Host Configuration: BOOTP and DHCP

Introduction

Information needed by a computer that uses TCP/IP protocol suite:

- IP Address
- Subnet mask
- IP address of default router
- IP address of name server

Previous protocols:

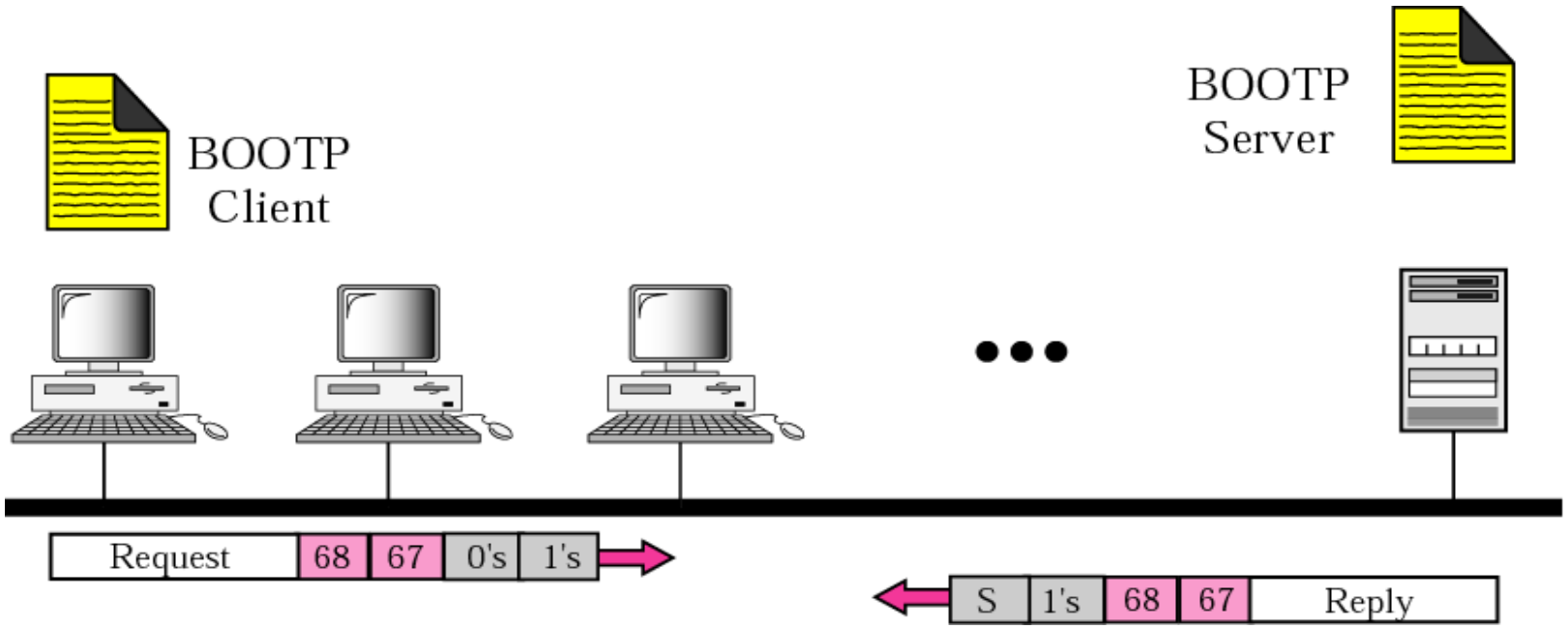
- RARP
- BOOTP

BOOTP

The Bootstrap Protocol (BOOTP) is a client/server protocol that *configures a diskless computer or a computer that is booted for the first time*. BOOTP provides the IP address, net mask, the address of a default router, and the address of a name server.

- BOOTP is a *static configuration* protocol.
- It is a client/server program, boot server can be anywhere in the internet.

