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BGP Link-State Information Distribution Implementation Report  
draft-ietf-idr-ls-distribution-impl-01

## Abstract

This document is an implementation report for the BGP Link-State Information Distribution protocol as defined in [[I-D.ietf-idr-ls-distribution](#)]. The editors 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. Respondents were asked to only use the YES answer if the feature had at least been tested in the lab.

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## [1.](#) Introduction

In order to share network link-state and traffic engineering information collected with external components using the BGP routing protocol a new BGP Network Layer Reachability Information (NLRI) encoding format is required.

This document provides an implementation report for the BGP Link-State Information Distribution NLRI Format as defined in [[I-D.ietf-idr-ls-distribution](#)].

The scope of the interoperability test is successful encoding and decoding of BGP-LS advertisements. No application specific logic has been verified.

The editors 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

Contact and implementation information for person filling out this form:

### IOS-XR

Name: Manish Bhardwaj  
Email: manbhard@cisco.com  
Vendor: Cisco Systems, Inc.  
Release: IOS-XR  
Protocol Role: Sender, Receiver, Originator

### JUNOS

Name: Balaji Rajagopalan  
Email: balajir@juniper.net  
Vendor: Juniper Networks, Inc.  
Release: JUNOS  
Protocol Role: Sender, Receiver, Originator

### OpenDaylight

Name: Dana Kutenicsova  
Email: dkutenic@cisco.com  
Vendor: OpenDaylight Project, Inc.  
Release: ODL Hydrogen  
Protocol Role: Receiver

## [3.](#) NLRI subtypes

Does the implementation support the Network Layer Reachability (NLRI) subtypes as described in Section 3.2 of [\[I-D.ietf-idr-ls-distribution\]](#) ?

N1: Node NLRI

N2: Link NLRI

N3: IPv4 Topology Prefix NLRI

N4: IPv6 Topology Prefix NLRI

	IOS-XR	JUNOS	ODL
Rcv.N1	YES	YES	YES
Snd.N1	YES	YES	NO
Org.N1	YES	YES	NO
Rcv.N2	YES	YES	YES
Snd.N2	YES	YES	NO
Org.N2	YES	YES	NO
Rcv.N3	YES	YES	YES
Snd.N3	YES	YES	NO
Org.N3	YES	NO	NO
Rcv.N4	YES	YES	YES
Snd.N4	YES	YES	NO
Org.N4	YES	NO	NO

#### 4. Link NLRI TLV support

Does the implementation support the TLVs described in Section 7 of [\[I-D.ietf-idr-ls-distribution\]](#) ?

TLV 256: Local Node Descriptor

TLV 257: Remote Node Descriptor

TLV 258: Link Local/Remote Identifier

TLV 259: IPv4 Interface address

TLV 260: IPv4 Neighbor address  
TLV 261: IPv6 Interface address  
TLV 262: IPv6 Neighbor address  
TLV 263: Multi-Topology IDs  
TLV 512: Autonomous System  
TLV 513: BGP-LS Identifier  
TLV 514: Area ID  
TLV 515: IGP Router ID  
TLV 1028: IPv4 router-ID of Local Node

TLV 1029: IPv6 router-ID of Local Node  
TLV 1030: IPv4 router-ID of Remote Node  
TLV 1031: IPv6 router-ID of Remote Node  
TLV 1088: Administrative group (color)  
TLV 1089: Maximum link bandwidth  
TLV 1090: Maximum reservable link bandwidth  
TLV 1091: Unreserved link bandwidth  
TLV 1092: TE default Metric  
TLV 1093: Link Protection Type  
TLV 1094: MPLS Protocol Mask  
TLV 1095: IGP Metric

TLV 1096: Shared Risk Link Group

TLV 1097: Opaque Link attribute

TLV 1098: Link name attribute

		IOS-XR	JUNOS	ODL
Rcv.TLV	256	YES	YES	YES
Snd.TLV	256	YES	YES	NO
Org.TLV	256	YES	YES	NO
Rcv.TLV	257	YES	YES	YES
Snd.TLV	257	YES	YES	NO
Org.TLV	257	YES	YES	NO
Rcv.TLV	258	YES	YES	YES
Snd.TLV	258	YES	YES	NO
Org.TLV	258	YES	YES	NO
Rcv.TLV	259	YES	YES	YES
Snd.TLV	259	YES	YES	NO
Org.TLV	259	YES	YES	NO
Rcv.TLV	260	YES	YES	YES
Snd.TLV	260	YES	YES	NO
Org.TLV	260	YES	YES	NO
Rcv.TLV	261	YES	YES	YES
Snd.TLV	261	YES	YES	NO

