### TLV Naming in the MANET Generalized Packet/Message Format
### draft-ietf-manet-tlv-naming-05

Abstract

   This document reorganizes the naming of already allocated TLV (type-
   length-value) types and type extensions in the Mobile Ad hoc NETwork
   (MANET) registries defined by RFC 5444 to use names appropriately.
   It has no consequences in terms of any protocol implementation.

   This document also updates the Expert Review guidelines from RFC
   5444, so as to establish a policy for consistent naming of future TLV
   type and type extension allocations.  It makes no other changes to
   RFC 5444.

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Table of Contents

## 1.  Introduction

   This document reorganizes and rationalizes the naming of TLVs (type-
   length-value structures), defined by [RFC5444] and recorded by IANA
   in the Mobile Ad hoc NETwork (MANET) Parameters registries "Packet
   TLV Types", "Message TLV Types", and "Address Block TLV Types".

   This document reorganizes the naming of already allocated Packet,
   Message and Address Block TLV types, and their corresponding Type
   Extensions, and updates corresponding IANA registries.

   TLVs have a type (one octet) and a type extension (one octet) which
   together form a full type (of two octets).  A TLV may omit the type
   extension when it is zero, but that applies only to its
   representation, it still has a type extension of zero.  A TLV type
   defines an IANA registry of type extensions for that type.

   There have been two forms of TLV allocation.

   The first, but less common, form of allocation has been that
   allocation of the type has immediately defined (but not necessarily
   allocated) all the corresponding type extensions for versions of that
   type.  This applies, for example, to the Address Block TLV
   LINK_METRIC specified in [RFC7181].  The LINK_METRIC type extensions
   are all available for allocation for different definitions of link
   metric.  It is appropriate in this case to apply the name LINK_METRIC
   to the type, and also to all the full types corresponding to that
   type, as has been done.  Type extensions can then be individually
   named, or can be simply referred to by their number.

   The second, more common, form of allocation has been that for a TLV
   type, only type extension 0, and possibly the type extension 1, are
   defined.  An example is the Address Block TLV LINK_STATUS defined in
   [RFC6130], where only type extension 0 is allocated.  It is not
   reasonable to assume that the remaining 255 type extensions will be
   allocated to forms of LINK_STATUS. (Other forms of link status are
   already catered to by the introduction, in [RFC7188], of a registry
   for values of the LINK_STATUS TLV.)  Thus the name LINK_STATUS should
   be attached to that specific type extension for that type, i.e., to
   the full type, and not to the TLV type when used with all other type
   extensions therefore.  This was, however, not done as part of the
   initial registration of this TLV type.  Effectively, this leaves, for
   the LINK_STATUS TLV type, the type extensions 1-255 either
   unavailable for allocation (if applying strictly the interpretation
   that they must relate to a LINK_STATUS), or counterintuitively named
   for their intended function.

The purpose of this document is to change how names of the second
form are applied, and recorded in IANA registries, and to provide
guidelines and instructions for future TLV type allocations.  This is
to facilitate the addition of new TLVs using type extensions other
than 0, but without them having inappropriate names attached.  So,
for example, LINK_STATUS will become the name of the full type (as
composed by the TLV type 3 and the TLV type extension 0), and will
cease being the name of the TLV type 3.  This leaves the question of
how to name the type.  As it is not clear what other TLVs might be
defined for other type extensions of the same type, it is proposed to
leave the type currently unnamed, specified only by number.

This document also updates the Expert Review guidelines from
[RFC5444], so as to establish a policy for consistent naming of
future TLV type and type extension allocations.

For clarity, all currently allocated TLVs in [RFC5497], [RFC6130],
[RFC6621], [RFC7181] and [RFC7182] will be listed in the IANA
considerations section of this document, indicating no change when
that is appropriate (such as the LINK_METRIC TLV, and including both
TLVs defined in [RFC6621]).  The only changes are of naming.

Note that nothing in this draft changes the operation of any
protocol.  This naming is already used, in effect, in [RFC6130] and
[RFC7181], currently the main users of allocated TLVs.  For example
the former indicates that all usage of LINK_STATUS refers to that TLV
with type extension 0.


