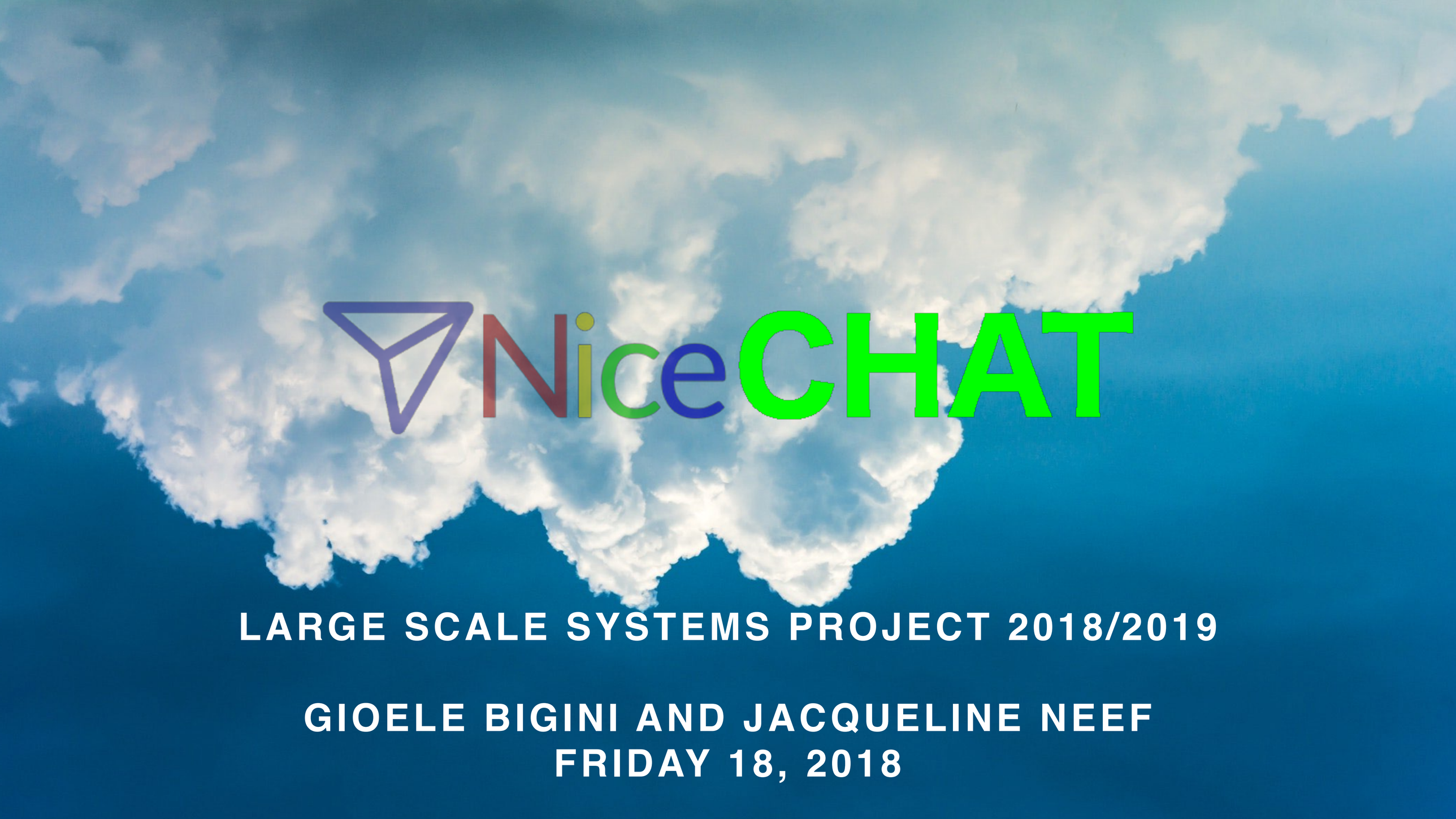


LARGE SCALE SYSTEMS PROJECT 2018/2019

GIOELE BIGINI AND JACQUELINE NEEF

FRIDAY 18, 2018

Distributed Chat Application

based on

Apache Zookeeper and

Apache Kafka

ZOOKEEPER

Distributed Coordination

Version 3.4.13

KAFKA

Distributed Messaging

Version 2.11-1.0.0

DEMO

Our NiceCHAT application

Java Version 8

ZOOKEEPER

ZooKeeper Tree

User Management

/

request

registry

online

enroll

quit

Messaging

