

# SonicWALL DHCP Server Enhancements in SonicOS Enhanced 4.0

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## Document Scope

This document describes the DHCP enhancements in SonicOS Enhanced 4.0, including DHCP server options and DHCP server persistence. This document contains the following sections:

- [“DHCP Server Options Overview” section on page 2](#)
- [“Configuring SonicWALL DHCP Server Options” section on page 3](#)
- [“DHCP Server Persistence Overview” section on page 12](#)
- [“Appendix A: DHCP Option Numbers” section on page 13](#)

# DHCP Server Options Overview

This section provides an introduction to DHCP server options feature. This section contains the following subsections:

- [“What Is the SonicWALL DHCP Server Options Feature?” section on page 2](#)
- [“Benefits” section on page 2](#)
- [“How Does the SonicWALL DHCP Server Options Feature Work?” section on page 2](#)
- [“Platforms” section on page 2](#)
- [“The SonicWALL DHCP server options feature is available on SonicWALL PRO and TZ appliances running SonicOS Enhanced 4.0 or higher.” section on page 12](#)

## What Is the SonicWALL DHCP Server Options Feature?

The SonicWALL DHCP server options feature provides support for DHCP options, also known as vendor extensions, as defined primarily in RFCs 2131 and 2132. DHCP options allow users to specify additional DHCP parameters in the form of pre-defined, vendor-specific information that is stored in the options field of a DHCP message. When the DHCP message is sent to clients on the network, it provides vendor-specific configuration and service information. [Table 1](#) provides a list of DHCP options by RFC-assigned option number.

## Benefits

The SonicWALL DHCP server options feature provides a simple interface for selecting DHCP options by number or name, making the DHCP configuration process quick, easy, and compliant with RFC-defined DHCP standards.

## How Does the SonicWALL DHCP Server Options Feature Work?

The SonicWALL DHCP server options feature allows definition of DHCP options using a drop-down menu based on RFC-defined option numbers, allowing administrators to easily create DHCP objects and object groups, and configure DHCP generic options for dynamic and static DHCP lease scopes. Once defined, the DHCP option is included in the options field of the DHCP message, which is then passed to DHCP clients on the network, describing the network configuration and service(s) available.

## Platforms

The SonicWALL DHCP server options feature is available on SonicWALL PRO and TZ appliances running SonicOS Enhanced 4.0 or higher.

## Supported Standards

The SonicWALL DHCP server options feature supports the following standards:

- RFC 2131 - Dynamic Host Configuration Protocol
- RFC 2132 - DHCP Options and BOOTP Vendor Extensions

# Configuring SonicWALL DHCP Server Options

This section provides configuration tasks for DHCP option objects, DHCP option groups, and DHCP generic options for lease scopes. This section contains the following subsections:

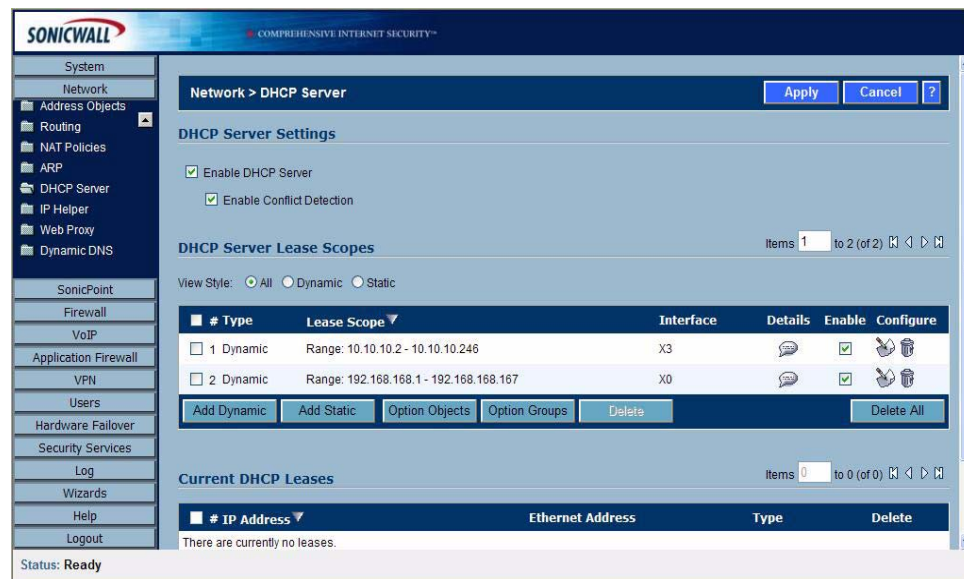
- “Configuring DHCP Option Objects” section on page 3
- “Configuring DHCP Option Groups” section on page 7
- “Configuring DHCP Generic Options for DHCP Lease Scopes” section on page 10