## 2.  Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and
"OPTIONAL" in this document are to be interpreted as described in
[RFC2119].

All references to elements such as packet, message and TLV in this
document refer to those defined in [RFC5444].

## 3.  IANA Considerations

This document updates the Expert Review evaluation guidelines for
Packet TLV Type, Message TLV Type, and Address Block TLV Type
allocations, from [RFC5444], and updates the registries for already
made allocations to follow these guidelines.

### 3.1.  Expert Review: Evaluation Guidelines

For registration from the registries for Packet TLV Types, Message
TLV Types, and Address Block TLV Types, the following guidelines
apply, in addition to those given in section 6.1 in [RFC5444]:

o  If the requested TLV Type immediately defines (but not necessarily
   allocates) all the corresponding type extensions for versions of
   that type, then a common name SHOULD be assigned for the TLV type.

o  Otherwise, if the requested TLV Type does not immediately define
   all the corresponding type extensions for versions of that type,
   then a common name SHOULD NOT be assigned for that TLV type.
   Instead, it is RECOMMENDED that:

   *  The "description" for the allocated TLV type be "Defined by
      Type Extension";

   *  For Packet TLV Types, that the Type Extension registry, created
      for the TLV Type, be named "Type XX Packet TLV Type
      Extensions", with XX replaced by the numerical value of the TLV
      Type.

   *  For Message TLV Types, that the Type Extension registry,
      created for the TLV Type, be named "Type XX Message TLV Type
      Extensions", with XX replaced by the numerical value of the TLV
      Type.

   *  For Address Block TLV Types, that the Type Extension registry,
      created for the TLV Type, be named "Type XX Address Block TLV
      Type Extensions", with XX replaced by the numerical value of
      the TLV Type.

   *  That when a new Type Extension is required that, unless there
      are reasons to the contrary, the next consecutive type
      extension is allocated and given a name.  (Reasons to the
      contrary MAY include maintaining a correspondence between
      corresponding Packet, Message, and Address Block TLVs, and
      reserving type extension zero if not yet allocated.)

Note that the former case is unchanged by this specification, this

   currently includes TLV types named ICV, TIMESTAMP and LINK_METRIC,
   and the HELLO Message-Type-specific TLVs defined in [RFC6621].

## 3.2.  Updated IANA Registries

   The following changes (including correcting some existing minor
   errors) all apply to the IANA registry "Mobile Ad hoc NETwork (MANET)
   Parameters".  For clarity, registries that are unchanged, including
   those that define all type extensions of a TLV type, are listed as
   unchanged.

   The IANA registry "Packet TLV Types" is unchanged.

   The IANA Registry "ICV Packet TLV Type Extensions" is unchanged.

   The IANA Registry "TIMESTAMP Packet TLV Type Extensions" is
   unchanged.

   The IANA Registry "Message TLV Types" is changed to Table 1.

| Type | Description | Reference |
|---------|------------------------------|-----------|
| 0 | Defined by Type Extension | [RFC5497] |
| 1 | Defined by Type Extension | [RFC5497] |
| 2-4 | Unassigned | |
| 5 | ICV | [RFC7182] |
| 6 | TIMESTAMP | [RFC7182] |
| 7 | Defined by Type Extension | [RFC7181] |
| 8 | Defined by Type Extension | [RFC7181] |
| 9-223 | Unassigned | |
| 224-255 | Reserved for Experimental Use | [RFC5444] |

                        Table 1: Message TLV Types

The IANA Registry "INTERVAL_TIME Message Type Extensions" is renamed
as "Type 0 Message TLV Type Extensions" and changed to Table 2.

```
+-----------+--------------+---------------------------+-----------+
|   Type    |     Name     | Description               | Reference |
| Extension |              |                           |           |
+-----------+--------------+---------------------------+-----------+
|     0     | INTERVAL_TIME| The maximum time before   | [RFC5497] |
|           |              | another message of the    |           |
|           |              | same type as this message |           |
|           |              | from the same originator  |           |
|           |              | should be received        |           |
|   1-223   |              | Unassigned                |           |
|  224-255  |              | Reserved for Experimental | [RFC5497] |
|           |              | Use                       |           |
+-----------+--------------+---------------------------+-----------+
```

