                 Experimental Codepoint Allocation for
        the Path Computation Element Communication Protocol (PCEP)

Abstract

   IANA assigns values to the Path Computation Element 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 codepoints as assigned
   for Experimental Use.

Status of This Memo

   This is an Internet Standards Track document.

   This document is a product of the Internet Engineering Task Force
   (IETF).  It represents the consensus of the IETF community.  It has
   received public review and has been approved for publication by the
   Internet Engineering Steering Group (IESG).  Further information on
   Internet Standards is available in Section 2 of RFC 7841.

   Information about the current status of this document, any errata,
   and how to provide feedback on it may be obtained at
   https://www.rfc-editor.org/info/rfc8356.

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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 Client (PCC)
   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 codepoints
   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 not collide with existing codepoints or any future
   allocations.

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

2.  Experimental 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.  Experimental 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.  Experimental 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 reacts by sending a PCErr message with
   Error-Type=2 (capability not supported) per Section 6.9 of [RFC5440].

   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 Request (PCUpd) message).

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

6.  IANA Considerations

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

6.1.  PCEP Messages

   Within the PCEP Numbers registry, IANA maintains the "PCEP Messages"
   sub-registry.

   IANA has changed the registration procedure for this registry to read
   as follows:

      0-251   IETF Review
      252-255 Experimental Use

   IANA has also marked the values 252-255 in the registry accordingly.

6.2.  PCEP Objects

   Within the PCEP Numbers registry, IANA maintains the "PCEP Objects"
   sub-registry.

   IANA has changed the registration procedure for this registry to read
   as follows:

      0-247   IETF Review
      248-255 Experimental Use

   IANA has also marked the values 248-255 in the registry accordingly,
   and Object-Types 0-15 have been marked for Experimental Use.

6.3.  PCEP TLVs

   Within the PCEP Numbers registry, IANA maintains the "PCEP TLV Type
   Indicators" sub-registry.

   IANA has changed the registration procedure for this registry to read
   as follows:

      0-65503     IETF Review
      65504-65535 Experimental Use

   IANA has also marked 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 codepoints
   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 codepoints needs to consider the security
   aspects of the experimental extensions.  [RFC6709] provides various
   design considerations for protocol extensions (including those
   designated as experimental).

8.  References

8.1.  Normative References

   [RFC3692]  Narten, T., "Assigning Experimental and Testing Numbers
              Considered Useful", BCP 82, RFC 3692,
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              <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>.

8.2.  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 codepoint 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 codepoint in another PCEP
   sub-registry, it can implement the same function using a new
   experimental object or TLV instead.

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