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IANA Assignment of DSCP Pool 3 (xxxx01) Values to require Publication of
           a Standards Track or Best Current Practice RFC
                 draft-ietf-tsvwg-iana-dscp-registry-01

Abstract

   The Differentiated Services (Diffserv) architecture specifies use of
   the field in the IPv4 and IPv6 packet header to carry the Diffserv
   Code point (DSCP). The Internet Assigned Numbers Authority (IANA)
   maintains a registry of assigned DSCP values.

   This update to RFC2474 changes the IANA assignment method for Pool 3
   of the registry (i.e., DSCP's of the form xxxx01) to Standards
   Action, i.e., values are assigned through a Standards Track or Best
   Current Practice RFC. The update also removes permission for
   experimental and Local Use of the code points that form Pool 3 of the
   DSCP registry; Pool 1 code points (i.e., DEC's of the form xxxx11)
   remain available for these purposes.

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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   This Internet-Draft will expire on September 06, 2018.

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[1](1). Introduction

The Differentiated Services (Diffserv) [[RFC2475](RFC2475)] architecture
(updated by [[RFC3260](RFC3260)]) provides scalable service differentiation in
the Internet. Diffserv uses the six most significant bits of the
former IPv4 Type of Service (TOS) octet or the former IPV6 Traffic
Class octet to convey the field, which is used to carry the Diffserv
Code point (DSCP). This DSCP value is used to select a Diffserv Per
hop Behaviour, PB.

The six bit field is capable of conveying 64 distinct code points,
and this code point space has been divided into three pools for the
purpose of code point assignment and management (as shown in figure
1). Pool 1 comprises 32 code points [[RFC2474](RFC2474)]. These are assigned
by Standards Action, as defined in [[RFC8126](RFC8126)]. Pool 2 comprises a
pool of 16 code points reserved for experimental or Local Use (EXP/
LU) as defined in [[RFC2474](RFC2474)], and Pool 3 comprises 16 code points
[[RFC2474](RFC2474)], which were initially "available for experimental or local
use, but which were indicated should be preferentially utilized for
standardized assignments if Pool 1 is ever exhausted."

```
+------+-----------------+
| Pool | Code point Space |
+------+-----------------+
|  1   |     xxxxx0      |
+------+-----------------+
|  2   |     xxxx11      |
+------+-----------------+
|  3   |     xxxx01      |
+------+-----------------+
```

Figure 1: Format of the field for code points allocated in the three IANA pools (where 'x' refers to either '0' or '1').

At the time of writing this document, 23 of the 32 Pool 1 code points have currently been assigned.

Although Pool 1 has not yet been completely exhausted, this document changes the IANA registration policy of Pool 3 to assignment by Standards Action, i.e., values are assigned by Standards Track or Best Current Practice RFCs. The rationale for this update is a need to assign code points for particular PHBs that are unable to use any of the unassigned values in Pool 1.

An example is the need to assign a suitable recommended default Code point for the Lower Effort (LE) per-hop behavior (PHB) [I-D.ietf-tsvwg-le-phb]. The LE PHB is designed to protect best-effort (BE) traffic (packets forwarded with the default PB) from LE traffic in congestion situations, i.e., when resources become scarce, best-effort traffic has precedence over LE traffic and may preempt it. The continued presence of bleaching of the IP precedence field (setting the top three bits of the former TOS byte to zero) in deployed networks motivates the desire for the LE PHB to use a DSCP with a zero value for the first three bits [I-D.ietf-tsvwg-le-phb]. At the same time, it is also important to reduce the likelihood of priority inversion caused by unintentional re-mapping of other (higher assurance) traffic to the DSCP used for this PHB. The absence of unassigned code points in Pool 1 that exhibit these important properties motivates assigning a Pool 3 code point as the default that is recommended for use with this PHB.

To allow the IETF to utilise Pool 3 code points, this document requests IANA to manage Pool 3 and make assignments for DSCP code points in Pool 3 when requested by Standards Action. This assignment method requires publication of a Standards Track or Best Current Practice RFC.

2. Terminology

This document assumes familiarity with the terminology used in [RFC2475] updated by [RFC3260].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and
"OPTIONAL" in this document are to be interpreted as described in
[RFC2119].

3. The update to RFC2474

This document updates section 6 of [RFC2474], in the following ways.

