

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 the subnet on which to allocate an address for a client.

Internet Draft

Subnet Selection Option

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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 that 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 for, 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).

There is a requirement to allocate addresses for devices connected to the networks to which the packet-handling plane is connected.

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. Since the control plane is requesting the address, the DHCP server would normally

allocate the address on the subnet on which the control plane is connected, which would not be the desired result.

If the option specified by this memo is included in the DHCPDISCOVER/DHCPREQUEST message then the server should allocate an address on the subnet or network segment that is specified by this option. The option would specify an address on 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 either:

- o The subnet specified in the option, or;
- o A subnet on the same network segment as the subnet specified in the option;

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 or network segment. The client SHOULD NOT respond to a DHCP OFFER or DHCP ACK of an address that is not on the requested subnet or network segment.

Servers supporting this option MUST return the option to any client that sends it, regardless of whether or not the client requests it in a parameter request list. Clients using this option must discard DHCP OFFER or DHCP ACK packets that do not contain this option.

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

When this option is present and the server supports this option, the server MUST NOT offer an address that is not on the requested subnet or network segment.

The IP address to which a DHCP server sends a reply to MUST be the same as it would chose when this option is not present.

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### 4. Acknowledgements

This document is the result of work undertaken the by DHCP working group. Thanks to Ted Lemon, Tim Aston and Ralph Droms for their helpful comments in this work.

### 5. Security Considerations

DHCP currently provides no authentication or security mechanisms. Potential exposures to attack are discussed is [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.

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Waters

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