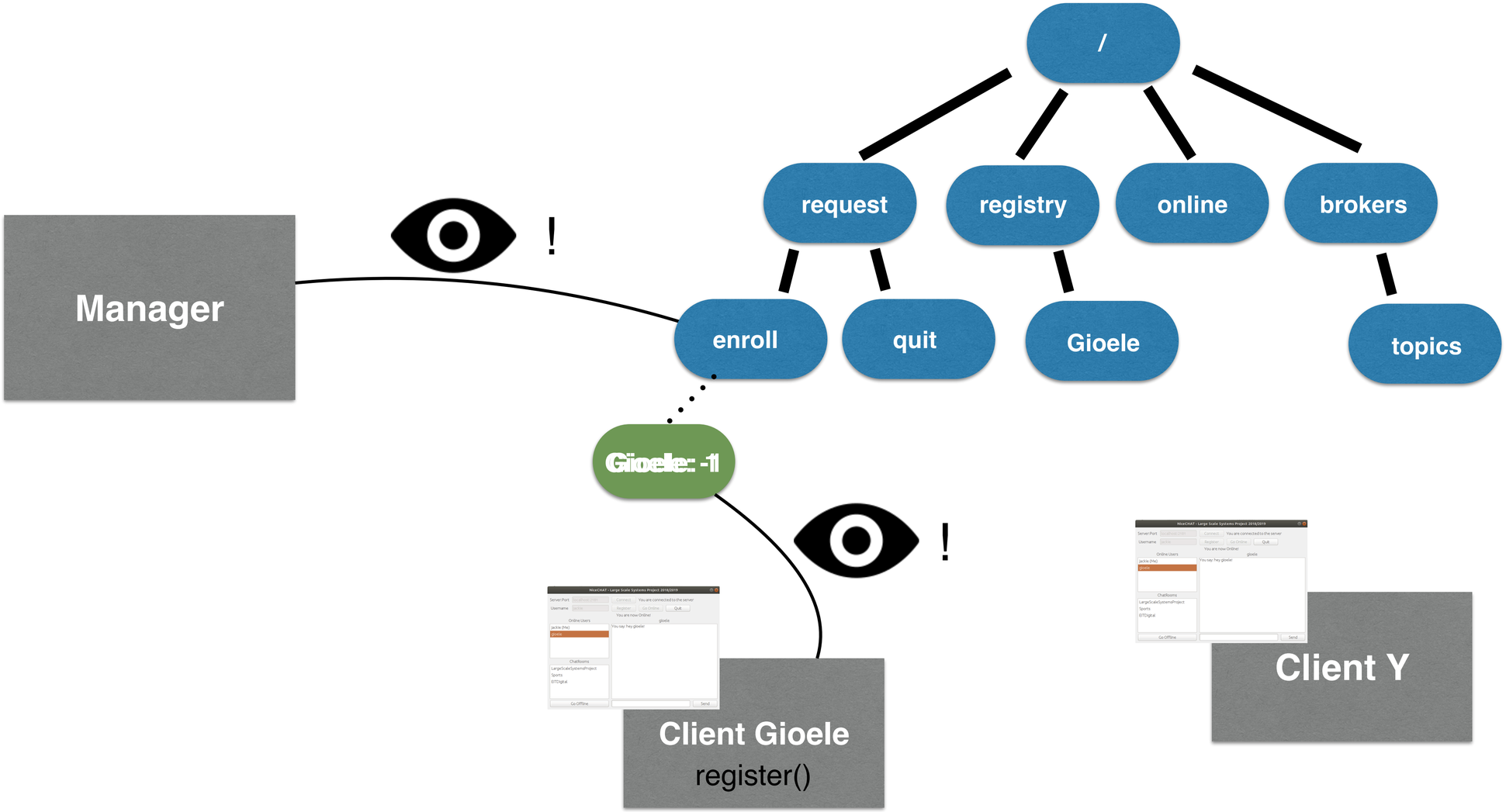
brokers

topics

chatrooms

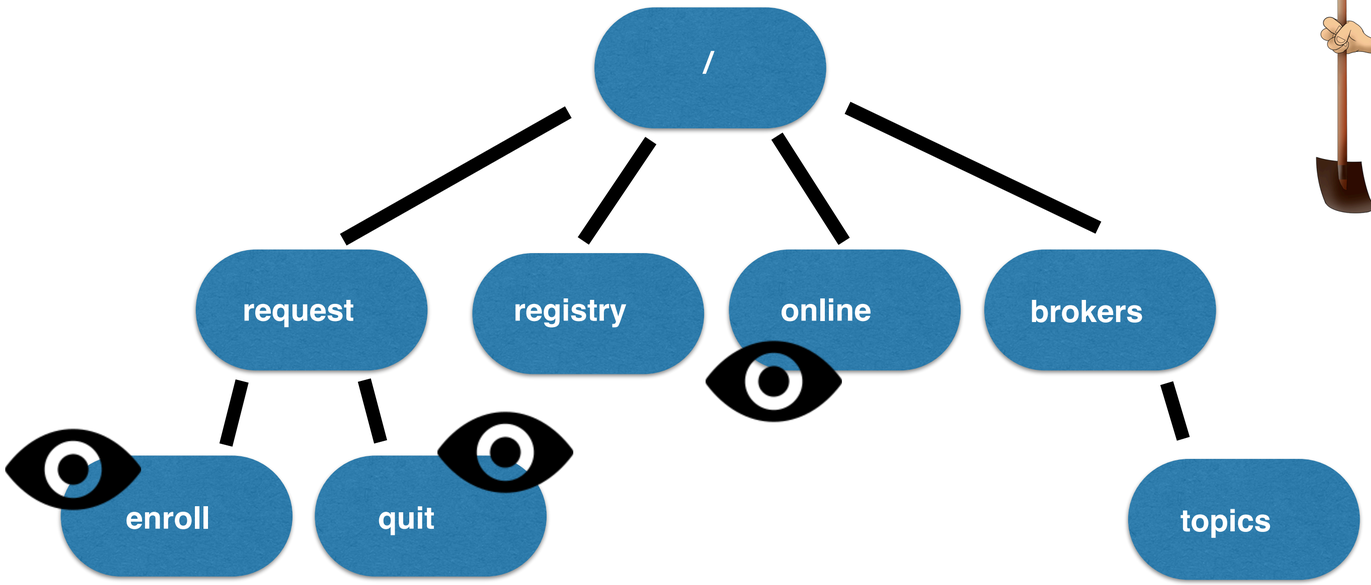
users

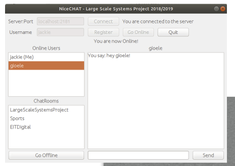
User Management - Registration



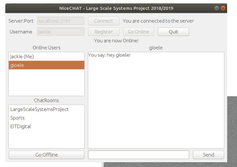
Watchers - Manager

Manager

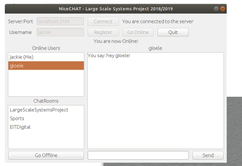




Client Gioele



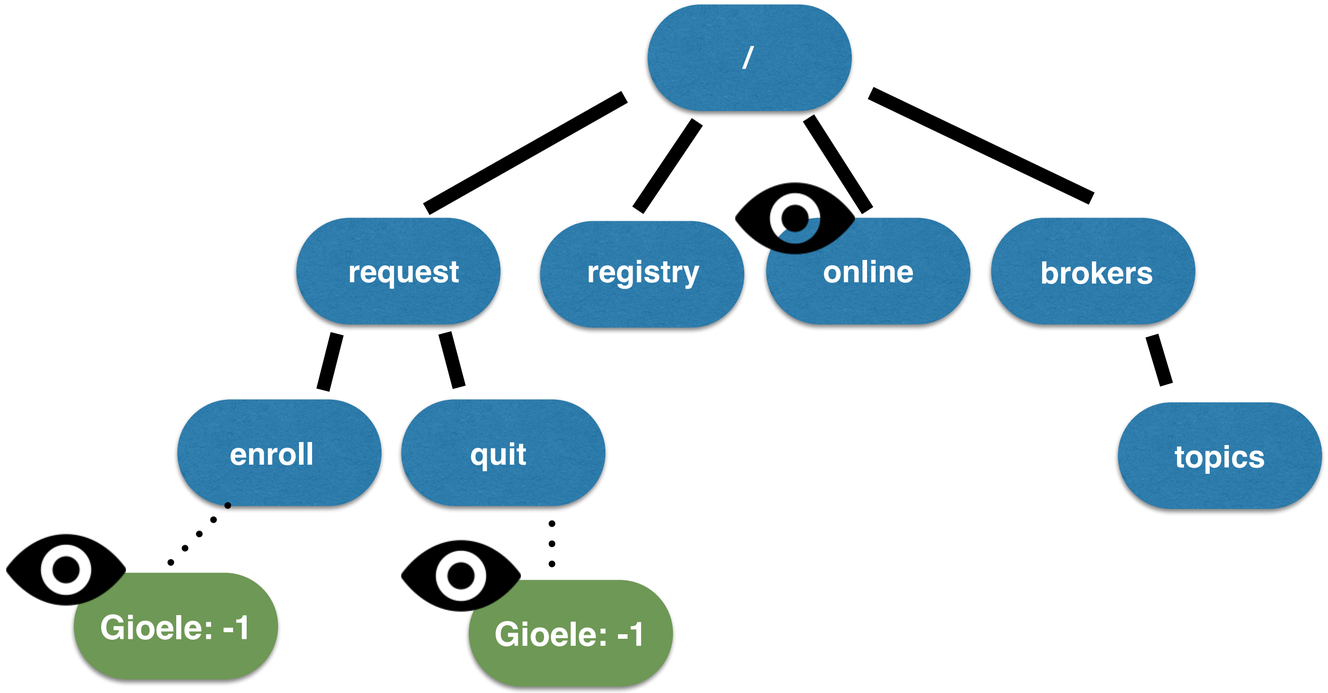
Client Y

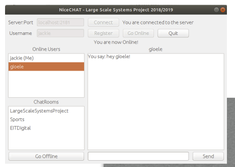


Client Z

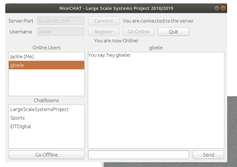
Watchers - Clients

