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Label Advertisement Discipline for LDP Forwarding Equivalence Classes (FECs)

Abstract

The label advertising behavior of an LDP speaker for a given Forwarding Equivalence Class (FEC) is governed by the FEC type and not necessarily by the LDP session's negotiated label advertisement mode. This document updates RFC 5036 to make that fact clear. It also updates RFCs 3212, 4447, 5918, 6388, and 7140 by specifying the label advertisement mode for all currently defined LDP FEC types.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc7358.

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1. Introduction

The Label Distribution Protocol (LDP) [RFC5036] allows label advertisement mode negotiation at the time of session establishment. The LDP specification also dictates that only a single label advertisement mode be negotiated, agreed upon, and used for a given LDP session between two Label Switching Routers (LSRs).

The negotiated label advertisement mode defined in RFC 5036 and carried in the LDP Initialization message is only indicative. It indicates how the LDP speakers on a session will advertise labels for some Forwarding Equivalence Classes (FECs), but it is not a rule that restricts the speakers to behave in a specific way. Furthermore, for some FEC types the advertising behavior of the LDP speaker is governed by the FEC type and not by the negotiated behavior.

This document updates [RFC5036] to make that fact clear. It also updates [RFC3212], [RFC4447], [RFC5918], [RFC6388], and [RFC7140] to indicate, for each FEC type that has already been defined, whether

the label binding advertisements for the FEC are constrained by the negotiated label advertisement mode or not. Furthermore, this document specifies the label advertisement mode to be used for all currently defined FECs.

2. Label Advertisement Discipline

To remove any ambiguity and conflict regarding a label advertisement discipline among different FEC types sharing a common LDP session, this document specifies a label advertisement discipline for FEC types.

This document introduces the following types for specifying a label advertisement discipline for a FEC type:

- DU (Downstream Unsolicited)
- DoD (Downstream on Demand)
- As negotiated (DU or DoD)
- Upstream ([RFC6389])
- Not applicable
- Unknown

2.1. Update to RFC 5036

Section 3.5.3 of [RFC5036] is updated to add the following two statements under the description of "A, Label Advertisement Discipline":

- Each document defining an LDP FEC must state the applicability of the negotiated label advertisement discipline for label binding advertisements for that FEC. If the negotiated label advertisement discipline does not apply to the FEC, the document must also explicitly state the discipline to be used for the FEC.

- This document defines the label advertisement discipline for the following FEC types:

FEC Type	FEC Name	Label Advertisement Discipline
0x01	Wildcard	Not applicable
0x02	Prefix	As negotiated (DU or DoD)

2.2. Specification for LDP FECs

The label advertisement discipline for currently defined LDP FEC types is listed in Section 4.

This document updates the respective RFCs in which these FECs are introduced and defined.

3. Security Considerations

This document only clarifies the applicability of an LDP session's label advertisement mode and hence does not add any LDP security mechanics and considerations to those already defined in the LDP specification [RFC5036].

4. IANA Considerations

This document mandates the specification of a label advertisement discipline for each defined FEC type and hence IANA's "Forwarding Equivalence Class (FEC) Type Name Space" registry under IANA's "Label Distribution Protocol (LDP) Parameters" registry has been extended as follows:

- Added a new column titled "Label Advertisement Discipline" with the following possible values:

    - DU
    - DoD
    - As negotiated (DU or DoD)
    - Upstream
    - Not applicable
    - Unknown

- Made this document an additional reference for the registry itself and for all affected registrations.

- Kept other columns of the registry in place and populated as they were.

For the currently assigned FEC types, the updated registry looks like:

Value	Hex	Name	Label Advertisement Discipline	Reference	Notes/ Registration Date
0	0x00	Reserved			
1	0x01	Wildcard	Not applicable	[RFC5036] [RFC7358]	
2	0x02	Prefix	As negotiated (DU or DoD)	[RFC5036] [RFC7358]	
4	0x04	CR-LSP	DoD	[RFC3212] [RFC7358]	
5	0x05	Typed Wildcard FEC Element	Not applicable	[RFC5918] [RFC7358]	
6	0x06	P2MP	DU	[RFC6388] [RFC7358]	
7	0x07	MP2MP-up	DU	[RFC6388] [RFC7358]	
8	0x08	MP2MP-down	DU	[RFC6388] [RFC7358]	
9	0x09	HSMP-upstream	DU	[RFC7140] [RFC7358]	2014-01-09
10	0x0A	HSMP-downstream	DU, Upstream	[RFC7140] [RFC7358]	2014-01-09
128	0x80	PWid FEC Element	DU	[RFC4447] [RFC7358]	
129	0x81	Generalized PWid FEC Element	DU	[RFC4447] [RFC7358]	
130	0x82	P2MP PW Upstream FEC Element	Upstream	[P2MP-PW] [RFC7358]	2009-06-03

131	0x83	Protection FEC Element	DU	[FAST-PROT] [RFC7358]	2010-02-26
132	0x84	P2MP PW Downstream FEC Element	DU	[P2MP-PW] [RFC7358]	2014-04-04

5. References

5.1. Normative References

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[RFC5036] Andersson, L., Ed., Minei, I., Ed., and B. Thomas, Ed., "LDP Specification", RFC 5036, October 2007, <http://www.rfc-editor.org/info/rfc5036>.

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5.2. Informative References

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