

# OSPF Extension for Inter-Area Topology Retrieval

[\[draft-wang-lsr-ospf-extension-inter-area\]](#)

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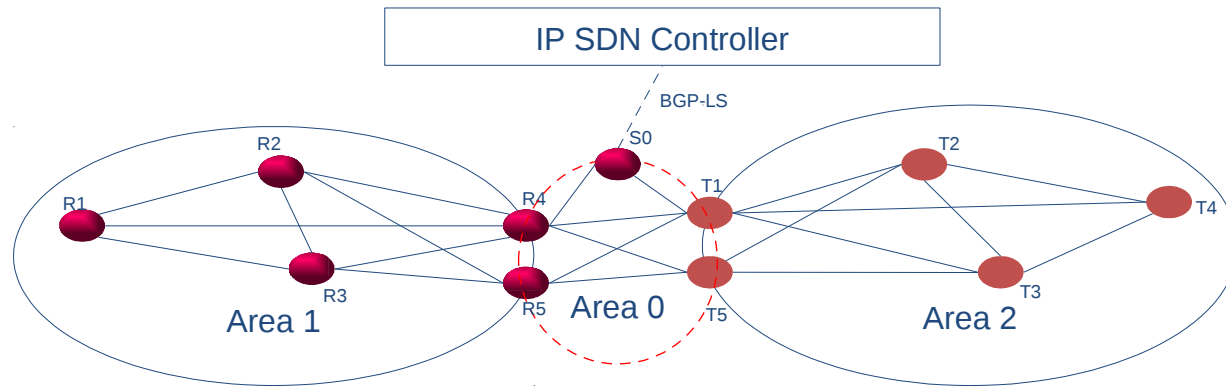
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# Background for OSPF extension for Inter-Area Topology Retrieval

1. The advantage of SDN controller is its global view capabilities of underlay topology and real time situation. Based on such information, the controller can easily calculate one E2E path that assures the QoS performance of application.
2. But when the underlay network is divided into several areas, and runs OSPF protocol:
  - The detail topology information is hidden by the ABR router
  - SDN controller can only get summary topology information from the router runs BGP-LS protocol that locates in one of the area.
3. IS-IS has already the solution in [RFC7794](#), there is no corresponding solution in OSPF.

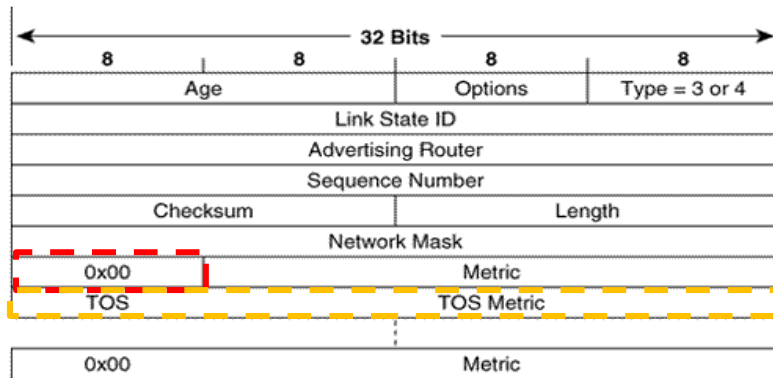


OSPF Inter-Area Topology Retrieval Scenario

# What The Proposal for OSPF extensions?

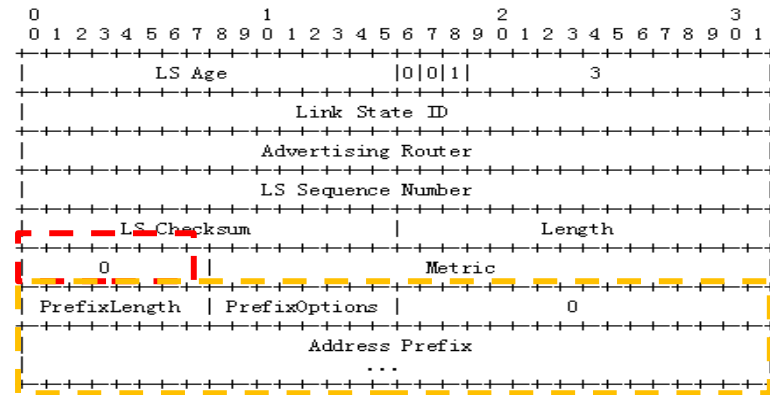
- For OSPFv2 [[RFC2328](#)] and OSPFv3 [[RFC5340](#)]:
  - Fixed-format is used in LSA message.
  - Reuses the rarely used field and redefines the associated fields to assure the backward compatible
  - Needs to standardize the special value of this field.
- For OSPFv2 [[RFC7684](#)] and OSPFv3 [[RFC8362](#)]
  - TLV format is used in LSA message
  - Define newly one sub-TLV “Prefix Source Router ID”
  - Should be included in “OSPFv2 Extended Prefix Opaque LSA” and “E-Inter-Area-Prefix-LSA” respectively
  - Encode in same format that defined in RFC7794 for IS-IS
- BGP-LS can report such information via the same Object, regardless of the IGP protocol is OSPF or ISIS.
  - Source Router-ID

