Birla Institute of Technology and Science Pilani, Pilani campus
CS G623 Advanced Operating Systems
Assignment 2

Maximum marks: 10

Date of issue of assignment: 1st November, 2019

Date of submission: 15th November, 2019 11:59 pm

Mode of submission: Form a group of maximum two students. Tar the entire source and executable files with your id as the tar file name (e.g. 2019h103004_155.tar if two students with id 004 and 155 make a group) and send it at amit.dua@pilani.bits-pilani.ac.in and upload it to nalanda. Include a readme.txt with group details in your tar file. Submit only one file per group. A penalty of 1 marks per day will be imposed on the group for missing the deadline.

Problem Statement

This assignment will get you familiarize with sockets/RPCs/RMIs, processes, threads as well as pipes, fork and other basic linux system calls. You are expected to develop a **Distributed terminal.** The following are the features of the distributed system.

Features

- There will be a Distributed Network where each node is connected to each other.
- In this Distributed terminal application, when a node wants to send a command to other node, it will send using *IP address* of that other node.
- Let's say node A want to send *ls* command to node B then node A will use IP address of node B and the command will be executed on node B, node B will send the response back to node A and the output will be shown on the terminal of node A.
    - Ex: B > ls (you can use '>' operator to differentiate the node and command in input string)
- Here any node can act as a client (which is sending a command) or as a server (which is executing a command).
- There also can be a pipeline of commands where one command is executed on one node then the response will be given to the next node and so on, the final output is shown on the client terminal.
    - Ex: B > ls || C > uniq || D > wc (here, '||' operator is used for the pipeline)
- You program should support basic linux commands like:
    - ls, date, mkdir, rmdir, rm, mv, cp, man, wc, uniq, sort

Hints

You can either create a network of multiple nodes with different IP address or create multiple instances of node on a single machine and differentiate each process by port numbers. You may need to use execv(), dup(), pipe(), fork() system calls to implement the above problem.

Submission tar file should include:

1. Source code
2. Executable file
3. Readme file containing the steps to execute the project

Plagiarism guideline: If any group is found copying the code or word document (any portion or complete) from Internet or from any other group, matter would be reported to the authority and zero marks will be awarded for this assignment. If any member repeats that, disciplinary action would be taken and he/she will have to repeat the course or full semester.
