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B. Aboba  
Microsoft  
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IANA Considerations for RADIUS  
(Remote Authentication Dial In User Service)

Status of this Memo

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Abstract

This document describes the IANA considerations for the Remote Authentication Dial In User Service (RADIUS).

This document updates RFC 2865.

1. Introduction

This document provides guidance to the Internet Assigned Numbers Authority (IANA) regarding registration of values related to the Remote Authentication Dial In User Service (RADIUS), defined in [RFC2865], in accordance with BCP 26, [RFC2434]. It also reserves Packet Type Codes that are or have been in use on the Internet.

1.1. Specification of Requirements

In this document, several words are used to signify the requirements of the specification. These words are often capitalized. 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].

## 1.2. Terminology

The following terms are used here with the meanings defined in BCP 26: "name space", "assigned value", "registration".

The following policies are used here with the meanings defined in BCP 26: "Private Use", "First Come First Served", "Expert Review", "Specification Required", "IESG Approval", "IETF Consensus", "Standards Action".

## 2. IANA Considerations

There are three name spaces in RADIUS that require registration: Packet Type Codes, Attribute Types, and Attribute Values (for certain Attributes). This document creates no new IANA registries, since a RADIUS registry was created by [RFC2865].

RADIUS is not intended as a general-purpose protocol, and allocations SHOULD NOT be made for purposes unrelated to Authentication, Authorization or Accounting.

### 2.1. Recommended Registration Policies

For registration requests where a Designated Expert should be consulted, the responsible IESG area director should appoint the Designated Expert. The intention is that any allocation will be accompanied by a published RFC. However, the Designated Expert can approve allocations once it seems clear that an RFC will be published, allowing for the allocation of values prior to the document being approved for publication as an RFC. The Designated Expert will post a request to the AAA WG mailing list (or a successor designated by the Area Director) for comment and review, including an Internet-Draft. Before a period of 30 days has passed, the Designated Expert will either approve or deny the registration request, publish a notice of the decision to the AAA WG mailing list or its successor, and inform IANA of its decision. A denial notice must be justified by an explanation and, in the cases where it is possible, concrete suggestions on how the request can be modified so as to become acceptable.

Packet Type Codes have a range from 1 to 253. RADIUS Type Codes 1-5 and 11-13 were allocated in [RFC2865], while Type Codes 40-45, 250-253 are allocated by this document. Type Codes 250-253 are allocated for Experimental Uses, and 254-255 are reserved. Packet Type Codes 6-10, 12-13, 21-34, 50-51 have no meaning defined by an IETF RFC, but are reserved until a specification is provided for them. This is being done to avoid interoperability problems with software that implements non-standard RADIUS extensions that are or

have been in use on the Internet. Because a new Packet Type has considerable impact on interoperability, a new Packet Type Code requires IESG Approval. The intention is that any allocation will be accompanied by a published RFC. Type Codes 52-249 should be allocated first; when these are exhausted, Type Codes 14-20, 35-39, 46-49 may be allocated. For a list of Type Codes, see Appendix A.

Attribute Types have a range from 1 to 255, and are the scarcest resource in RADIUS, thus must be allocated with care. Attributes 1-53, 55, 60-88, 90-91, 94-100 have been allocated, with 17 and 21 available for re-use. Attributes 17, 21, 54, 56-59, 89, 101-191 may be allocated by IETF Consensus. It is recommended that attributes 17 and 21 be used only after all others are exhausted.

Note that RADIUS defines a mechanism for Vendor-Specific extensions (Attribute 26) for functions specific only to one vendor's implementation of RADIUS, where no interoperability is deemed useful. For functions specific only to one vendor's implementation of RADIUS, the use of that should be encouraged instead of the allocation of global attribute types.

As noted in [RFC2865]:

Attribute Type Values 192-223 are reserved for experimental use, values 224-240 are reserved for implementation-specific use, and values 241-255 are reserved and should not be used.

Therefore Attribute Type values 192-240 are considered Private Use, and values 241-255 require Standards Action.

Certain attributes (for example, NAS-Port-Type) in RADIUS define a list of values to correspond with various meanings. There can be 4 billion ( $2^{32}$ ) values for each attribute. Additional values can be allocated by the Designated Expert. The exception to this policy is the Service-Type attribute (6), whose values define new modes of operation for RADIUS. Values 1-16 of the Service-Type attribute have been allocated. Allocation of new Service-Type values are by IETF Consensus. The intention is that any allocation will be accompanied by a published RFC.

