

Internet Engineering Task Force
Internet-Draft
Obsoletes: [3811](#) (if approved)
Intended status: Standards Track
Expires: March 9, 2015

V. Manral
Hewlett-Packard Corp.
T. Tsou
Huawei Technologies (USA)
W. Liu
Huawei Technologies
F. Fondelli
Ericsson
September 5, 2014

Definitions of Textual Conventions (TCs) for Multiprotocol Label
Switching (MPLS) Management
draft-manral-mpls-rfc3811bis-04

Abstract

This memo defines a Management Information Base (MIB) module which contains Textual Conventions to represent commonly used Multiprotocol Label Switching (MPLS) management information. The intent is that these TEXTUAL CONVENTIONS (TCs) will be imported and used in MPLS related MIB modules that would otherwise define their own representations.

This document obsoletes [RFC3811](#) as it addresses the need to support IPv6 extended TunnelID's by defining a new TC- MplsNewExtendedTunnelID which suggests using an IPv4(for dual stack network) / IPv6 (for IPv6-only network) address of the ingress or egress LSR for the tunnel for dual stack network or an IPv6-only network. This document also fixed the confusing part of MplsLSPID. Changes from [RFC3811](#) and the effect of the new TC to other related documents are summarized in [Section 4](#) and 5, respectively.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

Internet-Draft

rfc3811bis

September 2014

This Internet-Draft will expire on March 9, 2015.

Copyright Notice

Copyright (c) 2014 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

This document may contain material from IETF Documents or IETF Contributions published or made publicly available before November 10, 2008. The person(s) controlling the copyright in some of this material may not have granted the IETF Trust the right to allow modifications of such material outside the IETF Standards Process. Without obtaining an adequate license from the person(s) controlling the copyright in such materials, this document may not be modified outside the IETF Standards Process, and derivative works of it may not be created outside the IETF Standards Process, except to format it for publication as an RFC or to translate it into languages other than English.

Table of Contents

1.	Introduction	3
2.	The Internet-Standard Management Framework	3
3.	MPLS Textual Conventions MIB Definitions	3
4.	Changes from RFC3811	17
5.	Effect of the new TC	19
6.	Contributors	19
7.	Acknowledgements	20
8.	Security Considerations	20
9.	IANA Considerations	21
10.	References	21
10.1.	Normative References	21
10.2.	Informative References	22

[1.](#) Introduction

This document defines a MIB module which contains Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) networks. These Textual Conventions should be imported by MIB modules which manage MPLS networks. The need to support IPv6 extended TunnelID's is addressed by defining a new TC-MplsNewExtendedTunnelID which may represent an IPv4(for dual stack network) / IPv6 (for IPv6-only network) address of the ingress or egress LSR for the tunnel for an for dual stack network or an IPv6-only network.

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](#)].

For an introduction to the concepts of MPLS, see [[RFC3031](#)].

[2.](#) The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [Section 7 of \[RFC3410\]](#).

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a MIB module that is compliant to the SMIV2, which is described in STD 58 ([[RFC2578](#)], [[RFC2579](#)], and [[RFC2580](#)]).

[3.](#) MPLS Textual Conventions MIB Definitions

```
MPLS-TC-STD-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

MODULE-IDENTITY,
Unsigned32, Integer32,
transmission FROM SNMPv2-SMI -- [RFC2578]

TEXTUAL-CONVENTION
FROM SNMPv2-TC; -- [RFC2579]

mplsTCStdMIB MODULE-IDENTITY
LAST-UPDATED "200406030000Z" -- June 3, 2004
ORGANIZATION
"IETF Multiprotocol Label Switching (MPLS) Working

Manral, et al.

Expires March 9, 2015

[Page 3]

Internet-Draft

rfc3811bis

September 2014

Group."
CONTACT-INFO
" Vishwas Manral
Hewlett-Packard Corp.

Email comments to the MPLS WG Mailing List at
mpls@uu.net."

DESCRIPTION

"Copyright (C) The Internet Society (2008). The
initial version of this MIB module was published
in Internet Draft. For full legal notices see the RFC
itself or see:

<http://www.ietf.org/copyrights/ianamib.html>

This MIB module defines TEXTUAL-CONVENTIONS
for concepts used in Multiprotocol Label
Switching (MPLS) networks.

Changes from [RFC3811](#) - MplsExtendedTunnelId"

REVISION "200809080000Z" -- 8 September, 2008

DESCRIPTION

"Initial version published as part of Internet Draft. To be
published as RFC XXXX"

-- RFC Ed.: RFC-editor please fill in XXXX

::= { mplsStdMIB 1 }

mplsStdMIB OBJECT IDENTIFIER

