All the system design & architecture is done by Adithya Shenal

High Level System Architecture - Containerized Multi Service Architecture

Modular Monolithic (Node.js Main Backend)

User Module

Friends Module

Conversation Module

Message Module

Auth Module

Nginx API Gateway/Reverse Proxy

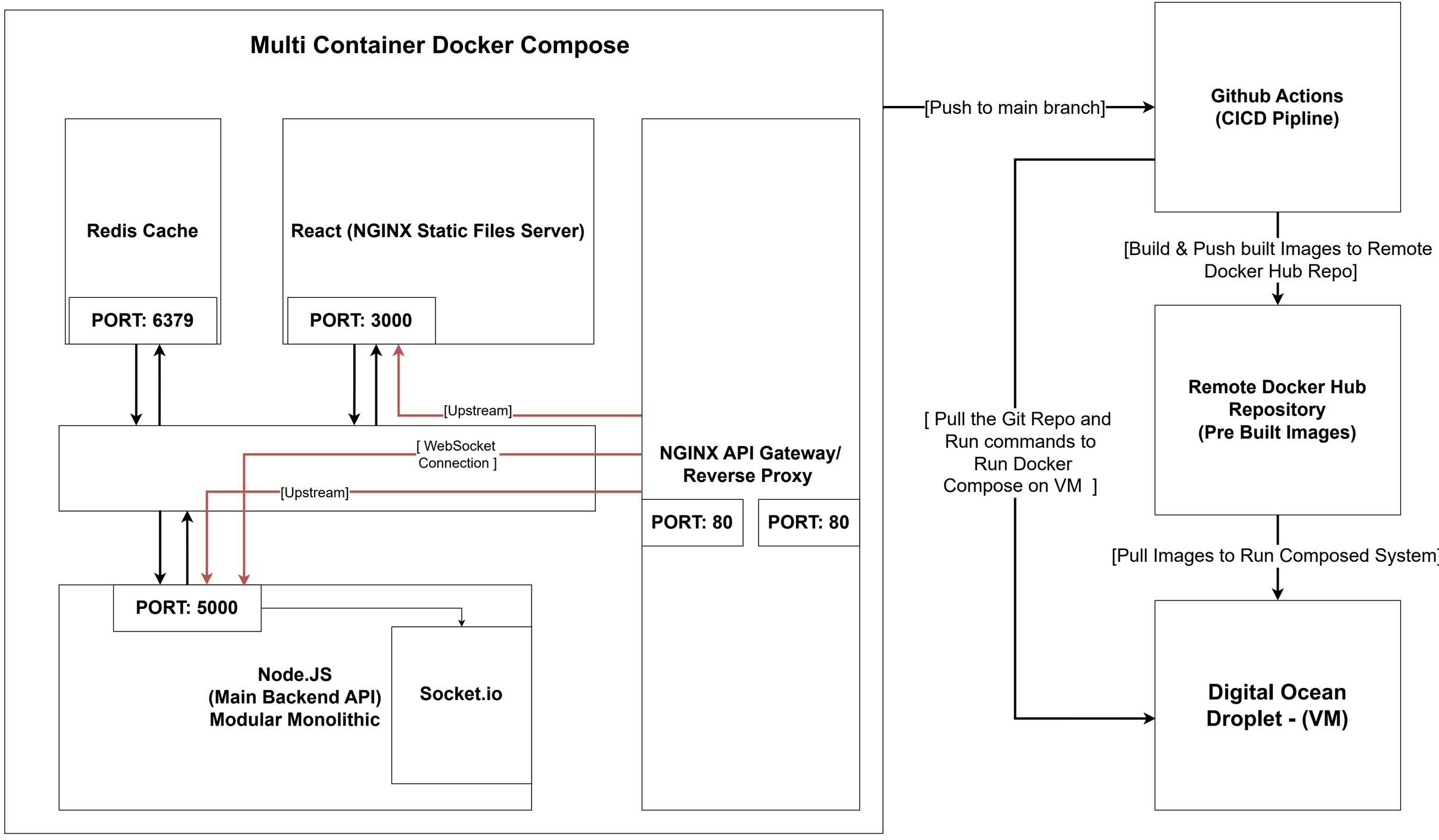
Nginx Static File Server

Chat Application Client
(React.js)

Redis Service

MongoDB Atlas Cluster Database

Containerized Multi Service Architecture - Deployment Strategy (Production)



REST API Architecture [Message & Conversation Modules]

Message Schema

senderId: mongoose ID

receiverId: mongoose ID

text: string

image: URL

Message Module

Message Collection

[Get Messages (Message Docs)]

[Send to Socket server (text)]

