

Network Working Group
Internet-Draft
Intended status: Standards Track
Expires: March 27, 2021

A. Lindem, Ed.
P. Psenak
Cisco Systems
September 23, 2020

Extensions to OSPF for Advertising Prefix Administrative Tags
draft-acee-lsr-ospf-admin-tags-07

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 be 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](#).

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on March 27, 2021.

Copyright Notice

Copyright (c) 2020 IETF Trust and the persons identified as the document authors. All rights reserved.

Internet-Draft

OSPF Administrative Tags

September 2020

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1.	Introduction	2
1.1.	Requirements Language	3
2.	32-Bit Administrative Tag Sub-TLV	3
3.	Administrative Tag Applicability	4
4.	Protocol Operation	5
4.1.	Equal-Cost Multipath Applicability	5
5.	Security Considerations	5
6.	IANA Considerations	6
7.	Acknowledgments	6
8.	References	6
8.1.	Normative References	6
8.2.	Informative References	7
Appendix A.	64-Bit Administrative Tag Sub-TLV	8
Appendix B.	Link Administrative Tags	8
	Authors' Addresses	9

[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.

TLV Format

The Length field defines the length of the value portion in octets (thus a TLV with no value portion would have a length of 0). The TLV is padded to 4-octet alignment; padding is not included in the length field (so a 3-octet value would have a length of 3, but the total size of the TLV would be 8 octets).

The format of the 32-bit Administrative Tag TLV is as follows:

Lindem & Psenak

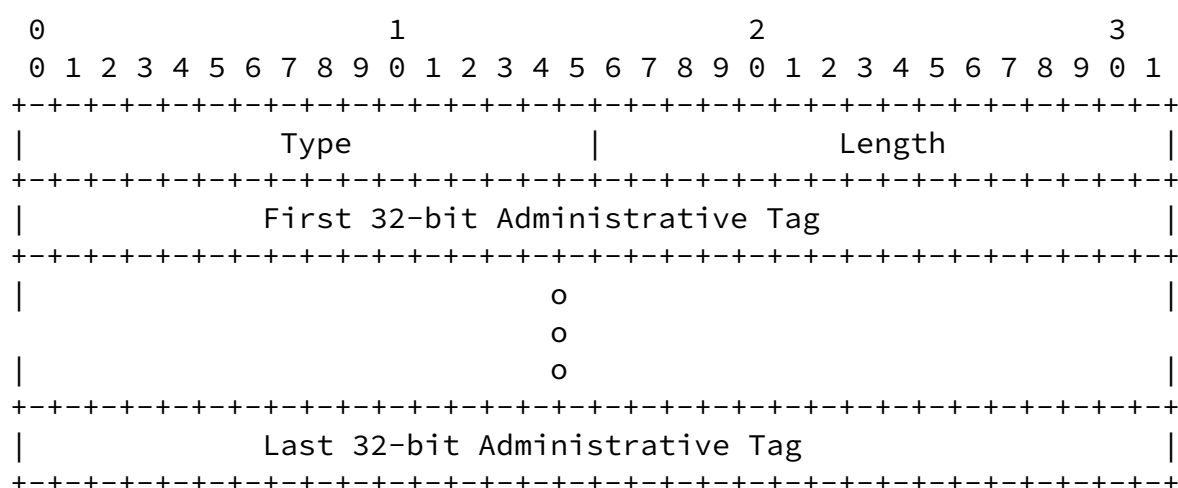
Expires March 27, 2021

[Page 3]

Internet-Draft

OSPF Administrative Tags

September 2020



Type A 16-bit field set to TBD. The value MAY be different depending upon the IANA registry from which it is allocated.

Length A 16-bit field that indicates the length of the value portion in octets and will be a multiple of 4 octets dependent on the number of administrative tags advertised. If the sub-TLV is specified, at least one administrative tag must be advertised.

Value A variable length list of one or more administrative tags.

32-bit Administrative Tag Sub-TLV

This sub-TLV will carry one or more 32-bit unsigned integer values that will be used as administrative tags.

