

MPLS Working Group  
Internet-Draft  
Intended status: Standards Track  
Expires: March 19, 2012

F. Zhang  
ZTE Corporation  
September 16, 2011

RSVP-TE Extensions to Exchange MPLS-TP Tunnel Numbers  
draft-zhang-ccamp-mpls-tp-rsvp-te-ext-tunnel-num-00

Abstract

The MPLS Transport Profile (MPLS-TP) identifiers document [[I-D.ietf-mpls-tp-identifiers](#)] introduce two tunnel numbers, A1-Tunnel\_Num and Z9-Tunnel\_Num, which allow a compact format for Maintenance Entity Point Identifier (MEP\_ID). For some Operation, Administration and Maintenance (OAM) functions, such as Connectivity Verification (CV) [[I-D.ietf-mpls-tp-cc-cv-rdi](#)], source MEP\_ID MUST be inserted in the OAM packets, so that the peer endpoint can compare the received and expected MEP\_IDs to judge whether there is a mismatch, which means that the two MEP nodes need to pre-store each other's MEP\_IDs.

The specification of setting up co-routed bidirectional LSP is described in the document [[RFC3473](#)], which does not introduce the locally configured tunnel number on the tunnel endpoint. This document defines the Connection object to exchange the tunnel numbers.

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."

This Internet-Draft will expire on March 19, 2012.

Copyright Notice

Copyright (c) 2011 IETF Trust and the persons identified as the

Internet-Draft

RSVP-TE Extensions for Tunnel-Num

September 2011

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.

## Table of Contents

<a href="#">1.</a>	Introduction . . . . .	<a href="#">3</a>
<a href="#">2.</a>	Conventions used in this document . . . . .	<a href="#">3</a>
<a href="#">3.</a>	Operation . . . . .	<a href="#">3</a>
<a href="#">4.</a>	Connection Object . . . . .	<a href="#">4</a>
<a href="#">5.</a>	IANA Considerations . . . . .	<a href="#">5</a>
<a href="#">6.</a>	Security Considerations . . . . .	<a href="#">5</a>
<a href="#">7.</a>	Acknowledgement . . . . .	<a href="#">5</a>
<a href="#">8.</a>	References . . . . .	<a href="#">6</a>
<a href="#">8.1.</a>	Normative references . . . . .	<a href="#">6</a>
<a href="#">8.2.</a>	Informative References . . . . .	<a href="#">6</a>
	Author's Address . . . . .	<a href="#">6</a>

## 1. Introduction

The MPLS Transport Profile (MPLS-TP) identifiers document [[I-D.ietf-mpls-tp-identifiers](#)] introduce two tunnel numbers, A1-Tunnel\_Num and Z9-Tunnel\_Num, which are locally assigned and allow a compact format for Maintenance Entity Point Identifier (MEP\_ID). For a co-routed bidirectional LSP, the format of A1-MEP\_ID is A1-Node\_ID::A1-Tunnel\_Num::LSP\_Num, and the format of Z9-MEP\_ID is Z9-Node\_ID::Z9-Tunnel\_Num::LSP\_Num. In order to realize some Operation, Administration and Maintenance (OAM) functions, such as Connectivity Verification (CV) [[I-D.ietf-mpls-tp-cc-cv-rdi](#)], source MEP-ID MUST be inserted in the OAM packets, in this way the peer endpoint can compare the received and expected MEP-IDs to judge whether there is a mismatch. Hence, the two MEP nodes must pre-store each other's MEP-IDs before sending the CV packets.

Although the exchange of MEP\_IDs can be accomplished by Network Management System (NMS) if it is deployed, it is still complex when the LSPs cross different administration domains, which needs the cooperation of NMSs. So when the LSPs are set up by control plane, Resource Reservation Protocol Traffic Engineering (RSVP-TE) signaling will be more suitable to realize the exchange of MEP\_IDs.

The specification of setting up co-routed bidirectional LSP is described in the document [[RFC3473](#)], which does not introduce the locally configured tunnel number on the tunnel endpoint. This document defines the Connection object to exchange the tunnel numbers.

## 2. 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](#)].

### 3. Operation

MPLS-TP co-routed bidirectional LSPs can be deployed across one or more administration domains, and NMS may exist in some administration domains, which knows the tunnel spaces of every node in its responsible domain. Consider that LSP1 is initialized at A1 node with Connection object inserted in LSP1's Path message, the following modes may happen.

