

Ethereum Network

Decentralized Applications



Ethereum

Paris LearningGeeks

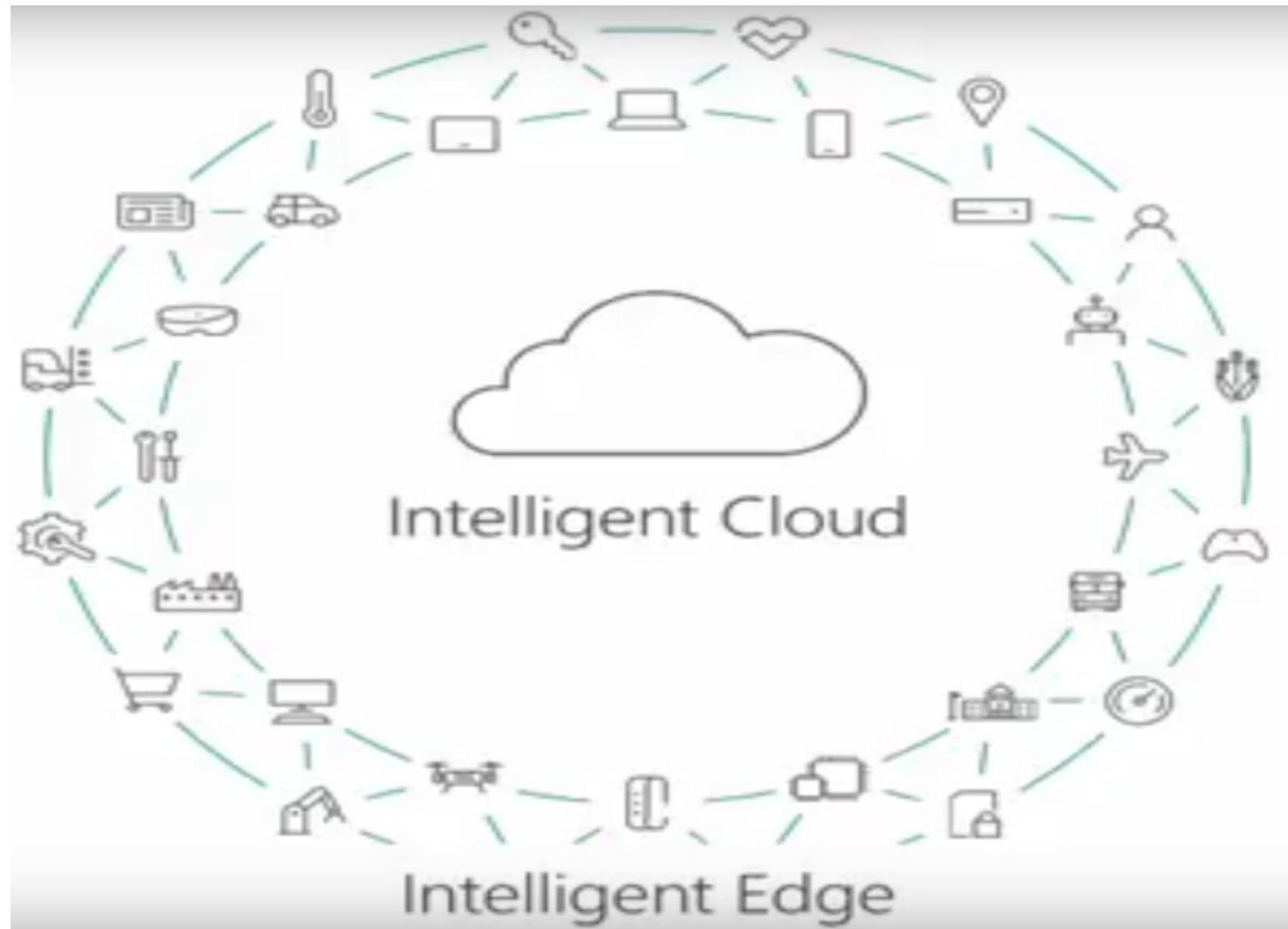
Ethereum Network



What is a Blockchain?

- Distributed Ledger Technology (DLT), managed by a Node-to-Node Overlay Virtual Network, governed by a consensus protocol, allowing the secure transfer of VALUE between two entities, to write FACTS and RULES unique, immutable, traceable and auditable in the form of TRANSACTIONS in BLOCKS chained to each other.

Centralized to Decentralized



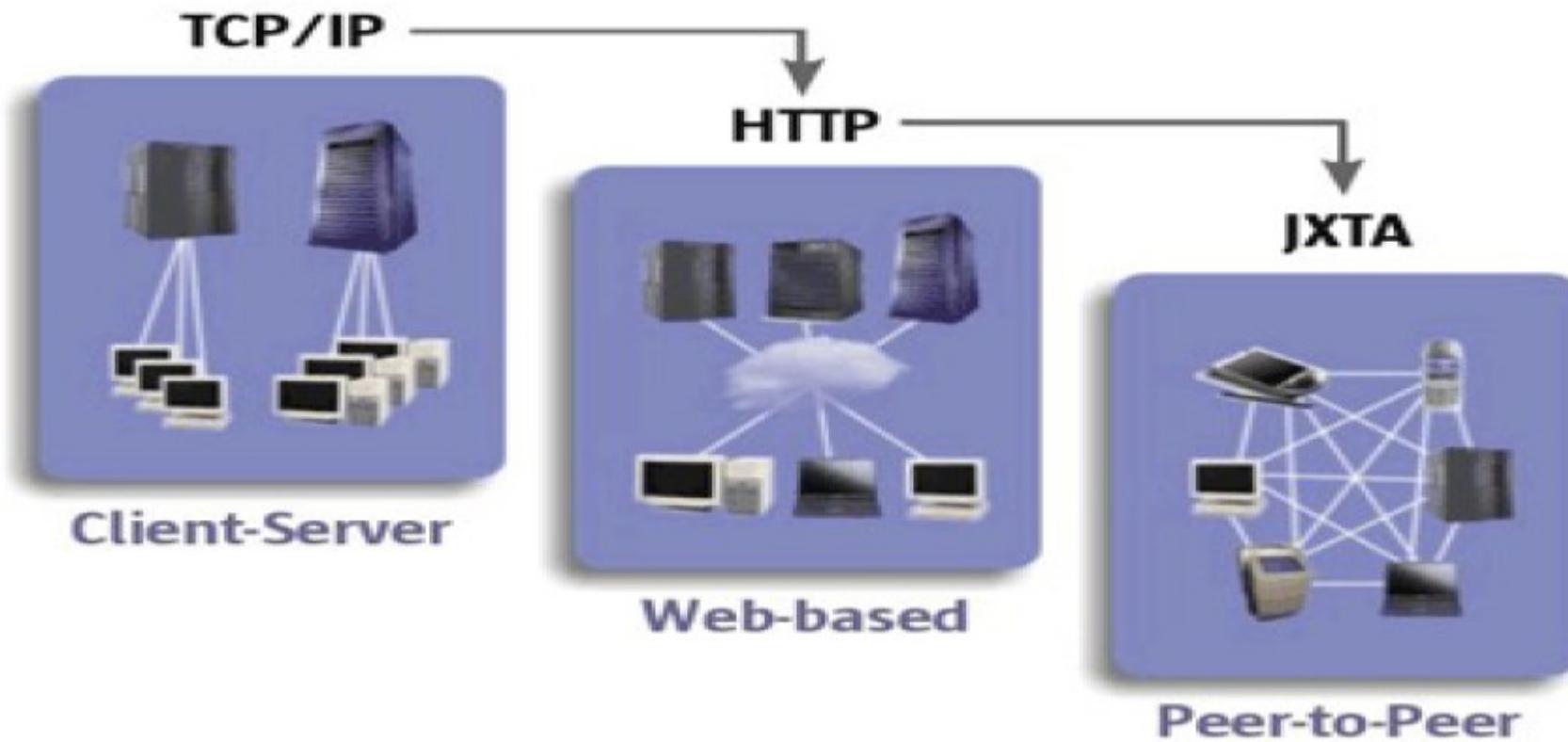
Centralized World Wide Web!



