

Clocks, Vector Clocks and Everything

Code Technology

Python 3, socket programming, logging

Code Documentation

Files

server.py, driver.py, client.py

The server file has a Server Class with 7 methods.

Class Server:

1. `initiateServer` – Creates a Socket
2. `startListening` – Starts an endless loop to keep accepting new connections
3. `acceptConnections` – Starts listening to requests that are incoming and differentiate them by sender either client or fellow server and calls corresponding method.
4. `requestHandler` – Takes the requests coming from client and calls `updateHandler` and `readHandler` according to the request type.
5. `updateHandler` – Takes in update request, updates local data and local clock than calls `synchronizeServers` to check if data is updated one or not and later replies according to conflict.
6. `readHandler` – Takes in read request, calls `synchronizeServers` and replies according to conflict detected or not.
7. `synchronizeServers` – Creates connection with each of the servers and receives their data and clock. Checks for conflict and stores data if conflict otherwise make update on local data, clock if required. It also prepares the reply data that is sent to client.
8. Main function – Spawns servers as per command line arguments in parallel.

Class Client:

1. `inputRequest` – Takes input from user, asks for which client to send the request to, which type of request read or update, then lastly asks for if you want to continue.
2. `readDataRequest` – Responsible of sending read request to server
3. `updateDataRequest` – Responsible of sending update request to server
4. `establishConnection` – After receiving information on which server to be connected to this method binds the host and ports to establish further communication.
5. `receiveData` – Responsible to receive data from server.

6. `closeConnection` – Closes the connection after a request is done.

Running Instructions

The running instructions are relatively simple:

Run following commands to run the project:

For Client:

```
python .\client.py --hosts "localhost" "localhost" "localhost"  
--ports 9990 9980 9999
```

For Server:

```
python .\server.py --hosts "localhost" "localhost" "localhost"  
--ports 9990 9980 9999
```

For TestFile:

```
python .\driver.py
```