

Design Report

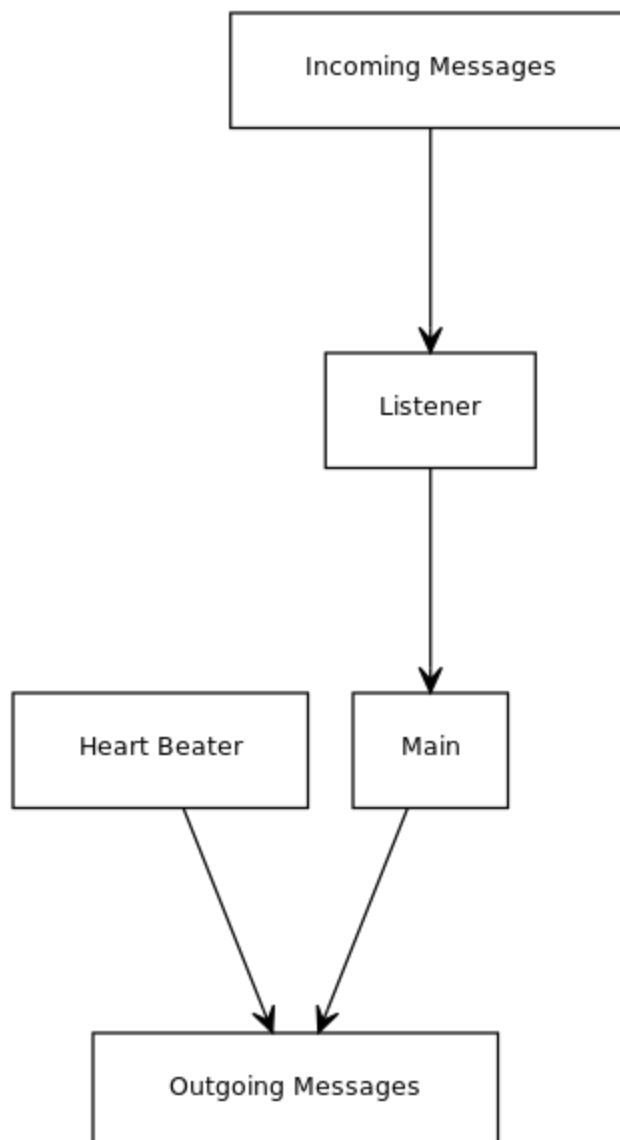
The Assignment has been completed up to Step 3.4 of the Assignment, which is implementing the Poisoned Reversed Module.

The architecture of the system was designed using multiple threads for each node.

- The Listener listening for any incoming messages
- The Main thread which processes the messages
- The Heart Beater thread which periodically sends heartbeats

The direction of the arrow represents the direction of flow of information.

This represents a basic view of a node architecture. Next page has a more detailed view.



