

Mini Project 2 - Chitty-Chat

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1 Git Repository

[Github repository](#)

2 System Architecture

We have elected to utilize a server-client architecture, as that is what we are used to work with, and also it seemed intuitive to do it that way given the technical requirements. The idea is that clients will be able to connect to a server, and to this server, send requests to publish messages, or leave the server. The server will receive requests and return responses, and will also be keeping track of all the users, and broadcast messages to all of them. As such, each client will just have to listen to broadcasts, and will not have to take other clients into consideration at all. The server has it's own port, 7080, that it always listens to, and whenever a client wants to join, it has to declare a port for itself to listen to. This port will be where the server broadcasts its messages to.

3 RPC Methods

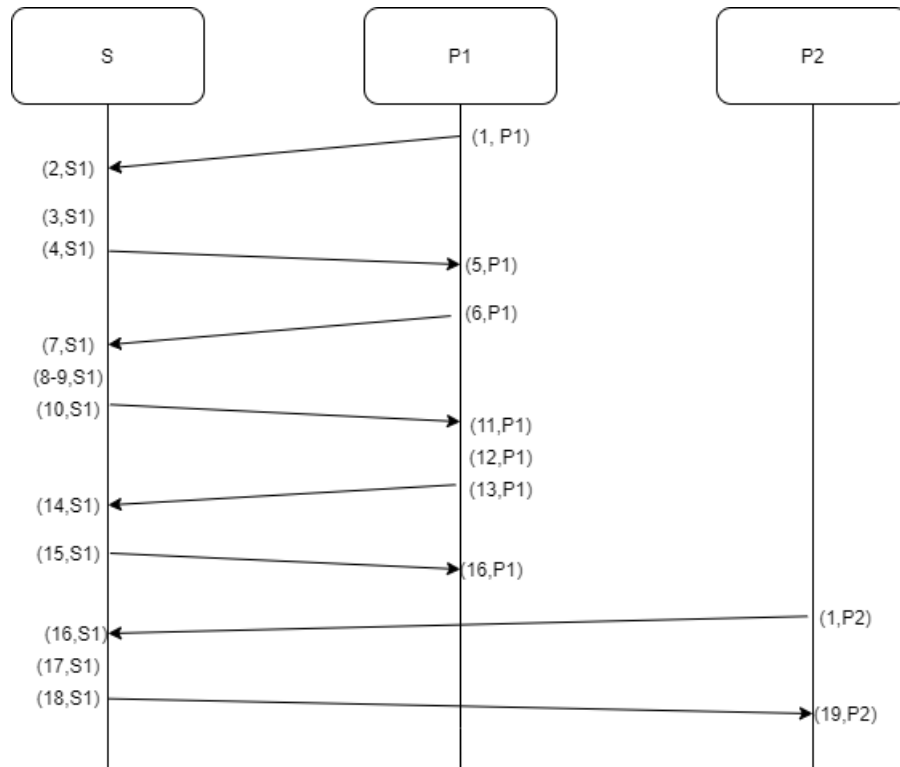
We have divided the methods into two services: ChittyChatServiceIN and ChittyChatService-OUT. In ChittyChatServiceIN, the Participants act as clients. We have the methods Publish(), Join() and Leave(), which can be requested from the server, ChatServer. in ChittyChatService-OUT, ChatServer acts as client, and the Participants are each their own server. This means that ChatServer can request a BroadCast() from each of the Participants.

4 Lamport timestamps

We have decided to increase the lamport timestamp every time, a request or a response is sent and recieved, and when an action is attempted performed for instance when a participant attempts join. The lamport timestamp is sent with the request, response and message. The participant or the ChatServer compare the timestamp from the request, response or message with its own, and registers the largest timestamp, so the timestamps are synchronized accross the systems.

5 Lamport Diagram

The following Lamport Diagram is sketched according to the Diagram.Log file from the GitHub repository with matching Lamport times. There are join, publish, and broadcast requests imbedded in the diagram.



Lamport diagram of the first actions from Diagram.log

6 Appendix

Furthermore, pictures of the terminals are shown in the report. This is added documentation to show that all requirements from the project description are fulfilled. These pictures show 3 participants and a server communicating with each other.

For full pictures and logs, see the [Github repository](#)