```
::= { transmission 166 }
```

```
MplsAtmVcIdentifier ::= TEXTUAL-CONVENTION  
DISPLAY-HINT "d"  
STATUS current  
DESCRIPTION  
"A Label Switching Router (LSR) that  
creates LDP sessions on ATM interfaces  
uses the VCI or VPI/VCI field to hold the  
LDP Label.
```

VCI values MUST NOT be in the 0-31 range.
The values 0 to 31 are reserved for other uses
by the ITU and ATM Forum. The value
of 32 can only be used for the Control VC,
although values greater than 32 could be
configured for the Control VC.

If a value from 0 to 31 is used for a VCI,

the management entity controlling the LDP
subsystem should reject this with an
inconsistentValue error. Also, if
the value of 32 is used for a VC which is
NOT the Control VC, this should
result in an inconsistentValue error."

REFERENCE

"MPLS using LDP and ATM VC Switching, [RFC3035](#)."

SYNTAX Integer32 (32..65535)

```
MplsBitRate ::= TEXTUAL-CONVENTION
```

```
DISPLAY-HINT "d"
```

```
STATUS current
```

```
DESCRIPTION
```

"If the value of this object is greater than zero,
then this represents the bandwidth of this MPLS
interface (or Label Switched Path) in units of
'1,000 bits per second'.

The value, when greater than zero, represents the
bandwidth of this MPLS interface (rounded to the
nearest 1,000) in units of 1,000 bits per second.

If the bandwidth of the MPLS interface is between $((n * 1000) - 500)$ and $((n * 1000) + 499)$, the value of this object is n , such that $n > 0$.

If the value of this object is 0 (zero), this means that the traffic over this MPLS interface is considered to be best effort."

SYNTAX Unsigned32 (0|1..4294967295)

MplsBurstSize ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The number of octets of MPLS data that the stream may send back-to-back without concern for policing. The value of zero indicates that an implementation does not support Burst Size."

SYNTAX Unsigned32 (0..4294967295)

MplsExtendedTunnelId ::= TEXTUAL-CONVENTION

STATUS obsolete

DESCRIPTION

"A unique identifier for an MPLS Tunnel. This may represent an IPv4 address of the ingress or egress LSR for the tunnel. This value is derived from the Extended Tunnel Id in RSVP or the Ingress Router ID

for CR-LDP."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels, [[RFC3209](#)]."

Constraint-Based LSP Setup using LDP, [[RFC3212](#)]."

SYNTAX Unsigned32(0..4294967295)

MplsLabel ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This value represents an MPLS label as defined in [[RFC3031](#)], [[RFC3032](#)], [[RFC3034](#)], [[RFC3035](#)] and [[RFC3471](#)]."

The label contents are specific to the label being represented, such as:

- * The label carried in an MPLS shim header (for LDP this is the Generic Label) is a 20-bit number represented by 4 octets. Bits 0-19 contain a label or a reserved label value. Bits 20-31 MUST be zero.

The following is quoted directly from [[RFC3032](#)]. There are several reserved label values:

- i. A value of 0 represents the 'IPv4 Explicit NULL Label'. This label value is only legal at the bottom of the label stack. It indicates that the label stack must be popped, and the forwarding of the packet must then be based on the IPv4 header.
