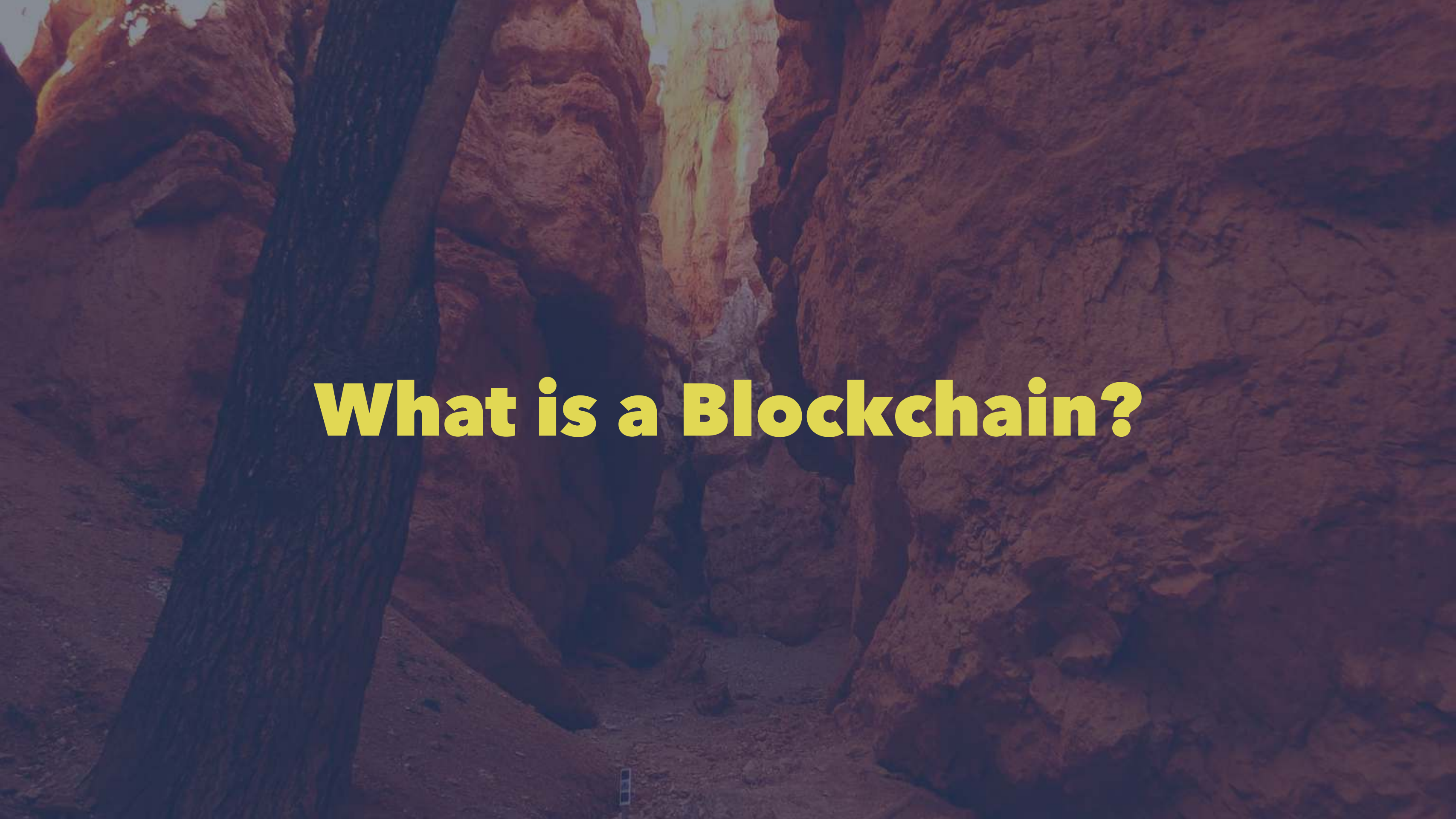


A nighttime photograph of a city skyline reflected in a body of water. A large suspension bridge is in the foreground, its structure and lights reflected in the water. In the background, several skyscrapers are lit up, including a prominent one with a spire. The sky is dark blue.

Blockchains in Go



What is a Blockchain?

Use Cases

- Money Transfer
- Immutable Ledgers
- Game Assets
- Tokenized equity



A nighttime photograph of a city skyline reflected in a body of water. A large suspension bridge is in the foreground, its structure and lights reflected in the water. In the background, several skyscrapers are illuminated, including a prominent one with a spire. The sky is dark blue, and the water is calm, showing clear reflections of the city lights.

