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Auto-Configuration in Virtual Aggregation
draft-ietf-grow-va-auto-03.txt

Abstract

Virtual Aggregation as specified in [I-D.ietf-grow-va] requires
configuration of a static "VP-List" on all routers. The VP-List allows
routers to know which prefixes may or may not be FIB-installed. This
draft specified an optional method of determining this that requires
far less configuration. Specifically, it requires the configuration of
a "VP-Range" in ASBRs connected to transit and peer ISPs. An Extended
Communities Attribute is used to convey to other routers that a given
route can be FIB-suppressed. This draft has no changes from the 02
draft.

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Table of Contents

1. Introduction

As the current VA specification stands ([I-D.ietf-grow-va]), routers have to know which prefixes they must FIB-install and and which they need not FIB-install. The VP-List tells them this: they must FIB-install routes to Virtual Prefixes (VP), and they need not FIB-install routes to prefixes that fall within VPs for which they are not an Aggregation Point Router (APR). The same VP-List must be installed in every router.
This draft specifies an optional alternative to the VP-List that requires far less configuration. Specifically, a list of one or more "VP-Ranges" is configured in ASBRs --- typically ASBRs that do not connect to customer networks. These ASBRs then simply tag routes as to whether the route can be suppressed. This is simpler than the current configured VP-List approach in two regards. First, fewer routers need to be configured. Second, the VP-Range is simpler than the VP-List. In most cases, once an ISP is past its initial VA roll-out phase, the VP-Range consists of a single 0/0 entry.
This draft uses terms defined in [I-D.ietf-grow-va].

1.1. Requirements notation

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 [RFC2119].

2. Specification

With the "VP-Range" approach to determining suppressability, certain ASBRs are designated as "tagging routers". Tagging routers explicitly tag routes with an Extended Communities Attribute that indicates whether the route can be FIB-suppressed. All ASBRs that connect to one or more transit provider ISPs MUST be tagging routers. ASBRs that connect to one or more peer ISPs SHOULD be tagging routers. ASBRs that connect to customer networks SHOULD NOT be tagging routers.

Tagging routers are configured with a "VP-Range" list. This consists of the ranges of IP address that are collectively covered by all VPs in the AS. In a mature deployment of VA, the range would amount to all IP addresses, in which case the VP-Range is simply 0/0. Early in VA deployment, when an ISP is still in the testing or roll-out phase, the VP-Range may consist of multiple entries.

Tagging routers SHOULD tag any route whose prefix falls within the VP-Range with a "can-suppress" tag, with the following exceptions:

The can-suppress tag itself is an Extended Communities Attribute [RFC4360] to be assigned by IANA. The Transitive Bit MUST be set to value 1 (the community is non-transitive across ASes).

Routers install or suppress FIB entries according to the following rules. Note that tagging routers conceptually follow these rules after tagging (or not tagging) the route. Note also that these rules apply only to the route used by the router as the best route. In other words, if a router receives two routes for the same prefix, and one route is tagged can-suppress and the other is not, the router follows these rules only with respect to the route that it selects as the best route.

3. IANA Considerations

IANA must assign type values for the Extended Communities Attributes that convey the tags.

4. Security Considerations

As of this writing, there are no known new security threats introduced by this draft.

5. References

5.1. Normative References

[RFC2119]	Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
[I-D.ietf-grow-va]	Francis, P, Xu, X, Ballani, H, Jen, D, Raszuk, R and L Zhang, "FIB Suppression with Virtual Aggregation", Internet-Draft draft-ietf-grow-va-01, Oct 2009.
[RFC4360]	Sangli, S., Tappan, D. and Y. Rekhter, "BGP Extended Communities Attribute", RFC 4360, February 2006.

5.2. Informative References

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