                   Diameter Per-Flow Max Bitrates
                   draft-bertz-dime-perflowmbr-01

Abstract

   This document defines optional Diameter attributes for per-flow
   maximum bit rates.

Status of This Memo

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

   Internet-Drafts are working documents of the Internet Engineering
   Task Force (IETF). Note that other groups may also distribute
   working documents as Internet-Drafts. The list of current Internet-
   Drafts is at http://datatracker.ietf.org/drafts/current/.

   Internet-Drafts are draft documents valid for a maximum of six months
   and may be updated, replaced, or obsoleted by other documents at any
   time. It is inappropriate to use Internet-Drafts as reference
   material or to cite them other than as "work in progress."

   This Internet-Draft will expire on January 9, 2017.

1. Introduction

This document provides a mechanism for the specification of per-flow
maximum bit rates. Such values are used to limit individual IP flow
(5 tuple) rates while maintaining a higher aggregate maximum bit rate
across aggregate flows.

It supplements the various values defined Aggregate Maximum Bitrates
such as those specified for IP Mobility [RFC7222].

2. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
document are to be interpreted as described in RFC 2119 [RFC2119].

3. Per Flow AVPs

3.1. Per-Flow-Max-DL-Bit-Rate

The Per-Flow-Max-DL-Bit-Rate AVP (AVP Code TBD1) is of type
Unsigned32.

It specifies the maximum downlink bit rate that is requested/
allocated for each of the mobile node's IP flows. The measurement
units are bits per second.

3.2. Per-Flow-Max-UL-Bit-Rate

The Per-Flow-Max-UL-Bit-Rate AVP (AVP Code TBD1) is of type
Unsigned32.

It specifies the maximum uplink bit rate that is requested/ allocated
for each of the mobile node's IP flows. The measurement units are
bits per second.

4. IANA Considerations

   IANA allocated AVP codes in the IANA-controlled namespace registry
   specified in Section 11.1.1 of [RFC6733] for the following AVPs that
   are defined in this document.

   +--------------------------+----------+----------------+-----------+
   | AVP | AVP Code | Section Defined | Data Type |
   +--------------------------+----------+----------------+-----------+
Per-Flow-Max-DL-Bit-Rate	TBD1	Section 3.1	Unsiged32
Per-Flow-Max-UL-Bit-Rate	TBD2	Section 3.2	Unsiged32
   +--------------------------+----------+----------------+-----------+

5. Relationship to other Max Bit Rate settings

   The per flow AVPs can be used with any other combination of AVPs
   representing multiple IP flows (5 tuples).

   For example, the Per-Flow-Max-DL-Bit-Rate can be used to limit the
   individual bit rate of any single IP flow while the aggregate rate of
   the IP flows can be limited by the Aggregate-Max-DL-Bit-Rate AVP
   [RFC7222].

   For example, setting a Per-Flow-Max-DL-Bit-Rate of 2Mbps and an
   Aggregate-Max-DL-Bit-Rate of 20Mbps would permit up a mimimum of ten
   IP flows of 2Mbps.

   Achieving higher throughput is possible through the use of mulitple
   connections or paths. However, no single IP flow will dominate
   amongst competing flows.

6. Security Considerations

   This document defines new AVPs to limit the maximum bitrate of an IP
   flow (5-tuple) in the mobile devices uplink or downlink. As these
   are further constraints on Diameter applications already specifying
   aggregeate maximum bit rates, they do not introduce new security
   concerns for an Authorized User.

   For an operator, access to this data may give some insight to how the
   associated service operates. It is RECOMMENDED that this or any
   Diameter communication is secured.

   The Security Considerations of the Diameter protocol itself have been
   discussed in RFC [RFC6733]. Use of the AVPs defined in this document
   MUST take into consideration the security issues and requirements of
   the Diameter base protocol.

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>.

[RFC6733]   Fajardo, V., Ed., Arkko, J., Loughney, J., and G. Zorn,
            Ed., "Diameter Base Protocol", RFC 6733,
            DOI 10.17487/RFC6733, October 2012,
            <http://www.rfc-editor.org/info/rfc6733>.

7.2. Informative References

[RFC7222]   Liebsch, M., Seite, P., Yokota, H., Korhonen, J., and S.
            Gundavelli, "Quality-of-Service Option for Proxy Mobile
            IPv6", RFC 7222, DOI 10.17487/RFC7222, May 2014,
            <http://www.rfc-editor.org/info/rfc7222>.

Author's Address

   Lyle Bertz
   Sprint
   6220 Sprint Parkway
   Overland Park, KS 66251
   United States

   Email: lylebe551144@gmail.com