

Network Working Group

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Local Domain Name Option

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Abstract

This document defines the local domain name option for DHCPv4 and DHCPv6. This option is used by the Peer (DHCP client) to request local domain name described in [[RFC5296](#)] which is used to derive the local root key, e.g., DSRK defined in [[RFC5295](#)].

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1. Introduction

[RFC5295] defines the domain-specific root keys (DSRK) which can be used in the specific domain, e.g., local domain which the peer may be attached to. [RFC5296] introduces one re-authentication mechanism in which the local root key, e.g., DSRK is used to derive re-authentication key to re-authenticate the peer in the local domain where the peer is attached. Considering the local root key is generated based on the local domain name, the local domain name (LDN) discovery is one important part of re-authentication. If the peer does not know the local domain name, ERP exchange or lower-layer announcement mechanism is required as described in the [RFC5296]. However lower-layer announcement to obtain the local domain name is not specified.

This document defines a Local Domain Name (Sub-)Option for DHCPv4 and DHCPv6. It can be used by the Peer acting as DHCP client to obtain the local domain name.

If a DHCPv4 client involves in the local domain name discovery, then the DHCPv4 Local Domain Name Option defined in [section 3.1](#) or 3.2 should be included.

If a DHCPv6 client involves in the local domain name discovery, then the DHCPv6 Local Domain Name Option defined in [section 3.3](#) should be included.

2. Conventions used in this document

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](#) [RFC2119].

3. Local Domain Name Option

In general, the local domain name discovery is used to request local domain name. It happens after network access authentication. An

example of local domain name discovery is described in [Appendix A](#). In the local domain name discovery, the LDN option is used by the client (Peer) to obtain the local domain name from DHCP Server.

[3.1](#). DHCPv4 Local Domain Name Option

The format of the option is:

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```

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
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Code   |   Length   |   Local Domain Name ...
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Code: The option code (TBD).

Length: The option length, minimum 1 octet.

Local Domain Name: The local domain name MUST be encoded using the technique described in [section 3.1 of RFC1035](#) [[RFC1035](#)]. It MUST NOT be stored in compressed form, as described in [section 4.1.4 of RFC1035](#) [[RFC1035](#)].

[3.2](#). DHCPv4 Local Domain Name Sub-Option

It is a sub-option of the relay-agent-information option [[RFC3046](#)]. The format of the sub-option is:

```

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
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
|   Code   |   Length   |   Local Domain Name ...
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Code: The option code (TBD).

Length: The option length, minimum 1 octet.

Local Domain Name: The local domain name MUST be encoded using the

technique described in [section 3.1 of RFC1035](#) [[RFC1035](#)]. It MUST NOT be stored in compressed form, as described in [section 4.1.4 of RFC1035](#) [[RFC1035](#)].

3.3. DHCPv6 Local Domain Name Option

The format of this option is:

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```

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
+-----+-----+-----+-----+-----+-----+-----+-----+
| OPTION_LOCAL_DOMAIN_NAME |          option-length          |
+-----+-----+-----+-----+-----+-----+-----+-----+
|          local-domain-name ...
+-----+-----+-----+-----+-----+-----+-----+

```

option-code: OPTION_LOCAL_DOMAIN_NAME (TBD)

option-length: Length of the 'local domain name' field in octets

local-domain-name: The local domain name MUST be encoded as specified in section "Representation and use of domain names" of [[RFC3315](#)].

4. Appearance of the option

The DHCPv4 LDN option MUST NOT appear in DHCPv4 messages other than the types DHCPOFFER and DHCPACK. Also the option-code of DHCPv4 LDN option MAY appear in the Parameter Request List in the DHCPv4 message types DHCPDISCOVERY and DHCPREQUEST.

The DHCPv4 LDN sub-option MUST NOT appear in DHCPv4 messages other than the types DHCPDISCOVERY and DHCPREQUEST.

