DHC Working Group
Internet-Draft
Intended status: Standards Track
Expires: January 31, 2013

L. Yeh, Ed.
Huawei Technologies
M. Boucadair
France Telecom
T. Lemon
Nominum, Inc

July 30, 2012

RADIUS Option for DHCPv6 Relay Agents on Broadband Access Server
draft-ietf-dhc-dhcpv6-radius-opt-01

Abstract

The DHCPv6 RADIUS option provides a communication mechanism between relay agent and the server. This mechanism can help the centralized DHCPv6 server to select the right configuration for the client based on the authorization information received from a separate RADIUS server which is not located at the same place of DHCPv6 server in the cases where the NAS acts as DHCPv6 relay agent and RADIUS client simultaneously.

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 31, 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 Language 3
3. Network Scenarios 4
4. OPTION_RADIUS 6
5. Relay Agent Behavior 6
6. Server Behavior 7
7. Client Behavior 7
8. Security Considerations 7
9. IANA Considerations 7
10. Acknowledgements 7
11. References 8
11.1. Normative References 8
11.2. Informative References 8
Authors' Addresses 8

1. Introduction

DHCPv6 provides a mechanism that allows the server to assign or delegate both stateful and stateless configuration parameters to the clients. The stateful configuration parameters include IPv6 address [RFC3315], IPv6 prefix [RFC3633], and etc. The stateless configuration parameters [RFC3736] include, for example, DNS [RFC3646]. The DHCPv6 server is typically deployed in the central part of an ISP network.

RADIUS [RFC2865], an essentially stateless protocol, is used widely as the centralized authentication, authorization and user management mechanism for the service provision in Broadband access network. [RFC3162], [RFC4818] and [ietf-radext-ipv6-access-10] specify attributes that supports the provision of service for IPv6 access. RADIUS authorizes the NAS to assign an IPv6 address or prefix from the indicated pool, or to assign an IPv6 address or prefix with an explicitly indicated value in the attributes for the subscribers.

These mechanisms work well in the deployment scenario where the NAS acts as the distributed DHCPv6 server. In this case the NAS responds as the indication conveyed by the attributes in the Access-Accept message from the RADIUS server. These mechanisms also work in the scenario where the centralized DHCPv6 server is co-located with the RADIUS server, where they can share the same database of the users. But when the NAS acts as the relay agent and RADIUS client simultaneously, and the centralized DHCPv6 server is not located in the same place as the RADIUS server, a new communication mechanism is needed for the relay agent to transfer the authorization information indicated by the RADIUS attributes to the DHCPv6 server.

2. Terminology and Language

This document specifies a DHCPv6 option for the distributed Relay Agent to transfer the authorization information of RADIUS attributes received in the Access-Accept message to the centralized DHCPv6 server. This document should be read in conjunction with the following specifications: [RFC2865], [RFC2869], [RFC3315] and [RFC4818]. These specifications will help the reader to understand how DHCPv6 and RADIUS work together to provide IPv6 service. Definitions for terms and acronyms not specified in this document are defined in [RFC2865], [RFC2869], [RFC3315] and [RFC4818].

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. Network Scenarios

Figure 1 and Figure 2 shows the typical network scenarios where the communication mechanism introduced in this document is necessary. In these scenarios, the centralized DHCPv6 server is not co-located with the RADIUS server, but both of them are in the same administrative domain. The NAS acts as the relay agent and the RADIUS client simultaneously. Figure 1 shows the sequence of DHCPv6 and RADIUS messages for IPoE access mode. Figure 2 shows the sequence of DHCPv6 and RADIUS messages for PPPoE access mode.

