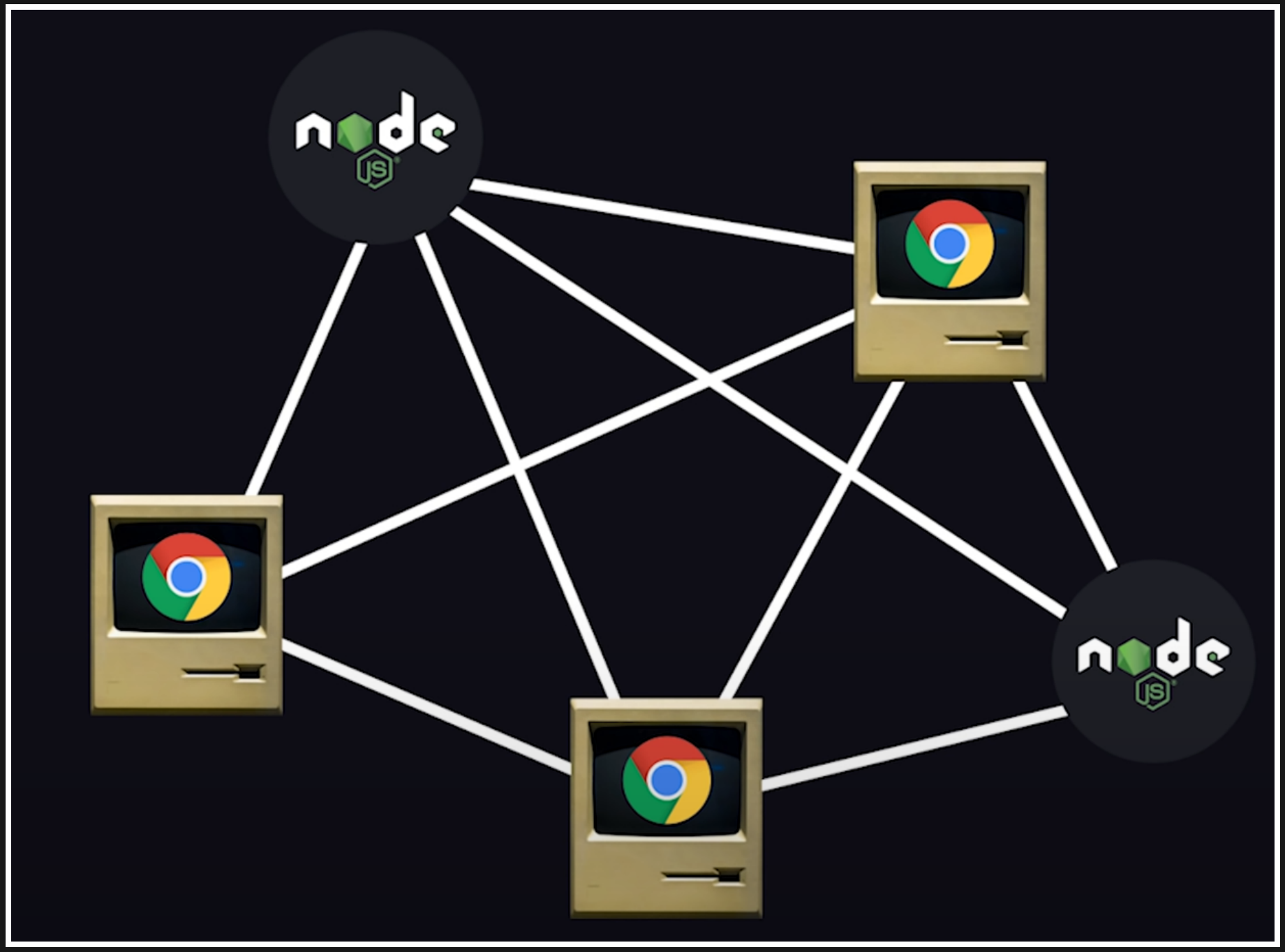
- NoSQL
- Fully Decentralized P2P
- No server required
- Implemented in JavaScript

Fully Decentralized


node
node

Client-side data storage

Enables offline-first abilities

Really fast access for locally available data

Storage spaces

- Public space
- User space
- Frozen space

Relay peer

Use of relay peers to enable P2P communication between clients and long term data persistence

Data storage

Data is stored using a radix data-storage

RAD produces JSON objects which can be stored on any file or object storages (file, S3, localstorage)

CAP Theorem

AP database

Eventually consistent
Always available (although may be empty)
Partitioning is one of the core principles

Consistency

Update consistency

Use of the HAM conflict-resolution algorithm

HAM: Hypothetical Amnesia Machine

Update consistency

It’s an optimistic algorithm, all updates are stored and merged if possible

Only the last known value is presented

Read consistency

No native transactions available
Read inconsistencies can happen
Partial reads can also happen

Read-your-writes consistency

As data is first stored locally then replicated, all reads from your writes will be read first from the local storage, ensuring read-your-writes consistency

