1. Why ipv6 does not have fragmentation and checksum

Fragmentation:

If one fragment is failed, all fragments will be resent.

Take more time to transmit.

Checksum:

The size of packet is increasing and decreases the transmission rate.

When the IP header corrupted, this packet will be dropped.

2. Checksum in UDP datagram in sender with port 1025 and in receiver with port 1026
   a. The last two bit in the datagram with port 1025 flipped, detect the corruption?

      Maybe. 1100 and 1111. When 1100 changes to 1111, it cannot detect the corruption. When the 1111 changes to 1100, it will detect the corruption.

   b. The last bit in the datagram with port 1025 and in the datagram with port 1026 flipped, detect the corruption?

      Maybe. When the last bit for them are all 1 or 0, it will detect the corruption. However, if one of them is 1 and the other is 0, the corruption cannot be detected.

3. Ping photo. 4 packets, 1 packet = 32bytes, RTT = 144ms. No processing delay. Bandwidth = 10 Mbps. Distance from sender to receiver is d = 2000km. Speed = 2x10^8 m/s. The percentage of queue delay in RTT??

RTT = 2(L/S + D/R+Dqueue)

= 4L/S + 4D/R + Q (Q is queue delay)

4L/S = 4*32*8/10*10^6 = 0.0001024s

4D/R = 4*1000*1000/2*10^8 = 0.02

0.144 = 0.0001024 + 0.02 + Q

-> (Q/0.144) * 100% = 86.04%

4.

	Local name server	Authority name server
Aaa.ttt.org	ttt.org	Ttt.org
bbb.un0sw.edu.au	unsw.edu.au	unsw.mit.edu.au

   a. How many DNS query from A.mit.edu.au to B.unsw.edu.au using iterate DNS query

      5 queries.

Aaa.mit.edu.au ask DNS request

Host server response

Get .au

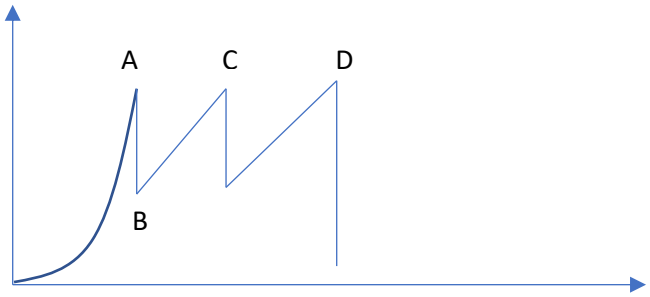
Get .edu.au

Get .mit.edu.au

b. 2 disadvantages for using Google public DNS as your local name server

Take too long

5. TCP Reno



a. Name the event in 3 points, A, C and D

A: 3 dup packets

C: 3 dup packets

D: timeout

b. Given the MSS = 1000 bytes. The connection set up is initial to 0. The connection set up takes 1 RTT. At point A, the sender has sent 31,000 bytes and the time is 3 second. What is the time for 1 RTT

RTT	EVENT	BYTES
1	Connection set up	0
2	Send 1 packets	1, 000
3	Send 2 packets	3, 000
4	Send 4 packets	7, 000
5	Send 8 packets	15, 000
6	Send 16 packets	31, 000

The total RTT is 6. Thus, 6 * time for one RTT = 3 sec. The time for 1 RTT is 0.5 sec.

c. From B to C is taking 2 sec. What is the last bytes has it sent?

The MSS in B is half of the MSS in A. From question b, the MSS in B is 16/2 = 8 segments. RTT is 2/0.5 = 4.

RTT	EVENT	BYTES
1	Send 8 packets	8, 000

2	Send 16 packets	24, 000
3	Send 32 packets	56, 000
4	Send 64 packets	120, 000

The last bytes is 64, 000 bytes.

d. In point D, the sender window size is 16,000 bytes and then down to 1,000 bytes. How long will it take the sender window size to 16,000 bytes. (in RTT or in sec)

The MSS is 16/2 = 8 segment.