Manager

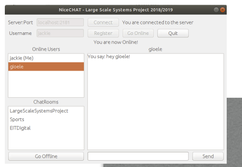




Client Gioele

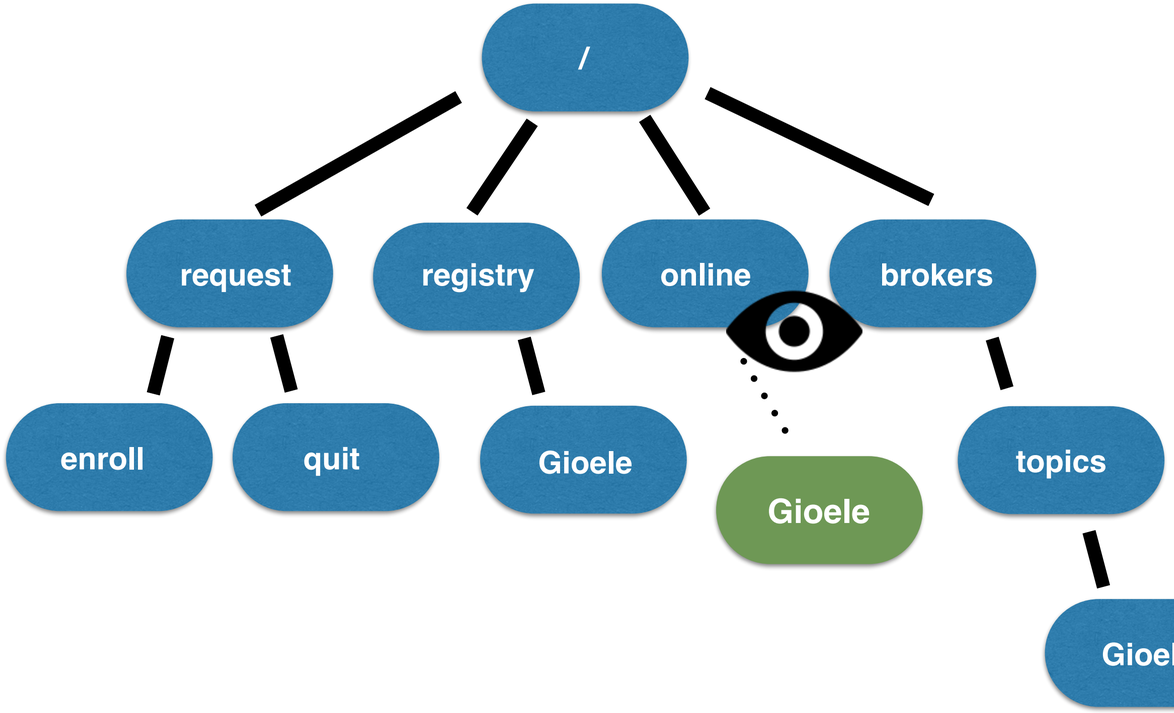


Client Y



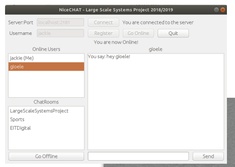
Client Z

Chat - Go Online

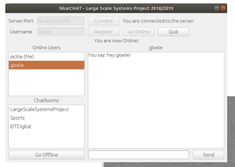


Kafka
AdminClient

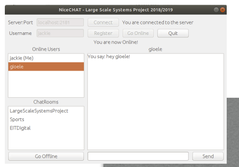
Manager



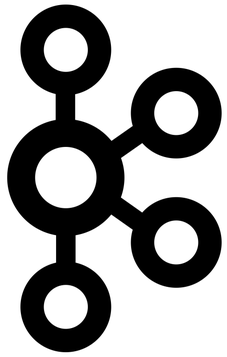
Client Gioele



Client Y



Client Z



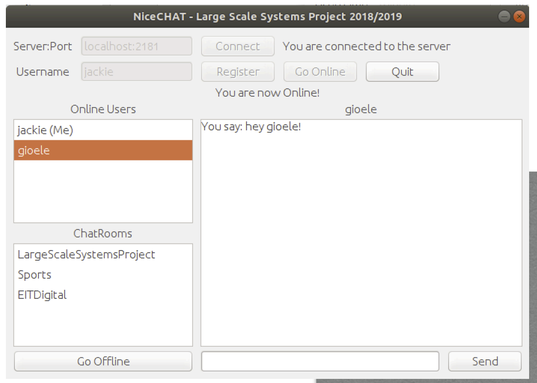
KAFKA

Messaging - Design Decisions