The DHCPv6 LDN option MUST NOT appear in DHCPv6 messages other than the types Solicit, Advertise, Request, Information-Request and Reply. Also the option-code of LDN option MAY appear in the Option Request

Option in the DHCPv6 message types Solicit, Request and Information-Request.

5. Client Behavior

If a DHCPv4 client (Peer) requires DHCP Server to provide the DHCPv4 LDN option, it MUST include an Parameter Request List, requesting the DHCPv4 LDN option, as described in [section 9.8 of RFC2132](#) [[RFC2132](#)].

If a DHCPv6 client (Peer) requires DHCP Server to provide the DHCPv6 LDN option, it MUST include an Option Request option, requesting the DHCPv6 LDN option, as described in [section 22.7 of RFC3315](#) [[RFC3315](#)].

6. Relay Agent Behavior

If a DHCPv4 relay agent retrieves the local domain name from authentication server, it SHOULD include it in the DHCPv4 LDN sub-

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option in a relay-agent-information option [[RFC3046](#)] and forward to the DHCPv4 server.

If a DHCPv6 relay agent retrieves the local domain name from authentication server, it SHOULD include it in the DHCPv6 LDN option and forward to the DHPv6 server.

7. Server Behavior

If a DHCPv4 LDN option in the Parameter Request List or a DHCPv6 LDN option in an ORO has been requested, the server SHOULD return the DHCPv4 or DHCPv6 the LDN option to the client. If a DHCPv4 LDN sub-option or a DHCPv6 LDN option is included from relay agent, the server SHOULD extract the local domain name and encapsulate it in the returned LDN option.

8. Security Considerations

The communication between the DHCP client and the DHCP server for the exchange of local domain name information is security sensitive and requires authentication, integrity and replay protection. Either lower-layer security (such as link layer security established as part of the network access authentication protocol run) or DHCP security [[RFC3118](#)] can be used.

9. IANA Considerations

Three option codes need to be assigned.

DHCPv4 LDN Option Code

DHCPv4 LDN Sub-Option Code

DHCPv6 LDN Option Code

10. References

10.1. Normative References

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

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- [RFC5296] Narayanan, V. and L. Dondeti, "EAP Extensions for EAP Re-authentication Protocol (ERP)", [RFC 5296](#), August 2008.
- [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.
- [RFC2131] Droms, R., "Dynamic Host Configuration Protocol", [RFC 2131](#), Bucknell University, March 1997.
- [RFC2132] Alexander, S. and R. Droms, "DHCP Options and BOOTP Vendor Extensions", [RFC 2132](#), March 1997.
- [RFC3046] Patrick, M., "DHCP Relay Agent Information Option", [RFC 3046](#), January 2001.
- [RFC1035] Mockapetris, P., "Domain Names -- Implementation and Specification", STD 13, [RFC 1035](#), USC/Information Sciences Institute, November 1987.

[10.2.](#) Informative References

[RFC1034] Mockapetris, P., "Domain Names -- Concepts and Facilities", STD 13, [RFC 1034](#), USC/Information Sciences Institute, November 1987.

[11.](#) Acknowledgments

Thanks to DHC and Hokey members for their comments.

