

# Large Scale Systems Project

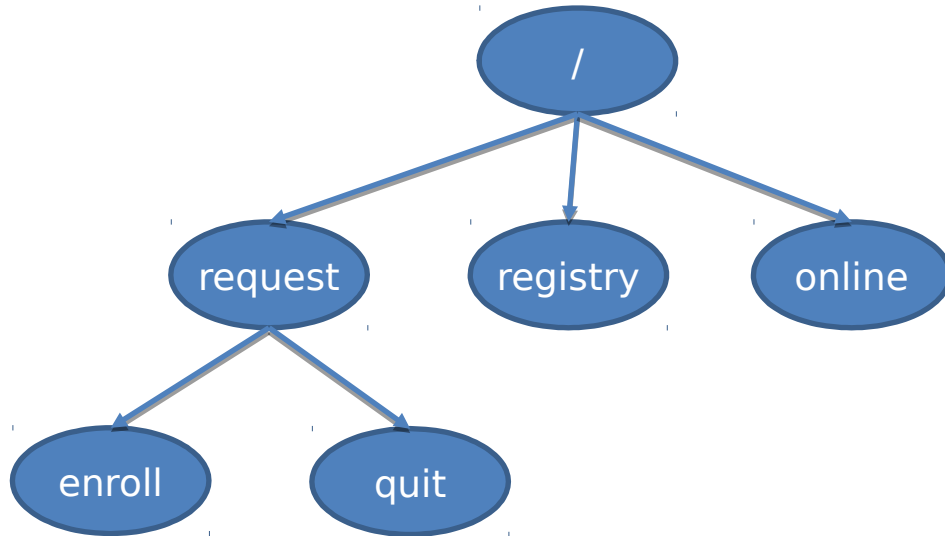
ZooKeeper Simple Project

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# Recipe: Chat Room

- Distributed Messaging System:
  - Users register in the system
  - Users connect into the system.
  - Only online users can write/read messages
  - Users: there is 1 one manager(M) and N writers(W)

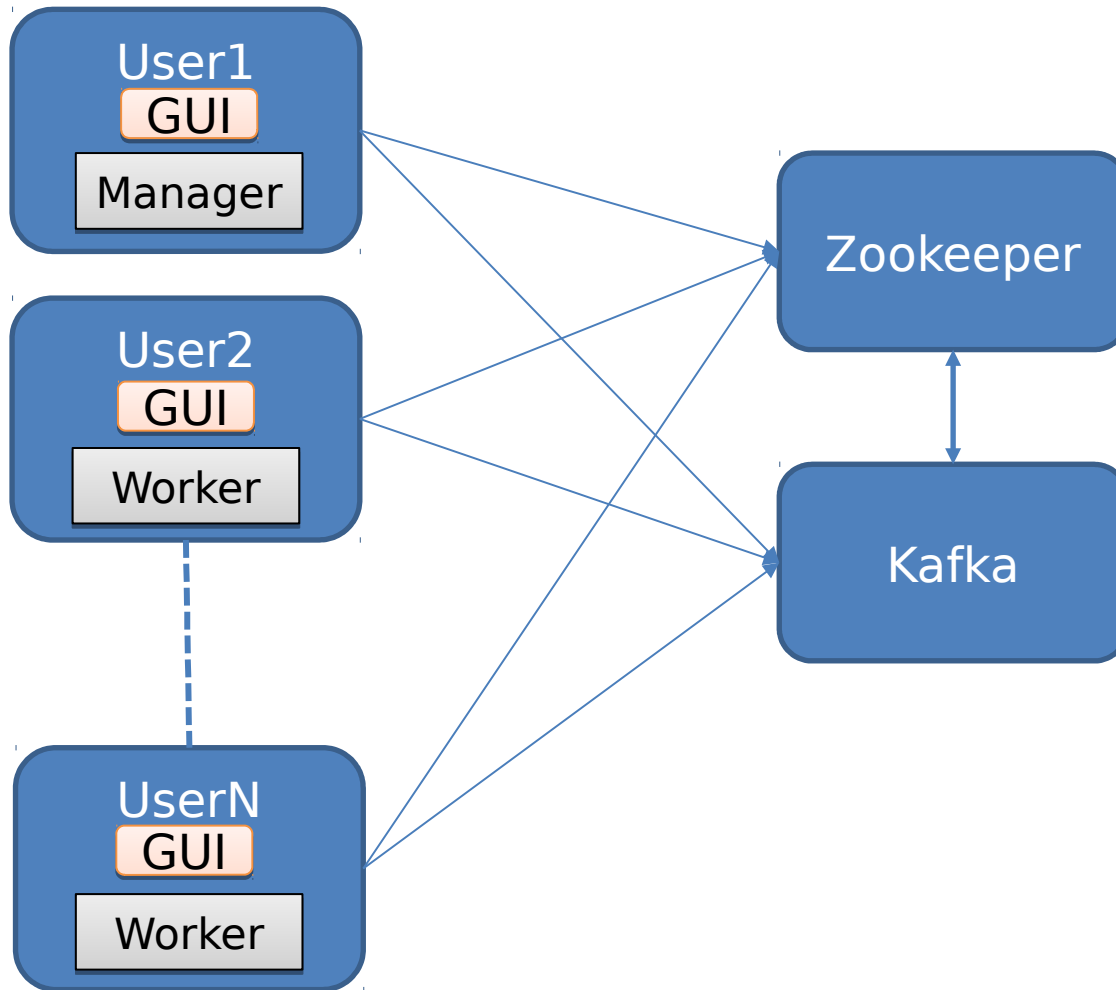
# Zookeeper Tree



# Kafka Topics

- One Topic per user.
- Message format: key: senderId, value: message.
- Only user online can:
  - Write messages to other online users.
  - Read her own messages.

# Architecture



# Action: Register

- M: watch the children of /request/enroll
- W: create and watch /request/enroll/w\_id:-1
- M: create /registry/w\_id
  - If create success □ M: set /request/enroll/w\_id:1
  - If user already registered □ M: set /request/enroll/w\_id:2
  - If create fails □ M: set /request/enroll/w\_id:0
- W: check the watched event data, if 1 or 2 => successful registered.
- W: remove /request/enroll/w\_id

# Action: Quit

- M: watch the children of /request/quit
- W: create and watch /request/quit/w\_id:-1
- M: delete /registry/w\_id
  - If delete success □ M: set /request/quit/w\_id:1
  - If user was not registered □ M: set /request/quit/w\_id:2
  - If delete fails □ M: set /request/quit/w\_id:0
- W: check the watched event data, if 1 or 2 => successful deleted.
- If success:
  - M: delete kafka topic associated with W\_id
- W: remove /request/quit/w\_id

# Action: Go online

- M: watch the children of /online
- W: create ephemeral node /online/w\_id
- M&W: check if /registry/w\_id exists.
- M: if w\_id registered and first time online □  
create /topic/w\_id in kafka
- Sender
  - W: publish messages to /topic/w\_id/msg:content
- Receiver
  - W: consume messages from /topic/w\_id/



# Action: Go offline

- M: watch the children of /online
- W: close connection.

# API

- Manager functionalities:
  - createZkTreeStructure
  - createKafkaTopic
  - deleteKafkaTopic
  - registerUser
  - removeUser
  - getRegisteredUsers
- Worker functionalities:
  - Register
  - GoOnline
  - GoOffline
  - Quit
  - SendMessage
  - ReadMessages
  - GetOnlineUsers