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OSPF Prefix/Link Attributes Extension Implementation Report  
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## Abstract

This document reports the results of the OSPFv2 Prefix/Link Attributes implementation survey. The survey has seven questions related to the implementer's support of OSPFv2 Prefix/Link Attributes. After a brief summary of the results, each response is listed. This document contains responses from six implementers who completed the survey. No external means were used to verify the accuracy of the information submitted by the respondents. The respondents are considered experts on the products they reported on. Additionally, responses were omitted from implementers who indicated that they have not implemented the function yet.

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## [1.](#) Introduction

This document reports the results of the OSPFv2 Prefix/Link Attributes [[PREFIX-LINK-ATTR](#)] implementation survey. The survey has seven questions related to the implementer's support of OSPFv2 Prefix/Link Attributes. The OSPFv2 Prefix/Link Attributes are extensions to the base OSPFv2 protocol [[OSPFV2](#)] to allow additional

information to be associated with an OSPFv2 link or attribute. After a brief summary of the results, each response is listed. This document contains responses from four implementers who completed the survey. No external means were used to verify the accuracy of the information submitted by the respondents. The respondents are

considered experts on the products they reported on. Additionally, responses were omitted from implementers who indicated that they have not implemented the function yet.

### [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 [[RFC-KEYWORDS](#)].

## [2](#). Summary Results of Survey

Four vendors replied to the survey. These include Alcatel-Lucent, Cisco, Huawei, Juniper. Cisco and Alcatel-Lucent also did interoperability testing. The Cisco and Alcatel-Lucent implementations are in released software versions. The Huawei and Junipers implementation releases are pending. For prefix attributes, the recent change incorporating the A-Flag is pending implementation for all four vendors. Implementation of the N-flag is pending for the Huawei and Juniper implementations. Otherwise, the vendors have full implementations of [[PREFIX-LINK-ATTR](#)]. For all four vendors, segment routing [[SEGMENT-ROUTING](#)] was an application making use of the extensions. Additionally, Cisco has implemented Topology-Independent Loop-Free Alternatives (TI-LFA) [[TI-LFA](#)] and Bit Indexed Egress Replication (BIER) advertisement [[BIER](#)].

## [3](#). Implementation Survey Results

### [3.1](#). Alcatel-Lucent

The Alcatel-Lucent responses to the survey questions are as follows:

1. Have you implemented the OSPFv2 Prefix/Link Attributes Draft?  
Yes

2. Have you implemented the OSPFv2 Extended Prefix opaque LSA and OSPFv2 Extended Prefix TLV? Yes
3. If yes for #3, have you implemented the A and N flags which have been moved from the segment routing extensions? Yes for N-flag, A-flag not yet.
4. Have you implemented the OSPFv2 Extended Link opaque LSA and OSPFv2 Extended Link TLV? Yes

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5. In your implementation, what applications utilize the OSPFv2 Extended Prefix/Link attributes (e.g., segment routing)? Segment Routing
6. Is the function in a generally available software release? Yes - Product Name: SR OS, Release: 13.0.R4
7. Have you tested interoperability with any other vendors? If yes, with whom? Yes. With Cisco.
8. Would you be amenable to your data being included in an implementation survey document (complete with vendor identification)? Yes

### [3.2.](#) Cisco

The Cisco responses to the survey questions are as follows:

1. Have you implemented the OSPFv2 Prefix/Link Attributes Draft? Yes
2. Have you implemented the OSPFv2 Extended Prefix opaque LSA and OSPFv2 Extended Prefix TLV? Yes
3. If yes for #3, have you implemented the A and N flags which have been moved from the segment routing extensions? Yes for N-flag, A-flag not yet.

