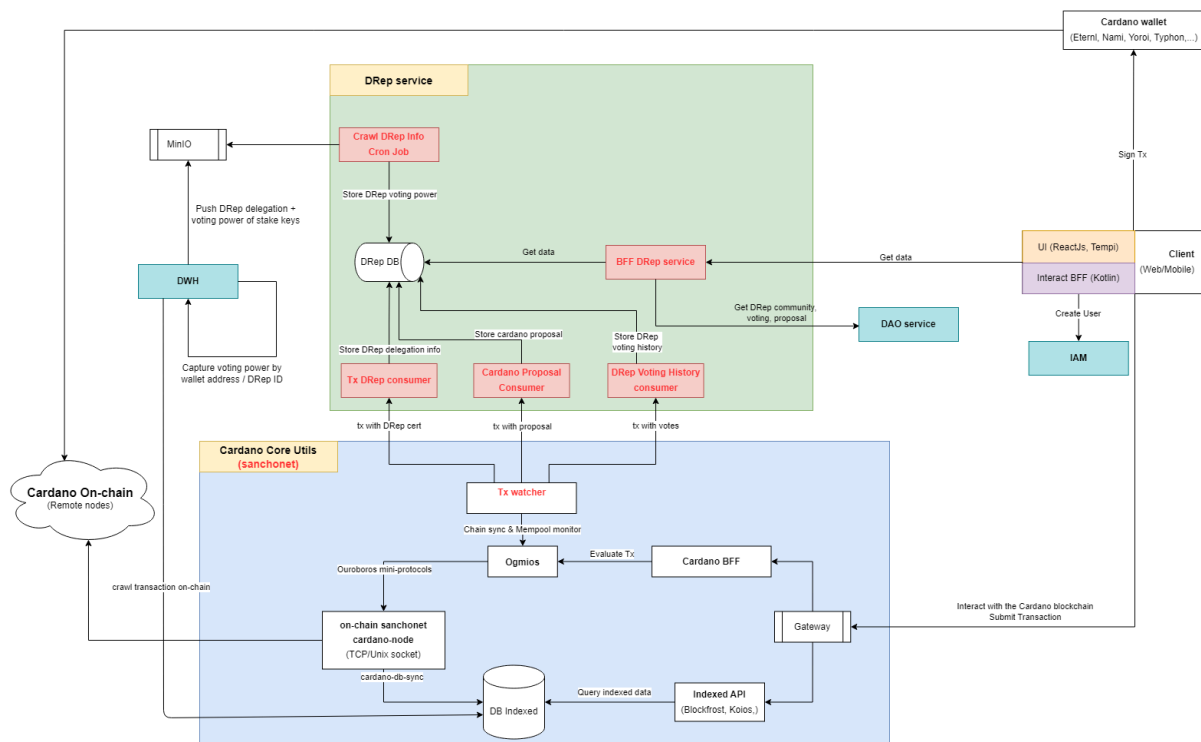# System Architecture Overview

1. High-level Architecture

The system is designed to manage and index information related to DReps (Delegated Representatives) on the Cardano blockchain. It consists of several key components that work together to gather, process, and serve data about DReps, proposals, voting history, and related transactions.

- Data Warehouse: Stores historical data, including the Voting Power of DReps, with a one-day delay.
- Real-time Consumers: Components that fetch and process real-time data from the Cardano blockchain.
- BFF (Backend For Frontend) DRep Service: Provides APIs for accessing processed data related to DReps, voting history, and proposals.
- Database: Stores indexed data for quick retrieval by the BFF service.

2. Details of Components and Modules

- Crawl DRep Info Cronjob:
    - Periodically fetches Voting Power data from the Data Warehouse.
    - Updates the database with the latest information, though with a one-day delay.
- Tx DRep Consumer:
    - Continuously monitors the Cardano blockchain for updates related to DReps.
    - Indexes real-time data such as Delegator Status and DRep Status.
    - We also supported CIP-119 for DReps to show information

- Voting History Consumer:
  - Monitors and indexes voting history data of DReps in real-time.
  - Ensures all historical voting data is stored and accessible.
- Proposal Consumer:
  - Tracks all proposals on the Cardano blockchain as they are created.
  - Indexes proposal data for future retrieval and analysis.
- BFF DRep Service:
  - Exposes APIs for querying DRep information, voting history, and proposal details.
  - Acts as an interface between the database and end-users or applications.
- Tx Watcher:
  - Listens for specific transactions related to DRep activities (e.g., registrations, retirements, delegations).
  - Indexes transactions related to voting and proposal procedures to maintain a comprehensive record.

3. Workflow of Data

1. Data Collection:
   - The Crawl DRep Info Cronjob collects Voting Power data from the Data Warehouse daily and updates the database.
   - The Tx DRep Consumer, Voting History Consumer, and Proposal Consumer gather real-time data directly from the Cardano blockchain.
2. Data Processing and Indexing:
   - Collected data is processed by the respective consumers (Tx DRep, Voting History, Proposal).
   - Tx Watcher indexes relevant transactions for further use, focusing on certificates, voting, and proposal procedures.
3. Data Storage:
   - All processed and indexed data is stored in a database, optimized for fast retrieval by the BFF service.
4. Data Access:
   - The BFF DRep Service provides a streamlined API to access the processed data, serving end-users or other systems that need information on DReps, voting history, and proposals.

4. System Interactions

- Cronjob Interaction:
  - The Crawl DRep Info Cronjob interacts with the Data Warehouse to fetch delayed Voting Power data and updates the database.
- Blockchain Interaction:
  - The Tx DRep Consumer, Voting History Consumer, and Proposal Consumer continuously interact with the Cardano blockchain to monitor and fetch real-time data.
  - The Tx Watcher listens to the blockchain for specific transactions and updates the database with the indexed information.
- Database Interaction:

- All components (Cronjob, Consumers, Tx Watcher) interact with the database to store indexed data.
- The BFF DRep Service retrieves data from the database to fulfill API requests.
- User/System Interaction:
  - External systems or users interact with the BFF DRep Service through its API, accessing the latest DRep information, voting history, and proposal details.

5. Resource Allocation Plan

Member	Task/Phase
Ho Trung Dung	Create project plans, timelines, and milestone
Nguyen Si Hung	-Design Architecture -Build API backend
Dam Thi Xuan Y	Build Backend API
Duong Huu Nguyen	Build UI Client
Nguyen Duc Manh	Build UI Client
Phan Trinh Dat	- Build a Test case document - Create a Testing Plan - Execute Test