3. Administrative Tag Applicability

The administrative tag TLV specified herein will be valid as a sub-TLV of the following TLVs specified in [[RFC7684](#)]:

1. Extended Prefix TLV advertised in the OSPFv2 Extended Prefix LSA

The administrative tag TLV specified herein will be valid as a sub-TLV of the following TLVs specified in [[RFC8362](#)]:

1. Inter-Area-Prefix TLV advertised in the E-Inter-Area-Prefix-LSA
2. Intra-Area-Prefix TLV advertised in the E-Link-LSA and the E-Intra-Area-Prefix-LSA

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 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 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>>.

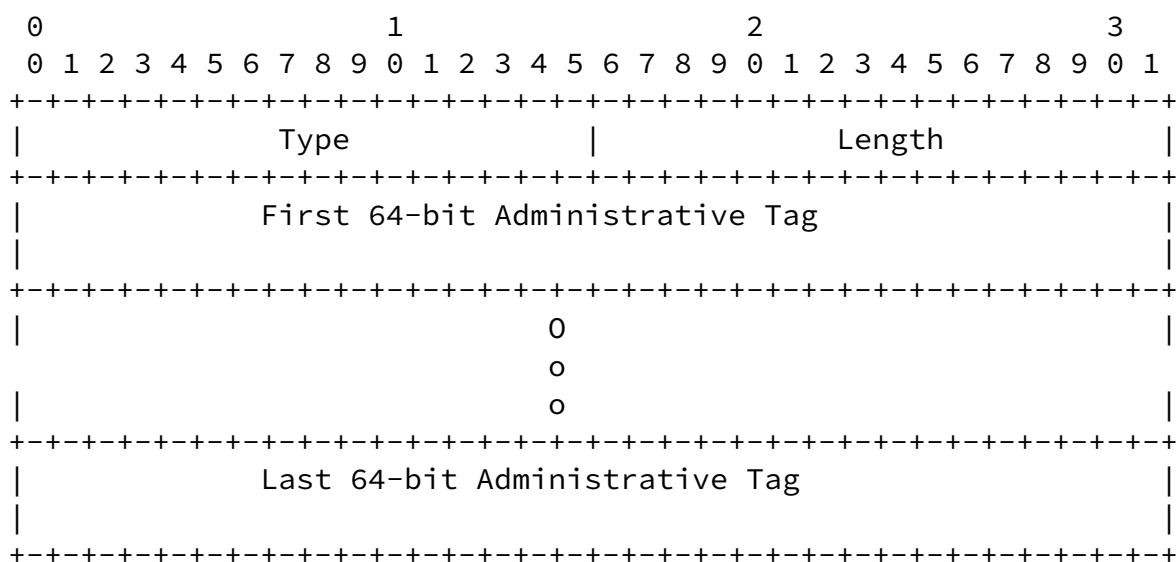
8.2. Informative References

- [I-D.ietf-ospf-te-link-attr-reuse]
Psenak, P., Ginsberg, L., Henderickx, W., Tantsura, J., and J. Drake, "OSPF Application-Specific Link Attributes", [draft-ietf-ospf-te-link-attr-reuse-16](#) (work in progress), June 2020.
- [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>>.

The definition of the 64-bit tag was considered but discarded given that there is no strong requirement or use case. The specification is included here for information.

This sub-TLV will carry one or more 64-bit unsigned integer values that will be used as administrative tags.

The format of the 64-bit Administrative Tag TLV is as follows:



- | | |
|--------|--|
| Type | A 16-bit field set to TBD. The value MAY be different depending upon the registry from which it is allocated. |
| Length | A 16-bit field that indicates the length of the value portion in octets and will be a multiple of 8 octets dependent on the number of administrative tags advertised. If the sub-TLV is specified, at least one administrative tag must be advertised. |
| Value | A variable length list of one or more 64-bit administrative tags. |

64-bit Administrative Tag TLV

[Appendix B](#). Link Administrative Tags

The advertisement of administrative tags corresponding to links has been removed from the document. The specification of advertising link administrative groups as specified in

[I-D.ietf-ospf-te-link-attr-reuse] advertising administrative tags for links.

Authors' Addresses

Acee Lindem (editor)
Cisco Systems
301 Midenhall Way
Cary, NC 27513
USA

EMail: acee@cisco.com

Peter Psenak
Cisco Systems
Apollo Business Center
Mlynske nivy 43
Bratislava, 821 09
Slovakia

EMail: ppsenak@cisco.com

