MedRec

A network solution to patient control of medical information and identity

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All You Need to Know

MedRec is a *network* solution to the problem of distribution and access to records

It has three principal components:

- A “wallet” where each person holds and manages *permissions*
- A blockchain where distribution *contracts* are stored
- A *full node* where providers provide access to data under the control of contracts

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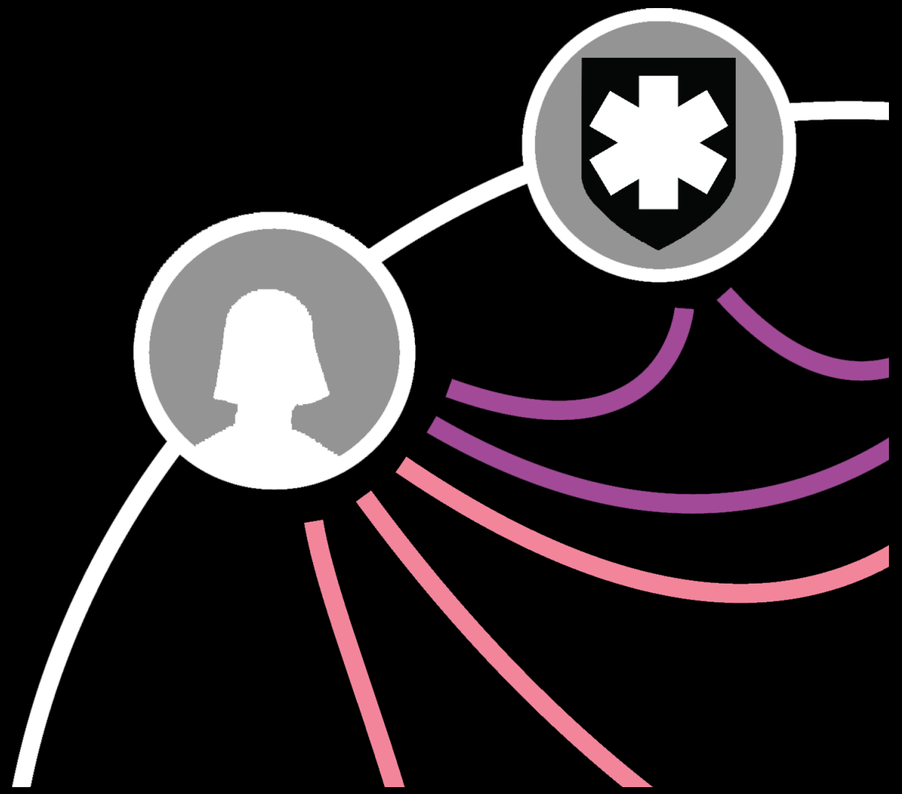
Extras

- Masks metadata such as physician name or occupation
- Open, granular contracts allow for new access styles such as temporal, spatial, oracle-based
- Platform architecture allows research and clinical community to solicit participation
- Notifications by polling under the control of the patient app



