



DHCP Options

DHCP provides a framework for passing configuration information to hosts on a TCP/IP network. Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message. The data items themselves are also called options.

This appendix contains DHCP options and BOOTP vendor extensions from RFC 2132, and includes the validation type for each option, as indicated in [Table B-9 on page B-11](#).

This appendix also contains the standard Microsoft client options and several tables displaying the options sorted by categories.

Option Descriptions

The following sections describe the DHCP options in detail:

- [BOOTP Extensions/DHCP Option Field Format, page B-1](#)
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- [IP Layer Parameters Per Host, page B-3](#)
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BOOTP Extensions/DHCP Option Field Format

DHCP options have the same format as the BOOTP vendor extensions defined in RFC 1497. Options can be fixed length or variable length. All options begin with a tag octet, which uniquely identifies the option. Fixed-length options without data consist of only a tag octet. Only options 0 and 255 are fixed length. All other options are variable-length with a length octet following the tag octet. The value of the length octet omits the two octets specifying the tag and length. The length octet is followed by that number of octets of data. Options containing NVT ASCII data should not include a trailing NULL; however, the receiver of such options must be prepared to delete trailing nulls if they exist. The receiver must not require that a trailing null be included in the data. In the case of some variable-length options, the length field must be specified.

Any options defined subsequent to this document must contain a length octet even if the length is fixed or zero. All multi-octet quantities are in network byte-order.

Except for the options in section 9, all options can be used with either DHCP or BOOTP. Many of these options have their default values specified in other documents. In particular, RFC 1122 [4] specifies default values for most IP and TCP configuration parameters.

Many options supply one or more 32-bit IP addresses. Use of IP addresses instead of DNS names can make future service migration more difficult. Use of IP addresses instead of DNS CNAMEs is not recommended.

When used with BOOTP, the first four octets of the vendor information field are reserved for a magic cookie (as suggested in RFC 951). This field identifies the mode in which the succeeding data is to be interpreted. The value of the magic cookie is the 4 octet dotted decimal 99.130.83.99 (or hexadecimal number 63.82.53.63) in network byte order.

All of the vendor extensions defined in RFC 1497 are also DHCP options.

Option codes 128 through 254 (decimal) are reserved for site-specific options.

RFC 1497 Vendor Extensions

Table B-1 lists the vendor extensions as defined in RFC 1497.

Table B-1 RFC 1497 Vendor Extension Options

Option Name	No.	Length	Description
Pad	0	1 octet	Causes the subsequent fields to align on word boundaries.
End	255	1 octet	End of valid information in the vendor field. Subsequent octets should be filled with the Pad options.
Subnet Mask	1	4 octets	Client's subnet mask, as per RFC 950. If both the Subnet Mask and the Router option are specified in a DHCP reply, the Subnet Mask option must be first.
Time Offset	2	4 octets	Offset of the client's subnet, in seconds, from Universal Time (UT). The offset is expressed as a twos-complement 32-bit integer. A positive offset indicates a location east of the zero meridian and a negative offset indicates a location west of the zero meridian.
Router	3	4 octet minimum; multiples of 4	List of IP addresses for routers on the client's subnet. Routers should be in order of preference.
Time Server	4	4 octet minimum; multiples of 4	List of RFC 868 compliant time servers available to the client. Servers should be in order of preference.
Name Server Option	5	4 octet minimum; multiples of 4	List of IEN 116 name servers available to the client. Servers should be in order of preference.
Domain Name Server	6	4 octet minimum; multiples of 4	List of Domain Name System (STD 13, RFC 1035) name servers available to the client. Servers should be in order of preference.
Log Server	7	4 octet minimum; multiples of 4	List of MIT-LCS UDP log servers available to the client. Servers should be in order of preference.
Cookie Server	8	4 octet minimum; multiples of 4	List of RFC 865-compliant cookie servers available to the client. Servers should be in order of preference.

Table B-1 RFC 1497 Vendor Extension Options (continued)

Option Name	No.	Length	Description
LPR Server	9	4 octet minimum; multiples of 4	List of RFC 1179-compliant line printer servers available to the client. Servers should be in order of preference.
Impress Server	10	4 octet minimum; multiples of 4	List of Imagen Impress servers available to the client. Servers should be in order of preference.
Resource Location Server	11	4 octet minimum; multiples of 4	List of RFC 887-compliant resource location servers available to the client. Servers should be in order of preference.
Host Name	12	1 octet minimum	Name of the client. The name may or may not be qualified with the local domain name. See RFC 1035 for the character set restrictions.
Boot File Size	13	2 octets	Number of 512-octet blocks in the default boot file.
Merit Dump File	14	1 octet minimum	Path name of a file to which the client's core image should be placed in the event the client crashes. The path is formatted as a character string consisting of characters from the NVT ASCII character set.
Domain Name	15	1 octet minimum	Domain name that the client should use when resolving host names through the Domain Name System.
Swap Server	16	4 octets	IP address of the client's swap server.
Root Path	17	1 octet minimum	Path name that contains the client's root disk. The path is formatted as a character string consisting of characters from the NVT ASCII character set.
Extensions Path	18	1 octet minimum	Uses a string to specify a file, retrievable through TFTP. The file contains information that can be interpreted in the same way as the 64-octet vendor-extension field within the BOOTP response, with these exceptions: the length of the file is unconstrained, and all references to instances of this option in the file are ignored.

IP Layer Parameters Per Host

Table B-2 lists the options that affect the operation of the IP layer on a per-host basis.