## Configuring DHCP Option Objects

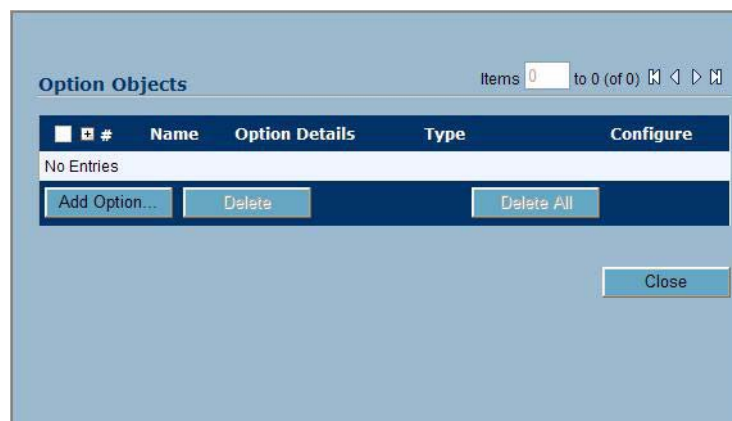
### Configuration Procedure

To configure DHCP option objects, perform the following steps:

- Step 1** In the left-hand navigation panel, navigate to **Network > DHCP Server**.



- Step 2** Under DHCP Server Lease Scopes, click the **Option Objects** button. The Option Objects page displays.



**Step 3** Click the **Add Option** button. The Add DHCP Option Objects page displays.

Option Name:

Option Number: 2 (Time Offset) ▼

Option Array

Option Type: Four Byte Data ▼

Option Value:

Ready

OK Cancel

**Step 4** Type a name for the option in the **Option Name** field.

Option Name: DNS server

Option Number: 2 (Time Offset) ▼

Option Array

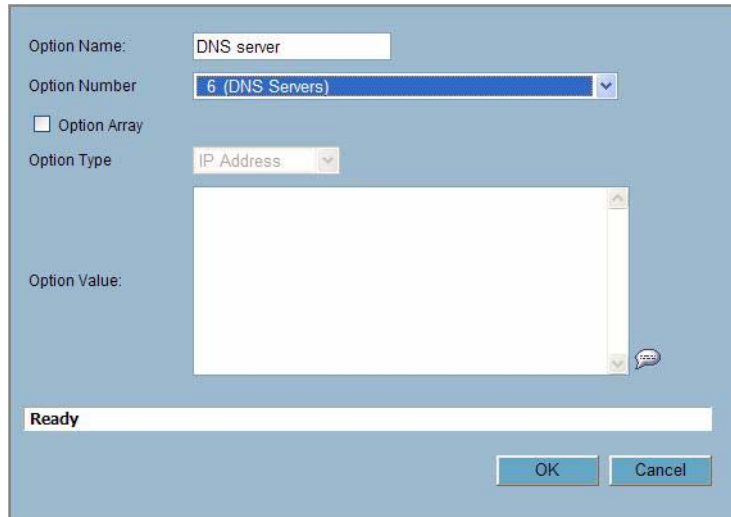
Option Type: Four Byte Data ▼

Option Value:

Ready

OK Cancel

- Step 5** From the **Option Number** drop-down list, select the option number that corresponds to your DHCP option. For a list of option numbers and names, refer to [Table 1](#) in “[Appendix A: DHCP Option Numbers](#)” section on page 13.



Option Name:

Option Number:

Option Array

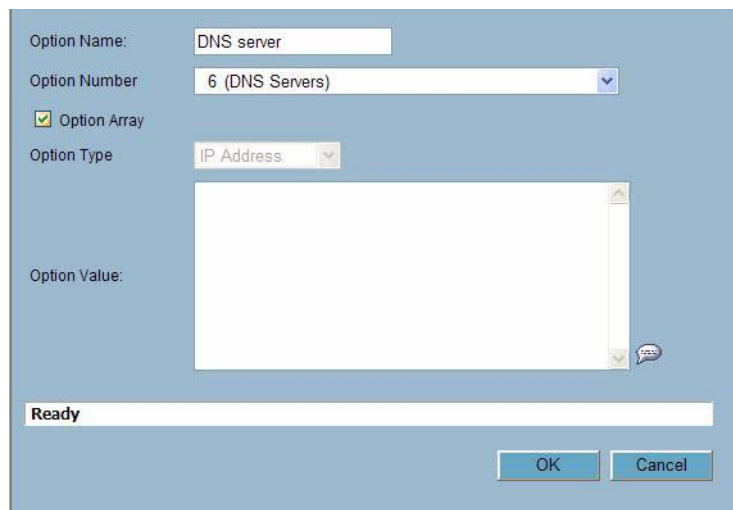
Option Type:

Option Value:

Ready

OK Cancel

- Step 6** Optionally check the **Option Array** box to allow entry of multiple option values in the **Option Value** field.



Option Name:

Option Number:

Option Array

Option Type:

Option Value:

Ready

OK Cancel

**Step 7** The option type displays in the **Option Type** drop-down menu. If only one option type is available, for example, for Option Number 2 (**Time Offset**), the drop-down menu will be greyed out. If there are multiple option types available, for example, for Option Number 77 (**User Class Information**), the drop-down menu will be functional.

**Figure 1** One option type available

Option Number: 2 (Time Offset) [v]  
 Option Array  
 Option Type: Four Byte Data [v]

**Figure 2** Multiple option types available

Option Number: 77 (User Class Information) [v]  
 Option Array  
 Option Type: Four Byte Data [v]

**Step 8** Type the option value, for example, an IP address, in the **Option Value** field. If **Option Array** is checked, multiple values may be entered, separated by a semi-colon (;).

Option Name: DNS server  
 Option Number: 6 (DNS Servers) [v]  
 Option Array  
 Option Type: IP Address [v]  
 Option Value: 10.0.1.1;10.0.1.2;10.0.1.3  
 Ready  
 [OK] [Cancel]

**Step 9** Click **OK**. The object will display in the Option Objects list.

Option Objects Items 1 to 1 (of 1) [refresh] [left] [right] [refresh]

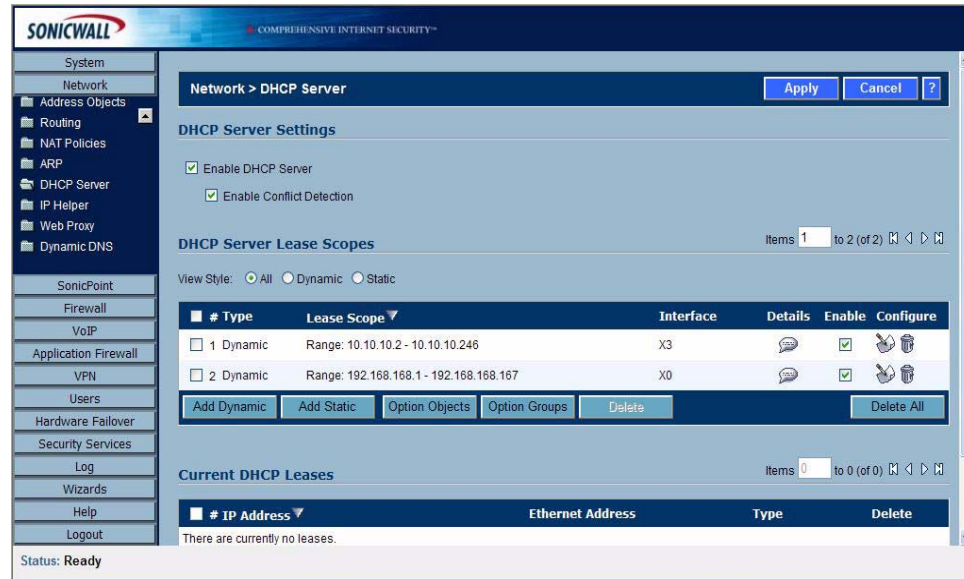
#	Name	Option Details	Type	Configure
<input type="checkbox"/> 1	DNS server	6/10.0.1.1;10.0.1.2;10.0.1.3	IP Address	[edit] [delete]

[Add Option...] [Delete] [Delete All] [Close]

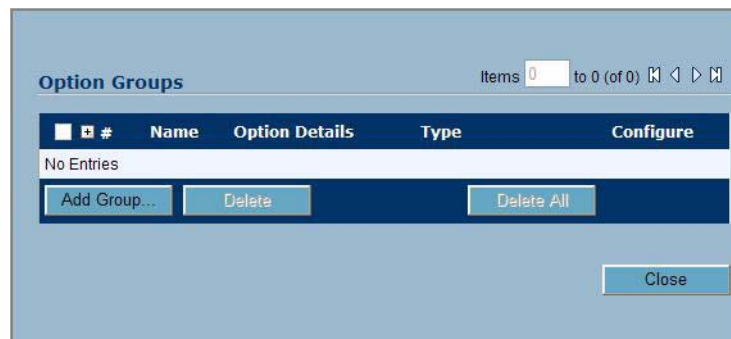
# Configuring DHCP Option Groups

To configure DHCP option groups, perform the following steps:

- Step 1** In the left-hand navigation panel, navigate to **Network > DHCP Server**.