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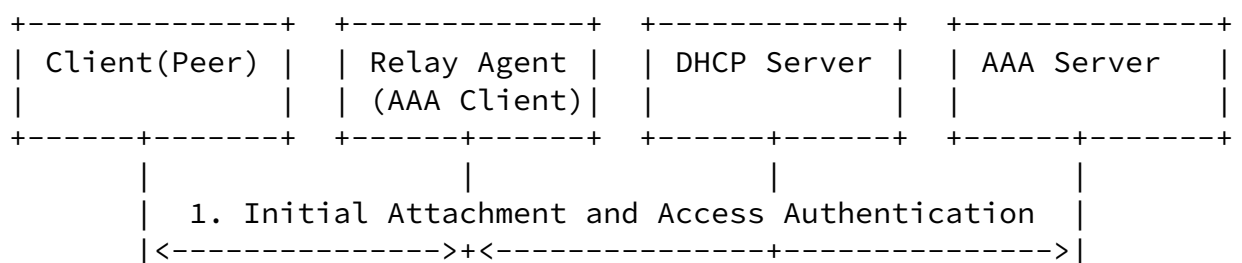
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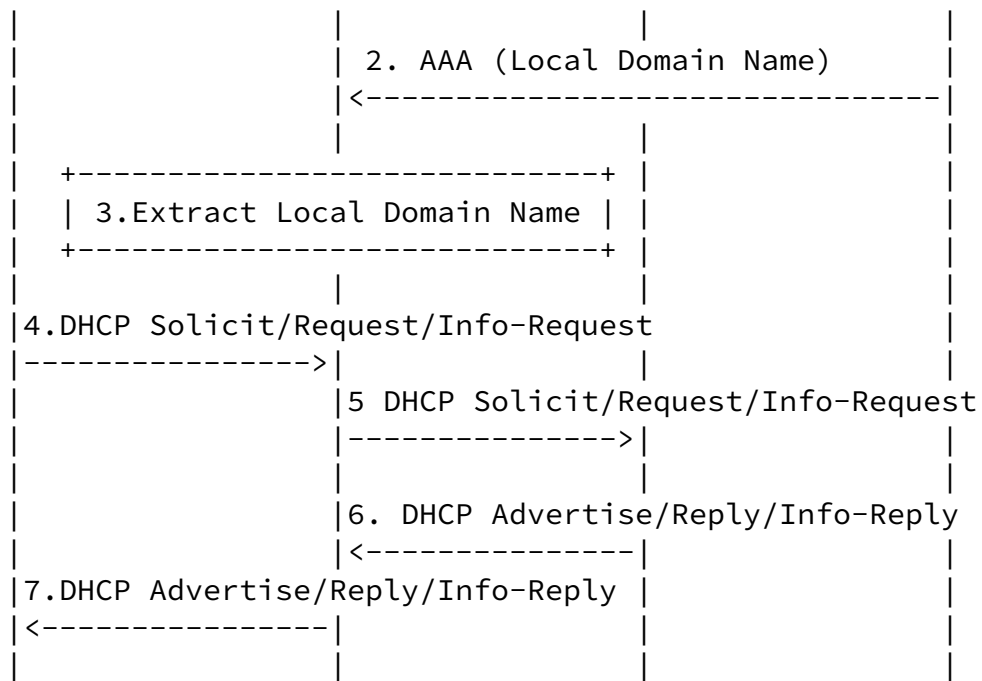
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[Appendix A.](#)

Example of Local Domain Name Discovery

This section introduces a example of local domain name discovery. In this example, the AAA client and DHCP Relay agent integrates into the same NAS. The local domain name can be assigned by the AAA server, e.g., ER server in the hokey re-authentication architecture or allocated by the DHCP server. The detailed procedure is shown below.





During step1 ~ step3, the client (Peer) performs initial attachment and access authentication with the AAA Server through NAS (relay agent). In success case, the AAA Server sends the AAA message with the local domain name to NAS (relay agent). NAS (relay agent) extracts the local domain name from the AAA message and then stores it in the local database.

During step4 ~ step11, the client (Peer) initiates the DHCP process, requesting a LDN option in an ORO in DHCP Solicit/ Request/ Information-Request message, to DHCP Server. If the local domain name is allocated by the AAA server at said step2, the relay agent SHOULD

include the local domain name in the LDN option/sub-option of the being relayed message, and send it to the DHCP Server.

The DHCP Server checks if the LDN option code is included in an ORO of DHCPv6 message or in the Parameter Request List of DHCPv4 message. If included, it MUST return the local domain name with the LDN option encapsulated in DHCP message to the client (Peer). If a DHCPv4 LDN sub-option or a DHCPv6 LDN option is included by the relay agent, i.e., the AAA server allocate the local domain name, the DHCP server SHOULD extract the local domain name received from the relay agent

and encapsulate it in the returned LDN option.

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