Table 2: Type 0 Message TLV Type Extensions

The IANA Registry "VALIDITY_TIME Message Type Extensions" is renamed
as "Type 1 Message TLV Type Extensions" and changed to Table 3.

```
+-----------+--------------+---------------------------+-----------+
|   Type    |     Name     | Description               | Reference |
| Extension |              |                           |           |
+-----------+--------------+---------------------------+-----------+
|     0     | VALIDITY_TIME| The time from receipt of  | [RFC5497] |
|           |              | the message during which  |           |
|           |              | the information contained |           |
|           |              | in the message is to be   |           |
|           |              | considered valid          |           |
|   1-223   |              | Unassigned                |           |
|  224-255  |              | Reserved for Experimental | [RFC5497] |
|           |              | Use                       |           |
+-----------+--------------+---------------------------+-----------+
```

Table 3: Type 1 Message TLV Type Extensions

The IANA Registry "ICV Message TLV Type Extensions" is unchanged.

The IANA Registry "TIMESTAMP Message TLV Type Extensions" is
unchanged.

The IANA Registry "MPR_WILLING Message Type Extensions" is renamed as
"Type 7 Message TLV Type Extensions" and changed to Table 4.

| Type Extension | Name | Description | Reference |
|------------|------------|------------------------------|-----------|
| 0 | MPR_WILLING | Bits 0-3 specify the originating router's willingness to act as a flooding MPR; bits 4-7 specify the originating router's willingness to act as a routing MPR | [RFC7181] |
| 1-223 | | Unassigned | |
| 224-255 | | Reserved for Experimental Use | [RFC7181] |

Table 4: Type 7 Message TLV Type Extensions

The IANA Registry "CONT_SEQ_NUM Message Type Extensions" is renamed
as "Type 8 Message TLV Type Extensions" and changed to Table 5.

| Type Extension | Name | Description | Reference |
|------------|------------|------------------------------|-----------|
| 0 | CONT_SEQ_NUM (COMPLETE) | Specifies a content sequence number for this complete message | [RFC7181] |
| 1 | CONT_SEQ_NUM (INCOMPLETE) | Specifies a content sequence number for this incomplete message | [RFC7181] |
| 2-223 | | Unassigned | |
| 224-255 | | Reserved for Experimental Use | [RFC7181] |

Table 5: Type 8 Message TLV Type Extensions

The IANA Registry "HELLO Message-Type-specific Message TLV Types" is
unchanged.

The IANA Registry "SMF_TYPE Message TLV Type Extensions" is
unchanged.

The IANA Registry "TC Message-Type-specific Message TLV Types" is
unchanged.

The IANA Registry "Address Block TLV Types" is changed to Table 6.

```
    +---------+------------------------------+-----------+
    |  Type   | Description                  | Reference |
    +---------+------------------------------+-----------+
    |    0    | Defined by Type Extension    | [RFC5497] |
    |    1    | Defined by Type Extension    | [RFC5497] |
    |    2    | Defined by Type Extension    | [RFC6130] |
    |    3    | Defined by Type Extension    | [RFC6130] |
    |    4    | Defined by Type Extension    | [RFC6130] |
    |    5    | ICV                          | [RFC7182] |
    |    6    | TIMESTAMP                    | [RFC7182] |
    |    7    | LINK_METRIC                  | [RFC7181] |
    |    8    | Defined by Type Extension    | [RFC7181] |
    |    9    | Defined by Type Extension    | [RFC7181] |
    |   10    | Defined by Type Extension    | [RFC7181] |
    | 11-223  | Unassigned                   |           |
    | 224-255 | Reserved for Experimental Use | [RFC5444] |
    +---------+------------------------------+-----------+
```

Table 6: Address Block TLV Types

The IANA Registry "INTERVAL_TIME Address Block TLV Type Extensions"
is renamed as "Type 0 Address Block TLV Type Extensions" and changed
to Table 7.

```
    +-----------+---------------+--------------------------+-----------+
    |   Type    |     Name      | Description              | Reference |
    | Extension |               |                          |           |
    +-----------+---------------+--------------------------+-----------+
    |     0     | INTERVAL_TIME | The maximum time before  | [RFC5497] |
    |           |               | another message of the   |           |
    |           |               | same type as this message |          |
    |           |               | from the same originator |           |
    |           |               | and containing this      |           |
    |           |               | address should be        |           |
    |           |               | received                 |           |
    |   1-223   |               | Unassigned               |           |
    | 224-255   |               | Reserved for Experimental | [RFC5497] |
    |           |               | Use                      |           |
    +-----------+---------------+--------------------------+-----------+
```

