Project 4 Part 1 Report

Christopher You & Logan Cundiff

Basic-Requirement: Finished.
Bonus: Finished.

In this project, we created a Twitter-like engine that can Register Account, Send Tweets, Subscribe to User's Tweets, Re-tweet, Query for Tweets, and Deliver only when connected.

For the simulation, the user would randomly do one of the actions described. Each action (Tweeting, Subscribing, Unsubscribing, etc.) had an equal probability of occurring during each iteration of the simulation. We tested this with 10000 users on 2 separate machines and found the following results.

To account for Zipf Distribution, some users were more likely than others to be subscribed to. We designated each user with a probability of being followed based on the Zipf Law and found the following distributions with 100 and 2000 clients. Furthermore, the probability of tweeting was increased as a function of Zipf's Law to allow for more tweets to happen with more followers.

Zipf Distribution of 100 Clients

Zipf Distribution of 1000 Clients
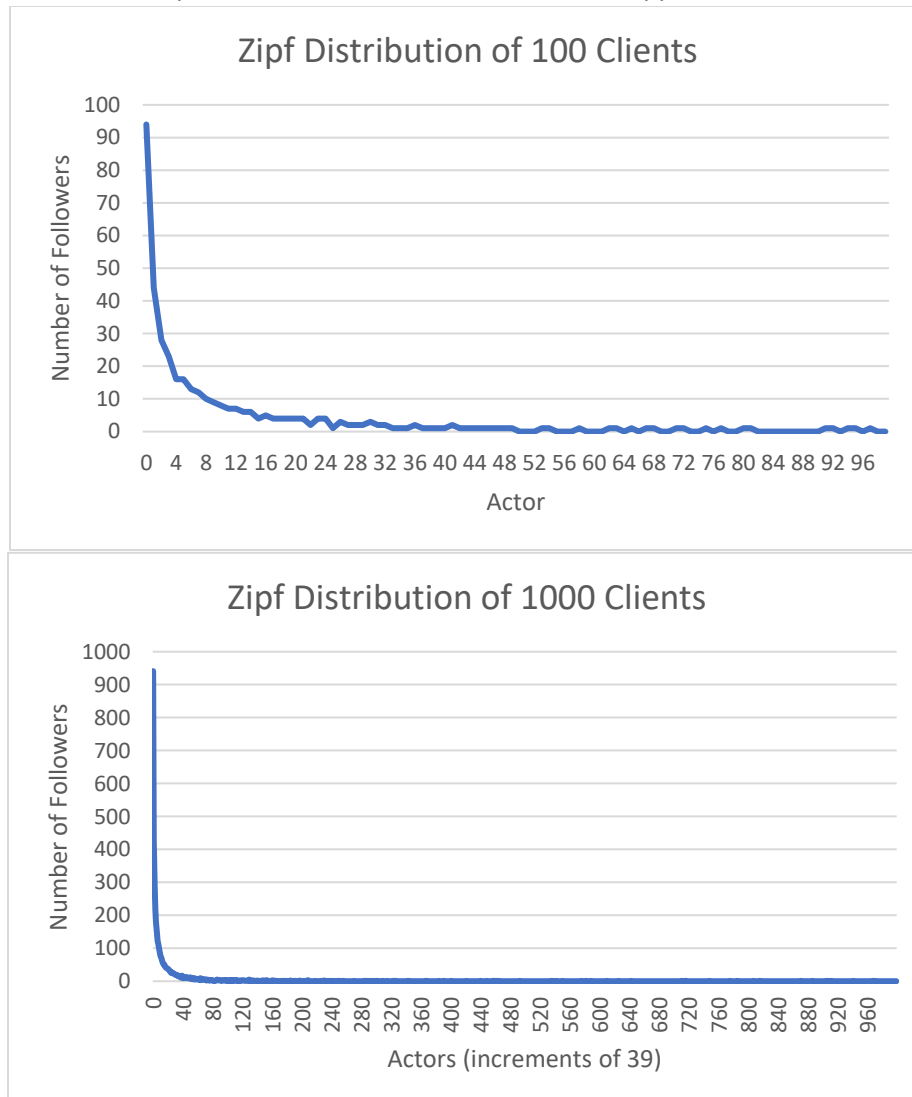
During the experiments, we also allowed users to Disconnect. During these periods, the only action the user could do was reconnect and had a 1 in 5 chance to do this. During these times, no interaction occurred with these users.

To test for performance, we measured the time it took for a user to get a response for their request.
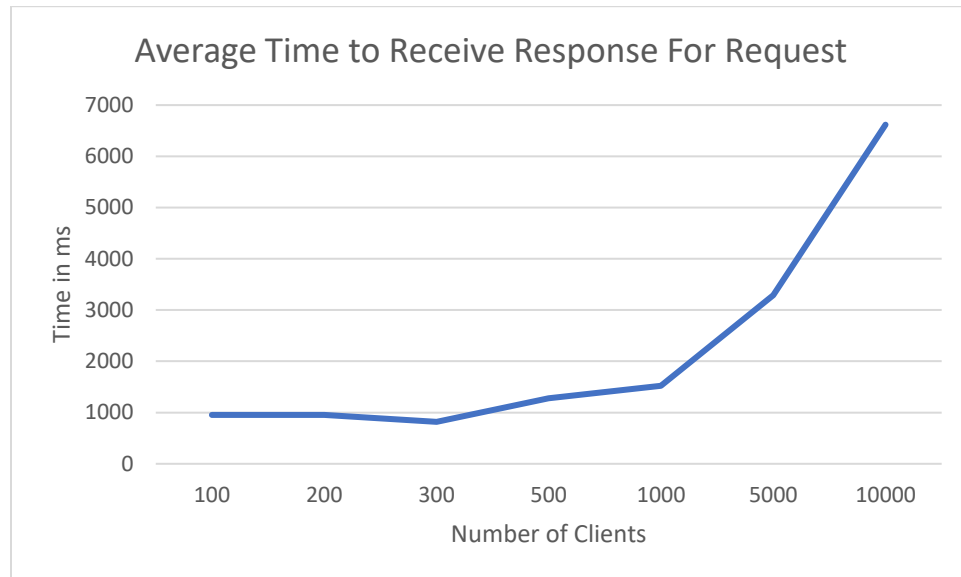
On average, time increased with the number of users as the server had to handle many requests at a time. One way this could be improved is by having numerous servers that the clients could refer to.

All sections of the "Other Considerations" were met.

The clients and server were hosted in different processes for the purposes of this experiment, as described by the rubric and we reported the above findings. The client simulated thousands of clients and the server was a single-engine process throughout this experiment.

To run this code:

Open one-instance of the server.fsx, and another instance(s) of the client.fsx.

> ➢ dotnet fsi server.fsx
> ➢ dotnet fsi client.fsx
> ➢ in the client terminal, when asked how many clients, specify with a number.

(Note: The code used to log the above is not present in the submitted code as it interfered with the processes within the Twitter-simulation. Data can be provided upon request.)