DHC Working Group
Internet Draft   Murali Achanta
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   **DHCP Option for Radio Configuration Parameters to Mobile Access
                              Points**

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Abstract

   This document defines a DHCP option that contains Radio specific
   Parameters for Mobile Access Points, Like Transmit Power, Country
   code, reserved RF channels.

Conventions used in this document

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in RFC-2119 [i].

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1.   Motivation

   Dynamic Host Configuration Protocol provides necessary mechanism for
   device configuration. However, there is no provision for Mobile
   access points to get their radio configuration information elements.

   With Introduction of portable mobile Access points, users can take
   these mobile access points along with them where ever they go to
   extend wired network to wireless network. Problem is when multiple
   users take multiple access points to a Motel then there will be
   overlapping radio cells, because one radio cell may go across
   multiple motel rooms. One way to solve this problem is to configure
   lower transmit power levels on these access points. However users
   will not proactively configure lower transmit powers on their access
   points. 802.11h TPC is only to control transmit power of 802.11
   clients not for the access points. We need a way to automatically set
   the transmit power from wired network, that way network admin can
   configure lower transmit powers to decrease the radio cell size
   depending on the room sizes, so that multiple rooms can have their
   own cell without interfering other radio cells.

   Mobile access points may get radio specific configuration parameters
   for this network from DHCP server, to determine what is the max
   transmit power allowed, which country this mobile portable access
   point has been plugged into, what are the recommended RF channels not
   to be used while connected to this network.

2.   **Mobile access point radio Configuration parameters option format**

   The option begins with a tag octet containing the option code(TBD). A
   length octet following the tag octet. The value of the length octet
   does not include itself or the tag octet. This option layout is
   depicted below:

```
+------+--------+-------------+-------------+---+-------------+
| TBD  |Length  | Sub-option 1 | Sub-option 2 |...| Sub-option n |
+------+--------+-------------+-------------+---+-------------+
```

   A sub-option begins with a tag octet containing the sub-option code.
   A length octet follows the tag octet. The value of the length octet
   does not include itself or the tag octet. The length octet is
   followed by "length" octets of sub-option information. The sub-ption
   layout is depicted below:

```
+------------------+--------+----------------------+
| Sub-option Code   | Length | Sub-option information |
+------------------+--------+----------------------+
```

2.1   **Radio transmit power sub-option**

   This sub-option provides a Max allowed Transmit power in unit of dBm.
   It is a one octet value.
    Code   Len   802.11 wireless transmit power
```
+-----+-----+--------------+-----
| 1   | 1   |  power in dBm |
+-----+-----+--------------+-----
```

2.2   **Radio IOS 3166 country code sub-option**

   This sub-option provides the country code of the network in which
   this mobile access point is connected to. This information MUST be
   used to derive the RF channel list this access point is supposed to
   operate as per regulatory requirements.

    Code Len   802.11 wireless A2 IS0 3166 country code
```
+-----+-----+-----+-----+-----+-----+--
| 2   | 2   | c1  | c2  |
+-----+-----+-----+-----+-----+-----+--
```

   County code values are to be taken from valid ISO 3166 standard.
   Alpha-2 code elements MUST be used in this option. c1 and c2 are the
   two characters for a given country code.

http://www.iso.org/iso/en/prods-services/iso3166ma/02iso-3166-code-lists/list-en1.html

2.3   Radio reserved RF channels sub-option

This sub-option provides a list of channel a mobile access point not supposed to operate in order to avoid interference to the native devices operating in the network.

```
 Code  Len     802.11 wireless reserved channels
+-----+-----+----------+-----------+----------+---
| 3   |  n  | channel1 |  channel2 | channel3 | . . . . .
+-----+-----+----------+-----------+----------+---
```

Channel[1..n] is 4 digit representation of the radio frequency in MHz. Example: 2412 MHz, 2462 MHz, 5180 MHz.

3.   IANA Considerations

IANA is requested to assign an option code for radio configuration parameters for mobile access points.

4. Security Considerations

These DHCP options may be used by intruder DHCP server to mislead the mobile access points to operate in country domain other than the existing country and provide wrong power levels.

References

[1]Bradner, S., "Intellectual Property Rights in IETF Technology", BCP 79, RFC 3668, Feb. 2004

[2] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997

[3] Droms, R., "Dynamic Host Configuration Protocol", RFC 2131, March 1997.

Acknowledgments

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