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Advertising Per-node Admin Tags in IS-IS
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Abstract

This document describes an extension to IS-IS protocol [[ISO10589](#)], [[RFC1195](#)] to add an optional operational capability, that allows tagging and grouping of the nodes in an IS-IS domain. This allows simple management and easy control over route and path selection, based on local configured policies.

This document describes the protocol extensions to disseminate per-node admin-tags in IS-IS protocols.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

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1. Introduction

This document provides mechanisms to advertise per-node administrative tags in the IS-IS Link State PDU [[RFC1195](#)]. In certain path-selection applications like for example in traffic-engineering or LFA [[RFC5286](#)] selection there is a need to tag the nodes based on their roles in the network and have policies to prefer or prune a certain group of nodes.

2. Administrative Tag

For the purpose of advertising per-node administrative tags within IS-IS, a new sub-TLV to the IS-IS Router Capability TLV-242 that is defined in [[RFC4971](#)] is proposed. Because path selection is a functional set which applies both to TE and non-TE applications the same has not added as a new sub-TLV in the Traffic Engineering TLVs [[RFC5305](#)].

An administrative Tag is a 32-bit integer value that can be used to identify a group of nodes in the IS-IS domain. The new sub-TLV specifies one or more administrative tag values. An IS-IS node advertises the set of groups it is part of in the specific IS-IS level. As an example, all PE-nodes may be configured with certain tag value, whereas all P-nodes are configured with a different tag value in.

The new sub-TLV defined will be carried inside the IS-IS Router Capability TLV-242 (defined in [[RFC4971](#)]) in the Link State PDUs originated by the router. Link State PDUs [[ISO10589](#)] has level-wise (i.e. L1 or L2) flooding scope. Choosing the flooding scope to flood the group tags are defined by the policies and is a local matter. Once a group tag is decided in a specific level the same will be inserted in the administrative tag sub-TLV in the Link State PDU for the same level. Implementations should allow configuring both a 'global' and 'per-level' admin tag. In the absence of a specific admin tag configuration for a specific level the global admin tag should be copied in to the LSP PDU for the same level.

3. TLV format

3.1. Per-node Admin Tag sub-TLV

The new Administrative Tag sub-TLV, like other ISIS Capability sub-TLVs, is formatted as Type/Length/Value (TLV) triplets. Figure 1 below shows the format of the new sub-TLV.


```

      0               1               2               3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Type   |   Length   |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                                     Administrative Tag #1                                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                                     Administrative Tag #2                                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
//                                                                 //
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                                     Administrative Tag #N                                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type : TBA

Length: A 8-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 tags advertised.

Value: A sequence of multiple 4 octets defining the administrative tags.

Figure 1: IS-IS per-node Administrative Tag sub-TLV

The 'Per-node Admin Tag' sub-TLV may be generated more than once by an originating router. This MAY happen if a node carries more than 63 per-node admin groups and a single sub-TLV does not provide sufficient space. As such occurrence of the 'Per-node Admin Tag' sub-TLV does not cancel previous announcements, but rather is cumulative.

3.2. Ordering of tags

The semantics of the tag order are implementation-dependent. There is no implied meaning to the ordering of the tags that indicates a certain operation or set of operations that need to be performed based on the ordering.

Each tag SHOULD be treated as an independent identifier that MAY be used in policy to perform a policy action. Whether or not tag A precedes or succeeds tag B SHOULD not change the meaning of the tag set.

4. Applications

Increased deployment of Loop Free Alternates (LFA) [[RFC5286](#)] has

exposed some limitations. A recent draft on Operation management of Loop Free Alternates [[I-D.ietf-rtgwg-lfa-manageability](#)] proposes refinements to address those limitations. One of the proposed refinements is to be able to group the nodes in IGP domain with administrative tags and engineer the alternate paths based on configured policies.

The proposal in this document helps provide the capability to advertise group tags within IS-IS protocol and perform policy based LFA selection. The policies configured on each node can then make use of these tags to prefer or prune LFAs via certain group of nodes.

5. Security Considerations

This document does not introduce any further security issues other than those discussed in [[IS010589](#)] and [[RFC1195](#)].

6. IANA Considerations

IANA maintains the registry for the Router Capability sub-TLVs. IS-IS Administrative Tags will require one new type code for the sub-TLV defined in this document.

7. Acknowledgments

8. References

8.1. Normative References

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8.2. Informative References

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