Project 3 Phase 2 Report

Ke Ma 112846615

Honglei Liu 112848525

1. Module description

There are two modules in the design, which is Mobile and Server.

In the Mobile module, there are methods for processing data and generate packets, there is a method used to send these packet to Server module, there is another method used to receive image from server. Mobile listen to Server and only send packet to Server when the network is free.

In the Server module, there are two methods. One is for receiving packet from Mobile, one is for sending image to Mobile. At the same time Server control the network. When it is sending image to Mobile it sets the network to busy, which means the Mobile can not send packet to Server and has to wait.

2. Description for handshake mechanism

When there are 20 packets and the network is free, then the Mobile is able to send packet to Server and at the same time, the network is set to busy at the Server side. When the Mobile has sent all the data, the network is set to free again.

At Server side, Server has to send the image packet to Mobile. When the Server is sending data, the network has be set to busy, which means that

Mobile can not send at this time. Mobile keeps listening to the network until the network is free.

3. Simulation result

In the simulation, I will take Image_pack_size equals to 1Kb, bandwidth equals to 1Mbps, delta equals to 100ms for example. Server send image packet at the very beginning of simulation. In this image, the server begins to send the first image packet of Image_1 at 10ms, at 30 ms Mobile1_1 receives this packet and then Server set network to free:

```
10 ms >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Begin to send one packet to Mobile1 at 10 ms

10 ms, At server side.
10 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 1
10 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0


20 ms, At server side.
20 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 0
20 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0

End sending to Mobile1 and will wait for 100ms at 30 ms
Mobile1 has received one packet at 30 ms
30 ms ###############################################

30 ms, At server side.
30 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 0
30 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0


40 ms, At server side.
40 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 1
40 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0
```

Since Delta time equals to 100ms, so at 130ms, Server sends the first image packet of Image_2:

```
130 ms >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Begin to send one packet to Mobile1 at 130 ms

130 ms, At server side.
130 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 1
130 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0


140 ms, At server side.
140 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 0
140 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0

End sending to Mobile1 and will wait for 100ms at 150 ms
Mobile1 has received one packet at 150 ms
150 ms ###############################################
```

At 510ms, Mobile_1 has received first image of Image_5 and at 610ms, Mobile_2 received the first packet of the Image_1:

```
610 ms >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Begin to send one packet to Mobile2 at 610 ms

610 ms, At server side.
610 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 1
610 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0

End sending to Mobile2 and will wait for 100ms at 620 ms
Mobile2 has received one packet at 620 ms
620 ms ###############################################
```

Mobile_3 receives the image packet is similar to Mobile_1 and Mobile_2.

At 1610ms, Mobile_1, Mobile_2, Mobile_3 has received all the packet of 5 images:

```
1600 ms >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Begin to send one packet to Mobile3 at 1600 ms

1600 ms, At server side.
1600 ms, Rqeuest1: 0, Request2: 0, Request3: 0, Free: 1
1600 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0

End sending to Mobile3 and will wait for 100ms at 1610 ms
Mobile3 has received one packet at 1610 ms
1610 ms ###############################################
```

At the Mobile side, 3 mobiles began processing image at 200ms. At 225010ms, they finished processing and all of them sent request signal to server, but only Mobile_1 was permitted to send, and Mobile_2 and Mobile_3 were denied, as shown below:

```
225010 ms, Rqeuest1: 1, Request2: 1, Request3: 1, Free: 1
225010 ms, If_ok1: 0, If_ok2: 0, If_ok3: 0

225010 ms MOBILE1 request:1, MOBILE2 request: 1, MOBILE3 request: 1
225010 ms If_ok1: 0, If_ok2: 0, If_ok3: 0

225020 ms MOBILE1 sensor:    348 897
225020 ms MOBILE1 convesion: 3
225020 ms MOBILE1 compress:
225020 ms MOBILE1 tuple_num: 2, packet_num: 1
225020 ms MOBILE1, ROI: 3, ts: 225020, te: 225040, free: 0
225020 ms MOBILE1 packetizer->flag: 1, a: 1
225020 ms MOBILE2 sensor:    348 897
225020 ms MOBILE2 convesion: 3
225020 ms MOBILE2 compress:
225020 ms MOBILE2 tuple_num: 2, packet_num: 1
225020 ms MOBILE2, ROI: 3, ts: 225020, te: 225040, free: 0
225020 ms MOBILE2 packetizer->flag: 1, a: 1
225020 ms MOBILE3 sensor:    348 897
225020 ms MOBILE3 convesion: 3
225020 ms MOBILE3 compress:
225020 ms MOBILE3 tuple_num: 2, packet_num: 1
225020 ms MOBILE3, ROI: 3, ts: 225020, te: 225040, free: 0
225020 ms MOBILE3 packetizer->flag: 1, a: 1
Received at MOBILE1. If_ok to transmit: 1 at 225020 ms
Received at MOBILE2. If_ok to transmit: 0 at 225020 ms
Received at MOBILE3. If_ok to transmit: 0 at 225020 ms
225020 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE1, If_ok: 1

##############################
225020 ms MOBILE1 Access to network. 顺利发送
##############################

225020 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE2, If_ok: 0
225020 ms MOBILE2 Request denied. Network is been using. Waiting for 1 ms.
225020 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE3, If_ok: 0
225020 ms MOBILE3 Request denied. Network is been using. Waiting for 4 ms.
225030 ms MOBILE1 sensor:    346 894
```