Table 7: Type 0 Address Block TLV Type Extensions

The IANA Registry "VALIDITY_TIME Address Block TLV Type Extensions"
is renamed as "Type 1 Address Block TLV Type Extensions" and changed
to Table 8.

```
+-----------+--------------+--------------------------+-----------+
|   Type    |     Name     | Description              | Reference |
| Extension |              |                          |           |
+-----------+--------------+--------------------------+-----------+
|     0     | VALIDITY_TIME | The time from receipt of | [RFC5497] |
|           |              | the address during which |           |
|           |              | the information regarding |           |
|           |              | this address is to be    |           |
|           |              | considered valid         |           |
|   1-223   |              | Unassigned               |           |
|  224-255  |              | Reserved for Experimental | [RFC5497] |
|           |              | Use                      |           |
+-----------+--------------+--------------------------+-----------+
```

            Table 8: Type 1 Address Block TLV Type Extensions

The IANA Registry "LOCAL_IF Address Block Type Extensions" is renamed
as "Type 2 Address Block TLV Type Extensions" and changed to Table 9.

```
+-----------+----------+----------------------+--------------------+
|   Type    |   Name   | Description          | Reference          |
| Extension |          |                      |                    |
+-----------+----------+----------------------+--------------------+
|     0     | LOCAL_IF | This value is to be  | [RFC7188][RFC6130] |
|           |          | interpreted according |                    |
|           |          | to the registry      |                    |
|           |          | [LOCAL_IF TLV Values] |                    |
|   1-223   |          | Unassigned           |                    |
|  224-255  |          | Reserved for         | [RFC6130]          |
|           |          | Experimental Use     |                    |
+-----------+----------+----------------------+--------------------+
```

            Table 9: Type 2 Address Block TLV Type Extensions

The IANA Registry "LINK_STATUS Address Block TLV Type Extensions" is
renamed as "Type 3 Address Block TLV Type Extensions" and changed to
Table 10.

```
+-----------+-------------+------------------+-------------------+
|   Type    |    Name     | Description      | Reference         |
| Extension |             |                  |                   |
+-----------+-------------+------------------+-------------------+
|     0     | LINK_STATUS | This value is to | [RFC7188][RFC6130]|
|           |             | be interpreted   |                   |
|           |             | according to the |                   |
|           |             | registry         |                   |
|           |             | [LINK_STATUS TLV |                   |
|           |             | Values]          |                   |
|   1-223   |             | Unassigned       |                   |
|  224-255  |             | Reserved for     | [RFC6130]         |
|           |             | Experimental Use |                   |
+-----------+-------------+------------------+-------------------+
```

              Table 10: Type 3 Address Block TLV Type Extensions

The IANA Registry "OTHER_NEIGHB Address Block TLV Type Extensions" is
renamed as "Type 4 Address Block TLV Type Extensions" and changed to
Table 11.

```
+-----------+-------------+------------------+-------------------+
|   Type    |    Name     | Description      | Reference         |
| Extension |             |                  |                   |
+-----------+-------------+------------------+-------------------+
|     0     | OTHER_NEIGHB| This value is to | [RFC7188][RFC6130]|
|           |             | be interpreted   |                   |
|           |             | according to the |                   |
|           |             | registry         |                   |
|           |             | [OTHER_NEIGHB TLV|                   |
|           |             | Values]          |                   |
|   1-223   |             | Unassigned       |                   |
|  224-255  |             | Reserved for     | [RFC6130]         |
|           |             | Experimental Use |                   |
+-----------+-------------+------------------+-------------------+
```

              Table 11: Type 4 Address Block TLV Type Extensions

The IANA Registry "ICV Address TLV Type Extensions" is renamed as
"ICV Address Block TLV Type Extensions" but is otherwise unchanged.

