TRILL: Nickname and Label Properties
<draft-eastlake-trill-nick-label-prop-02.txt>

Abstract

   There are a number of current and prospective requirements to
   indicate properties of nicknames, labels, and blocks thereof, for use
   with the TRILL (Transparent Interconnection of Lots of Links, RFC
   6325) protocol. To meet that need, this document specifies IS-IS
   (Intermediate System to Intermediate System) sub-TLVs and some of
   their uses.

Status of This Memo

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1. Introduction

There are a number of current and prospective requirements to indicate properties of Nicknames, data Labels, and blocks thereof, for use with the TRILL (Transparent Interconnection of Lots of Links [RFC6325]) protocol. To meet that need, this document specifies two IS-IS (Intermediate System to Intermediate System [ISO-10589] [RFC1195]) sub-TLVs and some of their uses.

These sub-TLVs are used to flag properties of Nicknames and data Labels. Provision is made for flags associated with

- o   individual Nicknames,
- o   blocks of Nicknames,
- o   individual Labels, and
- o   blocks of Labels.

In addition, different sizes of Nicknames and data Labels can be accommodated.

The sub-TLVs specified in this document are used as follows:

o   They appear only in the IS-IS Router Capability and MT-Capability TLVs, which are TLVs number 242 and 144 and are specified in [RFC4971] and [RFC6329] respectively.

o   They can appear multiple times in the same or different Capability or MT-Capability TLVs.

1.1 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 [RFC2119].

[2](). The Nickname Properties Sub-TLV

The structure of the Nickname properties (NICK-PROP) sub-TLV is as
shown below.

```
    +-+-+-+-+-+-+-+-+
    | Type = TBD    |                (1 byte)
    +-+-+-+-+-+-+-+-+
    | Length        |                (1 byte)
    +-+-+-+-+-+-+-+-+-+-+-+-+...
    | NICK-PROP RECORD 1            (variable)
    +-+-+-+-+-+-+-+-+-+-+-+-+...
    | NICK-PROP RECORD 2            (variable)
    +-+-+-+-+-+-+-+-+-+-+-+-+...
    | ...
    +-+-+-+-+-+-+-+-+-+-+-+-+...
    | NICK-PROP RECORD K
    +-+-+-+-+-+-+-+-+-+-+-+-+...
```

Figure 1. The Nickname Properties Sub-TLV

o Type: NICK-PROP Sub-TLV type, set to TBD.

o Length: Variable.

o NICK-PROP RECORD: Variable length record as described below.

Each NICK-PROP RECORD is structured as follows.

```
    0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
   +--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
   |NB|  NKSZ  |IN|OK|     RESV                    |
   +--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
   | Nickname Information        (variable)
   +-+-+-+-+-+-+-+-+-+-+-+-+...
```

NB: If the NB (Nickname Block) flag is zero, the Nickname Information
    is a single Nickname. If the NB flag is one, the Nickname
    Information consists of an initial and final Nickname that are
    treated as unsigned integers and specify a block of Nicknames
    inclusively.

NKSZ: The NKSZ field specifies the size of each of the one or two
    Nickname values (see NB bit) that occur in the Nickname
    Information

    The assigned value of NKSZ is as follows:

```
        NKSZ
        ----
          0    16-bit Nicknames
        1-7    Available for assignment
```

IN: The IN flag is ignored unless the NB flag is zero and the
    Nickname Information is a Nickname owned by the RBridge
    advertising the enclosing NICK-PROP sub-TLV. When it is not being
    ignored and is equal to one, the IN flag indicates that the
    Nickname may be used by the advertising RBridge as the ingress
    Nickname for TRILL Data frames it creates.

    TRILL switches may have multiple Nicknames [RFC6325] but there is
    no reason within the TRILL protocol for a TRILL switch to use
    more than one Nickname as the ingress Nickname for TRILL Data
    frames it creates. If a TRILL switch is not using all the
    Nicknames it holds as ingress Nicknames, it SHOULD use the NICK-
    PROP sub-TLV to indicate the Nickname (or Nicknames) it is using
    as ingress. This reduces the amount of Reverse Path Forwarding
    Check (RPFC) state in the campus. The amount of such state at
    each TRILL switch port is roughly proportional to the product the
    number of ingress Nicknames in use and the number of multi-
    destination distribution trees in use. If a TRILL switch does not
    avertise any ingress Nickname or Nicknames using the IN flag, it
    may use any Nickname it hold as an ingress Nickname.

OK: The OK flag is only effective if the NB flag is one and the NICK-
    PROP sub-TLV is advertised by the TRILL switch that is highest
    priority to be a tree root. TRILL switches that understand the OK
    flag and see one or more OK flags that are effective and are set
    to one dynamically select their Nickname as specified in
    [RFC6325] and [clearcorrect] except that they do so only from the
    block or blocks of nicknames advertised by NICK-PROP sub-TLV
    NICK-PROP RECORDS with an effective OK flag set to one. Such
    blocks are called the OK Nicknames blocks and a Nickname that is
    included in them is called an OK Nickname. If any Nickname value
    in the range from 0xFFC0 through 0xFFFF or equal to 0x0000 is
    advertised as part of an OK Nickname block they are ignored. For
    example, if 0xE000 through 0xFFFF was advertised as an OK
    Nickname block, it would be treated as if 0xE000 through 0xFFBF
    was advertised.