- config/server.properties:
  - **number of partitions:** 2 (= nb of consumers per client)
  - **replication factor:** 1 (default)
  - **auto.create.topics.enable:** false
- One topic per client
- One topic per chatroom
- Assigning of message to partition using round robin and hashed key
- Message format:
  - **Key:** “<R/S>=<SenderName/ReceiverName>“
  - **Value:** “:message”

```
sent record(key=R=Gioele value=:Hi Jackie!) meta(partition=0, offset=0) time=11
Message: [T=Jackie] [P=0] [O=0] [Timestamp=1547763023750] [K=R=Gioele] [V=:Hi Jackie!]
Message: [T=Gioele] [P=0] [O=0] [Timestamp=1547763466551] [K=S=Jackie] [V=:Hi Jackie!]
```

Producer and Consumer



Client Gioele

sendMessage()

Producer

Kafka Topic Jackie

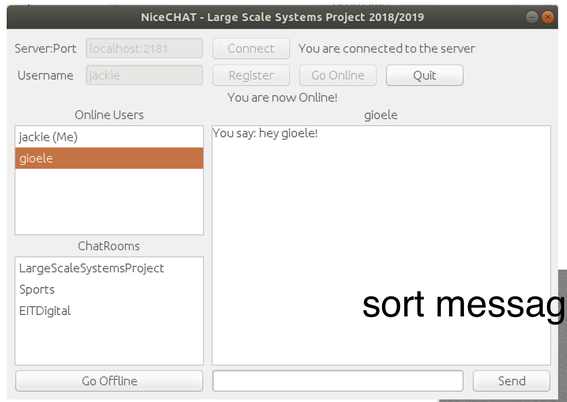
Partition 0

Partition 1

Consumer

Consumer

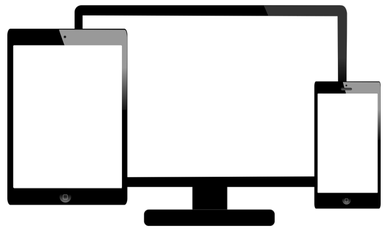
ConsumerGroup Jackie



sort messages by timestamp

Client Jackie

readMessage()

