

Purge Originator Identification for OSPF

draft-li-lsr-ospf-purge-originator-00

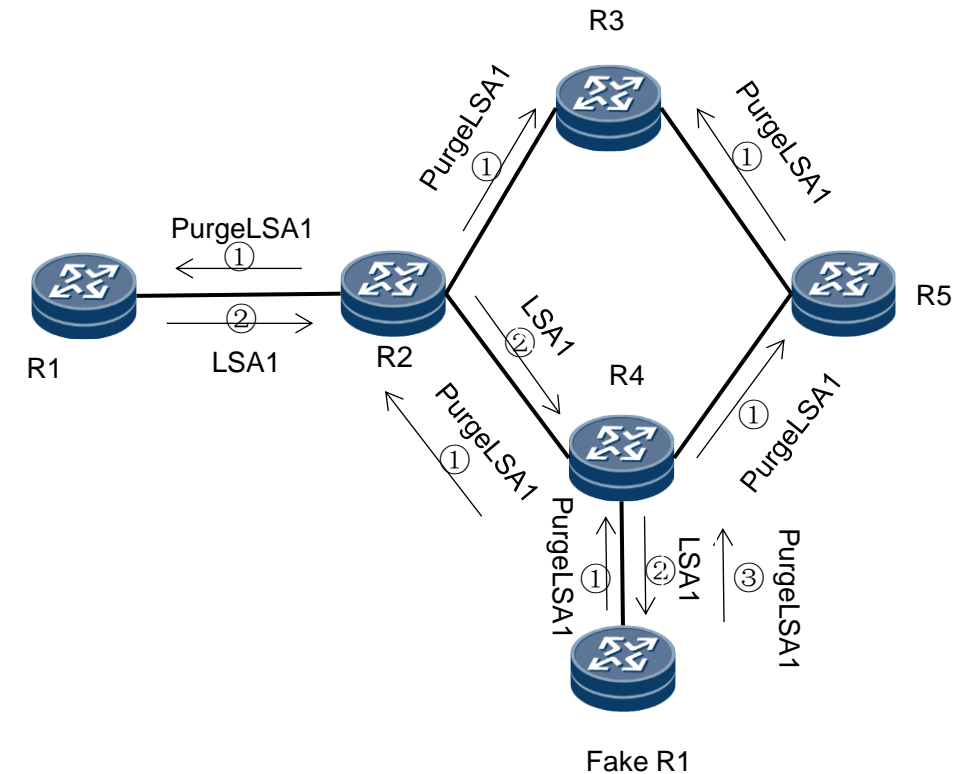
Zhenqiang Li(China Mobile)

Changwang Lin(New H3C Technologies))(Presenter)

Why we need Purge Originator Identification

Typical untraceable LSA purging scenario:

- In the case of a Fake R1 due to incorrect configuration or software bug, a PurgeLSA1 is triggered, and this LSA purge signal is propagated throughout the network.
- When R1 receives a PurgeLSA1, it regenerates LSA1.
- If this regenerated LSA1 is passed to the Fake R1, it generates a PurgeLSA1 again, leading to a network oscillation.



The network administrator is having difficulty quickly locating the source of network issues because they cannot identify the true originator of the Purge LSA1.

Purge Originator Identification for IGP

- In RFC6232 (Purge Originator Identification TLV for IS-IS), the IS-IS POI (Purge Originator Identification) TLV is added to the Purge LSP in order to record the system ID of the IS that generated it.
- At present, OSPF purge LSAs do not contain any information that identifies the router that generated the purge. This makes it difficult to locate the source router. Therefore, for the OSPF protocol, a similar mechanism for identifying the originator of purges is needed.