Table B-2 IP Layer Parameters Per Host Options

Option Name	No.	Length	Description
IP Forwarding Enable/Disable	19	1 octet	Specifies whether the client should configure its IP layer for packet forwarding. Values: 0=disable; 1=enable
Non-Local Source Routing Enable/Disable	20	1 octet	Specifies whether the client should configure its IP layer to allow forwarding of datagrams with non-local source routes. Values: 0=disable; 1=enable

Table B-2 IP Layer Parameters Per Host Options (continued)

Option Name	No.	Length	Description
Policy Filter	21	8 octet minimum; multiples of 8	Policy filters for non-local source routing. The filters consist of a list of IP addresses and masks that specify destination/mask pairs with which to filter incoming source routes. Any source-routed datagram whose next-hop address does not match one of the filters should be discarded by the client.
Maximum Datagram Reassembly Size	22	2 octets	Maximum size datagram that the client should be prepared to reassemble. Value: 576 minimum
Default IP Time-to-Live	23	1 octet	Default TTL that the client should use on outgoing datagrams. Values: 1 to 255
Path MTU Aging Timeout	24	4 octets	Timeout (in seconds) to use when aging Path MTU values (defined in RFC 1191).
Path MTU Plateau Table	25	2 octets minimum; multiples of 2	Table of MTU sizes to use when performing Path MTU Discovery as defined in RFC 1191. The table is formatted as a list of 16-bit unsigned integers, ordered from smallest to largest. Value: 68 minimum

IP Layer Parameters Per Interface

Table B-3 lists the options that affect the operation of the IP layer on a per-interface basis. A client can issue multiple requests, one per interface, to configure interfaces with their specific parameters.

Table B-3 IP Layer Parameters Per Interface Options

Option Name	No.	Length	Description
Interface MTU	26	2 octets	Maximum time to live to use on this interface.
All Subnets Are Local	27	1 octet	Specifies whether or not the client can assume that all subnets of the IP network to which the client is connected use the same MTU as the subnet of that network to which the client is directly connected. Values: 1=all subnets share same MTU; 0=some directly-connected subnets can have smaller MTUs
Broadcast Address	28	4 octets	Broadcast address in use on the client's subnet.
Perform Mask Discovery	29	1 octet	Specifies whether or not the client should perform subnet mask discovery using ICMP. Values: 0=disable; 1=enable
Mask Supplier	30	1 octet	Specifies whether or not the client should respond to subnet mask requests using ICMP. Values: 0=do not respond; 1=respond
Perform Router Discovery	31	1 octet	Specifies whether or not the client should solicit routers using the Router Discovery mechanism defined in RFC 1256. Values: 0=disable; 1=enable

Table B-3 IP Layer Parameters Per Interface Options (continued)

Option Name	No.	Length	Description
Router Solicitation Address	32	4 octets	Address to which the client should transmit router solicitation requests.
Static Route	33	8 octet minimum; multiples of 8	List of static routes that the client should install in its routing cache. If multiple routes to the same destination are specified, they are in descending order of priority. The routes consist of a list of IP address pairs. The first address is the destination address, and the second address is the router for the destination. The default route (0.0.0.0) is an illegal destination for a static route.

Link Layer Parameters Per Interface

Table B-4 lists the options that affect the operation of the data link layer on a per-interface basis.

Table B-4 Link Layer Parameters Per Interface Options

Option Name	No.	Length	Description
Trailer Encapsulation	34	1 octet	Specifies whether or not the client should negotiate the use of trailers (RFC 893) when using the ARP protocol. Values: 0=do not use; 1=use
ARP Cache Timeout	35	4 octets	Timeout in seconds for ARP cache entries.
Ethernet Encapsulation	36	1 octet	Specifies whether or not the client should use Ethernet Version 2 (RFC 894) or IEEE 802.3 (RFC 1042) encapsulation if the interface is an Ethernet. Value: 0=use RFC 894 encapsulation; 1=use RFC 1042 encapsulation

TCP Parameters

Table B-5 lists the options that affect the operation of the TCP layer on a per-interface basis.

Table B-5 TCP Parameter Options

Option Name	No.	Length	Description
TCP Default TTL	37	1 octet	Default TTL that the client should use when sending TCP segments. Value: minimum 1
TCP Keepalive Interval	38	4 octets	Interval (in seconds) that the client TCP should wait before sending a keepalive message on a TCP connection. The time is specified as a 32-bit unsigned integer. A value of zero indicates that the client should not generate keepalive messages on connections unless specifically requested by an application. Value: 32-bit unsigned; 0=do not generate keepalive messages unless specifically requested.

Table B-5 TCP Parameter Options (continued)

Option Name	No.	Length	Description
TCP Keepalive Garbage	39	1 octet	Specifies the whether or not the client should send TCP keep-alive messages with an octet of garbage for compatibility with older implementations. Values: 0=do not send; 1=send

Application and Service Parameters

Table B-6 lists some miscellaneous options used to configure miscellaneous applications and services.

Table B-6 Application and Service Parameter Options

Option Name	No.	Length	Description
Network Information Service (NIS) Domain	40	1 octet minimum	Name of the client's NIS domain. The domain is formatted as a character string consisting of characters from the NVT ASCII character set.
Network Information Service (NIS) Servers	41	4 octet minimum; multiples of 4	List of IP addresses indicating NIS servers available to the client. Servers should be in order of preference.
Network Time Protocol Servers	42	4 octet minimum; multiples of 4	List of IP addresses indicating NTP servers that are available to the client. Servers should be in order of preference.
Vendor-Specific Information	43	1 octet minimum	This option is used by clients and servers to exchange vendor-specific information. The information is an opaque object of n octets, presumably interpreted by vendor-specific code on the clients and servers. The definition of this information is vendor specific. The vendor is indicated in the <i>vendor-class-identifier</i> option. Servers not equipped to interpret the vendor-specific information sent by a client must ignore it (although it can be reported). Clients that do not receive desired vendor-specific information should make an attempt to operate without it, although they can do so (and announce they are doing so) in a degraded mode. If a vendor potentially encodes more than one item of information in this option, then the vendor should encode the option using encapsulated vendor-specific options as described here.

