

IDR Working Group Z.
Wang
Internet-Draft Q.
Wu
Intended status: Standards Track
Huawei
Expires: May 24, 2020 J.
Tantsura
Apstra,
Inc.
K.
Talaulikar
Cisco
Systems
November 21,
2019

Distribution of Traffic Engineering Extended Admin Groups using BGP-LS draft-ietf-idr-eag-distribution-11

Abstract

Administrative groups (commonly referred to as "colors" or "link colors") are link attributes that are advertised by link state protocols like IS-IS (Intermediate System to Intermediate System) and

OSPF (Open Shortest Path First) and used for traffic engineering. These administrative groups have initially been defined as a fixed-length 32-bit bitmask. As networks grew and more use-cases were introduced, the 32-bit length was found to be constraining and hence extended administrative groups were introduced in the link state protocols. The 32-bit administrative groups are already advertised as link attributes in BGP-LS (Border Gateway Protocol Link-State). This document defines extensions to BGP-LS for advertisement of the extended administrative groups.

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 May 24, 2020.

Copyright Notice

Copyright (c) 2019 IETF Trust and the persons identified as the document authors. All rights reserved.

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.](#) Advertising Extended Administrative Groups in BGP-LS
- [3](#)
- [3.](#) IANA Considerations
- [4](#)
- [4.](#) Security Considerations
- [4](#)
- [5.](#) Acknowledgments
- [4](#)
- [6.](#) Normative References
- [4](#)
- Authors' Addresses
- [5](#)

[1.](#) Introduction

Administrative groups (commonly referred to as "colors" or "link colors") are link attributes that are advertised by link state protocols like IS-IS [[RFC5305](#)], OSPFv2 [[RFC3630](#)] and OSPFv3 [[RFC5329](#)] for traffic engineering use-cases. The BGP-LS advertisement is encoded using the Administrative Group (color) TLV 1088 as defined in [[RFC7752](#)].

These administrative groups are defined as a fixed-length 32-bit bitmask. As networks grew and more use-cases were introduced, the 32-bit length was found to be constraining and hence extended administrative groups (EAG) were introduced in the IS-IS and OSPFv2 link state routing protocols [[RFC7308](#)].

This document specifies extensions to BGP-LS for advertisement of the extended administrative groups.

Wang, et al.
2]

Expires May 24, 2020

[Page

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in

[BCP](#)

[14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

2. Advertising Extended Administrative Groups in BGP-LS

This document defines extensions that enable BGP-LS speakers to signal the EAG of links in a network to a BGP-LS consumer of network topology such as a centralized controller. The centralized controller can leverage this information in traffic engineering computations and other use-cases. When a BGP-LS speaker is originating the topology learnt via link-state routing protocols like

OSPF or IS-IS, the EAG information of the links is sourced from the underlying extensions as defined in [[RFC7308](#)]. The BGP-LS speaker may also advertise the EAG information for the local links of a node when not running any link-state IGP protocol e.g. when running BGP

as

the only routing protocol.

EAG of a link is encoded in a new Link Attribute TLV [[RFC7752](#)] using the following format:

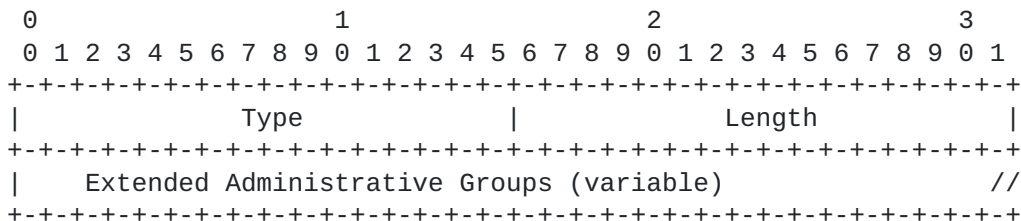


Figure 1: Extended Administrative Groups TLV Format

Where:

- o Type: 1173
- o Length: variable (MUST be multiple of 4); represents the total length of the value field in octets.
- o Value : one or more sets of 32-bit bitmasks that indicate the administrative groups (colors) that are enable on the link when those specific bits are set.

The EAG TLV is an optional TLV. The existing AG TLV 108 and the EAG TLV defined in this document MAY be advertised together. The

semantics of the EAG and the backward compatibility aspects of EAG with respect to the AG are handled as described in the Backward Compatibility section of [[RFC7308](#)].

3. IANA Considerations

This document requests assigning code-point from the registry "BGP-LS

Node Descriptor, Link Descriptor, Prefix Descriptor, and Attribute TLVs" based on table below. Early allocation for these code-points have been done by IANA.

Code Point	Description	IS-IS TLV/Sub-TLV
1173	Extended Administrative Group	22/14

4. Security Considerations

The extensions in this document advertise same administrative group information specified via [[RFC7752](#)] but as a larger/extended value and hence does not introduce security issues beyond those discussed in [[RFC7752](#)].

5. Acknowledgments

The authors gratefully acknowledge the review by Eric Osborne and Les Ginsberg.

6. 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>>.

[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>>.

[RFC5305] Li, T. and H. Smit, "IS-IS Extensions for Traffic Engineering", [RFC 5305](#), DOI 10.17487/RFC5305, October 2008, <<https://www.rfc-editor.org/info/rfc5305>>.

- [RFC5329] Ishiguro, K., Manral, V., Davey, A., and A. Lindem, Ed., "Traffic Engineering Extensions to OSPF Version 3", [RFC 5329](#), DOI 10.17487/RFC5329, September 2008, <<https://www.rfc-editor.org/info/rfc5329>>.
- [RFC7308] Osborne, E., "Extended Administrative Groups in MPLS Traffic Engineering (MPLS-TE)", [RFC 7308](#), DOI 10.17487/RFC7308, July 2014, <<https://www.rfc-editor.org/info/rfc7308>>.
- [RFC7752] Gredler, H., Ed., Medved, J., Previdi, S., Farrel, A., and S. Ray, "North-Bound Distribution of Link-State and Traffic Engineering (TE) Information Using BGP", [RFC 7752](#), DOI 10.17487/RFC7752, March 2016, <<https://www.rfc-editor.org/info/rfc7752>>.
- [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>>.

Authors' Addresses

Zitao Wang
Huawei
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

Email: wangzitao@huawei.com

Qin Wu
Huawei
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

Email: bill.wu@huawei.com

Jeff Tantsura
Apstra, Inc.

Email: jefftant.ietf@gmail.com

Internet-Draft
2019

Extended admin Group

November

Ketan Talaulikar
Cisco Systems

Email: ketant@cisco.com