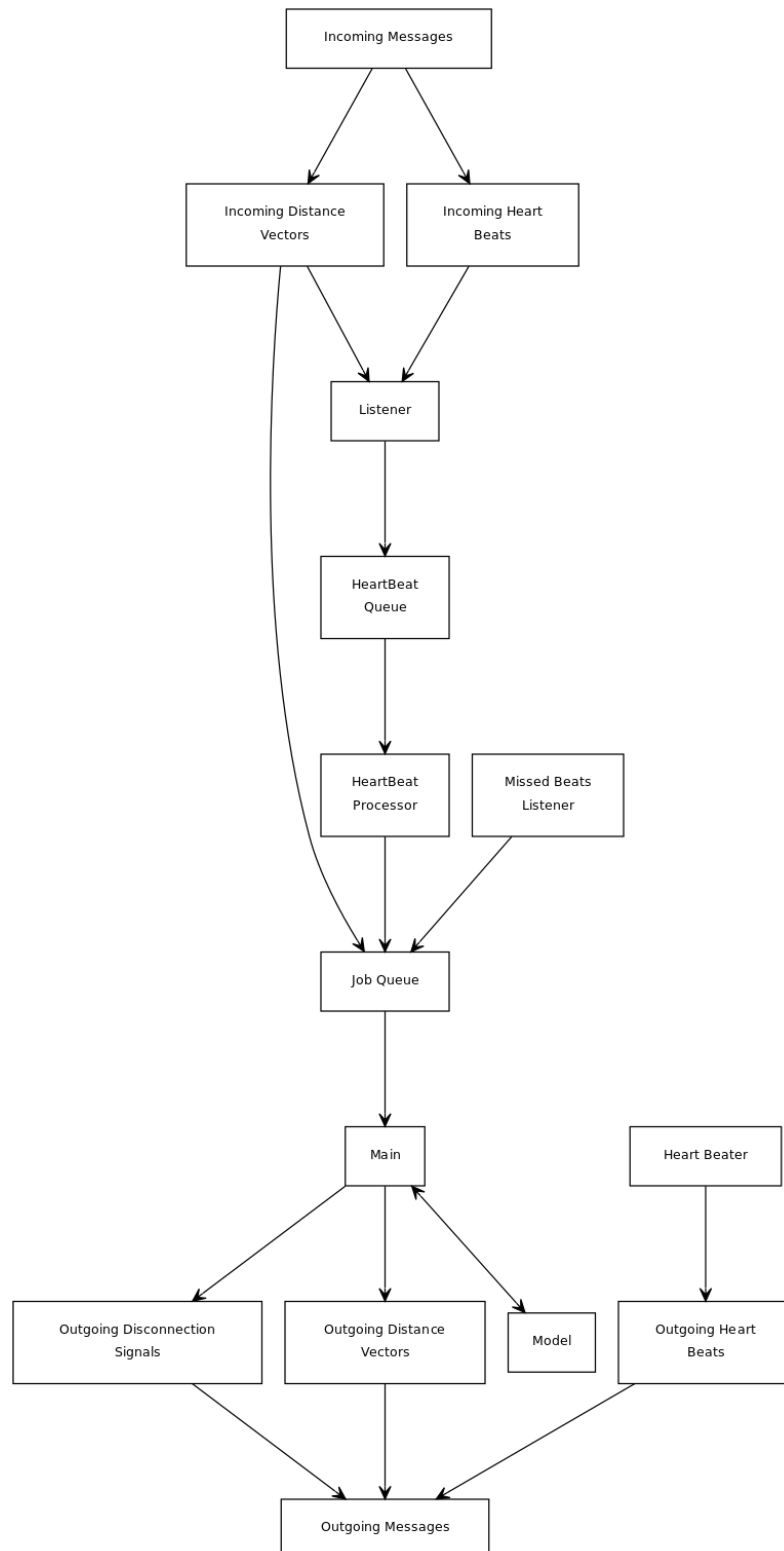
Each Node is designed in such a way that a single node does not specifically communicate to one node. If it is to send any outgoing messages, it sends it to all of its neighbours.

Therefore the network communication is designed without the need of separation of requests and response, only messages being propagated through the network.

Threads communicate with each other by using shared objects that all threads can manipulate. All Threads communicate with the main thread, giving it jobs to execute.

This relaying of jobs is done through using queues to where jobs are placed there by listeners and the Main thread waits by.

This represents a more detailed view of a node architecture, showing the flow of data through the system.



Only when the distance vector of a node has changed, does it send its new distance vector to its neighbours, therefore passing along the updated costs throughout the network.

The Heart Beat feature of the node is more complex than usual due to the fact that it can handle connection and disconnection of nodes properly (however still not proper handling of partitioned networks). The heart beats received are sent to an independent queue from the job queue as heart beats are periodic and reserved only for changes in the network topology. It would also disturb the convergence state of the node based on my implementation.

The heart beat queue is controlled by the heart beat processor which resets the 'last alive state' of each neighbouring node, while the Missed Beats counter periodically checks the number of missed heart beats and generates a disconnection signal if necessary. If the heart beat processor receives a heartbeat from a new source, it generates a connection signal to set up a new neighbouring node connection.

The model houses the network topology data of each node, along with other node specific data.

The model contains a list of both connected and disconnected neighbouring nodes, so it can keep track of which nodes are dead. The main part of the model is the distance table which is a table of connected adjacent nodes and all known nodes that it knows in the network.