

Radext Working Group
Internet-Draft
Intended status: Standards Track
Expires: January 10, 2013

L. Yeh
Huawei Technologies
July 9, 2012

RADIUS Accounting Extensions for Traffic Statistics
draft-yeh-radext-ext-traffic-statistics-03

Abstract

This document specifies the RADIUS extensions of attributes for the traffic statistics with different type, which can be used to support the differentiated accounting policies and traffic recording on the AAA server.

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 10, 2013.

Copyright Notice

Copyright (c) 2012 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	3
2.	Terminology and Conventions	4
3.	Deployment Scenarios	4
4.	Acct-Traffic-Statistics attribute	4
4.1.	Container attribute of Acct-Traffic-Statistics	5
4.2.	Contained attribute of Acct-Traffic-Statistics	6
4.2.1.	Acct-Traffic-Statistics.Stack-Type	6
4.2.2.	Acct-Traffic-Statistics.Input-Octets	7
4.2.3.	Acct-Traffic-Statistics.Output-Octets	7
4.2.4.	Acct-Traffic-Statistics.Input-Packets	8
4.2.5.	Acct-Traffic-Statistics.Output-Packets	9
4.2.6.	Acct-Traffic-Statistics.DSCP-Type	10
5.	Table of Attribute	10
6.	Diameter Considerations	11
7.	Security Considerations	11
8.	IANA Considerations	11
9.	Acknowledgements	11
10.	References	12
10.1.	Normative References	12
10.2.	Informative References	12
	Author's Address	13

Yeh

Expires January 10, 2013

[Page 2]

1. Introduction

RADIUS has been widely used as the centralized authentication, authorization and user management method for the service provision in Broadband access network. [RFC3162], [RFC4818] and [ietf-radext-ipv6-access-09] has specified some attributes to support the service provision for IPv6 access. In the meantime, Radius is also a protocol for carrying accounting information between a Network Access Server and a shared accounting server. In the scenarios of dual-stack or any other IPv6 transition use case, there is a demand to report the separated IPv4 & IPv6 traffic statistics for the differential accounting and traffic recording.

[BBF TR-187], whose purpose is to describe the network architecture and elements requirements in the PPPoE scenario to support IPv6-only or dual-stack for Internet access service, explicitly expressed this demand in its [section 9.4](#), that the BNG must also be able to support separate queues, input and output counters for IPv4 or IPv6 traffic. And it recommended to use the Radius attributes of Acct-Input-Octets (42), Acct-Output-Octets (43), Acct-Input-Packets (47), Acct-Output-Packets (48) for the combination of IPv6 and IPv4 traffic. Note that BNG of BBF is a kind of broadband NAS of IETF. The new RADIUS attributes for reporting the separated IPv4 or IPv6 traffic statistics are required.

[draft-hu-v6ops-radius-issues-ipv6-00] presented the same issue on 'protocol specific accounting' for the dual-stack traffic statistics, but it also limits to the PPP case.

[draft-maglione-radext-ipv6-acct-extensions-01] and [draft-yeh-radext-dual-stack-access-02] tried to defined a batch of attributes on the traffic statistics respectively for the IPv6-only access and dual-stack access in the traditional type space with the flat mode, while [draft-winter-radext-fancyaccounting-00] indicated that the accounting attributes of Input-Octets, Output-Octets, Input-Packets and Output-Packets can be grouped in the new basic data type of TLV-nesting defined in the section 2.3 of [draft-ietf-radext-radius-extensions-06] for the extended type space. According to [RFC6158] and the section 6.3 of [draft-ietf-radext-radius-extensions-06], Nesting-TLV is the only recommendation for the new attribute design now, which intends to employ multiple fields in the complex data type. Based on the judge of the quickly-exhausted traditional type space, the Radext Working Group tends to adopt the new data type of nesting-TLV defined for the extended type space to report the traffic statistics for the accounting extension.

Yeh

Expires January 10, 2013

[Page 3]

2. Terminology and Conventions

This document describes some new RADIUS attributes and the associated usage on NAS and AAA server. This document should be read in conjunction with the relevant RADIUS specifications, including [RFC2865], [RFC2866], [RFC2869], and [draft-ietf-radext-radius-extensions-06], for a complete mechanism. Definitions for terms and acronyms not specifically defined in this document are defined in [RFC2865], [RFC2866], [RFC2869], [RFC3575], [RFC6158], and [draft-ietf-radext-radius-extensions-06].