RTT	EVENT	BYTES
1	Send 2 packets	2, 000
2	Send 4 packets	4, 000
3	Send 8 packets	8, 000
4	Send 9 packets	9, 000
5	Send 10 packets	10, 000
6	Send 11 packets	11, 000
7	Send 12 packets	12, 000
8	Send 13 packets	13, 000
9	Send 14 packets	14, 000
10	Send 15 packets	15, 000
11	Send 16 packets	16, 000

It will take 11 RTTs.

6. MTU… IP header = 20.

A -> B: MTU = 1,500

B -> C: MTU = 1,000

C -> D: MTU = 500

D -> E: MTU = 1,500

a. Send a 1500 bytes packet from A to B and then from B to C, how the fragment looks like when it from B to C?

1000 – 20 = 980. But 1480 cannot divide by 8 nicely (1480 / 8 = 122.5). Then use 976 / 8 = 122. The length of first segment is 976 + 20 = 996

Length (with header)	More fragment(MF) flag	Offset
996	YES	0

The second is the rest of the packet. 1500 – 976 + 20 = 544.

Length (with header)	More fragment(MF) flag	Offset
544	NO	122

b. When the packet is sending from C to D and from D to E

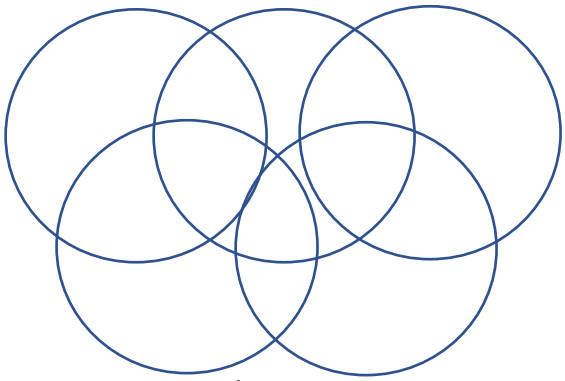
(一样的过程)

Length (with header)	More fragment(MF) flag	Offset

Length (with header)	More fragment(MF) flag	Offset

Length (with header)	More fragment(MF) flag	Offset

7. MAC – slot/802.11



   a. 802.11 sample question 10
   b. Two types slots -> processing

8. DNS + ARP + HTTP order

   a. AAA broadcast ARP request
   b. AAA broadcast ARP request
   c. BBB broadcast ARP request
   d. BBB AAA ARP response
   e. EEE AAA ARP response
   f. EEE AAA HTTP 200 OK
   g. AAA EEE HTTP GET request
   h. AAA BBB DNS request
   i. BBB AAA DNS response

   Order a-I, e.g. adechgfbi

   a -> d -> h -> c -> i -> b -> e -> g -> f

9.

   a. N person, 2 of them could communicate with each other and the others cannot know the chat. How many key needed?

Use separate answer booklet for each section

SECTION 1 – Questions 1 – 5 (20 marks)

4 **Question 1 (4 marks):** **Network layer** 2 parts Board cover

3 **Question 2 (3 marks):** **Transport Layer** UDP TCP

5 **Question 3 (5 marks):** **Introduction** 前三章 lecture (5分) Layer之前 的part

3 **Question 4 (3 marks):** **Application Layer** DNS, DLSP, SMTP,

5 **Question 5 (5 marks):** **Different questions for COMP3331 & COMP9331**
IP/transport Layer

Use separate answer booklet for each section

SECTION 2 - Questions 6 – 9 (20 marks)

6 **Question 6. (6 marks):** **Network layer, Different questions for COMP3331 & COMP9331** Network layer Routing protocal (Machine) distance, Links, IP address mgm

6 **Question 7 (6 marks) :** **Covers multiple layers** 例数第二个lecture, 有example when order is been sending to diffent layer

4 **Question 8 (4 marks):** **Datalink layer**
Don't waste time here framing Spand 2 weeks but only 4 marks
Alloha, csm, why. Intrend part.

4 **Question 9 (4 marks):** **Network Security** Last week, 报名, 未意图, only
10% for this. , 无针事,

END OF EXAM

HAVE A GREAT BREAK – WE HOPE YOU ENJOYED COMP3331/COMP9331.