

Mini Project 2 - Chitty-Chat

Written by Frederik Avlund, Simon Jørgensen, Joakim Dissing og Andreas Jørgensen Git repo for code: <https://github.com/hoaj/chat>

Describe your system architecture:

Since we're having clients communication with a server, we have a client/server system architecture.

Describe what RPC methods are implemented:

We have implemented 4 RPC methods:

- Connect
 - o The purpose of this message is to send a notification about a new client joining the chat. It also adds the calling client to the map of current clients in the chat. The method is invoked by writing "Join" in the chat. The parameter is a predefined empty message, that only contains identification information about the client. The callback from this method is a status together with a Lamport timestamp. The status indicates whether the client was able to connect or not.
- Publish
 - o Publish sends a message written from standard input to the server. It makes sure, that all connected clients receive the message by passing it into one or more channels, where each channel corresponds to a connected user. The callback from this method is a status together with a Lamport timestamp. The status indicates whether the client was able to publish the message to each channel.
- Broadcast
 - o Broadcast gets invoked only once for each connect client. It starts a goroutine on the sever side, that loops while the client is connected to the server. Inside the loop, a stream of messages is send, coming from the clients corresponding channel. To summarize; Publish add the message to all channels while broadcast retrieve messages from a client specific channel and sends to clients.
- Disconnect
 - o Disconnect makes sure remove the client and its channel from the server side. The method is invoked by writing "Leave" in the chat. The client is subsequently shut down.

Describe how you have implemented calculation of the Lamport timestamps

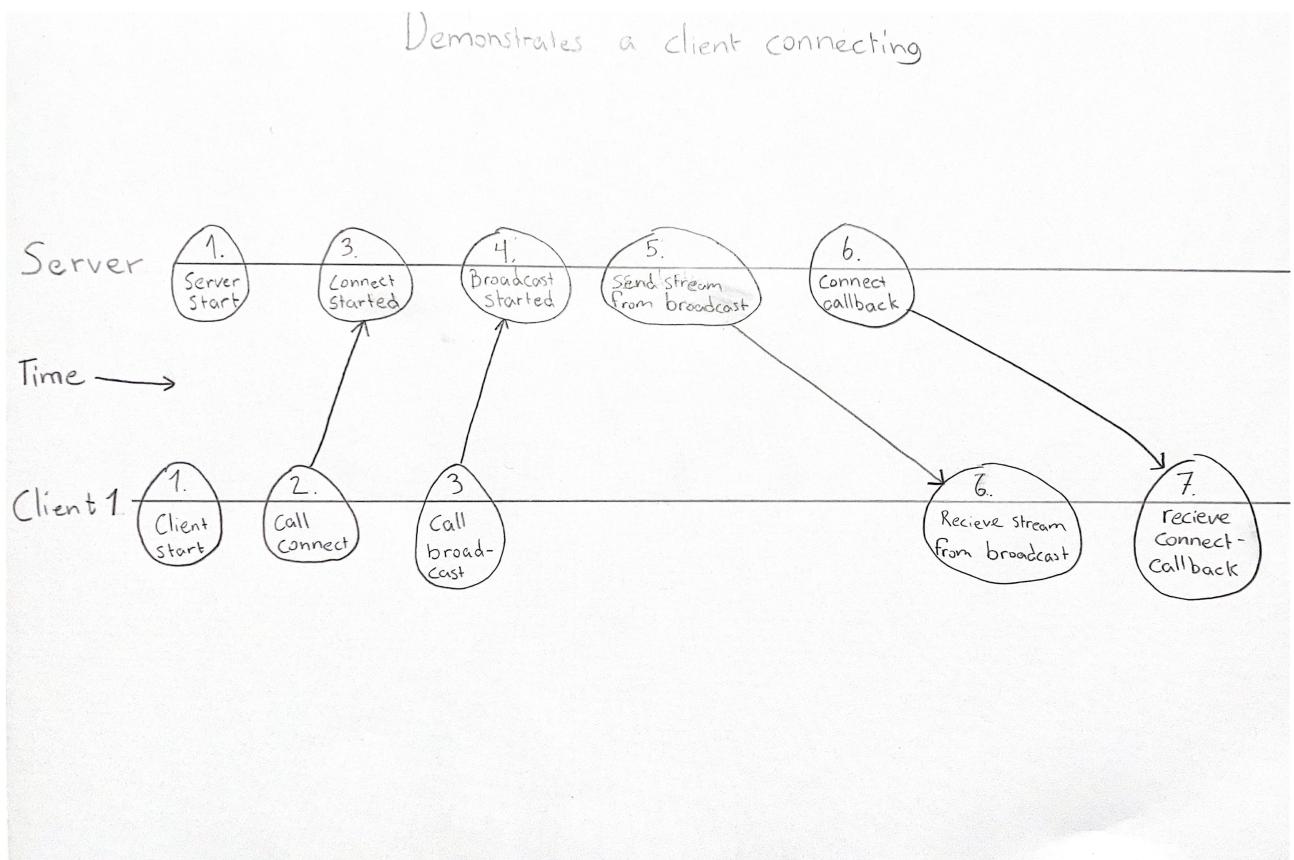
There is saved a lamport timestamp in each message being send between server and client.