    If the OK Nickname blocks change such that any TRILL switch is
    holding a Nickname that is no longer OK, that TRILL switch MUST
    allocate a new OK Nickname. To maximize network stability, all
    TRILL switches that might become highest priority tree root
    SHOULD advertise the same OK Nickname blocks.

    Intended uses of this flag are to restrict Nicknames within part
    of a network so as to support some methods to implement

[multilevel] or [multidatacenter] TRILL.

RESV: The remaining 10 bits are reserved and MUST be set to zero and
    ignored on receipt.

    Nickname Information: If NB is zero, this information consists of
    a single Nickname. If NB is one, this information consists of an
    initial and final Nickname and represents a block of Nicknames.
    The Nicknames are treated as unsigned integers in network byte
    order. If the final Nickname of a block is less than the initial
    Nickname, the NICK-PROP RECORD is ignored. If the initial and
    final Nicknames are equal, then a block of size one is indicated.
    Otherwise a block of Nickname values with a size greater than one
    is indicated, starting with initial Nickname through and
    including the final Nickname. If the size of each Nickname value
    is not a multiple of 8 bits, the Nickname values are padded with
    initial reserved bits up to the next multiple of 8. These
    reserved bits MUST be sent as zero and ignored on receipt.

Each NICK-PROP RECORD must fit within the Length of the NICK-PROP
sub-TLV. If there is a truncated NICK-PROP RECORD at the end of hte
sub-TLV, that RECORD is ignored.

For IANA Considerations in assigning values of NKSZ and bits in the
RESV field, see [Section 4](#).

3. The Label Properties Sub-TLV

The structure of the Label properties (LABEL-PROP) sub-TLV is as
shown below.

```
        +-+-+-+-+-+-+-+-+
        | Type = TBD    |                (1 byte)
        +-+-+-+-+-+-+-+-+
        | Length        |                (1 byte)
        +-+-+-+-+-+-+-+-+-+-+-+-+...
        | LABEL-PROP RECORD 1          (variable)
        +-+-+-+-+-+-+-+-+-+-+-+-+...
        | LABEL-PROP RECORD 2          (variable)
        +-+-+-+-+-+-+-+-+-+-+-+-+...
        | ...
        +-+-+-+-+-+-+-+-+-+-+-+-+...
        | LABEL-PROP RECORD K
        +-+-+-+-+-+-+-+-+-+-+-+-+...
```

                Figure 2. The Label Properties Sub-TLV

o   Type: LABEL-PROP Sub-TLV type, set to TBD.

o   Length: Variable.

o   LABEL-PROP RECORD: Variable length record as described below.

Each LABEL-PROP RECORD is structured as follows.

```
     0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
   +--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
   |LB|  LBSZ  | SCP |MG|   RESV                   |
   +--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
   | Label Information          (variable)
   +-+-+-+-+-+-+-+-+-+-+-+...
```

LB: If the LB (Label Block) flag is zero, the Label Information is a
    single Label. If the LB flag is one, the Label Information
    consists of an initial and final Label that are treated as
    unsigned integers and specify a block of Labels inclusively.

LBSZ: The LBSZ field specifies the size and type of each of the one
    or two Label values (see LB bit) that occur in the Nickname
    Information

    The assigned values of LBSZ are as follows:

```
      LBSZ
      ----
         0    12-bit VLAN ID
         1    24-bit FGL Label [FGL]
       2-7
```

SCP: The SCP or Scope field only has an effect if it is non-zero and
     the LABEL-PROP sub-TLV is advertised by the TRILL switch that is
     highest priority to be a tree root. If indicates the scope of
     propagation of TRILL Data frames having the data label or any of
     the data labels in the block indicated by the PROPERTY RECORD.
     The following values for SCP are currently specified:

```
      SCP   Meaning
      ---   -------
         0   No scope specified
         1   Available for assignment
         2   Throughout a campus
         3   Local, within part of a campus [TreeDistr]
```

MG: The MG bit is used to indicate the management Label. It is only
    effective if the LB flag is zero and the LABEL-PROP sub-TLV is
    advertised by the TRILL switch that is highest priority to be a
    tree root. All TRILL switches that understand this bit MUST
    indicate interest in the listed Label unless this bit is set for
    more than one Label, in which case only the lowest valued such
    Label will be considered the management Label. The failure of a
    TRILL switch to indicate interest in this label will be ignored
    and tree distribution of TRILL data frames with this label will
    not be pruned.

RESV: The remaining 9 bits are reserved. See Section 4 for IANA
    Considerations.

Label Information: If LB is zero, this information consists of a
    single Label. If LB is one, this information consists of an
    initial and final Label and represents a block of Labels. The
    Labels are treated as unsigned integers in network byte order. If
    the final Label for a block is less than the initial Label, the
    LABEL-PROP RECORD is ignored. If the initial and final Labels are
    equal, then a block of size one is indicated. Otherwise a block
    of Label values with a size greater than one is indicated,
    starting with initial Label through and including the final
    Label. If the size of each Label value is not a multiple of 8
    bits, each Label value is padded with initial reserved bits up to
    the next multiple of 8. These reserved bits MUST be sent as zero
    and ignored on receipt. For example, 12-bit Labels are padded
    with four initial zeros.

[4](#). **IANA Considerations**

   TBD

[5](#). **Security Considerations**

   TBD

   For general TRILL security considerations, see [[RFC6325](#)].

6. Normative References

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        progress.

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      tbd

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