



Anatomy of a Dapp – Rocket Pool



Introduction

- A quick overview of Ethereum consensus protocols, PoW / PoS.
- Rocket Pool – Decentralised app with a decentralised network.



The Dapp Tech

- Smart contracts, smart nodes and web frontends.
- Dapp frameworks and common tools.



Questions

- Quick summary of Rocket Pools Dapp.
- Ask me any questions ☺

Ethereum Consensus

How Ethereum keeps its entire decentralised network in sync



Current Generation – Proof of Work (PoW)



- Requires solving a hard calculation, also referred to as mining to achieve consensus.
- Miners use computer hardware to solve these calculations and if correct, they get rewarded ether.
- Large initial investment to participate, hugely resource intensive and not very environmentally friendly.

Next Generation – Casper, Proof of Stake (PoS)



- Casper is a smart contract that accepts deposits of ether from a node that is used to achieve consensus.
- Regular users can run these nodes and use their own deposits which are rewarded with interest.
- Environmentally friendly as low resources are required, but has high barriers to entry such as deposit size eg. 1000 ether.

Rocket Pool

A decentralised Proof of Stake pool with a decentralised network



What is the purpose of Rocket Pool?

Rocket Pool will integrate with Ethereum's new Proof of Stake system called Casper in 2018 and will allow everyday users and businesses the ability to earn interest on their ether holdings through a system that resembles a fixed term deposit.



Why should I use Rocket Pool?

In order to use Casper and earn interest on ether, users face several high barriers to entry which Rocket Pool removes. Currently the first version of Casper will require approximately 1,000 ether deposit minimum and users will be required to keep a full Ethereum node online 24/7 to validate transactions and get rewarded with interest. User will also need to keep node secure.

Rocket Pool will allow anyone with ether to earn interest by pooling users deposits together and managing the nodes.

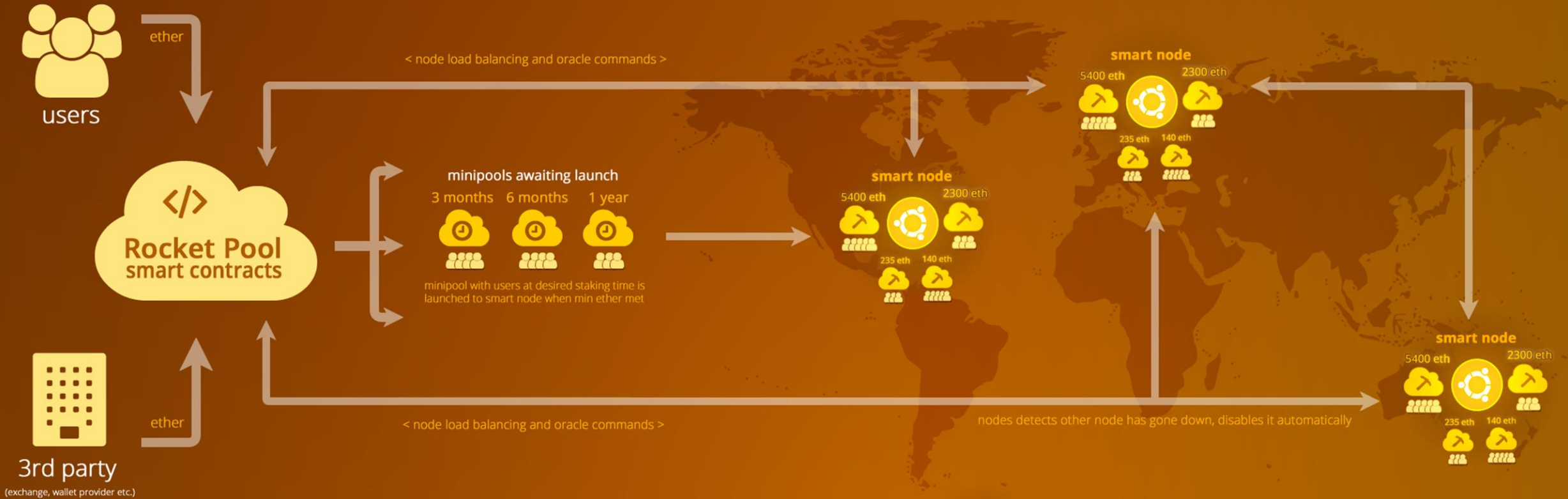


So how does Rocket Pool work?

Rocket Pool is composed of 3 primary elements. **Smart contracts**, **smart nodes** and **minipools**. All three integrate with each other to provide a network that can automatically scale and load balance itself across multiple cloud hosting providers in any region of the world.

When a user sends a deposit of ether to the Rocket Pool smart contracts, this user is grouped into a new smart contract called a minipool that contains other users deposits, when that minipool contains enough ether to work with Casper, it is assigned a smart node in the Rocket Pool network based on that nodes current server load and region, then its deposit is sent to Casper where it's monitored by Rocket Pools smart contracts.

Rocket Pool Network



Minipool Awaiting Launch

Will be assigned to a smart node and launched when min required Ether is met. Node assigned is based on geographic region and server load.



