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Overview of files in project:
We used stack to organize our files. The /app directory contains all the files with main function, which is the entry point of a function. All files containing utility functions and the code for workers reside in /src directory. /test directory contains code for testing. /resources contains files generated for testing.

In /app:
Node.hs: This file contains the entry point of server node program.
ClientUI.hs: This is the entry point for terminal UI of a chat client program.

In /src:
AppServer.hs:
KVStore.hs:
Txn.hs:
Utils.hs: Provides functions to generate UUID, pre-process message for client before sending it out and validate user input IP address.
Worker.hs:

Main components:
Server:

Client:
/app/ClientUI.hs makes use of Brick to generate a terminal user interface for interacting with a chat user. It has an event handler for mouse click events. When the mouse click happens in text editor area, the cursor will be moved to that particular position. If the mouse click is on “send” button, the text currently in editor will be sent to the server this connecting with. The same effect is achieved by press enter key. There is another thread keeps listening on its socket, waiting for input messages from server. Once there is available message, content is written to BChan, and a custom event handler will displaying incoming message with current time on screen. All the utility functions used by ClientUI.hs are in /src/Utils.hs.

In /test:
Spec.hs: Contains unit tests for utility functions.

Additional libraries the project depends on:
stm
containers
network
network-uri
async == 2.*
binary >=0.6.3 && <= 0.9
template-haskell
transformers
distributed-process
distributed-process-simplelocalnet == 0.2.*
distributed-static >= 0.2 && < 0.4
uuid
network-transport-tcp
socket

bytestring
time
split
lens
microlens
microlens-th
vty
text-zipper
HUnit

Compile:
In application's root directory:
stack build

Execute:
Server:
stack exec node server_port_num client_port_num ring index

Client UI:
stack exec clientui server_ip_address server_port_number