# Extension for fixed-format LSA (OSPFv2 [RFC2328](#) and OSPFv3 [RFC5340](#))



Extended Summary LSA Format

OSPFv2



Inter-Area-Prefix-LSA Format

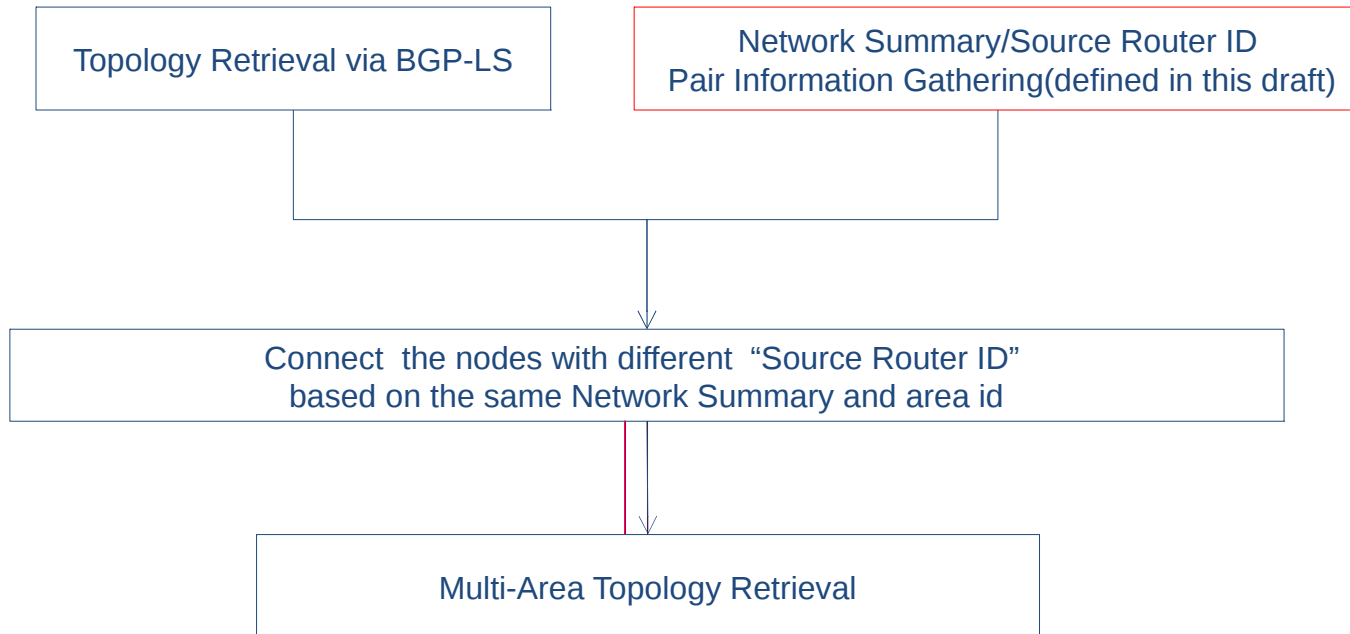
OSPFv3

- TOS related fields are rarely used in current network.
  - Reuses the rarely used field and redefines the associated fields to assure the backward compatible
  - When “Num. of TOS”(label in red box) is given one special value, for example “0xFE”, then the following field will carry the “source router id”(4 /16 bytes) and its associated “area id”(4 bytes)
  - Needs to standardize the special value of this field.
  - [RFC4915](#) (Multi-Topology Routing in OSPF) has the similar solution

# Extension for TLV-format LSA (OSPFv2 [\[RFC7684\]](#) and OSPFv3 [\[RFC8362\]](#))

- Define new sub-TLV “Prefix Source Router ID ”
- For IPv4 network, it is the following:
  - Type: IPv4 Source Router ID Type(TBD)
  - Length: 4
  - Value: IPv4 Router ID of the source of the advertisement
- This sub TLV should be included in the "OSPFv2 Extended Prefix Opaque LSA" that defined in [\[RFC7684\]](#)
- For IPv6 network, it is the following:
  - Type: IPv6 Source Router ID Type(TBD)
  - Length: 16
  - Value: IPv6 Router ID of the source of the advertisement
- This sub TLV should be included in "E-Inter-Area-Prefix-LSA" that defined in [[RFC8362](#)]

# Inter-Area Topology Retrieval Process



Multi-Area Topology Retrieval Process

# Further Action

- Adopt as WG draft?
- Co-Authors are welcome.
- Comments?

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