The image displays four terminal windows arranged in a 2x2 grid, showing the execution of a Chitty-Chat application. The top-left window is the 'Server' terminal, and the other three are 'Client' terminals. The Server terminal shows the process of starting the application, including setting the default shell to zsh and running the 'go run' command. The Client terminals show the process of joining the chat, receiving messages, and interacting with the server. The logs in the Client terminals show the sequence of events, including joining the chat, receiving messages, and interacting with the server.

```

Server — Server - go run . — 80x24
Last login: Wed Nov  3 08:49:18 on ttys003
-bash: nexpot: command not found

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Lines-MacBook-Air:~ linemeitongmaodejgaard$ cd /Volumes/TOSHIBA\ EXT/ITU\ -\ And
et\ år/Distribuerede\ systemer/DISYS_MiniProject2/
Lines-MacBook-Air:DISYS_MiniProject2 linemeitongmaodejgaard$ cd Server/
Lines-MacBook-Air:Server linemeitongmaodejgaard$ go run .

Client — -bash — 80x24
-bash: nexpot: command not found

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Lines-MacBook-Air:~ linemeitongmaodejgaard$ cd /Volumes/TOSHIBA\ EXT/ITU\ -\ And
et\ år/Distribuerede\ systemer/DISYS_MiniProject2/Client/
Lines-MacBook-Air:Client linemeitongmaodejgaard$ go run .
Please write your port
1111
Participant 1111 joined Chitty-Chat at Lampport time 5
Participant 2222 joined Chitty-Chat at Lampport time 19
Participant 3333 joined Chitty-Chat at Lampport time 38
Hej med jer
1111 said: Hej med jer, lampport time: 64
2222 said: Hej, lampport time: 83
3333 said: Jeg bliver desværre nød til at smutte, lampport time: 102
Participant 3333 left Chitty-Chat at Lampport time 117
2222 said: Jeg smutter også, lampport time: 137
Participant 2222 left Chitty-Chat at Lampport time 147
Participant 4444 joined Chitty-Chat at Lampport time 163
4444 said: Hej, lampport time: 186
/leave
Lines-MacBook-Air:Client linemeitongmaodejgaard$

Client — -bash — 80x24
Last login: Wed Nov  3 09:26:43 on ttys003
-bash: nexpot: command not found

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Lines-MacBook-Air:~ linemeitongmaodejgaard$ cd /Volumes/TOSHIBA\ EXT/ITU\ -\ And
et\ år/Distribuerede\ systemer/DISYS_MiniProject2/Client/
Lines-MacBook-Air:Client linemeitongmaodejgaard$ go run .
Please write your port
2222
Participant 2222 joined Chitty-Chat at Lampport time 19
Participant 3333 joined Chitty-Chat at Lampport time 38
1111 said: Hej med jer, lampport time: 69
Hej
2222 said: Hej, lampport time: 88
3333 said: Jeg bliver desværre nød til at smutte, lampport time: 107
Participant 3333 left Chitty-Chat at Lampport time 117
Jeg smutter også
2222 said: Jeg smutter også, lampport time: 142
/leave
Lines-MacBook-Air:Client linemeitongmaodejgaard$

Client — -bash — 80x24
The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
Lines-MacBook-Air:~ linemeitongmaodejgaard$ cd /Volumes/TOSHIBA\ EXT/ITU\ -\ And
et\ år/Distribuerede\ systemer/DISYS_MiniProject2/Client/
Lines-MacBook-Air:Client linemeitongmaodejgaard$ go run .
Please write your port
3333
Participant 3333 joined Chitty-Chat at Lampport time 38
1111 said: Hej med jer, lampport time: 74
2222 said: Hej, lampport time: 93
Jeg bliver desværre nød til at smutte
3333 said: Jeg bliver desværre nød til at smutte, lampport time: 112
/leave
Lines-MacBook-Air:Client linemeitongmaodejgaard$ go run .
Please write your port
4444
Participant 4444 joined Chitty-Chat at Lampport time 163
Hej
4444 said: Hej, lampport time: 191
Participant 1111 left Chitty-Chat at Lampport time 79
/leave
Lines-MacBook-Air:Client linemeitongmaodejgaard$

```

Picture of the terminals

6.1 Demo.log

2021/11/03 08:40:25 Join Request sent, lampport time: 1 2021/11/03 08:40:25 Received join request, lampport time: 2 2021/11/03 08:40:25 Attempt join, lampport time: 3 2021/11/03 08:40:25 Join reply, lampport time: 4 2021/11/03 08:40:25 Join response from the Server: You are now connected, lampport time: 5 2021/11/03 08:40:25 Publish Request sent, lampport time: 6 2021/11/03 08:40:25 Received publish request, lampport time: 7 2021/11/03 08:40:25 Attempt publish, lampport time: 8 2021/11/03 08:40:25 BroadCast Request sent, lampport time: 9 2021/11/03 08:40:25 BroadCast Request sent to 1111, lampport time: 10 2021/11/03 08:40:25 Received broadcast request, lampport time: 11 2021/11/03 08:40:25 Attempt BroadCast, lampport time: 12 2021/11/03 08:40:25 Participant 1111 joined Chitty-Chat at Lampport time 5 2021/11/03 08:40:25 BroadCast reply, lampport time: 13 2021/11/03 08:40:25 Response from 1111: BroadCast message reply, lampport time: 14 2021/11/03 08:40:25 Publish reply, lampport time: 15 2021/11/03 08:40:25 Response from the Server: Publish message reply, lampport time: 16 2021/11/03 08:40:31 Join Request sent, lampport time: 1 2021/11/03 08:40:31 Received join request, lampport time: 16 2021/11/03 08:40:31 Attempt join, lampport time: 17 2021/11/03 08:40:31 Join reply, lampport

