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RADIUS Accounting Extensions for IPv6  
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## Abstract

This document describes additional RADIUS attributes to be used for collecting IPv6 statistics in RADIUS Accounting messages.

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## 1. Introduction

[[RFC2866](#)] and [[RFC2869](#)] specify RADIUS attributes to be used for carrying statistics regarding how many packets/octets/Gigawords have been sent/received over a port while delivering the service.

With the introduction of the IPv6 in broadband environment there is a need to be able to collect IPv6 specific statistics, thus new RADIUS attribute have to be defined. This document describes additional RADIUS attributes for collecting IPv6 specific statistics in RADIUS Accounting messages.

## 2. Terminology

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](#)].

## 3. Deployment Scenarios

There are deployment scenarios, like for example dual-stack environments, where the Service Provider may need to collect separate statistics for IPv6 traffic. This may be used in order to differentiate among multiple service offers or to monitor the growth of IPv6 traffic in the network, compared to IPv4.

Existing RADIUS attributes like Acct-Input-Octets, Acct-Output-

Octets, Acct-Input-Packets, Acct-Output-Packets, Acct-Input-Gigawords and Acct-Output-Gigawords, could be used to collect statistics for all traffic(including IPv4, IPv6 and other protocols), while the availability of IPv6 specific RADIUS attributes would allow the collection of IPv6 statistics.

## [4.](#) Operation

### [4.1.](#) Sending Accounting-Request packets

Accounting-Request packets are sent from a client (typically a Network Access Server or its proxy) to a RADIUS accounting server, and convey information used to provide accounting for a service provided to a user. The client transmits a RADIUS packet with the Code field set to 4 (Accounting-Request).

If the Accounting-Request packet includes a Framed-IPv6-Prefix, that attribute MUST contain the IPv6 prefix allocated to the user. In

deployment scenarios where DHCPv6 prefix delegation is used, the Accounting-Request packet will contain a Delegated-IPv6-Prefix attribute that contains the IPv6 prefix delegated to the user.

## [5.](#) Attributes

This section defines six new RADIUS attributes for IPv6 statistics. These attributes correspond to the generic protocol-independent attributes Acct-Input-Octets, Acct-Output-Octets, Acct-Input-Packets, Acct-Output-Packets, Acct-Input-Gigawords and Acct-Output-Gigawords as defined in [[RFC2866](#)][RFC2869].

### [5.1.](#) IPv6-Acct-Input-Octets

#### Description

This attribute indicates how many IPv6 octets have been received from the port over the course of this service being provided, and can only be present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Input-Octets attribute format is shown 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)																																							

Type

TBA1 for IPv6-Acct-Input-Octets.

Length

6

Value

The Value field is four octets.

## 5.2. IPv6-Acct-Output-Octets

Description

This attribute indicates how many IPv6 octets have been sent to the port in the course of delivering this service, and can only be

present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Output-Octets attribute format is shown 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)																																							

Type

TBA2 for IPv6-Acct-Output-Octets.  
 Length  
 6

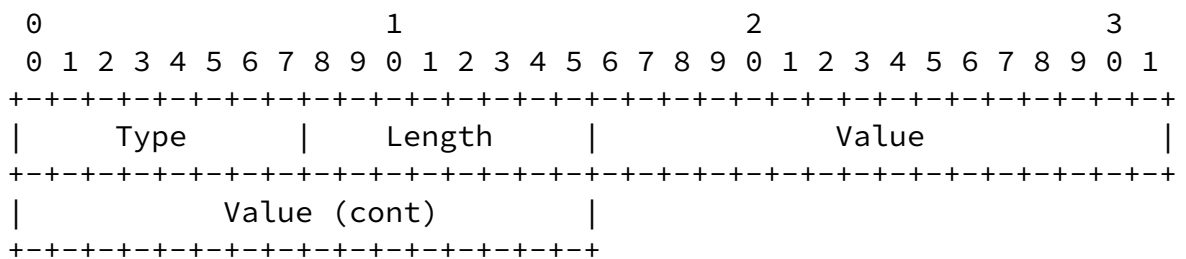
Value  
 The Value field is four octets.

### 5.3. IPv6-Acct-Input-Packets

#### Description

This attribute indicates how many IPv6 packets have been received from the port over the course of this service being provided to a Framed User, and can only be present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Input-Packets attribute format is shown below. The fields are transmitted from left to right.



