Subspace Network

Permanent, Scalable, Decentralized
Storage for Polkadot and Web3

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4. Vision

SUBSPACE LABS

Jeremiah Wagstaff

Nazar Mokrynskyi

web3 foundation

Web3 Foundation

NSF

The US National Science Foundation

Consensys

Hypersphere

Core Team

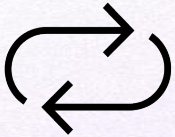
Key Advisors

Intro

A permanent, scalable, decentralized
storage layer for the Polkadot Network

Eco-Friendly
secured by *farmers*
not *miners*

Archival Storage
data is stored *forever*
on the blockchain

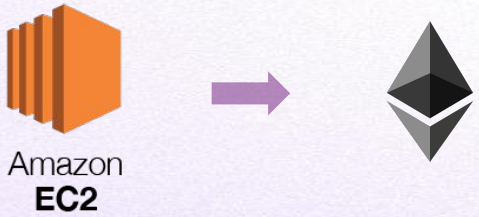


Market Pricing
cost-of-storage based on
supply and *demand*

Overview

- Background
- Demo
- Vision

Problem



https://twitter.com/DennisonBertram/status/1368555185946124294

Many decentralized apps are fairly centralized!

Research

Subspace: A decentralized database of edge devices

Jeremiah Wagstaff
June 12th 2018

Abstract

A purely peer-to-peer storage network would allow users to have full control over data they generate on the Internet without going through a remote server. Users could host their data directly on devices they already own, while replicating it across other devices on the network in a secure and persistent manner. We propose subspace, a decentralized key-value store with a familiar Javascript

Subspace: A Solution to the Farmer's Dilemma

Jeremiah Wagstaff
Subspace Labs
Palo Alto, California
jeremiah@subspace.network

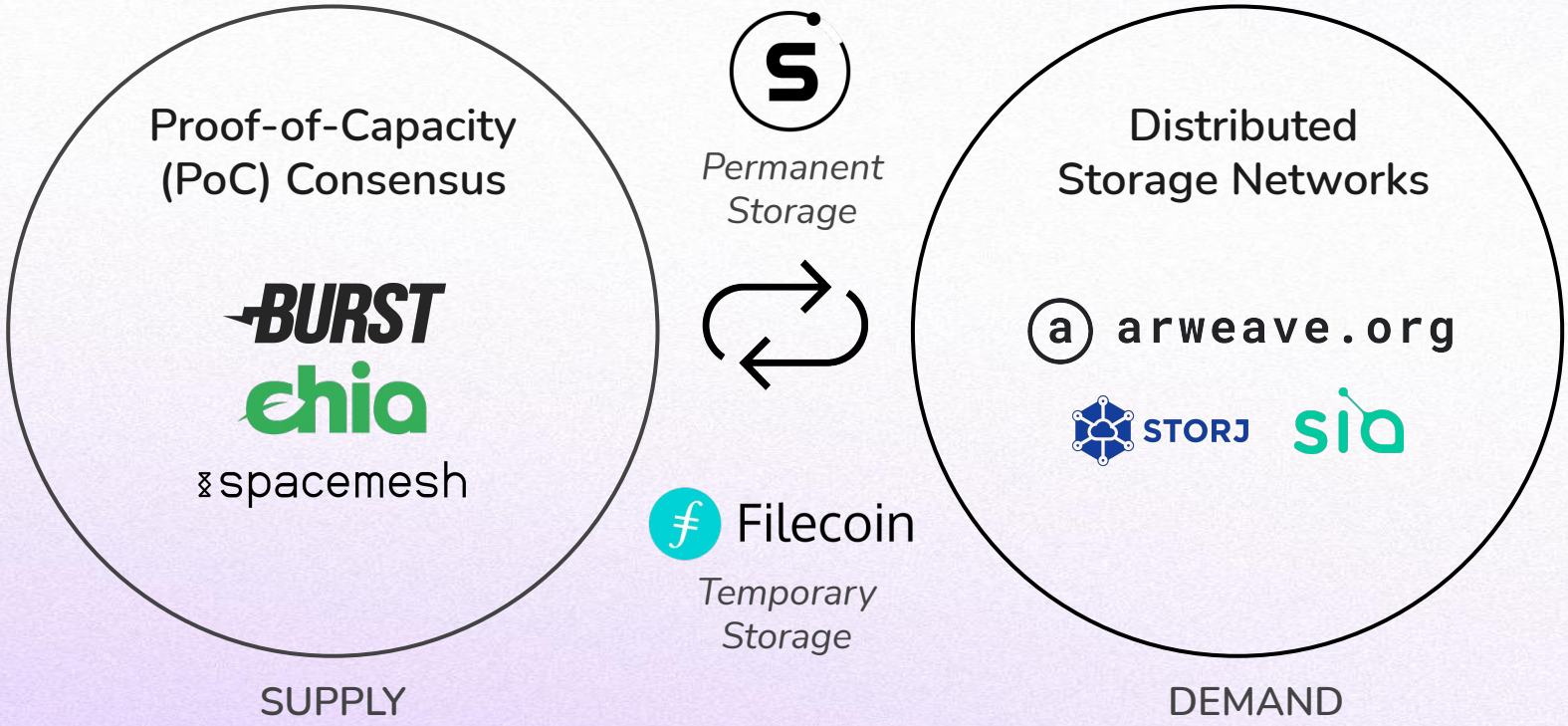
***Abstract*—In an effort to make blockchains more energy-efficient, egalitarian, and decentralized, several new protocols employ consensus based on *Proofs-of-Capacity* (PoC), which replace compute-intensive mining with storage-intensive farming. We observe that PoC consensus introduces a unique mechanism design challenge, referred to as *the farmer's dilemma*, which suggests that existing constructions are not actually incentive compatible. Simply put, farmers must decide whether to allocate scarce storage resources towards *either* maintaining the chain state and history *or* maximizing the amount of space they pledge towards consensus. Rational farmers will always choose the latter, at best becoming light clients, while at worst encouraging pooled farming under a few trusted operators. To resolve this dilemma, we introduce *Subspace*, a PoC blockchain in which farmers**