- Step 2** Under DHCP Server Lease Scopes, click **Option Groups**. The Option Groups page displays.



**Step 3** Click the **Add Group** button. The Add DHCP Option Group page displays.

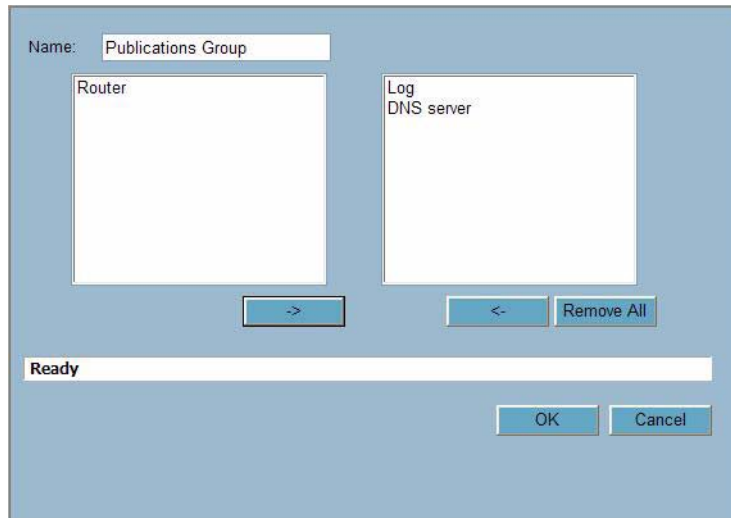
The screenshot shows a web interface for adding a DHCP option group. At the top, there is a text input field labeled "Name:" which is currently empty. Below this, there are two side-by-side list boxes. The left list box contains three items: "DNS server", "Log", and "Router". The right list box is empty. Between the two list boxes, there are three buttons: a right-pointing arrow ">", a left-pointing arrow "<", and a button labeled "Remove All". Below the list boxes, there is a text input field labeled "Ready" which contains the text "Ready". At the bottom right, there are two buttons: "OK" and "Cancel".

**Step 4** Enter a name for the group in the **Name** field.

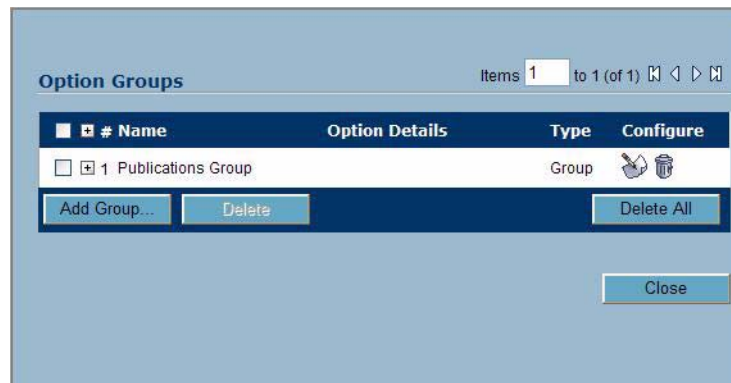
This screenshot is identical to the one in Step 3, but the "Name:" field now contains the text "Publications Group". All other elements, including the list boxes, buttons, and the "Ready" field, remain the same.



**Step 5** Select an option object from the left column and click the -> button to add it to the group. To select multiple option objects at the same time, hold the **Ctrl** key while selecting the option objects.



