Advertising Global Labels or SIDs Using IS-IS

draft-xu-isis-global-label-sid-adv-00

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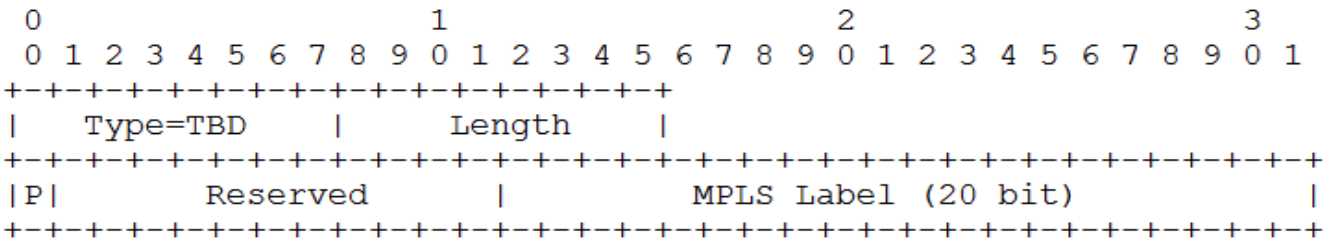
Motivation

- **In Segment Routing (SR), global MPLS labels or SIDs instead of indexes could be advertised as prefix segment identifiers when a single consistent label or SID block can be assigned by all SR-capable nodes.**
- **To eliminate the potential risk of global label or SID assignment collision, a single node, referred to as a mapping server, would be used to allocate and advertise global labels or SIDs on behalf of all SR-capable routers.**
  - As for which prefixes should be allocated with global labels, it can be configured on the mapping server or learnt from the advertisements by SR-capable routers.

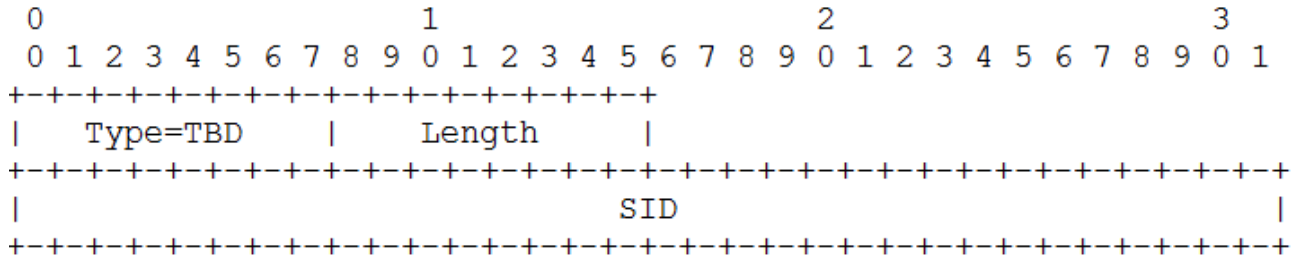
Advertising Label Bindings



Label Binding Sub-TLV

- **The mapping server uses the Extended IP Reachability TLVs to advertise global labels. A Label Binding Sub-TLV is associated with a prefix which is contained in the above TLVs.**
  - Since the mapping server uses these TLVs for advertising label bindings other than building IP routing table, the Metric field MUST be set to a value larger than MAX_PATH_METRIC (i.e., 0xFE000000).
  - P(HP)-Flag indicates whether the penultimate hop router SHOULD perform PHP action.

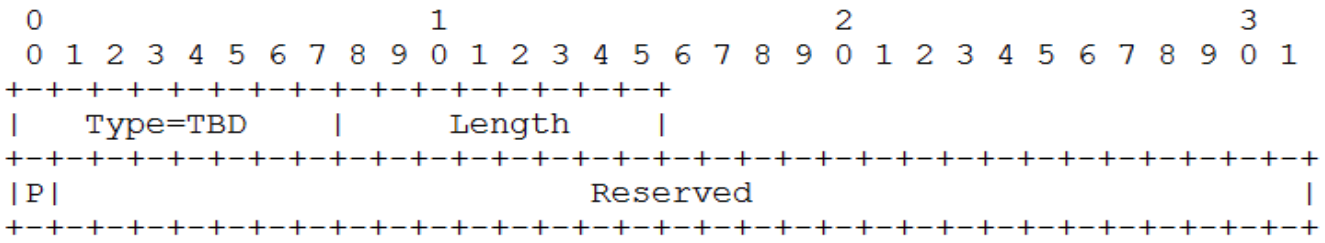
Advertising SID Bindings



SID Binding Sub-TLV

- **The mapping server uses the Extended IP Reachability TLVs to advertise global SIDs. A SID Binding Sub-TLV is associated with a prefix which is contained in the above TLVs.**
  - Since the mapping server uses these TLVs for advertising SID bindings other than building IP routing table, the Metric field MUST be set to a value larger than MAX_PATH_METRIC (i.e., 0xFE000000).