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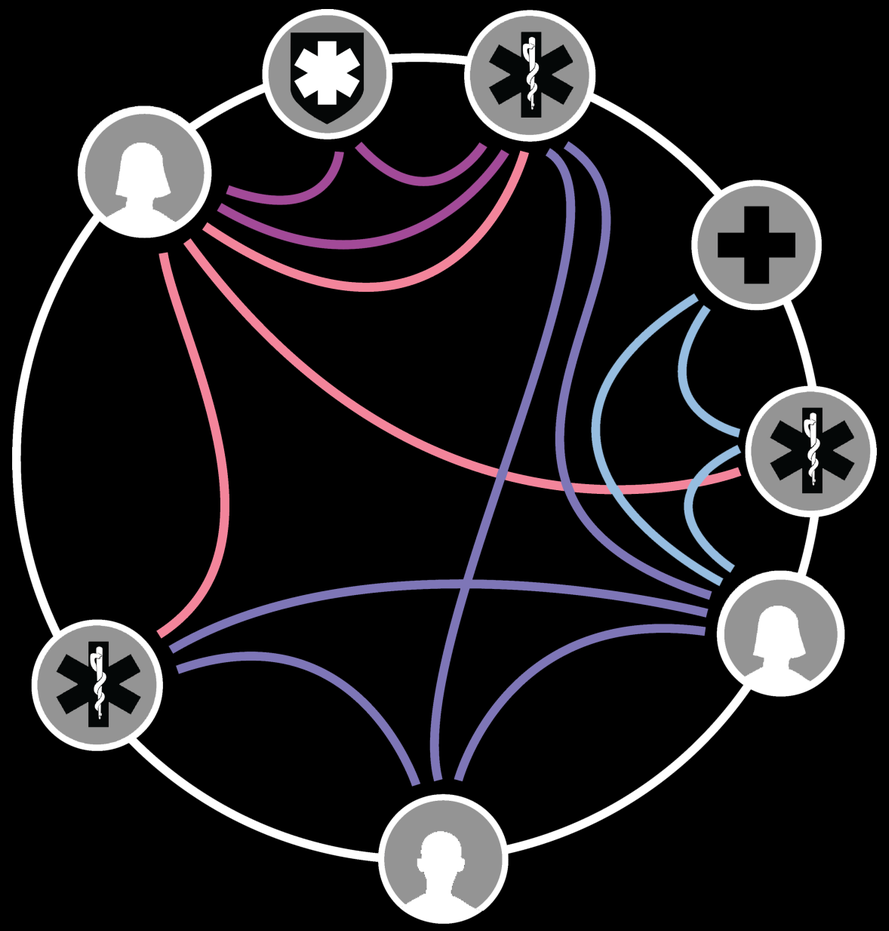
Distributed Systems — MedRec

Migrates control from a central “Swiss bank” for medical records to a network process