Figure 16.1 *Client and server on the same network*



- BOOTP uses UPD ports 67 and 68
- BOOTP uses a static database

Figure 16.2 *Client and server on two different networks*

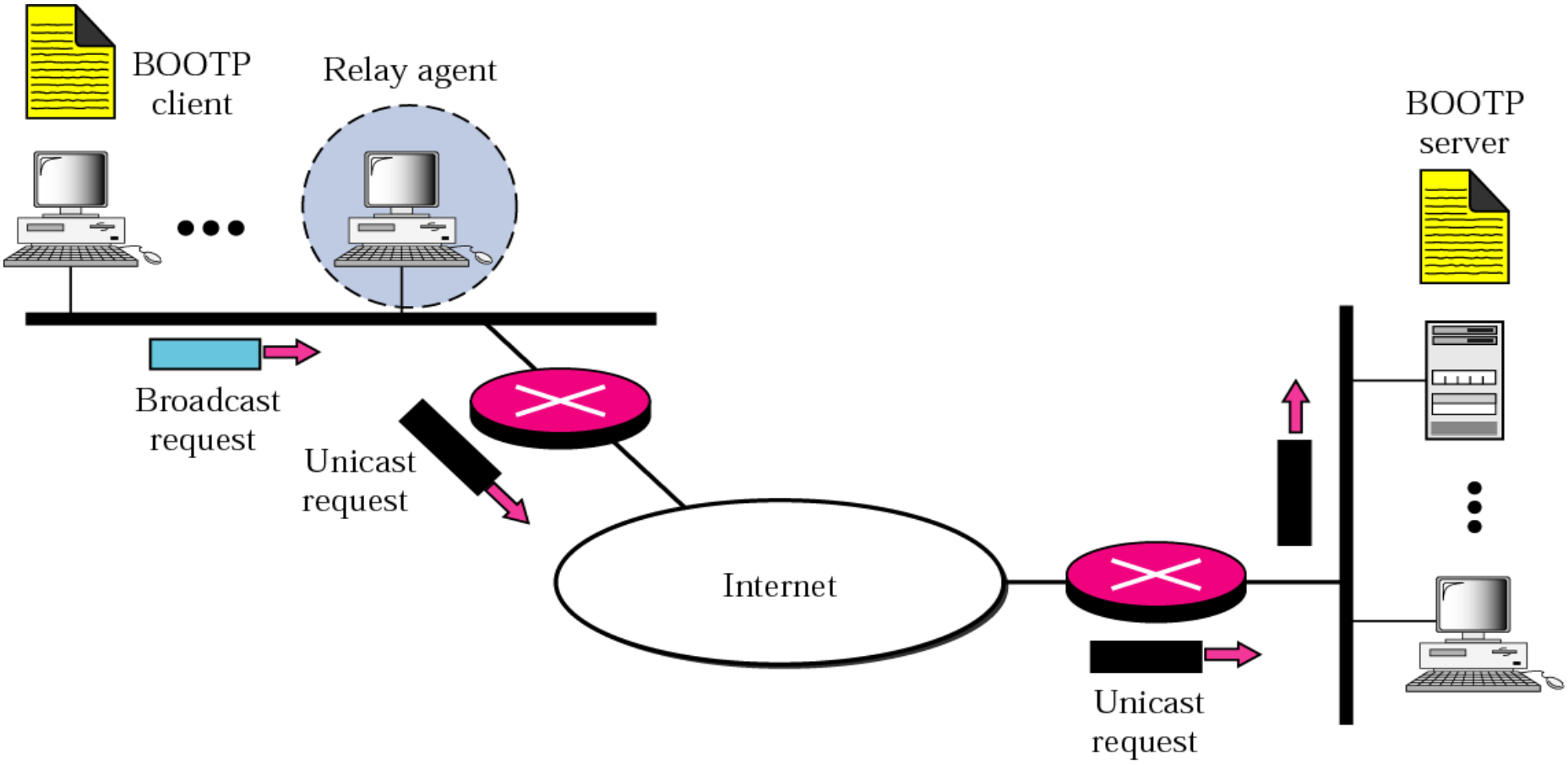


Figure 16.3 *Use of UDP ports*

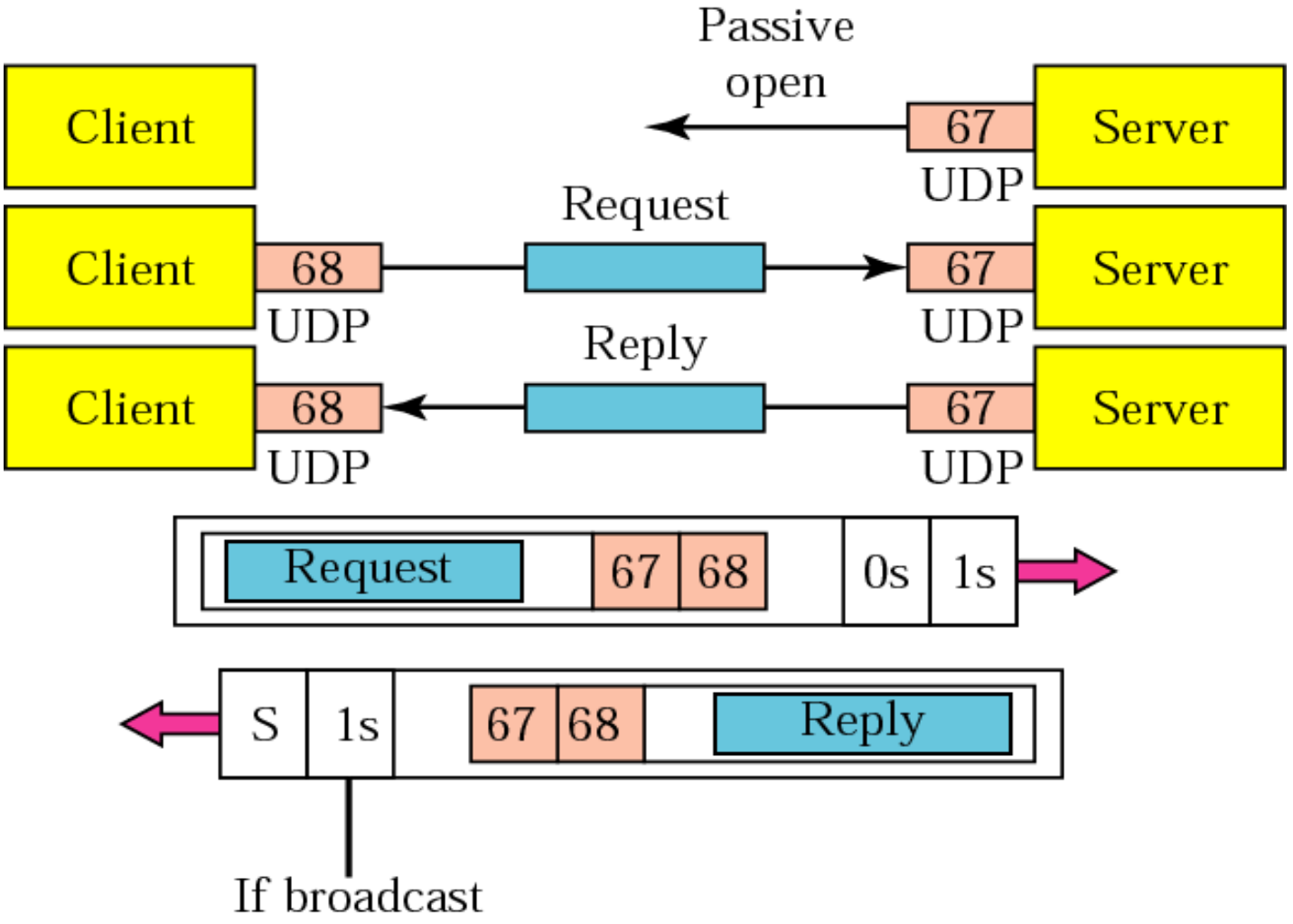


