

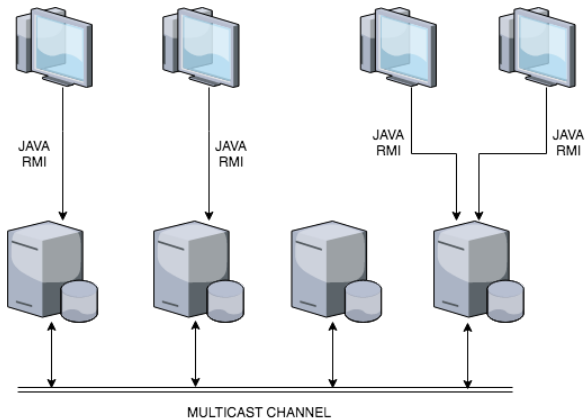


## Replicated Data Storage

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# Communication



## SEQUENTIAL CONSISTENCY

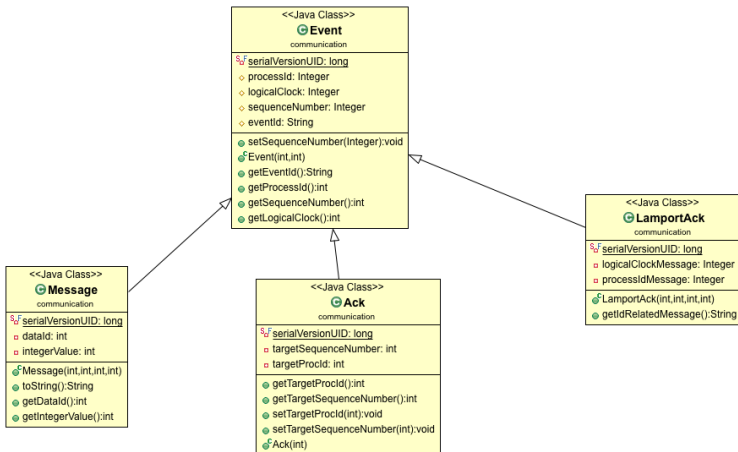
To provide sequential consistency we have used Lamport Algorithm, that provide Totally ordered multicast, on top of a reliable FIFO channel.

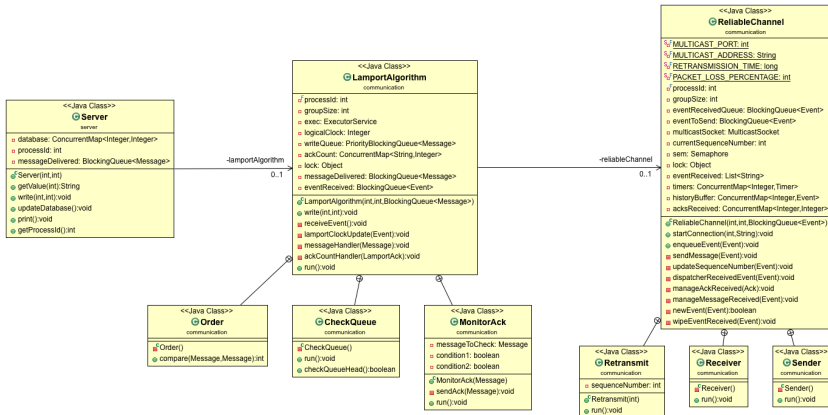
## Totally ordered multicast implementation

- Update messages are timestamped with sender's logical clock
- Update messages are multicast
- When a message is received:
  - It is put into local queue
  - Ordered according to timestamp and process id
  - When one of these conditions is satisfied an acknowledgement is multicast:
    - The server has not made an update (with the same logical clock of the message received)
    - The server has made an update and his process id is greater than the message just received
- When a message is on top of the local queue and the server has received all the acknowledgement it writes the update in his database

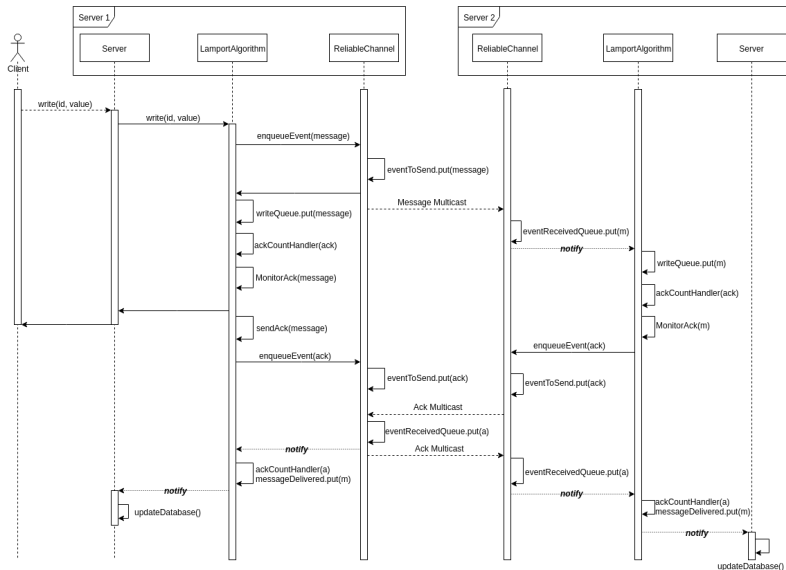
## Reliable FIFO Channel implementation

- A sequence number is assigned to the message that has to be sent
- A retransmission of the message with a new sequence number is scheduled after a fixed interval unless all the acknowledgments have been received in the meantime
- The next message is sent only after have been received all the acknowledgements related to the previous message





# Sequence Diagram: Writing to the database





# Producer/Consumer

## PRODUCER/CONSUMER