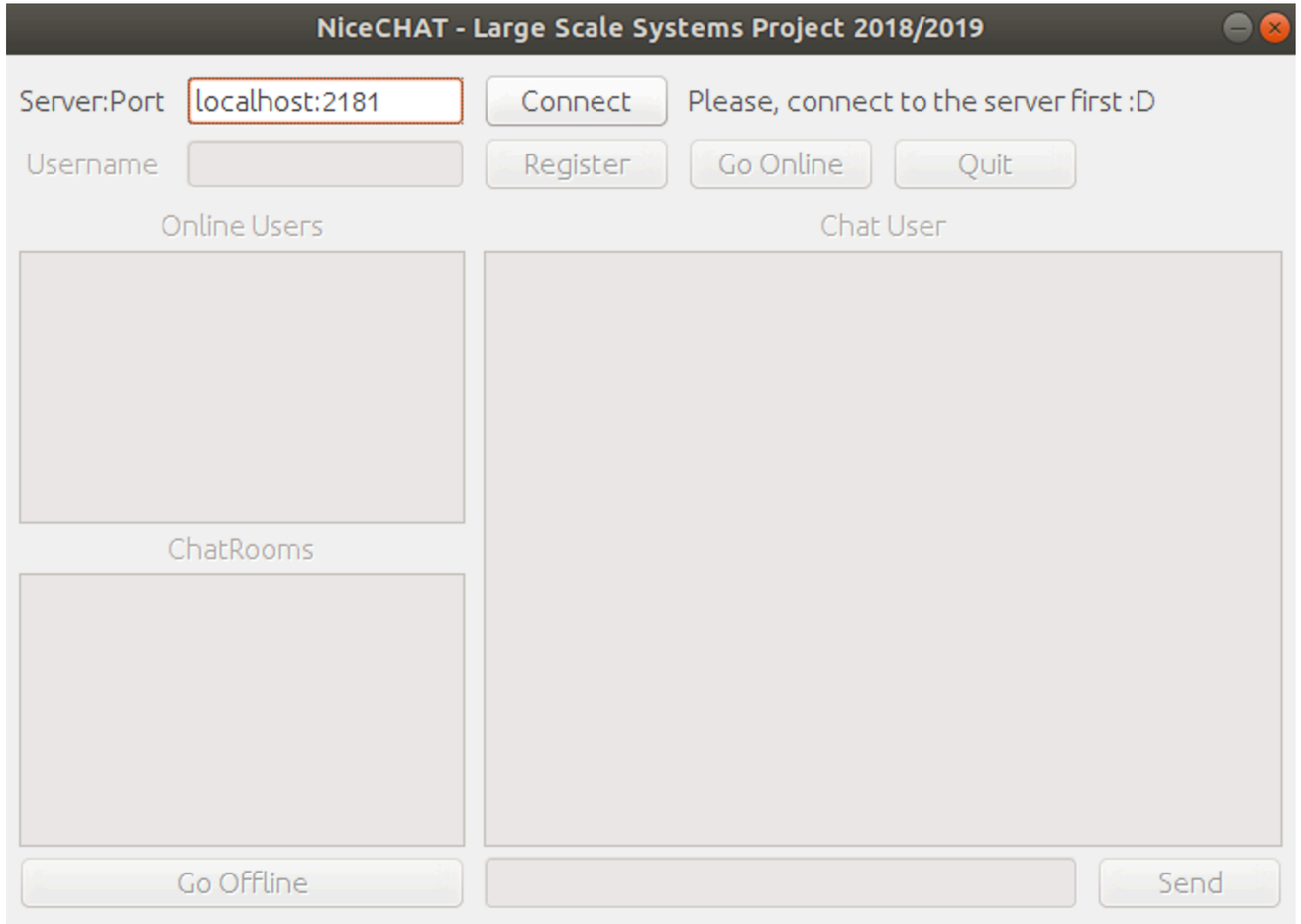


DEMO

Graphical User Interface

JAVAX SWING

Version 8

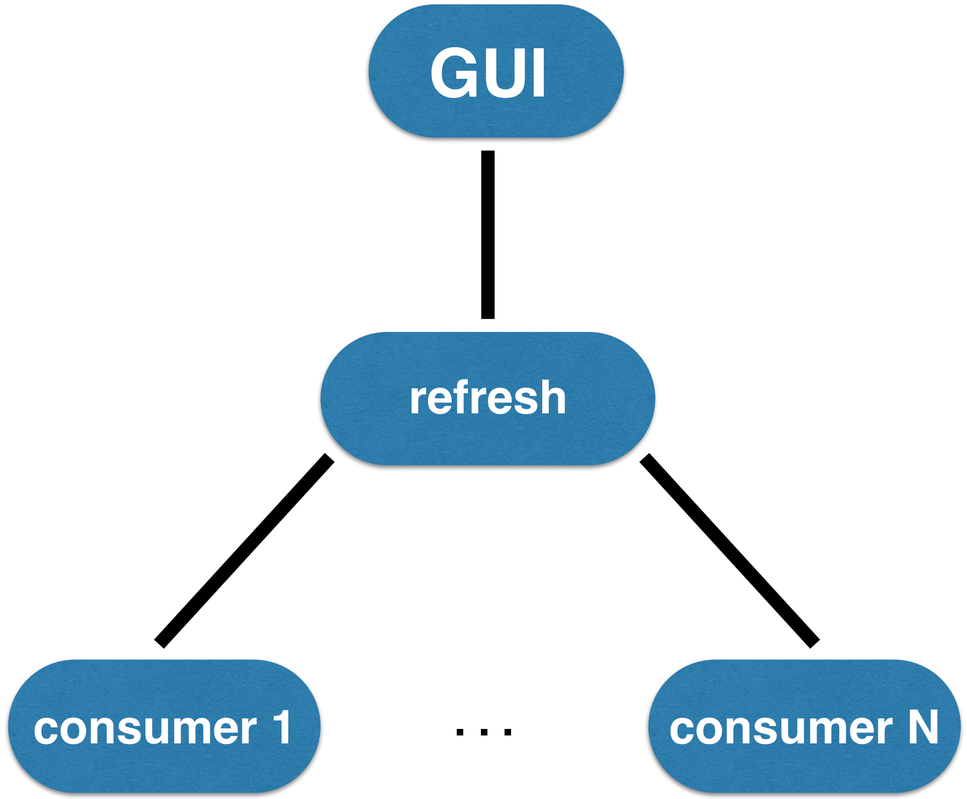


Refresh Handling

