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LDP Typed Wildcard PW FEC Elements  
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## Abstract

An extension to the Label Distribution Protocol (LDP) defines the general notion of a "Typed Wildcard Forwarding Equivalence Class (FEC) Element". This can be used when it is desired to request all label bindings for a given type of FEC Element, or to release or withdraw all label bindings for a given type of FEC element. However, a typed wildcard FEC element must be individually defined for each type of FEC element. This specification defines the typed wildcard FEC elements for the Pseudowire Identifier (PW Id) and Generalized Pseudowire Identifier (Gen. PW Id) FEC types.

## Conventions used in this document

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 [RFC2119].

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      0                               1                               2
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3
+-----+-----+-----+-----+-----+-----+-----+-----+
| Typed Wcard | Type=Gen.PWid | Len = 0 |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

Figure 2: Format of Generalized PWid Typed Wildcard FEC Element

Where:

Typed Wcard (one octet): as specified in [TYPED-WC]

FEC Element Type (one octet): Generalized PWid FEC Element (type 0x81 [RFC4447])

Len FEC Type Info (one octet): Zero. (There is no additional FEC info)

When Generalized PWid FEC Typed Wildcard is used, "PW Grouping ID TLV" [RFC4447] MUST NOT be present in the same message.

#### 4. Operation

The use of Typed Wildcard FEC elements for PW can be useful under several scenarios. This section describes two use cases to illustrate their usage. The following use cases consider two LSR nodes, A and B, with LDP session between them to exchange L2VPN PW bindings.

##### 4.1. PW Consistency Check

A user may request a control plane consistency check at LSR A for the PWid FEC and Generalized PWid FEC bindings that it had learnt from LSR B over LDP session. To perform this consistency check, LSR A marks all its learnt PW bindings from LSR B as stale, and then sends a Label Request message towards LSR B with Typed Wildcard FEC element for PWid FEC element and Generalized PWid FEC element. Upon receipt of such request, LSR B replays its database related to PWid FEC elements and Generalized PWid FEC element in Label Mapping message. As a PW binding is received at LSR A, the associated binding state is marked as refreshed (no stale). When replay completes for a given type of FEC, LSR B sends End-of-LIB Notification [END-OF-LIB] to mark the end of update for the given FEC type. Upon receipt of this Notification at LSR A, any remaining stale PW binding of given FEC type learnt from the peer LSR B, is

cleaned up and removed from the database. This completes consistency check with LSR B at LSR A for given FEC type.

#### 4.2. PW Graceful Shutdown

It may be desirable to perform shutdown/removal of existing PW bindings advertised towards a peer in a graceful manner -

- i.e. all

advertised PW bindings to be removed from a peer without session flap. For example, to request a graceful delete of the PWid FEC and Generalized PWid FEC bindings at LSR A learnt from LSR B, LSR A would send a Label Withdraw message towards LSR B with Typed Wildcard FEC elements pertaining to PWid FEC element and Generalized PWid FEC element. Upon receipt of such message, LSR B will delete all PWid and Generalized PWid bindings learnt from LSR A. Afterwards, LSR B would send Label Release message corresponding to received Label Withdraw with Typed FEC element.

#### 5. Security Considerations

No new security considerations beyond that apply to the base LDP specification [RFC5036], [RFC4447] and [MPLS\_SEC] apply to the use of the PW Typed Wildcard FEC Element types described in this document.

#### 6. IANA Considerations

This document defines no new element for IANA Consideration.

#### 7. Acknowledgments

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This document was prepared using 2-Word-v2.0 template.dot.

#### 8. References

##### 8.1. Normative References

[RFC5036] Andersson, L., Menei, I., and Thomas, B., Editors, "LDP Specification", RFC 5036, September 2007.

[TYPED-WC] Thomas, B., Asati, R., and Minei, I., "LDP Typed Wildcard FEC", draft-ietf-mpls-ldp-typed-wildcard-07.txt, Work in Progress, March 2010.

[END-OF-LIB] Asati, R., Mohapatra, P., Chen, E., and Thomas, B., "Signaling LDP Label Advertisement Completion", draft-ietf-mpls-ldp-end-of-lib-04.txt, Work in Progress, June 2010.

[RFC4447] L. Martini, Editor, E. Rosen, El-Aawar, T. Smith, G. Heron, "Pseudowire Setup and Maintenance using the Label Distribution Protocol", RFC 4447, April 2006.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC2119, March 1997.

## 8.2. Informative References

[MPLS\_SEC] Fang, L. et al., "Security Framework for MPLS and GMPLS Networks", draft-ietf-mpls-mpls-and-gmpls-security-framework-05.txt, Work in Progress, March 2009.

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