Socket io

Server

[Send via Socket (text)
Update the cache (include the message)]

React-Query

Cache

[Send a Message (text)]

User B

[Update Conversation (last message)
Doc of Receiver and chat user as Sender]

[If no Conversations
yet we start new one]

[Invalidate Conversations so "new"
will remove on visited conversations]

[Invalidate Cache (Refetch Conversations)]

[Conversation Visited (true)]

[Get Conversations (Conv.. Docs of the user)]

Conversations Modules

Conversation Collection

Conversation Schema

userId: mongoose ID

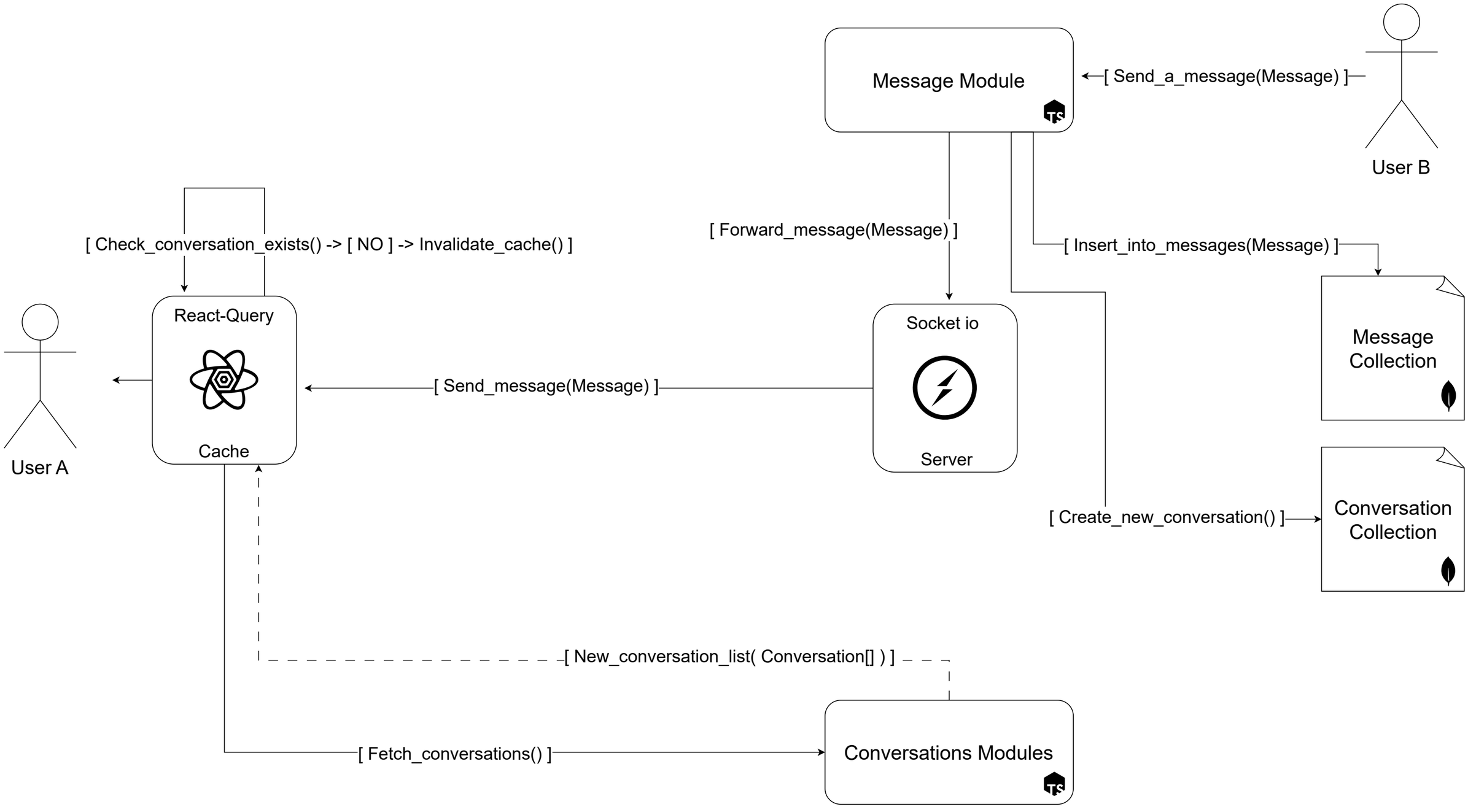
chatUserId: mongoose ID

lastMessage: string

time: Date.now()

Visited: boolean (true/false)

Receiving first ever message from a user



Sending a Friend Request to a user

[Get all the users (Users[])]

