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## RADIUS Filter Rule Attribute

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### Abstract

This document defines the NAS-Filter-Rule attribute within the Remote Authentication Dial In User Service (RADIUS), equivalent to the Diameter NAS-Filter-Rule AVP described in [RFC 4005](#).

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## 1. Introduction

This document defines the NAS-Filter-Rule attribute within the Remote Authentication Dialin User Service (RADIUS) which has the same functionality as the Diameter NAS-Filter-Rule AVP (400) defined in [\[RFC4005\] Section 6.6](#). This attribute may prove useful for provisioning of filter rules.

While [\[RFC2865\] Section 5.11](#) defines the Filter-Id attribute (11), this requires that the NAS be pre-populated with the desired filters. However, in situations where the server operator does not know which filters have been pre-populated, it useful to specify filter rules explicitly.

### 1.1. Terminology

This document uses the following terms:

#### Network Access Server (NAS)

A device that provides an access service for a user to a network.

#### RADIUS server

A RADIUS authentication server is an entity that provides an authentication service to a NAS.

#### RADIUS proxy

A RADIUS proxy acts as an authentication server to the NAS, and a RADIUS client to the RADIUS server.

### 1.2. 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 [\[RFC2119\]](#).

### 1.3. Attribute Interpretation

If a NAS conforming to this specification receives an Access-Accept packet containing a NAS-Filter-Rule attribute which it cannot apply, it MUST act as though it had received an Access-Reject. [RFC3576] requires that a NAS receiving a Change of Authorization Request (CoA-Request) reply with a CoA-NAK if the Request contains an unsupported attribute. It is recommended that an Error-Cause attribute with value set to "Unsupported Attribute" (401) be included in the CoA-NAK. As noted in [RFC3576], authorization changes are atomic so that this situation does not result in session termination and the pre-existing configuration remains unchanged. As a result, no accounting packets should be generated.

## 2. NAS-Filter-Rule Attribute

### Description

This attribute indicates filter rules to be applied for this user. Zero or more NAS-Filter-Rule attributes MAY be sent in Access-Accept, CoA-Request, or Accounting-Request packets.

The NAS-Filter-Rule attribute is not intended to be used concurrently with any other filter rule attribute, including Filter-Id (11) and NAS-Traffic-Rule [Traffic] attributes, and MUST NOT appear in the same RADIUS packet. If a Filter-Id or NAS-Traffic-Rule attribute is present, then implementations of this specification MUST silently discard NAS-Filter-Rule attributes, if present.

Where multiple NAS-Filter-Rule attributes are included in a RADIUS packet, the String field of the attributes are to be concatenated to form a set of filter rules. As noted in [RFC2865] Section 2.3, "the forwarding server MUST NOT change the order of any attributes of the same type", so that RADIUS proxies will not reorder NAS-Filter-Rule attributes.

A summary of the NAS-Filter-Rule 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	String...
TBD	>=3	

Type

TBD

Length

>=3

String

The String field is one or more octets. It contains filter rules in the IPFilterRule syntax defined in [\[RFC3588\] Section 4.3](#), with individual filter rules separated by a NUL (0x00). A NAS-Filter-Rule attribute may contain a partial rule, one rule, or more than one rule. Filter rules may be continued across attribute boundaries, so implementations cannot assume that individual

filter rules begin or end on attribute boundaries.

The set of NAS-Filter-Rule attributes SHOULD be created by concatenating the individual filter rules, separated by a NUL (0x00) octet. The resulting data should be split on 253 byte boundaries to obtain a set of NAS-Filter-Rule attributes. On reception, the individual filter rules SHOULD be determined by concatenating the contents of all NAS-Filter-Rule attributes, and then splitting individual filter rules with the the NUL octet (0x00) as a delimiter.

### 3. Table of Attributes

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

Access-Request	Access-Accept	Access-Reject	Access-Challenge	CoA-Req	Acct-Req	#	Attribute
0	0+	0	0	0+	0+	TBD	NAS-Filter-Rule

The following table defines the meaning of the above table entries.

- 0 This attribute MUST NOT be present in the packet.
- 0+ Zero or more instances of this attribute MAY be present in the packet.
- 0-1 Zero or one instance of this attribute MAY be present in the packet.

#### 4. Diameter Considerations

[RFC4005] [Section 6.6](#) defines the NAS-Filter-Rule AVP (400) with the same functionality as the RADIUS NAS-Filter-Rule attribute. In order to support interoperability, Diameter/RADIUS gateways will need to be configured to translate RADIUS attribute TBD to Diameter AVP 400 and vice-versa.

Where a Diameter NAS-Filter-Rule AVP contains a filter rule larger than 253 octets, Diameter/RADIUS gateways translate the AVP to multiple RADIUS NAS-Filter-Rule attributes, with each filter rule separated by a NUL octet (0x00). When multiple RADIUS NAS-Filter-Rule attributes are received, the String fields of the attributes are concatenated and the individual rules are separated out based on the use of the NUL octet as a delimiter. Each rule is then encoded as a single Diameter NAS-Filter-Rule AVP.

Note that a translated Diameter message can be larger than the maximum RADIUS packet size (4096). Where a Diameter/RADIUS gateway receives a Diameter message containing a NAS-Filter-Rule AVP that is

too large to fit into a RADIUS packet, the Diameter/RADIUS gateway will respond to the originating Diameter peer with the DIAMETER\_INVALID\_AVP\_LENGTH error (5014), and with a Failed-AVP AVP containing the NAS-Filter-Rule AVP. Since repairing the error will probably require re-working the filter rules, the originating peer should treat the combination of a DIAMETER\_INVALID\_AVP\_LENGTH error and a Failed-AVP AVP containing a NAS-Filter-Rule AVP as a terminal error.

#### 5. IANA Considerations

This specification does not create any new registries.

This document uses the RADIUS [\[RFC2865\]](#) namespace, see <http://www.iana.org/assignments/radius-types>. Allocation of one

update for the section "RADIUS Attribute Types" is requested. The RADIUS attribute for which a value is requested is:

TBD - NAS-Filter-Rule

## 6. Security Considerations

This specification describes the use of RADIUS for purposes of authentication, authorization and accounting. Threats and security issues for this application are described in [[RFC3579](#)] and [[RFC3580](#)]; security issues encountered in roaming are described in [[RFC2607](#)].

This document specifies a new attribute that can be included in existing RADIUS packets, which are protected as described in [[RFC3579](#)] and [[RFC3576](#)]. See those documents for a more detailed description.

A NAS-Filter-Rule attribute sent by a RADIUS server may not be understood by the NAS which receives it. A legacy NAS not compliant with this specification may silently discard the NAS-Filter-Rule attribute while permitting the user to access the network. This can lead to users improperly receiving unfiltered access to the network. As a result, the NAS-Filter-Rule attribute SHOULD only be sent to a NAS that is known to support it.

## 7. References

### 7.1. Normative references

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#### Open issues

Open issues relating to this specification are tracked on the following web site:

<http://www.drizzle.com/~aboba/RADEXT/>