Org.TLV	261	NO	NO	NO
Rcv.TLV	262	YES	YES	YES
Snd.TLV	262	YES	YES	NO
Org.TLV	262	NO	NO	NO
Rcv.TLV	263	YES	YES	YES
Snd.TLV	263	YES	YES	NO
Org.TLV	263	YES	NO	NO
Rcv.TLV	512	YES	YES	YES
Snd.TLV	512	YES	YES	NO
Org.TLV	512	YES	YES	NO
Rcv.TLV	513	YES	YES	YES
Snd.TLV	513	YES	YES	NO
Org.TLV	513	YES	YES	NO
Rcv.TLV	514	YES	YES	YES
Snd.TLV	514	YES	YES	NO

Org.TLV	514	YES	YES	NO
Rcv.TLV	515	YES	YES	YES
Snd.TLV	515	YES	YES	NO
Org.TLV	515	YES	YES	NO
Rcv.TLV	1028	YES	YES	YES
Snd.TLV	1028	YES	YES	NO
Org.TLV	1028	YES	YES	NO
Rcv.TLV	1029	YES	YES	YES
Snd.TLV	1029	YES	YES	NO
Org.TLV	1029	YES	NO	NO
Rcv.TLV	1030	YES	YES	YES
Snd.TLV	1030	YES	YES	NO
Org.TLV	1030	YES	YES	NO
Rcv.TLV	1031	YES	YES	YES
Snd.TLV	1031	YES	YES	NO
Org.TLV	1031	YES	NO	NO
Rcv.TLV	1088	YES	YES	YES
Snd.TLV	1088	YES	YES	NO
Org.TLV	1088	YES	YES	NO
Rcv.TLV	1089	YES	YES	YES
Snd.TLV	1089	YES	YES	NO
Org.TLV	1089	YES	YES	NO
Rcv.TLV	1090	YES	YES	YES
Snd.TLV	1090	YES	YES	NO
Org.TLV	1090	YES	YES	NO
Rcv.TLV	1091	YES	YES	YES
Snd.TLV	1091	YES	YES	NO
Org.TLV	1091	YES	YES	NO
Rcv.TLV	1092	YES	YES	YES
Snd.TLV	1092	YES	YES	NO
Org.TLV	1092	YES	YES	NO
Rcv.TLV	1093	YES	YES	YES
Snd.TLV	1093	YES	YES	NO

Org.TLV	1093	NO	NO	NO
Rcv.TLV	1094	YES	YES	YES
Snd.TLV	1094	YES	YES	NO
Org.TLV	1094	YES	NO	NO
Rcv.TLV	1095	YES	YES	YES
Snd.TLV	1095	YES	YES	NO
Org.TLV	1095	YES	YES	NO
Rcv.TLV	1096	YES	YES	YES

Snd.TLV	1096	YES	YES	NO
Org.TLV	1096	YES	YES	NO
Rcv.TLV	1097	YES	YES	NO
Snd.TLV	1097	YES	YES	NO
Org.TLV	1097	YES	NO	NO
Rcv.TLV	1098	YES	YES	YES
Snd.TLV	1098	YES	YES	NO
Org.TLV	1098	NO	NO	NO

## 5. Node NLRI TLV support

Does the implementation support the TLVs described in Section 7 of [\[I-D.ietf-idr-ls-distribution\]](#) ?

TLV 256: Local Node Descriptor

TLV 263: Multi-Topology IDs

TLV 512: Autonomous System

TLV 513: BGP-LS Identifier

TLV 514: Area ID

TLV 515: IGP Router ID

TLV 1024: Node flag bits

TLV 1025: Opaque Node properties

TLV 1026: Node name

TLV 1027: IS-IS Area Identifier

TLV 1028: IPv4 router-ID of Local Node

TLV 1029: IPv6 router-ID of Local Node

		IOS-XR	JUNOS	ODL
Rcv.TLV	256	YES	YES	YES
Snd.TLV	256	YES	YES	NO
Org.TLV	256	YES	YES	NO
Rcv.TLV	263	YES	YES	YES
Snd.TLV	263	YES	YES	NO
Org.TLV	263	YES	NO	NO
Rcv.TLV	512	YES	YES	YES
Snd.TLV	512	YES	YES	NO
Org.TLV	512	YES	YES	NO
Rcv.TLV	513	YES	YES	YES
Snd.TLV	513	YES	YES	NO
Org.TLV	513	YES	YES	NO
Rcv.TLV	514	YES	YES	YES
Snd.TLV	514	YES	YES	NO
Org.TLV	514	YES	YES	NO
Rcv.TLV	515	YES	YES	YES
Snd.TLV	515	YES	YES	NO
Org.TLV	515	YES	YES	NO
Rcv.TLV	1024	YES	YES	YES
Snd.TLV	1024	YES	YES	NO
Org.TLV	1024	YES	YES	NO
Rcv.TLV	1025	YES	YES	NO
Snd.TLV	1025	YES	YES	NO
Org.TLV	1025	YES	NO	NO
Rcv.TLV	1026	YES	YES	YES
Snd.TLV	1026	YES	YES	NO
Org.TLV	1026	YES	NO	NO
Rcv.TLV	1027	YES	YES	YES
Snd.TLV	1027	YES	YES	NO
Org.TLV	1027	YES	NO	NO
Rcv.TLV	1028	YES	YES	YES
Snd.TLV	1028	YES	YES	NO
Org.TLV	1028	YES	YES	NO
Rcv.TLV	1029	YES	YES	YES
Snd.TLV	1029	YES	YES	NO
Org.TLV	1029	YES	NO	NO