When a node sends message it adds 1 before sending.

When a node receives a timestamp it chooses the maximum value of the incoming timestamp and the local node timestamp. It then adds 1 to the max value, and assigns the value to the receivers local timestamp.

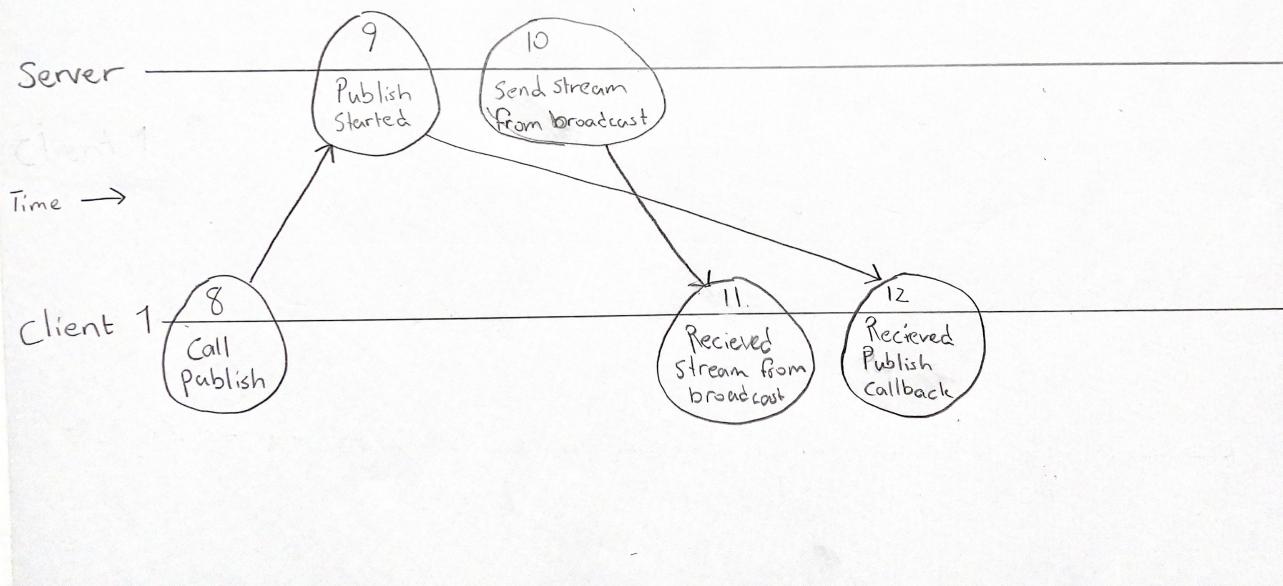
Provide a diagram, that traces a sequence of RPC calls together with the Lamport timestamps, that corresponds to a chosen sequence of interactions

See the next 3 pages.