New way to monetize applications

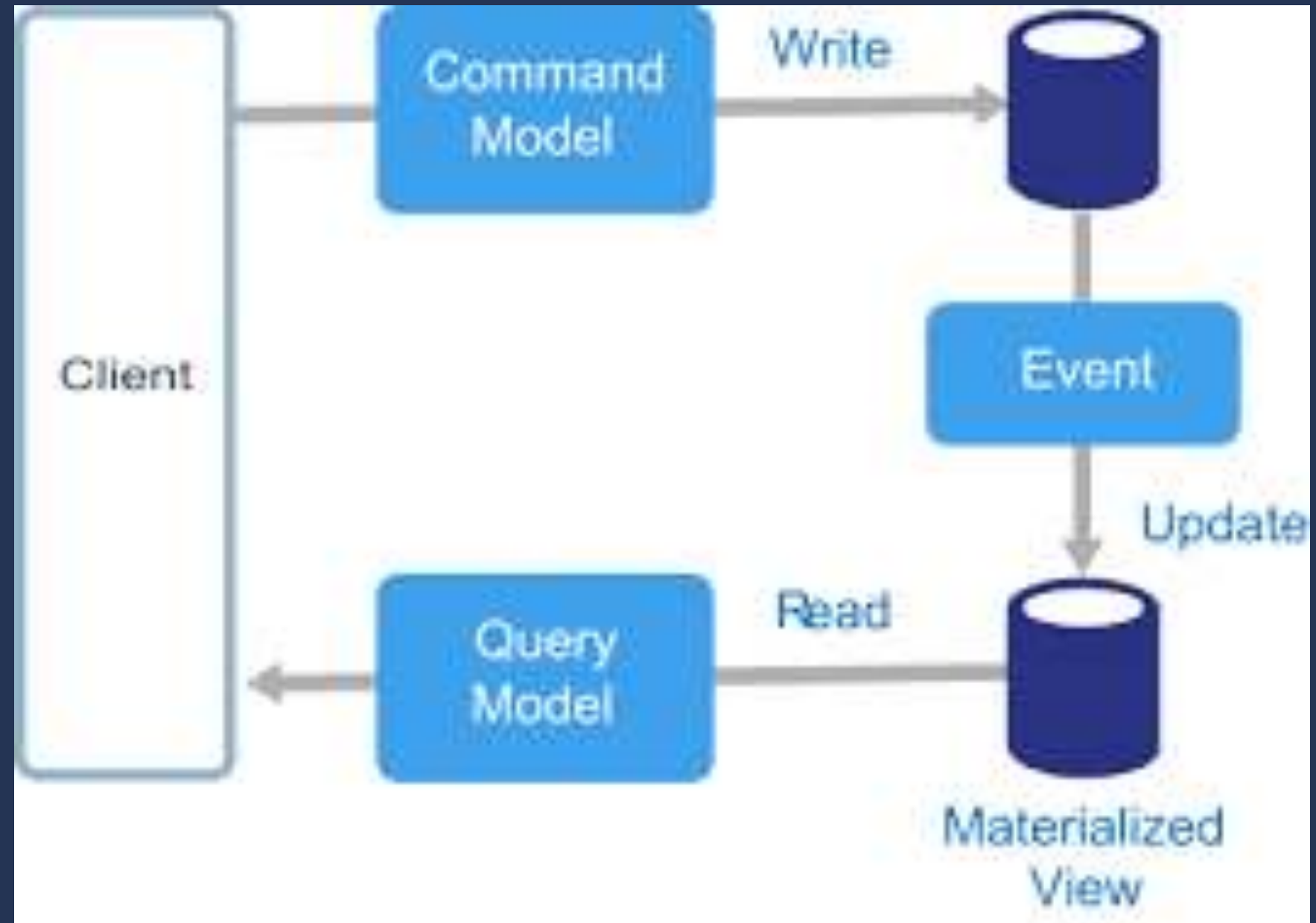
Blockchains

- Bitcoin
- Ethereum (Written in Go)