time: 18 2021/11/03 08:40:31 Join response from the Server: You are now connected, lamport time: 19 2021/11/03 08:40:31 Publish Request sent, lamport time: 20 2021/11/03 08:40:31 Received publish request, lamport time: 21 2021/11/03 08:40:31 Attempt publish, lamport time: 22 2021/11/03 08:40:31 BroadCast Request sent, lamport time: 23 2021/11/03 08:40:31 BroadCast Request sent to 1111, lamport time: 24 2021/11/03 08:40:31 Received broadcast request, lamport time: 25 2021/11/03 08:40:31 Attempt BroadCast, lamport time: 26 2021/11/03 08:40:31 Participant 2222 joined Chitty-Chat at Lamport time 19 2021/11/03 08:40:31 BroadCast reply, lamport time: 27 2021/11/03 08:40:31 Response from 1111: BroadCast message reply, lamport time: 28 2021/11/03 08:40:31 BroadCast Request sent to 2222, lamport time: 29 2021/11/03 08:40:31 Received broadcast request, lamport time: 30 2021/11/03 08:40:31 Attempt BroadCast, lamport time: 31 2021/11/03 08:40:31 Participant 2222 joined Chitty-Chat at Lamport time 19 2021/11/03 08:40:31 BroadCast reply, lamport time: 32 2021/11/03 08:40:31 Response from 2222: BroadCast message reply, lamport time: 33 2021/11/03 08:40:31 Publish reply, lamport time: 34 2021/11/03 08:40:31 Response from the Server: Publish message reply, lamport time: 35 2021/11/03 08:40:37 Join Request sent, lamport time: 1 2021/11/03 08:40:37 Received join request, lamport time: 35 2021/11/03 08:40:37 Attempt join, lamport time: 36 2021/11/03 08:40:37 Join reply, lamport time: 37 2021/11/03 08:40:37 Join response from the Server: You are now connected, lamport time: 38 2021/11/03 08:40:37 Publish Request sent, lamport time: 39 2021/11/03 08:40:37 Received publish request, lamport time: 40 2021/11/03 08:40:37 Attempt publish, lamport time: 41 2021/11/03 08:40:37 BroadCast Request sent, lamport time: 42 2021/11/03 08:40:37 BroadCast Request sent to 1111, lamport time: 43 2021/11/03 08:40:37 Received broadcast request, lamport time: 44 2021/11/03 08:40:37 Attempt BroadCast, lamport time: 45 2021/11/03 08:40:37 Participant 3333 joined Chitty-Chat at Lamport time 38 2021/11/03 08:40:37 BroadCast reply, lamport time: 46 2021/11/03 08:40:37 Response from 1111: BroadCast message reply, lamport time: 47 2021/11/03 08:40:37 BroadCast Request sent to 2222, lamport time: 48 2021/11/03 08:40:37 Received broadcast request, lamport time: 49 2021/11/03 08:40:37 Attempt BroadCast, lamport time: 50 2021/11/03 08:40:37 Participant 3333 joined Chitty-Chat at Lamport time 38 2021/11/03 08:40:37 BroadCast reply, lamport time: 51 2021/11/03 08:40:37 Response from 2222: BroadCast message reply, lamport time: 52 2021/11/03 08:40:37 BroadCast Request sent to 3333, lamport time: 53 2021/11/03 08:40:37 Received broadcast request, lamport time: 54 2021/11/03 08:40:37 Attempt BroadCast, lamport time: 55 2021/11/03 08:40:37 Participant 3333 joined Chitty-Chat at Lamport time 38 2021/11/03 08:40:37 BroadCast reply, lamport time: 56 2021/11/03 08:40:37 Response from 3333: BroadCast message reply, lamport time: 57 2021/11/03 08:40:37 Publish reply, lamport time: 58 2021/11/03 08:40:37 Response from the Server: Publish message reply, lamport time: 59 2021/11/03 08:40:47 Publish Request sent, lamport time: 17 2021/11/03 08:40:47 Received publish request, lamport time: 59 2021/11/03 08:40:47 Attempt publish, lamport time: 60 2021/11/03 08:40:47 BroadCast Request sent, lamport time: 61 2021/11/03 08:40:47 BroadCast Request sent to 1111, lamport time: 62 2021/11/03 08:40:47 Received broadcast request, lamport time: 63 2021/11/03 08:40:47 Attempt BroadCast, lamport time: 64 2021/11/03 08:40:47 1111 said: Hej med jer, lamport time: 64 2021/11/03 08:40:47 BroadCast reply, lamport time: 65 2021/11/03 08:40:47 Response from 1111: BroadCast message reply, lamport time: 66 2021/11/03 08:40:47 BroadCast Request sent to 2222, lamport time: 67 2021/11/03 08:40:47 Re-