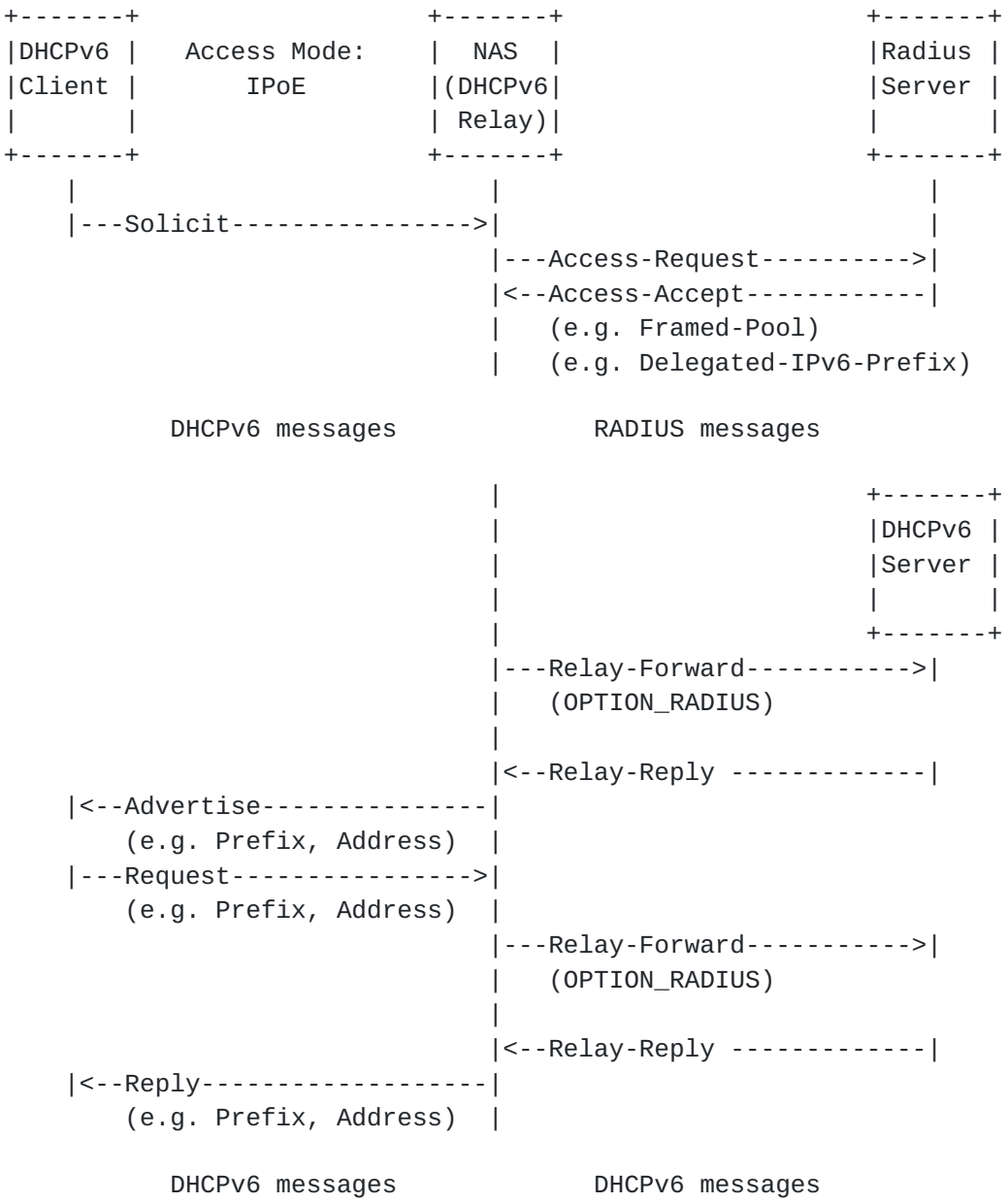


Figure 1: Network scenario and message sequence when employing DHCPv6

RADIUS option in IPoE access

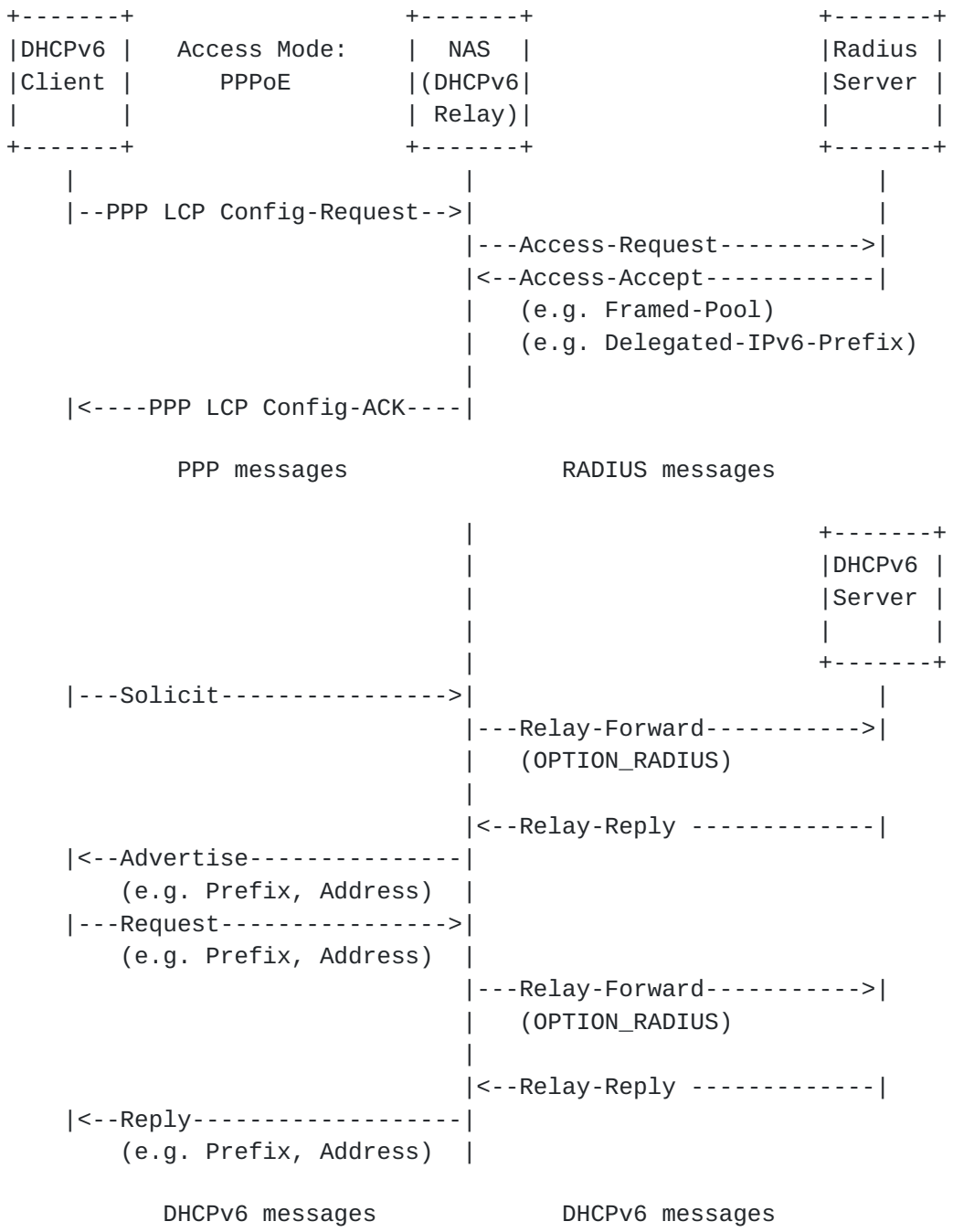


Figure 2: Network scenario and message sequence when employing DHCPv6 RADIUS option in PPPoE access

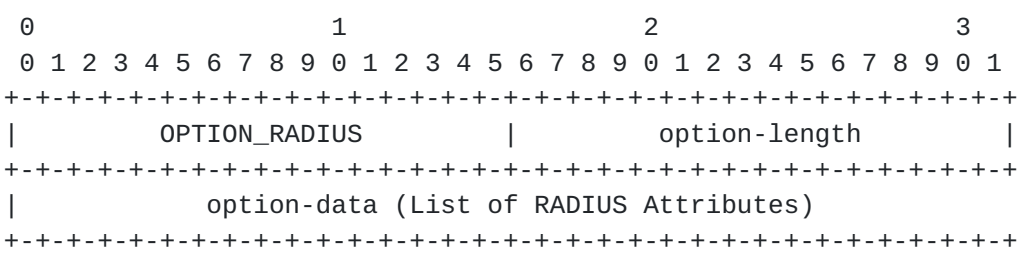
If the authorization through RADIUS fails, the associated message sequences will stop. The DHCPv6 relay will not forward the message

from the client to the server.

4. OPTION_RADIUS

The OPTION_RADIUS is a stateless DHCPv6 option, and is used by the relay agent to carry the authorization information of RADIUS attributes received in the Access-Accept message.

The format of the OPTION_RADIUS option is defined as follows:



option-code TBD
option-length Length of the option-data in Octets
option-data One or a list of RADIUS Attributes

The option-data of OPTION_RADIUS is one or a list of RADIUS attributes received in the Access-Accept message from the RADIUS server. As the same method in [RFC4014], only the attributes listed in the table below may be included in the OPTION_RADIUS.