- ii. A value of 1 represents the 'Router Alert Label'. This label value is legal anywhere in the label stack except at the bottom. When a received packet contains this label value at the top of the label stack, it is delivered to a local software module for processing. The actual forwarding of the packet is determined by the label beneath it in the stack. However, if the packet is forwarded further, the Router Alert Label should be pushed back onto the label stack before forwarding. The use of this label

is analogous to the use of the 'Router Alert Option' in IP packets [[RFC2113](#)]. Since this label cannot occur at the bottom of the stack, it is not associated with a particular network layer protocol.

- iii. A value of 2 represents the

'IPv6 Explicit NULL Label'. This label value is only legal at the bottom of the label stack. It indicates that the label stack must be popped, and the forwarding of the packet must then be based on the IPv6 header.

- iv. A value of 3 represents the 'Implicit NULL Label'. This is a label that an LSR may assign and distribute, but which never actually appears in the encapsulation. When an LSR would otherwise replace the label at the top of the stack with a new label, but the new label is 'Implicit NULL', the LSR will pop the stack instead of doing the replacement. Although this value may never appear in the encapsulation, it needs to be specified in the Label Distribution Protocol, so a value is reserved.
- v. Values 4-15 are reserved.
- * The frame relay label can be either 10-bits or 23-bits depending on the DLCI field size and the upper 22-bits or upper 9-bits must be zero, respectively.
- * For an ATM label the lower 16-bits represents the VCI, the next 12-bits represents the VPI and the remaining bits MUST be zero.
- * The Generalized-MPLS (GMPLS) label contains a value greater than $2^{24}-1$ and used in GMPLS as defined in [[RFC3471](#)]."
REFERENCE
"Multiprotocol Label Switching Architecture, [[RFC3031](#)]."

Use of Label Switching on Frame Relay Networks,
[RFC3034].

MPLS using LDP and ATM VC Switching, [RFC3035].
Generalized Multiprotocol Label Switching
(GMPLS) Architecture, [RFC3471]."
SYNTAX Unsigned32 (0..4294967295)

MplsLabelDistributionMethod ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The label distribution method which is also called
the label advertisement mode [RFC3036].
Each interface on an LSR is configured to operate
in either Downstream Unsolicited or Downstream
on Demand."
REFERENCE
"Multiprotocol Label Switching Architecture,
[RFC3031].

LDP Specification, [RFC3036, Section 2.6.3.](#)"
SYNTAX INTEGER {
downstreamOnDemand(1),
downstreamUnsolicited(2)
}

MplsLdpIdentifier ::= TEXTUAL-CONVENTION
DISPLAY-HINT "1d.1d.1d.1d:2d"
STATUS current
DESCRIPTION
"The LDP identifier is a six octet
quantity which is used to identify a
Label Switching Router (LSR) label space.

The first four octets identify the LSR and
must be a globally unique value, such as a
32-bit router ID assigned to the LSR, and the
last two octets identify a specific label
space within the LSR."
SYNTAX OCTET STRING (SIZE (6))

MplsLsrIdentifier ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The Label Switching Router (LSR) identifier is the
first 4 bytes of the Label Distribution Protocol

```
(LDP) identifier."
SYNTAX OCTET STRING (SIZE (4))
MplsLdpLabelType ::= TEXTUAL-CONVENTION
STATUS          current
DESCRIPTION
"The Layer 2 label types which are defined for MPLS
LDP and/or CR-LDP are generic(1), atm(2), or
frameRelay(3)."
```

