used to request the creation, modification, or deletion of mirrored stream classification using the procedures defined in 11.26.3 (MSCS procedures).

The Action field of the MSCS Request frame contains the information shown in Figure 9-xxx (MSCS Request frame Action field format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Category | Robust Action | Dialog Token | MSCS Descriptor element |
| Octets: | 1 | 1 | 1 | variable |
| **Figure 9-xxx MSCS Request frame Action field format** | | | | |

The Category field is defined in 9.4.1.11 (Action field).

The Robust Action field is defined in 9.6.18.1 (General).

The Dialog Token field is defined in 9.4.1.12 (Dialog Token field) and set by the requesting STA to a nonzero value that is used for matching action responses with action requests. See 10.29.5 (Operation of the Dialog Token field).

The MSCS Descriptor element is defined in 9.4.2.xxx (MSCS Descriptor element).

* + - 1. **MSCS Response frame format**

The MSCS Response frame is sent in response to an MSCS Request frame using the procedures defined in 11.26.3 (MSCS procedures). The Action field of an MSCS Response frame contains the information shown in Figure 9-xxx (MSCS Response frame Action field format).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Category | Robust Action | Dialog Token | Status | MSCS Descriptor element (optional) |
| Octets: | 1 | 1 | 1 | 2 | variable |
| **Figure 9-xxx MSCS Response frame Action field format** | | | | |  |

The Category field is defined in 9.4.1.11 (Action field).

The Robust Action field is defined in 9.6.18.1 (General).

The Dialog Token field is set to the nonzero value of the corresponding MSCS Request frame. If the MSCS Report frame is being transmitted for a reason other than in response to an MSCS Request frame, then the Dialog Token field is set to 0.

The Status field indicates the status of the request, as indicated in Table 9-52 (Status codes).

The MSCS Descriptor element is defined in 9.4.2.xxx (MSCS Descriptor element) and is optionally present as described in 11.26.3 (MSCS procedures).

* **Robust AV streaming**

***Instruct the Editor to add the following section:***

* + 1. **MSCS procedures**

The mirrored stream classification service (MSCS) is a service that may be provided by an AP to its associated STAs that support MSCS. In MSCS, the AP classifies incoming unicast MSDUs that are destined for a non-AP STA based upon classifier masks provided by that non-AP STA. The AP sets the UP of the MSDUs in the classified streams based on the UP of unicast MSDUs in the corresponding reverse stream from the non-AP STA to the AP.

Implementation of MSCS is optional for a STA. A STA that supports MSCS sets its dot11MSCSActivated to true, and shall set to 1 the Mirrored SCS field of the Extended Capabilities elements that it transmits. When dot11MSCSActivated is true, dot11QosOptionImplemented shall be true.

A non-AP STA that supports MSCS may request use of MSCS by sending an MSCS Request frame that includes an MSCS Descriptor element with the Request Type field set to “Add” or “Change.” The MSCS Descriptor List field in the MSCS Descriptor element identifies how MSDUs are classified into streams and indicates parameters that determine the priority to assign to the classified MSDUs.

Upon receipt of an MSCS Request frame from an associated non-AP STA, the AP shall respond with a corresponding MSCS Response frame. A value of “SUCCESS” shall be set in the Status field in the MSCS Response frame when the AP accepts the MSCS request; an MSCS Descriptor element is not present in the response. A value of “REQUEST\_DECLINED,” “REQUESTED\_TCLAS\_NOT\_SUPPORTED,” or “INSUFFICIENT\_TCLAS\_PROCESSING\_RESOURCES” shall be set in the Status field in the MSCS Response frame when the AP denies the MSCS request; an MSCS Descriptor element is not present in the response. The AP shall decline an MSCS request with the Request Type field set to “Add” or “Change” if a TCLAS Mask element is not present.

If mirrored steam classification for a non-AP STA is currently active and the AP declines a request from the non-AP STA to change the classification, the previously accepted parameters continue to apply.