ceived broadcast request, lampport time: 68 2021/11/03 08:40:47 Attempt BroadCast, lampport time: 69 2021/11/03 08:40:47 1111 said: Hej med jer, lampport time: 69 2021/11/03 08:40:47 BroadCast reply, lampport time: 70 2021/11/03 08:40:47 Response from 2222: BroadCast message reply, lampport time: 71 2021/11/03 08:40:47 BroadCast Request sent to 3333, lampport time: 72 2021/11/03 08:40:47 Received broadcast request, lampport time: 73 2021/11/03 08:40:47 Attempt BroadCast, lampport time: 74 2021/11/03 08:40:47 1111 said: Hej med jer, lampport time: 74 2021/11/03 08:40:47 BroadCast reply, lampport time: 75 2021/11/03 08:40:47 Response from 3333: BroadCast message reply, lampport time: 76 2021/11/03 08:40:47 Publish reply, lampport time: 77 2021/11/03 08:40:47 Response from the Server: Publish message reply, lampport time: 78 2021/11/03 08:40:52 Publish Request sent, lampport time: 36 2021/11/03 08:40:52 Received publish request, lampport time: 78 2021/11/03 08:40:52 Attempt publish, lampport time: 79 2021/11/03 08:40:52 BroadCast Request sent, lampport time: 80 2021/11/03 08:40:52 BroadCast Request sent to 1111, lampport time: 81 2021/11/03 08:40:52 Received broadcast request, lampport time: 82 2021/11/03 08:40:52 Attempt BroadCast, lampport time: 83 2021/11/03 08:40:52 2222 said: Halløj!, lampport time: 83 2021/11/03 08:40:52 BroadCast reply, lampport time: 84 2021/11/03 08:40:52 Response from 1111: BroadCast message reply, lampport time: 85 2021/11/03 08:40:52 BroadCast Request sent to 2222, lampport time: 86 2021/11/03 08:40:52 Received broadcast request, lampport time: 87 2021/11/03 08:40:52 Attempt BroadCast, lampport time: 88 2021/11/03 08:40:52 2222 said: Halløj!, lampport time: 88 2021/11/03 08:40:52 BroadCast reply, lampport time: 89 2021/11/03 08:40:52 Response from 2222: BroadCast message reply, lampport time: 90 2021/11/03 08:40:52 BroadCast Request sent to 3333, lampport time: 91 2021/11/03 08:40:52 Received broadcast request, lampport time: 92 2021/11/03 08:40:52 Attempt BroadCast, lampport time: 93 2021/11/03 08:40:52 2222 said: Halløj!, lampport time: 93 2021/11/03 08:40:52 BroadCast reply, lampport time: 94 2021/11/03 08:40:52 Response from 3333: BroadCast message reply, lampport time: 95 2021/11/03 08:40:52 Publish reply, lampport time: 96 2021/11/03 08:40:52 Response from the Server: Publish message reply, lampport time: 97 2021/11/03 08:40:57 Publish Request sent, lampport time: 60 2021/11/03 08:40:57 Received publish request, lampport time: 97 2021/11/03 08:40:57 Attempt publish, lampport time: 98 2021/11/03 08:40:57 BroadCast Request sent, lampport time: 99 2021/11/03 08:40:57 BroadCast Request sent to 1111, lampport time: 100 2021/11/03 08:40:57 Received broadcast request, lampport time: 101 2021/11/03 08:40:57 Attempt BroadCast, lampport time: 102 2021/11/03 08:40:57 3333 said: Jeg smutter, lampport time: 102 2021/11/03 08:40:57 BroadCast reply, lampport time: 103 2021/11/03 08:40:57 Response from 1111: BroadCast message reply, lampport time: 104 2021/11/03 08:40:57 BroadCast Request sent to 2222, lampport time: 105 2021/11/03 08:40:57 Received broadcast request, lampport time: 106 2021/11/03 08:40:57 Attempt BroadCast, lampport time: 107 2021/11/03 08:40:57 3333 said: Jeg smutter, lampport time: 107 2021/11/03 08:40:57 BroadCast reply, lampport time: 108 2021/11/03 08:40:57 Response from 2222: BroadCast message reply, lampport time: 109 2021/11/03 08:40:57 BroadCast Request sent to 3333, lampport time: 110 2021/11/03 08:40:57 Received broadcast request, lampport time: 111 2021/11/03 08:40:57 Attempt BroadCast, lampport time: 112 2021/11/03 08:40:57 3333 said: Jeg smutter, lampport time: 112 2021/11/03 08:40:57 BroadCast reply, lampport time: 113 2021/11/03 08:40:57 Response from 3333: BroadCast message reply, lampport time: 114 2021/11/03 08:40:57 Publish reply, lampport time: 115 2021/11/03 08:40:57 Response from the Server: Publish message re-

