Verteilte Systeme im Sommersemester 2021

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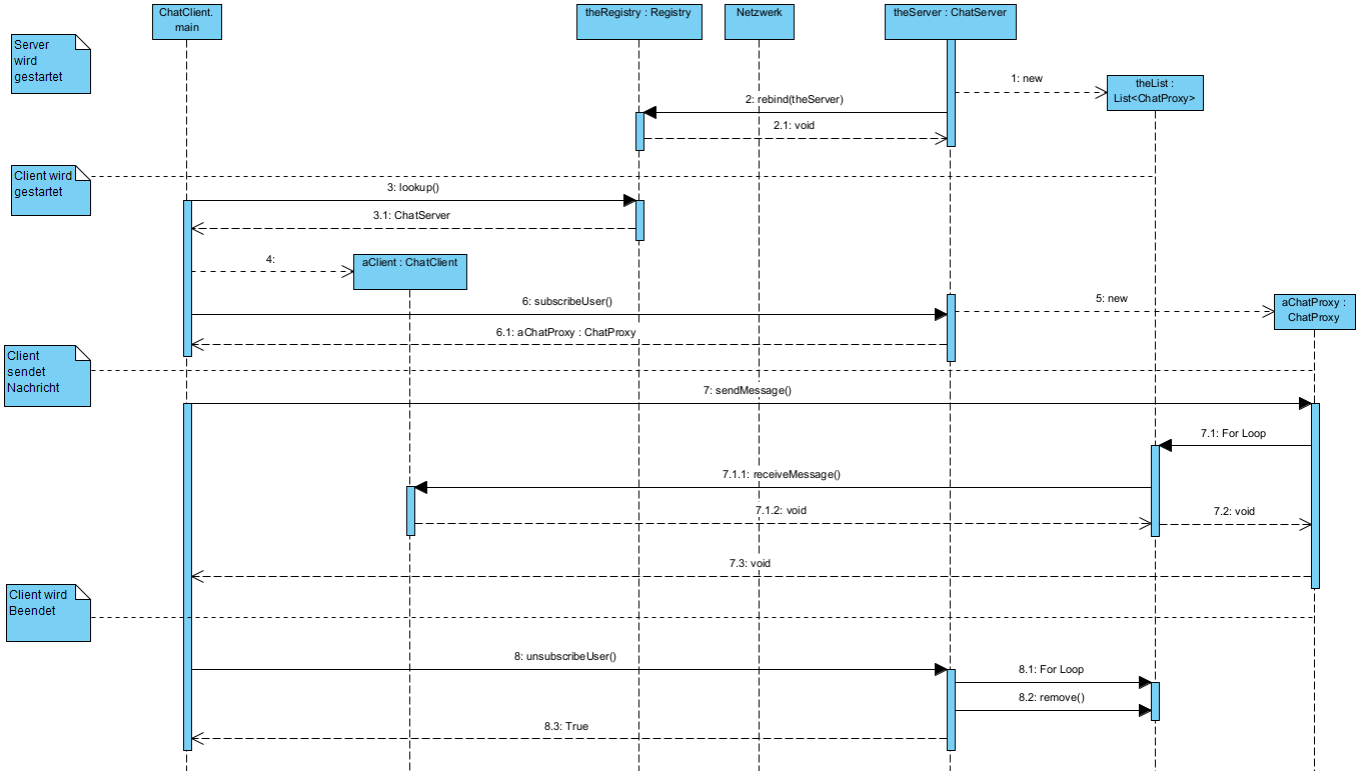
Osnabrück, 30.05.2021

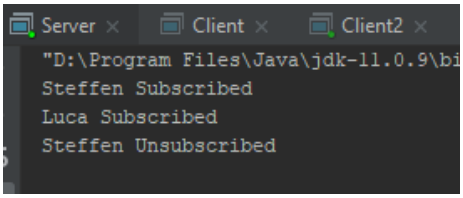
Aufgabenblatt 6

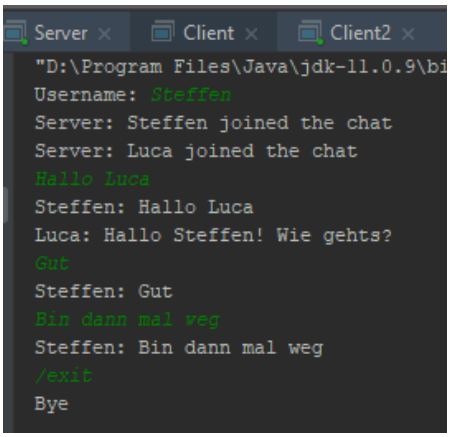
Sequenzdiagramm:

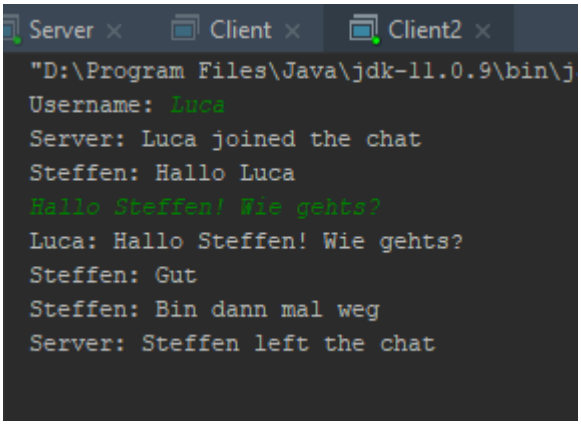


Tests:

Funktionierender Chat:







Wenn der Client zu einer falschen Server IP connecten will:

```
"D:\Program Files\Java\jdk-11.0.9\bin\java.exe" "-javaagent:D:\Program Files\JetBrain
Could not Connect to Host: java.net.ConnectException: Connection timed out: connect
```

ClientProxyImpl.java:

```
public class ClientProxyImpl extends UnicastRemoteObject implements
ClientProxy {

    private ClientProxyImpl() throws RemoteException {
        super();
    }

    public static void main(String[] args) {
        try {
            Registry registry;
            String host;
            if (args.length < 2) {
                host = "localhost";
                registry = LocateRegistry.getRegistry(Main.PORT);
            } else {
                host = args[1];
                registry = LocateRegistry.getRegistry(host, Main.PORT);
            }

            try {
                ChatServer chatServer = (ChatServer)
registry.lookup(Main.NAME);
                mainLoop(chatServer);
            } catch (UnknownHostException e) {
                System.err.printf("Unknown Host: %s\n", host);
                System.exit(1);
            } catch (NotBoundException e){
                System.err.printf("Service not bound on Host %s\n", host);
                System.exit(1);
            } catch (ConnectException e){
                System.err.printf("Could not Connect to Host: %s
\n",e.getCause());
                System.exit(1);
            }

        }catch (RemoteException e){
            e.printStackTrace();
            System.exit(1);
        }
    }

    private static void mainLoop(ChatServer chatServer) {

        Scanner scanner = new Scanner(System.in);
        System.out.print("Username: ");
        String username = scanner.nextLine();

        try {
            ChatProxy chatProxy = chatServer.subscribeUser(username, new
ClientProxyImpl());

            while (true) {
                String input = scanner.nextLine();
                if (input.equals("/exit")) {
```

```
                    chatServer.unsubscribeUser(username);
                    System.out.println("Bye");
                    System.exit(0);
                }
                chatProxy.sendMessage(input);
            }

        } catch (RemoteException e) {
            System.err.println("Could not get ChatProxy");
            System.exit(1);
        }
    }

    @Override
    public void receiveMessage(String username, String message) throws
RemoteException {
        System.out.printf("%s: %s\n", username, message);
    }
}
```

Main.java:

```
package chatsystem;
import chatsystem.client.ClientProxyImpl;
import chatsystem.server.ChatServerImpl;
import java.rmi.registry.Registry;

public class Main {

    public static final int PORT = Registry.REGISTRY_PORT;
    public static final String NAME = "ChatServer";

    public static void main(String[] args) {
        if(args.length < 1){
            printUsage();
            System.exit(1);
        }
        switch (args[0]){
            case "client":
                ClientProxyImpl.main(args);
                break;
            case "server":
                ChatServerImpl.main(args);
                break;
            default:
                printUsage();
        }

    }

    private static void printUsage(){
        System.err.println("Usage:");
        System.err.println("chatsystem client [hostaddress]");
        System.err.println("chatsystem server");
    }
}
```

ChatServerImpl.java:

```
public class ChatServerImpl extends UnicastRemoteObject implements
ChatServer {

    private class ChatProxyImpl extends UnicastRemoteObject implements
ChatProxy{

        private String username;

        ChatProxyImpl(String username) throws RemoteException {
            this.username = username;
        }

        @Override
        public void sendMessage(String message) throws RemoteException {
            for (ClientProxy clientProxy : clientProxies){
                clientProxy.receiveMessage(username,message);
            }
        }
    }

    private ArrayList<ClientProxy> clientProxies;
    private ArrayList<String> usernames;

    private ChatProxy serverChatProxy;

    public ChatServerImpl() throws RemoteException {
        clientProxies = new ArrayList<>();
        usernames = new ArrayList<>();
        serverChatProxy = new ChatProxyImpl("Server");
    }

    public static void main(String[] args) {
        try {
            LocateRegistry.createRegistry(Main.PORT);
            ChatServer stub = (ChatServer) new ChatServerImpl();
            Registry registry = LocateRegistry.getRegistry(Main.PORT);
            registry.rebind(Main.NAME, stub);

        } catch (RemoteException e) {
            e.printStackTrace();
        }
    }

    @Override
    public ChatProxy subscribeUser(String username, ClientProxy handle)
throws RemoteException {
        System.out.printf("%s Subscribed\n",username);
        clientProxies.add(handle);
        usernames.add(username);
        serverChatProxy.sendMessage(String.format("%s joined the
chat",username));
        return new ChatProxyImpl(username);
    }

    @Override
    public boolean unsubscribeUser(String username) throws RemoteException
{
        for(int i = 0; i < usernames.size(); i++){
            if(usernames.get(i).equals(username)){
                usernames.remove(i);
```

```
                clientProxies.remove(i);
                System.out.printf("%s Unsubscribed\n",username);
                serverChatProxy.sendMessage(String.format("%s left the
chat",username));
                return true;
            }
            else{
                System.err.printf("%s != %s\n",username,usernames.get(i));
            }
        }
        System.out.printf("%s tried to Unsubscribe\n",username);
        return false;
    }
}
```