**Blockchains are specialized
databases**

CROQS



Blocks vs Transactions

FAIL

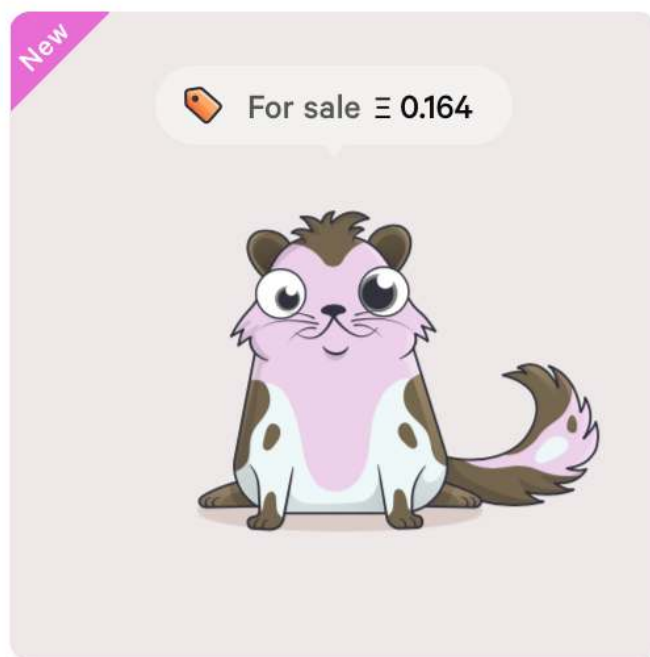
Games



Why Games on Blockchain

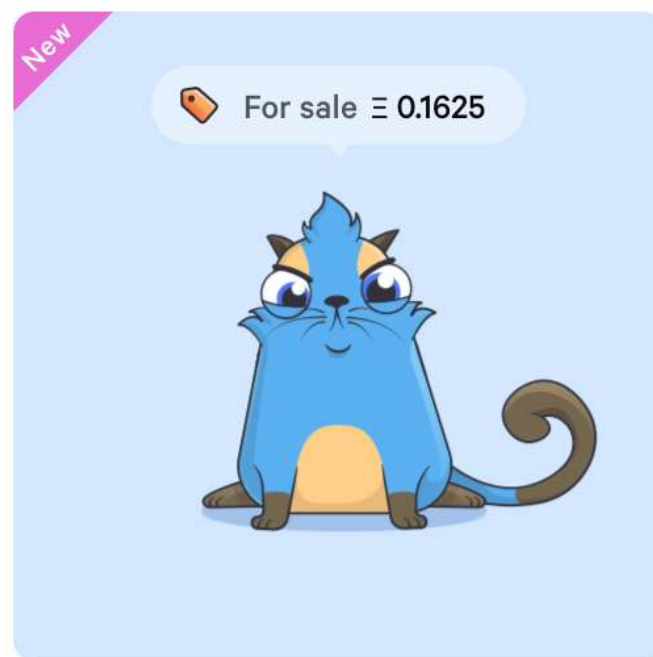
- Real Ownership of Assets
- Forkability
- Open Data
- Play run servers

