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BGP Prefix Origin Validation State Extended Community
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Abstract

As part of the origination AS validation process, it can be desirable to automatically consider the validation state of routes in the BGP decision process. The purpose of this document is to provide a specification for doing so. The document also defines a new BGP opaque extended community to carry the validation state inside an autonomous system to influence the decision process of the IBGP speakers.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

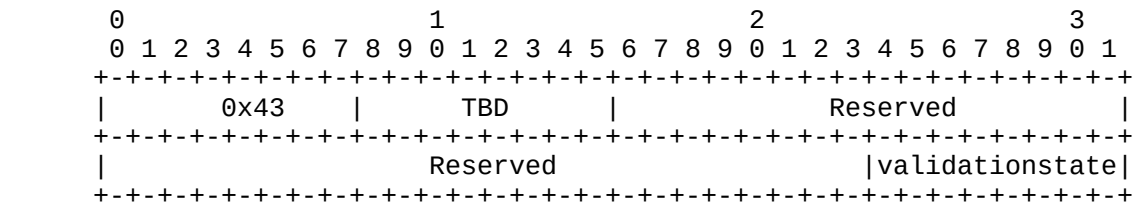
As part of the origination AS validation process, it can be desirable to automatically consider the validation state of routes in the BGP decision process. The purpose of this document is to provide a specification for doing so. The document defines a new BGP opaque extended community to carry the validation state inside an autonomous system to influence the decision process of the IBGP speakers.

1.1. 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].

2. Origin Validation State Extended Community

The origin validation state extended community is an opaque extended community [RFC4360] with the following encoding:



The value of the high-order octet of the extended Type Field is 0x43, which indicates it is non-transitive. The value of the low-order octet of the extended type field for this community is TBD. The last octet of the extended community encodes the route's validation state[RFC6811]. It can assume the following values:

Value	Meaning
0	Lookup result = "valid"
1	Lookup result = "not found"
2	Lookup result = "invalid"

If the router is configured to support the extensions defined in this draft, it SHOULD attach the origin validation state extended community to BGP UPDATE messages sent to IBGP peers by mapping the computed validation state in the last octet of the extended community. Similarly on the receiving IBGP speakers, the validation state of an IBGP route SHOULD be derived directly from the last octet of the extended community, if present.

3. Changes to the BGP Decision Process

If a BGP router supports prefix origin validation and is configured for the extensions defined in this document, the validation step SHOULD be performed prior to any of the steps defined in the decision process of [RFC4271]. The validation step is stated as follows:

> When comparing a pair of routes for a BGP destination, the route with the lowest "validation state" value is preferred.

In all other respects, the decision process remains unchanged.

3.1. Policy Control

It MUST be possible to enable or disable the validation step as defined in Section 3 through configuration. The default SHOULD be for the validation step to be disabled.

4. Deployment Considerations

In deployment scenarios where not all the speakers in an autonomous system are upgraded to support the extensions defined in this document, it is necessary to define policies that match on the origin validation extended community and set another BGP attribute [RFC6811] that influences the best path selection the same way as what would have been enabled by an implementation of this extension.

5. Acknowledgements

The authors would like to acknowledge the valuable review and suggestions from Wesley George and Roque Gagliano on this document.

6. IANA Considerations

IANA shall assign a new value from the "BGP Opaque Extended Community" type registry from the non-transitive range, to be called "BGP Origin Validation State Extended Community".

7. Security Considerations

This document introduces no new security concerns beyond what is described in [RFC6811].

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", RFC 4271, January 2006.

[RFC4360] Sangli, S., Tappan, D., and Y. Rekhter, "BGP Extended Communities Attribute", RFC 4360, February 2006.

8.2. Informational References

[RFC6480] Lepinski, M. and S. Kent, "An Infrastructure to Support Secure Internet Routing", RFC 6480, February 2012.

[RFC6482] Lepinski, M., Kent, S., and D. Kong, "A Profile for Route Origin Authorizations (ROAs)", RFC 6482, February 2012.

[RFC6811] Mohapatra, P., Scudder, J., Ward, D., Bush, R., and R. Austein, "BGP Prefix Origin Validation", RFC 6811, January 2013.

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