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                    User Ports for Experiments
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Abstract

   This document defines user ports for experiments using transport
   protocols. It describes the use of experiment identifiers to enable
   shared use of these user ports, as well as updating the use of
   system ports for experiments [RFC4727] in the same manner.

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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   reference material or to cite them other than as "work in progress."

   This Internet-Draft will expire on September 3, 2022.

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1. Introduction

   Various network codepoints have been allocated for experimental use,
   including those for IP, ICMP, UDP, and TCP [RFC4727]. These include
   transport protocol port numbers 1021 and 1022, using the service
   names "EXP1" and "EXP2".

   There has always been an expectation that experiments needing
   privileged (system) ports use these assignments and unprivileged
   ports use those from the dynamic range [RFC7605]. However, dynamic
   ports can be difficult to reserve in some systems or blocked from
   traversing some firewalls. As a consequence, there is a need for
   non-privileged, non-dynamic ports – i.e., user ports – for
   experiments.

   This document reserves user ports experimentation and describes the
   use of experiment identifiers to differentiate shared use of these
   ports for concurrent experiments.

2. User Ports for Experiments

   The system, user, and dynamic ranges vary in their properties
   [RFC7605]. System ports often include privileged access, sometimes
   known as 'root'. Dynamic ports are used as client ports when
   establishing associations with services on registered ports. User
   ports have neither privilege nor the risk of use by other

connections. User ports are also more likely to allow configuration
to pass through firewalls, where system and dynamic ports can be
difficult to 'un-block'.

This document registers USR-EXP1 and USR-EXP2 for user port
experiments, using port numbers #UPORT1 and #UPORT2. These ports are
assigned from the user range, allowing non-privileged experiments
without the need to use ports from the dynamic range.

This document also creates a registry for port experiment
identifiers (PExIDs), in the same manner as those created for shared
TCP option experiments [RFC6994]. Experimenters are encouraged to
register PExIDs with IANA and to include them in at the beginning of
their transport data, i.e., at the front of each separate message or
byte stream, in network standard byte order. The use of PEdIDs helps
differentiate experiments without the need for additional port
assignments.

This document also encourages the use of these PExIDs for
experiments using existing experiment ports, i.e., system ports EXP1
and EXP2.

PExIDs differentiate experiments but are not intended to be specific
to a given experiment port, whether system or user, so a single
registration is used for all experiment ports. It is the
responsibility of the experimenter to determine which port(s) each
experiment uses.

3. Security Considerations

The creation of new ports for experiment purposes does not create
any new security considerations. At best, it potentially reduces the
use of privileged system ports for such experiments, which avoids
the associated risk of unnecessary privileged access.

Experimenters are encouraged to include security in any new
experiment, regardless of port (per Section 7.4 of [RFC7605]).

4. IANA Considerations

This document hereby requests the assignment of two user ports for
experimental purposes below. IANA is asked to replace instances of

#UPORT1 and #UPORT2 throughout this document based on the actual
        allocation.

        IANA has assigned the following user ports for experiments:

            USR-EXP1 #UPORT1 (desired port 1031) all transports

            USR-EXP2 #UPORT2 (desired port 1032) all transports

    This document requests IANA create a "Port Experimental Option
    Experiment Identifiers (PExIDs)" registry. The registry records 32-
    bit PExIDs, consisting of a brief description, document pointer if
    available, assignee name, and e-mail contact for each entry. Once
    registered, PExIDs can be used with either the system (EXP1, EXP2)
    or user (USR-EXP1, USR-EXP2) ports and with any transport protocol.

    Entries are assigned on a First Come, First Served (FCFS) basis
    [RFC5226]. IANA will also record known duplicate uses to assist the
    community in both debugging assigned uses as well as correcting
    unauthorized duplicate uses.

    IANA should impose no requirements on making a registration request
    other than indicating the desired codepoint and providing a point of
    contact. A short description or acronym for the use is desired but
    not required.

5. References

5.1. Normative References

    [RFC4727] Fenner, B., "Experimental Values in IPv4, IPv6, ICMPv4,
              ICMPv6, UDP, and TCP Headers," RFC 4727, Nov. 2026.

    [RFC5226] Narten, T., H. Alvestrand," Guidelines for Writing an IANA
              Considerations Section in RFCs,", RFC 5226, May 2008.

    [RFC6994] Touch, J., "Shared Use of Experimental TCP Options," RFC
              6994, Aug. 2013.

5.2. Informative References

   [RFC7605] Touch, J., "Recommendations on Using Assigned Transport
             Port Numbers," RFC 7605, Aug. 2015.

6. Acknowledgments

   This document was prepared using 2-Word-v2.0.template.dot.

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