IEEE P802.11
Wireless LANs

|  |
| --- |
| Resolutions to CIDs 1146, 1220, 1446 and 1447 |
| Date: 2013-05-16 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Jarkko Kneckt | Nokia | Otaniementie 19b, 02150 Espoo Finland  |  | Jarkko.kneckt@nokia.com |
|  |  |  |  |  |

Abstract

The submission resolves the comments for synchronization detected field.

CIDS 1146, 1220, 1446 and 1447 are solved.

**Solved CIDS:**

**CID1142:**

**Comment:** The AP procedures to use the Synchronization Detected field are not described.

**Proposed change**:

Please add the following paragraph to the end of the clause 10.25.10.1:" The AP should set the Synchronization Detected subfield of ILS Synchronization field of ILSC Information field to 1 if any of the conditions below are met:

- The AP detects a peak of transmitted Association Request frames after the AP has transmitted a Beacon or a Probe Response frame and few or no transmissions of Association Request frame after the peak.

- The AP detects high percent of time after its Beacon frame transmission during which the carrier sense (CS) mechanism, as defined in 9.3.2.1, indicates a channel busy by either the physical or virtual CS mechanism and lower percent of time during which the CS mechanism indicates channel busy after the peak."

**CID1220**

**Comment:**

There are multiple issues with Figure 8-183ap and the paragraph in line 13 page 48, e.g.,

1) what is a "peak"? How much/many association request traffic is a peak?

2) why is called Synchronization detected when detected a Peak? Hard to connect those two words. More importantly, confusing with the synchronication concept in subsection 10.1.

3) why use a 1-byte for a 1-bit info? Why not just use one of the reserved bit in the ILSC bitmap field?

**Proposed change:**

Make the following changes:

1. provide clarificaiton to "Peak";

2. in subsection 8.4.2.187 and subsection 10.25.10, change "synchronization detected" to "detected heavy load of link setup requests"

3. use one of the reserved bits in ILSC bitmap field to indicate ""detected heavy load of link setup requests".

**CID1446**

**Comment:**

The behavior of the Synchronization Detected bit is not explained in clause 10.25.10.2

If the logic is based only on condition that the ILS synchronization subfield is present then a optional ILS synchronization subfield of 1 octet length seems redundant. The bit 3, ILS Synchronization bit, in ILSC Type subfield is sufficient.

**Proposed change:**

Explain how Synchronization Detected bit is used to define STA behavior or delect the ILS synchronization subfield and base the logic on just the bit 3 in ILSC Type subfield.

**CID 1447**

**Comment:**

The ILS synchronization subfield seems to define an action and not a condition that needs to be satisfied. However, the line 26 of this page seems to consider this subfield also as resuling in a condition.

**Proposed change:**

Instead of "each and every", modify text to indicate that the ILS synchronization subfield is omited in accessing the STAs ILSC value

**All the comments are revised with the following changes to 802.11 D0.5:**

**8.4.2.187 Differentiated Initial Link Setup element**

***Instructions to the editor. Change as shown. Please note that ILS Synchronization Detected field is deleted from Figure 8-183am***

The Differentiated Initial Link Setup element includes the conditions for a STA to determine the initial link

setup category (ILSC) value for the duration specified in the element. The Differentiated Initial Link Setup

element is optionally present in the Beacon, and Probe Response frames. The Differentiated Initial Link

Setup element is defined in Figure 8-183al.

******

The Element ID field is equal to the Differentiated Initial Link Setup element value in Table 8-54.

The Length field is 1 octet long. It specifies the length of Differentiated Initial Link Setup element in octets.

The ILSC Information field is of variable length, it indicates the conditions to determine the value of the initial link setup category (ILSC) for the time as indicated in the ILS Time field.

The ILSC Information field contains one ILSC Type bitmap subfield and at least one of the ~~four~~ five optional subfields including ILS User Priority, MAC Address Filter, ~~ILS Synchronization~~ Traffic Peak, Link Setup Peak, and Vendor Specific Category, as specified in Figure 8-183am.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ILSC Type | ILS User Priority | MAC Address Filter | Traffic Peak | Link Setup Peak | Vendor Specific Category |
| Octets: | 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or 1 | 0 or variable |

**Figure 8-183am — ILSC Information field format**

The ILSC Type bitmap subfield is 1 octet in length and it is used to indicate the presence of the optional subfields in the ILSC Information field, as defined in Table 8-183al. A bit value of 1 in the bitmap indicates that the corresponding ILSC subfield is present.