If the request is accepted by the AP, the mirrored service classification for the non-AP STA becomes active, and the AP shall classify and process subsequent incoming unicast MSDUs from the DS or WM that are destined to the requesting non-AP STA based on the parameters specified in the MSCS Descriptor element as follows:

The AP determines a tuple of classifier parameters (and, when defined, filter masks for those parameters) using the TCLAS Mask element(s) in the MSCS Descriptor element. This tuple is determined as follows:

* For TCLAS Mask elements indicating a classifier type value less than or equal to 5, but not equal to 3, the classifier parameters for that element are indicated by the Classifier Mask subfield
* For TCLAS Mask elements indicating classifier type 3, the classifier parameter for that element is defined by the Filter Offset subfield and length of the (reserved) Filter Value subfield, and the filter mask for the parameter is specified in the Filter Mask subfield
* For TCLAS Mask elements indicating classifier type 10, the classifier for that element is defined by the Previous Protocol Number of Next Header subfield and the length of the (reserved) Filter Value subfield, and the filter mask for the parameter is specified in the Filter Mask subfield
* For TCLAS Mask elements indicating classifier type 6, 7, 8 or 9, the classifier parameters for that element are indicated by the LSBs of the Classifier Mask Control subfields of the Classifier Mask subfield. The filter mask for each parameter is specified by the MSB of the corresponding Classifier Mask Control subfield and the MAC Header Filter in the corresponding Match Specification.
* When multiple TCLAS Mask elements are present, the tuple of classifier parameters comprises the classifier parameters indicated by all the TCLAS Mask elements.

The AP classifies the incoming unicast MSDUs that are destined to the non-AP STA into streams, whereby a stream comprises all such MSDUs for which the tuple of masked classifier parameter values (as determined above) is identical. An incoming unicast MSDU destined to the non-AP STA that does not have any value for one or more of the classifier parameters is not classified into any stream.

The AP maintains a value *R\_UPstream* for each of the streams, which is equal to the UP of the most recently received MSDU from the non-AP STA for which all the following conditions are true:

* The UP of the MSDU received from the non-AP STA is equal to one of the UPs specified for the mirrored stream classification in the User Priority bitmap subfield of the MSCS Descriptor element, and
* If source IP address is a classifier parameter for the (AP to non-AP STA) stream, the value of the source IP address of the stream is equal to the destination IP address of the MSDU received from the non-AP STA, and
* If destination IP address is a classifier parameter for the (AP to non-AP STA) stream, the value of the destination IP address of the stream is equal to the source IP address of the MSDU received from the non-AP STA, and
* If source port is a classifier parameter for the (AP to non-AP STA) stream, the value of the source port of the stream is equal to the destination port of the MSDU received from the non-AP STA, and
* If destination port is a classifier parameter for the (AP to non-AP STA) stream, the value of the destination port of MSDUs in the stream is equal to the source port of the MSDU received from the non-AP STA, and
* If Address 1 is a classifier parameter for the (AP to non-AP STA) stream, the masked value of Address 1 of the stream is equal to the masked value of Address 2 of the MSDU received from the non-AP STA, and
* If Address 2 is a classifier parameter for the (AP to non-AP STA) stream, the masked value of Address 2 of the stream is equal to the masked value of Address 1 of the MSDU received from the non-AP STA, and
* If Address 3 is a classifier parameter for the (AP to non-AP STA) stream, the masked value of Address 3 of the stream is equal to the masked value of Address 4 of the MSDU received from the non-AP STA, and
* If Address 4 is a classifier parameter for the (AP to non-AP STA) stream, the masked value of Address 4 of the stream is equal to the masked value of Address 3 of the MSDU received from the non-AP STA, and
* For all other classifier parameters for the (AP to non-AP STA) stream, the masked values of all parameters of the stream are equal to the masked values of all parameters of the MSDU received from the non-AP STA.

NOTE -- For the above conditions, the condition is false if the MSDU received from the non-AP STA does not have any value for the classifier parameter(s) corresponding to that condition.

