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Experimental Codepoint Allocation for the Path Computation Element communication Protocol (PCEP) draft-ietf-pce-pcep-exp-codepoints-05

Abstract

IANA assigns values to the Path Computation Element (PCE) communication Protocol (PCEP) parameters (messages, objects, TLVs). IANA established a top-level registry to contain all PCEP codepoints and sub-registries. This top-level registry contains sub-registries for PCEP message, object and TLV types. The allocation policy for each of these sub-registries is IETF Review.

This document updates RFC 5440 by changing the allocation policies for these three registries to mark some of the code points as assigned for Experimental Use.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

The Path Computation Element communication Protocol (PCEP) [RFC5440] provides mechanisms for Path Computation Elements (PCEs) to perform path computations in response to Path Computation Clients (PCCs) requests.

Further, in order to support use cases described in [RFC8051], [RFC8231] specifies a set of extensions to PCEP to enable stateful control of MPLS-TE and GMPLS LSPs via PCEP. [RFC8281] describes the setup, maintenance and teardown of PCE-initiated LSPs under the stateful PCE model.

In section 9 of [RFC5440], IANA assigns values to the PCEP protocol parameters (messages, objects, TLVs). IANA established a top- level registry to contain all PCEP codepoints and sub-registries. This top-level registry contains sub-registries for PCEP message, object and TLV types. The allocation policy for each of these sub-registries is IETF Review [RFC8126]. Also, early allocation [RFC7120] provides some latitude for allocation of these code points, but is reserved for features that are considered appropriately stable.

Recently, there have been rapid advancements in PCE technology, which has created an enhanced need to experiment with PCEP. It is often necessary to use some sort of number or constant in order to actually test or experiment with the new function, even when testing in a closed environment. In order to run experiments, it is important that the value won't collide not only with existing codepoints but any future allocation.

This document updates [RFC5440] by changing the allocation policies for these three registries to mark some of the code points as assigned for Experimental Use. As stated in [RFC3692], experiments using these code points are not intended to be used in general deployments and due care must be taken to ensure that two experiments with the same code points are not run in the same environment. See [RFC3692] for further discussion of the use of experimental codepoints.

2. PCEP Messages

PCEP message types are in the range 0 to 255. This document sets aside message types 252-255 for experimentation as described in Section 6.1.

3. PCEP Objects

PCEP objects are identified by values in the range 0 to 255. This document sets aside object identifiers 248-255 for experimentation as described in Section 6.2.

4. PCEP TLVs

PCEP TLV type codes are in the range 0 to 65535. This document sets aside object identifiers 65504-65535 for experimentation as described in Section 6.2.

5. Handling of Unknown Experimentation

A PCEP implementation that receives an experimental PCEP message, that it does not recognize, would react as per section 6.9 of [RFC5440] by sending a PCErr message with Error-value=2 (capability not supported).

If a PCEP speaker does not understand or support an experimental object then the way it handles this situation depends on the message type. For example, a PCE handles an unknown object in the Path Computation Request (PCReq) message according to the rules of [RFC5440]. Message-specific behavior may be specified (e.g., [RFC8231] defines rules for a PCC to handle an unknown object in a Path Computation LSP Update (PCUpd) Request message).

As per section 7.1 of [RFC5440], unknown experimental PCEP TLV would be ignored.

6. IANA Considerations

IANA maintains the "Path Computation Element Protocol (PCEP) Numbers" at <http://www.iana.org/assignments/pcep>.

6.1. New PCEP Messages

Within this registry IANA maintains a sub-registry for PCEP Messages (see PCEP Messages at <http://www.iana.org/assignments/pcep>).

IANA is requested to change the registration procedure for this registry to read as follows:

0-251	IETF Review
252-255	Experimental Use

IANA is also requested to mark the values 252-255 in the registry accordingly.

6.2. New PCEP Objects

Within this registry IANA maintains a sub-registry for PCEP Objects (see PCEP Objects at <http://www.iana.org/assignments/pcep>).

IANA is requested to change the registration procedure for this registry to read as follows:

```
0-247   IETF Review
248-255 Experimental Use
```

IANA is also requested to mark the values 248-255 in the registry accordingly.

6.3. New PCEP TLVs

Within this registry IANA maintains a sub-registry for PCEP TLVs (see PCEP TLV Type Indicators at <http://www.iana.org/assignments/pcep>).

IANA is requested to change the registration procedure for this registry to read as follows:

```
0-65503     IETF Review
65504-65535 Experimental Use
```

IANA is also requested to mark the values 65504-65535 in the registry accordingly.

7. Security Considerations

This document does not introduce any new security considerations to the existing protocol. Refer to [RFC5440] for further details of the specific security measures.

[RFC3692] asserts that the existence of experimental code points introduce no new security considerations. However, implementations accepting experimental codepoints need to take care in how they parse and process the messages, objects, and TLVs in case they come, accidentally, from another experiment. Further, an implementation accepting experimental code points needs to consider the security aspects of the experimental extensions. [RFC6709] provide various design considerations for protocol extensions (including those designated as experimental).

8. Acknowledgments

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9. References

9.1. Normative References

[RFC3692] Narten, T., "Assigning Experimental and Testing Numbers Considered Useful", BCP 82, RFC 3692, DOI 10.17487/RFC3692, January 2004, <https://www.rfc-editor.org/info/rfc3692>.

[RFC5440] Vasseur, JP., Ed. and JL. Le Roux, Ed., "Path Computation Element (PCE) Communication Protocol (PCEP)", RFC 5440, DOI 10.17487/RFC5440, March 2009, <https://www.rfc-editor.org/info/rfc5440>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

[RFC8231] Crabbe, E., Minei, I., Medved, J., and R. Varga, "Path Computation Element Communication Protocol (PCEP) Extensions for Stateful PCE", RFC 8231, DOI 10.17487/RFC8231, September 2017, <https://www.rfc-editor.org/info/rfc8231>.

[RFC8281] Crabbe, E., Minei, I., Sivabalan, S., and R. Varga, "Path Computation Element Communication Protocol (PCEP) Extensions for PCE-Initiated LSP Setup in a Stateful PCE Model", RFC 8281, DOI 10.17487/RFC8281, December 2017, <https://www.rfc-editor.org/info/rfc8281>.

9.2. Informative References

[RFC6709] Carpenter, B., Aboba, B., Ed., and S. Cheshire, "Design Considerations for Protocol Extensions", RFC 6709, DOI 10.17487/RFC6709, September 2012, <https://www.rfc-editor.org/info/rfc6709>.

[RFC7120] Cotton, M., "Early IANA Allocation of Standards Track Code Points", BCP 100, RFC 7120, DOI 10.17487/RFC7120, January 2014, <https://www.rfc-editor.org/info/rfc7120>.

[RFC8051] Zhang, X., Ed. and I. Minei, Ed., "Applicability of a Stateful Path Computation Element (PCE)", RFC 8051, DOI 10.17487/RFC8051, January 2017, <https://www.rfc-editor.org/info/rfc8051>.

Appendix A. Other PCEP Registries

Based on feedback from the PCE WG, it was decided to allocate an Experimental code point range only in the message, object and TLV sub-registries. The justification for this decision is that, if an experiment finds that it wants to use a new code point in another PCEP sub-registry, it can implement the same function using a new experimental object or TLV instead.

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