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Project 2 Idea

Project Idea: Peer-to-Peer Distributed Computing Framework

Description: Create a basic P2P distributed computing framework that allows peers on a local network to share their computational resources for collaborative processing of tasks. This project demonstrates P2P networking and distributed computing concepts.

Key Components:

- P2P Network Establishment: Develop a basic P2P network for peers to discover and connect to each other within the local network.
- Task Distribution: Implement a mechanism for distributing computational tasks to available peers.
- Task Processing: Enable peers to execute assigned tasks and return results to the requester.
- User Interface: Create a simple interface for submitting tasks and viewing results.
- Load Balancing: Implement load balancing mechanisms to ensure tasks are distributed efficiently among peers.
- Fault Tolerance: Include mechanisms to handle failures or unavailability of peers in the network.
- Documentation: Prepare a report that covers the project's network setup, task distribution mechanisms, results retrieval, and user instructions.

Possible Systems to Use:

- Apache Pulsar (released in 2019): modern messaging and event streaming platform that supports distributed data processing
- gRPC (released in 2015): gRPC is a high-performance, language-agnostic remote procedure call (RPC) framework that can be used for communication between peers in a distributed computing network.
- Docker (released in 2013): containerization and orchestration technology for creating and managing distributed applications