ply, lamport time: 116 2021/11/03 08:41:01 Leave Request sent, lamport time: 117 2021/11/03 08:41:01 Received publish request, lamport time: 119 2021/11/03 08:41:01 Attempt publish, lamport time: 120 2021/11/03 08:41:01 BroadCast Request sent, lamport time: 121 2021/11/03 08:41:01 BroadCast Request sent to 1111, lamport time: 122 2021/11/03 08:41:01 Participant 3333 left Chitty-Chat at Lamport time 117 2021/11/03 08:41:01 Response from 1111: BroadCast message reply, lamport time: 123 2021/11/03 08:41:01 BroadCast Request sent to 2222, lamport time: 124 2021/11/03 08:41:01 Participant 3333 left Chitty-Chat at Lamport time 117 2021/11/03 08:41:01 Response from 2222: BroadCast message reply, lamport time: 125 2021/11/03 08:41:01 BroadCast Request sent to 3333, lamport time: 126 2021/11/03 08:41:01 Response from 3333: BroadCast message reply, lamport time: 127 2021/11/03 08:41:01 Publish reply, lamport time: 128 2021/11/03 08:41:01 Received leave request, lamport time: 129 2021/11/03 08:41:01 Attempt leave, lamport time: 130 2021/11/03 08:41:01 Leave reply, lamport time: 131 2021/11/03 08:41:01 Leave response from the Server: User left the server, lamport time: 132 2021/11/03 08:41:07 Publish Request sent, lamport time: 98 2021/11/03 08:41:07 Received publish request, lamport time: 132 2021/11/03 08:41:07 Attempt publish, lamport time: 133 2021/11/03 08:41:07 BroadCast Request sent, lamport time: 134 2021/11/03 08:41:07 BroadCast Request sent to 1111, lamport time: 135 2021/11/03 08:41:07 Received broadcast request, lamport time: 136 2021/11/03 08:41:07 Attempt BroadCast, lamport time: 137 2021/11/03 08:41:07 2222 said: Når så er det bare os, lamport time: 137 2021/11/03 08:41:07 BroadCast reply, lamport time: 138 2021/11/03 08:41:07 Response from 1111: BroadCast message reply, lamport time: 139 2021/11/03 08:41:07 BroadCast Request sent to 2222, lamport time: 140 2021/11/03 08:41:07 Received broadcast request, lamport time: 141 2021/11/03 08:41:07 Attempt BroadCast, lamport time: 142 2021/11/03 08:41:07 2222 said: Når så er det bare os, lamport time: 142 2021/11/03 08:41:07 BroadCast reply, lamport time: 143 2021/11/03 08:41:07 Response from 2222: BroadCast message reply, lamport time: 144 2021/11/03 08:41:07 Publish reply, lamport time: 145 2021/11/03 08:41:07 Response from the Server: Publish message reply, lamport time: 146 2021/11/03 08:41:17 Join Request sent, lamport time: 1 2021/11/03 08:41:17 Received join request, lamport time: 146 2021/11/03 08:41:17 Attempt join, lamport time: 147 2021/11/03 08:41:17 Join reply, lamport time: 148 2021/11/03 08:41:17 Join response from the Server: You are now connected, lamport time: 149 2021/11/03 08:41:17 Publish Request sent, lamport time: 150 2021/11/03 08:41:17 Received publish request, lamport time: 151 2021/11/03 08:41:17 Attempt publish, lamport time: 152 2021/11/03 08:41:17 BroadCast Request sent, lamport time: 153 2021/11/03 08:41:17 BroadCast Request sent to 1111, lamport time: 154 2021/11/03 08:41:17 Received broadcast request, lamport time: 155 2021/11/03 08:41:17 Attempt BroadCast, lamport time: 156 2021/11/03 08:41:17 Participant 4444 joined Chitty-Chat at Lamport time 149 2021/11/03 08:41:17 BroadCast reply, lamport time: 157 2021/11/03 08:41:17 Response from 1111: BroadCast message reply, lamport time: 158 2021/11/03 08:41:17 BroadCast Request sent to 2222, lamport time: 159 2021/11/03 08:41:17 Received broadcast request, lamport time: 160 2021/11/03 08:41:17 Attempt BroadCast, lamport time: 161 2021/11/03 08:41:17 Participant 4444 joined Chitty-Chat at Lamport time 149 2021/11/03 08:41:17 BroadCast reply, lamport time: 162 2021/11/03 08:41:17 Response from 2222: BroadCast message reply, lamport time: 163 2021/11/03 08:41:17 BroadCast Request sent to 4444, lamport time: 164 2021/11/03 08:41:17 Received broadcast request, lamport time: 165