Source: Sun Microsystems

Centralized to Decentralized

Evolutions des systèmes répartis :
du tout **centralisé** vers le tout **décentralisé**



Source: Sun Microsystems

Centralized to Decentralized

The Meaning of Decentralization – Vitalik Buterin – Medium

<https://medium.com/@VitalikButerin/the-meaning-of-decentralization-a0c92b76a274>

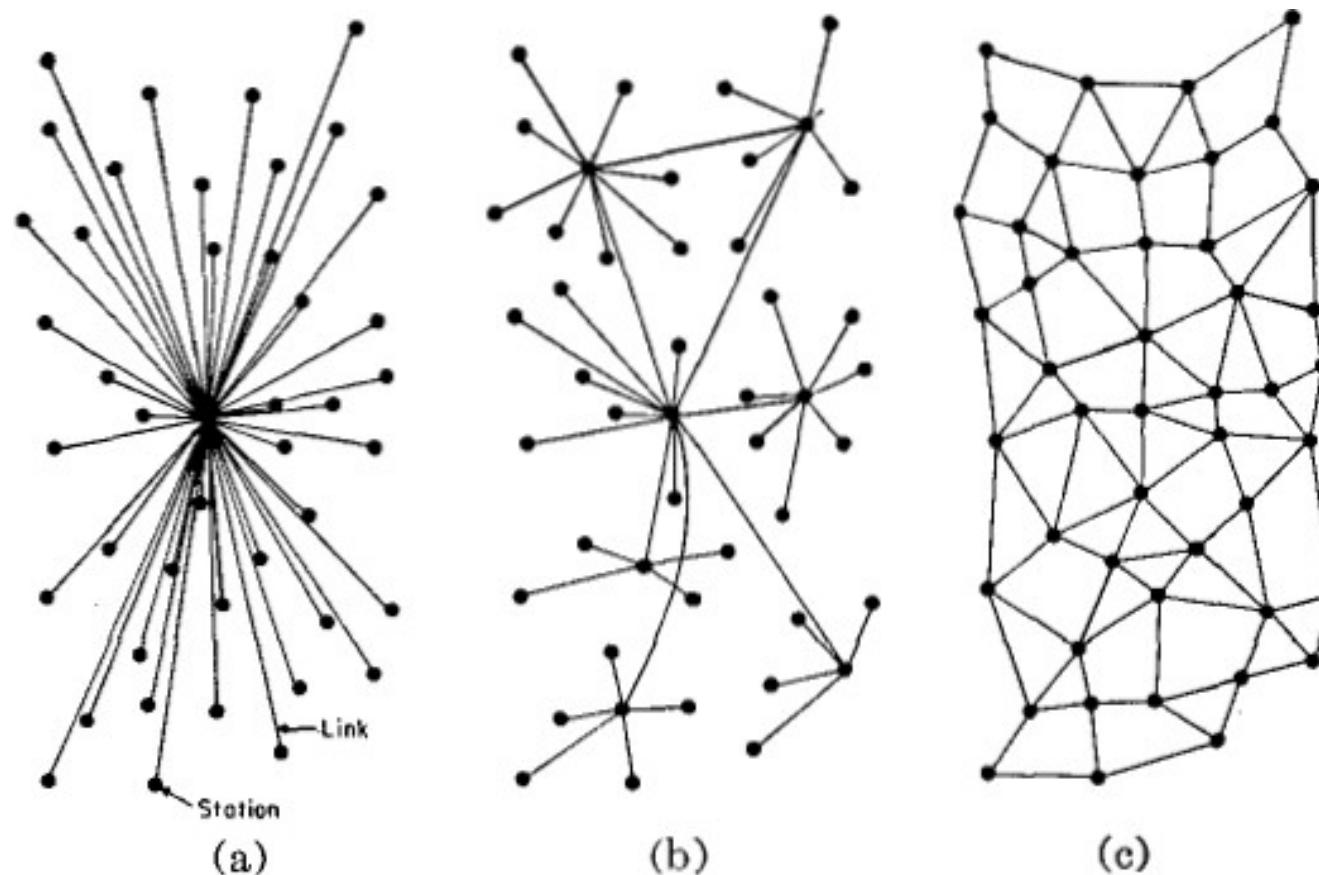
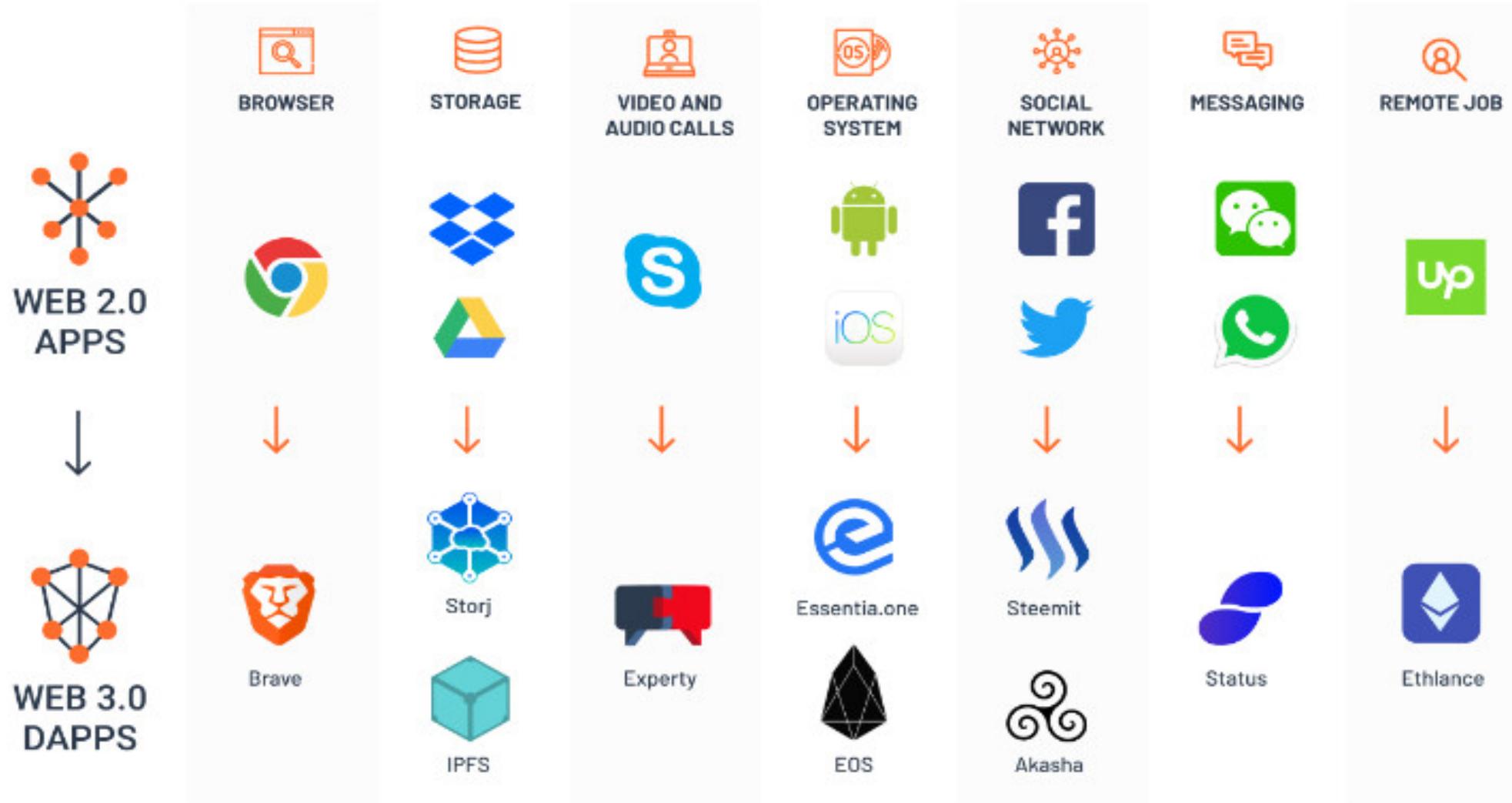
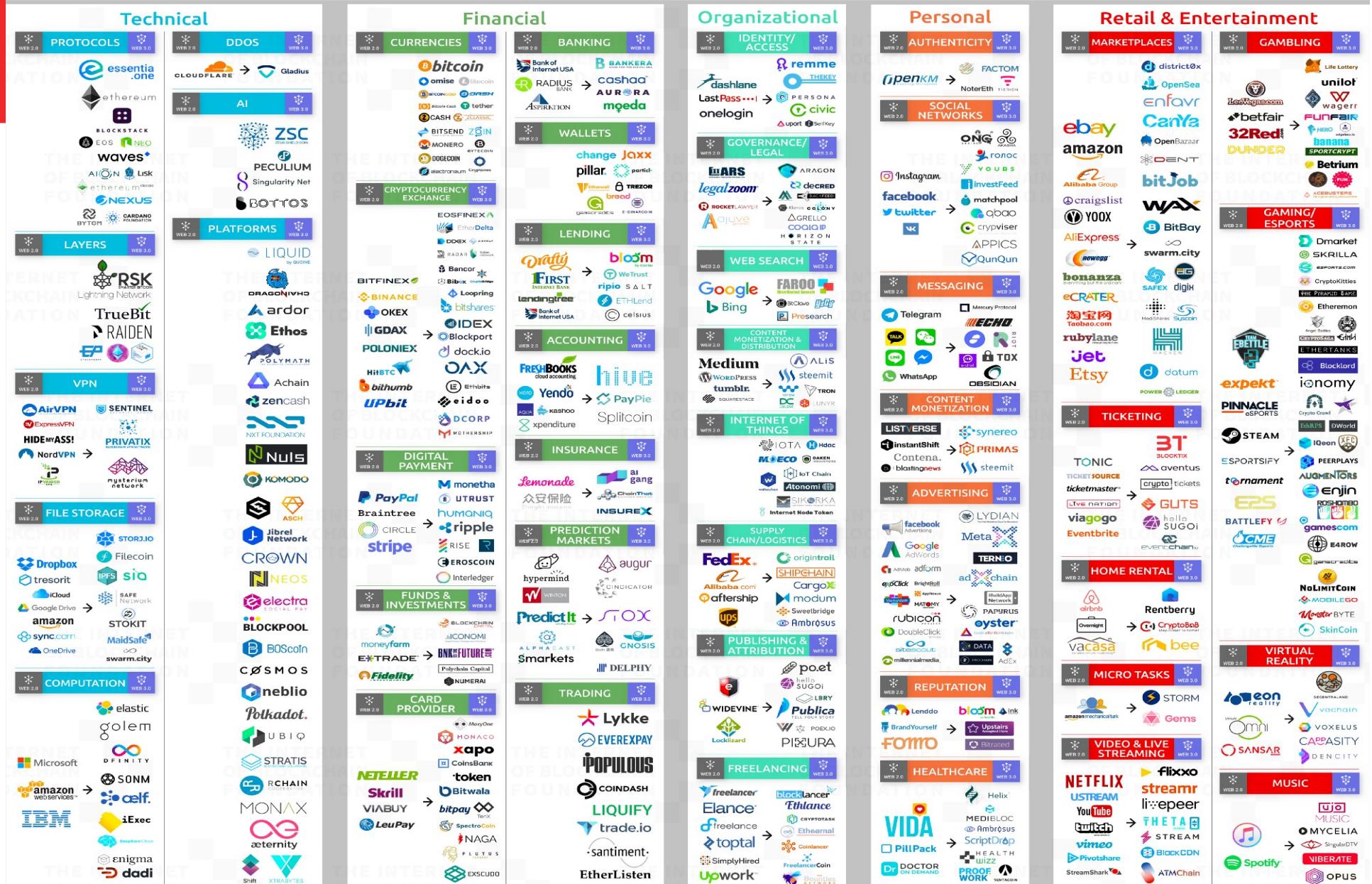