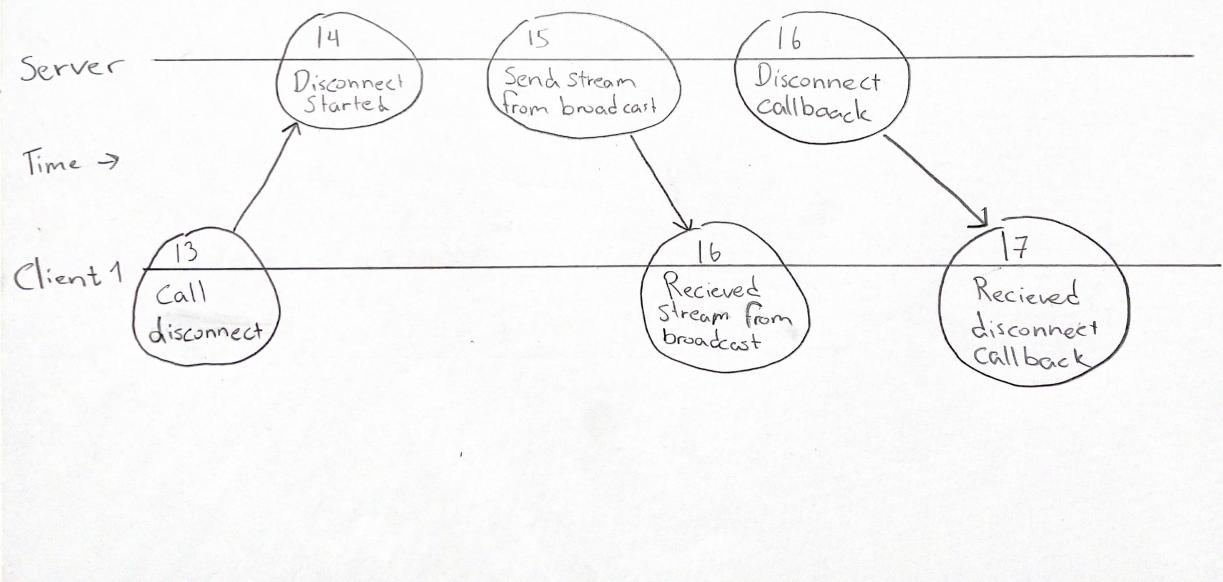
Client 2

Demonstrates sending a message



Client 1

Demonstrates leaving the chat



Log

2021/11/02 10:56:37 Starting server at port :8080
2021/11/02 10:58:36 Frederik joined Chitty-Chat (Lamport time: 0)
2021/11/02 10:58:36 Broadcasting message: Frederik joined Chitty-Chat (0) -- (Lamport time: 1)
2021/11/02 10:58:40 Simon joined Chitty-Chat (Lamport time: 2)
2021/11/02 10:58:40 Broadcasting message: Simon joined Chitty-Chat (2) -- (Lamport time: 3)
2021/11/02 10:58:40 Broadcasting message: Simon joined Chitty-Chat (2) -- (Lamport time: 4)
2021/11/02 10:58:42 Publish() from Frederik : Hej (Lamport time: 5)
2021/11/02 10:58:42 Broadcasting message: Frederik: Hej (Lamport time: 5) -- (Lamport time: 6)
2021/11/02 10:58:42 Broadcasting message: Frederik: Hej (Lamport time: 5) -- (Lamport time: 7)
2021/11/02 10:58:45 Publish() from Simon : Hey (Lamport time: 8)
2021/11/02 10:58:45 Broadcasting message: Simon: Hey (Lamport time: 8) -- (Lamport time: 9)
2021/11/02 10:58:45 Broadcasting message: Simon: Hey (Lamport time: 8) -- (Lamport time: 10)
2021/11/02 10:58:48 Andreas joined Chitty-Chat (Lamport time: 11)
2021/11/02 10:58:48 Broadcasting message: Andreas joined Chitty-Chat (11) -- (Lamport time:
12)
2021/11/02 10:58:48 Broadcasting message: Andreas joined Chitty-Chat (11) -- (Lamport time:
13)
2021/11/02 10:58:48 Broadcasting message: Andreas joined Chitty-Chat (11) -- (Lamport time:
14)
2021/11/02 10:58:50 Joakim joined Chitty-Chat (Lamport time: 15)
2021/11/02 10:58:50 Broadcasting message: Joakim joined Chitty-Chat (15) -- (Lamport time: 16
)
2021/11/02 10:58:50 Broadcasting message: Joakim joined Chitty-Chat (15) -- (Lamport time: 17
)
2021/11/02 10:58:50 Broadcasting message: Joakim joined Chitty-Chat (15) -- (Lamport time: 18
)
2021/11/02 10:58:50 Broadcasting message: Joakim joined Chitty-Chat (15) -- (Lamport time: 19
)
2021/11/02 10:58:52 Publish() from Joakim : Hej med jer (Lamport time: 20)
2021/11/02 10:58:52 Broadcasting message: Joakim: Hej med jer (Lamport time: 20) -- (Lamport
time: 21)
2021/11/02 10:58:52 Broadcasting message: Joakim: Hej med jer (Lamport time: 20) -- (Lamport
time: 22)
2021/11/02 10:58:52 Broadcasting message: Joakim: Hej med jer (Lamport time: 20) -- (Lamport
time: 23)
2021/11/02 10:58:52 Broadcasting message: Joakim: Hej med jer (Lamport time: 20) -- (Lamport
time: 24)
2021/11/02 10:58:59 Publish() from Andreas : Hvad så (Lamport time: 25)
2021/11/02 10:58:59 Broadcasting message: Andreas: Hvad så (Lamport time: 25) -- (Lamport
time: 26)
2021/11/02 10:58:59 Broadcasting message: Andreas: Hvad så (Lamport time: 25) -- (Lamport
time: 27)
2021/11/02 10:58:59 Broadcasting message: Andreas: Hvad så (Lamport time: 25) -- (Lamport
time: 28)