**Table 8-183al — ILSC Type subfield format**

|  |  |
| --- | --- |
| ILSC Type bitmap | Description |
| Bit 0 | ILS User Priority |
| Bit 1  | Vendor Specific Category |
| Bit 2  | MAC Address Filter |
| Bit 3  | Traffic Peak |
| Bit 4  | Link Setup Peak |
| Bit 5 - 7 | Reserved |

~~The value 1 of the Synchronization Detected subfield of ILS Synchronization subfield indicates that the AP~~

~~has detected peak of transmitted Initial Link Setup Request frames after the AP has transmitted Beacon or~~

~~Probe Response frame. Value 0 indicates that the peak is not detected.~~

The AP calculates the Periodic Channel Utilization separately for 8 periods. The Periodic Channel Utilisation is measured similarly as the Channel Utilization, but only for the duration of the period. The first period starts from the TBTT. Each period has duration of 1/8 TBTT.

The Channel Utilization is calculated as described in 8.4.2.30.

The following equation is used to calculate Periodic Channel Utilization:

Periodic Channel Utilization = Integer((channel busy time during the period/ (dot11ChannelUtilizationBeaconIntervals × dot11BeaconPeriod × 128)) × 255),

where

channel busy time during the period is defined to be the number of microseconds during the calculated period which the CS mechanism, as defined in 9.3.2.1, has indicated a channel busy indication,

dot11ChannelUtilizationBeaconIntervals represents the number of consecutive beacon intervals during which the channel busy time is measured. The default value of dot11ChannelUtilizationBeaconIntervals is defined in Annex C.

If the Periodic Channel Utilisation of the period is at least 125% of the Channel Utilization, then the AP sets the bit which index is the period number to the Traffic Peak bitmap to value 1. For instance, if the condition is met at the period from 3/8 – 4/8 TBTT, the bit in index 4 of the Traffic Peak bitmap is set to 1.

The AP calculates the average number of link setup request messages (ANSR) and maintains the periodic number of link setup request messages (PNSR) separately for 8 periods. The first period starts from the TBTT. Each period has duration of 1/8 TBTT.

The following equation is used to calculate the value of ANSR:

ANSR = Integer((number of received link setup request frames/(dot11ANSRBeaconIntervals × dot11BeaconPeriod × 1024)) × 255),

where

Number of received link setup request frames is measured over the beacon period,

dot11ANSRBeaconIntervals represents the number of consecutive beacon intervals during which the number of received link setup requests is calculated.

The following equation is used to calculate the value of PNSR:

PNSR = Integer((number of link setup request frames during the period /(dot11ANSRBeaconIntervals × dot11BeaconPeriod × 128)) × 255),

where

Number of link setup request frames during the period is measured over the time period of the pnsr period,

dot11ANSRBeaconIntervals represents the number of consecutive beacon intervals during which the number of received link setup requests is calculated.

If AP considers that number of the PNSR of the period is at least 150% of the ANSR, then the AP sets the bit which index is the period number to the Link Setup Peak bitmap to value 1. For instance, if the condition is met at the period from 7/8 – 8/8 TBTT, the bit in index 7 of the Link Setup Peak bitmap is set to 1.

**10.25.10.1 AP procedures for differential initial link setup**

***Instructions to the editor: Add the following two paragraphs to the end of the clause***.

The Traffic Peak field of the ILSC Type subfield of ILS Information field of the Differentiated Link Setup element may be set to 1 only if AP considers the medium congested. When AP considers the medium congested is out of the scope of the standard.

The Link Setup Peak field of the ILSC Type subfield of ILS Information field of the Differentiated Link Setup element may be set to 1 only if AP considers that it is congested by simultaneous link setup operations. When AP considers that it congested by simultaneous link setup operations is out of the scope of the standard.

**10.25.10.2 Non-AP STA procedures for differentiated initial link setup**

***Instructions to the editor: Change the second paragraph as shown. Add the following two paragraphs to the end of the clause***.

A STA is considered an ILSC STA with its ILSC value set to 1 that is allowed for fast initial link setup only when ~~it satisfies~~ the condition specified in ILS User Priority, Vendor Specific and MAC Address Filter ~~each and every optional~~ subfield that ~~is~~ are present in the ILSC information field are met . If the STA does not satisfy one or more optional subfields present in the ILSC information field, then the STA is not considered an ILSC STA and its ILSC value is set to 0. A logical AND operation of all the conditions in the present optional subfields is used to determine whether the STA is an ILSC STA. The logical AND is not needed if only one optional subfield is present.

If the STA detects that candidate AP indicates by setting bits in the Link Setup Peak bitmap of the ILS Information field of the Differentiated Link Setup element to 1 as defined in 8.4.2.187, the STA should avoid intiating link setup at the congested times.

If the STA detects that AP indicates by setting bits in the Traffic Peak bitmap of the ILS Information field of the Differentiated Link Setup element to 1 as defined in 8.4.2.187, the STA may avoid TXOP obtaining during these periods.

**Annex C**

(normative)

***Insert new MIB variable as shown below***

dot11 ANSRBeaconIntervals OBJECT-TYPE

SYNTAX Unsigned32 (1..100)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity.

Changes take effect as soon as practical in the implementation.

This attribute indicates the number of beacon intervals over which the ANSR and PNSR should be averaged."

DEFVAL { 5 }