Built-in secure user management

Based on Security, Encryption, & Authorization - SEA

User security

Based on asymetric encryption & signing methods

The only way to find the private keys for a user is to use a combination of his alias, public key and password

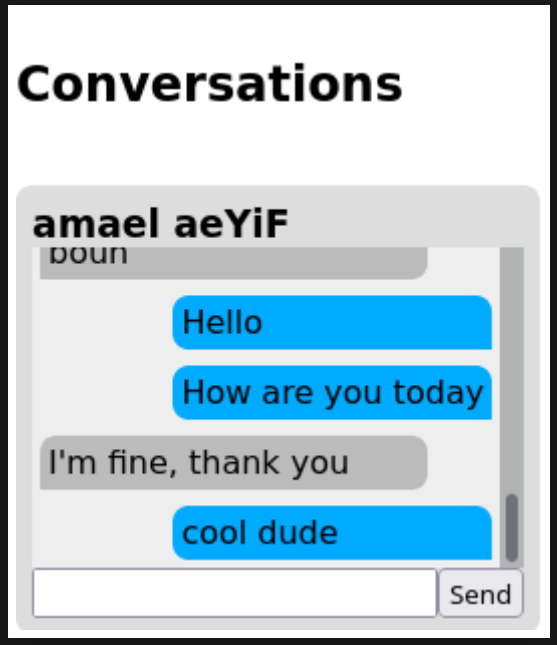
User security

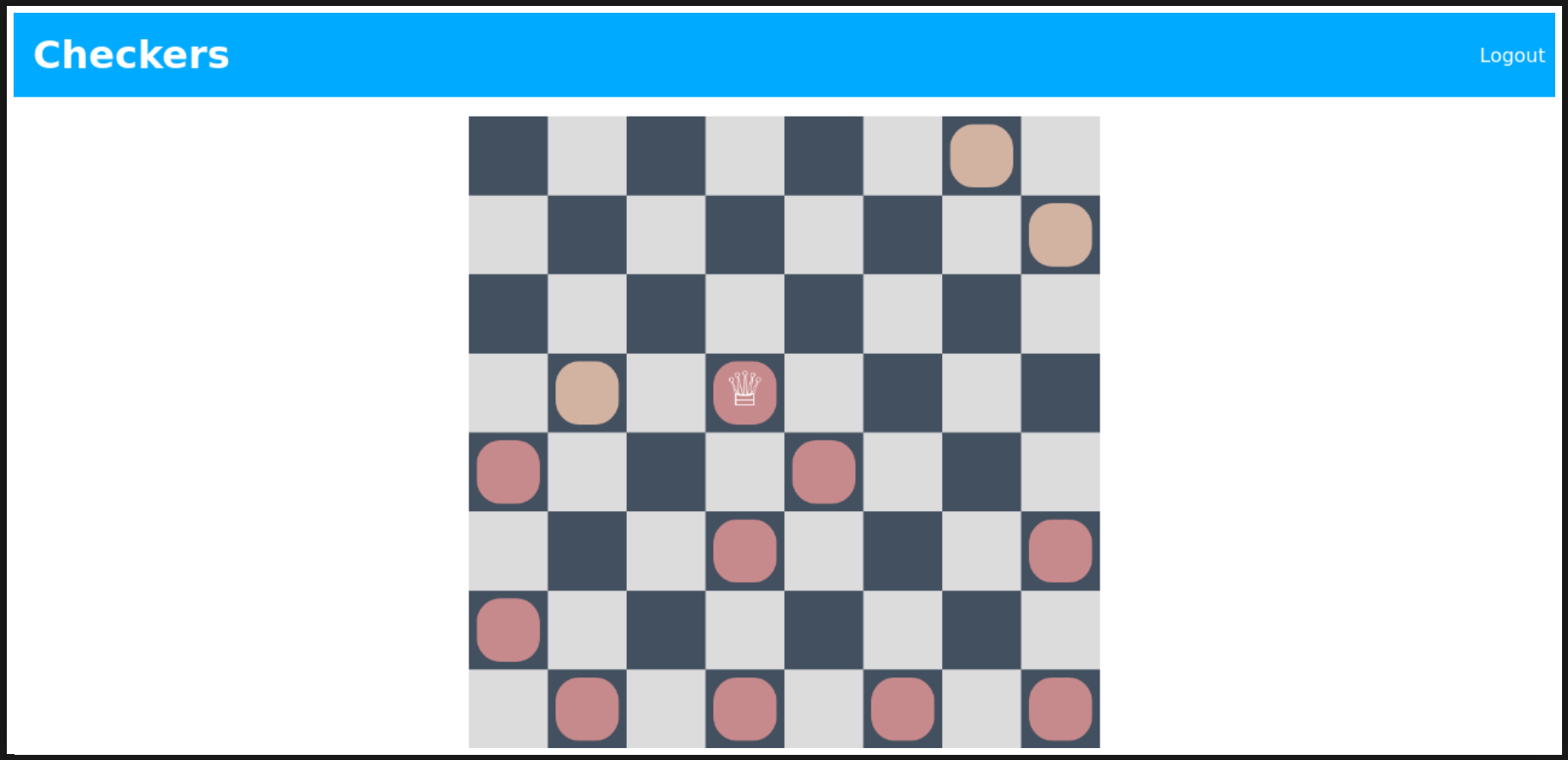
You are only allowed to write child nodes to a user node if you have the private key for that user