**Step 6** Click **OK**. The group displays in the Option Groups list.



# Configuring DHCP Generic Options for DHCP Lease Scopes

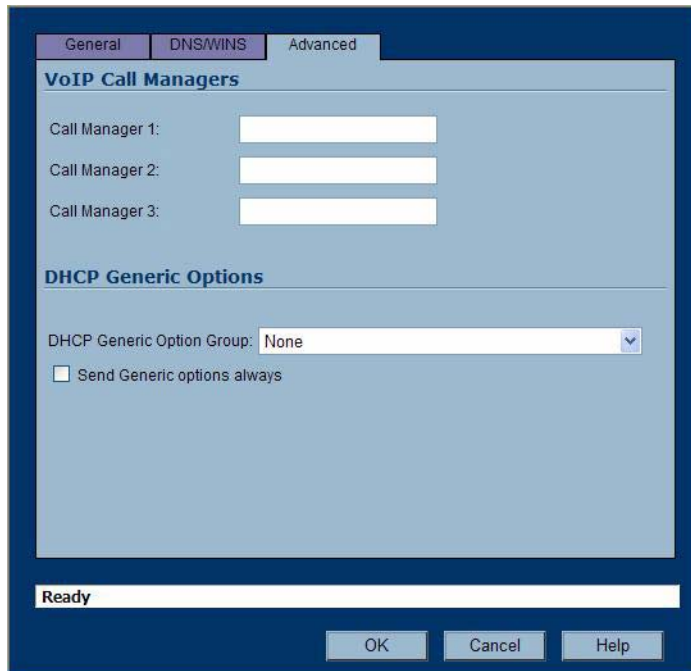
To configure DHCP generic options for DHCP server lease scopes, perform the following tasks:



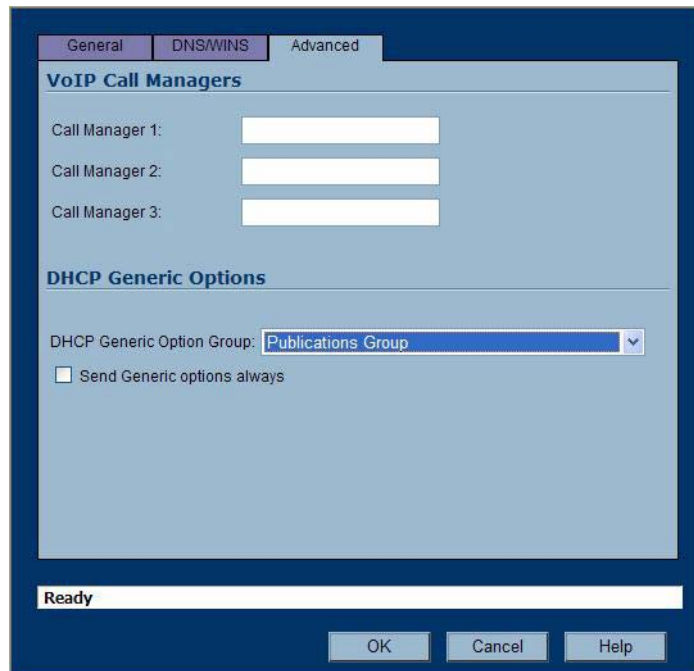
**Note**

Before generic options for a DHCP lease scope can be configured, a static or dynamic DHCP server lease scope must be created.

- Step 1** If modifying an existing DHCP lease scope, locate the lease scope under DHCP Server Lease Scopes on the **Network > DHCP Server** page and click the configure icon, then click the **Advanced** tab. If creating a new DHCP lease scope, click the **Advanced** tab.