The AP processes the incoming MSDUs that have been classified into (AP to non-AP STA) streams depending upon the access policy assigned to the MSDU:

* For MSDUs classified in a stream that are not part of a TS (as described in 11.4 (TS operation)) and are not part of an SCS stream (see 11.26.2 (SCS Procedures)), these MSDUs are assigned a UP equal to min(*R\_UPstream , UPLim*) if the No Reduction subfield of the MSCS Descriptor element is 0, or is assigned a UP equal to max(min(*R\_UPstream , UPLim*), *I\_UPMSDU*) if the No Reduction subfield is 1, where *R\_UPstream* is the value maintained by the AP for that stream, *UPLim* is the value of the User Priority Limit subfield of the MSCS Descriptor element, and *I\_UPMSDU* is the User Priority that would be assigned to the MSDU in the absence of the mirrored stream classification. If the AP does not have an *R\_UPstream* value for the stream, mirrored stream classification does not assign a UP for these MSDUs; i.e. the UP of a MSDU in the stream remains as *I\_UPMSDU*.
* For MSDUs classified in a stream that are part of a TS (as described in 11.4 (TS operation)), the TID and UP classification of these MSDUs shall follow the rules specified in 11.4.8 (Data transfer).

If the UP assigned to a stream by MSCS changes such that the EDCA transmit queue used for the stream changes, the AP should transmit any MSDUs in the stream that are already committed to the old transmit queue before transmitting MSDUs in the same stream using the new transmit queue, in order to avoid the possibility of MSDUs in the stream being received out-of-order. The method by which this is achieved is vendor-specific.

NOTE -- The AP does not have a *R\_UPstream* value for a stream if no MSDU has been received from the non-AP STA that matches all the conditions defined above since the request was accepted by the AP.

NOTE -- When mirrored stream classification does not assign a UP to MSDUs classified in a stream that are not part of a TS or an SCS stream, the UP of the MSDU might be set by other mechanisms such as interworking QoS mapping from DSCP values (e.g. see R.3 (QoS mapping guidelines for interworking with external network)).

NOTE -- A non-AP STA using MSCS is advised to set the UP of MSDUs it transmits to its AP in a way that does not cause the *R\_UPstream* value for a given stream to change excessively often, in order to avoid excessive stream management overhead on the AP.

A non-AP STA may request the termination of an active mirrored stream classification by sending an MSCS Request frame with the Request Type field set to “Remove” in the MSCS Descriptor element. No TCLAS Mask elements or optional subelements shall be included in the MSCS Descriptor element, and the User Priority Limit and User Priority Bitmap subfields are reserved.

Upon reception of a request to terminate an active mirrored stream classification, the AP shall cease to apply the corresponding classifiers and processing related to the active mirrored stream classification and delete any maintained values associated with the streams. The AP shall send an MSCS Response frame to confirm the termination of the active mirrored stream classification, by including a value of “TCLAS\_PROCESSING\_TERMINATED” in the Status field of an MSCS Response frame and the dialog token in the MSCS Response frame set to the value from the MSCS Request frame that requested termination; an MSCS Descriptor element is not present in the response.

The AP may send an unsolicited MSCS Response frame at any time to modify the User Priority Limit for an active mirrored stream classification, by including a value of “SUCCESS\_MSCS\_MODIFIED\_UP\_LIMIT” in the Status field of an MSCS Response frame and the dialog token in the MSCS Response frame set to 0. An MSCS Descriptor element is included with Request Type field set to “Change” and the User Priority Limit subfield set to the modified value; the User Priority Bitmap subfield is reserved, and no TCLAS Mask elements or optional subelements are present. The AP shall begin processing MSDUs in accordance with the specified User Priority limit as soon as possible after sending this frame.

The AP may send an unsolicited MSCS Response frame at any time to cancel an active mirrored stream classification, by including a value of “TCLAS\_PROCESSING\_TERMINATED”, “TCLAS\_PROCESSING\_TERMINATED\_INSUFFICIENT\_QOS” or “TCLAS\_RESOURCES\_EXHAUSTED” in the Status field of an MSCS Response frame and the dialog token in the MSCS Response frame set to 0. The MSCS Descriptor element is absent.

***Instruct the editor to modify C.3 as follows:***

**C.3 MIB detail**

Dot11StationConfigEntry::=

SEQUENCE {

......

dot11MSCSActivated TruthValue }

dot11MSCSActivated OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by the MAC or an external management entity.

Changes take effect as soon as practical in the implementation.

This variable indicates whether support for Mirrored SCS is enabled on the STA

.

::= { dot11StationConfigEntry <ANA>}

DEFVAL { false }