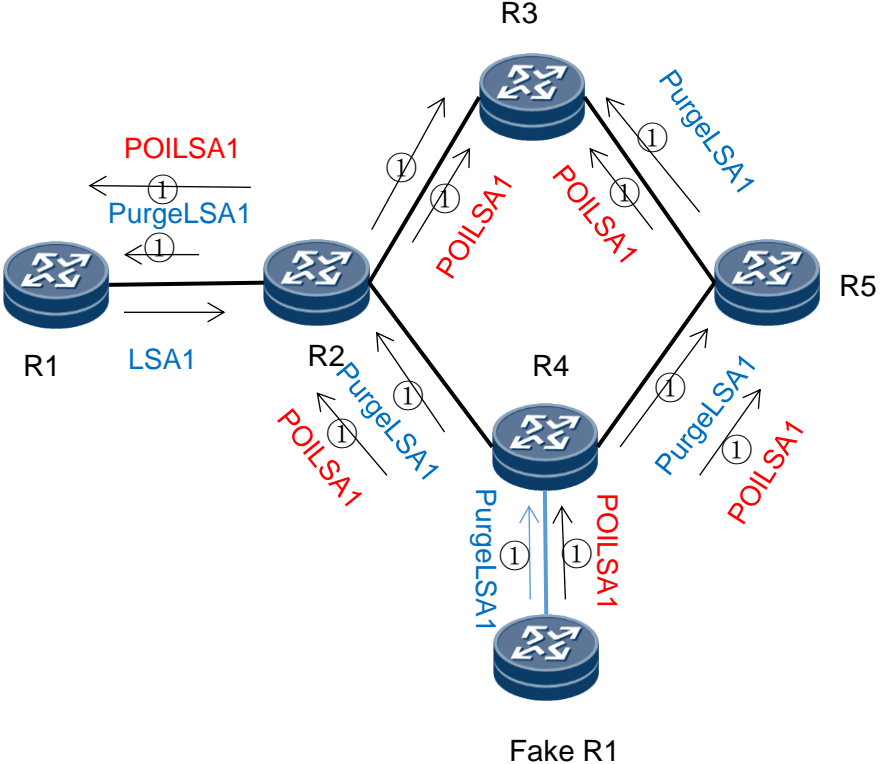
Solution

IS-IS LSPs can be extended by inserting any TLVs.

However, OSPF base LSAs cannot be extended by inserting new TLVs, due to their fixed format.

Therefore, in order to carry POI information in OSPF networks, new LSA types need to be defined and extended.

- While Fake R1 sends the PurgeLSA1, it also generates a POI LSA1 to indicate itself as the source of the Purge message for LSA1.
- Based on the information from the POI LSA1, the network administrator can determine that the PurgeLSA1 was generated by Fake R1 and first received by R4. This enables the quick identification of the faulty location.



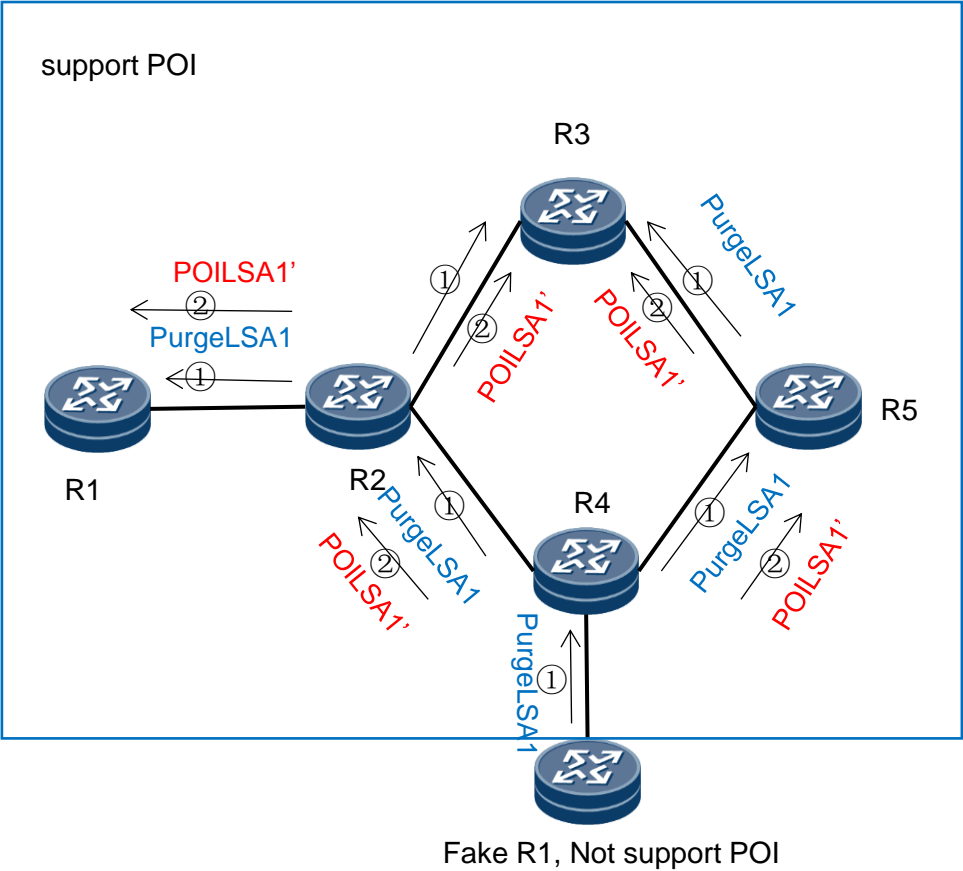
Information in POI LSA: } Purged LSA ID: LSA1
AdvRtID: Fake R1

