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BGP Shortest Path Routing Extension Implementation Report
draft-psarkar-lsvr-bgp-spf-impl-00

Abstract

This document is an implementation report for the Shortest Path Routing Extensions to BGP protocol as defined in [I-D.ietf-lsvr-bgp-spf]. The authors did not verify the accuracy of the information provided by respondents. The respondents are experts with the implementations they reported on, and their responses are considered authoritative for the implementations for which their responses represent. The respondents were asked to only use the "YES" answer if the feature had at least been tested in the lab.

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].

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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This Internet-Draft will expire on December 4, 2020.

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1. Introduction

[I-D.ietf-lsvr-bgp-spf] describes an alternative solution which leverages BGP-LS [RFC7752] and the Shortest Path First algorithm similar to Internal Gateway Protocols (IGPs) such as OSPF [RFC2328]. The solution introduces an new BGP-LS-SPF AFI-SAFI and replaces the Phase 1 and 2 decision functions of the Decision Process specifed by [RFC4271] with the Shortest Path First (SPF) algorithm also known as the Dijkstra algorithm. This solution avails the benefits of both BGP and SPF-based IGPs that include TCP based flow-control, no periodic link-state refresh, and completely incremental NLRI advertisements. These advantages can reduce the overhead in MSDCs where there is a high degree of Equal Cost Multi- Path (ECMPs) and the topology is very stable. Additionally, using an SPF-based computation can support fast convergence and the computation of Loop-Free Alternatives (LFAs) [RFC5286] in the event of link failures.

This document provides an implementation report of the Shortest Path Routing extensions to BGP protocol as specified in [I-D.ietf-lsvr-bgp-spf].

The authors did not verify the accuracy of the information provided by respondents or by any alternative means. The respondents are experts with the implementations they reported on, and their responses are considered authoritative for the implementations for which their responses represent. Respondents were asked to only use the "YES" answer if the feature had at least been tested in the lab.

2. Implementation Forms

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Release: ArcOS
Protocol Role: Route Reflector and Client

FRR
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Protocol Role: Route Reflector

Figure 1

3. BGP-LS-SPF Peering Models

Does the implementation support the following BGP-LS-SPF Peering Models as specified in Section 2 of [I-D.ietf-lsvr-bgp-spf]?

o 2.1 -- BGP Single-Hop Peering on Network Node Connections

- 2.2 -- BGP Peering Between Directly Connected Network Nodes
- 2.3 -- BGP Peering in Route-Reflector or Controller Topology

Reelease	2.1	2.2	2.3
ArcOS	Yes	Yes	Yes (Route Reflector only)
FRR	Yes	Yes	Yes

Table 1: Peering Model Support

4. Extensions to BGP-LS

Does the implementation support the following BGP-LS-SPF TLVs as described in Section 4 and sub-sections of [I-D.ietf-lsvr-bgp-spf]??

- T1 -- Node NLRI Attribute SPF Capability TLV
- T2 -- Node/Link/Prefix NLRI Attribute SPF Status TLV
- T3 -- Link NLRI Attribute IPv4 Prefix-Length TLV
- T4 -- Link NLRI Attribute IPv6 Prefix-Length TLV
- T5 -- Attribute Sequence-Number TLV

Release	Send / Recv	T1	T2	T3	T4	T5
ArcOS	Send	Yes	Yes	Yes	Yes	Yes
	Recv	Yes	Yes	Yes	Yes	Yes
FRR	Send	Yes	Yes	Yes	Yes	Yes
	Recv	Yes	Yes	Yes	Yes	Yes

Table 2: BGP-LS Extension TLVs Support

5. Support for Simplified Decision Process

Does the implementation support the following Best Path Decision processes as described in Section 5 and sub-sections of [I-D.ietf-lsvr-bgp-spf]?

- P1 -- Phase-1 BGP NLRI Selection
- P2 -- Dual Stack Support

o P3 -- SPF Calculation based on BGP-LS NLRI

Release	P1	P2	P3
ArcOS	Yes	Yes	Yes
TBA	---	---	---

Table 3: Decision Process Support

6. Acknowledgements

TBA

7. IANA Considerations

N/A. - No protocol changes are proposed in this document.

8. Security Considerations

This document does not introduce any change in any of the protocol specifications.

9. References

9.1. Normative References

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[RFC7752] Gredler, H., Ed., Medved, J., Previdi, S., Farrel, A., and S. Ray, "North-Bound Distribution of Link-State and Traffic Engineering (TE) Information Using BGP", RFC 7752, DOI 10.17487/RFC7752, March 2016, <https://www.rfc-editor.org/info/rfc7752>.

9.2. Informative References

[I-D.ietf-lsvr-bgp-spf] Patel, K., Lindem, A., Zandi, S., and W. Henderickx, "Shortest Path Routing Extensions for BGP Protocol", draft-ietf-lsvr-bgp-spf-08 (work in progress), March 2020.

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