INTERPLANETARY CHAIN

A new blockchain attemtping to solve many current problems

1. Introduction

At the current state, blockchains are extremely useful and can be used to perform many different tasks with a little effort. Nonetheless, many problems are to be faced as the blockchain space is very young. There are many but we can resume them in a few points:

* Gas system (especially on PoW blockchains)
* Decentralization (especially on PoA and relate blockchains)
* Performances (especially on L2 blockchains)
* Accessibility (especially on PoS blockchains)

Almost any blockchain out there is based on the same concepts, and Interplanetary is not different: transactions, wallets, blocks, validators, hashes… the name itself push toward a cryptographic approach and this is absolutely valid.

How to solve those problems, so?

1. IPFS

IPFS, the Interplanetary File System, is a protocol approaching the file sharing method in a decentralized way. One could imagine IPFS as a network of nodes that provide indexes and, in some cases, copies of the files hosted.

As we’ve seen in the last years, IPFS powers a lot of NFT projects thanks to the distributed availability of the metadata files that can’t be hosted on a blockchain.

One of the perks of the IPFS protocol is that is possible to create federations of nodes totally detached from the rest of the IPFS system. A sort of internal federation.  
This brings interesting speculations like: is it possible to exchange messages and informations through IPFS granting decentralization, high availability and efficiency? Our tests answer clearly: yes, it is totally possible.

1. A BLOCKCHAIN BASED ON IPFS?

While is not possible to replicate the structure of a blockchain by simply federating IPFS nodes, the protocol can be leveraged to produce the basis of a communication system able to route messages, data and bytes in blocks of transactions through the federation.

Obviously, the cryptographic verifications, the main core of the security and the general structure of the blockchain have to be implemented through any other capable language, but the data transportation is already well tested and performant.

Theoretically, this kind of blockchain could even transfer high amount of data, while the current chains store a few kb per transaction. Provided scalability and/or resources, a chain based on IPFS won’t have problems in transferring data.

1. WHAT ABOUT GAS?

While we tried hard, we didn’t find any reason to implement a gas fee on Interplanetary Chain.  
IPFS protocol works flawlessly even without paying and the various costs can be paid back by any other kind of fee, just like most of the projects do.

So, why one should become a validator?

As in any blockchain, validators will receive a prize for their work based on data transferred and ratio of accepted validations. An additional gas fee isn’t really required.

1. VALIDATORS AND CONSENSUS

No blockchain is alive without a consensus system. PoS, PoR, PoW and PoA are currently dominating the market and our solution isn’t much different than a sort of PoS, except for the fact that is not the staking to make a validator suitable but a mix of randomness, elderly and behaviour.

We called this consensus Proof of Integrity, codename “Democracy”.  
How does it work?

For each block, any node with 5 days or more of participation can be choosen to be part of a n members jury. The jury validate the nodes in a independent way through cryptographic methods such as hash comparison, validation and so on. When the jury emit the vote, if there is a disagreement the jury is replaced by other n members. The majority will make it clear which vote is the right one. Members that validate wrong blocks returns to day 1 elderness and loose the opportunity of validate for some days. Repeated offenses lead to exclusion.

1. BUT CRYPTOGRAPHY…

Don’t worry, cryptography is just there. Any tx is signed and verified with the classic Private/Public keypair, and any node hash is the result of the tx included. A nonce will guarantee unicity.  
More, the code itself is made for accepting federations only from compatible nodes through auto-hashing and auto-reporting. This means that if someone forks the code, the other nodes will recognize it and ban the node.