Table B-6 Application and Service Parameter Options (continued)

Option Name	No.	Length	Description
			<p>The encapsulated vendor-specific options field should be encoded as a sequence of code/length/value fields of identical syntax to the DHCP options field with these exceptions:</p> <ul style="list-style-type: none"> • There should not be a magic cookie field in the encapsulated vendor-specific extensions field. • Codes other than 0 or 255 can be redefined by the vendor within the encapsulated vendor-specific extensions field, but should conform to the tag-length-value syntax defined in section 2. <p>Code 255 (END), if present, signifies the end of the encapsulated vendor extensions, not the end of the vendor extensions field. If no code 255 is present, then the end of the enclosing vendor-specific information field is taken as the end of the encapsulated vendor-specific extensions field.</p>
NetBIOS over TCP/IP Name Server	44	4 octet minimum; multiples of 4	List of RFC 1001/1002 NBNS name servers in order of preference.
NetBIOS over TCP/IP Datagram Distribution Server	45	4 octet minimum; multiples of 4	List of RFC 1001/1002 NBDD servers in order of preference.
NetBIOS over TCP/IP Node Type	46	1 octet	<p>Allows NetBIOS over TCP/IP client, which are configured as described in RFC 1001/1002.</p> <p>Values: Single octet in hexadecimal that identifies the client type:</p> <ul style="list-style-type: none"> • 0x1=B-node (broadcast node) • 0x2=P-node (point-to-point node) • 0x4=M-node (mixed node) • 0x8=H-node
NetBIOS over TCP/IP Scope	47	1 octet minimum	NetBIOS over TCP/IP scope parameter for the client as specified in RFC 1001/1002.
X Window System Font Server	48	4 octet minimum; multiples of 4	List of X Window System Font servers available to the client. Servers should be in order of preference.
X Window System Display Manager	49	4 octet minimum; multiples of 4	List of IP addresses of systems that are running the X Window System Display Manager and are available to the client. Addresses should be in order of preference.
Network Information Service (NIS+) Domain	64	1 octet minimum	Name of the client's NIS+ domain. The domain is formatted as a character string consisting of characters from the NVT ASCII character set.

Table B-6 Application and Service Parameter Options (continued)

Option Name	No.	Length	Description
Network Information Service (NIS+) Servers	65	4 octet minimum; multiples of 4	List of IP addresses indicating NIS+ servers available to the client. Servers should be in order of preference.
Mobile IP Home Agent	68	0 octets minimum; multiples of 4; expected, 4 octets (single home agent's address)	List of IP addresses indicating mobile IP home agents available to the client. Agents should be in order of preference. Value: 32-bit address; 0=no home agents available
Simple Mail Transport Protocol (SMTP) Server	69	4 octet minimum; multiples of 4	List of SMTP servers available to the client. Servers should be in order of preference.
Post Office Protocol (POP3) Server	70	4 octet minimum; multiples of 4	List of POP3 servers available to the client. Servers should be in order of preference.
Network News Transport Protocol (NNTP) Server	71	4 octet minimum; multiples of 4	List of NNTP servers available to the client. Servers should be in order of preference.
World Wide Web (WWW) Server	72	4 octet minimum; multiples of 4	List of World Wide Web (WWW) servers available to the client. Servers should be in order of preference.
Finger Server	73	4 octet minimum; multiples of 4	List of Finger servers available to the client. Servers should be in order of preference.
Internet Relay Chat Server	74	4 octet minimum; multiples of 4	List of IRC servers available to the client. Servers should be in order of preference.
StreetTalk Server	75	4 octet minimum; multiples of 4	List of StreetTalk servers available to the client. Servers should be in order of preference.
StreetTalk Directory Assistance (STDA) Server	76	4 octet minimum; multiples of 4	List of STDA servers available to the client. Servers should be in order of preference.

DHCP Extensions

This section describes the options that are specific to DHCP.

[Table B-7](#) lists some options used to configure miscellaneous applications and services.

Table B-7 Application and Service Parameter Options

Option Name	No.	Length	Description
Requested IP Address	50	4 octets	Used in a client request (DHCPDISCOVER) to allow the client to request that a particular IP address be assigned.

Table B-7 Application and Service Parameter Options (continued)

