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## **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.

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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 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.



### 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:

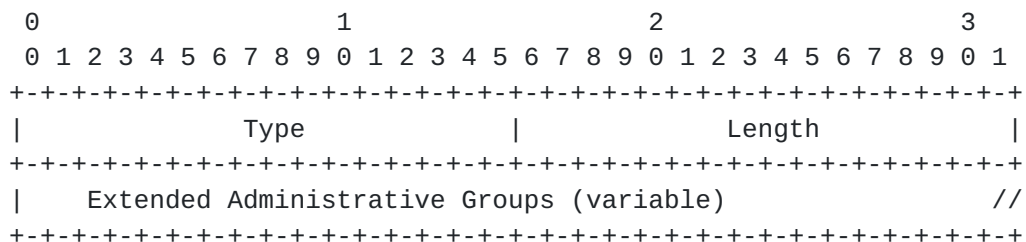


Figure 1: Extended Administrative Groups TLV Format

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

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