Backward Compatibility Consideration

- If a router in the network does not support the POI function and sends a Purge LSA that is received by its neighbors, **any neighbors that support POI will generate a POI LSA** on behalf of the router.

- For example:

1. Fake R1 sends a PurgeLSA1 to R4.
2. When R4 receives the PurgeLSA1, it generates the corresponding POI LSA on behalf of Fake R1 and advertises that this PurgeLSA was generated by Fake R1, as it is known that Fake R1 does not support the POI capability.
3. Upon receiving these POILSA from R4, R2 and R5 can determine that the Purge LSA originated from R4 and was generated by Fake R1. This information helps pinpoint the location of the fault.

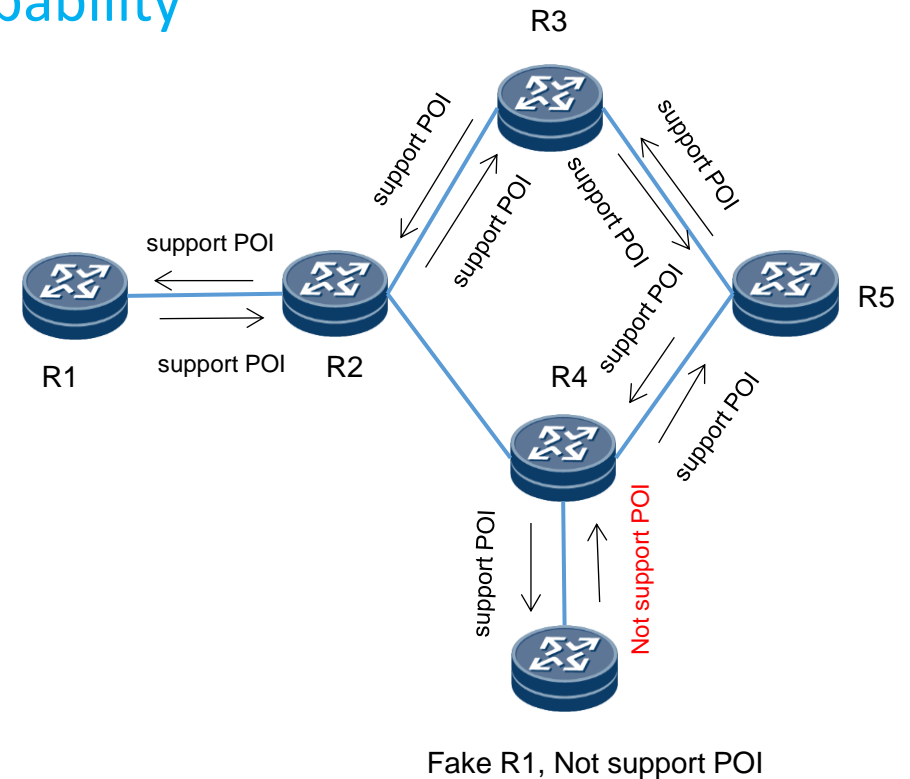


Information in POI LSA:
Purged LSA ID: LSA1
AdvRtID: R4
NbrRtID: Fake R1

How to obtain the neighbor's POI capability

By extending the capability field of the Neighbor Hello packet, we can obtain information about the neighbor's POI capability

