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IPFS: What is it? When will it be practical?
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IPFS: What is it? When will it be practical?

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Abstract

Keywords: Android, processes, strace, ltrace, provenance.

1 Introduction

"IPFS is a new hypermedia distribution protocol, addressed by content and identities. IPFS enables the creation of completely distributed applications. It aims to make the web faster, safer, and more open." New? 201x?

1.1 What is IPFS? What does it offer?

Many of the terms used below are explained in detail in the Background section.

IPFS is a distributed file system. The word file here is used with a wide meaning – e.g., it can be a ledger record. Currently (2018), only an alpha version is implemented. It can be installed from ipfs.io into a Linux, Windows, or Mac system.

IPFS whitepaper by Juan Benet https://medium.com/@ConsenSys/an-introduction-to-ipfs-9bba4860abd0

youtube.comNovember 19, 2016 The Decentralized Web, IPFS and Filecoin - Juan Benet Recorded at the Silicon Valley Ethereum Meetup - October 22nd, 2016

youtube.com December 8, 2016 The next Internet Revolution — Juan Benet — TEDxSanFrancisco Juan explains why the web is in danger and how there's an open source movement focused on creating a new way of sharing knowledge is building the Interplanetary Files System (IPFS).The Interplanetary Files System (IPFS), an open source movement focused on creating a new way of sharing knowledge.

IPFS is a distributed file system that seeks to connect all computing devices with the same system of files. In some ways, this is similar to the original aims of the Web, but IPFS is actually more similar to a single bittorrent swarm exchanging git objects. IPFS could become a new major subsystem of the internet. If built right, it could complement or replace HTTP. It could complement or replace even more. It sounds crazy. It is crazy."[1]

"IPFS is a global, versioned, peer-to-peer filesystem. It combines good ideas from Git, BitTorrent, Kademlia, SFS, and the web. It is like a single bittorrent swarm, exchanging git objects. IPFS provides an interface as simple as the HTTP web, but with permanence built in. You can also mount the world at /ipfs.IPFS could become a new major subsystem of the internet. If built right, it could complement or replace HTTP." https://alternativeto.net/software/ipfs/

"IPFS is a new hypermedia distribution protocol, addressed by content and identities. IPFS enables the creation of completely distributed applications. It aims to make the web faster, safer, and more open." New? 201x?

"Ten terrible attempts to make the Inter Planetary File System human-friendly This article is part 6 of the Blockchain train journal, start reading here: Catching the Blockchain Train. hackernoon.comSeptember 26, 2017"

decentralized.blog August 10, 2017 Understanding the IPFS White Paper part 1 This article is part 4 of the Blockchain train journal, start reading here: Catching the Blockchain Train. The crypto currency/blockchain world loves its white papers, and IPFS is no exception.

https://blockchainmind.com/ipfs/

https://blockonomi.com/interplanetary-file-system/

"Most people aren't running IPFS nodes, and IPFS isn't seen yet as a valuable resource by censors. So they'll probably just block the whole domain, and now people won't know about or download IPFS. We saw this progression with GitHub in China."

2 IPFS Hands on Introduction

Demo:: "Install IPFS on a server, create a new repo with ipfs init . Start a background IPFS node daemon process with: ipfs daemon & , add the files to the network with ipfs add -r ¡your-files¿ and pin the hash that you want to keep online forever with ipfs pin add -r ¡your-ipfs-hash/¿ ."

atnnn.com August 2, 2016 Serving a website over IPFS This page is available over HTTP at http://atnnn.com but also over IPFS at /ipns/atnnn.com. Here's how I do it: The rest of this article goes into more details and explains why you might want to do it too.

youtube.com Distributed Apps with IPFS (Juan Benet) - Full Stack Fest 2016 The InterPlanetary File System (IPFS) is a new hypermedia distribution protocol, addressed by content and identities. IPFS enables the creation of completely distributed applications. It aims to make the web faster, safer, and more open. IPFS enables completely decentralized and distributed apps. An

ipfs.ioMay 17, 2017 Take a look at pubsub on IPFS We recently merged a simple, experimental pubsub implementation into IPFS. This implementation is just a beginning. It is far from the performance and security goals we will achieve in our long-term target.

youtube.com IPFS Hands on Introduction This is a Hands on Introduction to IPFS.Includes:- Discussion on the problems IPFS solves- The basic model of IPFS- In-depth first steps with the IPFS commandline interface- Demos of adding files, downloading files, media streaming, booting VMs, and publishing names.—Recorded on 2015-04-23Presente

youtube.com July 12, 2017 Tutorial: How to build an Collaborative Editing Application with IPFS using CRDT This is a tutorial on how to create Distributed Web Applications with CRDT (Conflict-Free Replicated Data Types) and the JavaScript Implementation of IPFS*References:*- IPFS - https://ipfs.io- js-ipfs - https://github.com/ipfs/js-ipfs- Code for the Demo - https://github.com/ipfs-labs/shared-e...

https://getpocket.com/explore/ipfs

2.1 Paper Organization

3 Background

Juan Benet (the BDFL of IPFS).

https://decentralized.blog/catching-the-blockchain-train.html

https://decentralized.blog/understanding-the-ipfs-white-paper-part-2.html figures.

3.1 HTTP

3.2 BlockChain

3.3 Web Sockets

3.4 TBD

3.5 TBD

3.6 TBD

https://ipfs.io/docs/getting-started/ Add more details.

peer-to-peer systems distributed file system

Kademlia + BitTorrent + Git non-blockchain protocol an object storage engine (think S3) IPFS Companion 2.2.0 brings window.ipfs to your Browser ipfs.io

a dat version

File Permanance decentralized

Censor-Proof Networks

youtube.comFebruary 18, 2017 Juan Benet: Enter the Merkle Forest Juan Benet, founder of IPFS and Filecoin, describes IPLD and "The Merkle Forest" at the IPFS Ethereum Hackathon hosted by MetaMask, Seattle 2017.