Figure 16.4 *BOOTP packet format*

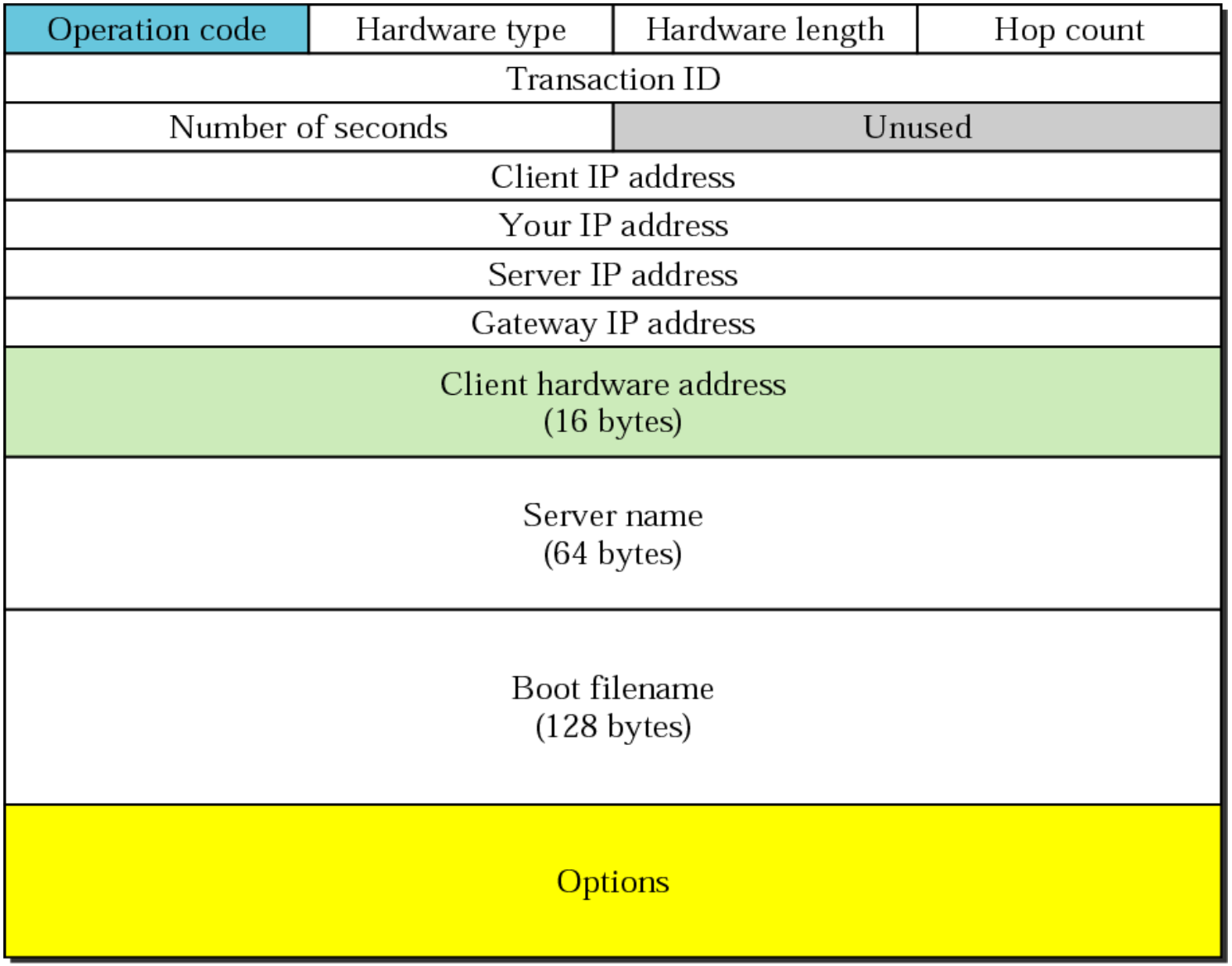


Figure 16.5 *Option format*

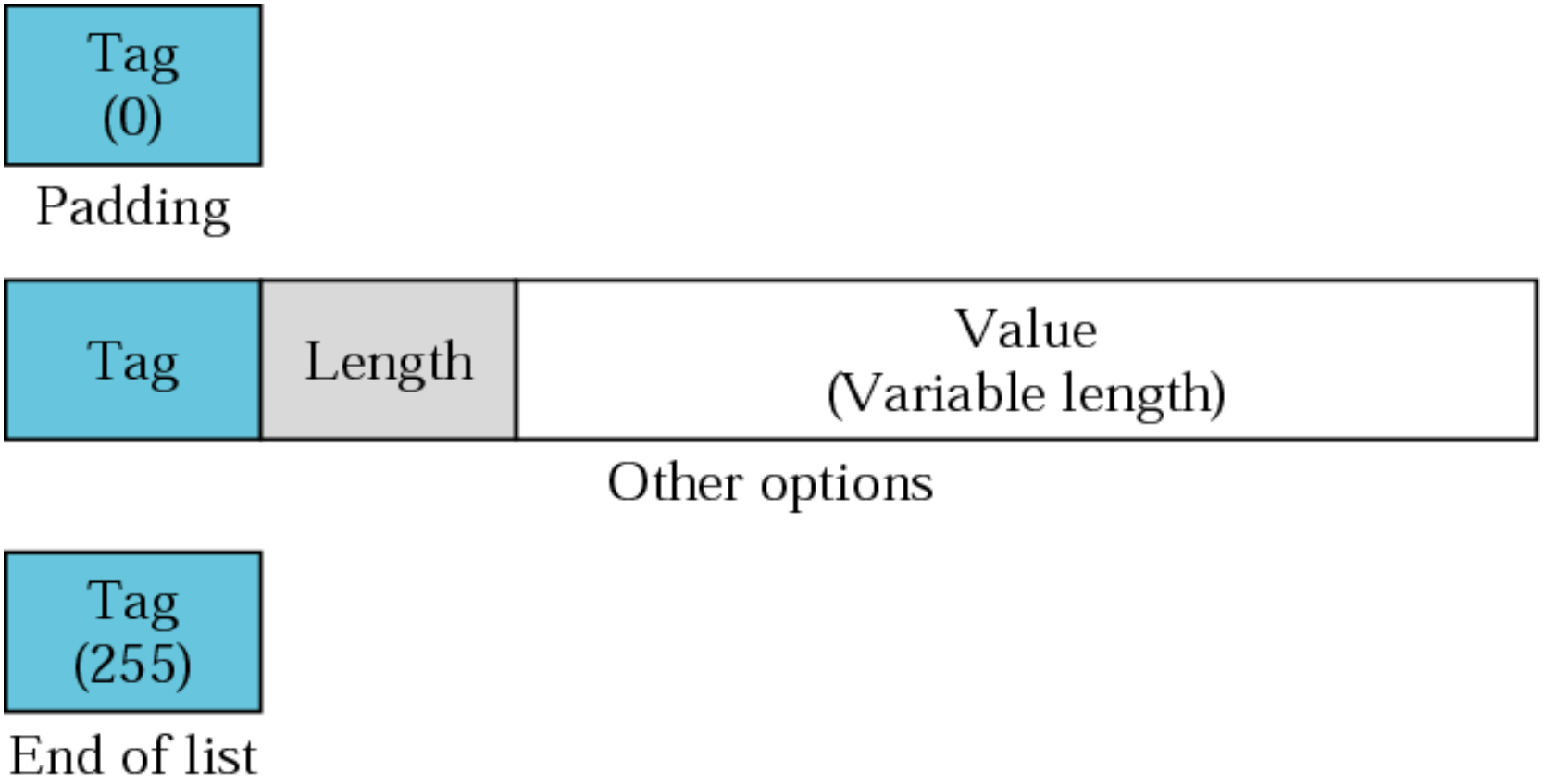


Table 16.1 Options for BOOTP

Description	*Tag*	*Length*	*Value*
Padding	0		
Subnet mask	1	4	Subnet mask
Time offset	2	4	Time of the day
Default routers	3	Variable	IP addresses
Time servers	4	Variable	IP addresses
DNS servers	6	Variable	IP addresses
Print servers	9	Variable	IP addresses
Host name	12	Variable	DNS name
Boot file size	13	2	Integer
Vendor specific	128–254	Variable	Specific information
End of list	255		

DHCP

- The Dynamic Host Configuration Protocol (DHCP) provides static and dynamic address allocation that can be manual or automatic.
- DHCP is successor to BOOTP and is backward compatible.
- DHCP server can be on same network or different network.