Vests distribution in a set of open, smart contracts

A disinterested, non-commercial, university project

Minimal alteration of provider practices, simple adoption



Patient control, simple interfaces

Full node: the provider gateway

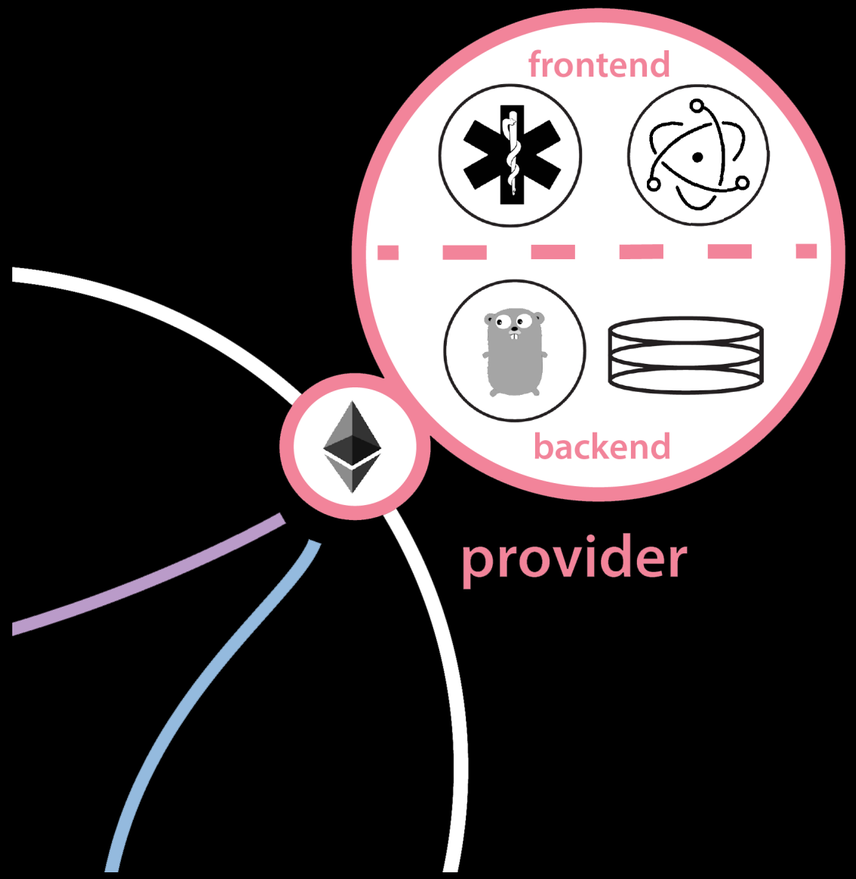
Runs a full Ethereum node

Stores blockchain with contracts

Provides access to provider database

Votes to admit new members