- To determine if a neighboring router supports POI LSA functionality, a flag indicating support for POI LSA is added to the Hello packet exchanged during neighbor discovery.
- Given that Fake R1 does not support the POI LSA capability, R4 becomes aware of this during neighbor exchanges. Therefore, R4 is capable of sending POI LSA messages to notify the source of the Purge LSA.

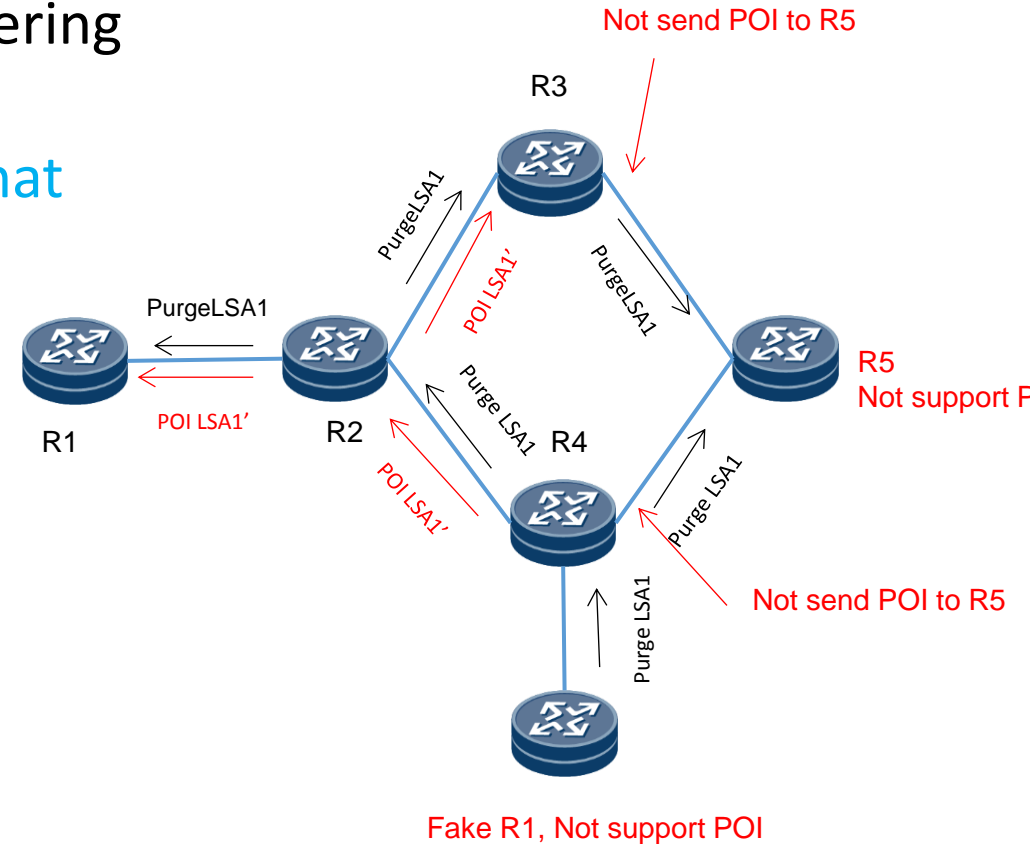


Flooding of POI LSAs

The flooding scope of the POI LSAs and the scope triggering the generation of the Purge LSAs are the same.

However, the POI LSAs are only flooded to neighbors that support the POI capability.

- In a scenario where Fake R1 does not support the POI LSA capability, R4 takes the responsibility of sending the POI LSA. However, the POI LSA is only flooded to R2 that have the POI ability.