Modes 1: L bit is set, and the Z9-Tunnel\_Num is designated in the "Destination Tunnel Num" field. If the Z9 node finds that this

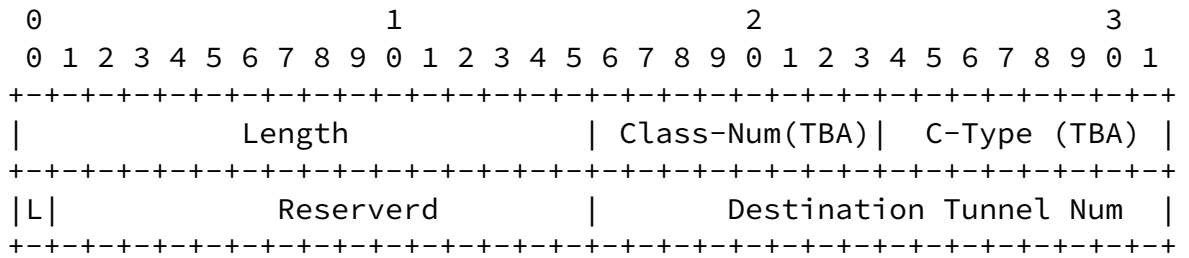
tunnel number is occupied, or it can not be used because of some local policies, a PathErr message must be sent with "Unavailable tunnel number" error. Otherwise, the designated tunnel number must be adopted, and the Connection object may be inserted in the Resv message without any change.

Modes 2: L bit is not set, and a recommended Z9-Tunnel\_Num may be filled in the "Destination Tunnel Num" field. If the Z9 node finds that the recommended value can be used, the Connection object must be inserted in the Resv message without any change; if the recommended value can not be used or the "Destination Tunnel Num" field is empty, a new tunnel number will be allocated and filled into the Connection object that must be inserted in the Resv message.

Each mode has its own pros and cons and how to determine the right mode for a specific network mainly depends on the operators' preference. For example, for the operators who are used to operate traditional transport network and familiar with the Transport-Centric operational model may prefer mode 1. The second mode is more suitable for the operators who are familiar with the operation and maintenance of IP/MPLS network, or the MPLS-TP LSPs cross multiple administration domains.

### 4. Connection Object

The format of Connection Object (Class-Num of the form 11bbbbbb with value = TBA, C-Type = TBA) is as follow:



### Connection Object

#### L

The L bit is set if the initiating node enforces the peer endpoint to configure the value carried in the field of "Destination Tunnle Num".

If the bit is not set, the peer endpoint firstly tries to use the recommended tunnel number; it can use any other unoccupied tunnel numbers when the recommended tunnel number is unavailable.

#### Reserverd

Must be set to 0 on transmit and ignored on receive.

#### Destination Tunnel Num

If the L bit is set, it indicates that the peer endpoint must configure the value carried in this field.

If the L bit is not set, this field can be empty or filled by the recommended value.

The Connection object may appear in Path or Resv message, and a midpoint that does not support this object is required to pass it on unaltered, as indicated by the C-Num and the rules defined in [\[RFC2205\]](#).

## [5.](#) IANA Considerations

TBD.

## [6.](#) Security Considerations

TBD.

## [7.](#) Acknowledgement

This document was prepared based on the discussion with George Swallow, valuable comments and input was also received from Venkatesan Mahalingam and Muliu Tao.

## [8.](#) References

Zhang

Expires March 19, 2012

[Page 5]

---

Internet-Draft

RSVP-TE Extensions for Tunnel-Num

September 2011

### [8.1.](#) Normative references

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2205] Braden, B., Zhang, L., Berson, S., Herzog, S., and S. Jamin, "Resource ReSerVation Protocol (RSVP) -- Version 1 Functional Specification", [RFC 2205](#), September 1997.
- [RFC3473] Berger, L., "Generalized Multi-Protocol Label Switching (GMPLS) Signaling Resource ReserVation Protocol-Traffic Engineering (RSVP-TE) Extensions", [RFC 3473](#), January 2003.

### [8.2.](#) Informative References

[I-D.ietf-mpls-tp-cc-cv-rdi]

Allan, D., Swallow, G., and J. Drake, "Proactive Connectivity Verification, Continuity Check and Remote Defect indication for MPLS Transport Profile", [draft-ietf-mpls-tp-cc-cv-rdi-06](#) (work in progress), August 2011.

[I-D.ietf-mpls-tp-identifiers]

Bocci, M., Swallow, G., and E. Gray, "MPLS-TP Identifiers", [draft-ietf-mpls-tp-identifiers-07](#) (work in progress), July 2011.

#### Author's Address

Fei Zhang  
ZTE Corporation

Email: zhang.feiz@zte.com.cn

Xiao Bao  
ZTE Corporation

Email: bao.xiao1@zte.com.cn