2021/11/03 08:41:17 Attempt BroadCast, lamport time: 166 2021/11/03 08:41:17 Participant 4444 joined Chitty-Chat at Lamport time 149 2021/11/03 08:41:17 BroadCast reply, lamport time: 167 2021/11/03 08:41:17 Response from 4444: BroadCast message reply, lamport time: 168 2021/11/03 08:41:17 Publish reply, lamport time: 169 2021/11/03 08:41:17 Response from the Server: Publish message reply, lamport time: 170 2021/11/03 08:41:22 Publish Request sent, lamport time: 171 2021/11/03 08:41:22 Received publish request, lamport time: 172 2021/11/03 08:41:22 Attempt publish, lamport time: 173 2021/11/03 08:41:22 BroadCast Request sent, lamport time: 174 2021/11/03 08:41:22 BroadCast Request sent to 1111, lamport time: 175 2021/11/03 08:41:22 Received broadcast request, lamport time: 176 2021/11/03 08:41:22 Attempt BroadCast, lamport time: 177 2021/11/03 08:41:22 4444 said: Jeg er her også nu, lamport time: 177 2021/11/03 08:41:22 BroadCast reply, lamport time: 178 2021/11/03 08:41:22 Response from 1111: BroadCast message reply, lamport time: 179 2021/11/03 08:41:22 BroadCast Request sent to 2222, lamport time: 180 2021/11/03 08:41:22 Received broadcast request, lamport time: 181 2021/11/03 08:41:22 Attempt BroadCast, lamport time: 182 2021/11/03 08:41:22 4444 said: Jeg er her også nu, lamport time: 182 2021/11/03 08:41:22 BroadCast reply, lamport time: 183 2021/11/03 08:41:22 Response from 2222: BroadCast message reply, lamport time: 184 2021/11/03 08:41:22 BroadCast Request sent to 4444, lamport time: 185 2021/11/03 08:41:22 Received broadcast request, lamport time: 186 2021/11/03 08:41:22 Attempt BroadCast, lamport time: 187 2021/11/03 08:41:22 4444 said: Jeg er her også nu, lamport time: 187 2021/11/03 08:41:22 BroadCast reply, lamport time: 188 2021/11/03 08:41:22 Response from 4444: BroadCast message reply, lamport time: 189 2021/11/03 08:41:22 Publish reply, lamport time: 190 2021/11/03 08:41:22 Response from the Server: Publish message reply, lamport time: 191 2021/11/03 08:41:26 Publish Request sent, lamport time: 147 2021/11/03 08:41:26 Received publish request, lamport time: 191 2021/11/03 08:41:26 Attempt publish, lamport time: 192 2021/11/03 08:41:26 BroadCast Request sent, lamport time: 193 2021/11/03 08:41:26 BroadCast Request sent to 1111, lamport time: 194 2021/11/03 08:41:26 Received broadcast request, lamport time: 195 2021/11/03 08:41:26 Attempt BroadCast, lamport time: 196 2021/11/03 08:41:26 2222 said: hyggeligt, lamport time: 196 2021/11/03 08:41:26 BroadCast reply, lamport time: 197 2021/11/03 08:41:26 Response from 1111: BroadCast message reply, lamport time: 198 2021/11/03 08:41:26 BroadCast Request sent to 2222, lamport time: 199 2021/11/03 08:41:26 Received broadcast request, lamport time: 200 2021/11/03 08:41:26 Attempt BroadCast, lamport time: 201 2021/11/03 08:41:26 2222 said: hyggeligt, lamport time: 201 2021/11/03 08:41:26 BroadCast reply, lamport time: 202 2021/11/03 08:41:26 Response from 2222: BroadCast message reply, lamport time: 203 2021/11/03 08:41:26 BroadCast Request sent to 4444, lamport time: 204 2021/11/03 08:41:26 Received broadcast request, lamport time: 205 2021/11/03 08:41:26 Attempt BroadCast, lamport time: 206 2021/11/03 08:41:26 2222 said: hyggeligt, lamport time: 206 2021/11/03 08:41:26 BroadCast reply, lamport time: 207 2021/11/03 08:41:26 Response from 4444: BroadCast message reply, lamport time: 208 2021/11/03 08:41:26 Publish reply, lamport time: 209 2021/11/03 08:41:26 Response from the Server: Publish message reply, lamport time: 210 2021/11/03 08:41:28 Publish Request sent, lamport time: 79 2021/11/03 08:41:28 Received publish request, lamport time: 210 2021/11/03 08:41:28 Attempt publish, lamport time: 211 2021/11/03 08:41:28 BroadCast Request sent, lamport time: 212 2021/11/03 08:41:28 BroadCast Request sent to 1111, lamport time: 213 2021/11/03 08:41:28 Received