Minipool Staking

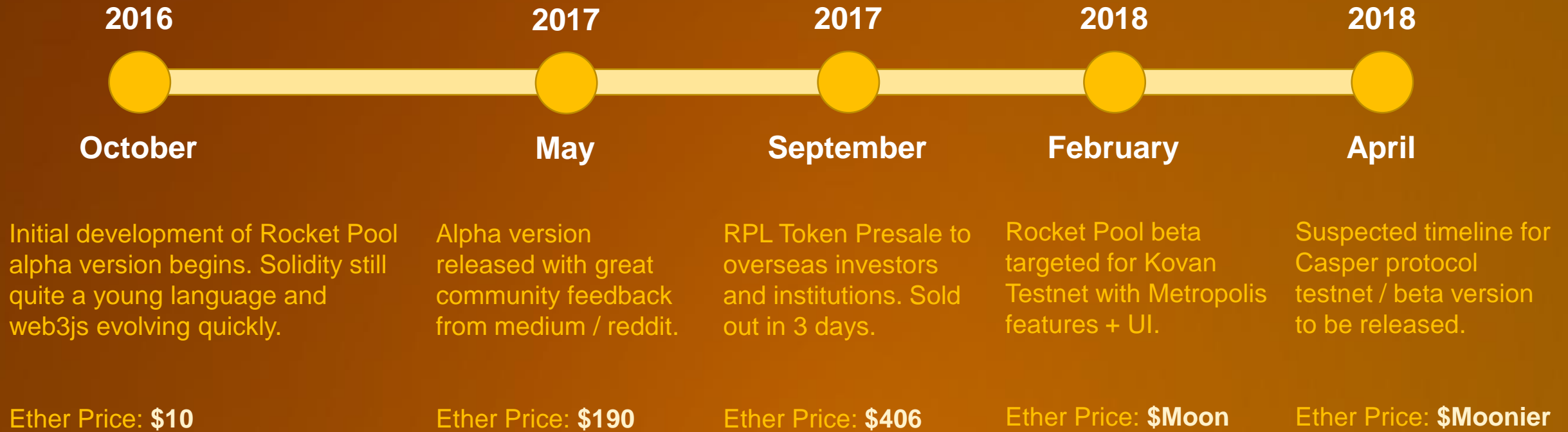
Minipool is assigned to a smart node and its collective deposit and node details are sent to Casper where it becomes a validator.



Smart Node

Not your average node. Smart nodes run special services that allow them broadcast their current server load, try to help other nodes and more.

Rocket Pool Timeline



The Dapp Tech

How the tech behind Rocket Pool works



Smart Contracts

- Programs that live on the blockchain that can execute code and enforce rules autonomously.
- Rocket Pools are written in Solidity, a contract-oriented, high-level language whose syntax is similar to that of JavaScript and it is designed to target the Ethereum Virtual Machine (EVM).
- Rocket Pools contracts accept ether from users or businesses, create other contracts themselves called minipools and monitor the status of the network.
- Rocket Pools contracts use a hub/spoke typology which allows almost every contract in the network to be upgradable.



Smart Nodes

- Full Ethereum nodes that contain a copy of the blockchain and are distributed around many different cloud hosting providers. They use Parity.
- These nodes will talk to Casper and be responsible for earning interest for Rocket Pools users by validating transactions on the blockchain.
- Not just a normal node. Each smart node has background processes written in NodeJS that allows it to listen for events on the main RP contract and also receive instructions from it.
- Each node in the Rocket Pool network is required to automatically report its server load to the main smart contract every 15 mins which helps to automatically load balance the network regardless of where each node is hosted.

The Dapp Tech

How the tech behind Rocket Pool works



Web Interfaces

- Rocket Pools frontend will be a combination of HTML, Javascript + web3 JS framework and truffle compiled contracts.
- If you're familiar with any kind of frontend using javascript, it's relatively easy to pickup.
- Requires an Ethereum browser such as Mist or using the Chrome plugin Metamask to interact with the blockchain.
- The aim of the UI is to be big, simple, effective and attractive and avoid the clunkiness associated with some Web3js apps currently in the ecosystem.



Dapp Tools and Frameworks

Tools and Frameworks used by Rocket Pool



Writing Contracts



VSCode

Great free editor that has numerous available plugins, including a Solidity addon that allows you to compile your contracts as you write them.

Deploying Contracts



Truffle

The best available framework for testing, tracking and deploying contracts to the Ethereum blockchain.

Testing Contracts



TestRPC

Get your own local version of an Ethereum blockchain up and running in seconds. Combined with truffle, creates a great, quick and easy testing environment.

Summary and Questions

Quick summary of Rocket Pool and any questions



What is Rocket Pool?

Rocket Pool is a decentralised application that controls a network of decentralised nodes which will help users and businesses earn interest on their ether when it integrates with Ethereum's new consensus protocol called Casper in 2018.



What kind of tech does Rocket Pool use?

Rocket Pool is composed of **smart contracts**, **smart nodes** and a **web frontend**. The smart contracts are written in Solidity which is a language similar to Javascript in syntax. The smart nodes are servers running a full copy of the Ethereum blockchain using node software called Parity with background services written in NodeJS. The web frontend is a mix of HTML, Javascript + web3js framework and can be used by any Ethereum browser or regular web browser with the Metamask plugin.



How was Rocket Pool made?

Rocket Pool was programmed in a free code editor called **VSCode** that uses a Solidity plugin for compiling smart contracts. These contracts are then tested, deployed and managed using the **Truffle Framework**. To make testing these contracts easier, **TestRPC** is installed which simulates a local Ethereum blockchain.