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We propose building a Decentralized Music Sharing Prototype that focuses on the basics of a peer-to-peer file-sharing system for music. Initially, we'll develop a simple P2P network where users can connect directly and transfer music files. Our primary goals are to implement core distributed computing concepts like file distribution, basic P2P networking, and handling data consistency. We aim to create a functional prototype that prioritizes basic file sharing and scalability within a manageable scope for a month.

Tentative Workflow for Decentralized Music Sharing Prototype:

P2P Network Setup

Users join a peer-to-peer (P2P) network where they can connect directly with other peers.

Output: Establishes peer connections and identifies available music files.

→ File Distribution

File Distribution

Distributes music files across connected peers.

Ensures balanced data transfer and optimal bandwidth usage.

Output: Music files are shared efficiently among peers.

→ Basic Networking Protocols

Basic Networking Protocols

Manages peer connections, data transfers, and error handling.

Implements protocols like handshake, file request/response, and retries for reliability.

Output: Stable peer communication and data integrity.

→ Data Consistency

Data Consistency

Ensures that shared music files remain consistent across peers, with mechanisms for synchronization or versioning.

Output: Consistent file versions and updates across the P2P network.

→ Scalability

Scalability

Allows new users to join the P2P network seamlessly, distributing the load as the network grows.

Handles increased data sharing without significant performance degradation.