武汉大学试卷纸

专业 软件工程专 年级 2017 学号 2017302580053 姓名 张红轩

科目 网络及分布式计算 成绩	总分	1	2	3	4	5	6	7	8	9	10

装订线内请勿答题

Predefined parameters:

A = "2017302580053"

B = 580053

Problem #1

My B = 580053.

equals 1000 1101 1001 1101 0101.

choose 16-bit lower-order word, the C should be:

1101 1001 1101 0101

with D = 1110 0000 0000 0001

the checksum should be calculated as

```
  1101 1001 1101 0101
  1110 0000 0000 0001
-------------------------
  1101 1001 1101 0110      with a roll back:
  1011 1001 1101 0111
```

one's complement code is

0100 0110 0010 1000

Problem #2

for C is 1101 1001 1101 0101

so C_1 = 1101 0101

C_2 = 1101 1001

convert them into decimal:

C_1 = 213 , C_2 = 55552

For 10Mbps broadcast channel

1 bit time $= \frac{1}{10Mbps} = \frac{1}{10 \times 10^6 bps} = 10^{-7} s$

Adapter_1 : $T_{a1} = 213 \times 10^{-7} s = 2.13 \times 10^{-5} s$

Adapter_2 $T_{a2} = 55552 \times 10^{-7} s = 5.5552 \times 10^{-3} s = 5.5552$ ms

For 100Mbps broadcast channel:

1 bit time $= \frac{1}{100Mbps} = 10^{-8} s$

Adapter_1 : $T_{a_1} = 213 \times 10^{-8} s = 2.13 \times 10^{-6} s$

$T_{a_2} = 55552 \times 10^{-8} s = 5.5552 \times 10^{-4} s$.

Problem #3

The corresponding extended URL should be like:

~~http://~~ cs.whu.edu.cn/studentID?2017302580053

Problem #4.

My C_1 = 213, so the size of data should be:

2400 + 213 = 2613 bytes

Since each IP header has 20 bytes at least, so, the total size of original datagram is:

Total = 20 + 2613 = 2633 bytes.

MTU = 700 bytes, means each IP datagram can only load 700 - 20 = 680 bytes

2613 ÷ 680 = 3 ..... 573 bytes

so it needs 4 fragments.

The identifier number is ++++2, used to combine all ~~the~~ fragments. And this field won't change in each datagram

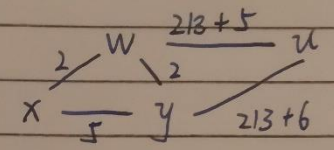
The various fields of value is shown below:

	Identifier:	Flags	Offset
Fragment 1	++++2	1	0
2	++++2	1	680
3	++++2	1	1360
4	++++2	0	2040

Though The PPT say ~~it~~ the offset field should divide by 8, but the value I check in the experiments of Wireshark didnot, so I did not divide

Problem #5

My $C_{-1} = 213$ so it should be like:



a) The x's distance vector :

$D_x(w) = 2$

$D_x(y) = 4$

$D_x(u) = 220$

b) The change of $C(x,w)$:

any change of $C(x,w)$ would cause x to inform.

~~Since~~ Since $D_x(u) = C(x,w) + d_w(u) = 220$.

if $C(x,w) \neq 2$, the minimum-cost path to u must change.

The change of $C(x,y)$:

Let new $C(x,y) = \beta$.

if $\beta + D_y(u) \leq 220$, then it would cause x to inform its neighbors.

$\because \beta + D_y(u) < 219 \leq 220$ ..... ①

integer

$\therefore \beta < 1$, since β has to be a strictly positive ~~number~~

~~so if new $\beta = 1$~~ so β can not be zero

so if new $C(x,y) = 1$, x has to inform ~~its~~ neighbors.

(c) We have elaborated that any change of $C(x,w)$ would cause x to inform. so only change in $C(x,y)$ would not

Let new $C(x,y) = \beta$.

if $\beta + 219 \geq 220$ (nearly same as expression ①)

$\beta \geq 1$, so as long as new $C(x,y) \geq 1$, x will not inform its neighbors.

Problem #6

~~C~~ = C_{-1} = 1101 0101,

The CRC generator polynomial is $x^4 + x + 1$,

which means $G = 10011$ so $r = 4 = 5 - 1$

so we divide 10011 into 1101 0101 0000 :

```
          11000001
      ------------
10011 ) 1101 0101 0000
        10011
        -----
        10011
        10011
        -----
        000000
             0
        -----
         10000
         10011
         -----
          0011
```

so the R is 0011, the sequence ~~sent~~ sends out should be

1101 0101 0011.

the first bit flip: 0101 0101 0011, use G to ~~do~~ divide it:

```
          1011011
      ------------
10011 ) 0101 0101 0011
        10011
        -----
         11001
         10011
         -----
          10100
          10011
          -----
           11101
           10011
           -----
            11101
            10011
            -----
             1110
```

1110 not equals to 0000. so the receiver can detect the errors.

