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Domain Suffix Option for DHCPv6
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Status of this Memo

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Abstract

This document specifies a new DHCPv6 (DHCP for IPv6) option which is passed from a DHCPv6 server to a DHCPv6 client to specify the domain suffix name used to perform domain name update.

1. Introduction

This document describes a new option for DHCPv6 [RFC3315] that provides a mechanism for the transfer of a domain suffix name. Using this option, an IPv6 device, which works as a DHCPv6 client, can configure the domain suffix name automatically.

For example, a service provider could use this option to transfer a domain suffix name to a Customer Premise Equipment (CPE) device acting as a router between the subscriber's internal network and the service provider's core network.

The configured domain suffix name is intended to be used by the IPv6 device to perform DNS update for the hosts inside its local network. The DNS update can be realized by several methods, e.g. the DHCPv6 Client FQDN Option [FQDNv6] provides a mechanism to exchange client's FQDN information during a stateful DHCPv6 session, and [RADNS] defines a DNS update mechanism for IPv6 stateless configuration.

1.1 Terminology

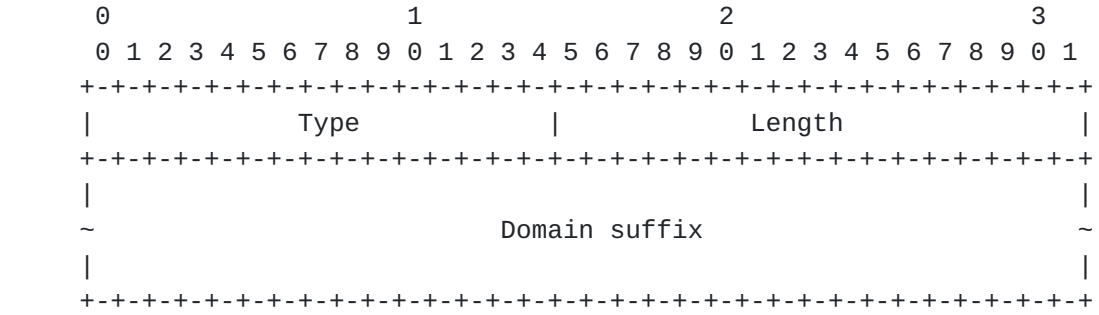
The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

This document should be read in conjunction with the DHCPv6 specification, [RFC3315]. Definitions for terms and acronyms used in this document are defined in [RFC3315] and [RFC3633].

2. Domain Suffix Option

The domain suffix option is used to carry a domain suffix to the DHCPv6 client, which will be used to construct and update the domain name for the hosts in local network.

The format of the domain suffix option is:



Type: 16-bits identifier of the type of option (TBD).

Length: Length of the "domain suffix" field in octets.

Domain suffix: The specification of a domain suffix.

The domain suffix in the 'domain suffix' MUST include only one item, and MUST be encoded as specified in section "Representation and use of domain names" of [RFC3315].

