Momina Atif Dar

P18-0030

Q1 18P-0030

ignore

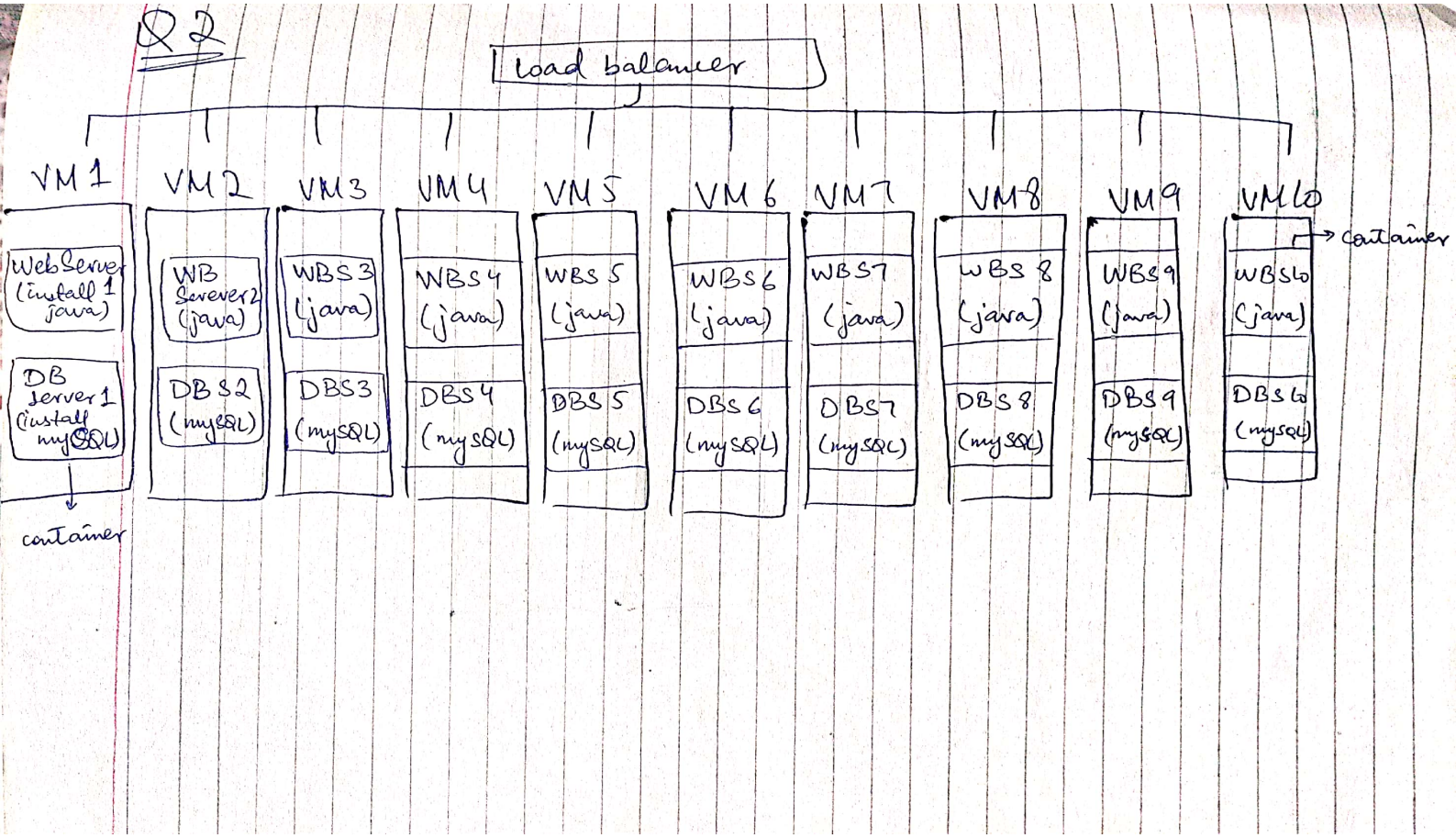
key = 180030

Hashing:

(180030 % 7) + 1 = 5.

topic id = 5

Q2



Q 3 Web Server 1 from VM1 and Web Server2 from VM2 are primary softwares.

User level threads would be better as scheduler is situated in user space so no mode switches will occur.
It also has greater portability. For example if you take this server to another system or OS, it will still work.

Q 4 Thread pools would be a better choice as we can create a pool of threads sensibly to handle even 3000 requests at some point in month.
For each task/request no new thread would be created and then destroyed & like in Single Task Thread. It's also a better choice than Worker threads as the 'specific task' can vary according to traffic on App store so some threads might be getting a lot of tasks and some very less number.

Q5 On VM3 and VM4 the Web server3 and Web server4 respectively are CPU-bound.

For VM3 and VM4 Priority Scheduling would be better. Each task would be assigned a priority and will be executed accordingly. Starvation would not be an issue as this algorithm does 'Process aging' in which the priority is increased for processes with low priority.

Another best suited algorithm would be Multi level Queue. It's a good choice as well because we can set different scheduling algorithms on each queue to cater to our needs.

Q6 Yes, the communication should be secure.
As the general idea is that all these severs are at different places so for that reason assymetric encryption would be a better option.
All the VMs' servers will have their own Public and Private keys and it's important for each server to know the data they are recieving is from the

correct server. Each server sending data/ message would encrypt it with its private key for other server to decrypt it using Public key. First they have to share their Public keys with eachother as well. For that they need certificate which is obtained in assymetric encryption.

Q7 Yes, because we need to communicate with servers outside our organization. In that case we need to ensure safety of our clients' data. If we would have a certificate of authority our client would know about our public key so when we send a message it would be encrypted by our Private key. When client decrypts our message by applying our public key to it, he would be able to see our message and would know the message is really from our server.

Q8 Yes, all the VMs have Database Servers which are storing sensitive user information like credit card number and related stuff to purchase paid apps or passwords for creating account on App Store.
We would not store sensitive information of user in plain Text but would make it go through irreversible hasling algorithm like SHA-256 and then store that in our database. To make it more secure we may add 'Salt' to it as well.
Other than that we would secure our Database Server by a password and granting previleges to only those who are owners.

Q9 I would like to monitor Web Servers whether they are sending and recieving data packets, how much time this is taking, if it's able to communicate with its Database Server or not, how many errors is it getting (if there are any), how much memory it is utilizing.

Q10 Instead of 10 VMs now I have four so I'll make more containers in each VM. Forexample, VM1 will have 3 containers of Web Servers and 3 containers of Database Servers now. This way 3000 requests could also be handled easily.
This change will not effect any of my answers above.