          RSVP-TE Extensions to Exchange MPLS-TP LSP Identifiers
            draft-zhang-ccamp-mpls-tp-rsvpte-ext-tunnel-num-02

Abstract

   The MPLS Transport Profile (MPLS-TP) identifiers document [RFC6370]
   specifies an initial set of identifiers, such as local assigned
   tunnel number and Global_ID, which can be used to form Maintenance
   Entity Point Identifier (MEP_ID). As to some Operation,
   Administration and Maintenance (OAM) functions, such as Connectivity
   Verification (CV) [RFC6428], 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 [RFC6371],
   which means that the two MEP nodes need to pre-store each other's
   MEP_IDs.

   This document defines the signaling extensions to exchange the Label
   Switched Path (LSP) identifiers.

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1. Introduction

The MPLS Transport Profile (MPLS-TP) identifiers document [RFC6370] specifies a initial set of identifiers, such as local assigned tunnel number (Tunnel_Num) and Global_ID, which can be used to form Maintenance Entity Point Identifier (MEP_ID). The MPLS-TP LSP_MEP_ID is Node_ID::Tunnel_Num::LSP_Num, and in situations where global uniqueness is required, this becomes: Global_ID::Node_ID:: Tunnel_Num::LSP_Num. In order to realize some Operation, Administration and Maintenance (OAM) functions, such as Connectivity Verification (CV) [RFC6428], 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 [RFC6371]. Hence, the two MEP nodes must pre-store each other's MEP-IDs before sending the CV packets.

Obviously, the exchange of MEP_IDs can be accomplished by the Network Management System (NMS), but it is complex when the LSPs cross different adiminstration domains, which involves the cooperation of NMSs. When the LSPs are set up by control plane, Resource ReserVation Protocol Traffic Engnieering (RSVP-TE) messages will be more suitable to realize the exchange of MEP_IDs.

Since the LSP identifiers can be carried in an Extended ASSOCIATION object, which may also be used in a single session [I-D.ietf-ccamp-assoc-ext], it is naturally to define the signaling extensions of co-routed and associated bidirectional LSP to exchange the LSP identifiers based on the Extended ASSOCIATION object.

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

3.1. Co-routed Bidirectional LSP

Consider that LSP1 is across different administration domains, which is initialized at A1 node with an Extended ASSOCIATION object inserted in Path message. Association Type is set to "LSP Identifers", Association ID set to A1-Tunnel_Num, Association Source set to A1-Node_ID, Global Association Source set to A1-Global_ID, and the Extended Association ID field is omitted. Upon receipt of the Extended Association Object, the terminating node Z9 checks the

Association Type field. If it is "LSP Identifiers" and an
Upstream_Label exists in Path message, the Extended ASSOCIATION
object must be carried in the Resv message also. Similarly,
Association Type is set to "LSP Identifiers", Association ID set to
Z9-Tunnel_Num, Association Source set to Z9-Node_ID, Global
Association Source set to Z9-Global_ID, and the Extended Association
ID field is omitted.

3.2. Associated Bidirectional LSP

The document [I-D.ietf-ccamp-mpls-tp-rsvpte-ext-associated-lsp]
discusses the provisioning models and signaling procedures of
associated bidirectional LSPs. Consider the example provided there,
when LSP1 and LSP2 are bound together to be an associated
bidirectional LSP which is across several administration domains, the
global ID filled in the Extended Association objects with Association
Type set to "Double Sided Associated Bidirectional LSP" or "Single
Sided Associated Bidirectional LSP" is A-Global_ID or B-Global_ID.
If it is A-Global_ID, node A still does know the global ID of node B
in case that LSP1 and LSP2 are across several administration domains.
Since multiple Association objects have always been supported in Path
messages, an Extended Association object with Asssociation Type "LSP
Identifiers" can be inserted in the Path messages of associated
bidirectional LSPs to let the terminating nodes exchange each others
LSP identifiers.

If double sided provisioning model is used, the values of an Extended
Association object in LSP1's Path message are set as below :
Association Type set to "LSP Identifiers", Association ID set to
A-Tunnel_Num, Association Source set to A-Node_ID, Global Association
Source set to A-Global_ID, and the Extended Association ID field
omitted; the object in LSP2's Path message are set similarly :
Association Type is set to "LSP Identifiers", Association ID set to
B-Tunnel_Num, Association Source set to B-Node_ID, Global Association
Source set to B-Global_ID, and the Extended Association ID field
omitted. While in case that single sided provisioning model is
adopted, in the initialized LSP1's Path message, the values of an
Extended Association object are set as following: Association Type
set to "LSP Identifiers", Association ID set to A-Tunnel_Num,
Association Source set to A-Node_ID, Global Association Source set to
A-Global_ID, and the Extended Association ID field omitted. When
node B receives this Path message, LSP2 is triggered to be
established by the received Extended ASSOCIATION objects with the
Association Type "Single Sided Associated Bidirectional LSPs" and
"LSP Identifiers". The Extended Association Object with Association
Type "LSP Identifiers" inserted in LSP2's Path message is like:
Association ID set to B-Tunnel_Num, Association Source set to
B-Node_ID, Global Association Source set to B-Global_ID, and the

Extended Association ID field omitted.

4. RSVP-TE Extensions

4.1. Association Type

Within the current document, a new Association Type is defined in the
Extended ASSOCIATION object.

Value   Type
-----   -----
6 (TBD)   LSP Identifiers (L)

See [I-D.ietf-ccamp-assoc-ext] for the definition of other fields and
values.

The rules associated with the processing of the Extended ASSOCIATION
objects in RSVP message are discussed in [I-D.ietf-ccamp-assoc-ext].
It said that in the absence of Association Type-specific rules for
identifying association, the included Extended ASSOCIATION objects
MUST be identical. Since the Association Type "LSP Identifiers" used
here is to carry LSP identifier, there is no need to associate Path
state to Path state or Resv state to Resv state, one specific rule is
added: when the Association Type is "LSP Identifiers", the Extended
ASSOCIATION object can appear in Path or Resv message across sessions
or in a single session, and the values can be different.

5. IANA Considerations

IANA is requested to administer assignment of new values for
namespace defined in this document and summarized in this section.

One bit ("LSP Identifers") needs to be allocated in the Association
Type Registry.

6. Security Considerations

A new Association Type is defined in this document, and except this,
there are no security issues about the Extended ASSOCIATION object
are introduced here. For Association object related security issues,
see the documents [RFC4872], [RFC4873], and
[I-D.ietf-ccamp-assoc-ext].

For a more comprehensive discussion on GMPLS security please see the
Security Framework for MPLS and GMPLS Networks [RFC5920].

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Wenjuan He.

8. References

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