ISIS MPLS Explicit NULL Label

draft-bitar-mpls-isis-explicit-null-label-00.txt

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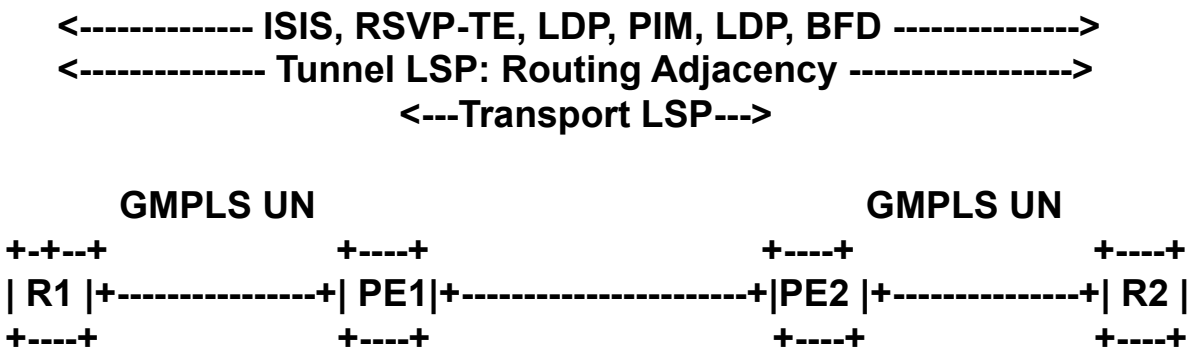
History

- **RFC 4206 defines a Forwarding Adjacency (FA) with the following attributes**
  - An FA is a GMPLS/MPLS TE tunnel between a pair of routers
  - An FA is advertised as an IGP link in the same IGP topology over which it is established
  - An FA is used only for traffic forwarding – multicast is not explicitly addressed and implementations have traditionally lacked support for IP/MPLS packet replication over FAs

- **Routing or signaling adjacencies are never established over FAs.**
  - IGP topology graph is assumed to be connected via layer2 interfaces

A Packet Transport Reference Model and Problem statement



- **A GMPLS tunnel between a pair routers is signaled over a different IGP topology than that of the routers**
  - In contrast FAs are signaled over the same routers' IGP topology
- **GMPLS TE tunnels provide the only connectivity among routers across MPLS-TP network**
  - In contrast, in networks where FAs are established, routers are connected over layer2 interfaces over which Routing and signaling adjacencies are formed ove
- **Requirement: Enable a GMPLS tunnel interface at a router head-end as a fully functional IP/MPLS interface**
  - Form IGP adjacencies, BGP peering sessions and multicast and MPLS signaling adjacencies over the tunnel
  - Forward unicast and multicast IPv4, IPv6 and MPLS traffic over the GMPLS tunnel

Enabling a GMPLS tunnel interface as an IP/MPSL interface

- **GMPLS tunnel is bidirectional as any IP link**

- **MPLS encapsulation (RFC3032) defines the encapsulation of:**
  - MPLS packets over MPLS tunnels
  - IPv4 packets over MPLS tunnels – can be used to encapsulate user-plane packets and control plane packets (e.g., RSVP-TE, LDP, OSPF-TE, PIM)
  - IPv6 packets using the IPv6 explicit NULL label (label value=2) over MPLS tunnels - can be used to encapsulate user-plane packets and control plane packets (e.g., RSVP-TE, LDP, OSPF-TE, PIM)
  - any mix of MPLS and IP packets on the same MPLS tunnel – demultiplexing among encapsulated protocols is inherent to RFC 3032

- **Standards Gap:**
  - Carrying ISIS Links state Packets over MPLS is not defined – focus of the draft

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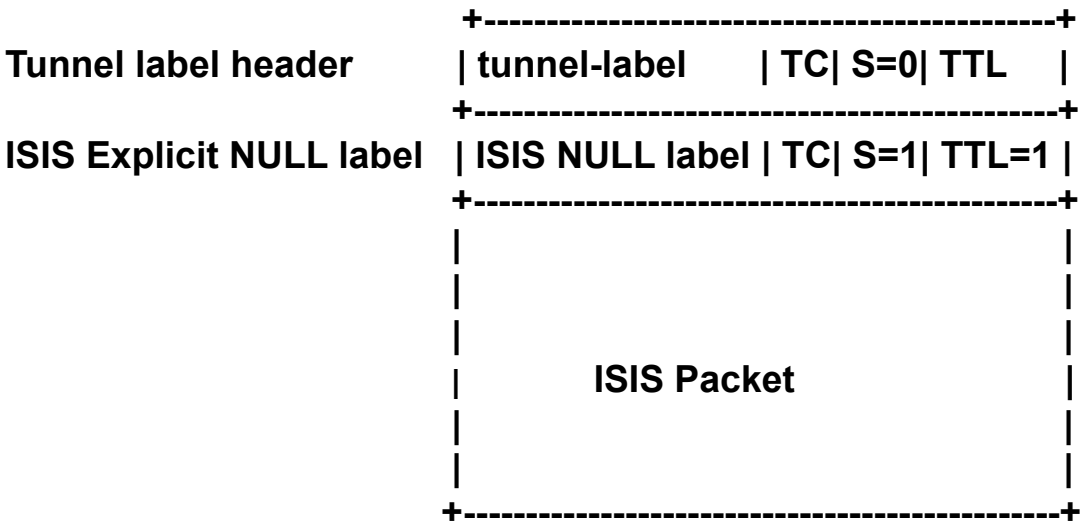
- **Define an ISIS MPLS Explcit NULL Label to address the gap in multiplexing ISIS Link state packets, MPLS and IPv4/IPv6 unicast/ multicast packets on the same GMPLS tunnel**
  - An enabler for supporting full IP Interfaces on GMPLS tunnels
  - Similar function to the IPv6 Explicit NULL label – enable the identification of the carried protocol (ISIS) in an MPLS packet
- **Format of ISIS Link State packet encapsulation over a GMPLS tunnel interface enabled for ISIS**



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Next Steps

- **Solicit WG input on the proposal**
- **If proposal is accepted, seek the definition of an ISIS MPLS Explicit NULL label value in the reserved MPLS label space**