Option Name	No.	Length	Description
IP Address Lease Time	51	4 octets	Used in a client request (DHCPDISCOVER or DHCPREQUEST) to allow the client to request a lease time for the IP address. In a server reply (DHCPOFFER), a DHCP server uses this option to specify the lease time it is willing to offer. Value: seconds, as 32-bit unsigned integer
Option Overload	52	1 octet	Indicates that the DHCP sname or file fields are being overloaded by using them to carry DHCP options. A DHCP server inserts this option if the returned parameters will exceed the usual space allotted for options. If this option is present, the client interprets the specified additional fields after it concludes interpretation of the standard option fields. Values: 1=file field is used to hold options; 2=sname field is used to hold options; 3=both fields are used to hold options
DHCP Message Type	53	1 octet	Used to convey the type of DHCP message. The value is 1 (DHCPDISCOVER). Values: 1=DHCPDISCOVER; 2=DHCPOFFER; 3=DHCPREQUEST; 4=DHCPDECLINE; 5=DHCPACK; 6=DHCPNAK; 7=DHCPRELEASE; 8=DHCPINFORM
Server Identifier	54	4 octets	Used in DHCPOFFER and DHCPREQUEST messages, and can optionally be included in the DHCPACK and DHCPNAK messages. DHCP servers include this option in the DHCPOFFER in order to allow the client to distinguish between lease offers. DHCP clients use the contents of the server identifier field as the destination address for any DHCP messages unicast to the DHCP server. DHCP clients also indicate which of several lease offers is being accepted by including this option in a DHCPREQUEST message. The identifier is the IP address of the selected server.
Parameter Request List	55	1 octet minimum	Used by a DHCP client to request values for specified configuration parameters. The list of requested parameters is specified as <i>n</i> octets, where each octet is a valid DHCP option code as defined in this document. The client can list the options in order of preference. The DHCP server does not have to return the options in the requested order, but must try to insert the options in the order that the client requested.
Message	56	1 octet minimum	Used by a DHCP server to provide an error message to a DHCP client in a DHCPNAK message in the event of a failure. A client can use this option in a DHCPDECLINE message to indicate why the client declined the offered parameters. The message consists of <i>n</i> octets of NVT ASCII text, which the client can display on an available output device.
Maximum DHCP Message Size	57	2 octets	Maximum length DHCP message that a server is willing to accept. The length is specified as an unsigned 16-bit integer. A client can use the maximum DHCP message size option in DHCPDISCOVER or DHCPREQUEST messages, but should not use the option in DHCPDECLINE messages. Value: 576 minimum

Table B-7 Application and Service Parameter Options (continued)

Option Name	No.	Length	Description
Renewal (T1) Time Value	58	4 octets	Time interval from address assignment until the client transitions to RENEWING state. Value: seconds, as 32-bit unsigned integer
Rebinding (T2) Time Value	59	4 octets	Time interval from address assignment until the client transitions to REBINDING state. Value: seconds, as 32-bit unsigned integer
Vendor Class Identifier	60	1 octet minimum	Used by DHCP clients to optionally identify the vendor type and configuration of a DHCP client. The information is a string of <i>n</i> octets, interpreted by servers. Vendors can choose to define specific vendor class identifiers to convey particular configuration or other identification information about a client. For example, the identifier can encode the client's hardware configuration. Servers not equipped to interpret the class-specific information sent by a client must ignore it (although it can be reported). Servers that respond should only use option 43 to return the vendor-specific information to the client.
Client-Identifier	61	2 octet minimum	Used by DHCP clients to specify their unique identifier. DHCP servers use this value to index their database of address bindings. This value is expected to be unique for all clients in an administrative domain. DHCP servers should treat identifiers as opaque objects. The client identifier can consist of type-value pairs similar to the <i>htype/chaddr</i> fields. For instance, it can consist of a hardware type and hardware address. In this case, the type field should be one of the ARP hardware types defined in STD2. A hardware type of 0 (zero) should be used when the value field contains an identifier other than a hardware address (for example, a fully qualified domain name). For correct identification of clients, each client's client-identifier must be unique among the client-identifiers used on the subnet to which the client is attached. Vendors and system administrators are responsible for choosing client-identifiers that meet this requirement for uniqueness.
TFTP Server Name	66	1 octet minimum	Identifies a TFTP server when the <i>sname</i> field in the DHCP header has been used for DHCP options.
Bootfile Name	67	1 octet minimum	Identifies a bootfile when the file field in the DHCP header has been used for DHCP options.

Microsoft Client Options

Table B-8 lists the standard Microsoft client options.

Table B-8 Microsoft DHCP Client Options

Option Name	No.	Description
dhcp-lease-time	51	14 days
domain-name	15	A domain name such as cisco.com
domain-name-servers	6	IP address of the name servers
netbios-name-servers	44	WINS server address
netbios-node-type	46	Identifies the NetBIOS client type; note that Network Registrar displays a warning if it is not present
routers	3	IP address of the router for this subnet

Option Tables

The following tables display the DHCP options in various ways. They show the options sorted numerically, by Network Registrar name, and by category.

DHCP options have a prescribed format and allowed values for their option parameters. [Table B-9](#) lists each DHCP option and parameter type (in the Validation column). The parameter formats and allowed values come from the DHCP and Internet RFCs. All the DHCP options appear, but clients control only some, and the CLI only others.

Options by Number

[Table B-9](#) shows the DHCP options sorted by option number, and includes the validation type. (See [Table B-12 on page B-21](#) for details on the option validation types found in the Validation column.)

Table B-9 DHCP Options by Number

No.	Network Registrar Name	Protocol Name	Category	Validation
--	packet-file-name	--	DHCP Packet Fields	STRING
--	packet-server-name	--	DHCP Packet Fields	STRING
--	packet-siaddr	--	DHCP Packet Fields	IPADDR
0	pad (set by protocol)	Pad	--	
1	subnet-mask (derived)	Subnet Mask	Basic	IPADDR as mask
2	time-offset	Time Offset	BOOTP	INT
3	routers	Router	Basic, MS DHCP Client	IPADDR_ARRAY
4	time-servers	Time Server	BOOTP	IPADDR_ARRAY
5	name-servers	Name Server	BOOTP	IPADDR_ARRAY
6	domain-name-servers	Domain Name Server	Basic, MS DHCP Client	IPADDR_ARRAY
7	log-servers	Log Server	Servers	IPADDR_ARRAY
8	cookie-servers	Cookie Server	BOOTP	IPADDR_ARRAY