```
SYNTAX INTEGER {
generic(1),
atm(2),
frameRelay(3)
}

MplsLSPID ::= TEXTUAL-CONVENTION
STATUS          current
DESCRIPTION
"A unique identifier within an MPLS network that is
assigned to each LSP. This is assigned at the head
end of the LSP and can be used by all LSRs
to identify this LSP. This value is piggybacked by
the signaling protocol when this LSP is signaled
within the network. This identifier can then be
used at each LSR to identify which labels are
being swapped to other labels for this LSP. This
object can also be used to disambiguate LSPs that
share the same RSVP sessions between the same
source and destination.
```

For LSPs established using CR-LDP, the LSPID is composed of the ingress LSR Router ID (or any of its own IPv4 addresses) and a locally unique CR-LSP ID to that LSR. The first two bytes carry the CR-LSPID, and the remaining 4 bytes carry the Router ID. The LSPID is useful in network management, in CR-LSP repair, and in using an already established CR-LSP as a hop in an ER-TLV.

For LSPs signaled using RSVP-TE, the LSP_ID is a local number defined as a 16-bit (2 byte) identifier used in the SENDER_TEMPLATE and the FILTER_SPEC that can be changed to allow a sender to share resources with itself. The LSP_ID is only unique within the context of the SESSION and it cannot be used as network identifier. RSVP-TE signaling use a 5-tuple to uniquely identify an LSP within an

operator's network. This tuple is composed of a Tunnel End-point Address, Tunnel_ID, Extended Tunnel ID,

Tunnel Sender Address, and LSP_ID.

The length of this object should only be 2 or 6 bytes. If the length of this octet string is 2 bytes, then it must identify an RSVP-TE LSP_ID, or it is 6 bytes, it must contain a CR-LDP LSPID."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels, [[RFC3209](#)]."

Constraint-Based LSP Setup using LDP, [[RFC3212](#)]."

SYNTAX OCTET STRING (SIZE (2|6))

MplsLspType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Types of Label Switch Paths (LSPs) on a Label Switching Router (LSR) or a Label Edge Router (LER) are:

unknown(1) -- if the LSP is not known to be one of the following.

terminatingLsp(2) -- if the LSP terminates on the LSR/LER, then this is an egressing LSP which ends on the LSR/LER,

originatingLsp(3) -- if the LSP originates from this LSR/LER, then this is an ingressing LSP which is the head-end of the LSP,

crossConnectingLsp(4) -- if the LSP ingresses and egresses on the LSR, then it is cross-connecting on that LSR."

SYNTAX INTEGER {

```
unknown(1),
terminatingLsp(2),
originatingLsp(3),
crossConnectingLsp(4)
}
```

```
MplsOwner ::= TEXTUAL-CONVENTION
STATUS      current
DESCRIPTION
```

"This object indicates the local network management subsystem that originally created the object(s) in question. The values of this enumeration are defined as follows:

unknown(1) - the local network management subsystem cannot discern which component created the object.

other(2) - the local network management subsystem is able to discern which component created the object, but the component is not listed within the following choices, e.g., command line interface (cli).

snmp(3) - The Simple Network Management Protocol was used to configure this object initially.

ldp(4) - The Label Distribution Protocol was used to configure this object initially.

crldp(5) - The Constraint-Based Label Distribution Protocol was used to configure this object initially.

rsvpTe(6) - The Resource Reservation Protocol was used to configure this object initially.

policyAgent(7) - A policy agent (perhaps in combination with one of the above protocols) was used to configure this object initially.

An object created by any of the above choices MAY be modified or destroyed by the same or a different choice."

```
SYNTAX INTEGER {  
  unknown(1),  
  other(2),  
  snmp(3),  
  ldp(4),  
  crldp(5),  
  rsvpTe(6),  
  policyAgent(7)  
}
```

```
MplsPathIndexOrZero ::= TEXTUAL-CONVENTION  
STATUS current  
DESCRIPTION
```

Manral, et al.

Expires March 9, 2015

[Page 11]

Internet-Draft

rfc3811bis

September 2014

"A unique identifier used to identify a specific path used by a tunnel. A value of 0 (zero) means that no path is in use."

```
SYNTAX Unsigned32(0..4294967295)
```

```
MplsPathIndex ::= TEXTUAL-CONVENTION  
STATUS current  
DESCRIPTION
```

"A unique value to index (by Path number) an entry in a table."

```
SYNTAX Unsigned32(1..4294967295)
```

```
MplsRetentionMode ::= TEXTUAL-CONVENTION  
STATUS current  
DESCRIPTION
```

"The label retention mode which specifies whether an LSR maintains a label binding for a FEC learned from a neighbor that is not its next hop for the FEC.

If the value is conservative(1) then advertised label mappings are retained only if they will be used to forward packets, i.e., if label came from a valid next hop.

If the value is liberal(2) then all advertised label mappings are retained whether they are from a valid next hop or not."

REFERENCE

"Multiprotocol Label Switching Architecture, [[RFC3031](#)].

LDP Specification, [[RFC3036](#)], [Section 2.6.2](#)."