The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, when they appear in this document, are to be interpreted as described in BCP 14, [RFC2119].

3. Deployment Scenarios

Figure 1 show the typical use case of the traffic statistics reporting for the dual-stack users.

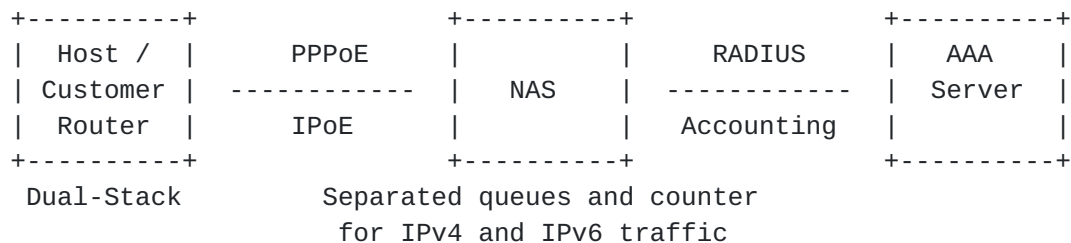


Figure 1: Traffic Statistics of Dual-Stack Users for RADIUS Accounting

Note that traffic statistics reporting is also needed in the IPv6 transition cases, such as DS-Lite, 6rd or the potential MAP, where AFTR (Address Family Transition Router) or BR (Border Router) acts as the broadband NAS.

4. Acct-Traffic-Statistics attribute

The attribute of Acct-traffic-statistics is designed according to the guidelines described in [RFC6158] and section 6 of [draft-ietf-radext-radius-extensions-06]. It adopts the data structure of the TLV nesting, has 1 container attribute, Acct-Traffic-Statistics, and 6 contained sub-attributes, Stack-Type, Input-Octets, Output-Octets, Input-Packets, Output-Packets, DSCP-Type (Differentiated Services CodePoint) to support the extensible types of traffic statistics. The sub-attribute of Stack-Type must be

Yeh

Expires January 10, 2013

[Page 4]

Value

Yeh

Expires January 10, 2013

[Page 5]

Yeh

Expires January 10, 2013

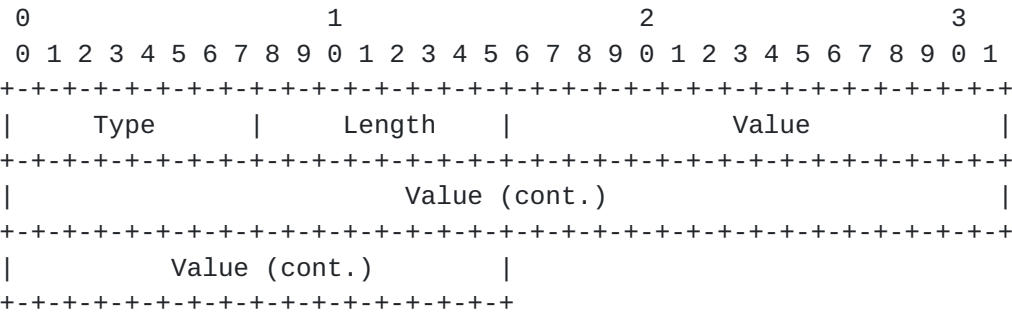
[Page 6]

4.2.2. Acct-Traffic-Statistics.Input-Octets

Description

This attribute indicates how many octets in IP layer have been received from the user from the starting of the service authorized. Note that IP layer is explicit here because this accounting attribute is definitely related to the IP service.

A summary of the Acct-Traffic-Statistics.Input-Octets attribute format is shown as below. The fields are transmitted from left to right.



Type

TBA.2 for Acct-Traffic-Statistics.Input-Octets (by IANA)

Length

10

Value

Integer64 data type in 8-Octet unsigned integer defined in [\[draft-ietf-radext-radius-extensions-06\]](#).

4.2.3. Acct-Traffic-Statistics.Output-Octets

Description

This attribute indicates how many octets in IP layer sent to the user from the starting of the service authorized.

