IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | IPSEC Classifier | | | | | | Date: 2019-02-15 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Matthew Fischer | Broadcom |  |  | [Matthew.fischer@broadcom.com](mailto:Matthew.fischer@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This document includes proposed language to add a classifier for the TCLAS element that allows the use of IPSEC header information for classification. There is no CID of reference for this document.

Changes are referenced to TGmd D2.1.

**REVISION NOTES:**

**R0**:

Initial

**R1**:

9.4.2.30 – modified wording a bit to clarify how to apply the classifier, noting that like classifier types 1 and 4, it applies to IP packets

9.4.2.30 – removed the interpretation of the classifier as reserved if no type 1 or 4 is present, as the new language indicates that this classifier is always applied to an IP packet

**R2**:

9.4.2.30 – removed mention of MMPDU, NA for IP case

**END OF REVISION NOTES**

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGm Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGm Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGm Editor: Editing instructions preceded by “TGm Editor” are instructions to the TGm editor to modify existing material in the TGm draft. As a result of adopting the changes, the TGm editor will execute the instructions rather than copy them to the TGm Draft.***

**CIDs**

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**Discussion:**

In examining the case for inclusion of 802.11 for use as a 5G technology, the common use case of multiple IPSEC tunnels for varying traffic flows is identified and in order to accommodate the QOS requirements of those varying flows, and given that all of the header information beyond the IPSEC header is scrambled by the IPSEC function, it is necessary, if TCLAS classifiers are to be used to assist in the provisioning of the QOS for those flows, that the IPSEC header itself be available for classification decisions. Therefore, this document proposes to add a new classifier type which will allow the specification of a classification for QOS purposes based on the subfields of an IPSEC header and as a side benefit, for other functions within 802.11 which also use the TCLAS element. In order to avoid additional classifier type additions in the future, the proposed classifier type is made to be rather generic for IP encapsulation. I.e. it can be used to identify and match on any fields of any protocol that is specified within an IP header of either IPv4 or IPv6 type.

**Proposed Changes to TGmd D2.1:**

***TGm editor: within TGmd D2.1, modify Table 9-164 Frame classifier type and the paragraph that follows the table within subclause 9.4.2.30 TCLAS element, as shown:***

**9.4.2.30 TCLAS element**

**Table 9-164—Frame classifier type**

|  |  |
| --- | --- |
| **Classifier type** | **Classifier parameters** |
| 0 | Ethernet parameters |
| 1 | TCP/UDP IP parameters |
| 2 | IEEE 802.1Q parameters |
| 3 | Filter Offset parameters |
| 4 | IP and higher layer parameters |
| 5 | IEEE 802.1D/Q parameters |
| 6 | IEEE 802.11 MAC header parameters |
| 7(11ah) | (11ah) IEEE Std 802.11 downlink PV1 MPDU MAC header parameters (From DS field of the Frame Control field equal to 1) |
| 8(11ah) | IEEE Std 802.11 nondownlink PV1 MPDU MAC header parameters (From DS field of the Frame Control field equal to 0) |
| 9(11ah) | IEEE Std 802.11 PV1 MPDU Full Address MAC header parameters |
| 10 | IP extensions and higher layer parameters |
| 11-255 | Reserved |

When the Classifier type is a value less than or equal to 5, but not equal to 3, the Classifier Mask subfield specifies a bitmap in which bits that have the value 1 identify a subset of the classifier parameters whose values need to match those of the corresponding parameters in a given MSDU for that MSDU to be classified to the TS of the affiliated TSPEC. The bitmap is ordered from the LSB to the MSB, with each bit pointing to one of the classifier parameters of the same relative position as shown in this subclause based on classifier type. When there are more bits in the bitmap than classifier parameters that follow, the MSBs that do not point to any classifier parameters are reserved.

***TGm editor: within TGmd D2.1, insert the following new text and figure at the end of subclause 9.4.2.30 TCLAS element, as shown:***

**9.4.2.30 TCLAS element**

For Classifier Type 10, the Frame Classifier subfield for IP extensions and higher layer parameters is defined for packets using IPv4 and IPV6 as shown in Figure 9-326b (Frame Classifier subfield of Classifier Type 10 for packets using IPv4 or IPv6). The subfields in the classifier parameters are represented and transmitted in the big-endian format.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  | Classifier Type (10) | Classifier Mask | Previous Protocol Number or Next Header | Filter Value | Filter Mask |
| Octets: | 1 | 1 | 1 | Variable | Variable |

**Figure 9-326b—Frame Classifier subfield of Classifier Type 10 for packets using IPV4 or IPV6**

The Classifier Mask subfield is reserved.

The Previous Protocol Number or Next Header subfield contains an IPv4 Protocol Number or an IPv6 Next Header value, which share a common interpretation, although some values are not valid for an IPv4 header. The Previous Protocol Number or Next Header subfield value is compared against the Protocol Number of an IPv4 header and to all Next Header values in all IP headers within an IPv6 packet and not just to the one in the fixed header. This rule also applies to an IPv6 packet that is encapsulated within an IPv4 packet. Because of this rule, the Classifier Type 10 Filter Value and Filter Mask are never applied to the first IP header of an IP packet.

The lengths of the Filter Value and Filter Mask subfields are the same and are each equal to (*Length* – 4)/2 octets, where *Length* is the value in the Length field of the TCLAS element.

The Filter Value subfield is an octet string that is compared to the MSDU content, beginning at the first subfield of the protocol header which is identified by the Previous Protocol Number or Next Header subfield.

The Filter Mask subfield is an octet string that is used to indicate which bits in the Filter Value subfield are compared. A bit in the Filter Value subfield is compared only if the matching bit in the Filter Mask subfield is 1.

**(#xxxx)**

**End of proposed changes.**