```
SYNTAX INTEGER {  
conservative(1),  
liberal(2)  
}
```

MplsTunnelAffinity ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Describes the configured 32-bit Include-any, include-all, or exclude-all constraint for constraint-based link selection."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels, [[RFC3209](#)], [Section 4.7.4](#)."

SYNTAX Unsigned32(0..4294967295)

MplsTunnelIndex ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A unique index into mplsTunnelTable. For tunnels signaled using RSVP, this value should correspond to the RSVP Tunnel ID used for the RSVP-TE session."

SYNTAX Unsigned32 (0..65535)

MplsTunnelInstanceIndex ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The tunnel entry with instance index 0 should refer to the configured tunnel interface (if one exists).

Values greater than 0, but less than or equal to 65535, should be used to indicate

signaled (or backup) tunnel LSP instances.
For tunnel LSPs signaled using RSVP,
this value should correspond to the
RSVP LSP ID used for the RSVP-TE
LSP.

Values greater than 65535 apply to FRR
detour instances."

SYNTAX Unsigned32(0|1..65535|65536..4294967295)

TeHopAddressType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A value that represents a type of address for a
Traffic Engineered (TE) Tunnel hop.

unknown(0) An unknown address type. This value
MUST be used if the value of the
corresponding TeHopAddress object is a
zero-length string. It may also be
used to indicate a TeHopAddress which
is not in one of the formats defined
below.

ipv4(1) An IPv4 network address as defined by
the InetAddressIPv4 TEXTUAL-CONVENTION
[\[RFC3291\]](#).

ipv6(2) A global IPv6 address as defined by
the InetAddressIPv6 TEXTUAL-CONVENTION

[\[RFC3291\]](#).

asnumber(3) An Autonomous System (AS) number as
defined by the TeHopAddressAS
TEXTUAL-CONVENTION.

unnum(4) An unnumbered interface index as
defined by the TeHopAddressUnnum
TEXTUAL-CONVENTION.

lspid(5) An LSP ID for TE Tunnels

([RFC3212](#)) as defined by the
MplsLSPID TEXTUAL-CONVENTION.

Each definition of a concrete TeHopAddressType value must be accompanied by a definition of a TEXTUAL-CONVENTION for use with that TeHopAddress.

To support future extensions, the TeHopAddressType TEXTUAL-CONVENTION SHOULD NOT be sub-typed in object type definitions. It MAY be sub-typed in compliance statements in order to require only a subset of these address types for a compliant implementation.

Implementations must ensure that TeHopAddressType objects and any dependent objects (e.g., TeHopAddress objects) are consistent. An inconsistentValue error must be generated if an attempt to change a TeHopAddressType object would, for example, lead to an undefined TeHopAddress value that is not defined herein. In particular, TeHopAddressType/TeHopAddress pairs must be changed together if the address type changes (e.g., from ipv6(2) to ipv4(1))."
REFERENCE
"TEXTUAL-CONVENTIONS for Internet Network Addresses, [[RFC3291](#)].

Constraint-Based LSP Setup using LDP,
[\[RFC3212\]](#)"

SYNTAX INTEGER {
unknown(0),
ipv4(1),

ipv6(2),
asnumber(3),
unnum(4),
lspid(5)

}

TeHopAddress ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Denotes a generic Tunnel hop address, that is, the address of a node which an LSP traverses, including the source and destination nodes. An address may be very concrete, for example, an IPv4 host address (i.e., with prefix length 32); if this IPv4 address is an interface address, then that particular interface must be traversed. An address may also specify an 'abstract node', for example, an IPv4 address with prefix length less than 32, in which case, the LSP can traverse any node whose address falls in that range. An address may also specify an Autonomous System (AS), in which case the LSP can traverse any node that falls within that AS.