Our example

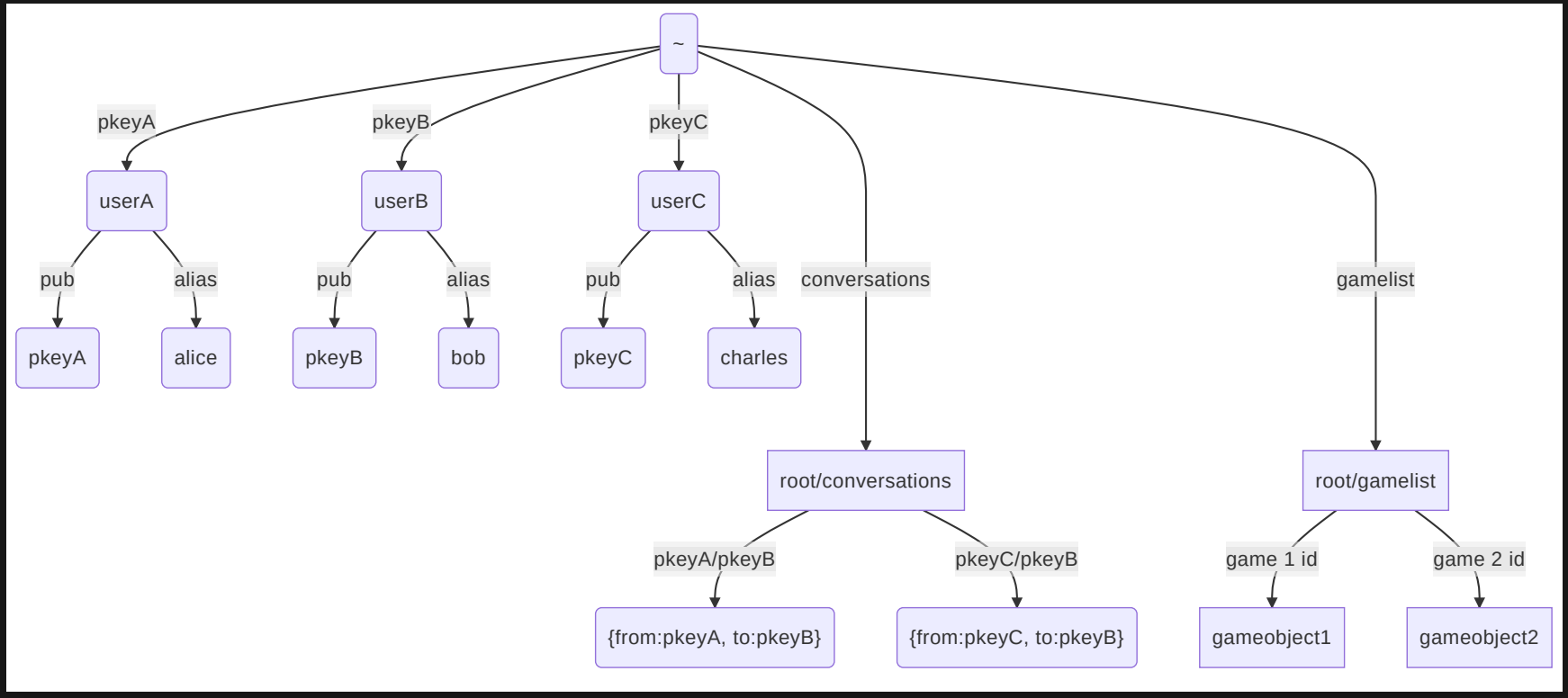
An online realtime checkers game, with chat between players

DEMO TIME


Conversations
amael aeYiF
boun
Hello
How are you today
I'm fine, thank you
cool dude
Send


Checkers
Logout

The graph


~
pkeyA
pkeyB
pkeyC
userA
userB
userC
pub
alias
pub
alias
pub
alias
conversations
gamelist
pkeyA
alice
pkeyB
bob
pkeyC
charles
root/conversations
root/gamelist
pkeyA/pkeyB
pkeyC/pkeyB
game 1 id
game 2 id
{from:pkeyA, to:pkeyB}
{from:pkeyC, to:pkeyB}
gameobject1
gameobject2

References

Main website: https://gun.eco
About CAP: https://gun.eco/docs/CAP-Theorem
Conflict handling: https://gun.eco/docs/Conflict-Resolution-with-Guns
HAM: https://gun.eco/docs/Hypothetical-Amnesia-Machine-(HAM)
SEA users: https://gun.eco/docs/User