Overlay Project - Group K
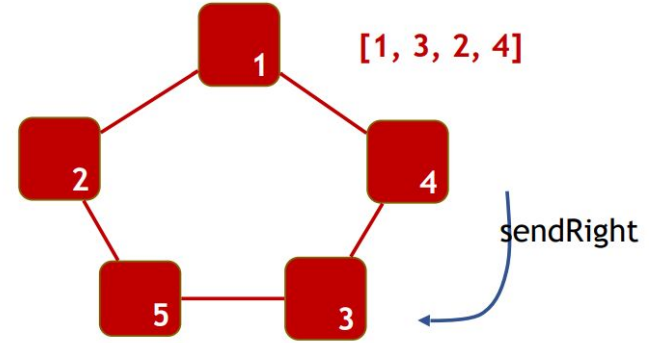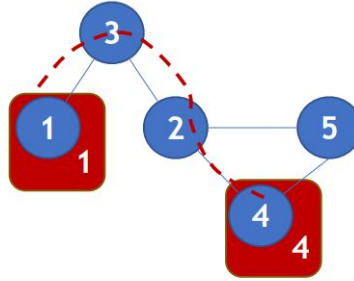
PHAN Manh Tung

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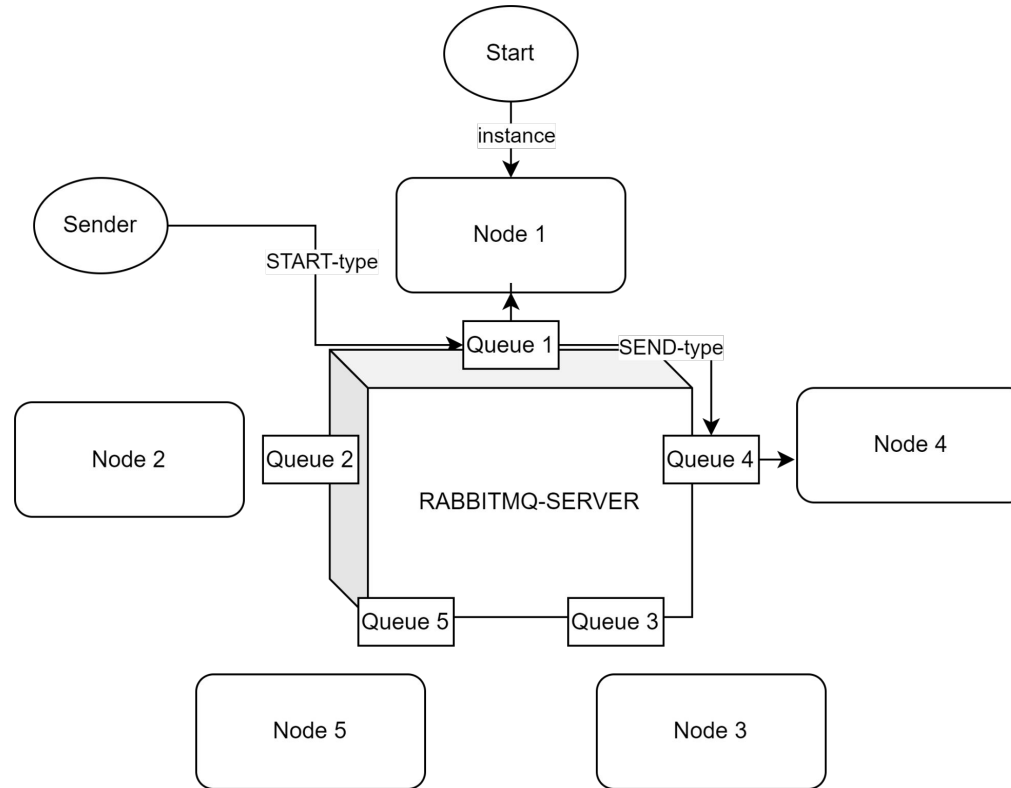# Outline

1. Objective

2. Design

3. Algorithm

4. Message handler

5. Demo

6. Conclusion

Objective

[1, 3, 2, 4]

sendRight

- Simulate a distributed network using RabbitMQ messaging protocol.

- Implement a routing algorithm considering both virtual ring structure and physical network topology.

Design

Algorithm

- Breadth-first search (BFS) algorithm to compute the shortest path from the current node, using a FIFO queue.

- Data structures:
  +) a FIFO queue for BFS algorithm.
  +) 'distance' array : update shortest distance to other nodes. Initialization: distance[itself] = 0, distance[other] = inf.
  +) 'prev' array to trace the shortest paths from the current node to all other reachable nodes
  => 'nextHop' array decides where the message goes.

- The algorithm runs once for every node to get the nextHop array for each node.

- Example (node 4): nextHop = [1, 1, 1, 3, 4] => nextHop[2] = 1 (To reach 2, pass to 1)

Message Handler (2 types)
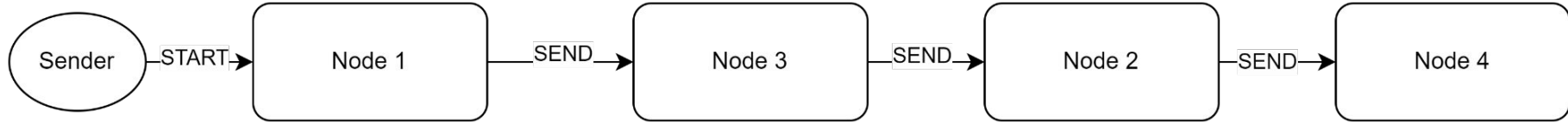
- **START**: one-time from the sender, consists of the destination, the message, the direction (left or right).

- **SEND**: many times until reaching destination, consists of the destination, the message, the direction (left or right) and the previous node.

- The sender initiates with a **START** message the process. Then each node will examine, construct and forward a **SEND** message until it reach the destination.

Demo time!

Conclusion

- We successfully completed the project with basic functionalities!

- Difficulty: One of our member left the team.

- What we like:
  + Distributed system simulation/concepts.
  + RabbitMQ is straightforward to use => focus on data structure, algorithm.