Fig. 1—(a) Centralized. (b) Decentralized. (c) Distributed networks.

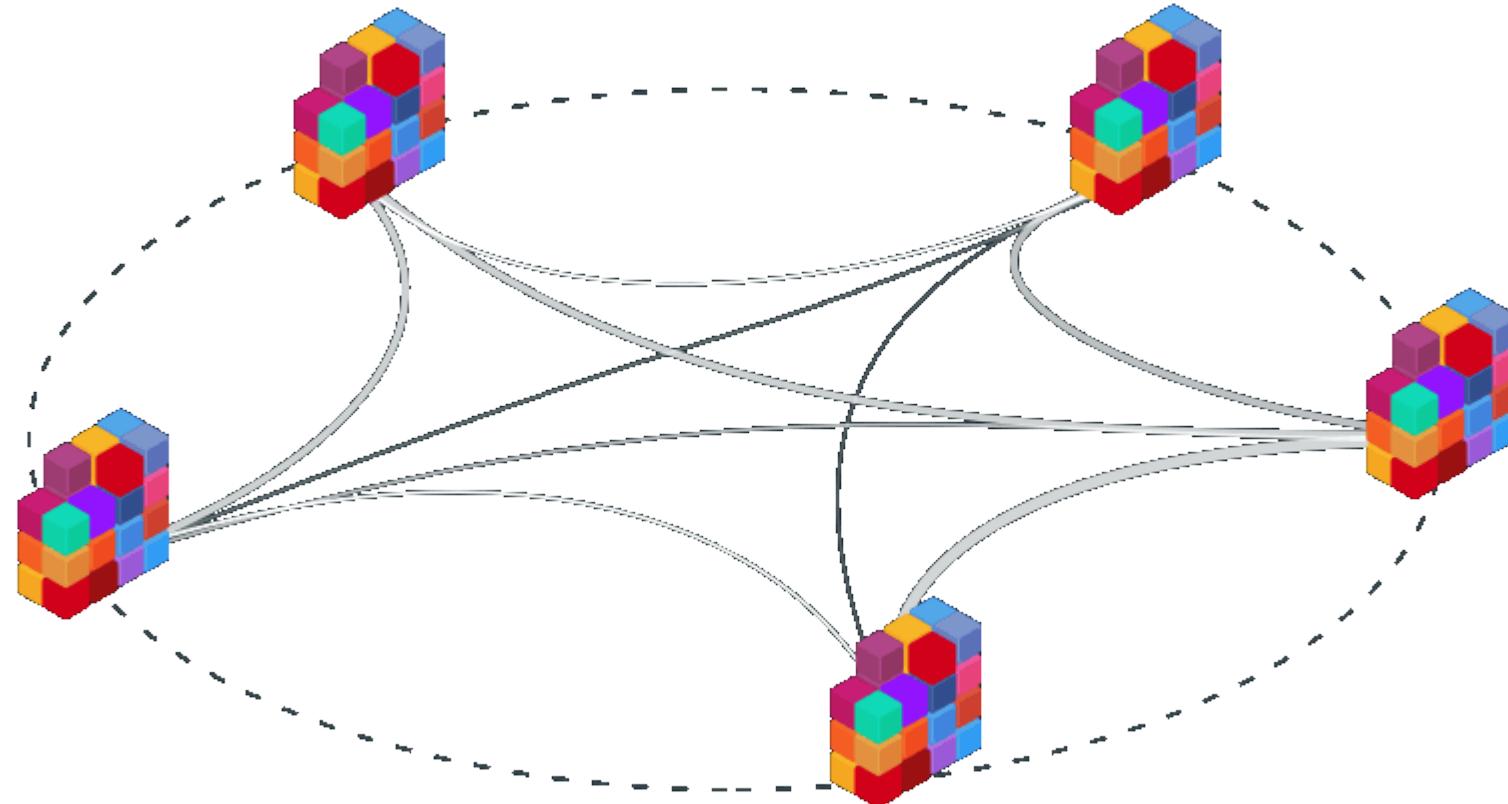
Web 2.0 → Web3



WEB 3.0: THE INTERNET OF BLOCKCHAINS



Ethereum Overlay Node-to-Node (N2N) Network



ÐΞVp2p Wire Protocol :