When Mobile_1 finished sending, Mobile_2 was permitted and final Mobile_3 was able to send packet when Mobile_2 was finished, as shown below:

```
************************
Server: MOBILE1 done. Network free at 225030 ms
************************
```

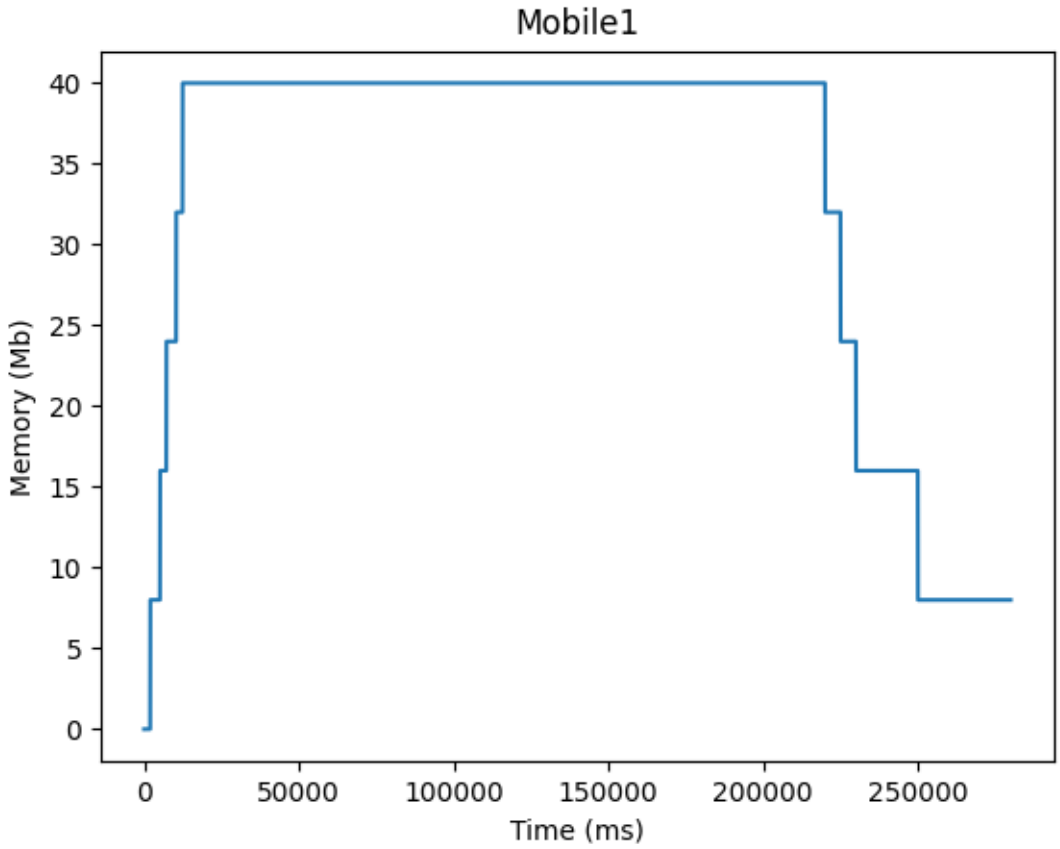
```
225050 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE2, If_ok: 1

##############################
225050 ms MOBILE2 Access to network. 顺利发送
##############################

225050 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE3, If_ok: 0
225050 ms MOBILE3 Request denied. Network is been using. Waiting for 5 ms.
225060 ms MOBILE1 sensor:    340 885
```