Maintains patient name server (PNS) addresses are keys, IDs are values

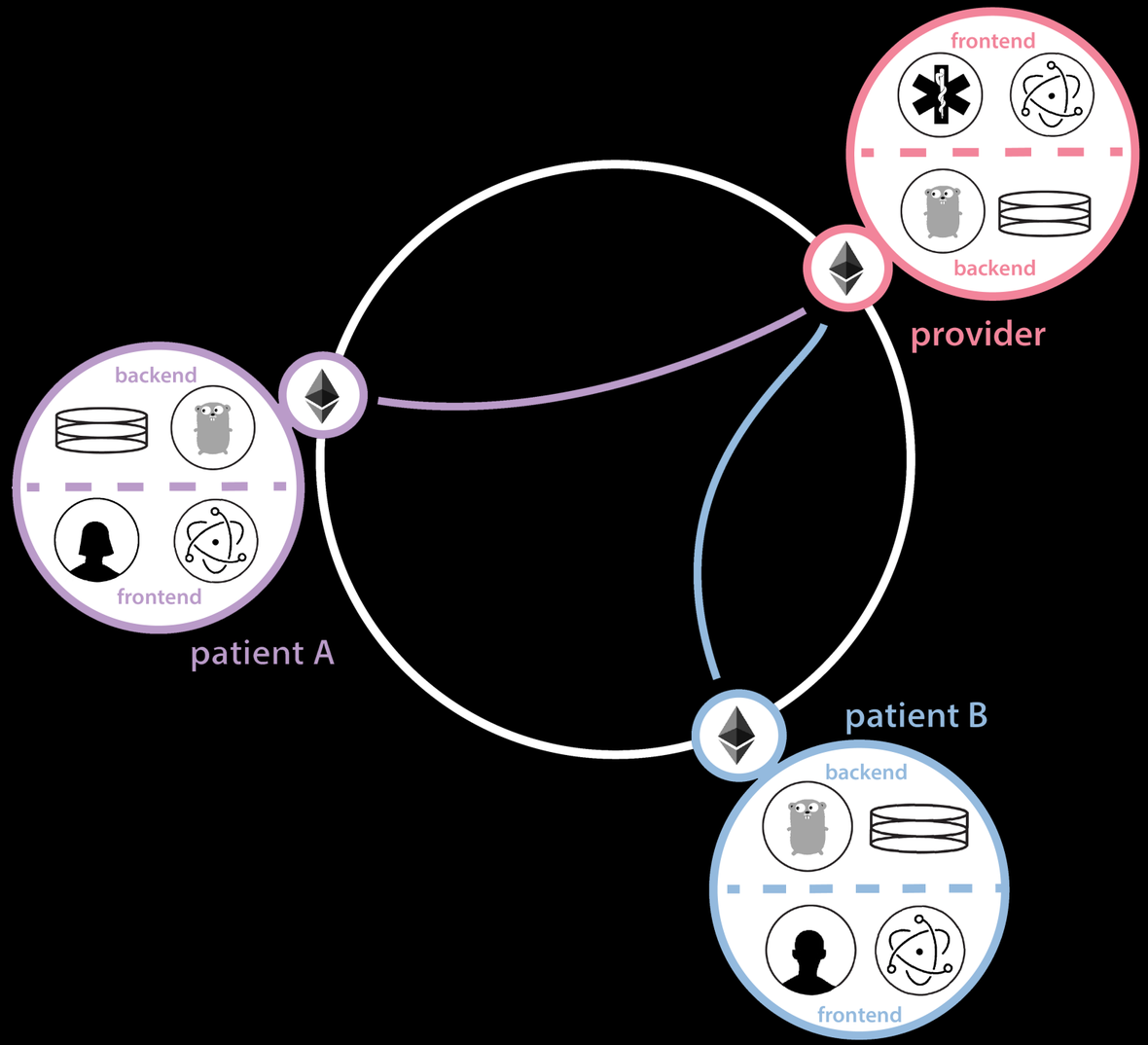


Blockchain

Uses Ethereum blockchain

***proof of authority* required to add block**

Potential Paxos — Federated Byzantine Agreement



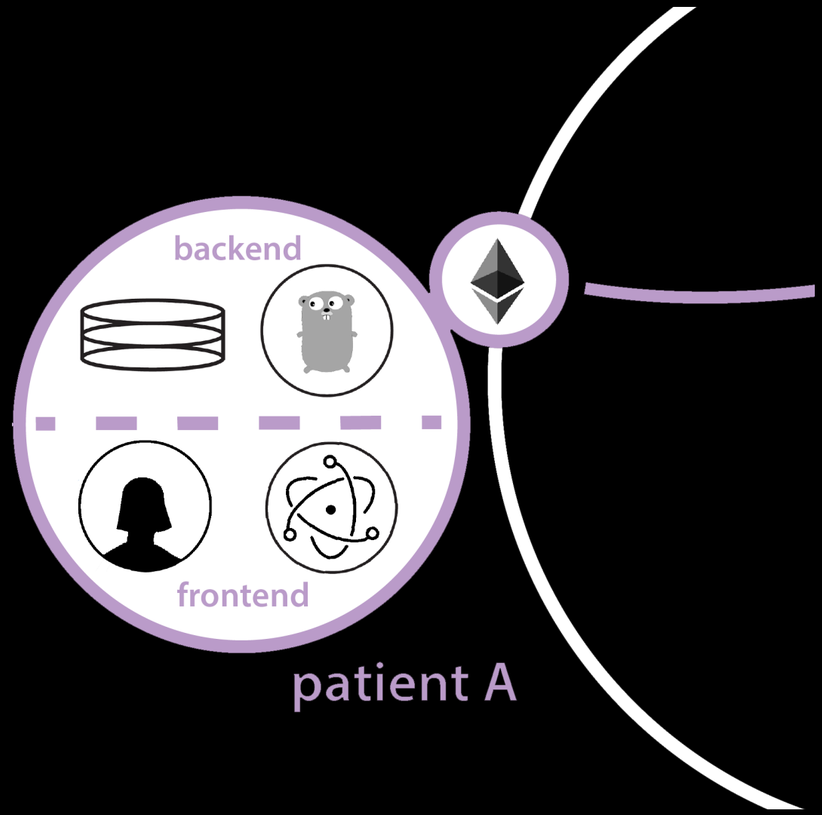
Wallet

Patient app interface to multiple providers

Contains identity and recovery mechanism

Allows creation of contracts

Runs as a ‘light node’

