

Inter-Domain Routing
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H. Gredler, Ed.
B. Rajagopalan
Juniper Networks, Inc.
S. Ray, Ed.
M. Bhardwaj
Cisco Systems, Inc.
July 4, 2014

BGP Link-State Information Distribution Implementation Report
draft-gredler-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 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

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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

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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 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 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 OpenDaylight Hydrogen release. BGP sender functionality is planned in 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 to 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, Jan Medved and Chris Bowers 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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Authors' Addresses

Hannes Gredler (editor)
Juniper Networks, Inc.
1194 N. Mathilda Ave.
Sunnyvale, CA 94089
US

Email: hannes@juniper.net

Balaji Rajagopalan
Juniper Networks, Inc.
Electra, Exora Business Park, Marathahalli - Sarjapur Outer Ring Road
Bangalore, Karnataka 560103
India

Email: balajir@juniper.net

Saikat Ray (editor)
Cisco Systems, Inc.
170, West Tasman Drive
San Jose, CA 95134
US

Email: sairay@cisco.com

Manish Bhardwaj
Cisco Systems, Inc.
170, West Tasman Drive
San Jose, CA 95134
US

Email: manbhard@cisco.com