broadcast request, lamport time: 214 2021/11/03 08:41:28 Attempt BroadCast, lamport time: 215 2021/11/03 08:41:28 1111 said: øv, lamport time: 215 2021/11/03 08:41:28 BroadCast reply, lamport time: 216 2021/11/03 08:41:28 Response from 1111: BroadCast message reply, lamport time: 217 2021/11/03 08:41:28 BroadCast Request sent to 2222, lamport time: 218 2021/11/03 08:41:28 Received broadcast request, lamport time: 219 2021/11/03 08:41:28 Attempt BroadCast, lamport time: 220 2021/11/03 08:41:28 1111 said: øv, lamport time: 220 2021/11/03 08:41:28 BroadCast reply, lamport time: 221 2021/11/03 08:41:28 Response from 2222: BroadCast message reply, lamport time: 222 2021/11/03 08:41:28 BroadCast Request sent to 4444, lamport time: 223 2021/11/03 08:41:28 Received broadcast request, lamport time: 224 2021/11/03 08:41:28 Attempt BroadCast, lamport time: 225 2021/11/03 08:41:28 1111 said: øv, lamport time: 225 2021/11/03 08:41:28 BroadCast reply, lamport time: 226 2021/11/03 08:41:28 Response from 4444: BroadCast message reply, lamport time: 227 2021/11/03 08:41:28 Publish reply, lamport time: 228 2021/11/03 08:41:28 Response from the Server: Publish message reply, lamport time: 229 2021/11/03 08:41:31 Leave Request sent, lamport time: 230 2021/11/03 08:41:31 Received publish request, lamport time: 232 2021/11/03 08:41:31 Attempt publish, lamport time: 233 2021/11/03 08:41:31 BroadCast Request sent, lamport time: 234 2021/11/03 08:41:31 BroadCast Request sent to 1111, lamport time: 235 2021/11/03 08:41:31 Response from 1111: BroadCast message reply, lamport time: 236 2021/11/03 08:41:31 BroadCast Request sent to 2222, lamport time: 237 2021/11/03 08:41:31 Participant 1111 left Chitty-Chat at Lamport time 230 2021/11/03 08:41:31 Response from 2222: BroadCast message reply, lamport time: 238 2021/11/03 08:41:31 BroadCast Request sent to 4444, lamport time: 239 2021/11/03 08:41:31 Participant 1111 left Chitty-Chat at Lamport time 230 2021/11/03 08:41:31 Response from 4444: BroadCast message reply, lamport time: 240 2021/11/03 08:41:31 Publish reply, lamport time: 241 2021/11/03 08:41:31 Received leave request, lamport time: 242 2021/11/03 08:41:31 Attempt leave, lamport time: 243 2021/11/03 08:41:31 Leave reply, lamport time: 244 2021/11/03 08:41:31 Leave response from the Server: User left the server, lamport time: 245 2021/11/03 08:41:38 Leave Request sent, lamport time: 211 2021/11/03 08:41:38 Received publish request, lamport time: 245 2021/11/03 08:41:38 Attempt publish, lamport time: 246 2021/11/03 08:41:38 BroadCast Request sent, lamport time: 247 2021/11/03 08:41:38 BroadCast Request sent to 2222, lamport time: 248 2021/11/03 08:41:38 Response from 2222: BroadCast message reply, lamport time: 249 2021/11/03 08:41:38 BroadCast Request sent to 4444, lamport time: 250 2021/11/03 08:41:38 Participant 2222 left Chitty-Chat at Lamport time 211 2021/11/03 08:41:38 Response from 4444: BroadCast message reply, lamport time: 251 2021/11/03 08:41:38 Publish reply, lamport time: 252 2021/11/03 08:41:38 Received leave request, lamport time: 253 2021/11/03 08:41:38 Attempt leave, lamport time: 254 2021/11/03 08:41:38 Leave reply, lamport time: 255 2021/11/03 08:41:38 Leave response from the Server: User left the server, lamport time: 256 2021/11/03 08:41:41 Leave Request sent, lamport time: 192 2021/11/03 08:41:41 Received publish request, lamport time: 256 2021/11/03 08:41:41 Attempt publish, lamport time: 257 2021/11/03 08:41:41 BroadCast Request sent, lamport time: 258 2021/11/03 08:41:41 BroadCast Request sent to 4444, lamport time: 259 2021/11/03 08:41:41 Response from 4444: BroadCast message reply, lamport time: 260 2021/11/03 08:41:41 Publish reply, lamport time: 261 2021/11/03 08:41:41 Received leave request, lamport time: 262 2021/11/03 08:41:41 Attempt leave, lamport time: 263 2021/11/03 08:41:41 Leave reply, lamport time: 264 2021/11/03