<https://github.com/ethereum/wiki/wiki/%C3%90%C3%A9Vp2p-Wire-Protocol>

Acronymes

P2P = Peer-to-Peer

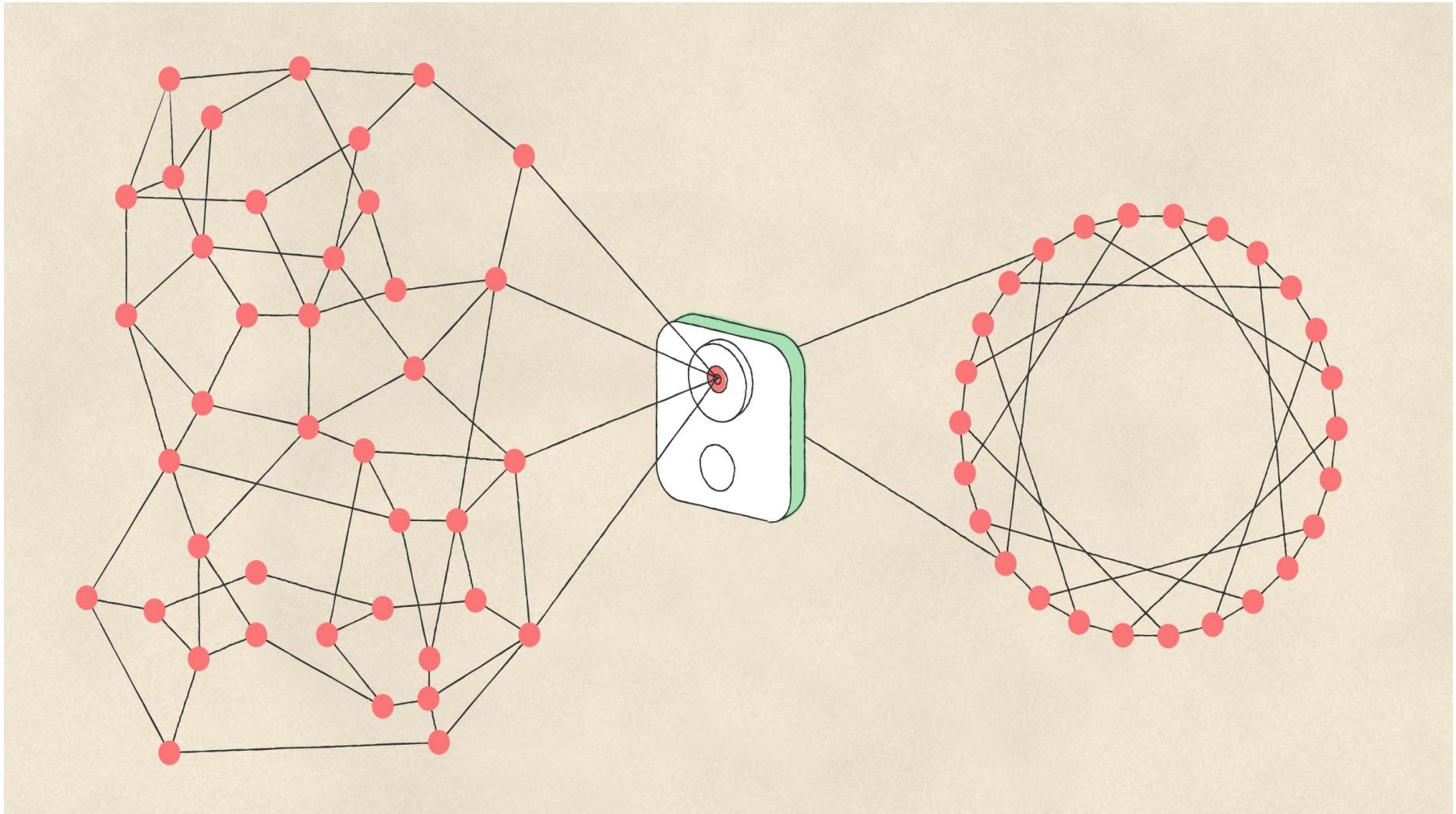
N2N = Node-to-Node

DLT = Distributed Ledger Technology (Example Ethereum)

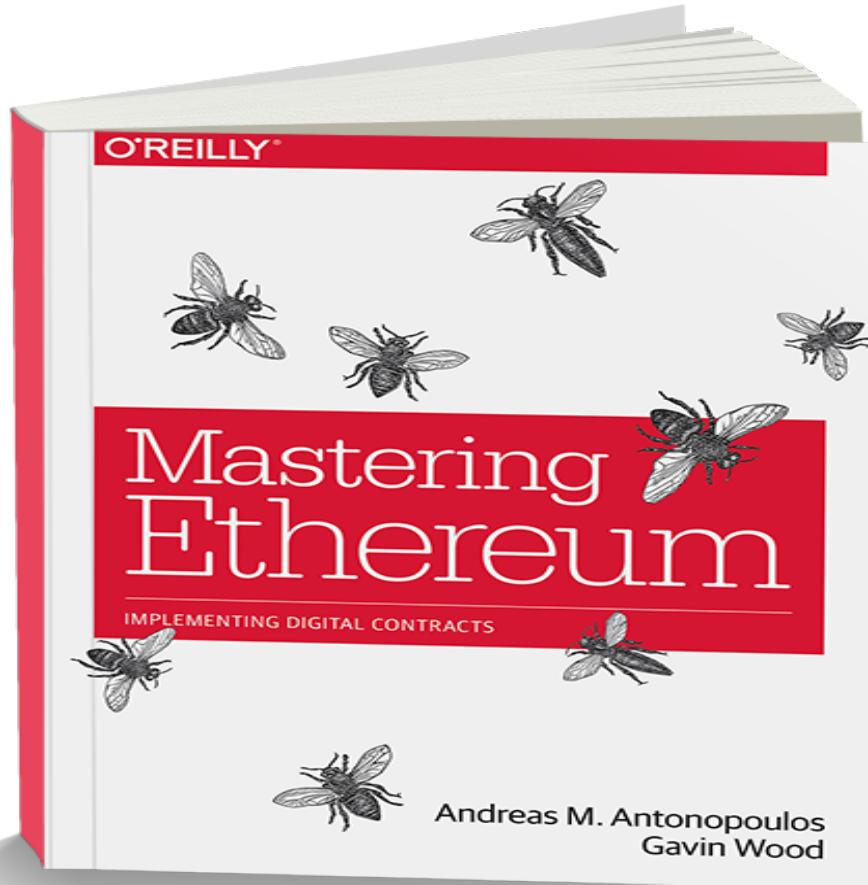
DHT = Distributed Hash Table (Example IPFS)

Web3 = (Front-end Web 2.0 (Angular/React) <--> DHT (IPFS)) Juxtaposition with DLT (Ethereum)

Node-to-Node Overlay Network

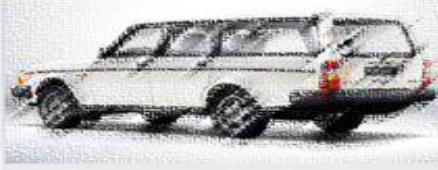
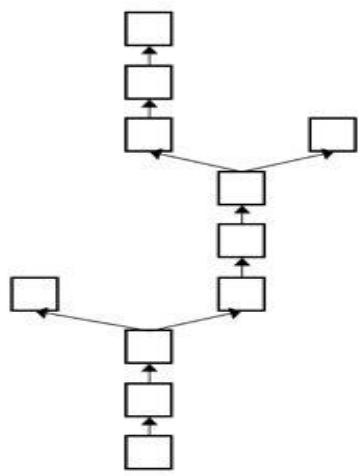
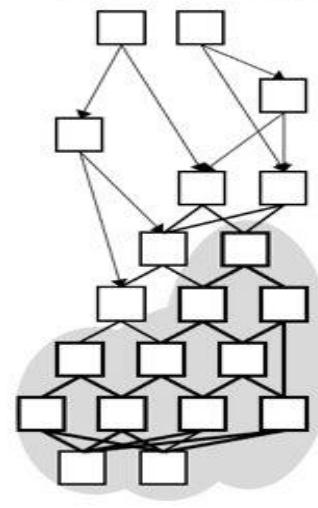
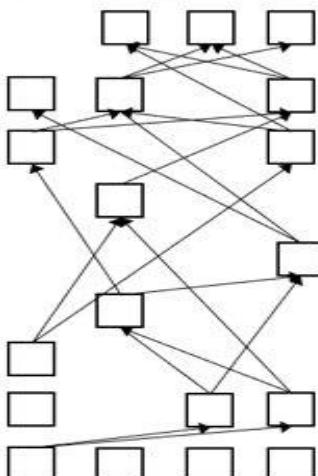