The IANA Registry "TIMESTAMP Address TLV Type Extensions" is renamed
as "TIMESTAMP Address Block TLV Type Extensions" but is otherwise
unchanged.

The IANA Registry "LINK_METRIC Address Block TLV Type Extensions" is
unchanged.

The IANA Registry "MPR Address Block TLV Type Extensions" is renamed
as "Type 8 Address Block TLV Type Extensions" and changed to
Table 12.

```
+-----------+------+--------------------------+-------------------+
|   Type    | Name | Description              | Reference         |
| Extension |      |                          |                   |
+-----------+------+--------------------------+-------------------+
|     0     | MPR  | This value is to be      | [RFC7188][RFC7181] |
|           |      | interpreted according to |                   |
|           |      | the registry [MPR TLV Bit |                   |
|           |      | Values]                  |                   |
|   1-223   |      | Unassigned               |                   |
|  224-255  |      | Reserved for Experimental | This Document     |
|           |      | Use                      |                   |
+-----------+------+--------------------------+-------------------+
```

                Table 12: Type 8 Address Block TLV Type Extensions

The IANA Registry "NBR_ADDR_TYPE Address Block TLV Type Extensions"
is renamed as "Type 9 Address Block TLV Type Extensions" and changed
to Table 13.

```
+-----------+---------------+-----------------+-------------------+
|   Type    |     Name      | Description     | Reference         |
| Extension |               |                 |                   |
+-----------+---------------+-----------------+-------------------+
|     0     | NBR_ADDR_TYPE | This value is to | [RFC7188][RFC7181] |
|           |               | be interpreted  |                   |
|           |               | according to the |                   |
|           |               | registry        |                   |
|           |               | [NBR_ADDR_TYPE  |                   |
|           |               | Address Block   |                   |
|           |               | TLV Bit Values] |                   |
|   1-223   |               | Unassigned      |                   |
|  224-255  |               | Reserved for    | This Document     |
|           |               | Experimental Use |                   |
+-----------+---------------+-----------------+-------------------+
```

                Table 13: Type 9 Address Block TLV Type Extensions

The IANA Registry "GATEWAY Address Block TLV Type Extensions" is
renamed as "Type 10 Address Block TLV Type Extensions" and changed to
Table 14.

```
+-----------+---------+----------------------+-------------------+
|   Type    |  Name   | Description          | Reference         |
| Extension |         |                      |                   |
+-----------+---------+----------------------+-------------------+
|     0     | GATEWAY | Specifies that a given| [RFC7188][RFC7181] |
|           |         | network address is   |                   |
|           |         | reached via a gateway |                   |
|           |         | on the originating   |                   |
|           |         | router, with value   |                   |
|           |         | equal to the number of|                   |
|           |         | hops                 |                   |
|   1-223   |         | Unassigned           |                   |
|  224-255  |         | Reserved for         | This Document     |
|           |         | Experimental Use     |                   |
+-----------+---------+----------------------+-------------------+
```

                Table 14: Type 10 Address Block TLV Type Extensions

The IANA Registry "HELLO Message-Type-specific Address Block TLV
Types" is unchanged.

The IANA Registry "SMF_NBR_TYPE Address Block TLV Type Extensions" is
unchanged.

The IANA Registry "TC Message-Type-specific Address Block TLV Types"
is unchanged.

Note: This document adds reservations for experimental use, omitted
in [RFC7181], to the last three tables.


4.  Security Considerations

As this document is concerned only with how entities are named, those
names being used only in documents such as this and IANA registries,
this document has no security considerations.


5.  Acknowledgments

The authors would like to thank Adrian Farrel for pointing out the
need to reorganize and rationalize the naming of the TLVs defined by
[RFC5444], and Tom Taylor for pointing out some omissions and errors.

6.  Normative References

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   [RFC6621]   Macker, J., "Simplified Multicast Forwarding", RFC 6621,
               May 2012.

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               "The Optimized Link State Routing Protocol version 2",
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               Check Value and Timestamp TLV Definitions for Mobile Ad
               Hoc Networks (MANETs)", RFC 7182, April 2014.

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               Discovery Protocol (NHDP) Extension TLVs", RFC 7188,
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