

# **NRC7292 Application Note**

## **(Dynamic Vendor IE in Beacon)**

**Ultra-low power & Long-range Wi-Fi**

**Ver 1.2**  
**Jul 05, 2022**

**NEWRACOM, Inc.**

## **NRC7292 Application Note (Dynamic Vendor IE in Beacon) Ultra-low power & Long-range Wi-Fi Module**

**© 2022 NEWRACOM, Inc.**

All right reserved. No part of this document may be reproduced in any form without written permission from Newracom.

Newracom reserves the right to change in its products or product specification to improve function or design at any time without notice.

### **Office**

Newracom, Inc.

25361 Commercentre Drive, Lake Forest, CA 92630 USA

<http://www.newracom.com>

# Contents

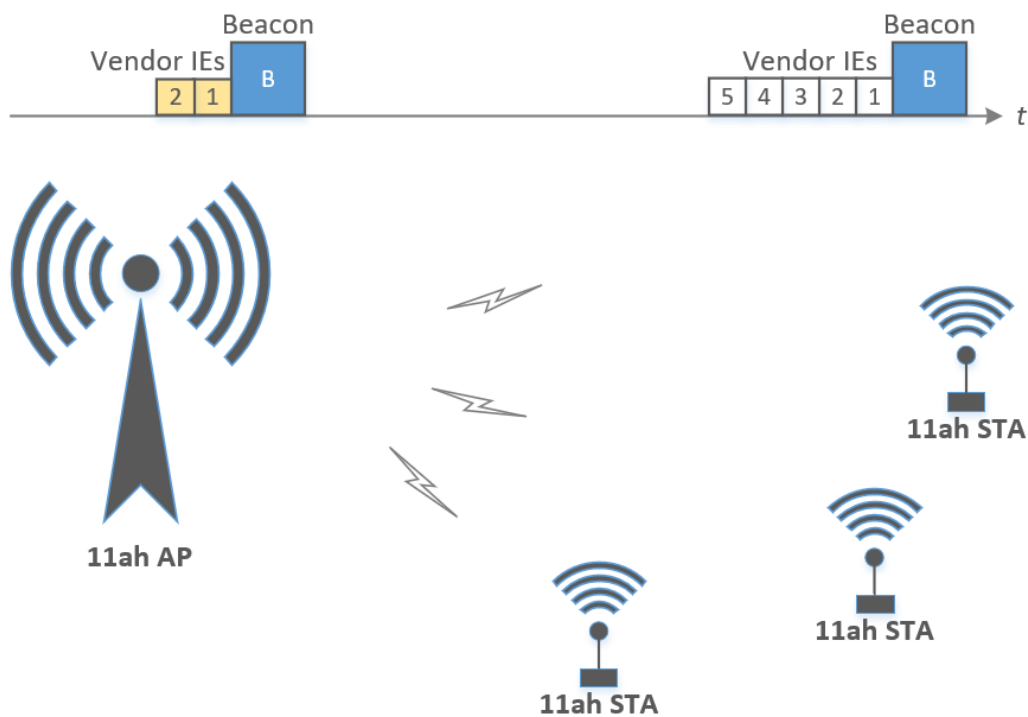
- 1 Overview..... 5**
- 2 How to use the Dynamic Vendor IE ..... 6**
  - 2.1 Deliver vendor specific information.....6
    - 2.1.1 Usage.....6
    - 2.1.2 Example .....6
  - 2.2 Retrieve vendor specific information .....6
    - 2.2.1 Usage.....7
    - 2.2.2 Example .....7
- 3 Revision History ..... 8**

# List of Figures

Figure 1.1    Concept of the Dynamic Vendor IE..... 5

# 1 Overview

This document describes the Dynamic Vendor IE feature. This feature is to broadcast vendor specific information in a Beacon frame. As shown in Figure 1.1, a 11ah AP can deliver up to 5 vendor specific information in one Beacon frame. Furthermore, the number of vendor specific information and its contents can be changed dynamically with *iw* command. The Dynamic Vendor IE feature is supported only through the host mode.



**Figure 1.1** Concept of the Dynamic Vendor IE

## 2 How to use the Dynamic Vendor IE

### 2.1 Deliver vendor specific information

User can use *iw* command for vendor information delivery on the host terminal. Once the user executes the command, the vendor information is sent at the next Beacon frame. User can run this command during 11ah AP operation.

#### 2.1.1 Usage

```
$iw dev <interface> vendor send <OUI> <Subcmd> <HEX data>
```

- Interface : 11ah interface (e.g. wlan0)
- OUI : Organization Unique Identifier (0xFCFFAA for NRC)
- Subcmd : sub-command ID for adding/removing hex data
  - 0xF0 ~ 0xF4  
; sub-command ID to add data in a beacon frame. If a vendor specific IE exists with the same sub-command, it will be updated to a new one.
  - 0xE0 ~ 0xE4  
; sub-command ID to remove a vendor specific IE which has corresponding sub-command ID. for example, 0xE0 will remove a vendor specific IE which has the sub-command ID 0xF0. 0xE1 will remove a vendor specific IE which has the sub-command ID 0xF1.....
- HEX data : vendor specific information data in hex (up to 255 bytes)

#### 2.1.2 Example

1. Deliver one vendor specific information in beacon frame with 0xF0.  

```
$sudo iw dev wlan0 vendor send 0xFCFFAA 0xF0 0x01 0x02 0x03 0x04
```
2. Deliver three vendor specific information in beacon frame  

```
$sudo iw dev wlan0 vendor send 0xFCFFAA 0xF0 0x01 0x02 0x03 0x04  
$sudo iw dev wlan0 vendor send 0xFCFFAA 0xF1 0x05 0x06 0x07 0x08  
$sudo iw dev wlan0 vendor send 0xFCFFAA 0xF2 0x09 0x0A 0x0B 0x0C
```

### 2.2 Retrieve vendor specific information

User can retrieve the vendor specific information by using *iw* command as shown in **Error! Reference source not found.** When the user executes this command, the retrieved vendor information printed out on the terminal. User only can use this command at the 11ah STA.

## 2.2.1 Usage

```
$iw event -f
```

## 2.2.2 Example

1. When 11ah AP broadcasts two vendor specific IEs, "0x01020304" and "0x05060708"

```
$sudo iw event -f
```

```
phy #28: vendor event fcffaa:0  
vendor event: 08 00 00 00 01 02 03 04
```

```
phy #28: vendor event fcffaa:0  
vendor event: 08 00 00 00 01 02 03 04
```

```
phy #28: vendor event fcffaa:0  
vendor event: 08 00 00 00 01 02 03 04
```

```
phy #28: vendor event fcffaa:0  
vendor event: 08 00 00 00 01 02 03 04
```

```
phy #28: vendor event fcffaa:0  
vendor event: 08 00 00 00 01 02 03 04
```

### 3 Revision History

Revision No	Date	Comments
Ver 1.0	07/05/2019	Initial version for customer release created
Ver 1.1	05/20/2022	Add description about removing sub-command
Ver 1.2	07/05/2022	Update description about deliver vendor specific information