

PWE3
Internet-Draft
Intended status: Standards Track
Expires: January 5, 2013

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July 4, 2012

Virtual Circuit Connectivity Verification version 2 (VCCV2)
draft-nadeau-pwe3-vcv2-00.txt

Abstract

This document describes VCCV2, a new version of Virtual Circuit Connectivity Verification (VCCV), the pseudowire OAM mechanism. This new version is backwards compatible with VCCV for MPLS PWs for modes that the versions share, although the Router Alert (RA) CV type is not supported by VCCV2. Furthermore, this document collects the complete description of VCCV2 into a single specification.

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1. Introduction

Virtual Circuit Connectivity Verification (VCCV), the pseudowire OAM mechanism is described in [[RFC5085](#)], [[RFC5885](#)], and [[I-D.ietf-pwe3-vccv-for-gal](#)]. This mechanism has been widely implemented and deployed, but it has been reported [[I-D.ietf-pwe3-vccv-impl-survey-results](#)] that the large number of VCCV options has led to interoperability issues.

[RFC5085] together with [[I-D.ietf-pwe3-vccv-for-gal](#)] define four Control Channel (CC) types for MPLS PWs:

Type 1 using the control word (CW),

Type 2 using the Router Alert label (label=1) above the PW label,

Type 3 using TTL expiry,

Type 4 using G-ACh Label (label=13) [[RFC5586](#)] below the PW label.

In order to simplify implementations and operations, we herein obsolete Type 2, and provide guidance as to when to use the remaining three types.

[RFC5085] together with [[RFC5885](#)] define four Connectivity Verification (CV) types for MPLS PWs:

ICMP ping,

LSP ping,

BFD with UDP/IP encapsulation,

raw BFD (without IP encapsulation),

and BFD has several options of its own (see [[RFC5880](#)]). The description of what and how to implement these is spread over several documents, and we herein attempt to summarize the entire functionality set in one place.

This document only describes OAM for PWs over MPLS. Functionality for L2TPv2-based PWs remains as presently specified.

The present version of this document is a skeleton only, intended to initiate discussion. Once the principles are agreed upon, the authors will flesh out the rest.

[2.](#) Overview of the PW OAM Channel

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](#)].

VCCV and VCCV2 are fault OAM mechanisms to verify liveness and to further diagnose the pseudowire forwarding path. This section will provide an overview of the requirements and architecture of PW OAM.

[3.](#) Abbreviations

AC Attachment Circuit [[RFC3985](#)]
CC Control Channel (used as CC Type)
CE Customer Edge
CV Connectivity Verification (used as CV Type)
CW Control Word [[RFC3985](#)]
GACH Generic Associated Channel [[RFC5586](#)]
GAL GACH Channel Label [[RFC5586](#)]
MPLS-TP MPLS-Transport Profile
OAM Operations, Administration and Maintenance
PE Provider Edge
PSN Packet Switched Network [[RFC3985](#)]
PW Pseudowire [[RFC3985](#)]
PW-ACH PW Associated Channel Header [[RFC4385](#)]
VCCV Virtual Circuit Connectivity Verification

[4.](#) The Protocol and its Options

This section will detail all the CC and CV options, the signaling needed to choose each of them, the bit-masks and codings. The description will be concise, yet readable.

In particular, CC Type 2 is obsoleted. Subsections will discuss Types 1, 3, and 4.

In addition, the text will provide guidance for selection of CC types, as follows: When the PW employs a CW then CC Type 1 SHOULD be

used. TDM PWs always use the CW, and thus SHOULD always use Type 1. Legacy (ATM, port mode frame relay, and HDLC PWs) without CWs SHOULD use Type 3. [[RFC5994](#)] states that Ethernet PWs over MPLS-TP MUST use the CW, and thus they SHOULD use Type 1, but MAY use Type 4.

Discussion is needed as to whether all CV types are required. Subsections will detail the use of the different CV types.

[5.](#) Security Considerations

Are there significant threats on PWs based on VCCV?

[6.](#) IANA Considerations

It is not clear what needs to be put here. Will CC Type 2 be removed?

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[7.2.](#) Informative References

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