Implementing a load-balancing application with omnet++

E/15/202

1. Implement load balancing considering the number of user as the criterion for server selection.

Try to assign equal amount of clients to each sever so that number of clients will be equally distributed among the given 3 servers (server load is equally distributed). The requests will be sent to the servers in the order they were received.

LoadBalncerRR.cc

2. Briefly describe the deficiencies in the selection criterion given in task 1.

The workload of all clients is not always equal. Some clients may take only a several minutes and some may take a higher time. So although the servers are assigned with equal amount of clients, the workload of servers may be different. Some servers may have a huge workload when some servers having a very small workload. Servers may be idling even after handling all the workload they had. Therefore the above load balancing method is not very efficient when considering about the different workloads.

On the other hand the above algorithm assumes that the servers are similar enough to handle equivalent loads. If certain servers have more CPU, RAM, or other specifications, the algorithm has no way to distribute more requests to these servers. As a result, servers with less capacity may overload and fail more quickly while capacity on other servers lie idle.

3. Suggest the improvements that you would like to propose over the above criterion.

We can use weighted Round robin load balancing algorithm.

This algorithm allows us to assign weights on each server based on criteria like traffic-handling capacity. Servers with higher weights will receive a higher proportion of client requests. For example, according to the traffic-handling capacity of the above 3 servers we can assign weights on them as below.

Server 1 can handle 15 client requests per second on average
Server 2 can handle 10 client requests per second, on average
Server 3 can handle 5 requests per second, on average

So if the controller receives 18 requests,
9 requests will be sent to server 1
6 requests will be sent to server 2
3 requests will be sent to server 3

4. Simulate the above solution by using omnet++ tool.