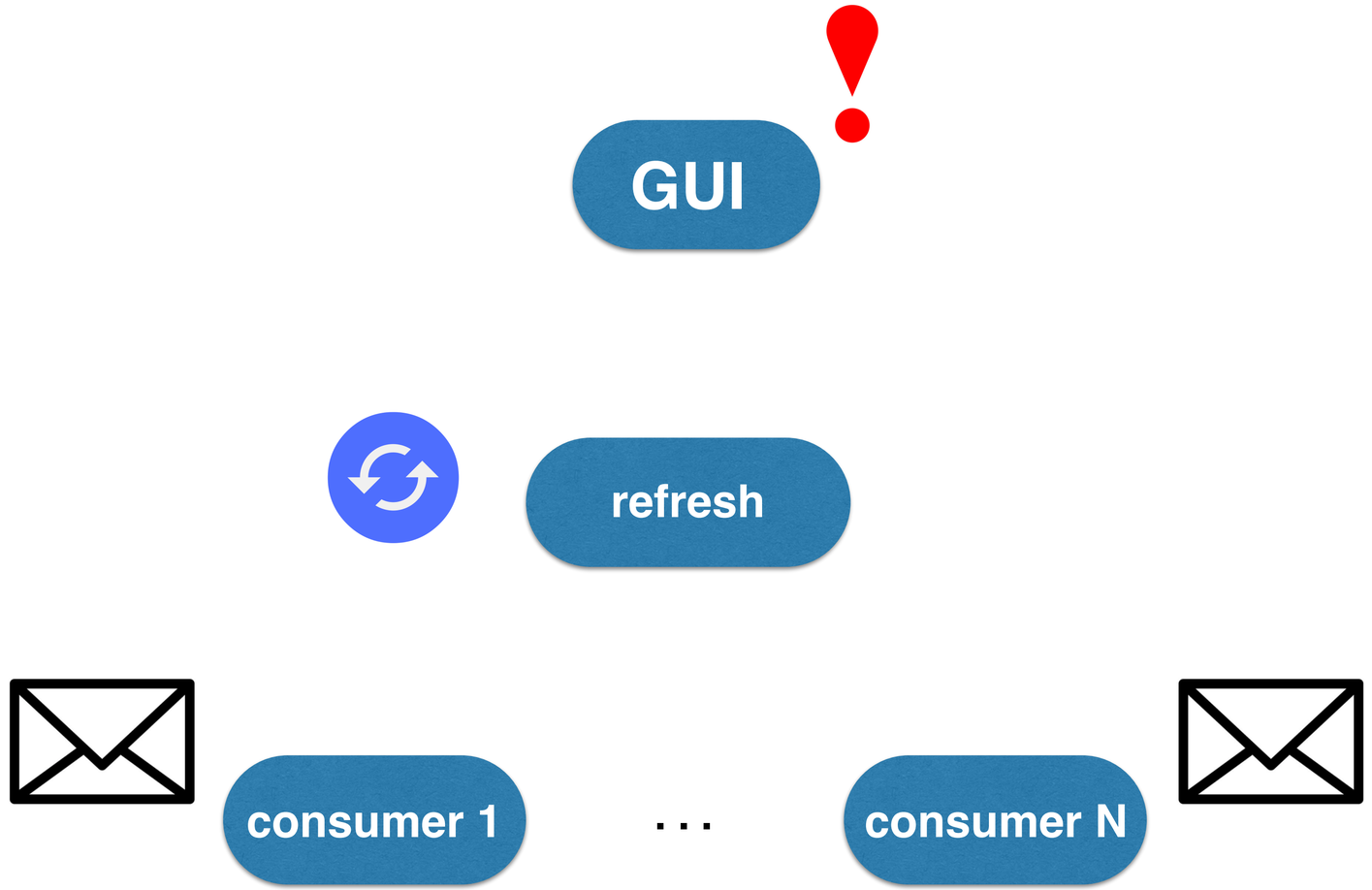
Main Thread
It monitors Refresh Thread

Refresh Thread
It is endless and manager of its children

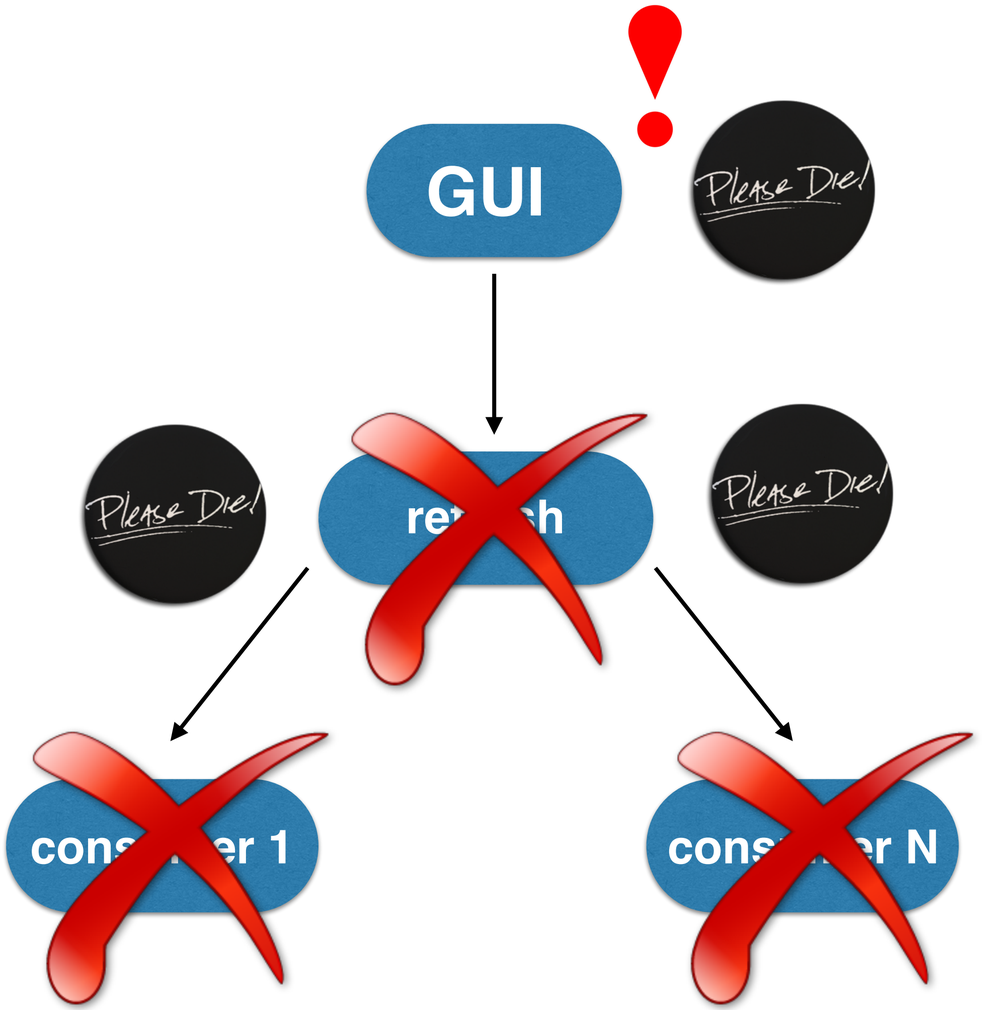
Consumer Threads
The Consumer Threads terminate



Refresh Handling



Refresh Handling



POLITÉCNICA

eit Digital

Thank You

Any Questions?