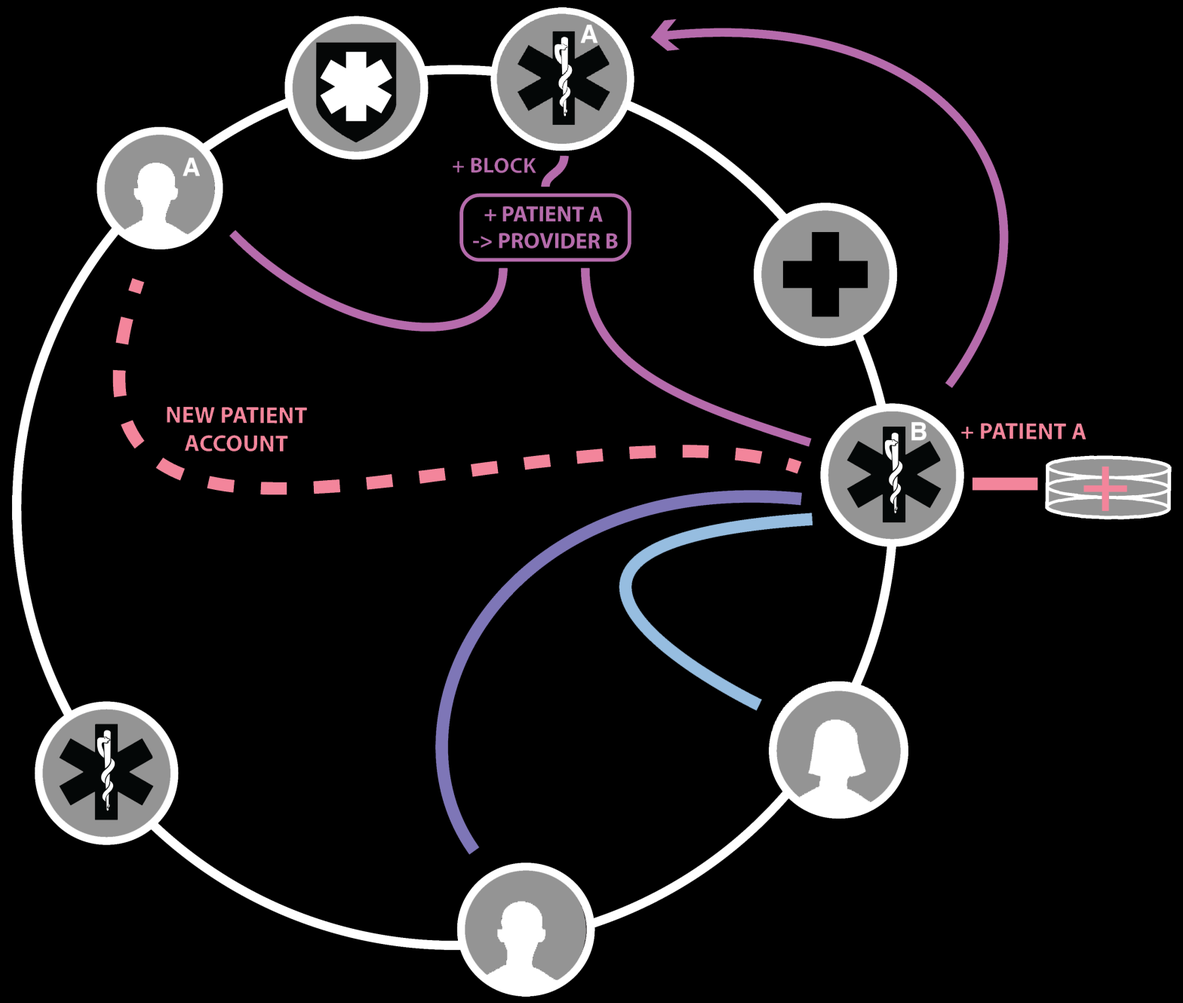


Example: Registration process flow

Provider initiates a contract with a patient using a privacy-preserving *delegate address*