Before



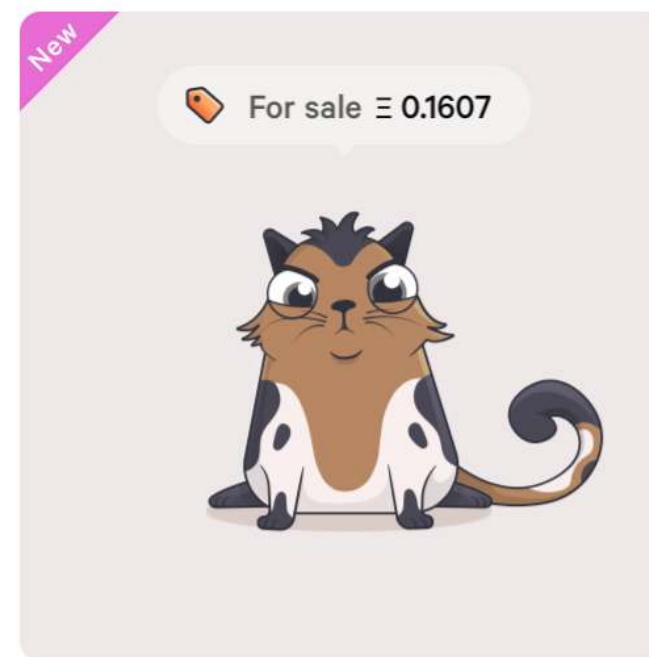
#870646 · Gen 0 · Fast

♡ 0



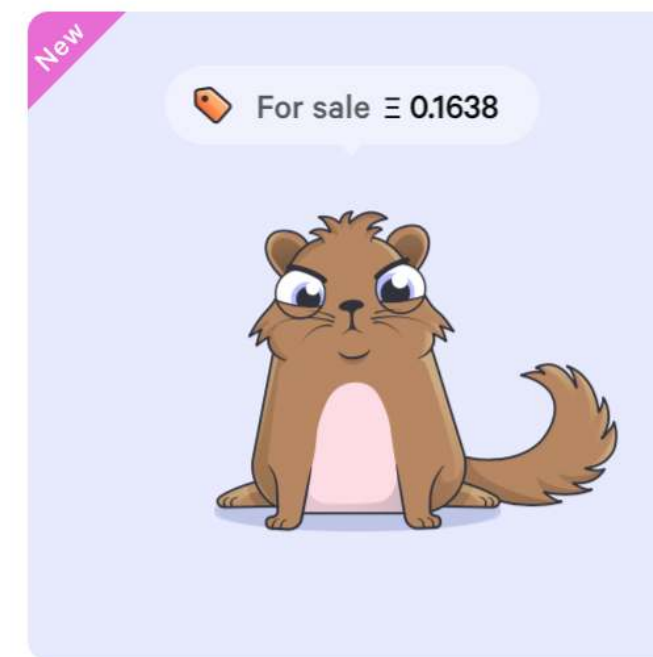
#870616 · Gen 0 · Fast

♡ 0



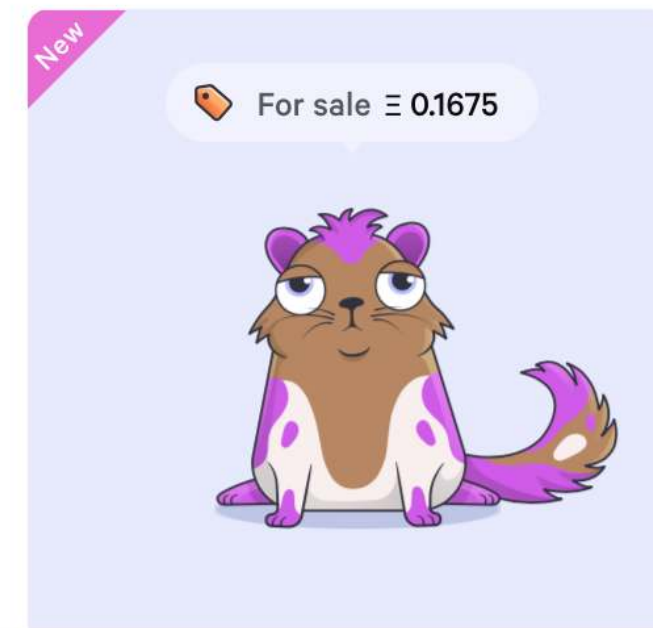
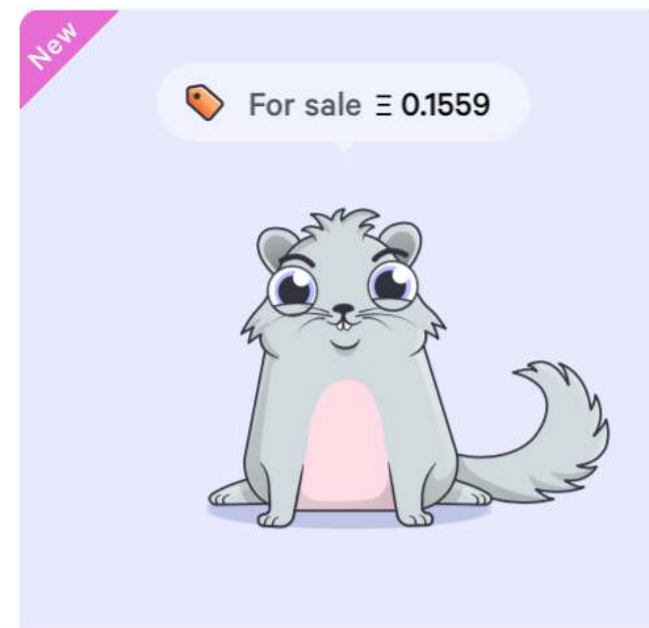
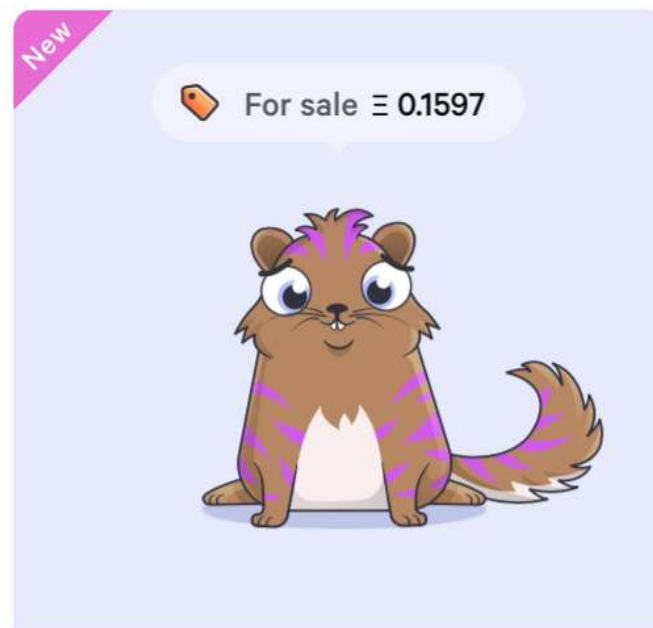
#870569 · Gen 0 · Fast