Table B-9 DHCP Options by Number (continued)

No.	Network Registrar Name	Protocol Name	Category	Validation
9	lpr-servers	LPR Server	Servers	IPADDR_ARRAY
10	impress-servers	Impress Server	BOOTP	IPADDR_ARRAY
11	resource-location-servers	Resource Location Server	BOOTP	IPADDR_ARRAY
12	host-name	Host Name	Basic	Hostname STRING
13	boot-size	Boot File Size	BOOTP	WORD (512-byte blocks)
14	merit-dump	Merit Dump File	BOOTP	STRING
15	domain-name	Domain Name	Basic, MS DHCP Client	STRING
16	swap-server	Swap Server	BOOTP	IPADDR
17	root-path	Root Path	BOOTP	STRING
18	extensions-path	Extensions Path	BOOTP	STRING
19	ip-forwarding	IP Forwarding Enable/Disable	Host IP	BOOL
20	non-local-source-routing	Non-Local Source Routing	Host IP	BOOL
21	policy-filters	Policy Filter	Host IP	Alternating IPADDR_ARRAY address/mask entries
22	max-dgram-reassembly	Maximum Datagram Reassembly Size	Host IP	WORD
23	default-ip-ttl	Default IP Time-to-Live	Host IP	BYTE
24	path-mtu-aging-timeout	Path MTU Aging Timeout	Host IP	UINT
25	path-mtu-plateau-tables	Path MTU Plateau Table	Host IP	WORD_ARRAY
26	interface-mtu	Interface MTU	Interface	WORD
27	all-subnets-local	All Subnets Are Local	Interface	BOOL
28	broadcast-address	Broadcast Address	Interface	IPADDR (255.255.255.255)
29	perform-mask-discovery	Perform Mask Discovery	Interface	BOOL
30	mask-supplier	Mask Supplier	Interface	BOOL
31	router-discovery	Perform Router Discovery	Interface	BOOL
32	router-solicitation-address	Router Solicitation Address	Interface	IPADDR

Table B-9 DHCP Options by Number (continued)

No.	Network Registrar Name	Protocol Name	Category	Validation
33	static-routes	Static Route	Interface	IPADDR_ARRAY
34	trailer-encapsulation	Trailer Encapsulation	Interface	BOOL
35	arp-cache-timeout	ARP Cache Timeout	Interface	UINT
36	ieee802.3-encapsulation	Ethernet Encapsulation	Interface	BOOL
37	default-tcp-ttl	TCP Default TTL	Interface	BYTE > 0
38	tcp-keepalive-interval	TCP Keepalive Interval	Interface	UINT
39	tcp-keepalive-garbage	TCP Keepalive Garbage	Interface	BOOL
40	nis-domain	NIS Domain	Servers	STRING
41	nis-servers	Network Information Service (NIS) Servers	Servers	IPADDR_ARRAY
42	ntp-servers	NTP Servers	Servers	IPADDR_ARRAY
43	vendor-encapsulated-options	Vendor-Specific Information	--	BYTE_ARRAY
44	netbios-name-servers	NetBIOS over TCP/IP Name Server	WINS/NetBIOS, MS DHCP Client	IPADDR_ARRAY
45	netbios-dd-servers	NetBIOS over TCP/IP Datagram Distribution Server	WINS/NetBIOS	IPADDR_ARRAY
46	netbios-node-type	NetBIOS over TCP/IP Node Type	WINS/NetBIOS, MS DHCP Client	BYTE (1, 2, 4, 8)
47	netbios-scope	NetBIOS over TCP/IP Scope	WINS/NetBIOS, MS DHCP Client	STRING
48	font-servers	X Window System Font Server	Servers	IPADDR_ARRAY
49	x-display-managers	X Window System Display Manager	Servers	IPADDR_ARRAY
50	dhcp-requested-address (set by DHCP client)	Requested IP Address	--	IPADDR
51	dhcp-lease-time	IP Address Lease Time	Lease Information, MS DHCP Client	UINT
52	dhcp-option-overload	Option Overload	--	BYTE
53	dhcp-message-type (set by protocols)	DHCP Message Type	--	BYTE
54	dhcp-server-identifier (set by DHCP server)	Server Identifier	--	IPADDR
55	dhcp-parameter-request-list	Parameter Request List	--	BYTE_ARRAY
56	dhcp-message	Message	--	STRING

Table B-9 DHCP Options by Number (continued)

No.	Network Registrar Name	Protocol Name	Category	Validation
57	dhcp-max-message-size (set by protocol)	Maximum DHCP Message Size	--	WORD
58	dhcp-renewal-time	Renewing (T1) Time Value	Lease Information, MS DHCP Client	UINT
59	dhcp-rebinding-time	Rebinding (T2) Time Value	Lease Information, MS DHCP Client	UINT
60	dhcp-class-identifier (set by DHCP client)	Vendor Class Identifier	--	STRING
61	dhcp-client-identifier (set by DHCP client)	Client-Identifier	Basic	BYTE_ARRAY
62	netwareip-domain	NetWare/IP Domain Name	NetWare Client	STRING
63	netwareip-information	NetWare/IP Information	NetWare Client	BYTE_ARRAY
64	nis+-domain	NIS+ Domain	Servers	STRING
65	nis+-servers	NIS+ Servers	Servers	IPADDR_ARRAY
66	tftp-server	TFTP Server Name	Servers	STRING
67	boot-file	Bootfile Name	BOOTP	STRING
68	mobile-ip-home-agents	Mobile IP Home Agent	Servers	IPADDR_ARRAY
69	smtp-servers	SMTP Server	Servers	IPADDR_ARRAY
70	pop3-servers	POP3 Server	Servers	IPADDR_ARRAY
71	nnntp-servers	NNTP Server	Servers	IPADDR_ARRAY
72	www-servers	WWW Server	Servers	IPADDR_ARRAY
73	finger-servers	Finger Server	Servers	IPADDR_ARRAY
74	irc-servers	IRC Server	Servers	IPADDR_ARRAY
75	streettalk-servers	StreetTalk Server	Servers	IPADDR_ARRAY
76	streettalk-directory- assistance-servers	STDA Server	Servers	IPADDR_ARRAY
77	dhcp-user-class-id (set by DHCP client)	--	--	STRING
81	client-fqdn	DHCP Client FQDN	--	BYTE_ARRAY
82	relay-agent-info	DHCP Relay Agent Information	(for suboptions, see relay-agent-info , page C-4)	BYTE_ARRAY
85	nds-servers	NDS Servers	NetWare Client	IPADDR_ARRAY
86	nds-tree	NDS Tree Name	NetWare Client	STRING
87	nds-context	NDS Context	NetWare Client	STRING
118	subnet-selection	Subnet Selection	--	IPADDR