A summary of the Acct-Traffic-Statistics.Output-Octets attribute format is shown as below. The fields are transmitted from left to right.

Yeh

Expires January 10, 2013

[Page 7]

```

      0                   1                   2                   3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Type   |   Length   |                               Value   |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                               Value (cont.)                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                               Value (cont.)                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type

TBA.3 for Acct-Traffic-Statistics.Output-Octets (by IANA)

Length

10

Value

Integer64 data type in 8-Octet unsigned integer defined in
[\[draft-ietf-radext-radius-extensions-06\]](#).

4.2.4. Acct-Traffic-Statistics.Input-Packets

Description

This attribute indicates how many packets in IP layer received from the user from the starting of the service authorized.

A summary of the Acct-Traffic-Statistics.Input-Packets attribute format is shown as below. The fields are transmitted from left to right.

```

      0                   1                   2                   3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Type   |   Length   |                               Value   |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                               Value (cont.)                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                               Value (cont.)                     |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type

Yeh

Expires January 10, 2013

[Page 8]

TBA.4 for Acct-Traffic-Statistics.Input-Packets (by IANA)

Length

10

Value

Integer64 data type in 8-Octet unsigned integer defined in [\[draft-ietf-radext-radius-extensions-06\]](#).

4.2.5. Acct-Traffic-Statistics.Output-Packets

Description

This attribute indicates how many packets in IP layer sent to the user from the starting of the service authorized.

A summary of the Acct-Traffic-Statistics.Output-Packets attribute format is shown as below. The fields are transmitted from left to right.

```

      0               1               2               3
    0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|      Type      |      Length      |      Value      |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|                                     Value (cont.)      |
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|      Value (cont.)      |
+---+---+---+---+---+---+---+---+---+---+---+---+

```

Type

TBA.5 for Acct-Traffic-Statistics.Output-Packets (by IANA)

Length

10

Value

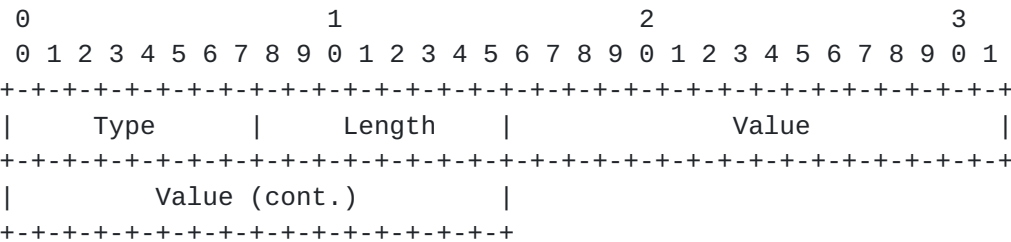
Integer64 data type in 8-Octet unsigned integer defined in [\[draft-ietf-radext-radius-extensions-06\]](#).

4.2.6. Acct-Traffic-Statistics.DSCP-Type

Description

The sub-attribute of Acct-Traffic-Statistics.DSCP-Type indicates the DSCP type of the separated or combined IPv4 and IPv6 traffic.

A summary of the Acct-Traffic-Statistics.DSCP-Type attribute format is shown as below. The fields are transmitted from left to right.



Type

TBA.6 for Acct-Traffic-Statistics.DSCP-Type (by IANA)

Length

6

Value

Enumerated Data Type in 4-Octet unsigned integer defined in [RFC6158]. The beginning 3 Octets are reserved for future use, and are set to 0x00 now. The last 6 bits of the last octet is used to contain the DSCP value as per [RFC2474]

5. Table of Attribute

The following table provides a guide to which attributes may be found in which kinds of packets, and in what quantity.

Req-uest	Acc-ept	Rej-ect	Chall-enge	Accounting # Request	Attribute
0	0	0	0	0-1 TBA	Acct-Traffic-Statistics

The meaning of the above table entries is as follows:

Yeh

Expires January 10, 2013

[Page 10]

- 0 This attribute MUST NOT be present.
- 0+ Zero or more instances of this attribute MAY be present.
- 0-1 Zero or one instance of this attribute MAY be present.
- 1 Exactly one instance of this attribute MUST be present.
- 1+ One or more of these attributes MUST be present.