Ethereum Book

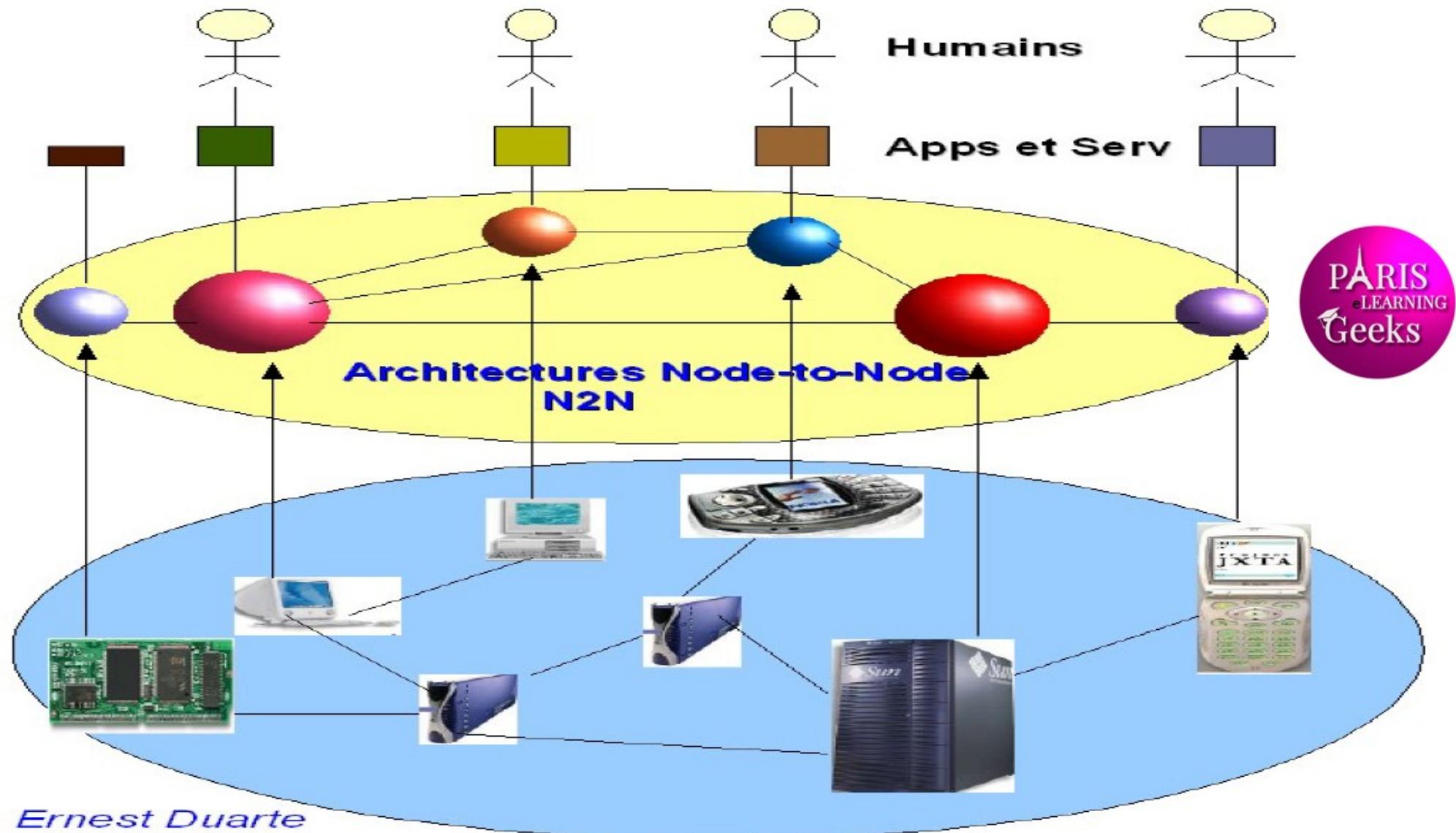


<https://github.com/ethereumbook/ethereumbook>

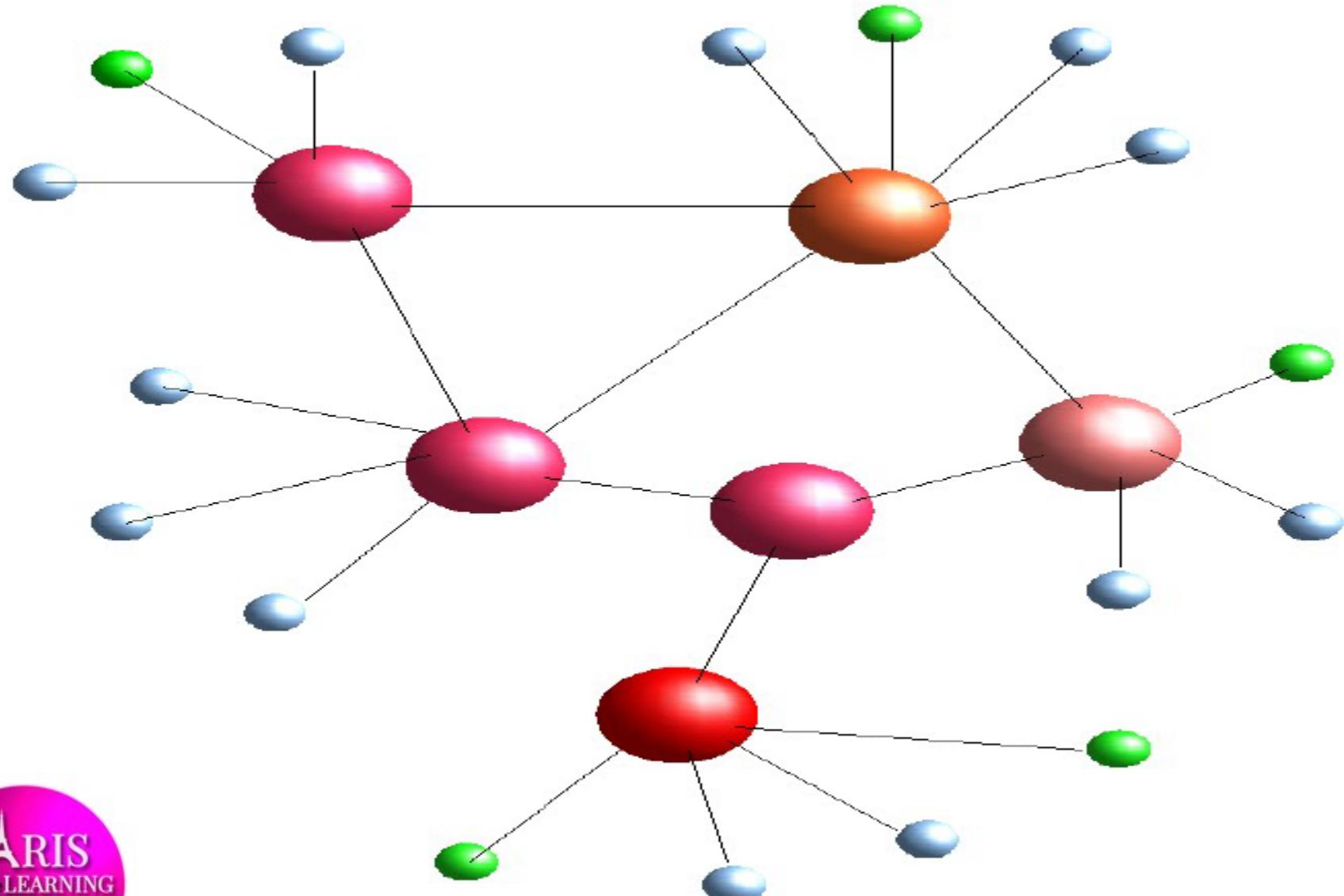
DLT Distributed Ledger Techno

	Blockchain	Tangle	Hashgraph
			
			
Technology	Block chain	Directed acyclic graph	Directed acyclic graph
Copyright	Open source	Open source	Patented
Consensus	Proof of Work: SHA256-Hash	Proof of Work: check of Tangle tip	Virtual voting
Openness	Public ledger	Public ledger	Private ledger
Applications	Bitcoin	Iota	Swirls
Efficiency (tps)	3-4	500-800	> 250,000