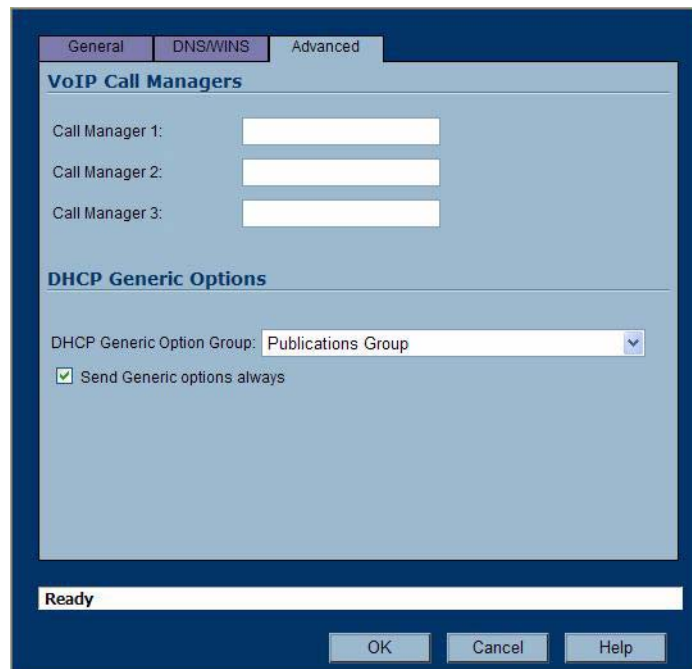


**Step 2** Select a DHCP option or option group in the **DHCP Generic Option Group** drop-down menu.



The screenshot shows a configuration window with three tabs: 'General', 'DNS/WINS', and 'Advanced'. The 'Advanced' tab is selected. Under the 'VoIP Call Managers' section, there are three input fields for 'Call Manager 1:', 'Call Manager 2:', and 'Call Manager 3:'. Below this is the 'DHCP Generic Options' section, which contains a dropdown menu for 'DHCP Generic Option Group:' set to 'Publications Group' and an unchecked checkbox for 'Send Generic options always'. At the bottom, there is a 'Ready' status bar and 'OK', 'Cancel', and 'Help' buttons.

**Step 3** To always use DHCP options for this DHCP server lease scope, check the box next to **Send Generic options always**



This screenshot is identical to the previous one, but the checkbox for 'Send Generic options always' is now checked. The rest of the interface, including the 'VoIP Call Managers' section and the 'DHCP Generic Option Group' dropdown, remains the same.

**Step 4** Click **OK**.

# DHCP Server Persistence Overview

- [“What is DHCP Server Persistence?” section on page 12](#)
- [“Benefits” section on page 12](#)
- [“How Does DHCP Server Persistence Work?” section on page 12](#)
- [“Platforms” section on page 12](#)
- [“The SonicWALL DHCP server options feature is available on SonicWALL PRO and TZ appliances running SonicOS Enhanced 4.0 or higher.” section on page 12](#)

## What is DHCP Server Persistence?

DHCP server persistence is the ability of the firewall save DHCP lease information and to provide the client with a predictable IP address that does not conflict with another use on the network, even after a client reboot.

## Benefits

DHCP server persistence provides a seamless experience when a user reboots a workstation. The DHCP lease information is saved, and the user retains the same workstation IP address. When a firewall is restarted, usually due to maintenance or an upgrade, DHCP server persistence provides the following benefits:

- IP address uniqueness: Lease information is stored in flash memory, so the risk of assigning the same IP address to multiple users is nullified
- Ease of use: By saving the lease information in the flash memory, the user’s connections are automatically restored

## How Does DHCP Server Persistence Work?

DHCP server persistence works by storing DHCP lease information periodically to flash memory. This ensures that users have predictable IP addresses and minimizes the risk of IP addressing conflicts after a reboot.

## Platforms

The SonicWALL DHCP server options feature is available on SonicWALL PRO and TZ appliances running SonicOS Enhanced 4.0 or higher.

# Appendix A: DHCP Option Numbers

This section provides a list of RFC-defined DHCP option numbers and descriptions:

**Table 1** Option Numbers

Option Number	Name	Description
2	Time Offset	Time offset in seconds from UTC
3	Router	N/4 router addresses
4	Time Servers	N/4 time server addresses
5	Name Servers	N/4 IEN-116 server addresses
6	DNS Servers	N/4 DNS server addresses
7	Log Servers	N/4 logging server addresses
8	Cookie Servers	N/4 quote server addresses
9	LPR Servers	N/4 printer server addresses
10	Impress Servers	N/4 impress server addresses
11	RLP Servers	N/4 RLP server addresses
12	Host Name	Hostname string
13	Boot File Size	Size of boot file in 512 byte chunks
14	Merit Dump File	Client to dump and name of file to dump to
15	Domain Name	The DNS domain name of the client
16	Swap Server	Swap server addresses
17	Root Path	Path name for root disk
18	Extension File	Patch name for more BOOTP info
19	IP Layer Forwarding	Enable or disable IP forwarding
20	Src route enabler	Enable or disable source routing
21	Policy Filter	Routing policy filters
22	Maximum DG Reassembly Size	Maximum datagram reassembly size
23	Default IP TTL	Default IP time-to-live
24	Path MTU Aging Timeout	Path MTU aging timeout
25	MTU Plateau	Path MTU plateau table
26	Interface MTU Size	Interface MTU size
27	All Subnets Are Local	All subnets are local
28	Broadcast Address	Broadcast address
29	Perform Mask Discovery	Perform mask discovery
30	Provide Mask to Others	Provide mask to others
31	Perform Router Discovery	Perform router discovery
32	Router Solicitation Address	Router solicitation address
33	Static Routing Table	Static routing table
34	Trailer Encapsulation	Trailer encapsulation

