

Diameter Maintenance and Extensions (DIME)
Internet-Draft
Intended Status: Proposed Standard
Expires: October 15, 2014

B. Hirschman
L. Bertz
Sprint
April 2014

Diameter Congestion and Filter Attributes
draft-ietf-dime-congestion-flow-attributes-00.txt

Abstract

This document defines optional ECN and filter related attributes that can be used for improved traffic identification, support of ECN and minimized filter administration within Diameter.

[RFC 5777](#) defines a Filter-Rule AVP that accommodates extensions for classification, conditions and actions. It does not support traffic identification for packets using Explicit Congestion Notification as defined in [RFC 3168](#) and does not provide specific actions when the flow(s) described by the Filter-Rule are congested.

A Filter-Rule can describe multiple flows but not the exact number of flows. Flow count and other associated data (e.g. packets) is not captured in Accounting applications, leaving administrators without useful information regarding the effectiveness or understanding of the filter definition.

These optional attributes are forward and backwards compatible with [RFC 5777](#).

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 February 14, 2014.

Copyright Notice

Copyright (c) 2013 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

- [1.](#) Introduction [4](#)
- [2.](#) Terminology and Abbreviations [4](#)
- [3.](#) ECN-IP-Codepoint, Congestion-Treatment and Filter Attributes . 4
 - [3.1.](#) ECN-IP-Codepoint AVP [4](#)
 - [3.2.](#) Congestion-Treatment AVP [5](#)
 - [3.3.](#) Flow-Count AVP [5](#)
 - [3.4.](#) Packet-Count AVP [5](#)
- [4.](#) IANA Considerations [5](#)
 - [4.1.](#) AVP Codes [5](#)
- [5.](#) Security Considerations [6](#)
- [6.](#) Acknowledgements [6](#)
- [7.](#) References [6](#)
 - [7.1.](#) Normative References [6](#)
- Authors' Addresses [6](#)

1. Introduction

Two optional Explicit Congestion Notification (ECN) [[RFC3168](#)] related AVPs are specified in the document. The first AVP provides direct support for ECN [[RFC3168](#)] in the IP header and the second AVP provides the ability to define alternate traffic treatment when congestion is experienced.

This document also defines two optional AVPs, Flow-Count and Packet-Count, used for conveying flow information within the Diameter protocol [[RFC6733](#)]. These AVPs were found to be useful for a wide range of applications. The AVPs provide a way to convey information of the group of flows described by the Filter-Rule, IPFilterRule or other Diameter traffic filters.

The semantics and encoding of all AVPs can be found in [Section 3](#).

Such AVPs are, for example, needed by some ECN applications to determine the number of flows congested or used by administrators to determine the impact of filter definitions.

Additional parameters may be defined in future documents as the need arises. All parameters are defined as Diameter-encoded Attribute Value Pairs (AVPs), which are described using a modified version of the Augmented Backus-Naur Form (ABNF), see [[RFC6733](#)]. The data types are also taken from [[RFC6733](#)].

2. Terminology and Abbreviations

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 [RFC2119](#) [[RFC2119](#)].

3. ECN-IP-Codepoint, Congestion-Treatment and Filter Attributes

3.1. ECN-IP-Codepoint AVP

The ECN-IP-Codepoint AVP (AVP Code TBD) is of type Enumerated and specifies the Explicit Congestion Notification codepoint values to match in the IP header.

Value	Binary	Keyword	References
0	00	Non-ECT (Not ECN-Capable Transport)	[RFC3168]
1	01	ECT(1) (ECN-Capable Transport)	[RFC3168]
2	10	ECT(0) (ECN-Capable Transport)	[RFC3168]
3	11	CE (Congestion Experienced)	[RFC3168]

When this AVP is used for classification in the Filter-Rule it MUST be part of Classifier Grouped AVP as defined in [RFC5777](#).

[3.2.](#) Congestion-Treatment AVP

The Congestion-Treatment AVP (AVP Code TBD) is of type Grouped and indicates how congested traffic, i.e., traffic that has Explicit Congestion Notification Congestion Experienced marking set or some other administratively defined criteria, is treated. In case the Congestion-Treatment AVP is absent the treatment of the congested traffic is left to the discretion of the node performing QoS treatment.

```
Congestion-Treatment ::= < AVP Header: TBD >
    { Treatment-Action }
    [ QoS-Profile-Template ]
    [ QoS-Parameters ]
    * [ AVP ]
```

Treatment-Action, QoS-Profile-Template and QoS-Parameters are defined in [RFC5777](#). The Congestion-Treatment AVP is an action and MUST be an attribute of the Filter-Rule Grouped AVP as defined in [RFC5777](#).

[3.3.](#) Flow-Count AVP

The Flow-Count AVP (AVP Code TBD) is of type Unsigned64.

It indicates the number of protocol specific flows. The protocol is determined by the filter (e.g. IPFilterRule, Filter-Id, etc.).

[3.4.](#) Packet-Count AVP

The Packet-Count AVP (AVP Code TBD) is of type Unsigned64.

It indicates the number of protocol specific packets. The protocol is determined by the filter (e.g. IPFilterRule, Filter-Id, etc.).

[4.](#) IANA Considerations

[4.1.](#) AVP Codes

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

+-----+			
ECN-IP-Codepoint	TBD 3.1	Enumerated	
Congestion-Treatment	TBD 3.2	Grouped	
Flow-Count	TBD 3.3	Unsigned64	
Packet-Count	TBD 3.4	Unsigned64	
+-----+			

5. Security Considerations

The document does not raise any new security concerns. This document describes an extension of [RFC5777](#) that introduces a new filter parameter applied to ECN as defined by [RFC3168](#). It also defines a new Grouped AVP that expresses what action to take should congestion be detected. The Grouped AVP reuses attributes defined in [RFC5777](#).

The security considerations of the Diameter protocol itself have been discussed in [RFC 6733](#) [[RFC6733](#)]. Use of the AVPs defined in this document MUST take into consideration the security issues and requirements of the Diameter base protocol.

6. Acknowledgements

We would like to thank Avi Lior for his guidance and feedback during the development of this specification.

7. References

7.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC3168] Black, D., Floyd, S., and K. Ramakrishnan, "The Addition of Explicit Congestion Notification (ECN) to IP", [RFC 3168](#), September 2001.
- [RFC6733] Fajardo, V., Arkko, J., Loughney, J., and G. Zorn, "Diameter Base Protocol", [RFC 6733](#), October 2012.
- [RFC5777] Korhonen, J., Tschofenig, H., Arumaithurai, M., Lior, A. and Jones, M. Ed., "Traffic Classification and Quality of Service (QoS) Attributes for Diameter", [RFC 5777](#), February 2010.

Authors' Addresses

Lyle Bertz
Sprint

6220 Sprint Parkway
Overland Park, KS 66251
United States

EEmail: Lyle.T.Bertz@sprint.com

Brent Hirschman
Sprint
6220 Sprint Parkway
Overland Park, KS 66251
United States

EEmail: Brent.Hirschman@sprint.com