Type Code	Attribute	Reference
26	Vendor-Specific	[RFC2865]
88	Framed-Pool	[RFC2869]
123	Delegated-IPv6-Prefix	[RFC4818]
[TBD]	Framed-IPv6-Address	[ietf-radext-ipv6-access-10]
[TBD]	Stateful-IPv6-Address-Pool	[ietf-radext-ipv6-access-10]
[TBD]	Delegated-IPv6-Prefix-Pool	[ietf-radext-ipv6-access-10]
[TBD]	DNS-Server-IPv6-Address	[ietf-radext-ipv6-access-10]

Note: The above table might have more attributes in the future.

5. Relay Agent Behavior

The DHCPv6 relay agent may include OPTION_RADIUS in the RELAY-FORW (12) message. When the value in the attributes of Framed-Pool (88) (or Stateful-IPv6-Address-Pool, Delegated-IPv6-Prefix-Pool), Delegated-IPv6-Prefix (123) and Framed-IPv6-Address in the Access-Accept message replied from RADIUS server are valid, the relay agent that supports OPTION_RADIUS SHOULD include these RADIUS attributes in

the container option, OPTION_RADIUS. The relay agent MUST ignore OPTION_RADIUS if received.

6. Server Behavior

Upon receipt of the RELAY-FORW message with OPTION_RADIUS from a relay agent, the DHCPv6 server SHOULD extract and interpret the RADIUS attributes in the OPTION_RADIUS, and use that information in selecting configuration parameters for the requesting client. If the DHCPv6 server does not support OPTION_RADIUS, the DHCPv6 server SHOULD ignore this option. The DHCPv6 server MUST NOT include OPTION_RADIUS in RELAY-REPL messages.

7. Client Behavior

OPTION_RADIUS option is only exchanged between the relay agents and the servers. DHCPv6 clients are not aware of the usage of OPTION_RADIUS. DHCPv6 Client MUST NOT send OPTION_RADIUS, and MUST ignore OPTION_RADIUS if received.

8. Security Considerations

Known security vulnerabilities of the DHCPv6 and RADIUS protocol may apply to its options. Security issues related with DHCPv6 are described in section 23 of [RFC3315]. Security issues related with RADIUS are described in section 8 of [RFC2865], section 5 of [RFC3162].

9. IANA Considerations

The authors of this document request to assign a new DHCPv6 option code for OPTION_RADIUS.

10. Acknowledgements

Expert comments from Bernie Volz and Tomek Mrugalski for the discussion on the technology selection in the mailing list are appreciated.

11. References

11.1. 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.

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

[RFC3315] Droms, R., Bound, J., Volz, B., Lemon, T., Perkins, C., and M. Carney, "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", RFC 3315, July 2003.

[RFC3736] Droms, R., "Stateless Dynamic Host Configuration Protocol (DHCP) Service for IPv6", RFC 3736, April 2004.

[RFC4014] Droms, R. and J. Schnizlein, "Remote Authentication Dial-In User Service (RADIUS) Attributes Suboption for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Information Option", RFC 4014, February 2005.

[RFC4818] Salowey, J. and R. Droms, "RADIUS Delegated-IPv6-Prefix Attribute", RFC 4818, April 2007.

11.2. Informative References

[RFC3162] Aboba, B., Zorn, G., and D. Mitton, "RADIUS and IPv6", RFC 3162, August 2001.

[RFC3633] Troan, O. and R. Droms, "IPv6 Prefix Options for Dynamic Host Configuration Protocol (DHCP) version 6", RFC 3633, December 2003.

[RFC3646] Droms, R., "DNS Configuration options for Dynamic Host Configuration Protocol for IPv6 (DHCPv6)", RFC 3646, December 2003.

[ietf-radext-ipv6-access-10] Lourdelet, B., Dec, W., Sarikaya, B., Zorn, G., and D. Miles, "RADIUS attributes for IPv6 Access Networks", July 2011.

Authors' Addresses

Leaf Y. Yeh (editor)
Huawei Technologies
P. R. China

Email: leaf.y.yeh@huawei.com

Mohamed Boucadair
France Telecom
France

Email: mohamed.boucadair@orange.com

Ted Lemon
Nominum, Inc
USA

Email: Ted.Lemon@nominum.com