3.7 Hashes

```
$ echo -n 'hello' > /tmp/hello.txt
$ sha256sum /tmp/hello.txt
2cf24dba5fb0a30e26e83b2ac5b9e29e1b161e5c1fa7425e730433629
```

Double-sha256 is sha256(sha256(data)); note the missing "sum".

3.8 MerkleTree

A Merkle tree is an n-ary tree in which every leaf node is labelled with the hash of a data block and every non-leaf node is labelled with the hash of the labels of its child nodes. Merkle trees are typically implemented as binary trees,.

Figures/merkle-bin-tree.png   Figures/merkle-tree.jpg Figures/merkle-tree-2.png

Once built, data can be audited (known as a Merkle-Proof) using only the root hash in logarithmic time to the number of leaves. https://en.bitcoin.it/wiki/Protocol_documentation#Merkle_Trees

3.9 Blockchain

4 Architecture of IPFS

Identities - manage node identity generation and verification. Network - manages connections to other peers, uses vari-

ous underlying network protocols. Configurable. Routing - maintains information to locate specific peers and objects. Responds to both local and remote queries. Defaults to a DHT, but is swappable. Exchange - a novel block exchange protocol (BitSwap) that governs efficient block distribution. Modelled as a market, weakly incentivizes data replication. Trade Strategies swappable. Objects - a Merkle DAG of content-addressed immutable objects with links. Used to represent arbitrary data structures, e.g. file hierarchies and communication systems. Files - versioned file system hierarchy inspired by Git. Naming - A self-certifying mutable name system.

IPFS - Content Addressed, Versioned, P2P File System (DRAFT 3) Juan Benet (Juan Batiz-Benet) juan@benet.ai

4.1 IPNS

4.2 IPLD

4.3 libp2p

https://discuss.ipfs.io/ https://github.com/ipfs/community/blob/master/contributing.md#dive-right-in

5 Implementation

5.1 Android

https://www.reddit.com/r/ipfs/comments/8o96yg/ipfs_on_android/

https://github.com/ligi/IPFSDroid Android App for the InterPlanetary File System(IPFS) No Full node yet! Mainly for developers currently to experiment with IPFS on Android. Jul 2018

https://stackoverflow.com/questions/45388191/ how-to-use-ipfs- from-javascript-app- without-running-ipfs-node

https://ethereum.stackexchange.com/questions/23036/ ipfs-android-cant-add-file

6 Distributed Apps

DApp:: medium.comAugust 13, 2017 The ultimate end-to-end tutorial to create and deploy a fully decentralized Dapp in ethereum In this tutorial my objective is to walk you through the steps required to create a descentralized application from start to finish and deploy it in ethereum.

news.ycombinator.comMarch 29, 2018 OpenBazaar 2.0, powered by IPFS : Hacker News How do you intend to prevent sybil attacks on seller ratings? Since there are no ac-

count sign ups and subsequent verifications, it would be theoretically possible to create a large number of accounts with fake reviews. There are a few factors that still make reviews somewhat useful though.

hackernoon.comJune 11, 2018 A short trip to Jupyter via the Inter-planetary File System IPFS is the Distributed Web. It is an idea and a protocol designed to support a distributed file system that seeks to connect all computing devices with the same system of files. There has been plenty of hype around IPFS, but much of it is well-deserved.

nytimes.comJune 8, 2018 Beyond the Bitcoin Bubble The sequence of words is meaningless: a random array strung together by an algorithm let loose in an English dictionary. What makes them valuable is that they've been generated exclusively for me, by a software tool called MetaMask. In the lingo of cryptography, they're known as my seed phrase.

https://d.tube/ https://news.ycombinator.com/item?id=16481112 heimindanger Feb 2018

A good old website? No. We don't need the domain, you can take the https://github.com/dtube/production repository, ipfs add -r it on ipfs, and use DTube this way -¿ https://ipfs.io/ipfs/QmRWPnY8h7Eg4v74GtKT6UBy2kUAN139Qw (few bugs but it works apart from /home not being rendered on first load, you need to click the logo)

What is decentralised:

- The website (its fully static and can be hosted on ipfs)

- The video storage (IPFS)

- The account system / commenting / voting / subscribing (when you do that, it directly creates the transaction on the blockchain)

What isnt decentralised:

- The upload endpoints (upldr*.d.tube). You can legitimately avoid it if you have a local IPFS node running and you add files yourself, however it's really not convenient for users.

- The search endpoint (asksteem.com). This is used for the search, tags browsing, and related videos.

- Server side rendering stuff for robots only (we enabled that recently)

P.S: I am the founder of DTube

BitKariero A decentralised record of professional credentials http://students.cs.ucl.ac.uk/2016/group15/index.html https://github.com/bitkariero students.cs.ucl.ac.uk

Architecture. The backbone of our application is built on Ethereum and IPFS.

Vlattice https://github.com/danielquinn/vlattice/ A "video lattice", this will essentially be a federated YouTube, but realistically, it could be used for permanent distribution of files of any type.

7 Evaluation

7.1 Hype

"HTTP is obsolete. It's time for the distributed, permanent web."

7.2 Nextgen Web?

Nextgen Web? Replace HTTPS. news.ycombinator.comDecember 16, 2016 An introduction to IPFS : Hacker News The claim is that IPFS could replace HTTP, the web, and so on. The only thing I see, however, is a distributed filesystem, which is only one part of the puzzle.

8 Related Work

9 Conclusion

References

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