
CHAPTER 9

ICMP

9.1 MULTIPLE-CHOICE QUESTIONS

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. a | 3. b | 5. d | 7. b | 9. a |
| 11. c | 13. c | 15. b | 17. d | 19. a |

9.2 EXERCISES

- Hostid: 27 Class: C
- It could happen that host B is unreachable, for some reason. The error message could then be lost on its way back to host A. It could also happen that host A is on an isolated network that does not contain host B or any router.
- The maximum value is 59 because the pointer points to a byte somewhere in the error data that consists of the original IP header (a maximum of 60 bytes). An offset of 0 would point to the first byte, so an offset of 59 would point to the 60th byte.

27. See Table 9.1.

Table 9.1 Solution to Exercise 27

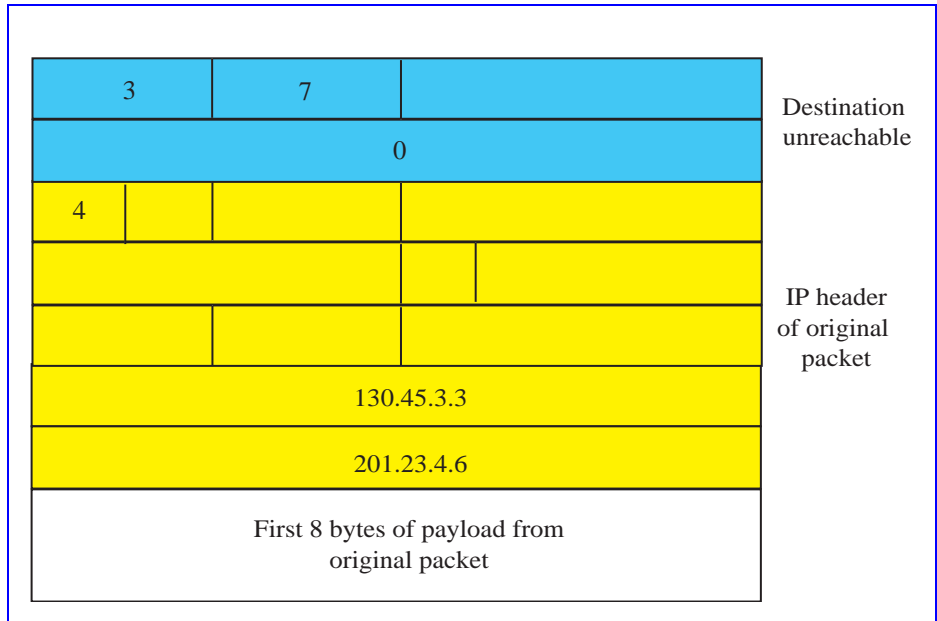
Category	Type	Code	NonDest. host	Router	Destin. host	
<i>Error</i>	Destination unreachable	0		X		
		1		X		
		2				X
		3				X
		4			X	
		5			X	
		6			X	
		7			X	
		8			X	
		9			X	
		10			X	
		11			X	
		12			X	
		13			X	
		14			X	
	15			X		
		Source quench	0		X	X
		Time exceeded	0		X	
			1			X
		Parameter problem	0		X	X
	Redirection	0		X		
<i>Query</i>	Echo request	0	X	X	X	
	Echo reply	0	X	X	X	
	Timestamp request	0	X			
	Timestamp reply	0			X	
	Addr. mask request	0	X			
	Addr. mask reply	0			X	
	Router solicitation	0	X			
	Router advertisement	0		X		

29. The one way time is not the round trip divided by 2 because the request packet may have traveled by a different route than the response packet. In this case, the transmission time in one direction may be different than the transmission time in the other direction.
31. The minimum size of an IP packet that carries an ICMP packet would be 28 bytes (a 20 byte IP header + an 8 byte router solicitation packet). The maximum size

would be 2068 bytes (a 20 byte IP header + a 2048 byte router advertisement packet).

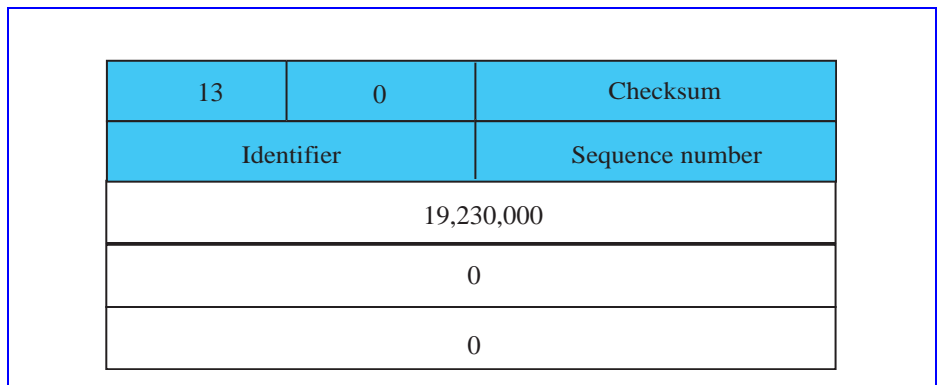
33. The value of the protocol field of an IP packet carrying an ICMP packet is 1.
 35. See Figure 9.1.

Figure 9.1 Exercise 35



37. The type in this message is 3, which means it is a destination unreachable message. The code in this message is 3, which means that the target port is unreachable. The purpose of this message is to inform the sender that the target application of the data that was sent is not available on the destination host at this time.
 39. See Figure 9.2

Figure 9.2 Exercise 39



41. 7005 milliseconds

43. 26.9 milliseconds (assuming the message travels at the speed of light).