#### Type

TBA3 for IPv6-Acct-Input-Packets.  
 Length

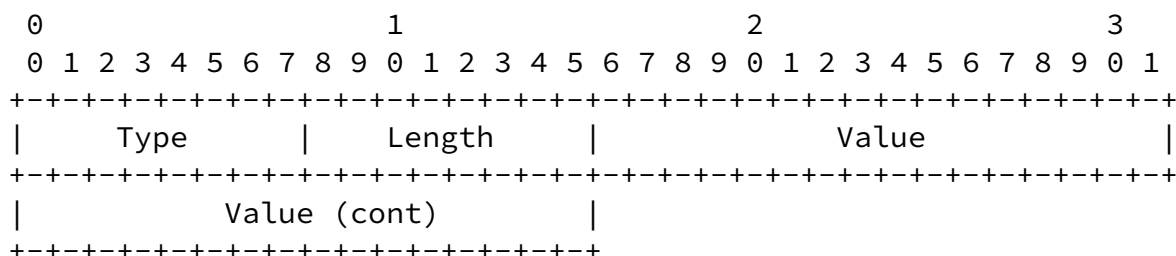
Value  
 The Value field is four octets.

### 5.4. IPv6-Acct-Output-Packets

#### Description

This attribute indicates how many IPv6 packets have been sent to the port in the course of delivering this service to a Framed User, and can only be present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Output-Packets attribute format is shown below. The fields are transmitted from left to right.



Type

TBA4 for IPv6-Acct-Output-Packets.

Length

6

Value

The Value field is four octets.

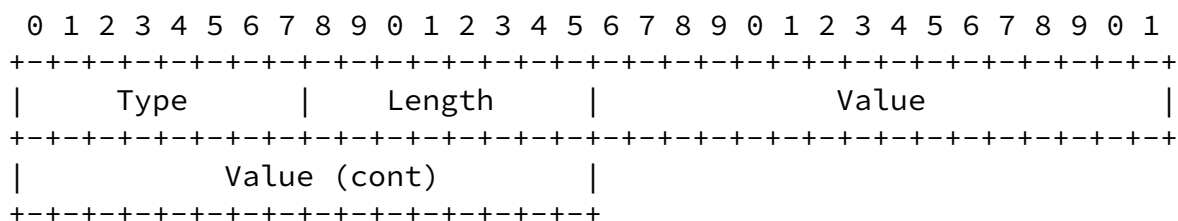
## 5.5. IPv6-Acct-Input-Gigawords

Description

This attribute indicates how many times the IPv6-Acct-Input-Octets counter has wrapped around  $2^{32}$  over the course of this service being provided, and can only be present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Input-Gigawords attribute format is shown below. The fields are transmitted from left to right.





Type

TBA5 for IPv6-Acct-Input-Gigawords.

Length

6

Value

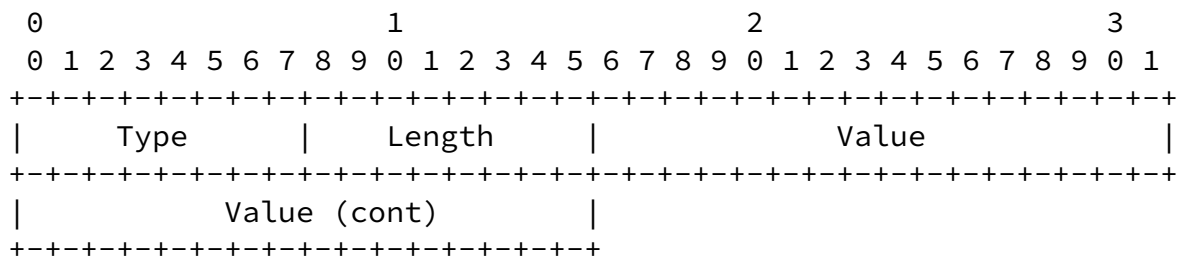
The Value field is four octets.

5.6. IPv6-Acct-Output-Gigawords

Description

This attribute indicates how many times the IPv6-Acct-Output-Octets counter has wrapped around 2^32 in the course of delivering this service, and can only be present in Accounting-Request records where the Acct-Status-Type is set to Stop or Interim-Update.

A summary of the IPv6-Acct-Output-Gigawords attribute format is shown below. The fields are transmitted from left to right.



Type

TBA6 for IPv6-Acct-Output-Gigawords.

Length

6

Value

The Value field is four octets.

## 6. Security Considerations

This document has no additional security considerations beyond those already identified in [[RFC2865](#)]

## 7. IANA Considerations

This document requests the allocation of six new Radius attribute types from the IANA registry "Radius Attribute Types" located at <http://www.iana.org/assignments/radius-types>

IPv6-Acct-Input-Octets - TBA1  
IPv6-Acct-Output-Octets - TBA2  
IPv6-Acct-Input-Packets - TBA3  
IPv6-Acct-Output-Packets - TBA4  
IPv6-Acct-Input-Gigawords - TBA5  
IPv6-Acct-Output-Gigawords - TBA6

## 8. References

### 8.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [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.

### 8.2. Informative References

- [RFC2869] Rigney, C., Willats, W., and P. Calhoun, "RADIUS Extensions", [RFC 2869](#), June 2000.

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