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IPv6 Host Configuration in 6rd
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Abstract

The 6rd [RFC5969] linktype does not support IPv6 link-local addressing, multicast and 6rd nodes are off-link from each other. The host configuration protocol DHCPv6 [RFC3315] relies on link-local addressing and multicast to function. This document specifies how DHCPv6 can be used across a 6rd link.

Status of this Memo

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1. Introduction

IPv6 rapid deployment on IPv4 infrastructures (6rd) [RFC5969] enables a service provider to rapidly deploy IPv6 service to residential sites via stateless tunneling across its existing IPv4 network.

With 6rd, a 6rd CE can provide address assignments to hosts on the LAN side, but there is no provision for providing other configuration information to hosts on the LAN.

If only DNS configuration is required on IPv6-only hosts, DNS Proxy [RFC5625] mechanism implemented on the 6rd CE would be enough. Otherwise, stateless DHCPv6 [RFC3736] SHOULD be supported in 6rd for IPv6 hosts to obtain other configuration information besides DNS.

As specified in the DHCPv6 specification [RFC3315], "...The client MUST use a link-local address assigned to the interface for which it is requesting configuration information as the source address in the header of the IP datagram." A DHCPv6 client uses the All_DHCP_Servers_or_Relays IPv6 multicast address as the destination address of requests it sends. Link-local addresses are not supported on 6rd links. 6rd as described in [RFC5969] does not support multicast.

This document describes how DHCPv6 service can be provided across a 6rd link.

2. Conventions

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 RFC 2119 [RFC2119].

3. DHCPv6 over 6rd links

There are two problems to be solved with regards to providing DHCPv6 service over a 6rd link:

- A DHCPv6 client uses an IPv6 link-local address as the source address when requesting configuration information [RFC3315]. Link-local addressing is not supported on an 6rd link.

- o A DHCPv6 client sends a request to the All_DHCP_Relay_Agent_and_Servers multicast address. 6rd as specified in [RFC5969] does not support IPv6 multicast.

The first problem can be solved by changing the DHCPv6 protocol to allow for a global address to be used as the source address in requests. Another solution that does not require protocol changes, is to send DHCPv6 requests via a local DHCPv6 relay on the 6rd CE.

The 6rd CE MUST support a local DHCPv6 client and relay. The DHCPv6 client running on the 6rd CE's virtual tunnel interface MUST send DHCPv6 messages through a local DHCPv6 relay that encapsulates the client message and forwards it to a DHCPv6 server or relay using one of the 6rd CE's global unicast addresses as the source address.

The 6rd CE DHCPv6 relay agent SHOULD use the 6rd BR IPv6 anycast address as the destination address, section 20 of [RFC3315]. If the 6rd link supports multicast [I-D.ietf-mboned-auto-multicast] the 6rd CE DHCPv6 relay MAY use the All_DHCP_Servers [RFC3315] as the destination address of Relay-forward messages.

The 6rd BRs in the 6rd domain must be configured as DHCPv6 relays or servers on their 6rd virtual interfaces.

The 6rd CE SHOULD behave according to [I-D.ietf-v6ops-ipv6-cpe-router]. In particular it operates a DHCPv6 client on the WAN side (6rd virtual) interface and as a DHCPv6 server on the LAN-side interface(s).

4. IANA Considerations

This specification does not require any IANA actions.

5. Security Considerations

There are no new security considerations pertaining to this document.

6. Acknowledgements

7. References

7.1. Normative References

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

[RFC3315] Droms, R., 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.

[RFC5969] Townsley, W. and O. Troan, "IPv6 Rapid Deployment on IPv4 Infrastructures (6rd) -- Protocol Specification", RFC 5969, August 2010.

7.2. Informative References

[I-D.ietf-mboned-auto-multicast] Thaler, D., Talwar, M., Aggarwal, A., Vicisano, L., and T. Pusateri, "Automatic IP Multicast Without Explicit Tunnels (AMT)", draft-ietf-mboned-auto-multicast-10 (work in progress), March 2010.

[I-D.ietf-v6ops-ipv6-cpe-router] Singh, H., Beebee, W., Donley, C., Stark, B., and O. Troan, "Basic Requirements for IPv6 Customer Edge Routers", draft-ietf-v6ops-ipv6-cpe-router-09 (work in progress), December 2010.

[RFC5625] Bellis, R., "DNS Proxy Implementation Guidelines", BCP 152, RFC 5625, August 2009.

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