4. Have you implemented the OSPFv2 Extended Link opaque LSA and OSPFv2 Extended Link TLV? Yes
5. In your implementation, what applications utilize the OSPFv2 Extended Prefix/Link attributes (e.g., segment routing)? Segment Routing, Topology-Independent Loop-Free-Alternatives (TI-LFA), and OSPF Bit Index Egress Replication (BIER) extensions
6. Is the function in a generally available software release? Segment Routing and TI-LFA are available in IOS-XR 5.3.2. OSPF BIER Extensions are not available yet.
7. Have you tested interoperability with any other vendors? If yes, with whom? Yes. With Alcatel-Lucent.
8. Would you be amenable to your data being included in an implementation survey document (complete with vendor identification)? Yes

### [3.3.](#) Huawei

The Huawei responses to the survey questions are as follows:

1. Have you implemented the OSPFv2 Prefix/Link Attributes Draft? Yes
2. Have you implemented the OSPFv2 Extended Prefix opaque LSA and OSPFv2 Extended Prefix TLV? Yes
3. If yes for #3, have you implemented the A and N flags which have been moved from the segment routing extensions? Not yet.
4. Have you implemented the OSPFv2 Extended Link opaque LSA and OSPFv2 Extended Link TLV? Yes
5. In your implementation, what applications utilize the OSPFv2 Extended Prefix/Link attributes (e.g., segment routing)? Segment Routing
6. Is the function in a generally available software release? Not

yet. It will be in Huawei Versatile Routing Platform (VRP)

7. Have you tested interoperability with any other vendors? No
8. Would you be amenable to your data being included in an implementation survey document (complete with vendor identification)? Yes

#### [3.4.](#) Juniper

The Juniper responses to the survey questions are as follows:

1. Have you implemented the OSPFv2 Prefix/Link Attributes Draft? Yes
2. Have you implemented the OSPFv2 Extended Prefix opaque LSA and OSPFv2 Extended Prefix TLV? Yes
3. If yes for #3, have you implemented the A and N flags which have been moved from the segment routing extensions? Not yet.
4. Have you implemented the OSPFv2 Extended Link opaque LSA and OSPFv2 Extended Link TLV? Yes

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5. In your implementation, what applications utilize the OSPFv2 Extended Prefix/Link attributes (e.g., segment routing)? Segment Routing
6. Is the function in a generally available software release? Not yet. It will be in Juniper Network Operating System (JUNOS).
7. Have you tested interoperability with any other vendors? No
8. Would you be amenable to your data being included in an implementation survey document (complete with vendor identification)? Yes

#### [4.](#) Security Considerations

This document reports the results of an OSPFv2 Prefix/Link Attributes implementation survey. As such, it does not introduce any security risks.

## 5. IANA Considerations

No IANA actions are required.

## 6. References

### 6.1. Normative References

[OSPFV2] Moy, J., "OSPF Version 2", [RFC 2328](#), April 1998.

[PREFIX-LINK-ATTR]

Psenak, P., Gredler, H., Shakir, R., Henderickx, W., Tantsura, J., and A. Lindem, "OSPFv2 Prefix/Link Attribute Advertisement", [draft-ietf-ospf-prefix-link-04.txt](#) (work in progress), April 2015.

[RFC-KEYWORDS]

Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), March 1997.

### 6.2. Informative References

[BIER]

Psenak, P., Kumar, N., Wijnands, I., Dolganow, A., Przygienda, T., Zhang, J., and S. Aldrin, "OSPF Extensions for BIER", [draft-ietf-bier-ospf-bier-extensions-00.txt](#) (work in progress), April 2015.

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[SEGMENT-ROUTING]

Psenak, P., Previdi, S., Filsfils, C., Gredler, H., Shakir, R., Henderickx, W., and J. Tantsura, "OSPF Extensions for Segment Routing", [draft-ietf-ospf-segment-routing-extensions-04.txt](#) (work in progress), February 2015.

[TI-LFA]

Francois, P., Filsfils, C., Bashandy, A., Decraene, B.,

and S. Litkowski, "Topology Independent Fast Reroute using Segment Routing", [draft-francois-spring-segment-routing-ti-lfa-01.txt](#) (work in progress), October 2014.

#### [Appendix A](#). Acknowledgments

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