Figure 16.6 *DHCP packet*

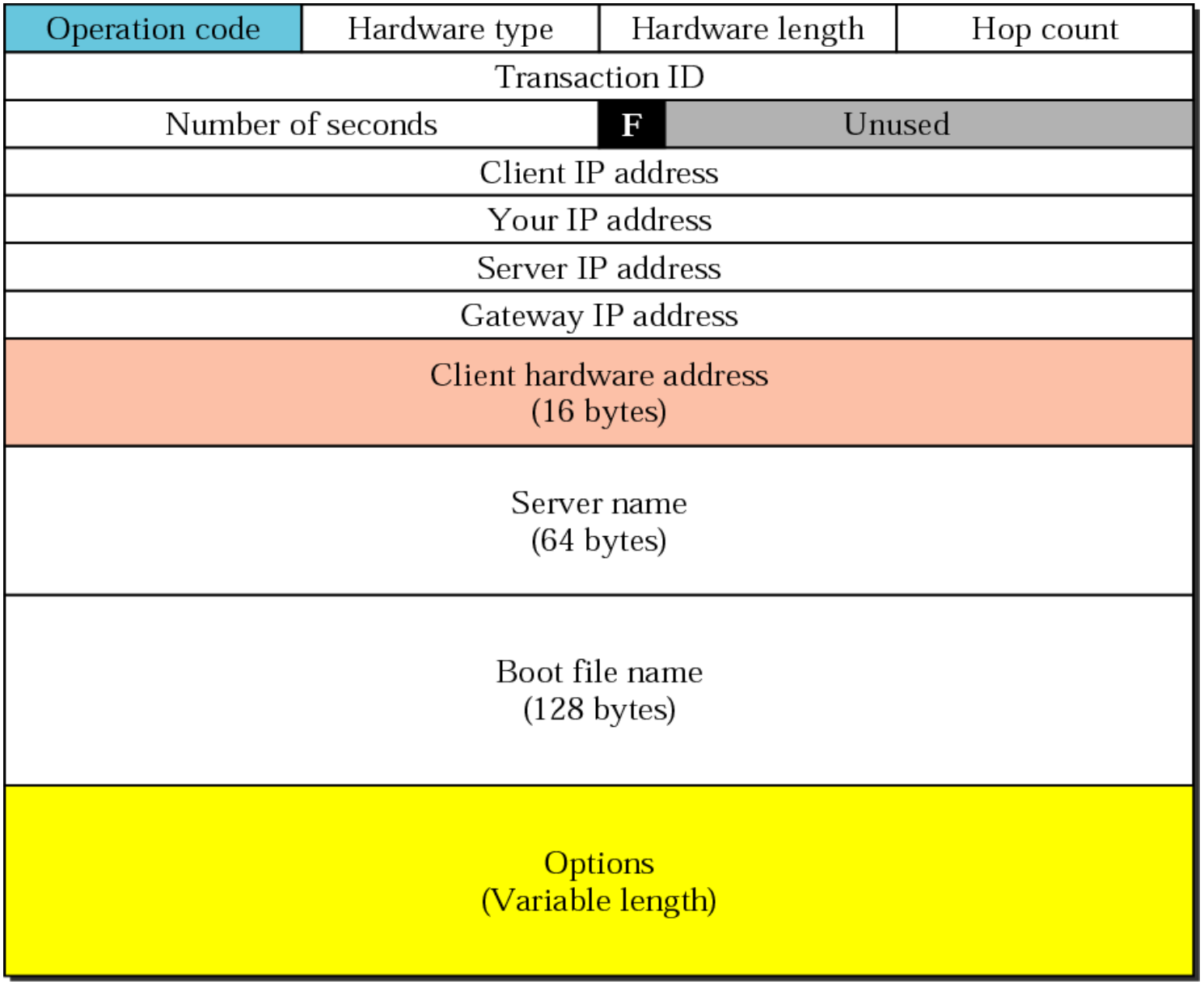


Table 16.2 Options for DHCP

Value	*Value*
1 DHCPDISCOVER	5 DHCPACK
2 DHCPOFFER	6 DHCPNACK