Option Number	Name	Description
35	ARP Cache Timeout	ARP cache timeout
36	Ethernet Encapsulation	Ethernet encapsulation
37	Default TCP Time to Live	Default TCP time to live
38	TCP Keepalive Interval	TCP keepalive interval
39	TCP Keepalive Garbage	TCP keepalive garbage
40	NIS Domain Name	NIS domain name
41	NIS Server Addresses	NIS server addresses
42	NTP Servers Addresses	NTP servers addresses
43	Vendor Specific Information	Vendor specific information
44	NetBIOS Name Server	NetBIOS name server
45	NetBIOS Datagram Distribution	NetBIOS datagram distribution
46	NetBIOS Node Type	NetBIOS node type
47	NetBIOS Scope	NetBIOS scope
48	X Window Font Server	X window font server
49	X Window Display Manager	X window display manager
50	Requested IP address	Requested IP address
51	IP Address Lease Time	IP address lease time
52	Option Overload	Overload "sname" or "file"
53	DHCP Message Type	DHCP message type
54	DHCP Server Identification	DHCP server identification
55	Parameter Request List	Parameter request list
56	Message	DHCP error message
57	DHCP Maximum Message Size	DHCP maximum message size
58	Renew Time Value	DHCP renewal (T1) time
59	Rebinding Time Value	DHCP rebinding (T2) time
60	Client Identifier	Client identifier
61	Client Identifier	Client identifier
62	Netware/IP Domain Name	Netware/IP domain name
63	Netware/IP sub Options	Netware/IP sub options
64	NIS+ V3 Client Domain Name	NIS+ V3 client domain name
65	NIS+ V3 Server Address	NIS+ V3 server address
66	TFTP Server Name	TFTP server name
67	Boot File Name	Boot file name
68	Home Agent Addresses	Home agent addresses

Option Number	Name	Description
69	Simple Mail Server Addresses	Simple mail server addresses
70	Post Office Server Addresses	Post office server addresses
71	Network News Server Addresses	Network news server addresses
72	WWW Server Addresses	WWW server addresses
73	Finger Server Addresses	Finger server addresses
74	Chat Server Addresses	Chat server addresses
75	StreetTalk Server Addresses	StreetTalk server addresses
76	StreetTalk Directory Assistance Addresses	StreetTalk directory assistance addresses
77	User Class Information	User class information
78	SLP Directory Agent	Directory agent information
79	SLP Service Scope	Service location agent scope
80	Rapid Commit	Rapid commit
81	FQDN, Fully Qualified Domain Name	Fully qualified domain name
82	Relay Agent Information	Relay agent information
83	Internet Storage Name Service	Internet storage name service
84	Undefined	N/A
85	Novell Directory Servers	Novell Directory Services servers
86	Novell Directory Server Tree Name	Novell Directory Services server tree name
87	Novell Directory Server Context	Novell Directory Services server context
88	BCMCS Controller Domain Name List	CMCS controller domain name list
89	BCMCS Controller IPv4 Address List	BCMCS controller IPv4 address list
90	Authentication	Authentication
91	Undefined	N/A
92	Undefined	N/A
93	Client System	Client system architecture
94	Client Network Device Interface	Client network device interface
95	LDAP Use	Lightweight Directory Access Protocol
96	Undefined	N/A
97	UUID/GUID Based Client Identifier	UUID/GUID-based client identifier

Option Number	Name	Description
98	Open Group's User Authentication	Open group's user authentication
99	Undefined	N/A
100	Undefined	N/A
101	Undefined	N/A
102	Undefined	N/A
103	Undefined	N/A
104	Undefined	N/A
105	Undefined	N/A
106	Undefined	N/A
107	Undefined	N/A
108	Undefined	N/A
109	Autonomous System Number	Autonomous system number
110	Undefined	
111	Undefined	
112	NetInfo Parent Server Address	NetInfo parent server address
113	NetInfo Parent Server Tag	NetInfo parent server tag
114	URL:	URL
115	Undefined	N/A
116	Auto Configure	DHCP auto-configuration
117	Name Service Search	Name service search
118	Subnet Collection	Subnet selection
119	DNS Domain Search List	DNS domain search list
120	SIP Servers DHCP Option	SIP servers DHCP option
121	Classless Static Route Option	Classless static route option
122	CCC, CableLabs Client Configuration	CableLabs client configuration
123	GeoConf	GeoConf
124	Vendor-Identifying Vendor Class	Vendor-identifying vendor class
125	Vendor Identifying Vendor Specific	Vendor-identifying vendor specific
126	Undefined	N/A
127	Undefined	N/A
128	TFTP Server IP Address	TFTP server IP address for IP phone software load
129	Call Server IP Address	Call server IP address
130	Discrimination String	Discrimination string to identify vendor