A TeHopAddress value is always interpreted within the context of an TeHopAddressType value. Every usage of the TeHopAddress TEXTUAL-CONVENTION is required to specify the TeHopAddressType object which provides the context. It is suggested that the TeHopAddressType object is logically registered before the object(s) which use the TeHopAddress TEXTUAL-CONVENTION if they appear in the same logical row.

The value of a TeHopAddress object must always be consistent with the value of the associated TeHopAddressType object. Attempts to set a TeHopAddress object to a value which is inconsistent with the associated TeHopAddressType must fail with an inconsistentValue error."

SYNTAX OCTET STRING (SIZE (0..32))

TeHopAddressAS ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Represents a two or four octet AS number. The AS number is represented in network byte order (MSB first). A two-octet AS number has the two MSB octets set to zero."

REFERENCE

"Textual Conventions for Internet Network Addresses, [[RFC3291](#)]. The InetAutonomousSystemsNumber TEXTUAL-CONVENTION has a SYNTAX of Unsigned32, whereas this TC has a SYNTAX of OCTET STRING (SIZE (4)). Both TCs represent an autonomous system number but use different syntaxes to do so."
SYNTAX OCTET STRING (SIZE (4))

TeHopAddressUnnum ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Represents an unnumbered interface:

octets	contents	encoding
1-4	unnumbered interface	network-byte order

The corresponding TeHopAddressType value is unnum(5)."

SYNTAX OCTET STRING(SIZE(4))

MplsNewExtendedTunnelId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A unique identifier for an MPLS Tunnel. This may represent an IPv4 address of the ingress or egress LSR for the tunnel for an IPv4 network. This represents an IPv4(for dual stack address of the ingress or egress LSR for the tunnel for an dual stack network or IPv6-only network. This value is derived from the Extended Tunnel Id in RSVP or the Ingress Router ID for CR-LDP."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels, [[RFC3209](#)]."

Constraint-Based LSP Setup using LDP, [[RFC3212](#)]."

SYNTAX OCTET STRING(SIZE(16))

END

Internet-Draft

rfc3811bis

September 2014

4. Changes from [RFC3811](#)

Following is the list of technical changes and other fixes from [RFC3811](#).

Main purpose of this work is to address the need to support IPv6 extended TunnelID's by defining a new TC-MplsNewExtendedTunnelID, resulting in the following changes:

Old MplsExtendedTunnelId status is changed to obsolete.

A new defined MplsNewExtendedTunnelId is added as below.

MplsNewExtendedTunnelId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A unique identifier for an MPLS Tunnel. This may represent an IPv4 address of the ingress or egress LSR for the tunnel for an IPv4 network. This represents an IPv4(for dual stack address of the ingress or egress LSR for the tunnel an dual stack network or IPv6-only network. This value is derived from the Extended Tunnel Id in RSVP or the Ingress Router ID for CR-LDP."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels, [[RFC3209](#)].

Constraint-Based LSP Setup using LDP, [[RFC3212](#)]."

SYNTAX OCTET STRING(SIZE(16))

The confusing part of MplsLSPID is modified as below.

MplsLSPID ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"A unique identifier within an MPLS network that is assigned to each LSP. This is assigned at the head end of the LSP and can be used by all LSRs to identify this LSP. This value is piggybacked by the signaling protocol when this LSP is signaled within the network. This identifier can then be used at each LSR to identify which labels are being swapped to other labels for this LSP. This object can also be used to disambiguate LSPs that share the same RSVP sessions between the same source and destination.

For LSPs established using CR-LDP, the LSPID is composed of the ingress LSR Router ID (or any of its own IPv4 addresses) and a locally unique CR-LSP ID to that LSR. The first two bytes carry the CR-LSPID, and the remaining 4 bytes carry the Router ID. The LSPID is useful in network management, in CR-LSP repair, and in using an already established CR-LSP as a hop in an ER-TLV.

