

OSPFv3 LSA Extendability IETF 87, Berlin

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OSPFv3 LSA Extension History



- LSA Extension proposed in “Multi-topology Routing for OSPFv3” years ago.
- Base RFC 5340 LSAs are fixed format. This poses the following problems:
 - Information associated with the OSPFv3 topology and prefixes must be advertised in a separate LSAs.
 - Introduces complications in terms of advertisement and additional lookups.
 - ISIS LSPs are extendable.



OSPFv3 LSA Requirements

- Source address based routing – Fred Baker Draft
- Flow label based routing – Fred Baker Draft
- Tags on Intra/Inter prefixes
- Segment Routing (SR)
- Multi-Address Family in single instance
- Multi-Topology in single instance
- Useful for any information to be advertised that **MUST** be correlated with base topology or prefixes

OSPFv3 LSA Extension – Direction of this draft



- Or, “Why does this draft have a chance of succeeding when others have failed?”
- Limit scope of draft SOLELY to LSA extension – don’t include the application use cases. These can progress on their own.
- Be conservative with clever backward compatibility mechanisms.
 - Introduces more corner cases and a higher barrier to deployment.
 - Deployment will be controlled anyway.

OSPFv3 LSA Extension – Encodings



- Define TLV based equivalents of all the base LSAs including E-Router-LSA, E-Network-LSA, E-Inter-Area-Prefix-LSA, E-Inter-Area-Router-LSA, E-AS-External-LSA, E-NSSA-LSA, E-Link-LSA, and E-Intra-Area-Prefix-LSA.
- Define Top Level TLVs and Sub-TLVs supporting existing functionality.
- Two IANA Registeries – Top-Level TLVs and Sub-TLVs (shared for all TLVs for synergies)

OSPFv3 LSA Extension – Backward Compatibility



- Two mechanisms – One very simple and one more complicated for deployments where a single OSPFv3 routing domain is required.
- Both mechanisms are configuration based rather than based on automatic detection.
 - Simpler more robust implementations.
 - Not prone to scaling problems during successive transitions.
 - Deterministic introduction

OSPFv3 LSA Extension – primary mechanism



- OSPFv3 option bit in Hello/Data Description packet used to control adjacency formation.
- OSPFv3 Routers advertising extended LSAs will not form adjacencies with OSPFv3 Routers not advertising extended LSAs.
- Configuration based
- Separate OSPFv3 routing domain and instances can be used to support routers not supporting the extended LSAs.

OSPFv3 LSA Extension – secondary mechanism



- Same OSPFv3 option bit in Hello/Data Description packets is set but not used to control adjacency formation.
- Configuration dictates whether both legacy (non-extended) and extended LSAs are advertised.
- OSPFv3 Routers supported extended LSAs SHOULD use the extended LSAs in SPF computation and other OSPFv3 functions.
- Potentially doubles size of OSPFv3 database

Next Steps for Draft

- Address pending comments in revision.
 - Make metric a separate Sub-TLV for use cases where it may be optional.
- OSPF WG Acceptance as WG Document
- Review and discussion
- Consensus on backward compatibility
- Implementation(s)?