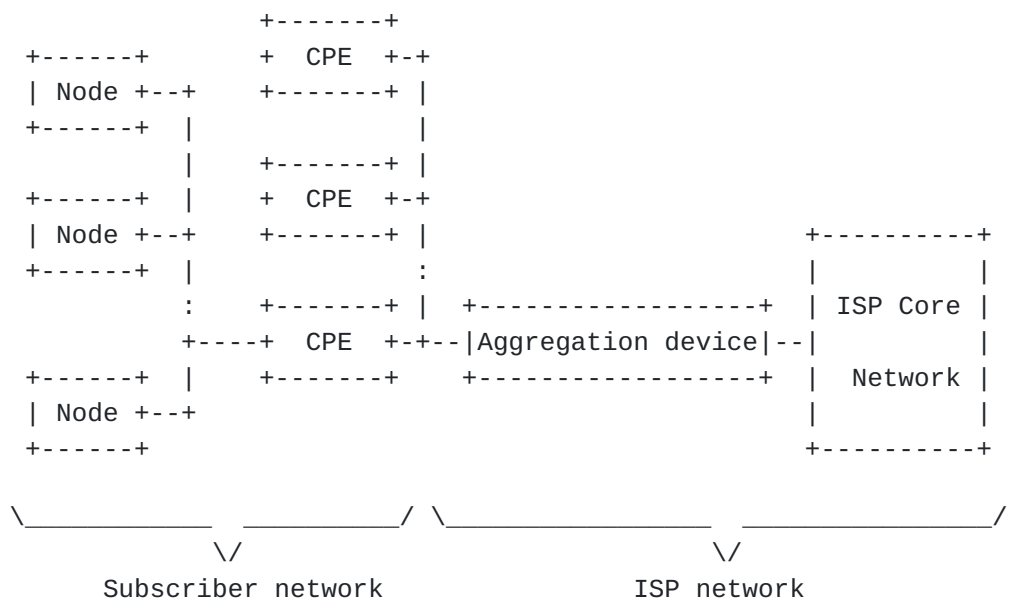
2.1 Usage

In stateful DHCPv6 [RFC3315], the DHCPv6 server MAY place a domain suffix option in the options field of IA_PD option [RFC3363] in an outgoing DHCPv6 message. The DHCPv6 server MUST NOT place a domain suffix option in any other portion of a stateful DHCPv6 message.

In stateless DHCPv6 [RFC3736], the DHCPv6 server MAY place a domain suffix option in the main option buffer of any DHCPv6 message sent to a client.

A DHCPv6 server may provide different values for the domain suffix option to different clients. This is useful to avoid domain name conflict in large-scale network. The mechanism for choosing which suffix to assign to which client is a matter of implementation and administrative policy, and is therefore not specified in this document.

3. Example



The above figure shows a typical usage of the domain suffix option. In this model, ISP has the ISP level domain name suffix (e.g. example.com). CPE in subscriber network may include a DNS server for name resolution for local hosts.

The CPE in the subscriber network, which acts as a requesting router, initiates a DHCPv6 session with the ISP's aggregation device, acting as a delegation route. During the DHCP session, an IPv6 prefix, along with the corresponding domain suffix name (i.e. example.com) will be transferred to the CPE.

The domain suffix name can then be used to construct the domain name for the hosts in subscriber network, using mechanisms defined in [FQDNv6] or [RADNS].

To avoid frequent domain name conflicts, aggregation device might allocate different domain suffix name for the CPEs. An example way can be selection based on an external authority such as a RADIUS server, in which a unique domain suffix name prefix, called "home name", is negotiated between user and ISP when subscribing. For example, "user1.example.com" and "user2.example.com".

4. Security Considerations

Security considerations in DHCP are described in section 23, "Security Considerations" of [RFC3315].

A rogue DHCP server can issue bogus domain suffix to a client. This may cause wrong domain name update.

A malicious client may be able to mount a denial of service attack by repeated DHCP requests for domain suffix, thus exhausts the DHCP server's resource.

Currently, it is difficult for DHCP servers to develop much confidence in the identities of its clients, given the absence of entity authentication from the DHCP protocol itself. To guard against attack, DHCP Authentication as described in section 21 of [RFC3315] can be used.

5. IANA Considerations

IANA is requested to assign a DHCPv6 option code for the Domain Suffix Option.

6. Acknowledgements

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7. References

7.1 Normative References

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[RFC3363] O. Troan, R. Droms, "IPv6 prefix option for DHCPv6", RFC 3363, December 2003.

7.2 Informative References

[FQDNv6] B. Volz, "The DHCPv6 Client FQDN Option", draft-ietf-dhc-dhcpv6-fqdn-00.txt, September, 2004.

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

[RADNS] R. Yan, "DNS update in IPv6 stateless configuration", draft-yan-ipv6-ra-dns-01.txt, June 2005.

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