♡ 0



#870540 · Gen 0 · Fast

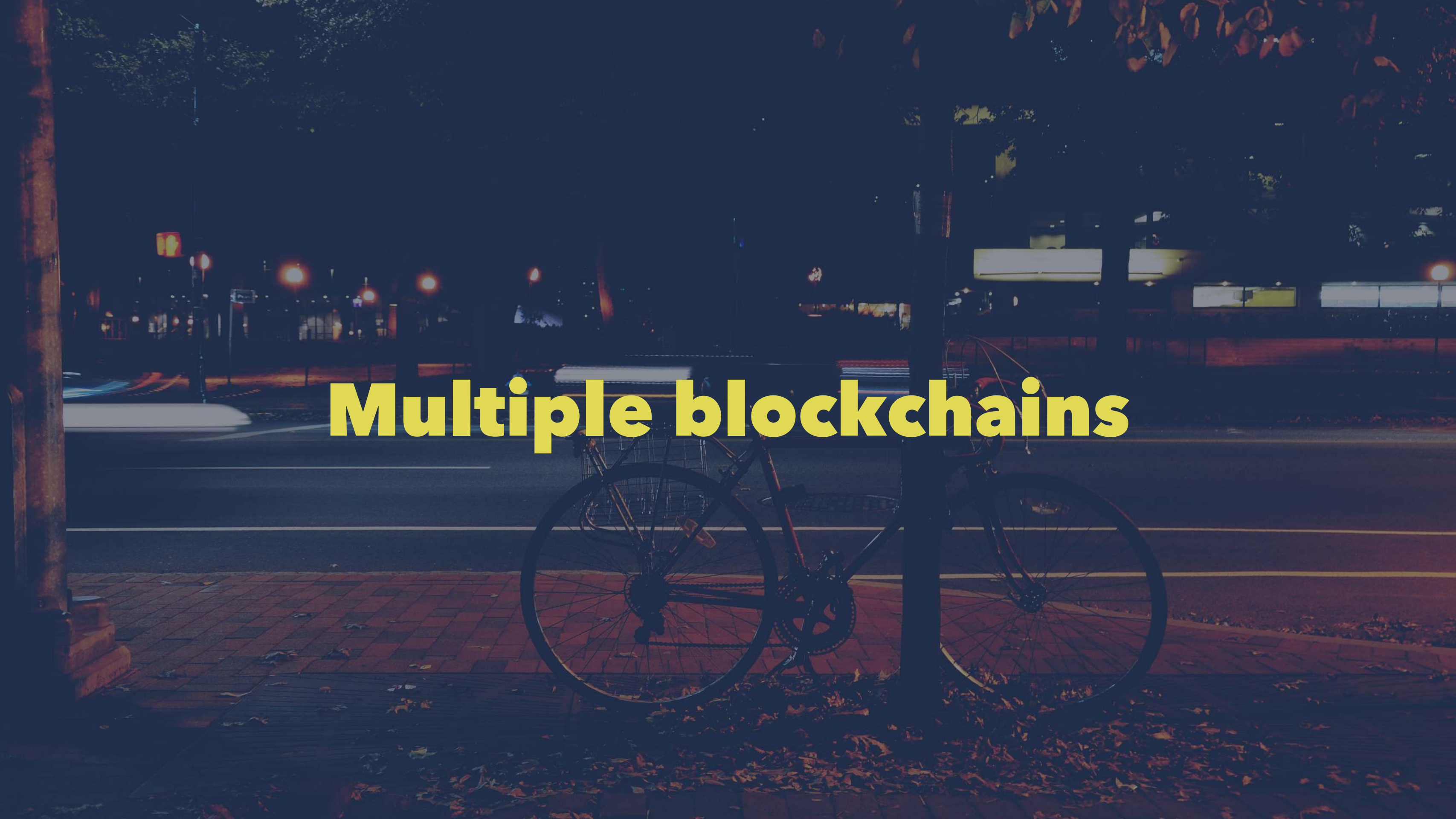
♡ 0



Now





A photograph of a city street at night. In the foreground, a bicycle is parked on a brick-paved sidewalk, leaning against a dark metal pole. The ground is covered with fallen autumn leaves. In the background, a road with white lane markings is visible, with a few blurred cars suggesting motion. Further back, there are trees and buildings illuminated by city lights, creating a bokeh effect. The overall scene is dimly lit, with the primary light sources being the streetlights and building windows.

Multiple blockchains



Serverless vs Blockchain



What are Smart Contracts

Attributes of Smart Contracts

- Deterministic
- Can Mutate Data
- Can emit events
- Cannot read external state

30 seconds about me

- Founder Loom Network
- DigitalOcean
- Go Developer 5 years
- Spoken all over the world
- Rode an elephant at my wedding
- ชอบพูดไทยเวลาเมา



Hackathon Aug 4/5



Interface for a Smart Contract

```
type Contract interface {
    Meta() (Meta, error)
    Init(ctx Context, req *Request) error
    Call(ctx Context, req *Request) (*Response, error)
    StaticCall(ctx ReadOnlyContext, req *Request) (*Response, error)
}
```

```
type ReadOnlyContext interface {
    Get(key []byte) []byte
    Has(key []byte) bool
    Block() BlockHeader
    Now() time.Time
    Message() Message
    ContractAddress() Address
}
```

```
type Context interface {
    StaticContext
    Set(key, value []byte)
    Delete(key []byte)
}
```


Sample Contract

```
func (e *Blueprint) Meta() (plugin.Meta, error) {
    return plugin.Meta{
        Name:      "Blueprint Contract",
        Version: "0.0.1",
    }, nil
}

func (e *Blueprint) SetMsg(ctx contract.Context, req *types.MapEntry) error {
    eventData := struct {
        Method string
        Key     string
        Value   string
    }{Method: "SetMsg", Key: req.Key, Value: req.Value}
    eventJSON, err := json.Marshal(&eventData)
    if err != nil {
        log.Println("Error marshalling emit message")
    }
    ctx.Emit(eventJSON)

    return ctx.Set([]byte(req.Key), req)
}

func (e *Blueprint) GetMsg(ctx contract.StaticContext, req *types.MapEntry) (*types.MapEntry, error) {
    var result types.MapEntry
    if err := ctx.Get([]byte(req.Key), &result); err != nil {
        return nil, err
    }
    return &result, nil
}
```


Problems with Go

- Non deterministic
- Map Ordering
- Time
- Go Routines



A photograph of a sunset over the ocean, taken from the deck of a boat. The sun is low on the horizon, casting a warm glow across the sky and water. The sky is filled with dark, silhouetted clouds. The ocean is dark blue with small, choppy waves. In the foreground, the white deck of the boat is visible, along with a black winch and some rigging lines. The word "Solidity" is overlaid in the center in a bold, yellow, sans-serif font.

Solidity



Awesome how do I start?

