

Extensions to OSPF for Advertising Prefix Administrative Tags
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Abstract

It is useful for routers in an OSPFv2 or OSPFv3 routing domain to be able to associate tags with prefixes. Previously, OSPFv2 and OSPFv3 were relegated to a single tag for AS External and Not-So-Stubby-Area (NSSA) prefixes. With the flexible encodings provided by OSPFv2 Prefix/Link Attribute Advertisement and OSPFv3 Extended LSAs, multiple administrative tags may advertised for all types of prefixes. These administrative tags can be used for many applications including route redistribution policy, selective prefix prioritization, selective IP Fast-ReRoute (IPFRR) prefix protection, and many others.

The ISIS protocol supports a similar mechanism that is described in [RFC 5130](#).

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[1.](#) Introduction

It is useful for routers in an OSPFv2 [[RFC2328](#)] or OSPFv3 [[RFC5340](#)] routing domain to be able to associate tags with prefixes. Previously, OSPFv2 and OSPFv3 were relegated to a single tag for AS External and Not-So-Stubby-Area (NSSA) prefixes. With the flexible encodings provided by OSPFv2 Prefix/Link Attribute Advertisement ([[RFC7684](#)]) and OSPFv3 Extended LSA ([[RFC8362](#)]), multiple administrative tags may be advertised for all types of prefixes. These administrative tags can be used many applications including (but not limited to):

1. Controlling which routes are redistributed into other protocols for readvertisement.
2. Prioritizing selected prefixes for faster convergence and installation in the forwarding plane.
3. Identifying selected prefixes for Loop-Free Alternative (LFA) protection.

3. External-Prefix TLV advertised in the E-AS-External-LSA and the E-NSSA-LSA

4. Protocol Operation

An OSPF router supporting this specification **MUST** propagate administrative tags when acting as an Area Border Router and originating summary advertisements into other areas. Similarly, an OSPF router supporting this specification and acting as an ABR for a Not-So-Stubby Area (NSSA) **MUST** propagate tags when translating NSSA routes to AS External advertisements [[RFC3101](#)]. The number of tags supported **MAY** limit the number of tags that are propagated. When propagating multiple tags, the order of the the tags must be preserved.

For configured area ranges, NSSA ranges, and configured summarization of redistributed routes, tags from component routes **SHOULD NOT** be propagated to the summary. Implementations **SHOULD** provide a mechanism to configure tags for area ranges, NSSA ranges, and redistributed route summaries.

An OSPF router supporting this specification **MUST** be able to advertise and interpret one 32-bit tag for prefixes. An OSPF router supporting this specification **MAY** be able to advertise and propagate multiple 32-bit tags. The maximum tags that an implementation supports is a local matter depending upon supported applications using the prefix or link tags.

When a single tag is advertised for AS External or NSSA LSA prefix, the existing tag in OSPFv2 and OSPFv3 AS-External-LSA and NSSA-LSA encodings **SHOULD** be utilized. This will facilitate backward compatibility with implementations that do not support this specification.

4.1. Equal-Cost Multipath Applicability

When multiple LSAs contribute to an OSPF route, it is possible that these LSAs will all have different tags. In this situation, the OSPF router **MUST** associate the tags from one of the LSAs contributing a path and, if the implementation supports multiple tags, **MAY** associate tags for multiple contributing LSAs up to the maximum number of tags supported.

5. Security Considerations

This document describes a generic mechanism for advertising administrative tags for OSPF prefixes. The administrative tags are generally less critical than the topology information currently

advertised by the base OSPF protocol. The security considerations for the generic mechanism are dependent on their application. One such application is to control leaking of OSPF routes to other protocols (e.g., BGP [[RFC4271](#)]). If an attacker were able to modify the admin tags associated with OSPF routes and they were be used for this application, such routes could be prevented from being advertised in routing domains where they are required (subtle denial or service) or they could be advertised into routing domains where they shouldn't be advertised (routing vulnerability). Security considerations for the base OSPF protocol are covered in [[RFC2328](#)] and [[RFC5340](#)].

6. IANA Considerations

The following values should be allocated from the OSPF Extended Prefix TLV Sub-TLV Registry [[RFC7684](#)]:

- o TBD - 32-bit Administrative Tag TLV

The following values should be allocated from the OSPFv3 Extended-LSA Sub-TLV Registry [[RFC8362](#)]:

- o TBD - 32-bit Administrative Tag TLV

7. Acknowledgments

The authors of [RFC 5130](#) are acknowledged since this document draws upon both the ISIS specification and deployment experience.

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The RFC text was produced using Marshall Rose's xml2rfc tool.

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link administrative groups as specified in [[RFC8920](#)] advertising administrative tags for links.

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