6. Diameter Considerations

Given that the Attributes defined in this document are allocated from the RADIUS extended type space, no special handling is required by Diameter entities.

7. Security Considerations

Known security vulnerabilities of the RADIUS protocol may apply to its attributes. Security issues related RADIUS are described in [section 8 of \[RFC2865\]](#), [section 5 of \[RFC3162\]](#).

8. IANA Considerations

The authors of this document request to assign new Radius type codes for Acct-Traffic-Statistics and its following sub-attributes.

Acct-Traffic-Statistics.Stack-Type
Acct-Traffic-Statistics.Input-Octets
Acct-Traffic-Statistics.Output-Octets
Acct-Traffic-Statistics.Input-Packets
Acct-Traffic-Statistics.Output-Packets
Acct-Traffic-Statistics.DSCP-Type

These type codes should be allocated from the RADIUS extended type space based on section 10 of [\[draft-ietf-radext-radius-extensions-06\]](#) and "IETF Review" policy [\[RFC5226\]](#).

9. Acknowledgements

Thanks to Roberta Maglione, Jie Hu for their efforts in the history to bring this problem to IETF, Stefan Winter for his effort to introduce TLV in the attribute design, and Alan DeKok, Peter Deacon for their valuable comments in the mailing list of Radext.

10. References

Yeh

Expires January 10, 2013

[Page 11]

10.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2474] Nichols, K., Blake, S., Baker, F., and D. Black, "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers", [RFC 2474](#), December 1998.
- [RFC2865] Rigney, C., Willens, S., Rubens, A., and W. Simpson, "Remote Authentication Dial In User Service (RADIUS)", [RFC 2865](#), June 2000.
- [RFC2866] Rigney, C., "RADIUS Accounting", [RFC 2866](#), June 2000.
- [RFC2869] Rigney, C., Willats, W., and P. Calhoun, "RADIUS Extensions", [RFC 2869](#), June 2000.
- [RFC3162] Aboba, B., Zorn, G., and D. Mitton, "RADIUS and IPv6", [RFC 3162](#), August 2001.
- [RFC3575] Aboba, B., "IANA Considerations for RADIUS (Remote Authentication Dial In User Service)", [RFC 3575](#), July 2003.
- [RFC4818] Salowey, J. and R. Droms, "RADIUS Delegated-IPv6-Prefix Attribute", [RFC 4818](#), April 2007.
- [RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 5226](#), May 2008.
- [[draft-ietf-radext-radius-extensions-06](#)] DeKok, A. and A. Lior, "Remote Authentication Dial In User Service (RADIUS) Protocol Extensions", Apr. 2012.

10.2. Informative References

- [BBF TR-187] Broadband Forum, "IPv6 for PPP Broadband Access, Issue 1", May 2010.
- [RFC6158] DeKok, A. and G. Weber, "RADIUS Design Guidelines", [BCP 158](#), [RFC 6158](#), March 2011.
- [[draft-hu-v6ops-radius-issues-ipv6-00](#)] Hu, J., Yan, L., Wang, Q., and J. Qin, "RADIUS issues in

Yeh

Expires January 10, 2013

[Page 12]

IPv6 deployments", February 2011.

[[draft-maglione-radext-ipv6-acct-extensions-01](#)]

Maglione, R., Krishnan, S., Kavanagh, A., Varga, B., and J. Kaippallimalil, "RADIUS Accounting Extensions for IPv6", January 2011.

[[draft-winter-radext-fancyaccounting-00](#)]

Winter, S., "RADIUS Accounting for traffic classes", March 2011.

[[draft-yeh-radext-dual-stack-access-02](#)]

Yeh, L. and T. Tsou, "RADIUS Attributes for Dual Stack Access", March 2011.

[[ietf-radext-ipv6-access-09](#)]

Lourdelet, B., Dec, W., Sarikaya, B., Zorn, G., and D. Miles, "RADIUS attributes for IPv6 Access Networks", May 2012.

Author's Address

Leaf Y. Yeh
Huawei Technologies
Shenzhen
P. R. China

Email: leaf.y.yeh@huawei.com

Yeh

Expires January 10, 2013

[Page 13]