08:41:41 Leave response from the Server: User left the server, lamport time: 265

6.2 Diagram.log

2021/11/03 08:51:02 Join Request sent, lamport time: 1 2021/11/03 08:51:02 Received join request, lamport time: 2 2021/11/03 08:51:02 Attempt join, lamport time: 3 2021/11/03 08:51:02 Join reply, lamport time: 4 2021/11/03 08:51:02 Join response from the Server: You are now connected, lamport time: 5 2021/11/03 08:51:02 Publish Request sent, lamport time: 6 2021/11/03 08:51:02 Received publish request, lamport time: 7 2021/11/03 08:51:02 Attempt publish, lamport time: 8 2021/11/03 08:51:02 BroadCast Request sent, lamport time: 9 2021/11/03 08:51:02 BroadCast Request sent to 1111, lamport time: 10 2021/11/03 08:51:02 Received broadcast request, lamport time: 11 2021/11/03 08:51:02 Attempt BroadCast, lamport time: 12 2021/11/03 08:51:02 Participant 1111 joined Chitty-Chat at Lamport time 5 2021/11/03 08:51:02 BroadCast reply, lamport time: 13 2021/11/03 08:51:02 Response from 1111: BroadCast message reply, lamport time: 14 2021/11/03 08:51:02 Publish reply, lamport time: 15 2021/11/03 08:51:02 Response from the Server: Publish message reply, lamport time: 16 2021/11/03 08:51:10 Join Request sent, lamport time: 1 2021/11/03 08:51:10 Received join request, lamport time: 16 2021/11/03 08:51:10 Attempt join, lamport time: 17 2021/11/03 08:51:10 Join reply, lamport time: 18 2021/11/03 08:51:10 Join response from the Server: You are now connected, lamport time: 19 2021/11/03 08:51:10 Publish Request sent, lamport time: 20 2021/11/03 08:51:10 Received publish request, lamport time: 21 2021/11/03 08:51:10 Attempt publish, lamport time: 22 2021/11/03 08:51:10 BroadCast Request sent, lamport time: 23 2021/11/03 08:51:10 BroadCast Request sent to 1111, lamport time: 24 2021/11/03 08:51:10 Received broadcast request, lamport time: 25 2021/11/03 08:51:10 Attempt BroadCast, lamport time: 26 2021/11/03 08:51:10 Participant 2222 joined Chitty-Chat at Lamport time 19 2021/11/03 08:51:10 BroadCast reply, lamport time: 27 2021/11/03 08:51:10 Response from 1111: BroadCast message reply, lamport time: 28 2021/11/03 08:51:10 BroadCast Request sent to 2222, lamport time: 29 2021/11/03 08:51:10 Received broadcast request, lamport time: 30 2021/11/03 08:51:10 Attempt BroadCast, lamport time: 31 2021/11/03 08:51:10 Participant 2222 joined Chitty-Chat at Lamport time 19 2021/11/03 08:51:10 BroadCast reply, lamport time: 32 2021/11/03 08:51:10 Response from 2222: BroadCast message reply, lamport time: 33 2021/11/03 08:51:10 Publish reply, lamport time: 34 2021/11/03 08:51:10 Response from the Server: Publish message reply, lamport time: 35 2021/11/03 08:51:18 Publish Request sent, lamport time: 17 2021/11/03 08:51:18 Received publish request, lamport time: 35 2021/11/03 08:51:18 Attempt publish, lamport time: 36 2021/11/03 08:51:18 BroadCast Request sent, lamport time: 37 2021/11/03 08:51:18 BroadCast Request sent to 1111, lamport time: 38 2021/11/03 08:51:18 Received broadcast request, lamport time: 39 2021/11/03 08:51:18 Attempt BroadCast, lamport time: 40 2021/11/03 08:51:18 1111 said: Hej, lamport time: 40 2021/11/03 08:51:18 BroadCast reply, lamport time: 41 2021/11/03 08:51:18 Response from 1111: BroadCast message reply, lamport time: 42 2021/11/03 08:51:18 BroadCast Request sent to 2222, lamport time: 43 2021/11/03 08:51:18 Received broadcast request, lamport time: 44 2021/11/03 08:51:18 Attempt BroadCast, lamport time: 45 2021/11/03 08:51:18 1111 said: Hej, lamport time: 45 2021/11/03 08:51:18 BroadCast reply, lamport time: 46 2021/11/03 08:51:18 Response from 2222: BroadCast message reply, lamport time:

47 2021/11/03 08:51:18 Publish reply, lamport time: 48 2021/11/03 08:51:18 Response from the Server: Publish message reply, lamport time: 49 2021/11/03 08:51:34 Leave Request sent, lamport time: 50 2021/11/03 08:51:34 Received publish request, lamport time: 52 2021/11/03 08:51:34 Attempt publish, lamport time: 53 2021/11/03 08:51:34 BroadCast Request sent, lamport time: 54 2021/11/03 08:51:34 BroadCast Request sent to 1111, lamport time: 55 2021/11/03 08:51:34 Response from 1111: BroadCast message reply, lamport time: 56 2021/11/03 08:51:34 BroadCast Request sent to 2222, lamport time: 57 2021/11/03 08:51:34 Participant 1111 left Chitty-Chat at Lamport time 50 2021/11/03 08:51:34 Response from 2222: BroadCast message reply, lamport time: 58 2021/11/03 08:51:34 Publish reply, lamport time: 59 2021/11/03 08:51:34 Received leave request, lamport time: 60 2021/11/03 08:51:34 Attempt leave, lamport time: 61 2021/11/03 08:51:34 Leave reply, lamport time: 62 2021/11/03 08:51:34 Leave response from the Server: User left the server, lamport time: 63 2021/11/03 08:51:47 Leave Request sent, lamport time: 36 2021/11/03 08:51:47 Received publish request, lamport time: 63 2021/11/03 08:51:47 Attempt publish, lamport time: 64 2021/11/03 08:51:47 BroadCast Request sent, lamport time: 65 2021/11/03 08:51:47 BroadCast Request sent to 2222, lamport time: 66 2021/11/03 08:51:47 Response from 2222: BroadCast message reply, lamport time: 67 2021/11/03 08:51:47 Publish reply, lamport time: 68 2021/11/03 08:51:47 Received leave request, lamport time: 69 2021/11/03 08:51:47 Attempt leave, lamport time: 70 2021/11/03 08:51:47 Leave reply, lamport time: 71 2021/11/03 08:51:47 Leave response from the Server: User left the server, lamport time: 72
