

Diameter Maintenance and Extensions  
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**Diameter Per-Flow Max Bitrates  
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Abstract

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

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## **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	<a href="#">Section 3.1</a>	Unsigned32
Per-Flow-Max-UL-Bit-Rate	TBD2	<a href="#">Section 3.2</a>	Unsigned32

#### 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 minimum of ten IP flows of 2Mbps.

Achieving higher throughput is possible through the use of multiple 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 aggregate 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>>.

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