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## CHAPTER 18

# *DNS*

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### 18.1 MULTIPLE-CHOICE QUESTIONS

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

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### 18.2 EXERCISES

- The DNS structure is very similar to the UNIX directory structure in that they are both hierarchical tree structures with the root at the top and the most specific items at the leaves.
- The pathnames in UNIX are listed from the root down to the most specific name while domain names start with the most specific name and end in the root.
- PQDN
  - FQDN
  - PQDN
  - FQDN
- $0000000100000000 = 0x0100$
- $1000111110000000 = 0x8F80$ 

This is a response message from an authoritative server. The request was an inverse request with recursion desired and recursion was available. The message is truncated, which means the client should open a TCP connection to receive the entire answer.
- The size of a question record is not fixed because it usually contains the domain name for which an IP address is required. The domain name is contained in a variable length field of the record.
- 14 bytes.

- 35. Assuming that the record contains only a pointer to the IP address and the single record, 22 bytes.
- 37. 41 bytes.
- 39. 57 bytes.
- 41. See Figure 18.1.

**Figure 18.1** Exercise 41

0x1333		0x8580	
1		1	
1		0	
4	"c"	"h"	"a"
"l"	4	"f"	"h"
"d"	"a"	3	"e"
"d"	"u"	0	0
1	1	0xC0	
0x0C	1	0	
1	12000		
0	4	153	
18	8	105	0xC0
0x0C	2	0	
1	12000		
0	10	4	
"l"	"h"	"d"	"a"
3	"e"	"d"	"u"
0			

- 43. See Figure 18.2.

**Figure 18.2** Exercise 43

0x1334		0x0100	
1		0	
0		0	
3	"x"	"x"	"x"
3	"y"	"y"	"y"
3	"c"	"o"	"m"
0	1		0
1			

45. See Figure 18.3.

**Figure 18.3** Exercise 45

0x1335		0x0100	
2		0	
0		0	
3	"x"	"x"	"x"
3	"y"	"y"	"y"
3	"c"	"o"	"m"
0	1		0
1	3	"a"	"a"
"a"	3	"b"	"b"
"b"	3	"e"	"d"
"u"	0	1	
1			

47. See Figure 18.4.

**Figure 18.4** Exercise 47

0x1335		0x8583	
2		1	
0		0	
3	"x"	"x"	"x"
3	"y"	"y"	"y"
3	"c"	"o"	"m"
0	1		0
1	3	"a"	"a"
"a"	3	"b"	"b"
"b"	3	"e"	"d"
"u"	0	1	
1	0xC00C		
1	1		
12000			
4	14		23
45	12		

49. See Figure 18.5.

**Figure 18.5** Exercise 49

0x1336		0x8980	
1		1	
0		0	
1	"8"	2	"l"
"7"	1	"1"	3
"1"	"3"	"2"	7
"i"	"n"	"D"	"a"
"d"	"d"	"r"	4
"a"	"r"	"p"	"a"
0	12		0
1	0xC00C		0
12	1		0
12000			0
13	4	"s"	"o"
"m"	"e"	2	"c"
"o"	3	"c"	"o"
"m"	0		

51. See Figure 18.6.

**Figure 18.6** Exercise 51

53		Ephemeral port number	
53		Checksum	
0x1334		0x8180	
1		1	
0		0	
3	"x"	"x"	"x"
3	"y"	"y"	"y"
3	"c"	"o"	"m"
0	1		0
1	0xC00C		0
1	1		0
12000			0
4	201	34	23
12			