DLT / DHT OverLay N2N Network



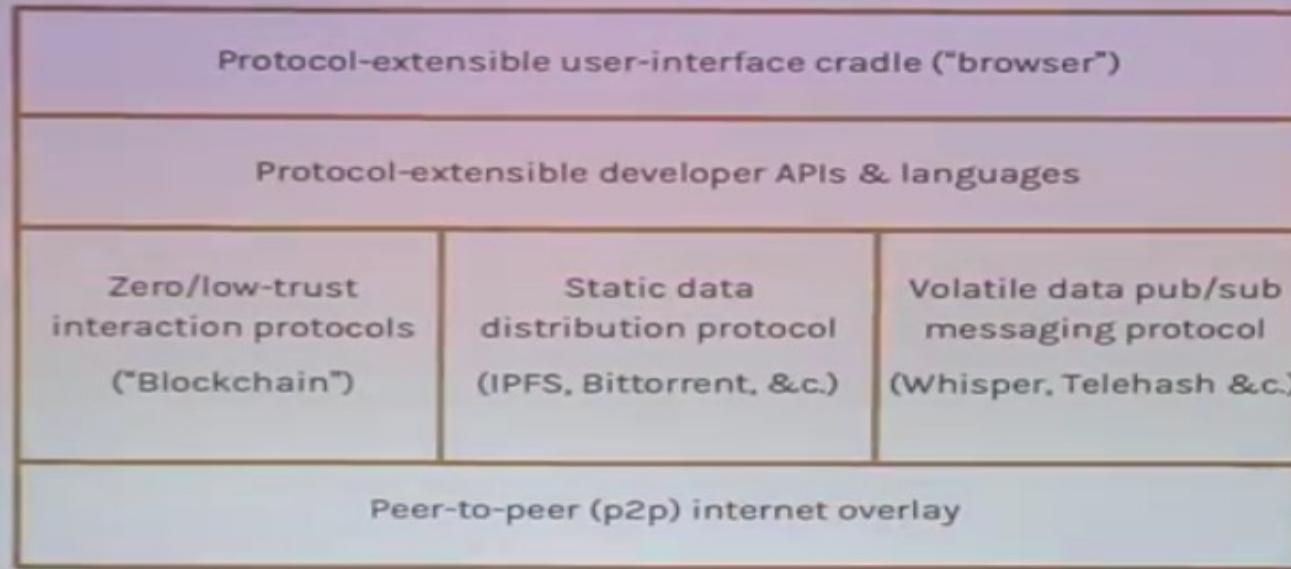
DLT / DHT OverLay N2N Network



LearningGeeksNetwork

Web3 Foundation / Parity

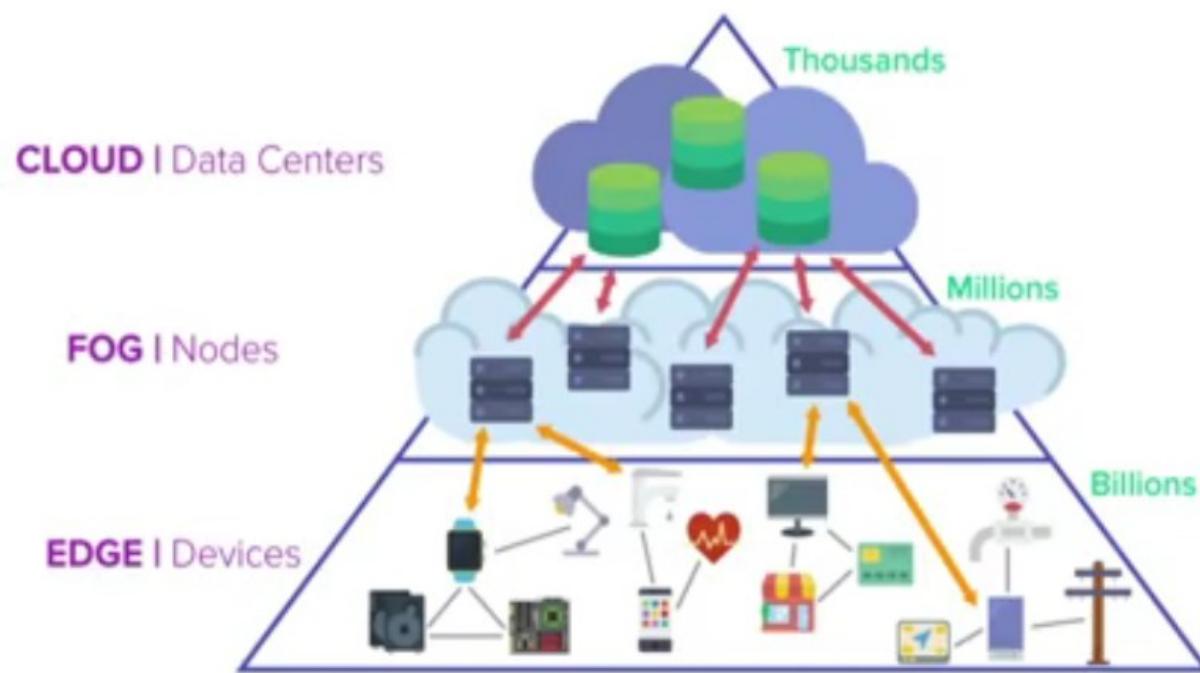
The Web3 stack, roughly...