For LSPs signaled using RSVP-TE, the LSP_ID is a local number defined as a 16-bit (2 byte) identifier used in the SENDER_TEMPLATE and the FILTER_SPEC that can be changed to allow a sender to share resources with itself. The LSP_ID is only unique within the context of the SESSION and it cannot be used as network identifier. RSVP-TE signaling use a 5-tuple to uniquely identify an LSP within an operator's network. This tuple is composed of a

Tunnel End-point Address, Tunnel_ID, Extended Tunnel ID,
Tunnel Sender Address, and LSP_ID.

The length of this object should only be 2 or 6 bytes.
If the length of this octet string is 2 bytes, then it
must identify an RSVP-TE LSP_ID, or it is 6 bytes, it must
contain a CR-LDP LSPID."

REFERENCE

"RSVP-TE: Extensions to RSVP for LSP Tunnels,
[[RFC3209](#)].

Constraint-Based LSP Setup using LDP,
[[RFC3212](#)]."

SYNTAX OCTET STRING (SIZE (2|6))

5. Effect of the new TC

The new TC definition for the MPLS Tunnel will have an effect on the MPLS-TE-MIB and MPLS-TC-STD-MIB. Also the following RFCs which use the MIB may have to be updated to accommodate the changed definition: [[RFC3209](#)], [[RFC3812](#)], [[RFC3813](#)], [[RFC3212](#)], [[RFC4368](#)], [[RFC3814](#)], [[RFC3815](#)], and [[RFC6639](#)].

6. Contributors

This MIB fixes a small issue with the earlier version of this MIB as defined in [RFC3811](#). The earlier document was created by combining TEXTUAL-CONVENTIONS from current MPLS MIBs and a TE-WG MIB. Co-authors on each of these MIBs contributed to the TEXTUAL-CONVENTIONS contained in this MIB and also contributed greatly to the revisions of this document. These co-authors are:

Rajiv Papneja
Huawei Technologies
2330 Central Expressway
Santa Clara, CA 95050
USA

Email: rajiv.papneja@huawei.com

Cheenu Srinivasan
Bloomberg L.P.
499 Park Ave.
New York, NY 10022

Phone: +1-212-893-3682
EMail: cheenu@bloomberg.net

Arun Viswanathan
Force10 Networks, Inc.
1440 McCarthy Blvd
Milpitas, CA 95035

Phone: +1-408-571-3516
EMail: arunv@force10networks.com

Hans Sjostrand
ipUnplugged
P.O. Box 101 60
S-121 28 Stockholm, Sweden

Manral, et al.

Expires March 9, 2015

[Page 19]

Internet-Draft

rfc3811bis

September 2014

Phone: +46-8-725-5900
EMail: hans@ipunplugged.com

Kireeti Kompella
Juniper Networks
1194 Mathilda Ave
Sunnyvale, CA 94089

Phone: +1-408-745-2000
EMail: kireeti@juniper.net

Thomas D. Nadeau
Cisco Systems, Inc.
BXB300/2/
300 Beaver Brook Road
Boxborough, MA 01719

Phone: +1-978-936-1470
EMail: tnadeau@cisco.com

Joan E. Cucchiara
Marconi Communications, Inc.
900 Chelmsford Street
Lowell, MA 01851

Phone: +1-978-275-7400
EMail: jcucchiara@mindspring.com

[7.](#) Acknowledgements

The author would like to thank Adrian Farrel and Thomas Nadeau for thier guidance, Kenji Fujihira and Josh Rogers for helpful comments. The earlier editors and contributors would like to thank Mike MacFadden and Adrian Farrel for their helpful comments on several reviews. Also, a special acknowledgement to Bert Wijnen for his many detailed reviews. Bert's assistance and guidance is greatly appreciated.

[8.](#) Security Considerations

This module does not define any management objects. Instead, it defines a set of textual conventions which may be used by other MPLS MIB modules to define management objects.

Meaningful security considerations can only be written in the MIB modules that define management objects. Therefore, this document has no impact on the security of the Internet.

[9.](#) IANA Considerations

IANA has made a MIB OID assignment under the transmission branch, that is, assigned the mplsStdMIB under { transmission 166 }. This sub-id is requested because 166 is the ifType for mpls(166) and is available under transmission.