### 3. References

#### 3.1. Normative References

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

- [RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.
- [RFC2865] Rigney, C., Willens, S., Rubens, A. and W. Simpson, "Remote Authentication Dial In User Service (RADIUS)", RFC 2865, June 2000.

### 3.2. Informative References

- [RFC2607] Aboba, B. and J. Vollbrecht, "Proxy Chaining and Policy Implementation in Roaming", RFC 2607, June 1999.
- [RFC2866] Rigney, C., "RADIUS Accounting", RFC 2866, June 2000.
- [RFC2867] Zorn, G., Aboba, B. and D. Mitton, "RADIUS Accounting Modifications for Tunnel Protocol Support", RFC 2867, June 2000.
- [RFC2868] Zorn, G., Leifer, D., Rubens, A., Shriver, J., Holdrege, M. and I. Goyret, "RADIUS Attributes for Tunnel Protocol Support", RFC 2868, June 2000.
- [RFC2869] Rigney, C., Willats, W. and P. Calhoun, "RADIUS Extensions", RFC 2869, June 2000.
- [RFC2869bis] Aboba, B. and P. Calhoun, "RADIUS Support for Extensible Authentication Protocol (EAP)", Work in Progress.
- [RFC2882] Mitton, D., "Network Access Servers Requirements: Extended RADIUS Practices", RFC 2882, July 2000.
- [RFC3162] Aboba, B., Zorn, G. and D. Mitton, "RADIUS and IPv6", RFC 3162, August 2001.
- [DynAuth] Chiba, M., Dommety, G., Eklund, M., Mitton, D. and B. Aboba, "Dynamic Authorization Extensions to Remote Authentication Dial In User Service (RADIUS)", RFC 3576, July 2003.

### 4. Security Considerations

The security considerations detailed in [RFC2434] are generally applicable to this document. Security considerations relating to the RADIUS protocol are discussed in [RFC2607], [RFC2865], [RFC3162], [DynAuth], and [RFC2869bis].

## Appendix A - RADIUS Packet Types

A list of RADIUS Packet Type Codes is given below. This document instructs IANA to list them in the registry of Packet Type Codes. Note that Type Codes 40-45, defined in [DynAuth], are being formally allocated here. Codes 40-45 were listed in [RFC2882] and have been implemented and used. Given their current widespread usage, these assignments are not reclaimable in practice.

#	Message	Reference
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1	Access-Request	[RFC2865]
2	Access-Accept	[RFC2865]
3	Access-Reject	[RFC2865]
4	Accounting-Request	[RFC2865]
5	Accounting-Response	[RFC2865]
6	Accounting-Status (now Interim Accounting)	[RFC2882]
7	Password-Request	[RFC2882]
8	Password-Ack	[RFC2882]
9	Password-Reject	[RFC2882]
10	Accounting-Message	[RFC2882]
11	Access-Challenge	[RFC2865]
12	Status-Server (experimental)	[RFC2865]
13	Status-Client (experimental)	[RFC2865]
21	Resource-Free-Request	[RFC2882]
22	Resource-Free-Response	[RFC2882]
23	Resource-Query-Request	[RFC2882]
24	Resource-Query-Response	[RFC2882]
25	Alternate-Resource- Reclaim-Request	[RFC2882]
26	NAS-Reboot-Request	[RFC2882]
27	NAS-Reboot-Response	[RFC2882]
28	Reserved	
29	Next-Passcode	[RFC2882]

#	Message	Reference
30	New-Pin	[RFC2882]
31	Terminate-Session	[RFC2882]
32	Password-Expired	[RFC2882]
33	Event-Request	[RFC2882]
34	Event-Response	[RFC2882]
40	Disconnect-Request	[DynAuth]
41	Disconnect-ACK	[DynAuth]
42	Disconnect-NAK	[DynAuth]
43	CoA-Request	[DynAuth]
44	CoA-ACK	[DynAuth]
45	CoA-NAK	[DynAuth]
50	IP-Address-Allocate	[RFC2882]
51	IP-Address-Release	[RFC2882]
250-253	Experimental Use	
254	Reserved	
255	Reserved	[RFC2865]

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## Authors' Addresses

Bernard Aboba  
Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052

EMail: [bernarda@microsoft.com](mailto:bernarda@microsoft.com)  
Phone: +1 425 706 6605  
Fax: +1 425 936 7329

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