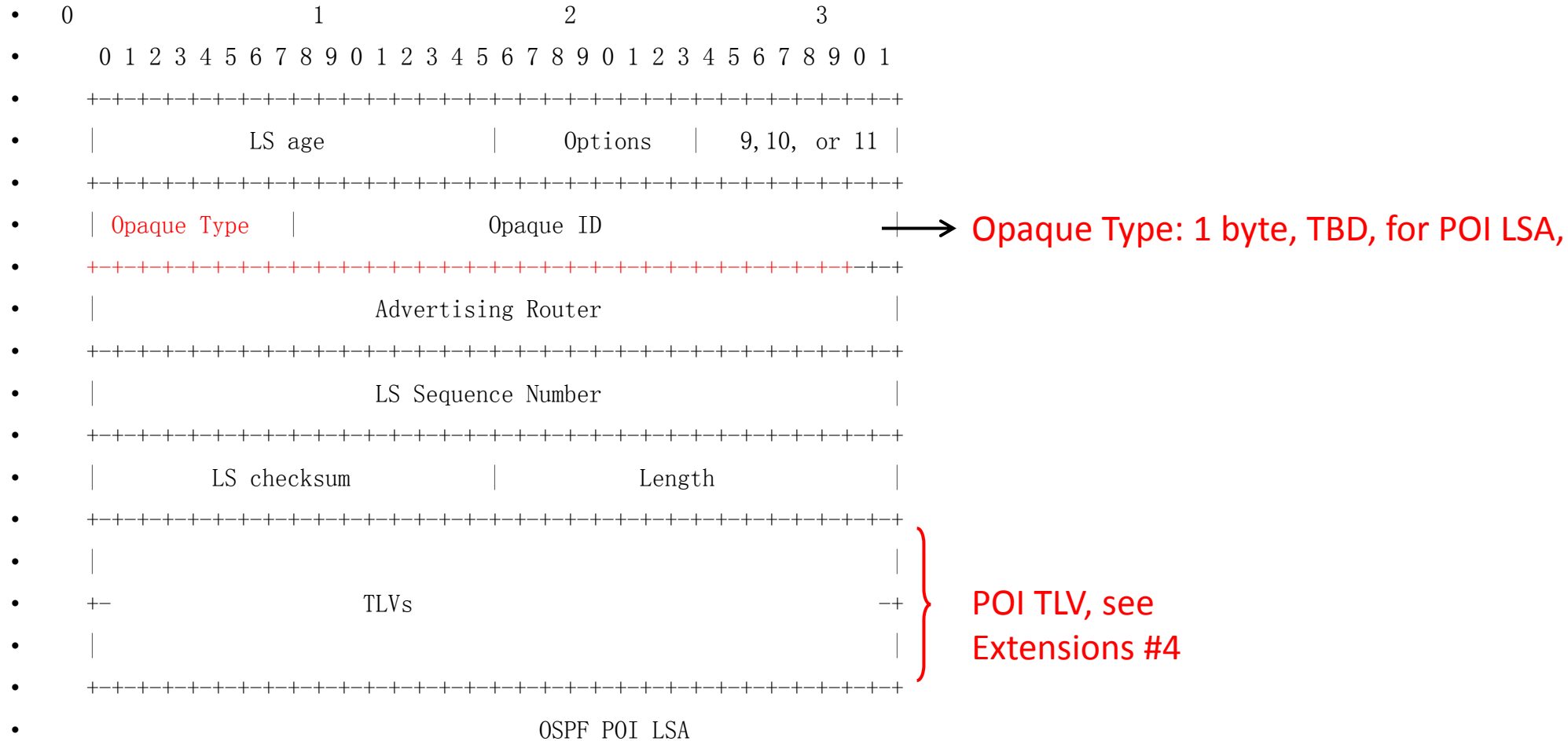


Summary

- Announcing support for POI capability via an extension in the Hello.
- Defining specific content for POI information in new POI LSAs.
- The POI LSAs are only flooded to neighbors that support the POI capability.
- The solution can be incrementally deployed, allowing for compatibility with existing OSPF networks.

