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Path Computation Element (PCE) Communication Protocol (PCEP)

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This document specifies the Path Computation Element (PCE) Communication Protocol (PCEP) for communications between a Path Computation Client (PCC) and a PCE, or between two PCEs. Such interactions include path computation requests and path computation replies as well as notifications of specific states related to the use of a PCE in the context of Multiprotocol Label Switching (MPLS) and Generalized MPLS (GMPLS) Traffic Engineering. PCEP is designed to be flexible and extensible so as to easily allow for the addition of further messages and objects, should further requirements be expressed in the future.

Table of Contents

1. Introduction

[RFC4655] describes the motivations and architecture for a Path Computation Element (PCE) based model for the computation of Multiprotocol Label Switching (MPLS) and Generalized MPLS (GMPLS) Traffic Engineering Label Switched Paths (TE LSPs). The model allows for the separation of PCE from Path Computation Client (PCC), and allows for the cooperation between PCEs. This necessitates a communication protocol between PCC and PCE, and between PCEs. [RFC4657] states the generic requirements for such a protocol including that the same protocol be used between PCC and PCE, and between PCEs. Additional application-specific requirements (for scenarios such as inter-area, inter-AS, etc.) are not included in [RFC4657], but there is a requirement that any solution protocol must be easily extensible to handle other requirements as they are introduced in application-specific requirements documents. Examples of such application-specific requirements are [RFC4927], [RFC5376], and [INTER-LAYER].

This document specifies the Path Computation Element Protocol (PCEP) for communications between a PCC and a PCE, or between two PCEs, in compliance with [RFC4657]. Such interactions include path computation requests and path computation replies as well as notifications of specific states related to the use of a PCE in the context of MPLS and GMPLS Traffic Engineering.

PCEP is designed to be flexible and extensible so as to easily allow for the addition of further messages and objects, should further requirements be expressed in the future.

1.1. Requirements Language

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 [RFC2119].

2. Terminology

The following terminology is used in this document.

AS: Autonomous System.

Explicit path: Full explicit path from start to destination; made of a list of strict hops where a hop may be an abstract node such as an AS.

IGP area: OSPF area or IS-IS level.

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