

SCS3203 Middleware Architecture - Assignment 01

Task - 04 : Enhance the Architecture to Gain Improvement in Availability and Reliability.

A single server-based architecture for the distribution of messages among Publishers and Subscribers developed in this assignment has a single point of failure - the server. Propose a new distributed architecture for the Pub/Sub implementation to gain improved availability and reliability over the single server node failure deficiency. Only required to draw and describe the new architecture and improvements to the implementation is not expected.

Use a Heartbeat Mechanism.

Every distributed architecture needs a heartbeat mechanism. It enables the servers to keep track of one another and immediately identify faults. The system can now take corrective action before the failure of a single server grinds the entire system to a halt, which is crucial.

A heartbeat mechanism can be implemented in a variety of ways. Using a straightforward TCP socket connection between the servers is one typical strategy. The servers would then communicate by exchanging heartbeat messages on a regular basis. A server can assume that another server has failed if it does not receive a heartbeat message from that server within a predetermined amount of time.

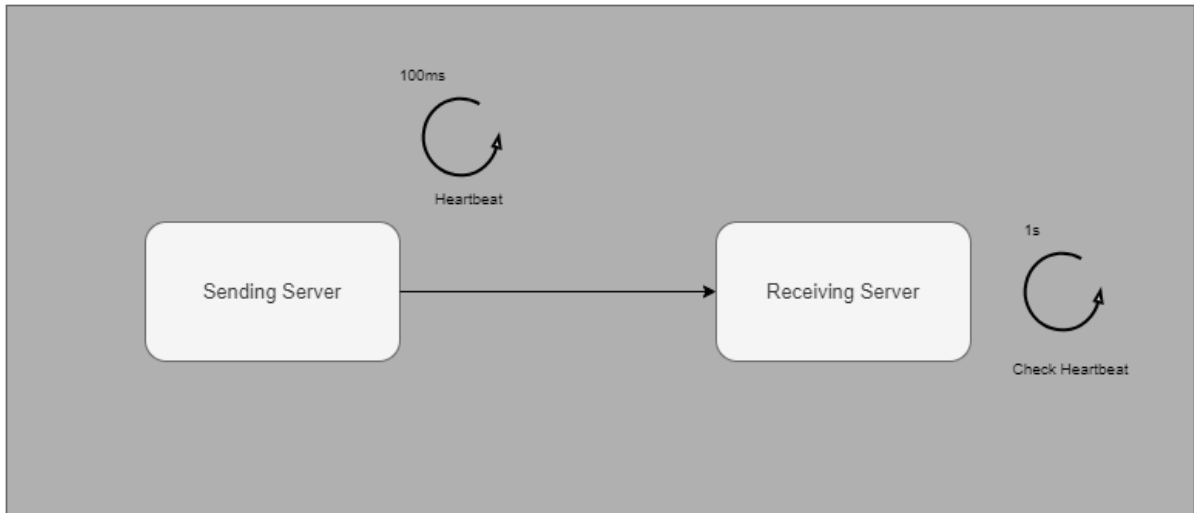
Utilizing a specific heartbeat protocol is another way to construct a heartbeat mechanism.

The heartbeat protocol would typically include features such as:

- A mechanism for sending heartbeat messages between servers
- A mechanism for detecting failures
- A mechanism for notifying other servers of failures

Advantages of Heartbeat Mechanism

- Improved availability: The system will be more likely to be available even if some of the servers fail.
- Improved reliability: The message data will be less likely to be lost if a server fails.
- Scalability: The system can be scaled by adding more servers to the cluster.



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