

Programming Assignment 0

*Assigned: September 3rd**Due: September 10th, 11:59:59 PM.*

1 Description

In this assignment you will develop a UDP network client. Your client will communicate with a timestamp server, which we provide to you, in order to retrieve a timestamp and print it out to standard output. To format the timestamp you receive from the server use the `ctime(3)` function.

2 Protocol

This section describes the protocol your client should follow:

1. Initialization (Client $\rightarrow$ Server): The initialization messages has exactly two fields. Your username and a message of your choice. The total message size shouldn't be longer than 256 bytes. The fields in the message are separated by '#'. An example of an initialization message might be: `lex#networks`.
2. Timestamp (Server $\rightarrow$ Client): The timestamp message has exactly three fields. The first is a random nonce that is produced from the server. The length of the nonce is always 32 bytes. The second field is the SHA1 digest of the nonce, username, the message you send to the server and the timestamp the server sends you. The length of the digest is always 40 bytes. The third is the string representation of the timestamp. The server sends the timestamp as in Unix time format (elapsed seconds from January, 1, 1970). The string representation of the timestamp is 10 bytes long. The fields in the message are separated by '#'. Therefore, remember to count the number of the # when you compute the size of the message server sends you. An example of a timestamp message is:

```
60feaf...b695baa3#99800b8c...eade3224ab345#1346177187
|---nonce(32B)----|-----digest(40B)-----|-timestamp(10B)-|
```

- The output of your program should the following:

```
nonce:<nonce> timestamp:<ctime output> digest:<digest>
```

- The client program takes four arguments: the server IP address, port number, your username, and a message of your choice.
- Details about the server will be sent on Piazza.
- Your code must be -Wall clean on gcc. Do not ask the TA for help on (or post to the forum) code that is not -Wall clean.
- The TA will post information on Piazza about how to submit your assignment.