

BGP Route Oscillation Reduction with Confederation

[draft-chen-confed-oscillation-reduce-01.txt](#)

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2. Abstract

This document proposes a simple revision to Confederation that allows a BGP speaker in a Confederation to send a route advertisement (instead of a route withdraw) in certain cases. The route advertisement helps narrow the gap between Confederation and IBGP full-mesh in terms of routing information. It has been shown that the proposed mechanism helps achieve stable route selection and eliminate a number of persistent route oscillations involving Confederation.

3. Introduction

As documented in [1], the routing information reduction by BGP Confederation [2] can result in persistent route oscillations with certain routing setup and network topologies.

This document proposes a simple revision to Confederation that allows a BGP speaker in a Confederation to send a route advertisement (instead of a route withdraw) in certain cases. The route advertisement helps narrow the gap between Confederation and IBGP full-mesh in terms of routing information. It has been shown that the proposed mechanism helps achieve stable route selection and eliminate a number of persistent route oscillations involving Confederation.

The proposed mechanisms work within the current BGP protocol [4] that limits route advertisement to only one path per prefix. In addition, only the Confederation Sub-AS Border Routers need to be upgraded. One can upgrade one router at a time when required, and then immediately benefit from the route oscillation reduction or elimination.

4. Modification to Confederation

Currently a BGP speaker in a Confederation [3] follows the basic BGP principle that only the best path is advertised to a BGP peer. Therefore when the overall best path for a speaker is from a peer in a neighboring AS of the same Confederation, none of the paths from peers in the same AS would be advertised by the speaker to a peer in a neighboring AS of the same Confederation, and be considered in route selection. Similarly when the overall best path for a speaker is from a peer in the same AS, none of paths from peers in a neighboring AS of the same Confederation would be advertised by the speaker to a peer in the same AS, and be considered in route selection.

In order to increase the routing information advertised in a Confederation, the following modification is proposed:

In addition to calculating the overall best path among all the received paths, a BGP speaker in a Confederation may calculate a best path ("I-BEST") among all the paths received from peers within the same AS. It may also calculate a best path ("E-BEST") among all the paths received from peers in neighboring ASs of the same Confederation.

When the E-BEST for a speaker exists, and the I-BEST is the overall best path for the speaker, the speaker may advertise the E-BEST to a peer in the same AS of the Confederation. When the

E-BEST becomes non-existence, or when it should no longer be advertised, a replacement path or route withdraw must be sent to a peer in the same AS if an E-BEST was advertised to the peer previously.

Consider the case in which a BGP speaker in a Confederation maintains BGP sessions with remote speakers in neighboring ASs of the Confederation, and all the remote speakers maintain direct BGP sessions among them. In this case the speaker does not need to advertise routes learned from one such a remote peer to another. When the I-BEST for the speaker exists, and the E-BEST is the overall best path for the speaker, the speaker may advertise the I-BEST to peers in neighboring ASs of the Confederation. When the I-BEST becomes non-existence, or when it should no longer be advertised, a replacement path or route withdraw must be sent to a peer in a neighboring AS of the Confederation if an I-BEST was advertised to the peer previously.

It is noted that the advertisement of I-BEST (or E-BEST) is not useful and should not be sent when the overall best path wins over the I-BEST (or E-BEST) prior to (and including) the step of MED comparison in the route selection procedure [3, Sect. 9.1].

This modification allows additional routing information to be advertised, and be available in route selection.

5. Remarks

The proposed mechanism alleviates to some degree, but does not fully resolve the concern of routing information reduction by Confederation. It is possible that the proposed mechanism may not be adequate for certain persistent route oscillation cases in which the advertisement of multiple paths for a prefix (as proposed in [4]) may be required for their resolution.

It should be noted that compared to the existing mechanism of Confederation, the proposed revision may cause memory usage in a network to increase due to the advertisement of additional routing information.

6. Intellectual Property Considerations

Redback Networks, Inc. may seek patent protection on some of the technology described in this Internet Draft. If technology in this document is adopted as a standard, Redback Networks agrees to license, on reasonable and non-discriminatory terms, any patent rights it obtains covering such technology to the extent necessary to comply with the standard.

7. Security Considerations

This document introduces no new security concerns to BGP or other specifications referenced in this document.

8. Acknowledgments

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9. References

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