In the future, MPLS related standards track MIB modules should be

rooted under the mplsStdMIB subtree. The IANA is requested to manage that namespace. New assignments can only be made via a Standards Action as specified in [[RFC2434](#)].

The IANA has also assigned { mplsStdMIB 1 } to the MPLS-TC-STD-MIB specified in this document.

[10](#). References

[10.1](#). Normative References

- [RFC2113] Katz, D., "IP Router Alert Option", [RFC 2113](#), February 1997.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 2434](#), October 1998.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIV2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIV2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIV2", STD 58, [RFC 2580](#), April 1999.
- [RFC3031] Rosen, E., Viswanathan, A., and R. Callon, "Multiprotocol Label Switching Architecture", [RFC 3031](#), January 2001.

- [RFC3032] Rosen, E., Tappan, D., Fedorkow, G., Rekhter, Y., Farinacci, D., Li, T., and A. Conta, "MPLS Label Stack Encoding", [RFC 3032](#), January 2001.
- [RFC3034] Conta, A., Doolan, P., and A. Malis, "Use of Label

Switching on Frame Relay Networks Specification", [RFC 3034](#), January 2001.

- [RFC3035] Davie, B., Lawrence, J., McCloghrie, K., Rosen, E., Swallow, G., Rekhter, Y., and P. Doolan, "MPLS using LDP and ATM VC Switching", [RFC 3035](#), January 2001.
- [RFC3036] Andersson, L., Doolan, P., Feldman, N., Fredette, A., and B. Thomas, "LDP Specification", [RFC 3036](#), January 2001.
- [RFC3209] Awduche, D., Berger, L., Gan, D., Li, T., Srinivasan, V., and G. Swallow, "RSVP-TE: Extensions to RSVP for LSP Tunnels", [RFC 3209](#), December 2001.
- [RFC3212] Jamoussi, B., Andersson, L., Callon, R., Dantu, R., Wu, L., Doolan, P., Worster, T., Feldman, N., Fredette, A., Girish, M., Gray, E., Heinanen, J., Kilty, T., and A. Malis, "Constraint-Based LSP Setup using LDP", [RFC 3212](#), January 2002.
- [RFC3291] Daniele, M., Haberman, B., Routhier, S., and J. Schoenwaelder, "Textual Conventions for Internet Network Addresses", [RFC 3291](#), May 2002.
- [RFC3471] Berger, L., "Generalized Multi-Protocol Label Switching (GMPLS) Signaling Functional Description", [RFC 3471](#), January 2003.

[10.2.](#) Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC3812] Srinivasan, C., Viswanathan, A., and T. Nadeau, "Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)", [RFC 3812](#), June 2004.
- [RFC3813] Srinivasan, C., Viswanathan, A., and T. Nadeau, "Multiprotocol Label Switching (MPLS) Label Switching Router (LSR) Management Information Base (MIB)", [RFC 3813](#), June 2004.

- [RFC3814] Nadeau, T., Srinivasan, C., and A. Viswanathan, "Multiprotocol Label Switching (MPLS) Forwarding Equivalence Class To Next Hop Label Forwarding Entry (FEC-To-NHLFE) Management Information Base (MIB)", [RFC 3814](#), June 2004.
- [RFC3815] Cucchiara, J., Sjostrand, H., and J. Luciani, "Definitions of Managed Objects for the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP)", [RFC 3815](#), June 2004.
- [RFC4368] Nadeau, T. and S. Hegde, "Multiprotocol Label Switching (MPLS) Label-Controlled Asynchronous Transfer Mode (ATM) and Frame-Relay Management Interface Definition", [RFC 4368](#), January 2006.
- [RFC6639] King, D. and M. Venkatesan, "Multiprotocol Label Switching Transport Profile (MPLS-TP) MIB-Based Management Overview", [RFC 6639](#), June 2012.

Authors' Addresses

Vishwas Manral
Hewlett-Packard Corp.
191111 Pruneridge Ave.
Cupertino, CA 95015
USA

Phone: +1-408-447-1497
Email: vishwas.manral@hp.com

Tina Tsou
Huawei Technologies (USA)
2330 Central Expressway
Santa Clara, CA 95050
USA

Phone: +1 408 330 4424
Email: tina.tsou.zouting@huawei.com

Internet-Draft

rfc3811bis

September 2014

Will(Shucheng) Liu
Huawei Technologies
Bantian, Longgang District
Shenzhen 518129
P.R. China

Email: liushucheng@huawei.com

Francesco Fondelli
Ericsson
via Moruzzi 1
Pisa 56100
Italy

Email: francesco.fondelli@ericsson.com