3 DHCPREQUEST	7 DHCPRELEASE
4 DHCPDECLINE	

Figure 16.7 *DHCP transition diagram*

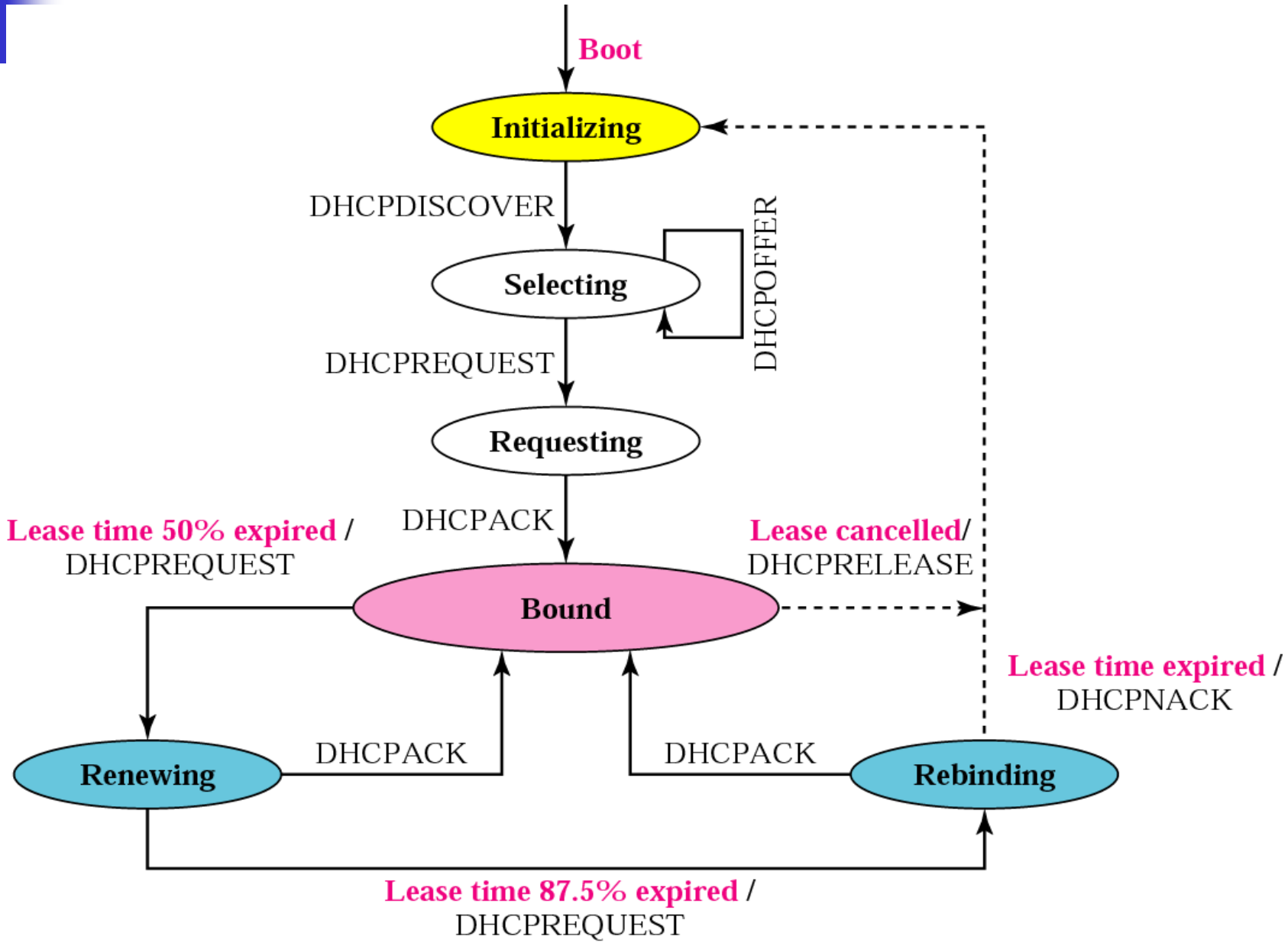


Figure 16.8 *Exchanging messages*