Internet Engineering Task Force J. Scudder
Internet-Draft K. Kompella
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Deprecation of BGP Entropy Label Capability Attribute
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Abstract

RFC 6790 defines the BGP Entropy Label Capability attribute. Regrettably, it has a bug: although RFC 6790 mandates that Entropy Label-incapable routers must remove the attribute, in practice this requirement can't be guaranteed to be fulfilled. This specification deprecates the attribute. A forthcoming document will propose a replacement.

Status of This Memo

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1. Introduction

[RFC6790] defines the Entropy Label Capability attribute (ELCA), an optional, transitive BGP path attribute. For correct operation, it is necessary that an intermediate node modifying the next hop of a route must remove the ELCA unless the node so doing is able to process entropy labels. Sadly, this requirement cannot be fulfilled with the ELCA as specified, because it is an optional, transitive attribute: by definition, a node that does not support the ELCA will propagate the attribute. (This is a general property of optional, transitive attributes, see [RFC4271].) But such an ELCA-oblivious node is likely to also be entropy label-incapable and is exactly the one that we desire to remove the attribute!

This specification updates RFC 6790 by deprecating the version of ELCA defined in Section 5.2 of that document. A forthcoming document will propose a replacement.

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. IANA Considerations

For the reasons given in Section 1, IANA is requested to mark attribute 28 in the "BGP Path Attributes" registry as "deprecated", reference this RFC.

3. Security Considerations

ELCA as defined in [RFC6790] S. 5.2, has in common with other optional, transitive path attributes the property that it will be "tunneled" through intervening routers that don't implement the relevant specification. Unfortunately, as discussed elsewhere in this document, implementations of [RFC6790] S. 5.2 receiving such "tunneled" attributes could -- sometimes improperly -- rely on them. The consequence of so doing could be a black hole in the forwarding path for the affected routes. Whether this is a new security issue or not is somewhat debatable, since to be exploited an attacker would have to be part of the control plane path for the route in question, and under those circumstances an attacker already has a panoply of mischief-making tools available, as discussed in [RFC4272].

In any case, this document renders any real or imagined security issues with ELCA moot, by deprecating it.

4. Acknowledgements

Thanks to Alia Atlas, Bruno Decraene, Martin Djernaes, John Drake, Adrian Farrell, Keyur Patel, Ravi Singh and Kevin Wang for their discussion of this issue.

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.

[RFC6790] Kompella, K., Drake, J., Amante, S., Henderickx, W., and L. Yong, "The Use of Entropy Labels in MPLS Forwarding", RFC 6790, November 2012.

5.2. Informative References

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

[RFC4272] Murphy, S., "BGP Security Vulnerabilities Analysis", RFC 4272, January 2006.

Authors' Addresses

John G. Scudder
Juniper Networks

Email: jgs@juniper.net

Kireeti Kompella
Juniper Networks

Email: kireeti@juniper.net