It updates the following text concerning the assignment method:

OLD: which are initially available for experimental or local use, but
   which should be preferentially utilized for standardized
   assignments if Pool 1 is ever exhausted.

NEW: which are utilized for standardized assignments (replacing the
   previous availability for experimental or local use)".

It removes the footnote in RFC2474 relating to Pool 3:

DELETE: "(*) may be utilized for future Standards Action allocations
   as necessary"

The new registry contents are shown in Figure 2.

```
            Pool        code point space        Assignment Policy
            ----        ---------------         ----------------

            1              xxxxx0               Standards Action
            2              xxxx11               EXP/LU
            3              xxxx01               Standards Action
```

            Figure 2: Updated Assignment Policy for the DSCP Registry

4. Security Considerations

Security considerations for the use of DSCP's are described in the
RFCs that define their usage. This document does not present new
security considerations.

5. IANA Considerations

This section requests IANA to change the use of Pool 3 in the DSCP
registry and to manage this pool using a Standards Action assignment
method.

This requests IANA to make the following changes to the
Differentiated Services field Code Points (DSCP) Registry, made
available at [Registry].

The previous registry text:

    3 xxxx01 Experimental or Local Use May be utilized for future
    Standards Action allocations as necessary.

  is replaced with the following registry text:

    3 xxxx01 Standards Action.

  To manage code points in Pool 3, IANA is requested to create and
  maintain a "Pool 3 code points" entry. Pool 3 of the registry is to
  be created initially empty, with a format identical to that used for
  "Pool 1 code points".

  The Registration Procedure for use of Pool 3 is "Standards Action"
  [RFC8126]. IANA is expected to normally make assignments from Pool
  1, until this Pool is exhausted, but MAY make assignments from Pool 3
  where the format of the code point has properties that are needed for
  a specific PB. The required characteristics for choosing the DSCP
  value MUST be explained in the IANA considerations of the document
  that requests any assignment from Pool 3

  IANA is requested to reference RFC3260 and this current document.

6. Acknowledgments

7. References

7.1. Normative References

  [RFC2119]   Bradner, S., "Key words for use in RFCs to Indicate
              Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/
              RFC2119, March 1997, <http://www.rfc-editor.org/info/
              rfc2119>.

  [RFC2474]   Nichols, K., Blake, S., Baker, F. and D. Black,
              "Definition of the Differentiated Services Field (DS
              Field) in the IPv4 and IPv6 Headers", RFC 2474, DOI
              10.17487/RFC2474, December 1998, <http://www.rfc-
              editor.org/info/rfc2474>.

  [RFC3260]   Grossman, D., "New Terminology and Clarifications for
              Diffserv", RFC 3260, DOI 10.17487/RFC3260, April 2002,
              <http://www.rfc-editor.org/info/rfc3260>.

7.2. Informative References

[I-D.ietf-tsvwg-le-phb]
          Bless, R., "A Lower Effort Per-Hop Behavior (LE PHB)",
          Internet-Draft draft-ietf-tsvwg-le-phb-02, June 2017.

[RFC2475]   Blake, S., Black, D., Carlson, M., Davies, E., Wang, Z.
            and W. Weiss, "An Architecture for Differentiated
            Services", RFC 2475, DOI 10.17487/RFC2475, December 1998,
            <http://www.rfc-editor.org/info/rfc2475>.

[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>.

[Registry]
            IANA, "Differentiated Services Field code points (DSCP),
            https://www.iana.org/assignments/dscp-registry/dscp-
            registry.xhtml", .

Appendix A. Revision Notes

Note to RFC-Editor: please remove this entire section prior to
publication.

This document is an individual submission, seeking adoption by the
Transport and Services Working Group (TSVWG).

Individual submission as draft -00.

o   This is the initial version of the document.

o   Advice in this rev. from Michelle Cotton on the IANA procedure.

o   Thanks to Brian Carpenter for helpful inputs to this ID.

Individual submission as draft -01.

o   Thanks to Roland Bless for review comments.

Individual submission as draft -02 (author requests adoption as a
TSVWG WG draft).

o   Thanks to David Black for review comments in preparing rev -02.

Working Group submission as draft -00

o   Adopted by the TSVWG working group.

Working Group submission as draft -01

o   Fixed exploded acronyms.

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