

The Server Identification Option for DHCP
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[1.0](#) Abstract

This option is provided by DHCP servers to DHCP clients to identify the origin of a DHCP OFFER -- on a basis other than a server's IP address -- so that a DHCP client may optionally select from among multiple offers based on a client's preference to a particular DHCP server(s). The information contained in this option is a hex value indicating the assigned identification of the server originating the DHCP OFFER in which this option is contained.

[2.0](#) Definitions

Throughout this document, the words that are used to define the significance of the particular requirements are capitalized. These words are:

MUST

This word or the adjective "REQUIRED" means that the item is an absolute requirement of this specification.

MUST NOT

This phrase means the item is an absolute prohibition of this specification.

SHOULD

This word or the adjective "RECOMMENDED" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighed before choosing a different course.

SHOULD NOT

This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighted before implementing any behavior described with this label.

MAY

This word or the adjective "OPTIONAL" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example, another vendor may omit the same item.

This document also uses the following terms:

o "DHCP client"

DHCP client or "client" is an Internet host using DHCP to obtain configuration parameters such as a network address.

o "DHCP server"

A DHCP server of "server" is an Internet host that returns configuration parameters to DHCP clients.

o "binding"

A binding is a collection of configuration parameters, including at least an IP address, associated with or "bound to" a DHCP client. Bindings are managed by DHCP servers.

3.0 The DHCP Server Identification Option

DHCP provides a powerful mechanism for automating and centralizing the administration of IP host configuration and has become a critical service in many large IP networks. Because of its importance in networks and because it can create a single point of failure for network operations (from a DHCP client's perspective), many network administrators choose to deploy many DHCP servers in order to enhance availability and/or performance of DHCP services.

However, for networks with multiple DHCP servers, the DHCP protocol does not provide a means by which a DHCP client may "pre-specify" a preference for offers from a particular DHCP server -- or set of servers -- on the network. Such a means would allow, for example, clients on a large, switched LAN subnet to choose DHCP OFFERS from a preferred, "local" DHCP server (e.g., one located on the same floor of the building and administered by the client host user's department).

The DHCP protocol specification [see [RFC1541](#) or current internet draft] currently states that:

"DHCP clients are free to use any strategy in selecting a DHCP server among those from which the client receives a DHCP OFFER message."

Thus, currently, client "policy" -- of which there is essentially no standardization -- determines which of many offers is selected. In practice, most vendors' implementation of "policy" here is very basic (e.g., first offer received) and is "hard-coded" (i.e., non-configurable).

In order for a client to choose a DHCP OFFER from a particular DHCP server, it must have a means of identifying the server. That is, unless a DHCP client can identify an individual server, the client has no means by which to select it.

Thus, the problem of a client specifying a preference for a particular server is simply that of identifying DHCP servers to the client so that the client can select a DHCP OFFER from a particular server (e.g., by matching a pre-configured, preferred server identity against the set of server identities contained in DHCP OFFERS received).

This document specifies an option that can be specified at DHCP servers by network administrators to identify particular DHCP server (or servers) to DHCP clients in order to enable the DHCP clients to select from available identities. The option, known as the DHCP

Server Identification Option, specifies a simple DHCP server identification value to be included in DHCP OFFERs so that DHCP clients can distinguish among DHCP servers when making an offer selection decision.

4.0 DHCP Server Identification Option Format

The code for this option is TBD, and its length is 4 bytes.

Code	Len	DHCP Server ID
+-----+	+-----+	+-----+
TBD	2	server_id
+-----+	+-----+	+-----+

where:

server_id is an unsigned integer (x'00' thru x'FF', inclusive) which identifies the DHCP server originating the DHCP OFFER packet in which the option is contained.

5.0 DHCP Server Behavior

A DHCP Server which supports the DHCP Server Identification Option MUST include the option in (and only in?) DHCP OFFER packets to requesting clients. Note that there is no requirement for the server_id values to be unique in a subnet or across the network. That is, two or more DHCP servers may share the same server_id value and therefore be considered equivalent from the perspective of the DHCP client's selection decision.

In the case where a DHCP Server Identification Option with server_id value is included in a client's DHCPDISCOVER message and the server_id value does not match that of the server, then the server MAY ignore the DHCPDISCOVER. If the DHCP Server Identification Option is included (in the requested parameter list) without a server_id value, then the DHCP Server SHOULD respond with a DHCP OFFER and include the appropriate server_id value in the DHCP Server Identification option (assuming an available address/binding and defined server_id value exist).

6.0 DHCP Client Behavior

A DHCP client MAY use the DHCP Server Identification Option to make a DHCP OFFER selection decision. If two DHCP OFFERs have equivalent DHCP Server Identification Option values or if no DHCP Server Identification Option is included, then the DHCP client SHOULD report the error and SHOULD use another mechanism to choose from among the multiple offers.

Also, note that a client may specify a DHCP Server Identification Option in a DHCPDISCOVER to express a preference for a particular DHCP server (Is this a good idea? ...seems harmless, but what's the point...unless a particular implied behavior?).

7.0 Application Notes

The DHCP Server Identification option allows a DHCP client to select a DHCP OFFER from a preferred server or servers. The following sections outline some useful applications of this capability:

7.1 DHCP Server Segregation within (large) Subnets

In large, flat networks (e.g., large, switched LANs), the DHCP Server Identification option can be used to "assign" groups of clients to be served by a particular DHCP server (e.g., one which serves a particular workgroup/department/organization or a particular building or floor of a building). This is accomplished by configuring clients to prefer DHCP OFFERS with a designated DHCP server identification option value.

7.2 Pre-production Testing of DHCP Servers

Similarly, in networks where a DHCP Server is being introduced into production, DHCP clients which support the DHCP server identification option can be used to specifically exercise that newly introduced DHCP server for the purposes of testing configuration correctness, etc.

6.0 Security Considerations

There are currently no security mechanisms defined for the DHCP protocol.

7.0 References

[RFC1533] S. Alexander, R. Droms, "DHCP Options and BOOTP Vendor Extensions" [[RFC1541](#)] R. Droms, "Dynamic Host Configuration Protocol"

8.0 Acknowledgments

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