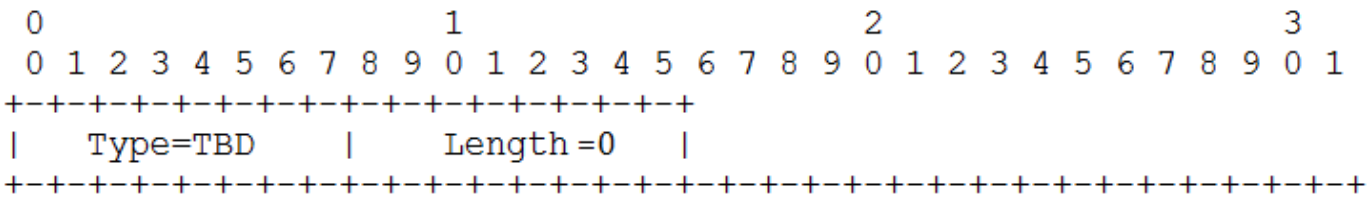
Requesting Label Bindings (optional)



Label Request Sub-TLV

- **In the single-level case, when advertising IP reachability information with Extended IP Reachability TLVs, SR-capable routers mark those prefixes which need global labels by associating a Label Request Sub-TLV with them.**
- **In the multi-level case, separate Extended IP Reachability TLVs other than those for IP reachability advertisement purpose are recommended to be used.**
  - In this way, the prefixes contained in the latter TLVs could be aggregated on L1/L2 routers while the former TLVs containing Label Request Sub-TLVs could be propagated intactly across level boundaries, even in the case where L1/L2 routers are not SR capable.

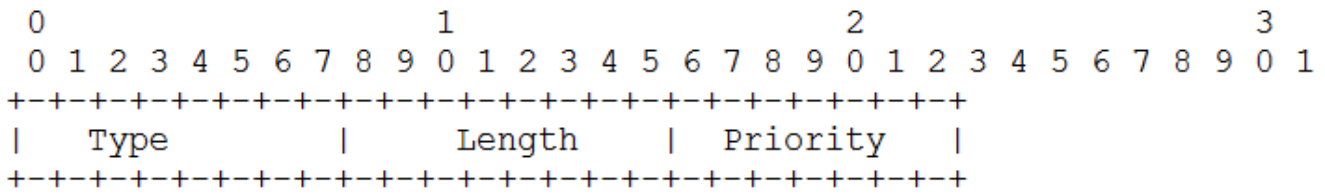
Requesting SID Bindings (optional)



Label Request Sub-TLV

- **In the single-level case, when advertising IP reachability information with Extended IP Reachability TLVs, SR-capable routers mark those prefixes which need global SIDs by associating a SID Request Sub-TLV with them.**
- **In the multi-level case, separate Extended IP Reachability TLVs other than those for IP reachability advertisement purpose are recommended to be used.**
  - In this way, the prefixes contained in the latter TLVs could be aggregated on L1/L2 routers while the former TLVs containing SID Request Sub-TLVs could be propagated intactly across level boundaries, even in the case where L1/L2 routers are not SR capable.

Mapping Server Redundancy (IS-IS)



Mapping Server Capability Sub-TLV

- **For redundancy purpose, more than one router could be configured as candidates for mapping servers.**
  - Each candidate advertises its capability of being a mapping servers by using a Mapping Server Capability Sub-TLV contained in the Router Capability TLV.
  - The one with the highest priority is elected as the primary mapping server which is eligible to allocate and advertise global labels or SIDs.
  - The one with the second highest priority is elected as the backup mapping server which is responsible for advertising the same label or SID bindings as those advertised by the primary mapping server routers during mapping server failover.

Next Steps

- **Comments?**