Table B-9 DHCP Options by Number (continued)

No.	Network Registrar Name	Protocol Name	Category	Validation
122	cablelabs-client-configuration	CableLabs Client Configuration	(for suboptions, see cablelabs-client-configuration , page C-2)	BYTE_ARRAY
128	mcns-security-server	--	Servers	IPADDR
185	vpn-id	VPN Identifier	--	BYTE_ARRAY (structured)
220	cisco-subnet-allocation	Cisco Subnet Allocation	--	BYTE_ARRAY (structured)
221	cisco-vpn-id	Cisco VPN Identifier	--	BYTE_ARRAY (structured)
251	auto-configure	Autoconfiguration	--	BYTE
255	end (set by protocol)	End	--	

Options by Network Registrar Name

Table B-10 lists the DHCP options by Network Registrar name. (For each option's validation type, cross-reference it by number to Table B-9 and check the Validation column.)

Table B-10 DHCP Options by Network Registrar Name

Network Registrar Name	Number	Option Name	Category
all-subnets-local	27	All Subnets Are Local	Interface
arp-cache-timeout	35	ARP Cache Timeout	Interface
boot-file	67	Bootfile Name	BOOTP
boot-size	13	Boot File Size	BOOTP
broadcast-address	28	Broadcast Address	Interface
cablelabs-client-configuration	122	CableLabs Client Configuration	Interface
cisco-subnet-allocation	220	Cisco Subnet Allocation	--
cisco-vpn-id	221	Cisco VPN Identifier	--
client-fqdn	81	DHCP Client FQDN	(proposed)
cookie-servers	8	Cookie Server	BOOTP
default-ip-ttl	23	Default IP Time-to-Live	Host IP
default-tcp-ttl	37	TCP Default TTL	Interface
dhcp-class-identifier	60	Vendor Class Identifier	--
dhcp-client-identifier	61	Client-Identifier	Basic
dhcp-lease-time	51	IP Address Lease Time	Lease Information, MS DHCP Client

Table B-10 DHCP Options by Network Registrar Name (continued)

Network Registrar Name	Number	Option Name	Category
dhcp-max-message-size	57	Maximum DHCP Message Size	--
dhcp-message-type	53	DHCP Message Type	--
dhcp-message	56	Message	--
dhcp-option-overload	52	Option Overload	--
dhcp-parameter-request-list	55	Parameter Request List	--
dhcp-rebinding-time	59	Rebinding (T2) Time Value	Lease Information, MS DHCP Client
dhcp-renewal-time	58	Renewing (T1) Time Value	Lease Information, MS DHCP Client
dhcp-requested-address	50	Requested IP Address	--
dhcp-server-identifier	54	Server Identifier	--
dhcp-user-class-id	77	--	--
domain-name	15	Domain Name	Basic, MS DHCP Client
domain-name-servers	6	Domain Name Server	Basic, MS DHCP Client
end	255	End	--
extensions-path	18	Extensions Path	BOOTP
finger-servers	73	Finger Server	Servers
font-servers	48	X Window System Font Server	Servers
host-name	12	Host Name	Basic
ieee802.3-encapsulation	36	Ethernet Encapsulation	Interface
impress-servers	10	Impress Server	BOOTP
interface-mtu	26	Interface MTU	Interface
ip-forwarding	19	IP Forwarding Enable/Disable	Host IP
irc-servers	74	IRC Server	Servers
log-servers	7	Log Server	Servers
lpr-servers	9	LPR Server	Servers
mask-supplier	30	Mask Supplier	Interface
max-dgram-reassembly	22	Maximum Datagram Reassembly Size	Host IP
mcns-security-server	128	--	Servers
merit-dump	14	Merit Dump File	BOOTP
mobile-ip-home-agents	68	Mobile IP Home Agent	Servers
name-servers	5	Name Server	BOOTP
nds-context	87	NDS Context	NetWare Client
nds-servers	85	NDS Servers	NetWare Client

Table B-10 DHCP Options by Network Registrar Name (continued)

