IEEE P802.11
Wireless LANs

|  |
| --- |
| MAC Address Change Scrambler Reset |
| Date: 2019-09-16 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Assaf Kasher | Qualcomm |  |  | akasher@qti.qualcomm.com |
|  |  |  |  |  |

Abstract

This contribution addresses an issue with scrambler reset when the MAC address changes as proposed by TGaq and inserted into TGmd.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 2939 | 17.3.5.5 | 60 | "when the STA's MAC address is changed" - how does the PHY know the MAC address have chagned? | Add a field to the TXVECTOR that indicates MAC Address change - see 11-18-2165r5 |
|  | 2939 | 17.3.5.5 | 60 | "scrambler shall be reset" - what does reset mean? Certainly not set the scarmbler shift register to be all zeros. | Define that the intent is that the scrambler is not initialized to the state it had at the end of the last transmitted PPDU - see 11-18-2165r5  |

Proposed Resolution: **Revised**

Discussion:

Clause 17.3.5.5 now has the following text:

If dot11MACPrivacyActivated is true, the initial state of the scrambler shall be reset when the STA’s

MAC address is changed. The intent was not to reset the scrambler. The intent was to use a pseudo-random value which is different than the pseudoranom value which normaly used – the scrambler shift register value at the end of the last PPDU.

There are a few issues with this text:

1. How does the PHY know when the MAC address has changed.
2. The scrambler shift register is supposed to be set a non-zero pseudo-random value. What does resetting it mean[[1]](#footnote-1). Setting the scrambler to all ones (all zeros is forbidden) is akin to yelling “I am the device that changed MAC address”
3. The scrambler is sometimes used to carry information. See the paragraph above this text. If the scrambler is reset, this information is lost.

Proposed Resolution:

1. Add a TXVECTOR parameter of SCRMABLER\_RESET. The scrambler reset should be based on this parameter.
2. Rather than reset the scrambler, set the scrambler to a value which is different that the value which is usually used, the value at the end of the last PPDU.

***Editor: Add the following parameter to the TX vector parameter (17.2.2.1):***

|  |  |  |
| --- | --- | --- |
| SCRAMBLER\_RESET | PHY-TXSTART.request (TXVECTOR) | Indicates that the scrambler shall be reset before the start of the PPDUEnumerated Type:RESET\_SCRAMBLER: The scrambler should be reset NO\_SCRAMBLER\_RESET: The scrambler should not be reset. |

***Editor: modify the text in P2939L61 (17.3.5.5 RevMD D3.0) as follows:***

If SCRAMBLER\_RESET is set to RESET\_SCRAMBLER and dot11MACPrivacyActivated is true, the initial state of the scrambler shall be set to a random value not based on the scrambler value at the end of the last transmitted PPDU , before changes based on CH\_BANDWIDTH\_IN\_NON\_HT defined above are applied. ~~reset when the STA’s MAC address is changed.~~

***Editor: Modify the following text 12.2.10 (P2554L8-12 – RevMD D3.0):***

Every time a MAC address is changed to a new random value, counters in all sequence number spaces used to identify each MSDU or MMPDU shall be reset (see 10.3.2.14.2 (Transmitter requirements)), the STA shall set the TXVECTOR parameter SCAMBLER\_RESET to RESET\_SCRAMBLER on the next transmitted PPDU, and the OFDM data scrambler shall be reseeded per the procedure described in 17.3.5.5 (PHY DATA scrambler and descrambler), if applicable.

**References:**

1. The idea behind the reset is clear. Most implementations will keep the scrambler shift register value from the end of the last transmitted packet to be used in the beginning of the next packet. This is random enough for purposes for which the scrambler is used, but it can tell an eavesdropper that this packet is from a specific STA. The question remains, what does reset mean. [↑](#footnote-ref-1)