Patient creates an account with a token from provider

Patient's eth address associated with a unique ID in the database



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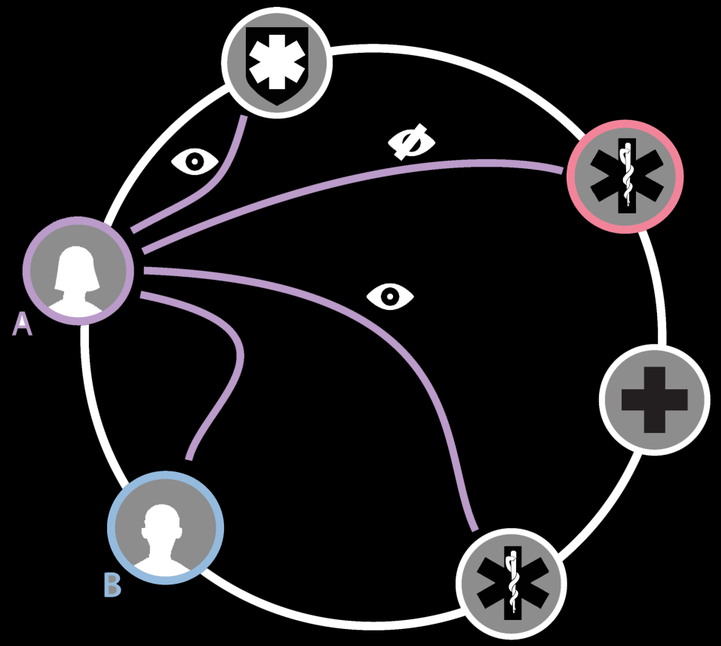
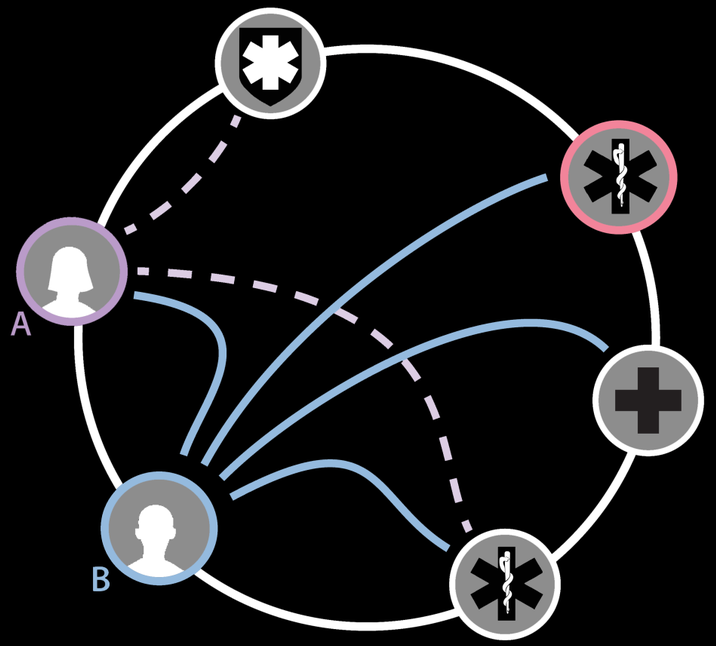
Example: Patient-defined contract

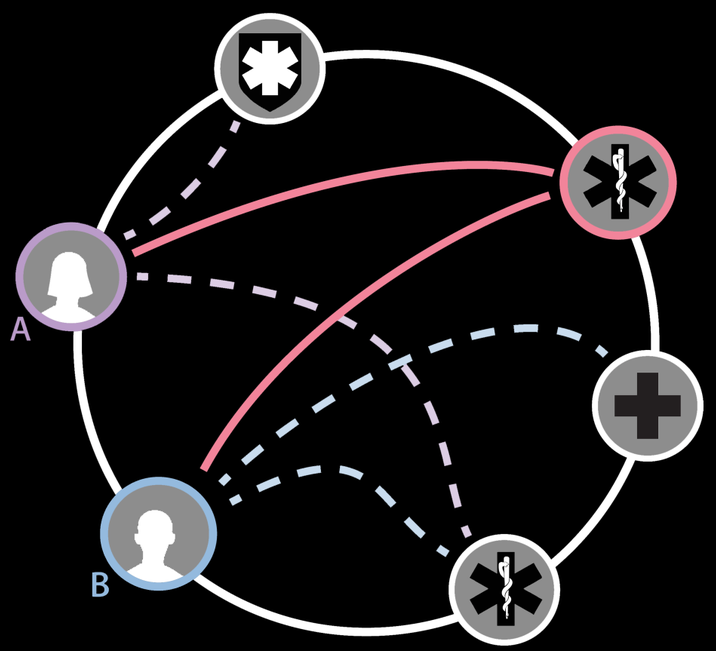
Patient contracts define viewing permissions



patient A view
(custom permissions)



patient B view
(auto permissions)

