

**Extensions to OSPF for Advertising Prefix/Link Administrative Tags**  
**draft-acee-ospf-admin-tags-06**

Abstract

It is useful for routers in an OSPFv2 or OSPFv3 routing domain to be able to associate tags with prefixes and links. 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 be advertised for all types of prefixes and links. 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 and links. 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 and links. 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. Intra-Area-Prefix TLV advertised in the E-Link-LSA and the E-Intra-Area-Prefix-LSA
4. 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 and links. 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 both OSPF prefixes and links. 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 the future application and, as such, should be described as additional capabilities are proposed for advertisement. 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 OSPF Extended Link 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.

Thanks to Donnie Savage for his comments and questions.

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

## 8. References

### 8.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.



- [RFC2328] Moy, J., "OSPF Version 2", STD 54, [RFC 2328](#), DOI 10.17487/RFC2328, April 1998, <<https://www.rfc-editor.org/info/rfc2328>>.
- [RFC3630] Katz, D., Kompella, K., and D. Yeung, "Traffic Engineering (TE) Extensions to OSPF Version 2", [RFC 3630](#), DOI 10.17487/RFC3630, September 2003, <<https://www.rfc-editor.org/info/rfc3630>>.
- [RFC5340] Coltun, R., Ferguson, D., Moy, J., and A. Lindem, "OSPF for IPv6", [RFC 5340](#), DOI 10.17487/RFC5340, July 2008, <<https://www.rfc-editor.org/info/rfc5340>>.
- [RFC7684] Psenak, P., Gredler, H., Shakir, R., Henderickx, W., Tantsura, J., and A. Lindem, "OSPFv2 Prefix/Link Attribute Advertisement", [RFC 7684](#), DOI 10.17487/RFC7684, November 2015, <<https://www.rfc-editor.org/info/rfc7684>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [RFC8362] Lindem, A., Roy, A., Goethals, D., Reddy Vallem, V., and F. Baker, "OSPFv3 Link State Advertisement (LSA) Extensibility", [RFC 8362](#), DOI 10.17487/RFC8362, April 2018, <<https://www.rfc-editor.org/info/rfc8362>>.

## **[8.2.](#) Informative References**

- [RFC3101] Murphy, P., "The OSPF Not-So-Stubby Area (NSSA) Option", [RFC 3101](#), DOI 10.17487/RFC3101, January 2003, <<https://www.rfc-editor.org/info/rfc3101>>.
- [RFC5130] Previdi, S., Shand, M., Ed., and C. Martin, "A Policy Control Mechanism in IS-IS Using Administrative Tags", [RFC 5130](#), DOI 10.17487/RFC5130, February 2008, <<https://www.rfc-editor.org/info/rfc5130>>.







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