

## 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.



Where a single filter rule is less than or equal to 252 octets in length, it MUST be encoded with a Tag field value of zero (0) and MUST NOT be split between multiple NAS-Filter-Rule attributes. On



receipt, attributes with a Tag field value of zero (0) MUST NOT be concatenated to form a single filter rule.

Where a single filter rule exceeds 252 octets in length, the rule MUST be encoded across multiple NAS-Filter-Rule attributes, each with the same Tag value which MUST be in the range 0x01 - 0x3F.

NAS-Filter-Rule attributes comprising a single filter rule MUST be sent consecutively, without intervening attributes with another Tag field value. The Tag field value of 0xFF is reserved and NAS-Filter-Rule attributes containing this Tag field value should be ignored upon receipt.

Adjacent filter rules exceeding 252 octets in length MUST be encoded with different non-zero Tag field values; however, the Tag field value used for a given filter rule need not be unique within the entire RADIUS packet.

#### String

The String field is one or more octets. It contains filter rules in the IPFilterRule syntax defined in [\[RFC3588\] Section 4.3](#). A robust implementation SHOULD support the field as undistinguished octets.

### 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 252 octets, Diameter/RADIUS gateways translate the AVP to multiple RADIUS NAS-Filter-Rule attributes, each with the same Tag field value not equal to '0' (0x30). Similarly, when multiple RADIUS NAS-Filter-Rule attributes are received with the same Tag field value not equal to '0' (0x30), the String fields of the attributes are concatenated together and encoded as the value in a single Diameter NAS-Filter-Rule AVP. RADIUS NAS-Filter-Rule attributes with a Tag field of '0' (0x30) are encoded as distinct Diameter NAS-Filter-Rule AVPs.

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**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), March, 1997.
- [RFC2865] Rigney, C., Rubens, A., Simpson, W. and S. Willens, "Remote Authentication Dial In User Service (RADIUS)", [RFC 2865](#), June 2000.
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- [RFC3629] Yergeau, F., "UTF-8, a transformation of ISO 10646", [RFC 3629](#), November 2003.
- [RFC4005] Calhoun, P., Zorn, G., Spence, D. and D. Mitton, "Diameter Network Access Server Application", [RFC 4005](#), August 2005.

### **7.2. Informative references**

- [RFC2607] Aboba, B. and J. Vollbrecht, "Proxy Chaining and Policy Implementation in Roaming", [RFC 2607](#), June 1999.
- [RFC3576] Chiba, M., Dommetry, G., Eklund, M., Mitton, D. and B. Aboba, "Dynamic Authorization Extensions to Remote Authentication Dial In User Service (RADIUS)", [RFC 3576](#), July 2003.
- [RFC3579] Aboba, B. and P. Calhoun, "RADIUS Support for Extensible Authentication Protocol (EAP)", [RFC 3579](#), September 2003.
- [RFC3580] Congdon, P., Aboba, B., Smith, A., Zorn, G., Roese, J., "IEEE 802.1X Remote Authentication Dial In User Service (RADIUS) Usage Guidelines", [RFC3580](#), September 2003.
- [Traffic] Congdon, P., Sanchez, M., Lior, A., Adrangi, F. and B. Aboba, "Filter Attributes", Internet draft (work in progress), [draft-ietf-radext-filter-rules-00.txt](#), February 2006.

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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/>