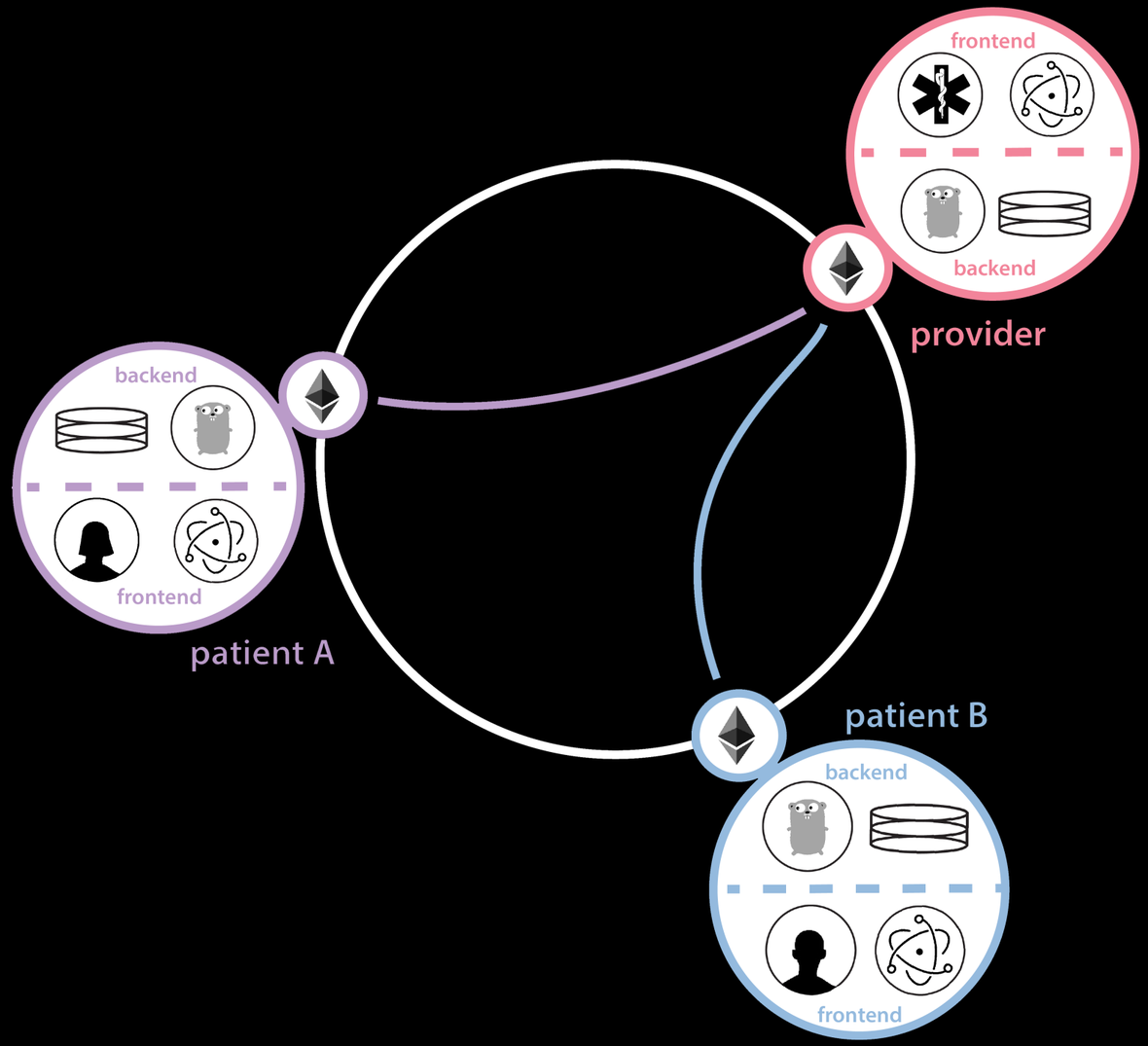


provider view

Notifications

App controls notifications, polling the provider for changes

Pull not push to avoid making changes to the provider database



Patient control, simple interfaces

Current State

open-sourced at https://github.com/mitmedialab/medrec/

adopted for development and testing by Beth Israel Deaconess Medical Centre