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                Registration Policy for TCP Header Flags
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Abstract

   RFC2780 specifies the registration policy for reserved TCP header
   flags as Standards Action. RFC3168 created an IANA registry for
   these header flags and registered bit 8 (CWR) and 9 (ECE). This
   draft changes the registration policy of the registration to IETF
   Review as usually new TCP mechanisms that could use the remaining
   reserved flags will be first specified as experimental. Not noting
   any of those experiments in the registry would undermine the purpose
   of having a registry. However, care must be taken, as only a few
   reserved flags are left and if a new (experimental) mechanism sees
   deployment in the Internet, the flag cannot be unassigned anymore or
   used for something else.

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

[RFC2780] specifies the registration policy for reserved TCP header
flags as Standards Action. In section 9.2 (Reserved Bits in TCP
Header) is says:

   "The reserved bits in the TCP header are assigned following a Standards
Action process."

Earlier on, in section 2 (Temporary Assignments) it also says

   "From time to time temporary assignments are made in the values for fields
in these headers for use in experiments. IESG Approval is required for any
such temporary assignments."

However, it does not specify what exactly is meant with a temporary
assignment and how this could work for TCP header given they can
hardly be re-purposed once deployed on the Internet.

[RFC3168] created a IANA registry for these header flags and
registered bit 8 (CWR) and 9 (ECE). [RFC3540] assigned bit 7 to the
experimental ECN Nonce extension and [RFC8311] recently declared
RFC3540 as historic and changed the assignment to reserved, as ECN
Nonce was not deployed on the Internet. The purpose of RFC8311 was
to concentrate updates to Standard Track RFCs in one document in oder
to enable new experimentation with various ECN-related mechanisms.
However, RFC8311 does not provide any recommendation of the use of
bit 7 and the TCP flags registry.

2. Notation

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 BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Registration Policy for TCP Header Flags

This draft changes the registration policy of the registration to IETF Review as usually new TCP mechanisms that could use the remaining reserved flags will be first specified as experimental. Not noting any of those experiments in the registry would undermine the purpose of having a registry. However, assignments based on experimental RFC should be marked as such in the "Comments" field and potentially even provide hints about the nature of the experiment or provide a pointer to a section in an RFC where the experiment is explained.

Further, care must be taken, when assigning TCP header flags for experimental use, as a) only a few reserved flags are left, and b) if a new (experimental) mechanism sees deployment in the Internet, the flag cannot be unassigned anymore or used for something else. Therefore, any experimental RFC that registers a reserved flags in the TCP flags registry MUST provide ways to alter the proposed mechanism at the end of the experimental phase without using additional TCP header flags. E.g. it would be possible to add an additional negotiation mechanism after the TCP handshake that would make it possible to use different versions of the general mechanism/ extension that was negotiated or indicated during the TCP handshake using the newly assigned flag. Further, any experimental extension SHOULD discussion the scope of the experiment and potential failure cases or open questions that need to be answered when running the experiment and explain how these could be addressed in an updated version.

TCP flags can only be de-assigned if no deployment of an experimental extension happened. This should be evaluated some years after the assignment to an experimental extension, in order to change the registry entry back to "RESERVED" and move the respective experimental RFC to history, or assign it permanently. This might be done by IESG Approval or based on an Standards track document. However, even when reversed to "RESERVED", the experiment should still be noted (as failed and over) in the "Comments" field of the registry entry.

4. IANA Considerations

IANA is requested to change the registration policy of the "TCP Header Flags" registry (https://www.iana.org/assignments/tcp-header-flags/tcp-header-flags.xhtml) to IETF Review or IESG Approval and note this accordingly on the registry page.

In addition, the registry should be updated with a new column called "Comments". The text in the "name" field of the entry for bit 7 there should be moved into this new column while the name will then only say "RESERVED". Further, bits 4, 5, 6 should be added to the registry and marked as "RESERVED".

Moreover, as a matter of cleaning-up, IANA is requested to move the registry to a sub-registry on the Transmission Control Protocol (TCP) Parameters page (https://www.iana.org/assignments/tcp-parameters/tcp-parameters.xhtml).

5. Security Consideration

   TBD

6. Contributors

7. Acknowledgments

8. References

8.1. Normative References

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8.2. Informative References

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