Edge Computing Cloud Computing

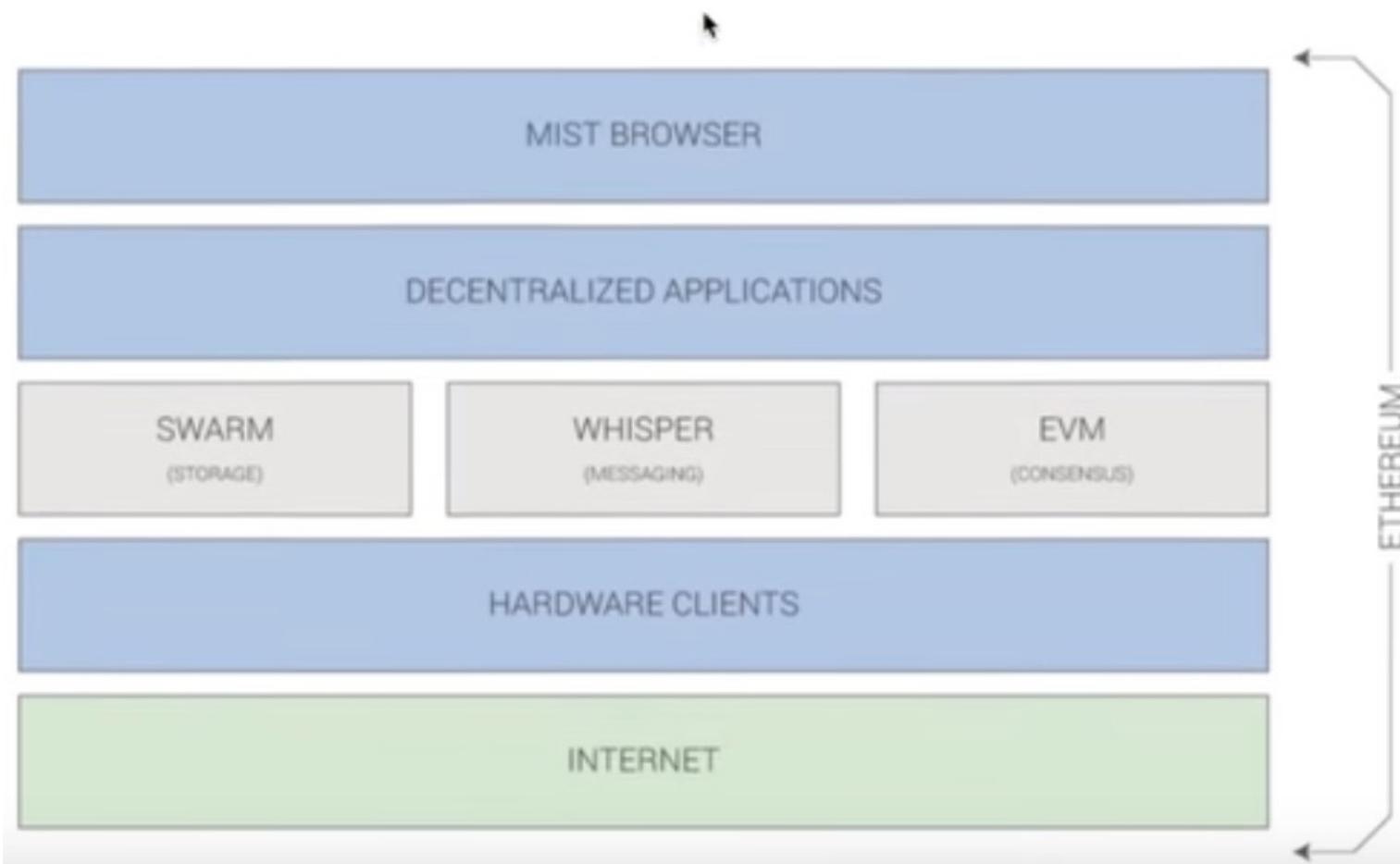


Deep Learning with Intel

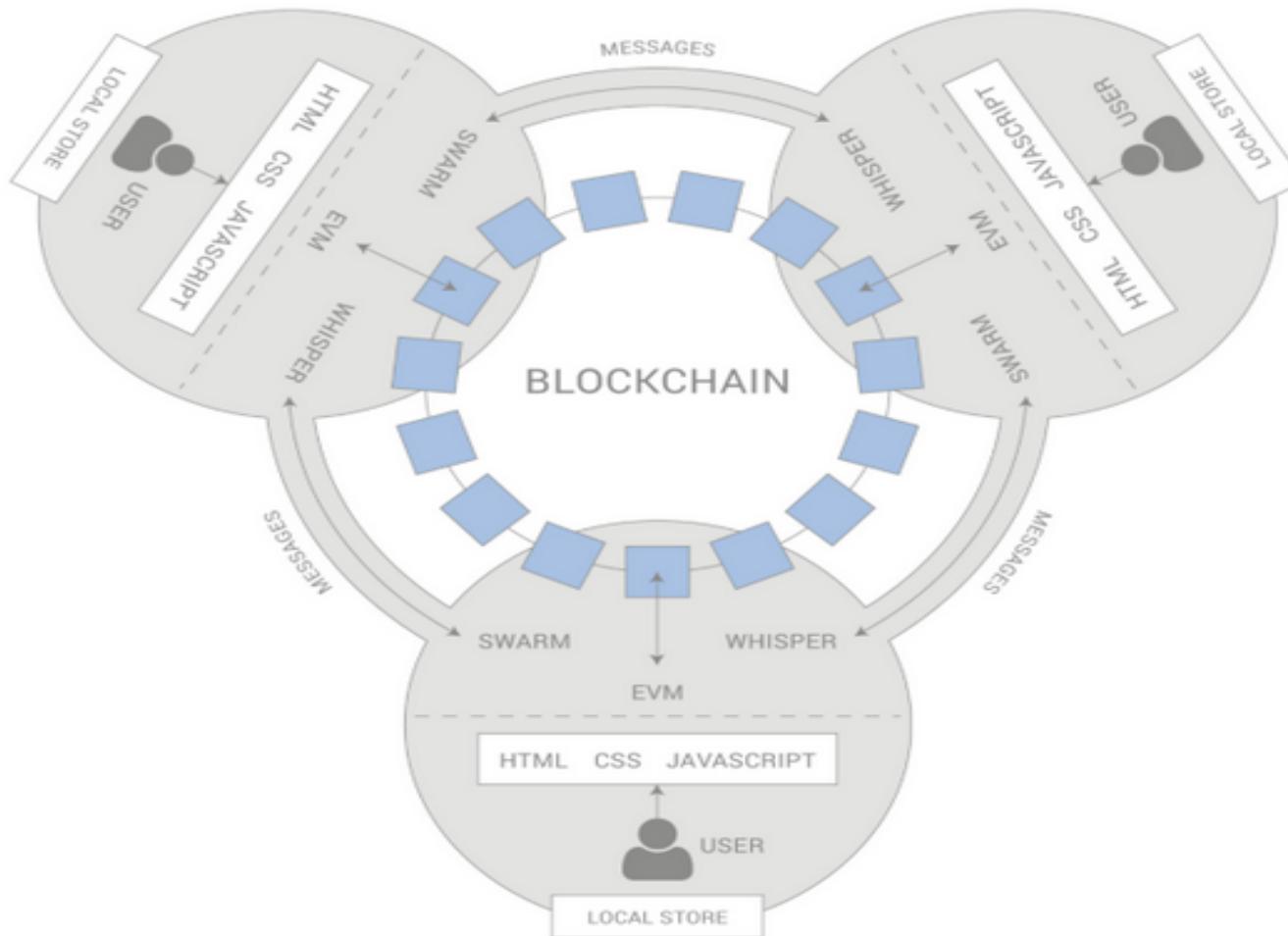


Web3 Decentralized Network

Web 3.0 Tech Stack



Web3 Decentralized Network



Graphic courtesy of Ian Meikle as conceptualised by Parity Technologies Gavin Wood

Web3 Decentralized Network

The Web 3.0 Abstracted Stack

Diagram v.1.0 by @stephantual - 26 May 2017

Dapps Browsers

(Parity, status.im, Mist, L^ETH, Metamask, etc.)

Decentralized Applications

(slock.it, Gnosis, Melonport, Zonafide, Etherisc, jaak.io, etc.)

Messaging

(whisper, telehash, etc.)

Storage

(IPFS, SWARM, StorJ, maidsafe, etc.)

State Machines

(EVM, MSC/qtum-like, custom, etc.)

Consensus

(PoW, PoS, PoA, PoET, etc)

Data Feeds

(Oraclize.it, Town Crier, etc.)

Off-chain Computing

(Cloud, Ewasm VMs, etc.)

Governance

(DAOs, futarchy, hard/soft forks , etc.)

State Channels

(Raiden, Lighting Network, etc)

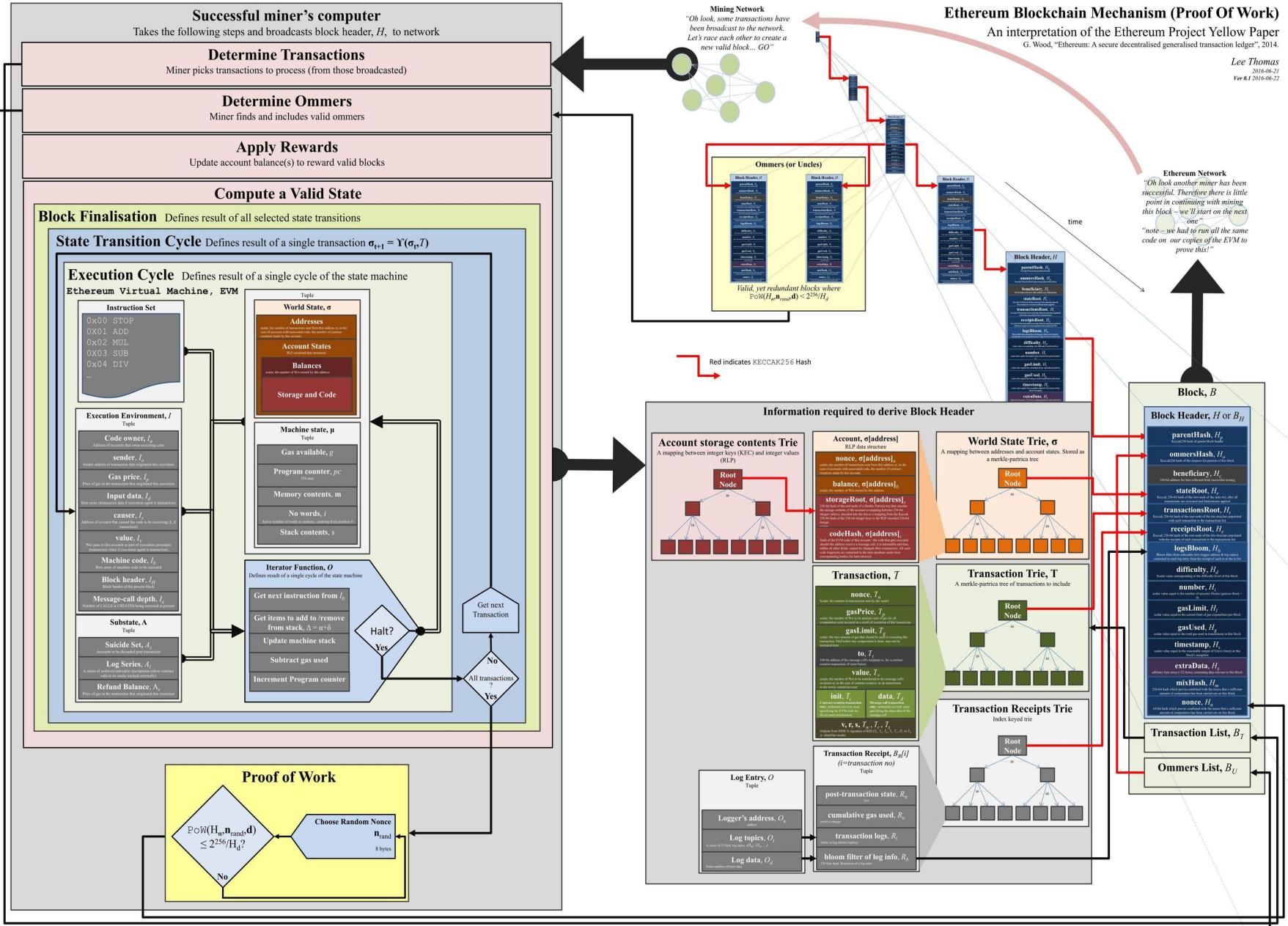
Cryptographic Network & Transport Protocols

