
CHAPTER 19

Domain Name System (DNS)

Exercises

1.

- a. **PQDN** (It does **not** end with dot.)
- b. **FQDN** (It does end with dot.)
- c. **PQDN** (It does **not** end with dot.)
- d. **FQDN** (It does end with dot.)

3. The following shows the individual fields.

QR	OpCode	AA	TC	RD	RA	Three 0's	rCode
0	0000	0	0	1	0	000	0000

The flag is then $(00000001\ 00000000)_2$ or $(0100)_{16}$.

5. The flag 0x8F80 means $(10001111\ 10000000)_2$. This means

QR	OpCode	AA	TC	RD	RA	Three 0's	rCode
1	0001	1	1	1	1	000	0000

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.

7. The size of a question record is not fixed because query name field is variable in length.

9.

Query name = 3 a t c 4 f h d a 3 e d u 0 = 14 bytes **Query type** = 2 bytes
Query class = 2 bytes **Question Record** = 14 + 2 + 2 = 18 bytes

11. Assuming that the domain name field is a pointer, the record is 22 bytes in length.

13. **Query name** = 10 c h a l l e n g e r 3 a t c 4 f h d a 3 e d u 0 = 25 bytes
Header = 12 bytes **Query type** = 2 bytes **Query class** = 2 bytes
Query Message = 25 + 12 + 2 +2 = 41 bytes
15. The size of the response message depends on the number of digits in the requested IP address.
17. See Figure 19.E17.

Figure 19.E17 Solution to Exercise 17

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	
"f"	"h"	"d"	"a"
3	"e"	"d"	"u"
0			

19. See Figure 19.E19.

Figure 19.E19 Solution to Exercise 19

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

21. See Figure 19.E21.

Figure 19.E21 *Solution to Exercise 21*

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			

23. See Figure 19.E23.

Figure 19.E23 *Solution to Exercise 23*

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		

25. See Figure 19.E25.

Figure 19.E25 Solution to Exercise 25

0x1336		0x8980	
1		1	
0		0	
1	"8"	2	"1"
"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		

27. See Figure 19.E27.

Figure 19.E27 Solution to Exercise 27

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			