Existing Frameworks

Tendermint

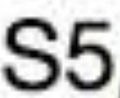
Loom SDK





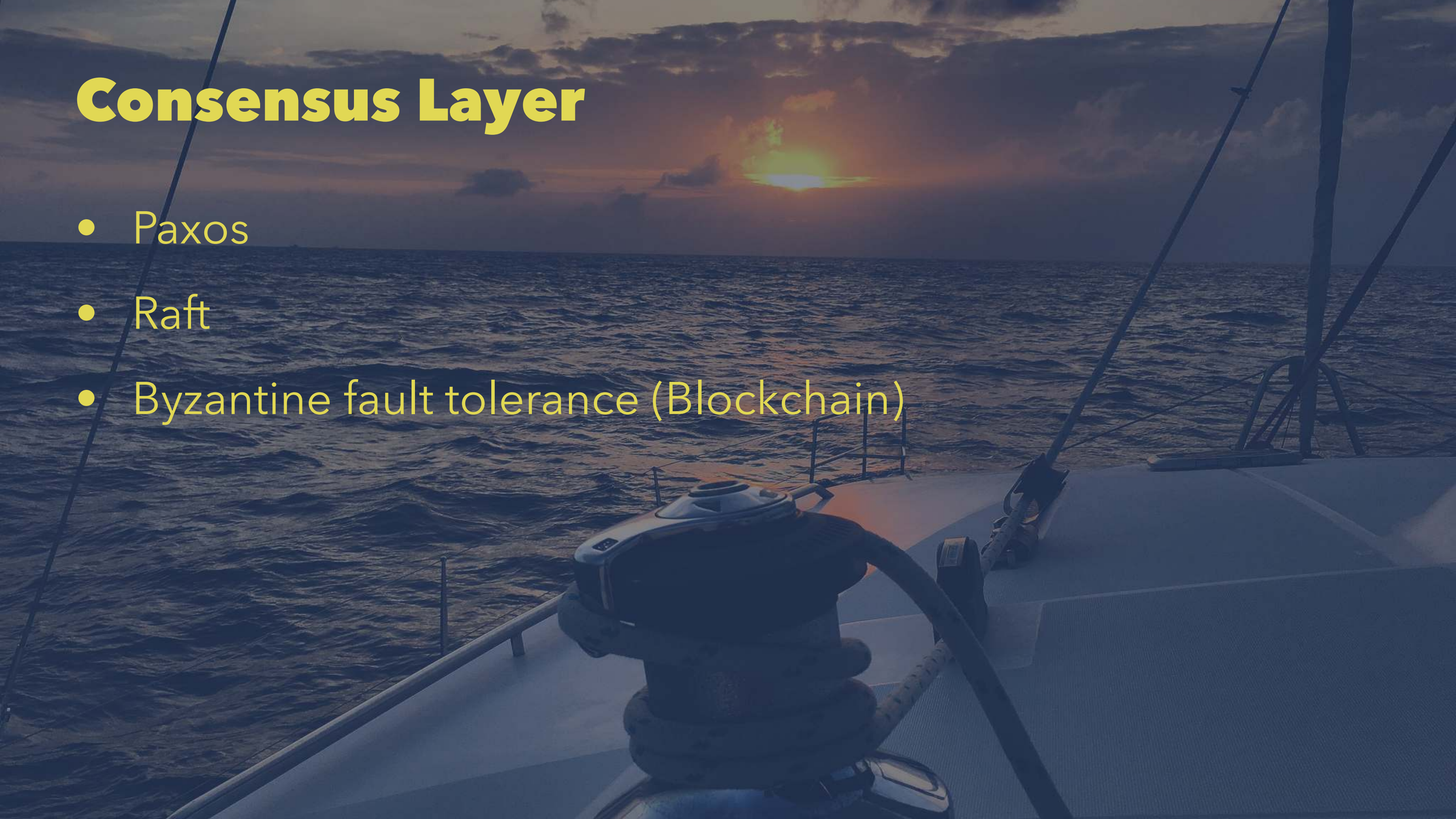
Economics

Consensus



Consensus Layer

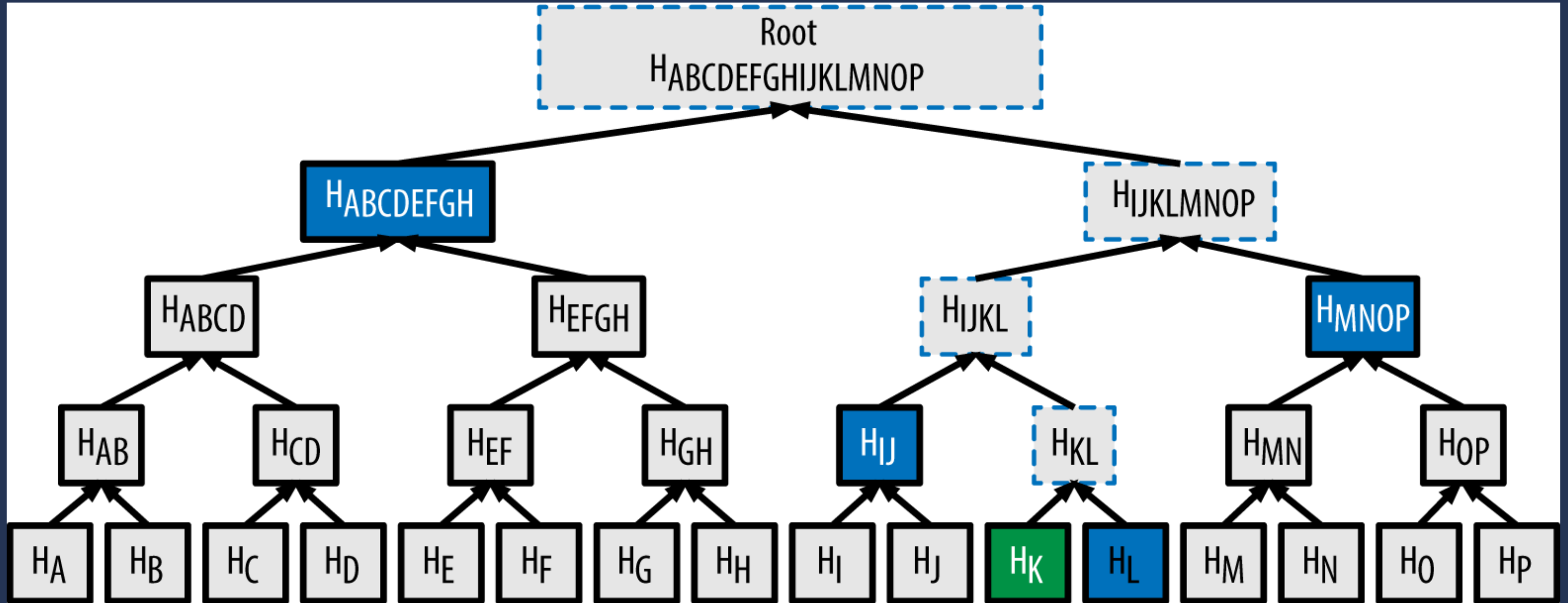
- Paxos
- Raft
- Byzantine fault tolerance (Blockchain)