Network Registrar Name	Number	Option Name	Category
nds-tree	86	NDS Tree Name	NetWare Client
netbios-dd-servers	45	NetBIOS over TCP/IP Datagram Distribution Server	WINS/NetBIOS
netbios-name-servers	44	NetBIOS over TCP/IP Name Server	WINS/NetBIOS, MS DHCP Client
netbios-node-type	46	NetBIOS over TCP/IP Node Type	WINS/NetBIOS, MS DHCP Client
netbios-scope	47	NetBIOS over TCP/IP Scope	WINS/NetBIOS, MS DHCP Client
netwareip-domain	62	NetWare/IP Domain Name	NetWare Client
netwareip-information	63	NetWare/IP Information	NetWare Client
nis+-domain	64	NIS+ Domain	Servers
nis+-servers	65	Network Information Service (NIS+) Servers	Servers
nis-domain	40	NIS Domain	Servers
nis-servers	41	Network Information Service (NIS) Servers	Servers
nntp-servers	71	NNTP Server	Servers
non-local-source-routing	20	Non-Local Source Routing	Host IP
nntp-servers	42	NTP Servers	Servers
packet-file-name	--	--	DHCP Packet Fields
packet-server-name	--	--	DHCP Packet Fields
packet-siaddr	--	--	DHCP Packet Fields
pad	0	Pad	--
path-mtu-aging-timeout	24	Path MTU Aging Timeout	Host IP
path-mtu-plateau-tables	25	Path MTU Plateau Table	Host IP
perform-mask-discovery	29	Perform Mask Discovery	Interface
policy-filters	21	Policy Filter	Host IP
pop3-servers	70	POP3 Server	Servers
relay-agent-info	82	DHCP Relay Agent Information	--
resource-location-servers	11	Resource Location Server	BOOTP
root-path	17	Root Path	BOOTP
router-discovery	31	Perform Router Discovery	Interface
router-solicitation-address	32	Router Solicitation Address	Interface
routers	3	Router	Basic, MS DHCP Client
smtp-servers	69	SMTP Server	Servers
static-routes	33	Static Route	Interface

Table B-10 DHCP Options by Network Registrar Name (continued)

Network Registrar Name	Number	Option Name	Category
streettalk-directory-assistance-servers	76	STDA Server	Servers
streettalk-servers	75	StreetTalk Server	Servers
subnet-mask	1	Subnet Mask	Basic
swap-server	16	Swap Server	BOOTP
tcp-keepalive-garbage	39	TCP Keepalive Garbage	Interface
tcp-keepalive-interval	38	TCP Keepalive Interval	Interface
tftp-server	66	TFTP Server Name	Servers
time-offset	2	Time Offset	BOOTP
time-servers	4	Time Server	BOOTP
trailer-encapsulation	34	Trailer Encapsulation	Interface
vendor-encapsulated-options	43	Vendor Specific Information	--
vpn-id	185	VPN Identifier	--
www-servers	72	WWW Server	Servers
x-display-managers	49	X Window System Display Manager	Servers

Options by Category

Table B-11 list each option by category. (For each option's validation type, cross-reference it by number to Table B-9 on page B-11 and check the Validation column.)

Table B-11 DHCP Options by Category

Category	Number	Network Registrar Name	Option Name
--	0	pad	Pad
--	43	vendor-encapsulated-options	Vendor Specific Information
--	50	dhcp-requested-address	Requested IP Address
--	52	dhcp-option-overload	Option Overload
--	53	dhcp-message-type	DHCP Message Type
--	54	dhcp-server-identifier	Server Identifier
--	55	dhcp-parameter-request-list	Parameter Request List
--	56	dhcp-message	Message
--	57	dhcp-max-message-size	Maximum DHCP Message Size
--	60	dhcp-class-identifier	Vendor Class Identifier
--	77	dhcp-user-class-id	--
--	82	relay-agent-info	--
--	122	cablelabs-client-configuration	--

Table B-11 DHCP Options by Category (continued)

Category	Number	Network Registrar Name	Option Name
--	255	end	End
Basic	1	subnet-mask	Subnet Mask
Basic	3	routers	Router
Basic	6	domain-name-servers	Domain Name Server
Basic	12	host-name	Host Name
Basic	15	domain-name	Domain Name
Basic	61	dhcp-client-identifier	Client-Identifier
BOOTP	2	time-offset	Time Offset
BOOTP	4	time-servers	Time Server
BOOTP	5	name-servers	Name Server
BOOTP	8	cookie-servers	Cookie Server
BOOTP	10	impress-servers	Impress Server
BOOTP	11	resource-location-servers	Resource Location Server
BOOTP	13	boot-size	Boot File Size
BOOTP	14	merit-dump	Merit Dump File
BOOTP	16	swap-server	Swap Server
BOOTP	17	root-path	Root Path
BOOTP	18	extensions-path	Extensions Path
BOOTP	67	boot-file	Bootfile Name
DHCP Packet Fields	--	packet-file-name	--
DHCP Packet Fields	--	packet-server-name	--
DHCP Packet Fields	--	packet-siaddr	--
Host IP	19	ip-forwarding	IP Forwarding Enable/Disable
Host IP	20	non-local-source-routing	Non-Local Source Routing
Host IP	21	policy-filters	Policy Filter
Host IP	22	max-dgram-reassembly	Maximum Datagram Reassembly Size
Host IP	23	default-ip-ttl	Default IP Time-to-Live
Host IP	24	path-mtu-aging-timeout	Path MTU Aging Timeout
Host IP	25	path-mtu-plateau-tables	Path MTU Plateau Table
Interface	26	interface-mtu	Interface MTU
Interface	27	all-subnets-local	All Subnets Are Local
Interface	28	broadcast-address	Broadcast Address
Interface	29	perform-mask-discovery	Perform Mask Discovery
Interface	30	mask-supplier	Mask Supplier
Interface	31	router-discovery	Perform Router Discovery

Table B-11 DHCP Options by Category (continued)