Problem #7

My C is 1101 1001 1101 0101.

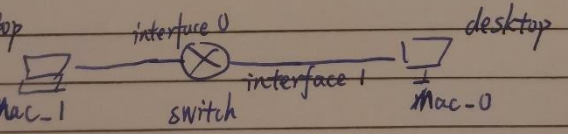
~~They~~ it should use the longest prefix matching.

But my C only have the same first 8 bits in the table, "~~1101 1001~~", "1101 1001 1", however none of the "prefix Match" has "1" following. so the interface for my C is 10,

Problem #8

My C is corresponding M_3 = D9 D5

so ~~MAC~~ Mac_1 = 00-15-5D-41-D9-D5



Sine the laptop sends series of frames to desktop, According to my picture, the frames from laptop would arrive switch from interface 0.

Because no entry in the switch table, the switch would ~~fo~~ broadcast the frames to destination, and record the Mac-1 into switch table:

Mac address	interface	time
00-15-5D-41-D9-D5	1	Arrival-time.

The hexadecimal value for the two-byte type field is 0x0806.
The upper layer protocol is ARP

Problem #9.
Wireless network technologies:
① IEEE 802.11 Wireless LAN
characteristics: it has wider bandwith and the RF signal is stronger, without high consumption.
② WiMAX, based on IEEE 802.16
it can support a longer transmission distance, provide user a higher speed broadband access with excellent last-mile network access service and multimedia communication services.
③ LTE
1) It has low network delay, with shorter preparation time for handover and connection creation than other.
2) It strengthen the support of mobile state connection, even the speed is up to 400km/h
3) Support from femto base stations covering tens of meters to Macrocell base stations covering 100 km.
4) Support packet switching wireless interface
5) Support group broadcast single frequence network.

④ UWB: anti-interference
1) Strong anti-performance, high transmission rate, large system

capacity and very small transmission power.
2) Use pulse radio
3) No need to use carries
4) Extremely wide bandwith and good confidentiality ~~confidentiality~~

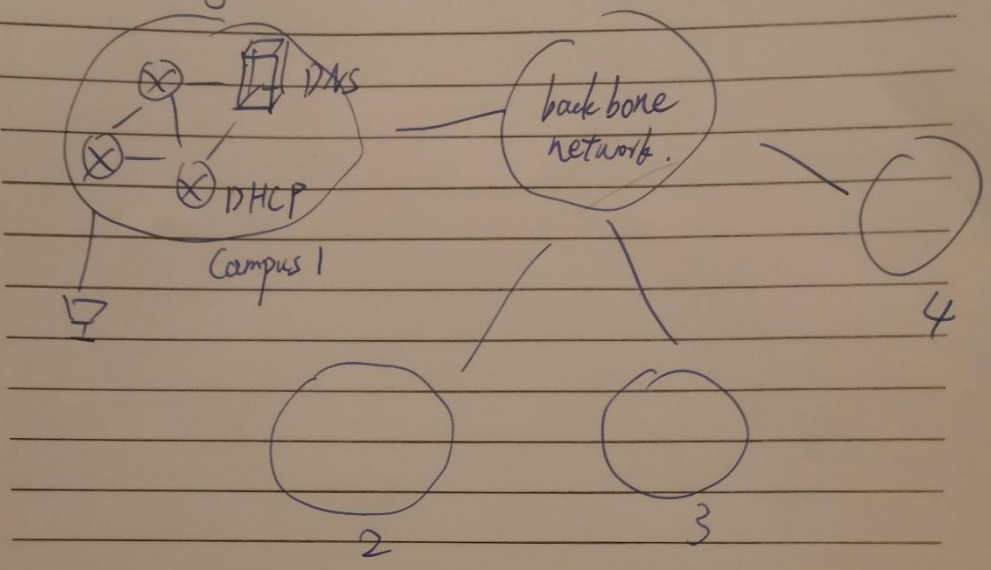
~~Zee~~ ZigBee:
low speed. low cost and support a large number of online nodes. low complexity Fast, reliable and safe

NFC:
bidirectional connection and

~~Abj~~ I prefer UWB because I am more care about my communication secrety than others and due to the good confidentiality UWB provides us.

The Network System:
I choose HFC to connect four campus of our school, since HFC have high speed and other advantages
Since different campus's students have different requirements for the network. it has to deal with the communication in the same campus

So I design the network as below:



Campus 1 to 4 have the same ~~co~~ structure. And DHCP, DNS provide service ~~to~~ to the computer connect to to network.

Only the flow that need to go ~~*~~ to another campus will use the backbone network.

The computer ~~*~~ in the same ~~Ether~~ Ethernet will use the VLAN to form some small Ethernet network logically to protect the secrety of the students and provide the portability to the students' computer since to connect to the networks of other campus.