People Module

User Collection

[Check_Friend_Exists() -> [NO] -> Invalidate_cache()]

React-Query

Cache

User A

[Invalidate_Friends_Cache ()]

Friend Module

[Sending a Friend Request to user A ()]

User B

[Optimistic Update the Request (Friend)]

[Send_Friend_Request Via_Socket (Friend)]

Socket io

Server

[Send_Friend_Request (Friend)]

[Create_New_Pending_Req (Friend)]

Friend Collection

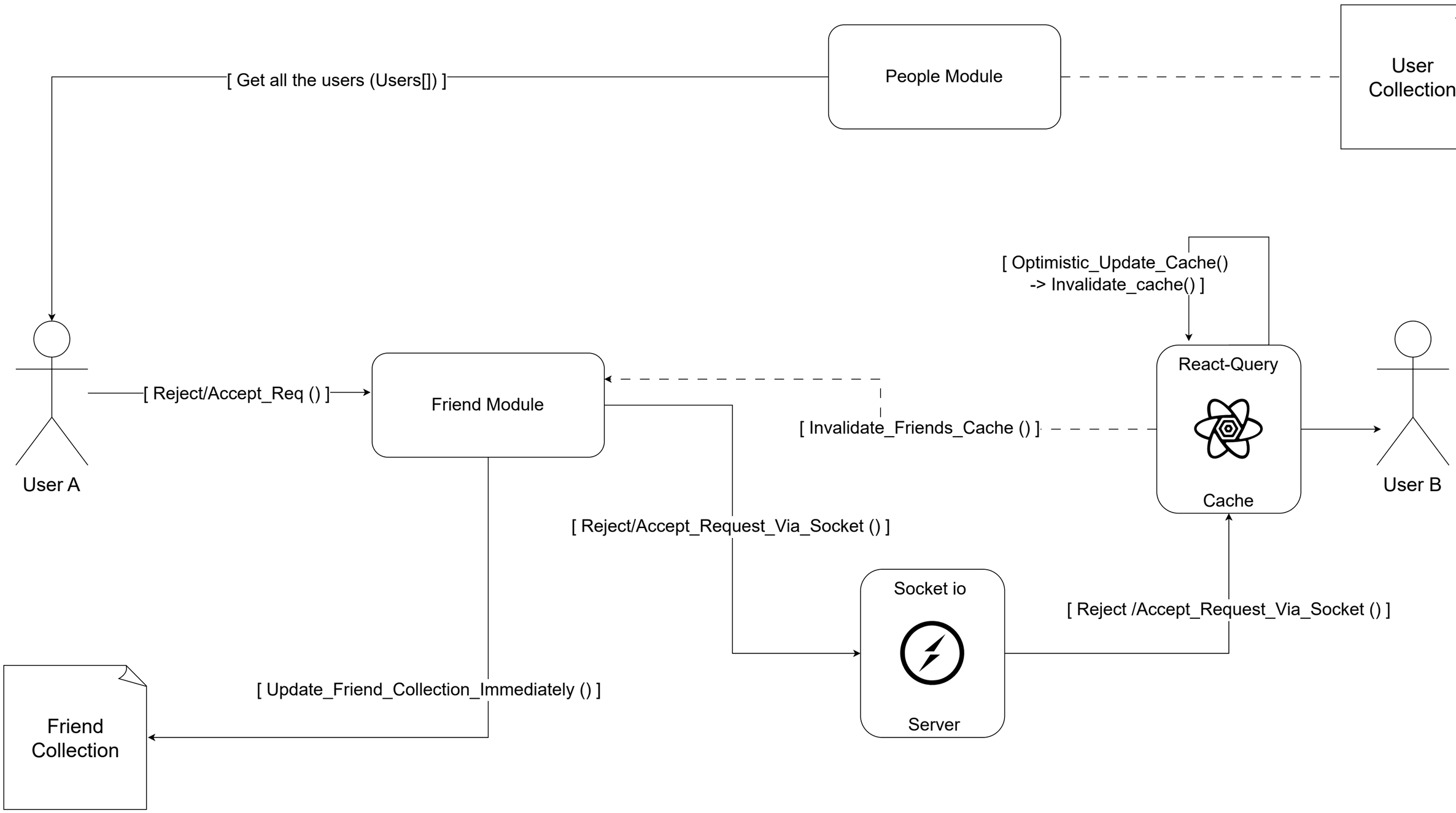
Friend Schema

requester: mongoose ID

recipient: mongoose ID

status:["pending", "accepted", "blocked"],

blockedBy: mongoose ID

time: Date.now()

Accepting / Reject a Friend Request