ICT-6544: Distributed Systems
Term Project
07/09/2020
Deadline: 22/10/2020

Title: Distributed Hash Generator

Description: The system will work as follows:

- Develop a client program and a server program
- The server will read a roll_no (T). Example, T = "1011312001"
- Assume that max key length will be 64 bits binary. So, key space is 2^{64}
- Server will divide the key space into 2^{10} (1024) blocks; each block will cotains2^{22} (4194304) keys.
- When a client sends a REQ packet, the server will reply with T and a key block num, e.g., 789.
- The server will send different range to different clients and will keep track of the ranges-
- The client will generate a matching string S as contact ("00", the last 3 digit of T). Example, for T=1011312001, S = 00001
- The client will generate a MD5 hash of V, M = MD5(V) = MD5(concat(T, Nonce)). Example, if T=1011312001 and nonce= 12345 => V = 101131200112345
- Then, it will compare first 5 characters of M with S. If matches, a possible key is found and it will send a SUCCESS packet to the server with M. The client will continue loop to find more keys.
- Once all keys are tried, the client will send a NEXT packet to the server and the server will send a new block to the client
- When server retrieves the M from a client, it will print the key in an output file.
- Run your program with 1, 2, 4, and 8 clients and report the time required to finish execution as well as the values of M.
    - Time = server receives response for all 1024 blocks – time of first request from the first client
    - Values of M (one in each line)
    - Example Output

      Number of Clients = 2

      1. ***[client-1] 00001sddsdsdsdsdsdsss***
      2. ***[client-2]00001xyssddsdlsdsdjsds***

      Time = ….

Development Platform: UNIX C/C++ or Java