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Distribution of Traffic Engineering Extended Admin Groups using BGP-LS draft-ietf-idr-eag-distribution-14

Abstract

Administrative groups are link attributes (commonly referred to as "colors" or "link colors") advertised by link state protocols (e.g. ISIS or OSPF) and used for traffic engineering. These administrative groups were initially defined as 32 bit masks. As network usage grew, these 32 bit masks were found to constrain traffic engineering.

Therefore, link state protocols (ISIS, OSPF) were expanded to advertise a variable length administrative group. This document defines an extension to BGP-LS for advertisement of extended administrative groups (EAGs) to allow to support a number of administrative groups greater than 32, as defined in [[RFC7308](#)].

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[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 of the originally defined (non-extended) administrative groups 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 an extension to BGP-LS for advertisement of the extended administrative groups.

[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 an extension 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.

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

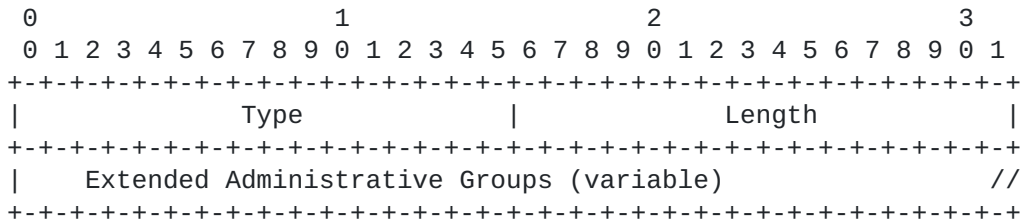


Figure 1: Extended Administrative Groups TLV Format

Where:

- o Type: 1173
- o Length: variable length which represents the total length of the value field. The length value must MUST be multiple of 4. If the length is not a multiple of 4, the TLV must be considered malformed.
- 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 originally defined AG TLV 1108 and the EAG TLV 1173 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], namely - If a node advertises both AG and EAG, then the first 32 bits of the EAG MUST be identical to the advertised AG.

3. IANA Considerations

This document requests assigning a 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] and [I-D.ietf-idr-rfc7752bis].

5. Acknowledgments

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

6. Normative References

[I-D.ietf-idr-rfc7752bis]
Talaulikar, K., "Distribution of Link-State and Traffic Engineering Information Using BGP", [draft-ietf-idr-rfc7752bis-05](#) (work in progress), November 2020.

[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>>.

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