2021/11/02 10:58:59 Broadcasting message: Andreas: Hvad så (Lamport time: 25) -- (Lamport time: 29)
2021/11/02 10:59:04 Publish() from Frederik : Smutter lige hurtigt! (Lamport time: 30)
2021/11/02 10:59:04 Broadcasting message: Frederik: Smutter lige hurtigt! (Lamport time: 30) -- (Lamport time: 31)
2021/11/02 10:59:04 Broadcasting message: Frederik: Smutter lige hurtigt! (Lamport time: 30) -- (Lamport time: 32)
2021/11/02 10:59:04 Broadcasting message: Frederik: Smutter lige hurtigt! (Lamport time: 30) -- (Lamport time: 33)
2021/11/02 10:59:04 Broadcasting message: Frederik: Smutter lige hurtigt! (Lamport time: 30) -- (Lamport time: 34)
2021/11/02 10:59:05 Frederik left Chitty-Chat (Lamport time: 35)
2021/11/02 10:59:05 Broadcasting message: Frederik left Chitty-Chat. (Lamport time: 35) -- (Lamport time: 36)
2021/11/02 10:59:05 Broadcasting message: Frederik left Chitty-Chat. (Lamport time: 35) -- (Lamport time: 37)
2021/11/02 10:59:05 Broadcasting message: Frederik left Chitty-Chat. (Lamport time: 35) -- (Lamport time: 38)
2021/11/02 10:59:05 Broadcasting message: Frederik left Chitty-Chat. (Lamport time: 35) -- (Lamport time: 39)
2021/11/02 10:59:22 Publish() from Simon : Bliver også nødt til at smutte nu - vi ses! (Lamport time: 40)
2021/11/02 10:59:22 Broadcasting message: Simon: Bliver også nødt til at smutte nu - vi ses! (Lamport time: 40) -- (Lamport time: 41)
2021/11/02 10:59:22 Broadcasting message: Simon: Bliver også nødt til at smutte nu - vi ses! (Lamport time: 40) -- (Lamport time: 42)
2021/11/02 10:59:22 Broadcasting message: Simon: Bliver også nødt til at smutte nu - vi ses! (Lamport time: 40) -- (Lamport time: 43)
2021/11/02 10:59:23 Simon left Chitty-Chat (Lamport time: 44)
2021/11/02 10:59:23 Broadcasting message: Simon left Chitty-Chat. (Lamport time: 44) -- (Lamport time: 45)
2021/11/02 10:59:23 Broadcasting message: Simon left Chitty-Chat. (Lamport time: 44) -- (Lamport time: 46)
2021/11/02 10:59:23 Broadcasting message: Simon left Chitty-Chat. (Lamport time: 44) -- (Lamport time: 47)
2021/11/02 10:59:25 Publish() from Andreas : Det gør vi (Lamport time: 48)
2021/11/02 10:59:25 Broadcasting message: Andreas: Det gør vi (Lamport time: 48) -- (Lamport time: 49)
2021/11/02 10:59:25 Broadcasting message: Andreas: Det gør vi (Lamport time: 48) -- (Lamport time: 50)
2021/11/02 10:59:26 Andreas left Chitty-Chat (Lamport time: 51)
2021/11/02 10:59:26 Broadcasting message: Andreas left Chitty-Chat. (Lamport time: 51) -- (Lamport time: 52)
2021/11/02 10:59:26 Broadcasting message: Andreas left Chitty-Chat. (Lamport time: 51) -- (Lamport time: 53)
2021/11/02 10:59:28 Joakim left Chitty-Chat (Lamport time: 54)
2021/11/02 10:59:28 Broadcasting message: Joakim left Chitty-Chat. (Lamport time: 54) -- (Lamport time: 55)

2021/11/02 10:59:45 Frederik joined Chitty-Chat (Lamport time: 56)

2021/11/02 10:59:45 Broadcasting message: Frederik joined Chitty-Chat (56) -- (Lamport time: 57)

2021/11/02 10:59:52 Publish() from Frederik : Nå, de er smuttet også (Lamport time: 58)

2021/11/02 10:59:52 Broadcasting message: Frederik: Nå, de er smuttet også (Lamport time: 58) - - (Lamport time: 59)

2021/11/02 10:59:53 Frederik left Chitty-Chat (Lamport time: 60)

2021/11/02 10:59:53 Broadcasting message: Frederik left Chitty-Chat. (Lamport time: 60) -- (Lamport time: 61)