COP 5615 – Project 4 (Part 1) - Facebook Simulator

Name: Rishabh Jain

Programming language: Scala
Framework: Spray, Akka
Architecture: REST

How to test (linux):
1. Open the terminal and open two windows.
2. Change the directory to the project directory in each window and run the “sbt run” command.
3. Choose option number to run the **server first** and then the client in each window.

Implementation:
As per the requirements of a one person group: Page, Post, Friend List, Profile, were successfully implemented.
1. The user profile is created with requisite details.
2. Other users are added to the friend list of each created user.
3. A few users create a facebook page and other users subscribe to the same.
4. A user posts status updates, posts to friend's wall and posts on the subscribed pages.

The client can send requests (create user, post status update etc.) to server using Post/Get methods through pipeline to which the server responds with a JSON formatted string which is displayed on the client window.
The description of each case class is mentioned in the comments inside the code.

Expected Output:
On the server window:
NumberOfUsers:1000 NumberOfFriends:47180 NumberOfPosts:3149 NumberOfPages:250
Uptime: 60 seconds RequestsProcessed: 51580

On the client window:
fysfa jfcuq posted status update
Created page with ID # 18
jhqnu hosqx posted on the wall of nolly fymio ------ names are generated randomly

How user behavior was simulated:
The research paper “User Interactions in Social Networks and their Implications” by Christo Wilson et al, (https://www.cs.ucsb.edu/~ravenben/publications/pdf/interaction-eurosys09.pdf) was made the basis of the statistics which were used in order to implement the human behavior.
The following characteristics were implemented:
1. 37% of the users have more than 100 friends. (Random number between 100-500 was chosen)
2. The rest 63% users have less than 100 friends.(Random number less than was chosen)
3. A user subscribes to an average 40 facebook pages.
4. Since a user posts a status update most frequently, posts on friend's wall with lesser frequency and posts on subscribed pages with least frequency, a scheduler was set with appropriate delay to implement the same.

5. Privacy settings: A user on only post on the wall of a person in its friend list and only on pages it has subscribed to.

Test Results:
The tests were performed on i3 2nd generation processor system. Following are the results:
> In spite of a slow processor, the simulator was successfully tested for 3000 users with avg. 4500 requests processed per second.

Further Work:
Implementation of security for part 2 of the project.

References:

1. *https://www.cs.ucsb.edu/~ravenben/publications/pdf/interaction-eurosys09.pdf*
2. *http://www.javacodegeeks.com/2014/11/first-steps-with-rest-spray-and-scala.html*
3. *https://github.com/spray/spray-json*
4. *http://www.adweek.com/socialtimes/how-many-pages-does-the-average-facebook-user-like/418322*