has access to low-cost electricity. Ethereum mining sought to circumvent this by adopting *one-GPU-one-vote*, but this too has proven susceptible to special purpose hardware and still has the tendency to concentrate in regions with low-cost electricity. This raises another key question of whether or not existing cryptocurrencies are actually decentralized, or if we have simply substituted one trusted third-party (financial institutions) for another (mining pools).

These challenges have served as a rallying cry for a diverse group of hackers, researchers, and engineers who have sought to design a sustainable blockchain that holds true to Nakamoto's vision for a more democratic and decentralized

NSF | America's SEED FUND SBIR.STTR

Solution


Proof-of-Capacity
(PoC) Consensus
BURST
chia
spacemesh
SUPPLY
Permanent
Storage
Filecoin
Temporary
Storage
Distributed
Storage Networks
arweave.org
STORJ
sia
DEMAND

May 2021

Open Grants Program

web3 foundation

PoC Consensus for Substrate

Spartan PoC
simple & secure

Milestone 1
Simple Consensus

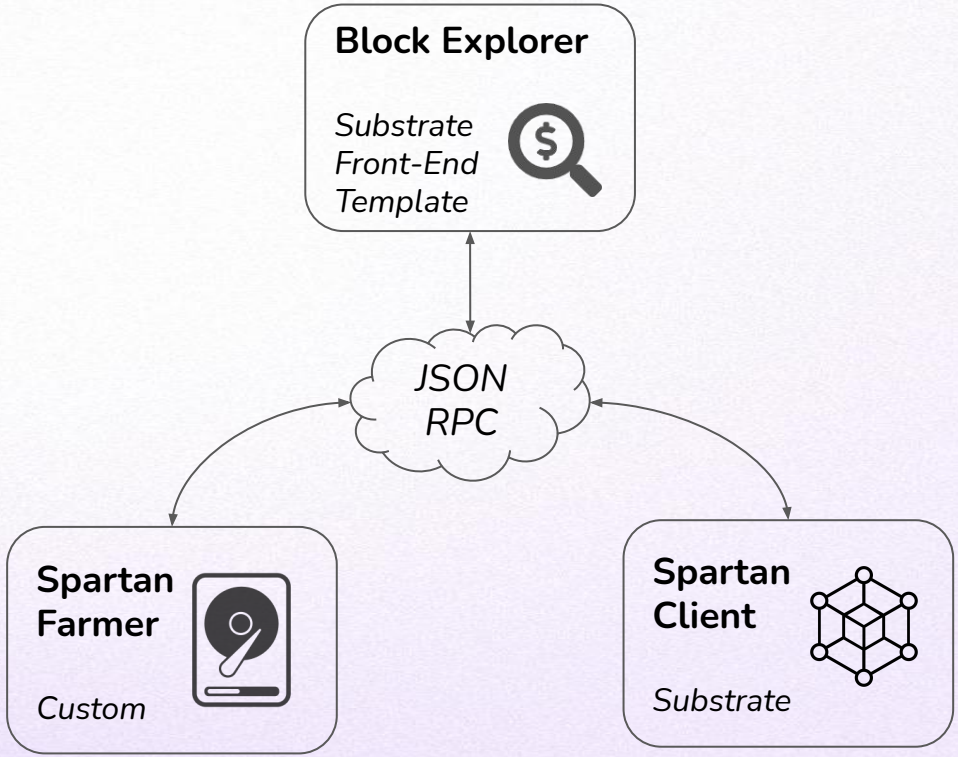
Milestone 2
Distributed Consensus

Milestone 3
Secure Consensus

Protocol Demo!

Workflow

1. Create plot (farmer)
2. Start Node (client)
3. Produce Blocks
4. Block Explorer
5. Network Explorer

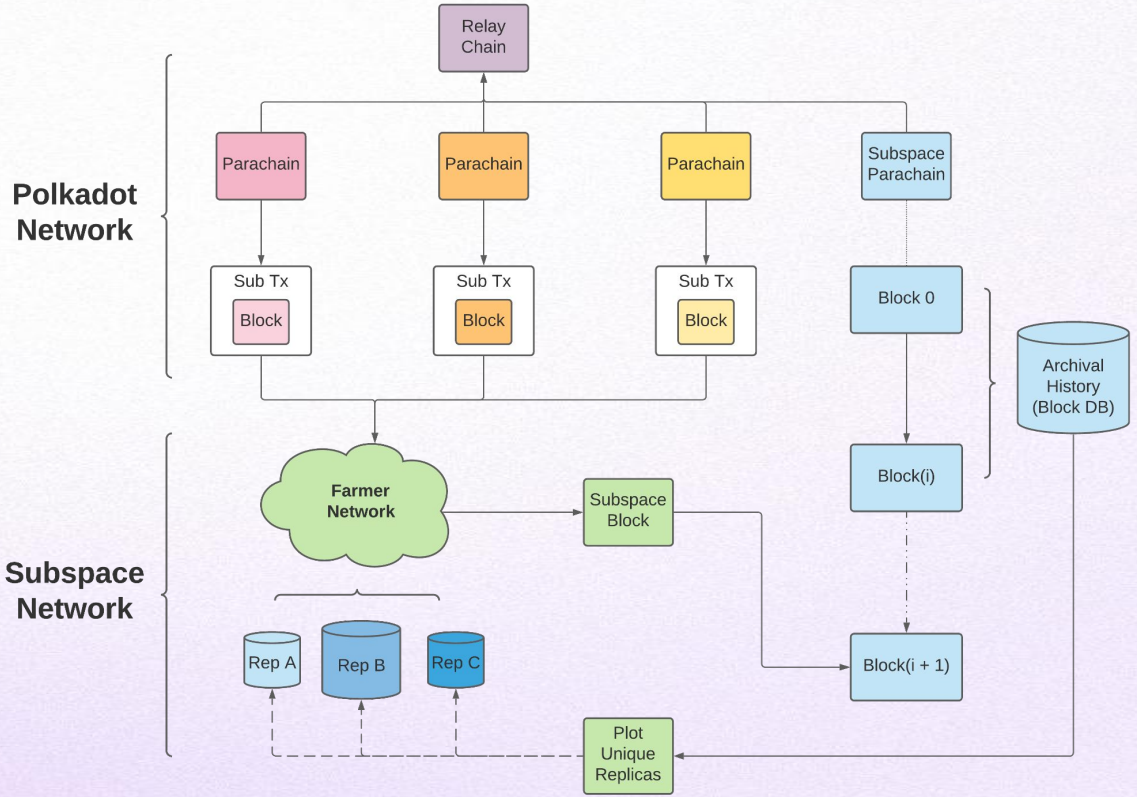


Vision

Archival storage
Parachain backups

Off-chain storage
NFT Metadata Storage

Cross-chain storage
XCMP Async Storage



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