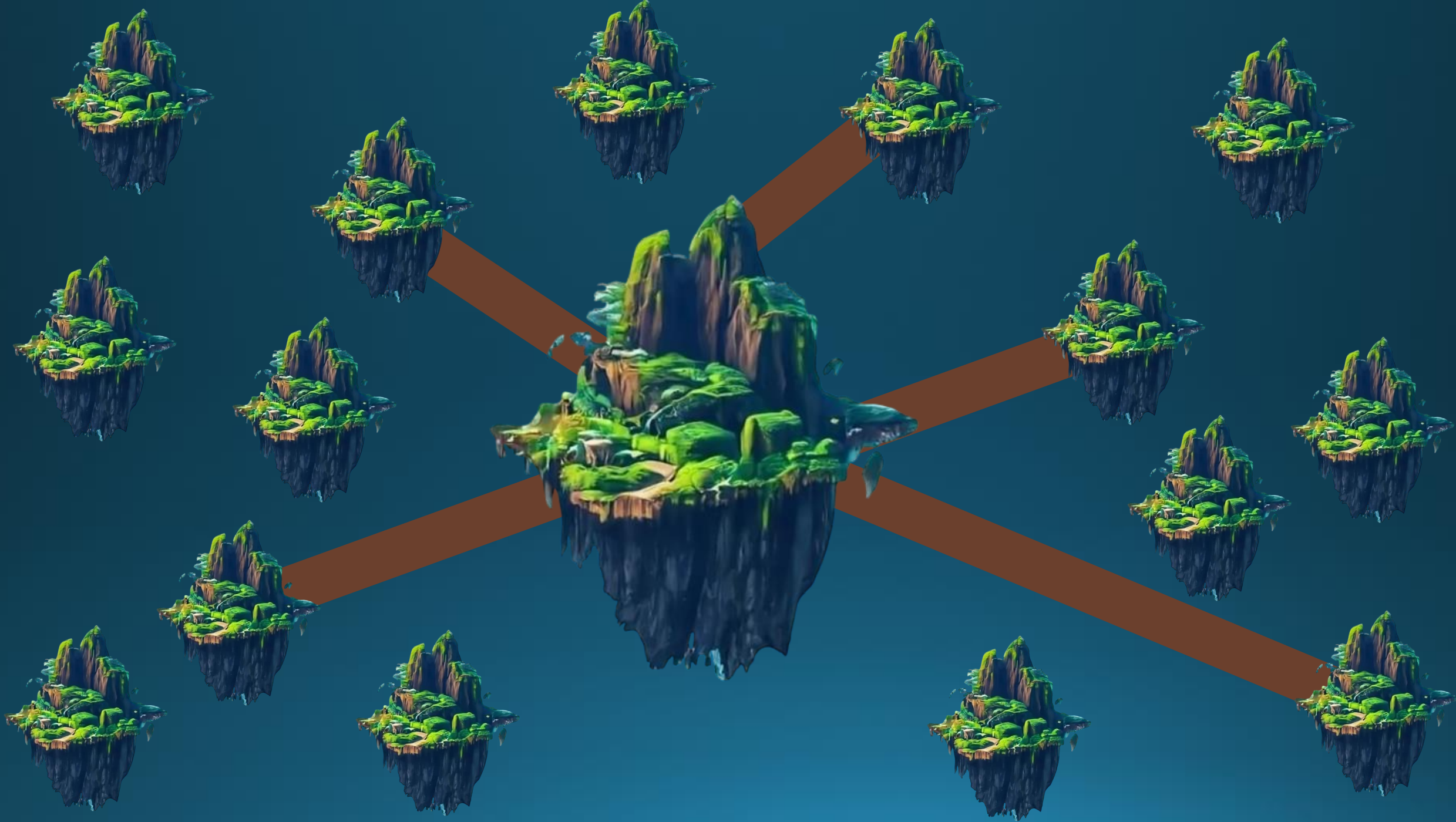# Distributed System

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Summary of the Problem

Structure

- Flying Islands :
  - 15 small islands and 1 big central island.
- Connections :
  - About 5 small islands are connected to the big island by narrow bridges.
- Inhabitants :
  - Each small island houses one family (2-5 members), with a smart bird and some islands having a small dog.
- Mayor :
  - Resides on the central island and manages communications.

Communication Rules

- Bridge :
  - Only small dogs can pass through.

- Mayor's Role :
  - Acts as a communication hub. Each family knows other families but not their locations. They can contact other families only through the mayor.

- Birds :
  - Can fly to the center and return to their own island but cannot fly between small islands.

- Dogs :
  - Can pass to the center island and back, but with limited success.

Card System

- Sending Cards :
  - Families can send cards to each other through the mayor.
- Content :
  - Cards include names, requests, and whether a reply is needed.
- Cost :
  - 1$ per letter, half price if sent by dog. Cards contain only letters and a notable phrase for privacy costs the same as other letters.

Requests

- Types :
  - 150 different types.

- Items :
  - 3200 different items might be requested.

Requirements for the Solution

Optimize Communication Flow

- Smart Birds :
  - Utilize smart birds for reliable communication to the center island and back, particularly for important messages.
- Small Dogs :
  - Use dogs for less critical communications to take advantage of the cost reduction, acknowledging that success rates may vary.

Centralized Message Handling

- Mayor's Hub :
  - All messages are routed through the mayor to maintain order and confidentiality.
- Digital Management:
  - Introduce a digital system for the mayor to track and manage communications efficiently.