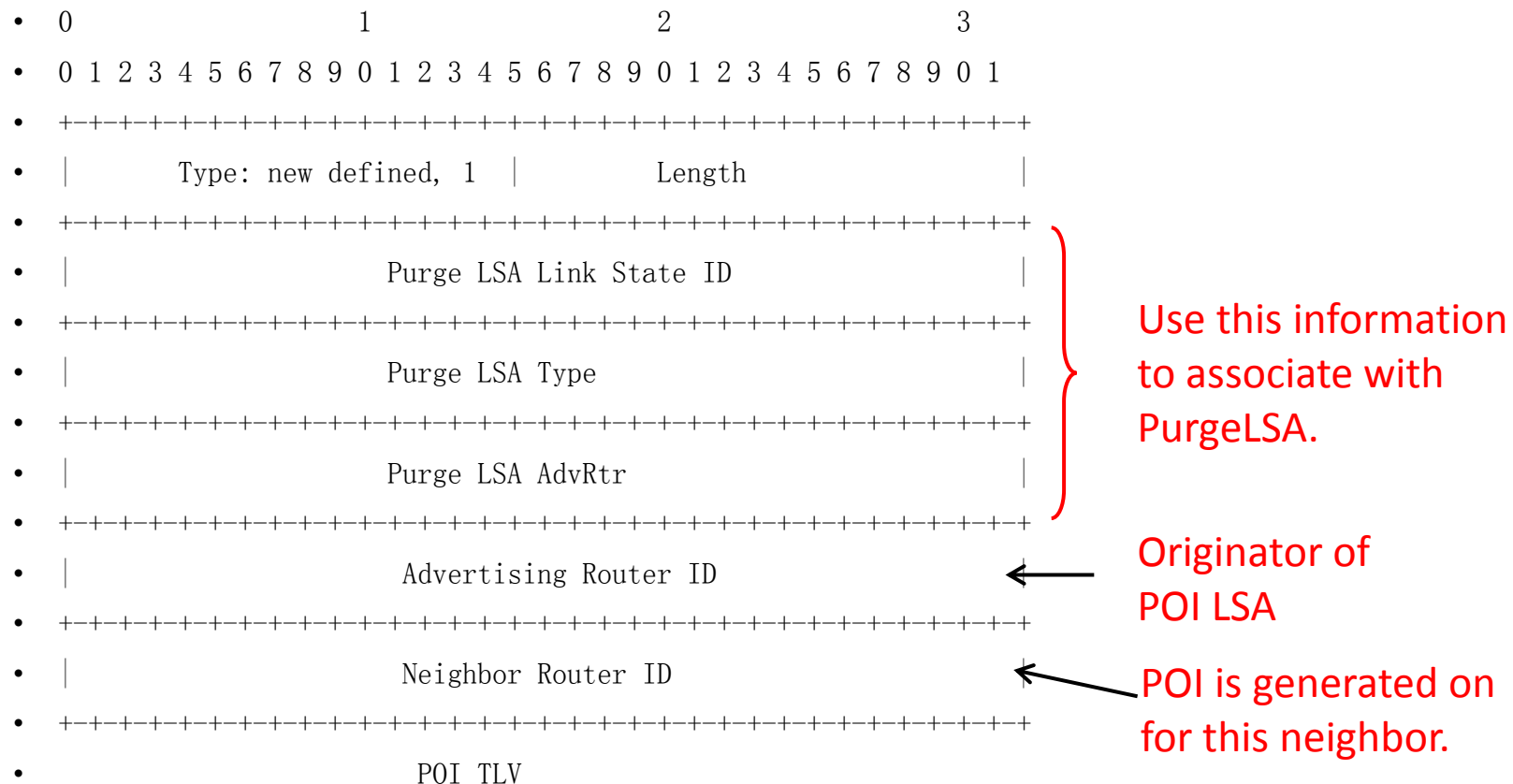
Extensions #2: New POI LSA for OSPF

To advertise POI-related information, a new LSA type is defined for OSPF.



Extensions #4: POI TLV, used by OSPF and OSPFv3

The POI information that is advertised includes the LinkState ID of the Purge LSA, the originator of the POI LSA, and whether the POI LSA is generated for a specific neighbor.



Next Step

- Any questions or comments are Welcomed

THANKS