

The Subnet Selection Option for DHCP

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Abstract

This memo defines a new DHCP option for selecting the subnet on which to allocate an address. This option would override a DHCP server's normal methods of selecting which subnet on which to allocate an address for a client.

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[1. Introduction](#)

This memo was produced by the DHCP Working Group and defines a new DHCP option that specifies the subnet on which a DHCP server should use when selecting an address. This option takes precedence over other methods that the DHCP server may use to determine the subnet on which to select an address. Two existing methods of determining the subnet on which to select an address are:

- o To use the subnet address of the giaddr field in the DHCP packet, or if the giaddr field is zero;
- o To use the subnet address of the local interface on which the packet was received by the DHCP server.

Methods other than the two described above may exist.

The subnet selection option is useful, but not limited to, the class of devices that have a packet-handling plane (e.g.: switching, routing functionality) and a control plane (e.g.: device management and control functionality). The control plane is network connected and there is a DHCP server connected to that network. The packet-handling plane may or may not be network connected, however, in either case there is no network connected DHCP server available to this plane. The control plane is not network connected to the packet-handling plane, although the two planes may communicate using some method (e.g.: an internal data bus).

For the networks to which the packet-handling plane is connected, there is a requirement to allocate addresses for devices connected to those networks.

Since there is no network connectivity between the DHCP server and the packet-handling plane, the control plane must allocate addresses using the DHCP on behalf of the packet-handling plane. Because the control plane is requesting the addresses, the DHCP server would normally have

the undesired result of allocating the address on the subnet on which the control plane is connected.

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If the option specified by this memo is included in the DHCPDISCOVER then the server should allocate addresses on the subnet specified by this option. The option would specify an address of one of the packet-handling plane's subnets.

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. Subnet Selection Option

The subnet selection option is a DHCP option. The option contains a single IP address that is the address of a subnet. The value for the subnet address is determined by taking any IP address on the subnet and ANDing that address with the subnet mask (i.e.: the network and subnet bits are left alone and the remaining (address) bits are set to zero). When this option is present the DHCP server MUST use the subnet specified on which to allocate an address.

The format of the option is:

Code	Len	IP Address			
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
TBD	4	A1	A2	A3	A4
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+

In order to ensure backwards compatibility of clients that do support this option when communicating with DHCP servers that do not support this option, the DHCP client SHOULD check that an allocated address is on the requested subnet. The client SHOULD NOT respond to a DHCP OFFER of an address which is not on the requested subnet.

This option does not require any change to other operations or features of the DHCP server other than to select the subnet on which to allocate an address. For example, the handling of DHCPDISCOVER for an unknown subnet may continue to operate unchanged.

A server that supports this option MUST NOT offer an address that is not on the requested subnet when this option is present.

Existing methods for determining where to send a reply to a DHCP client are not changed when this option is present in a request.

3. Intellectual Property

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[4. Acknowledgements](#)

This document is the result of work undertaken the by DHCP working group. Thanks to Tim Aston and Ralph Droms for reviewing this memo.

[5. Security Considerations](#)

DHCP currently provides no authentication or security mechanisms. Potential exposures to attack are discussed in [section 7](#) of the protocol specification [[RFC2131](#)].

[6. References](#)

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), [BCP 14](#), March 1997.
- [RFC2131] Droms, R., "Dynamic Host Configuration Protocol", [RFC 2131](#), March 1997.
- [RFC2132] Alexander, S. and Droms, R., "DHCP Options and BOOTP Vendor Extensions", [RFC 2132](#), March 1997.

[7. Editor's Addresses](#)

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