

IDR Working Group  
Internet-Draft  
Intended status: Standards Track  
Expires: March 14, 2019

Z. Wang  
Q. Wu  
Huawei  
J. Tantsura  
Nuage Networks  
September 10, 2018

## **Distribution of MPLS-TE Extended admin Group Using BGP draft-ietf-idr-eag-distribution-07**

### Abstract

As MPLS-TE network grows, administrative Groups advertised as a fixed-length 32-bit Bitmask is quite constraining. "Extended Administrative Group" IGP TE extensions sub-TLV is introduced to provide for additional administrative groups (link colors) beyond the current limit of 32. This document describes extensions to BGP protocol, that can be used to distribute extended administrative groups in MPLS-TE.

### 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 14, 2019.

### Copyright Notice

Copyright (c) 2018 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

<a href="#">1.</a>	<a href="#">Introduction . . . . .</a>	<a href="#">2</a>
<a href="#">2.</a>	<a href="#">Requirements Language . . . . .</a>	<a href="#">2</a>
<a href="#">3.</a>	<a href="#">Carrying Extended Administrative Groups in BGP . . . . .</a>	<a href="#">3</a>
<a href="#">3.1.</a>	<a href="#">AG and EAG coexistence . . . . .</a>	<a href="#">3</a>
<a href="#">3.2.</a>	<a href="#">Desire for unadvertised EAG bits . . . . .</a>	<a href="#">4</a>
<a href="#">4.</a>	<a href="#">Security Considerations . . . . .</a>	<a href="#">4</a>
<a href="#">5.</a>	<a href="#">IANA Considerations . . . . .</a>	<a href="#">4</a>
<a href="#">6.</a>	<a href="#">Acknowledgments . . . . .</a>	<a href="#">4</a>
<a href="#">7.</a>	<a href="#">Normative References . . . . .</a>	<a href="#">4</a>
	<a href="#">Authors' Addresses . . . . .</a>	<a href="#">5</a>

## [1.](#) Introduction

MPLS-TE advertises 32 administrative groups (commonly referred to as "colors" or "link colors") using the Administrative Group sub-TLV of the Link TLV defined in OSPFv2 ([RFC3630](#)), OSPFv3 ([RFC5329](#)) and ISIS ([RFC5305](#)).

As MPLS-TE network grows, administrative Groups advertised as a fixed-length 32-bit Bitmask is quite constraining. "Extended Administrative Group" IGP TE extensions sub-TLV defined in [[RFC7308](#)] is introduced to provide for additional administrative groups (link colors) beyond the current limit of 32.

This document proposes new BGP Link attribute TLVs that can be announced as attribute in the BGP-LS attribute (defined in [I.D-ietf-idr-ls-distribution]) to distribute extended administrative groups in MPLS-TE.

## [2.](#) 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.



### 3. Carrying Extended Administrative Groups in BGP

This document proposes one new BGP link attribute TLVs that can be announced as attribute in the BGP-LS attribute (defined in [I-D.ietf-idr-ls-distribution]) to distribute extended administrative groups. The extensions in this document build on the ones provided in BGP-LS [RFC7752] and BGP-4 [RFC4271].

BGP-LS attribute defined in [RFC7752] has nested TLVs which allow the BGP-LS attribute to be readily extended. Link attribute TLVs defined in [section 3.2.2](#) of [I-D.ietf-idr-ls-distribution] are TLVs that may be encoded in the BGP-LS attribute with a link NLRI. Each 'Link Attribute' is a Type/Length/ Value (TLV) triplet formatted as defined in [Section 3.1](#) of [I-D.ietf-idr-ls-distribution].

This document proposes one new TLV as a link attribute:

Type	Value
TBD1	Extended Administrative Group (EAG)

The EAG TLV is used in addition to the Administrative Groups when a node wants to advertise more than 32 colors for a link. The EAG TLV is optional. The format and semantics of the 'value' fields in EAG TLVs correspond to the format and semantics of value fields in IGP extension sub-TLVs, defined in [RFC7308].

TLV Code Point	Description	IS-IS TLV/Sub-TLV	Defined in:
TBD1	Extended Admininstrative Group	22/14	[RFC7308]

Table 1: 'EAG' Link Attribute TLV

#### 3.1. AG and EAG coexistence

Similar to [section 2.3.1 of \[RFC7308\]](#), if a BGP speaker advertises both AG and EAG then AG and EAG should be dealt with in the same way as AG and EAG carried in the Extended Administrative Group (EAG) sub-TLV [RFC7308] for both OSPF [RFC3630] and ISIS [RFC5305].



### **3.2. Desire for unadvertised EAG bits**

Unlike AGs, EAGs are advertised as any non-zero-length-bit Bitmask. the EAG length may be longer for some links than for others. Similar to [section 2.3.2 of \[RFC7308\]](#), if a BGP peer wants to only use links where the specific bits of an EAG is set to 1 but the specific bits of this EAG is not advertised, then the implementation SHOULD process these desire and unadvertised EAG bits in accordance with rule defined in [section 2.3.2 of \[RFC7308\]](#).

## **4. Security Considerations**

This document does not introduce security issues beyond those discussed in [\[RFC7752\]](#) and [\[RFC4271\]](#).

## **5. IANA Considerations**

This document requests assigning code-points from the registry "BGP-LS Node Descriptor, Link Descriptor, Prefix Descriptor, and Attribute TLVs" for the new Link Attribute TLVs defined in the table above:

## **6. Acknowledgments**

The authors gratefully acknowledge the review made by Eric Osborne.

## **7. Normative References**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", March 1997.
- [RFC3630] Katz, D., Yeung, D., and K. Kompella, "Traffic Engineering (TE) Extensions to OSPF Version 2", [RFC 3630](#), September 2003.
- [RFC4271] Rekhter, Y., "A Border Gateway Protocol 4 (BGP-4)", [RFC 4271](#), January 2006.
- [RFC5305] Li, T. and H. Smit, "IS-IS Extensions for Traffic Engineering", [RFC 5305](#), October 2008.
- [RFC7308] Osborne, E., "Extended Administrative Groups in MPLS-TE", ID [RFC7308](#), July 2014.
- [RFC7752] Gredler, H., "North-Bound Distribution of Link-State and TE Information using BGP", [RFC 7752](#), March 2016.

[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  
Nuage Networks

Email: jefftant.ietf@gmail.com