## 6. Prefix NLRI TLV support

Does the implementation support the TLVs described in Section 7 of [\[I-D.ietf-idr-ls-distribution\]](#) ?

TLV 256: Local Node Descriptor

TLV 263: Multi-Topology IDs

TLV 264: OSPF route type

TLV 265: IP Reachability information

TLV 1152: IGP Flags

TLV 1153: Route Tag

TLV 1154: Extended Tag

TLV 1155: Prefix Metric

TLV 1156: OSPF Forwarding Address

TLV 1157: Opaque Prefix Attribute

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		IOS-XR	JUNOS	ODL
Rcv.TLV	256	YES	YES	YES
Snd.TLV	256	YES	YES	NO
Org.TLV	256	YES	NO	NO
Rcv.TLV	263	YES	YES	YES
Snd.TLV	263	YES	YES	NO
Org.TLV	263	YES	NO	NO
Rcv.TLV	264	YES	YES	YES
Snd.TLV	264	YES	YES	NO
Org.TLV	264	YES	NO	NO
Rcv.TLV	265	YES	YES	YES
Snd.TLV	265	YES	YES	NO
Org.TLV	265	YES	NO	NO
Rcv.TLV	1152	YES	YES	YES
Snd.TLV	1152	YES	YES	NO
Org.TLV	1152	YES	NO	NO
Rcv.TLV	1153	YES	YES	YES
Snd.TLV	1153	YES	YES	NO
Org.TLV	1153	YES	NO	NO
Rcv.TLV	1154	YES	YES	YES
Snd.TLV	1154	YES	YES	NO
Org.TLV	1154	NO	NO	NO
Rcv.TLV	1155	YES	YES	YES
Snd.TLV	1155	YES	YES	NO
Org.TLV	1155	YES	NO	NO
Rcv.TLV	1156	YES	YES	YES
Snd.TLV	1156	YES	YES	NO
Org.TLV	1156	YES	NO	NO
Rcv.TLV	1157	YES	YES	NO
Snd.TLV	1157	YES	YES	NO
Org.TLV	1157	YES	NO	NO

## 7. Interoperable Implementations

List other implementations that you have tested interoperability of BGP-LS Protocol Implementation.

## [7.1.](#) Cisco Implementation

Cisco: The Cisco Systems, Inc. IOS-XR implementation should be interoperable with other vendor BGP-LS Protocol implementations. In particular, we have tested our interoperability with Juniper's JUNOS implementation.

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## [7.2.](#) Juniper Implementation

Juniper: The Juniper Networks, Inc. JUNOS implementation should be interoperable with other vendor BGP-LS Protocol implementations. In particular, we have tested our interoperability with the Cisco Systems, Inc. IOS-XR implementation and the Opendaylight implementation.

## [7.3.](#) OpenDaylight Implementation

Opendaylight: The Opendaylight implementation should be interoperable with other vendor BGP-LS Protocol implementations. In particular, we have tested our interoperability with Juniper's JUNOS implementation and the Cisco Systems, Inc. IOS-XR implementation. BGP receiver is implemented in the OpenDaylight Hydrogen release. BGP sender functionality is planned in the upcoming Helium release.

## [8.](#) IANA Considerations

This document makes no request of IANA.

Note to RFC Editor: The IANA has requested that this section remain in the document upon publication as an RFC. This note to the RFC Editor, however, may be removed.

## [9.](#) Security considerations

No new security issues are introduced by the BGP Link-State Information Distribution Protocol defined in [\[I-D.ietf-idr-ls-distribution\]](#).

## [10.](#) Acknowledgements

The authors would like to thank Stefano Previdi and Jan Medved for their contributions to this document.

## 11. Informative References

[I-D.ietf-idr-ls-distribution]

Gredler, H., Medved, J., Previdi, S., Farrel, A., and S. Ray, "North-Bound Distribution of Link-State and TE Information using BGP", [draft-ietf-idr-ls-distribution-05](#) (work in progress), May 2014.

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