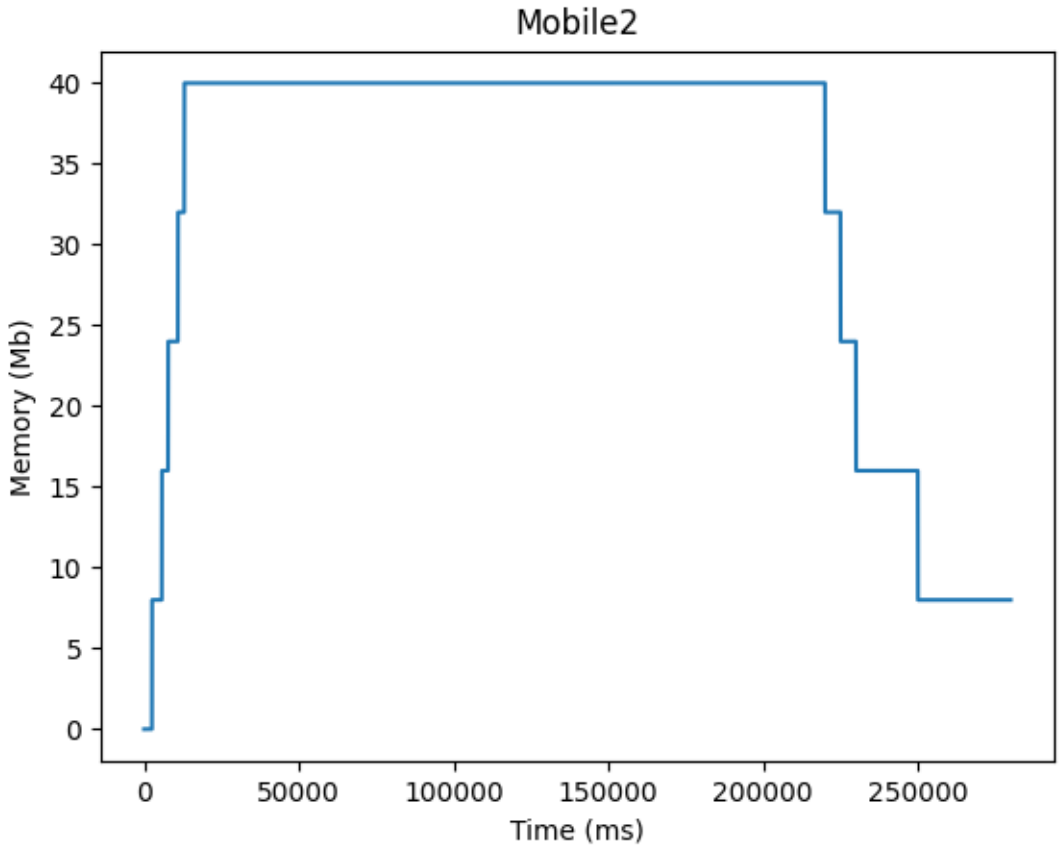
```
************************
Server: MOBILE2 done. Network free at 225060 ms
************************
```

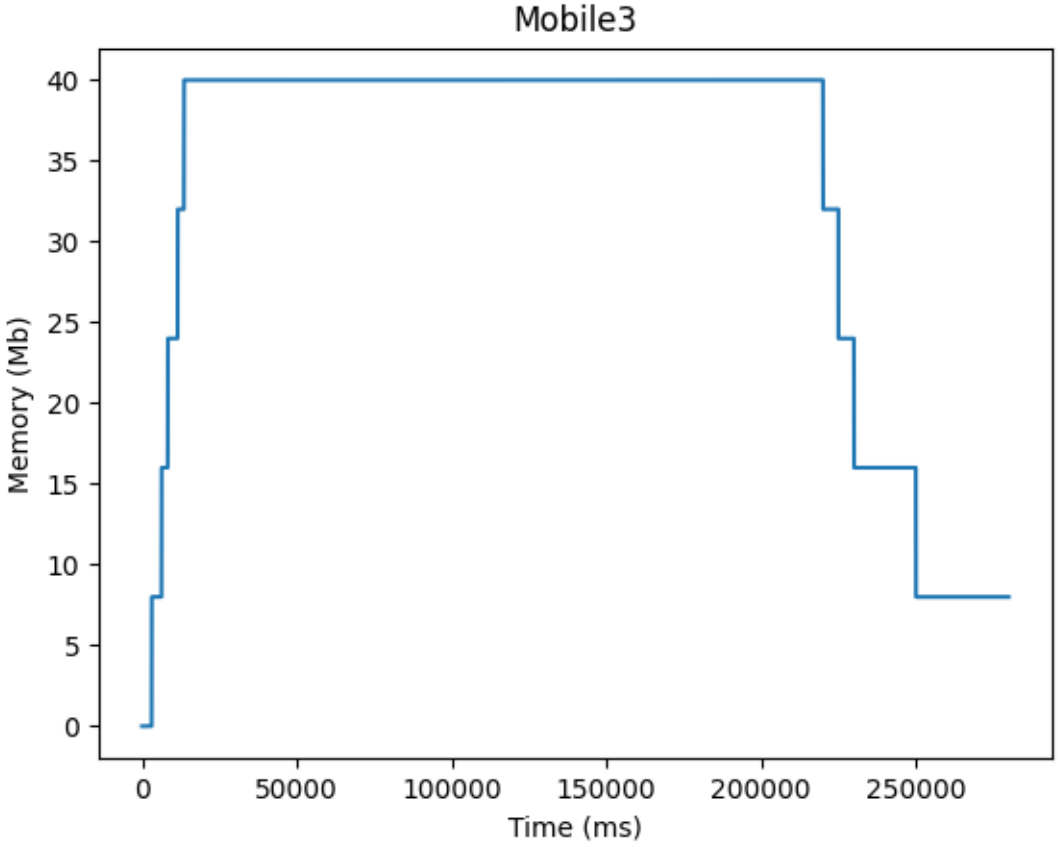
```
225080 ms ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^MOBILE3, If_ok: 1

##############################
225080 ms MOBILE3 Access to network. 顺利发送
##############################
```

```
************************
Server: MOBILE3 ddone. Network free at 225090 ms
************************
```

4. Memory plot (Mb vs ms)






Mobile3
Memory (Mb)
0
5
10
15
20
25
30
35
40
0
50000
100000
150000
200000
250000
Time (ms)