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The EAP Re-authentication Protocol (ERP) Local Domain Name DHCPv6 Option

Abstract

In order to derive a Domain-Specific Root Key (DSRK) from the Extended Master Session Key (EMSK) generated as a side effect of an Extensible Authentication Protocol (EAP) method, the EAP peer must discover the name of the domain to which it is attached.

This document specifies a Dynamic Host Configuration Protocol Version 6 (DHCPv6) option designed to allow a DHCPv6 server to inform clients using the EAP Re-authentication Protocol (ERP) EAP method of the name of the local domain for ERP.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6440.

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1. Introduction

The EAP Re-authentication Protocol (ERP) [RFC5296] is designed to allow faster re-authentication of a mobile device that was previously authenticated by means of the Extensible Authentication Protocol [RFC3748]. Given that the local root key (e.g., a DSRK, as described in RFC 5295 [RFC5295]) is generated using the local domain name (LDN), LDN discovery is an important part of re-authentication. As described in RFC 5296 [RFC5296], the LDN to be used in ERP can be learned by the mobile device through the ERP exchange or via a lower-layer mechanism. However, no lower-layer mechanisms for LDN discovery have yet been defined.

This document specifies an extension to DHCPv6 for LDN to be used in ERP.

2. Terminology

2.1. Standards 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].

2.2. Acronyms

- FQDN: Fully Qualified Domain Name
- AAA: Authentication, Authorization, and Accounting
- DSRK: Domain-Specific Root Key

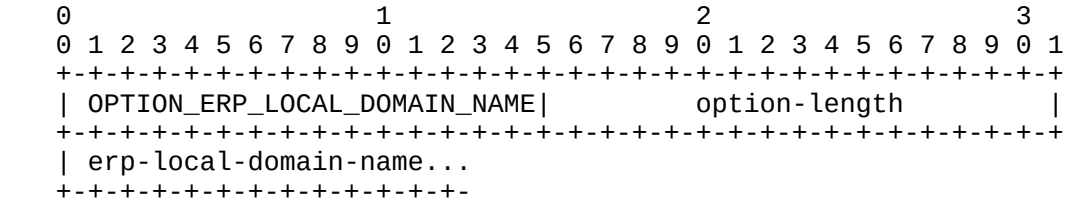
3. Option Format

In DHCPv6-based local domain name discovery, the LDN option is used by the DHCPv6 client to obtain the local domain name from the DHCPv6 server after full EAP authentication has taken place.

The contents of the ERP Local Domain Name option are intended only for use with ERP and do not represent the name of a local domain for any other purposes.

3.1. DHCPv6 ERP Local Domain Name Option

The format of this option is:



option code
OPTION_ERP_LOCAL_DOMAIN_NAME (65)

option-length
Length of the erp-local-domain-name field, in octets

erp-local-domain-name
This field contains the name of the local ERP domain and MUST be encoded as specified in Section 8 of RFC 3315 [RFC3315]. Note that this encoding does enable the use of internationalized domain names, but only as a set of A-labels [RFC5890].

4. Client Behavior

If a DHCPv6 client doesn't know the ERP LDN and requires the DHCPv6 server to provide the DHCPv6 ERP LDN option, it MUST include an Option Request option requesting the DHCPv6 ERP Local Domain Name option, as described in Section 22.7 of RFC 3315 [RFC3315].

When the DHCPv6 client receives an ERP Local Domain Name option with the ERP LDN present in it, it MUST verify that the option length is no more than 256 octets (the maximum length of a single fully qualified domain name (FQDN) allowed by the DNS), and that the local domain name is a properly encoded single FQDN, as specified in Section 8 of RFC 3315 ("Representation and Use of Domain Names") [RFC3315].

5. Relay Agent Behavior

If a DHCPv6 relay agent has pre-existing knowledge of the ERP local domain name for a client (for example, from a previous AAA exchange), it SHOULD include it in an instance of the DHCPv6 ERP Local Domain Name option and forward to the DHCPv6 server as a suboption of the Relay-Supplied Options option [RFC6422].

6. Security Considerations

The communication between the DHCPv6 client and the DHCPv6 server for the exchange of local domain name information is security sensitive and requires server authentication and integrity protection. DHCPv6 security as described in [RFC3315] can be used for this purpose.

7. IANA Considerations

IANA has added the name "OPTION_ERP_LOCAL_DOMAIN_NAME" to the registry titled "Options Permitted in the Relay-Supplied Options Option" maintained at http://www.iana.org/.

IANA has assigned one new option code to the registry titled "DHCP Option Codes" maintained at http://www.iana.org/, referencing this document.

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.

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

[RFC5295] Salowey, J., Dondeti, L., Narayanan, V., and M. Nakhjiri, "Specification for the Derivation of Root Keys from an Extended Master Session Key (EMSK)", RFC 5295, August 2008.

[RFC5296] Narayanan, V. and L. Dondeti, "EAP Extensions for EAP Re-authentication Protocol (ERP)", RFC 5296, August 2008.

[RFC6422] Lemon, T. and Q. Wu, "Relay-Supplied DHCP Options", RFC 6422, December 2011.

8.2. Informative References

[RFC3748] Aboba, B., Blunk, L., Vollbrecht, J., Carlson, J., and H. Levkowetz, Ed., "Extensible Authentication Protocol (EAP)", RFC 3748, June 2004.

[RFC5890] Klensin, J., "Internationalized Domain Names for Applications (IDNA): Definitions and Document Framework", RFC 5890, August 2010.

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