Category	Number	Network Registrar Name	Option Name
Interface	32	router-solicitation-address	Router Solicitation Address
Interface	33	static-routes	Static Route
Interface	34	trailer-encapsulation	Trailer Encapsulation
Interface	35	arp-cache-timeout	ARP Cache Timeout
Interface	36	ieee802.3-encapsulation	Ethernet Encapsulation
Interface	37	default-tcp-ttl	TCP Default TTL
Interface	38	tcp-keepalive-interval	TCP Keepalive Interval
Interface	39	tcp-keepalive-garbage	TCP Keepalive Garbage
Lease Information	51	dhcp-lease-time	IP Address Lease Time
Lease Information	58	dhcp-renewal-time	Renewing (T1) Time Value
Lease Information	59	dhcp-rebinding-time	Rebinding (T2) Time Value
Microsoft DHCP Client	3	routers	Router
Microsoft DHCP Client	6	domain-name-servers	Domain Name Server
Microsoft DHCP Client	15	domain-name	Domain Name
Microsoft DHCP Client	44	netbios-name-servers	NetBIOS over TCP/IP Name Server
Microsoft DHCP Client	46	netbios-node-type	NetBIOS over TCP/IP Node Type
Microsoft DHCP Client	47	netbios-scope	NetBIOS over TCP/IP Scope
Microsoft DHCP Client	51	dhcp-lease-time	IP Address Lease Time
Microsoft DHCP Client	58	dhcp-renewal-time	Renewing (T1) Time Value
Microsoft DHCP Client	59	dhcp-rebinding-time	Rebinding (T2) Time Value
NetWare Client	62	netwareip-domain	NetWare/IP Domain Name
NetWare Client	63	netwareip-information	NetWare/IP Information
NetWare Client	85	nds-servers	NDS Servers
NetWare Client	86	nds-tree	NDS Tree Name
NetWare Client	87	nds-context	NDS Context
Servers	7	log-servers	Log Server
Servers	9	lpr-servers	LPR Server
Servers	40	nis-domain	NIS Domain
Servers	41	nis-servers	Network Information Service (NIS) Servers
Servers	42	ntp-servers	NTP Servers
Servers	48	font-servers	X Window System Font Server
Servers	49	x-display-managers	X Window System Display Manager
Servers	64	nis+-domain	NIS+ Domain
Servers	65	nis+-servers	NIS+ Servers

Table B-11 DHCP Options by Category (continued)

Category	Number	Network Registrar Name	Option Name
Servers	66	tftp-server	TFTP Server Name
Servers	68	mobile-ip-home-agents	Mobile IP Home Agent
Servers	69	smtp-servers	SMTP Server
Servers	70	pop3-servers	POP3 Server
Servers	71	nntp-servers	NNTP Server
Servers	72	www-servers	WWW Server
Servers	73	finger-servers	Finger Server
Servers	74	irc-servers	IRC Server
Servers	75	streettalk-servers	StreetTalk Server
Servers	76	streettalk-directory- assistance-servers	STDA Server
Servers	128	mcns-security-server	--
WINS/NetBIOS	44	netbios-name-servers	NetBIOS over TCP/IP Name Server
WINS/NetBIOS	45	netbios-dd-servers	NetBIOS over TCP/IP Datagram Distribution Server
WINS/NetBIOS	46	netbios-node-type	NetBIOS over TCP/IP Node Type
WINS/NetBIOS	47	netbios-scope	NetBIOS over TCP/IP Scope

Option Validation Types

Table B-12 defines the DHCP option validation types.

Table B-12 Validation Types

Validation	Format and Allowed Values
BOOL	Boolean value. Represents the state of an enabled or disabled option.
BYTE	Unrestricted sequence of octets.
BYTE_ARRAY	List of BYTES. Unrestricted sequence of octets.
INT	32-bit integer value. Maximum range of values: – 2147483648 through 2147483647.
IPADDR	IP address as 32-bit number, entered as a quadruple-octet (numbers ranging from 0-255) with decimal points separating the octet numbers. Some IP addresses are subnet masks, as per RFC 950. A subnet mask is a 32-bit number, entered in IP Address format, starting with 0 or more bits, with the remaining bits set to zero. Nine numbers can appear in a subnet mask— 0, 128, 192, 224, 240, 248, 252, 254, and 255. The <i>subnet-mask</i> option is an exception: it accepts any valid IP address, even invalid masks.
IPADDR_ARRAY	List containing at least one IP address. See IPADDR for format and allowed values of each list member.

Table B-12 Validation Types (continued)

Validation	Format and Allowed Values
STRING	<p>Unrestricted sequence of ASCII characters (from 1 through 255). A hostname string may or may not be qualified with the local domain name (see RFC 1035). The grammar for hostnames is:</p> <ul style="list-style-type: none"> • domain ::= <subdomain> " " • <subdomain> ::= <label> <subdomain> "." <label> • <label> ::= <ldh-str> <let-dig> • <ldh-str> ::= <let-dig-hyp> <let-dig-hyp> <ldh-str> • <let-dig-hyp> ::= <let-dig> '-' • <let-dig> ::= <letter> <digit> • <letter> ::= any one of the 52 alphabetic characters 'A' through 'Z' in uppercase and 'a' through 'z' in lowercase. • <digit> ::= any one of the ten digits '0' through '9'
UINT	32-bit unsigned value. Represents a count, size or duration. Can have a range of allowed values associated with a given option. Maximum range of values: 0 through 4294967295.
WORD	16-bit unsigned value. Represents a count, size or duration. Can have a range of allowed values associated with a given option. Maximum range of values: 0 through 65535.
WORD_ARRAY	List containing at least one WORD. See WORD for format and allowed values of each list member.