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Wildcard Pseudowire Type

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Abstract

Pseudowire signaling requires that the Pseudowire Type (PW Type) be identical in both directions. For certain applications the configuration of the PW Type is most easily accomplished by configuring this information at just one PW endpoint. In any form of LDP-based signaling, each PW endpoint must initiate the creation of a unidirectional LSP. In order to allow the initiation of these two LSPs to remain independent, a means is needed for allowing the PW endpoint (lacking a priori knowledge of the PW Type) to initiate the creation of an LSP. This document defines a Wildcard PW Type to satisfy this need.

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1. Introduction

Pseudowire signaling requires that the Pseudowire Type (PW Type) be identical in both directions. For certain applications the configuration of the PW Type is most easily accomplished by configuring this information at just one PW endpoint. In any form of LDP-based signaling, each PW endpoint must initiate the creation of a unidirectional LSP.

By the procedures of [CONTROL], both Label Mapping messages must carry the PW type, and the two unidirectional mapping messages must be in agreement. Thus within the current procedures, the PW endpoint that lacks configuration must wait to receive a Label Mapping message in order to learn the PW Type, prior to signaling its unidirectional LSP.

For certain applications this can become particularly onerous. For example, suppose that an ingress Provider Edge (PE) is serving as part of a gateway function between a layer 2 network and layer 2 attachment circuits on remote PEs. Suppose further that the initial setup needs to be initiated from the layer 2 network, but the layer 2 signaling does not contain sufficient information to determine the PW Type. However, this information is known at the PE supporting the targeted attachment circuit.

In this situation, it is often desirable to allow the initiation of the two LSPs that compose a pseudowire to remain independent. A means is needed for allowing a PW endpoint (lacking a priori knowledge of the PW Type) to initiate the creation of an LSP. This document defines a wildcard PW Type to satisfy this need.

1.1. Conventions and Terminology

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 2119 [KEYWORDS].

This document introduces no new terminology. However, it assumes that the reader is familiar with the terminology contained in [CONTROL] and RFC 3985, "Pseudo Wire Emulation Edge-to-Edge (PWE3) Architecture" [ARCH].

2. Wildcard PW Type

In order to allow a PE to initiate the signaling exchange for a pseudowire without knowing the pseudowire type, a new PW Type is defined. The codepoint is 0x7FFF. The semantics are the following:

1. To the targeted PE, this value indicates that it is to determine the PW Type (for both directions) and signal that in a Label Mapping message back to the initiating PE.

2. For the procedures of [CONTROL], this PW Type is interpreted to match any PW Type other than itself. That is, the targeted PE may respond with any valid PW Type other than the wildcard PW Type.

3. Procedures

3.1. Procedures When Sending the Wildcard FEC

When a PE that is not configured to use a specific PW Type for a particular pseudowire wishes to signal an LSP for that pseudowire, it sets the PW Type to "wildcard". This indicates that the target PE should determine the PW Type for this pseudowire.

When a Label Mapping message is received for the pseudowire, the PE checks the PW Type.

If the PW Type can be supported, the PE uses this as the PW Type for both directions.

If the PW Type cannot be supported or is "wildcard", it MUST respond to this message with a Label Release message with an LDP Status Code of "Generic Misconfiguration Error". Further actions are beyond the scope of this document, but could include notifying the associated application (if any) or notifying network management.

3.2. Procedures When Receiving the Wildcard FEC

When a targeted PE receives a Label Mapping message indicating the wildcard PW Type, it follows the normal procedures for checking the Attachment Group Identifier (AGI) and Target Attachment Individual Identifier (TAII) values. If the targeted PE is not configured to use a specific, non-wildcard PW Type, it MUST respond to this message with a Label Release message with an LDP Status Code of "Generic Misconfiguration Error".

Otherwise, it treats the Label Mapping message as if it had indicated the PW Type it is configured to use.

4. Security Considerations

This document has little impact on the security aspects of [CONTROL]. The message exchanges remain the same. However, a malicious agent attempting to connect to an access circuit would require one less piece of information. To mitigate against this, a pseudowire control entity receiving a request containing the wildcard FEC type SHOULD only proceed with setup if explicitly configured to do so for the particular AI in the TAI. Further, the reader should note the security considerations of [CONTROL], in general, and those pertaining to the Generalized PWid FEC Element, in particular.

5. IANA Considerations

IANA has made the following allocation from the IETF consensus range of the "Pseudowire Type" registry as defined in [IANA].

PW Type	Description
0x7FFF	Wildcard

6. References

6.1. Normative References

[KEYWORDS] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[CONTROL] Martini, L., Ed., Rosen, E., El-Aawar, N., Smith, T., and G. Heron, "Pseudowire Setup and Maintenance Using the Label Distribution Protocol (LDP)", RFC 4447, April 2006.

[IANA] Martini, L., "IANA Allocations for Pseudowire Edge to Edge Emulation (PWE3)", BCP 116, RFC 4446, April 2006.

6.2. Informative References

[ARCH] Bryant, S., Ed., and P. Pate, Ed., "Pseudo Wire Emulation Edge-to-Edge (PWE3) Architecture", RFC 3985, March 2005.

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