Option Number	Name	Description
131	Remote Statistics Server IP Address	Remote statistics server IP address
132	802.1Q VLAN ID	IEEE 802.1Q VLAN ID
133	802.1Q L2 Priority	IEEE 802.1Q layer 2 priority
134	Diffserv Code Point	Diffserv code point for VoIP signalling and media streams
135	HTTP Proxy For Phone Applications	HTTP proxy for phone-specific applications
136	Undefined	N/A
137	Undefined	N/A
138	Undefined	N/A
139	Undefined	N/A
140	Undefined	N/A
141	Undefined	N/A
142	Undefined	N/A
143	Undefined	N/A
144	Undefined	N/A
145	Undefined	N/A
146	Undefined	N/A
147	Undefined	N/A
148	Undefined	N/A
149	Undefined	N/A
150	TFTP Server Address, Etherboot, GRUB Config	TFTP server address, Etherboot, GRUB configuration
151	Undefined	
152	Undefined	N/A
153	Undefined	N/A
154	Undefined	N/A
155	Undefined	N/A
156	Undefined	N/A
157	Undefined	N/A
158	Undefined	N/A
159	Undefined	N/A
160	Undefined	N/A
161	Undefined	N/A
162	Undefined	N/A
163	Undefined	N/A
164	Undefined	N/A
165	Undefined	N/A
166	Undefined	N/A

Option Number	Name	Description
167	Undefined	N/A
168	Undefined	N/A
169	Undefined	N/A
170	Undefined	N/A
171	Undefined	N/A
172	Undefined	N/A
173	Undefined	N/A
174	Undefined	N/A
175	Ether Boot	Ether Boot
176	IP Telephone	IP telephone
177	Ether Boot PacketCable and CableHome	Ether Boot PacketCable and CableHome
178	Undefined	N/A
179	Undefined	N/A
180	Undefined	N/A
181	Undefined	N/A
182	Undefined	N/A
183	Undefined	N/A
184	Undefined	N/A
185	Undefined	N/A
186	Undefined	N/A
187	Undefined	N/A
188	Undefined	N/A
189	Undefined	N/A
190	Undefined	N/A
191	Undefined	N/A
192	Undefined	N/A
193	Undefined	N/A
194	Undefined	N/A
195	Undefined	N/A
196	Undefined	N/A
197	Undefined	N/A
198	Undefined	N/A
199	Undefined	N/A
200	Undefined	N/A
201	Undefined	N/A
202	Undefined	N/A
203	Undefined	N/A

Option Number	Name	Description
204	Undefined	N/A
205	Undefined	N/A
206	Undefined	N/A
207	Undefined	N/A
208	pxelinux.magic (string) = 241.0.116.126	pxelinux.magic (string) = 241.0.116.126
209	pxelinux.configfile (text)	pxelinux.configfile (text)
210	pxelinux.pathprefix (text)	pxelinux.pathprefix (text)
211	pxelinux.reboottime	pxelinux.reboottime
212	Undefined	N/A
213	Undefined	N/A
214	Undefined	N/A
215	Undefined	N/A
216	Undefined	N/A
217	Undefined	N/A
218	Undefined	N/A
219	Undefined	N/A
220	Subnet Allocation	Subnet allocation
221	Virtual Subnet Allocation	Virtual subnet selection
222	Undefined	N/A
223	Undefined	N/A
224	Private Use	Private use
225	Private Use	Private use
226	Private Use	Private use
227	Private Use	Private use
228	Private Use	Private use
229	Private Use	Private use
230	Private Use	Private use
231	Private Use	Private use
232	Private Use	Private use
233	Private Use	Private use
234	Private Use	Private use
235	Private Use	Private use
236	Private Use	Private use
237	Private Use	Private use
238	Private Use	Private use
239	Private Use	Private use
240	Private Use	Private use

<b>Option Number</b>	<b>Name</b>	<b>Description</b>
241	Private Use	Private use
242	Private Use	Private use
243	Private Use	Private use
244	Private Use	Private use
245	Private Use	Private use
246	Private Use	Private use
247	Private Use	Private use
248	Private Use	Private use
249	Private Use	Private use
250	Private Use	Private use
251	Private Use	Private use
252	Private Use	Private use
253	Private Use	Private use
254	Private Use	Private use