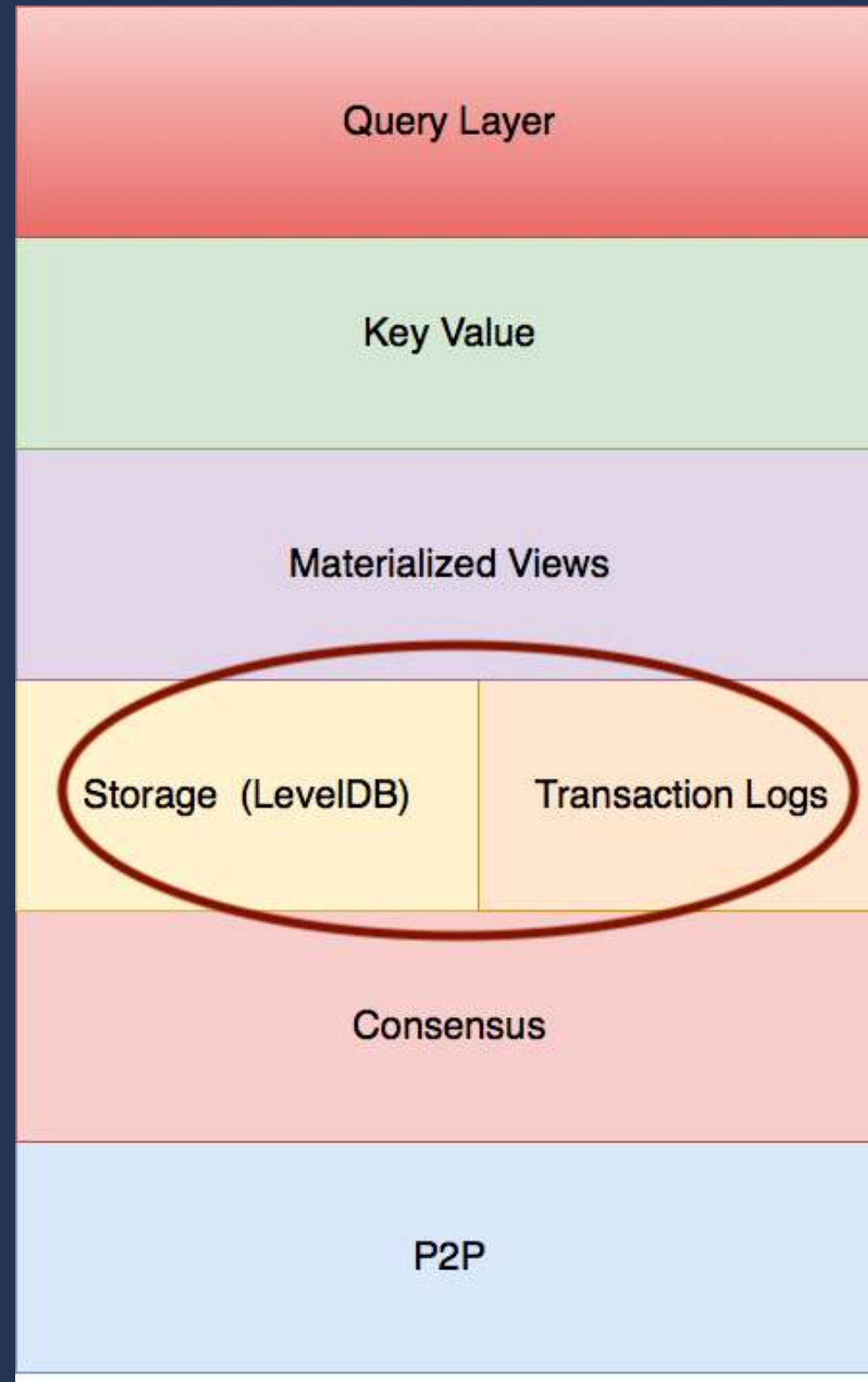


Go implementations

- Hashicorp Raft
- ETCD Raft
- TenderMint

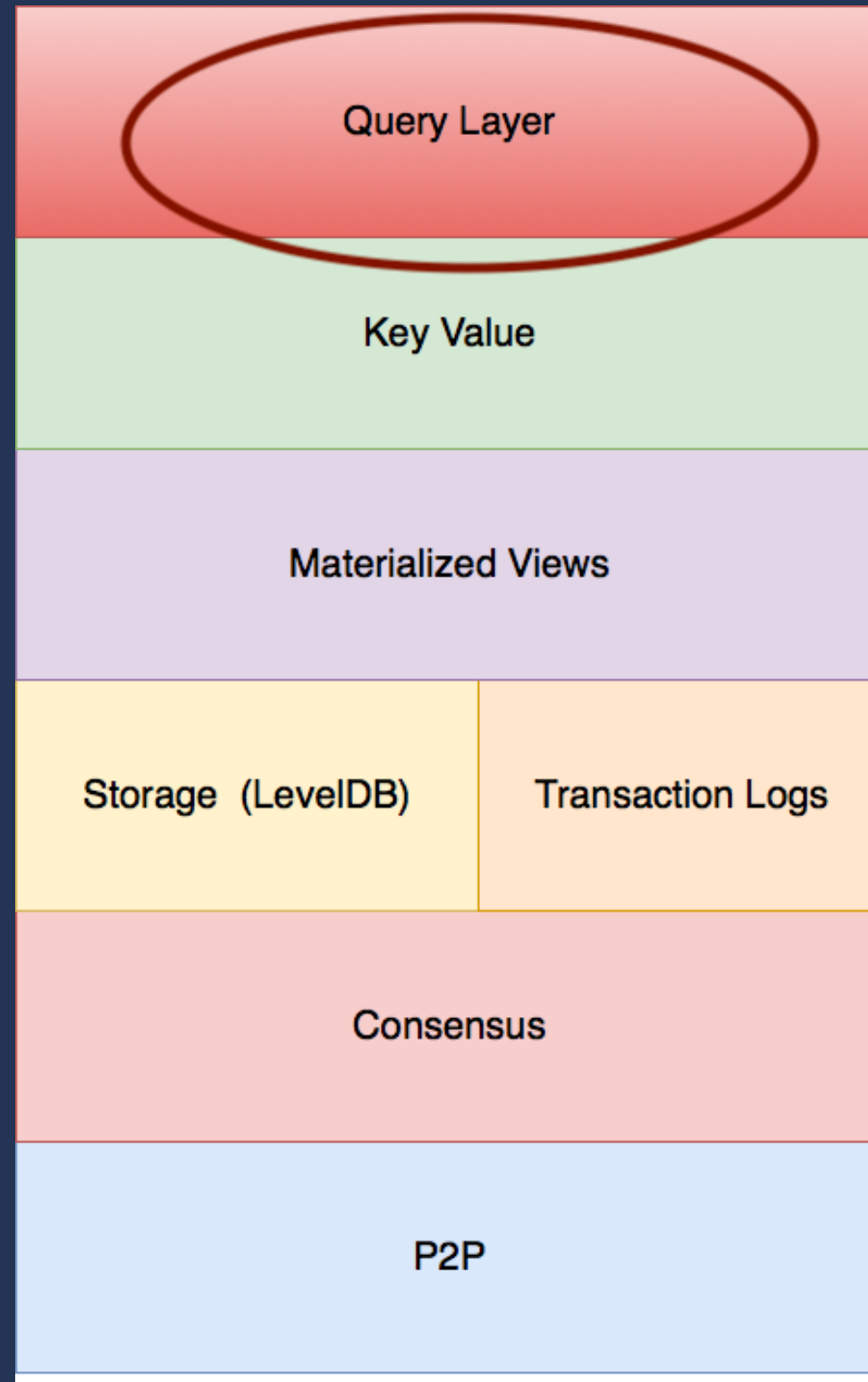
Merkle Trees





Storage Layer

- LevelDB
- RocksDB
- Sqlite
- BoltDB



Query Layer

- Toy Sql Parser
- <https://blog.gopheracademy.com/advent-2014/parsers-lexers/>
- Prometheus Query Language
- Influx Query Language

A nighttime photograph of a city skyline reflected in a body of water. A large suspension bridge with red cables and white supports dominates the left side of the frame. In the background, several skyscrapers are illuminated, including a prominent one with a yellow and blue facade. The lights from the buildings and bridge are reflected in the calm water. The sky is a deep blue.

Query backwards and forwards in time



Julius Volz

@juliusvolz

You ask why [@PrometheusIO](#) has PromQL and not some SQL-like dialect for time series computations? Behold:

PromQL: `errors{job="foo"} / total{job="foo"}`

SQL:

`SELECT errors.job, errors.instance, [...more labels...], errors.value / total.value FROM errors, total WHERE errors.job="foo" AND total.job="foo" JOIN [...some more complicated stuff here...]`



Tying this together



Gotchas

A photograph of a natural rock archway in a desert landscape. The arch is made of reddish-brown sandstone and frames a view of a clear blue sky and distant rock formations. The word "Experiences" is written in yellow text across the center of the arch.

Experiences

Take Aways

- Importance of Custom Built blockchains
- Demystified blockchains
- Libraries for Implementing this in Go
- Blockchains aren't a magical solution

FAIL

Questions?

- Loom Network
- London Hackathon 4/5
- New York Hackathon 11/12
- Yes we're hiring