(RLPx, roll your own, etc.)

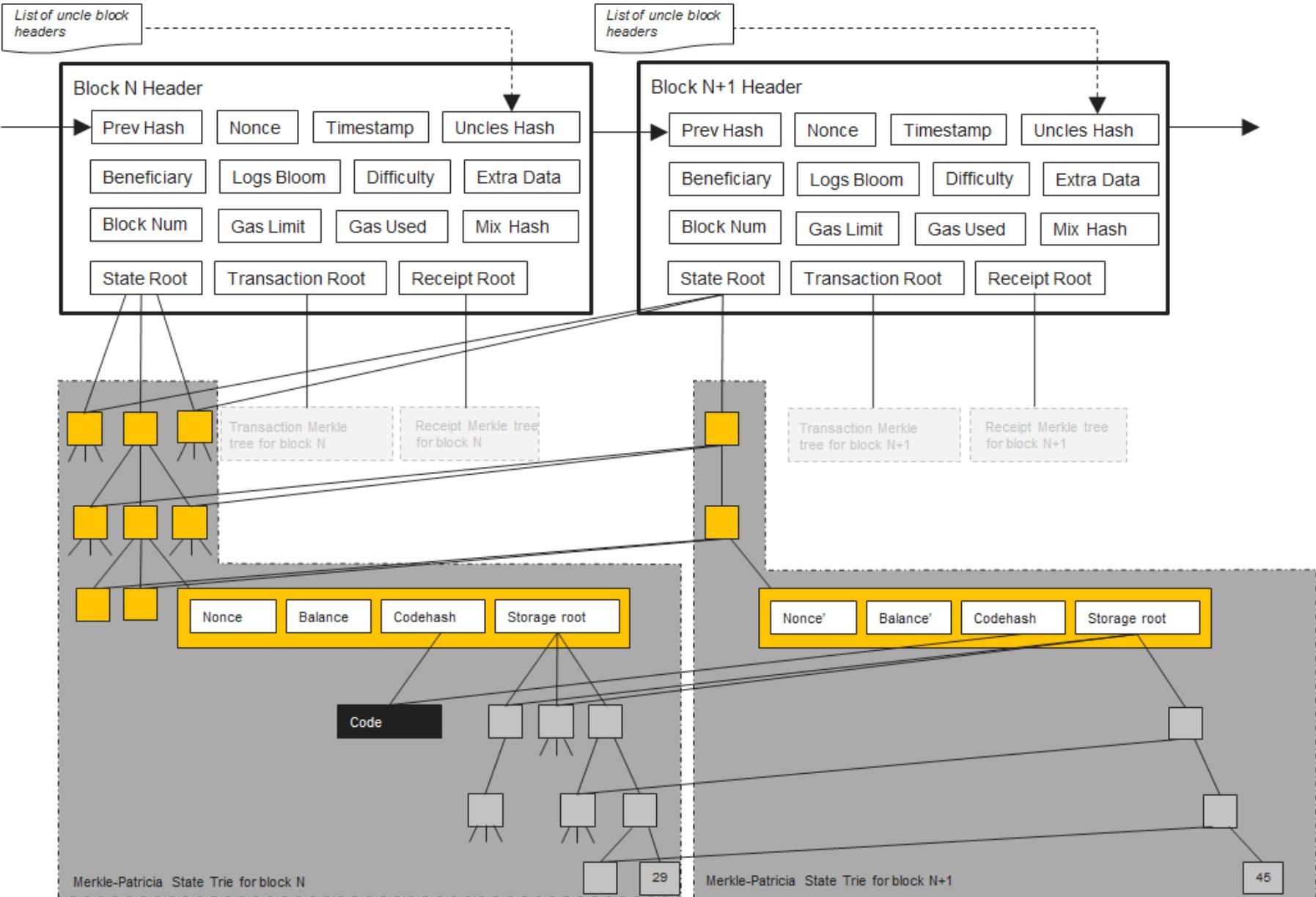
Optional Internet Routing Protocols

(none, Tor, i2P, etc.)

Ethereum Blockchain



Ethereum Blockchain



Ethereum & IPFS N2N Network



Screenshot of a GitHub repository page for the "ethereum / wiki". The top navigation bar includes links for Features, Business, Explore, Marketplace, and Pricing. Below the navigation bar, there is a link to "ethereum / wiki". A horizontal bar shows metrics: Code (0), Issues (4), Pull requests (0), and Projects (0). The main content area features the title "DEVP2P Wire Protocol" and a note that James Ray edited this page 7 days ago · 20 revisions.



Screenshot of a GitHub repository page for the "libp2p" project. The top navigation bar includes links for Features, Business, Explore, Marketplace, and Pricing. The main content area features the title "libp2p", a description "Modular peer-to-peer networking stack (used by IPFS and others)", and links to "Earth" and the URL "https://libp2p.io".

Ethereum « clients »

  <http://ethdocs.org/en/latest/ethereum-clients/choosing-a-client.html#why-are-there-multiple-ethereum-clients>

AngularFirebase ... Payment Reques... Le trafic routier e... Angular Firebase Trio Parada Dura... Create and Sell Y... Angular 2 Select ... Ge...

Why are there multiple Ethereum clients?

From the earliest days of the project there have been multiple client implementations across a range of different operating systems. That client diversity is a huge win for the ecosystem as a whole. It lets us verify that the protocol (specified in the [Yellow Paper](#)) is unambiguous. It keeps the door open for new innovation. It keeps us all honest. However, it can be very confusing for end-users, because there is no universal “Ethereum Installer” for them to use.

As of September 2016, the leading implementations are [go-ethereum](#) and [Parity](#).

Client	Language	Developers	Latest release
go-ethereum	Go	Ethereum Foundation	go-ethereum-v1.4.18
Parity	Rust	Ethcore	Parity-v1.4.0
cpp-ethereum	C++	Ethereum Foundation	cpp-ethereum-v1.3.0
pyethapp	Python	Ethereum Foundation	pyethapp-v1.5.0
ethereumjs-lib	Javascript	Ethereum Foundation	ethereumjs-lib-v3.0.0
Ethereum(J)	Java	<ether.camp>	ethereumJ-v1.3.1
ruby-ethereum	Ruby	Jan Xie	ruby-ethereum-v0.9.6
ethereumH	Haskell	BlockApps	no Homestead release yet

What should I install on my desktop/laptop?

Most users will likely just install [Mist / Ethereum Wallet](#) and that will be enough for their needs.

The Ethereum Wallet is a “single dapp” deployment of the [Mist Browser](#) which will be the centerpiece of the Metropolis phase of development, which comes after Homestead.

Ethereum Milestones

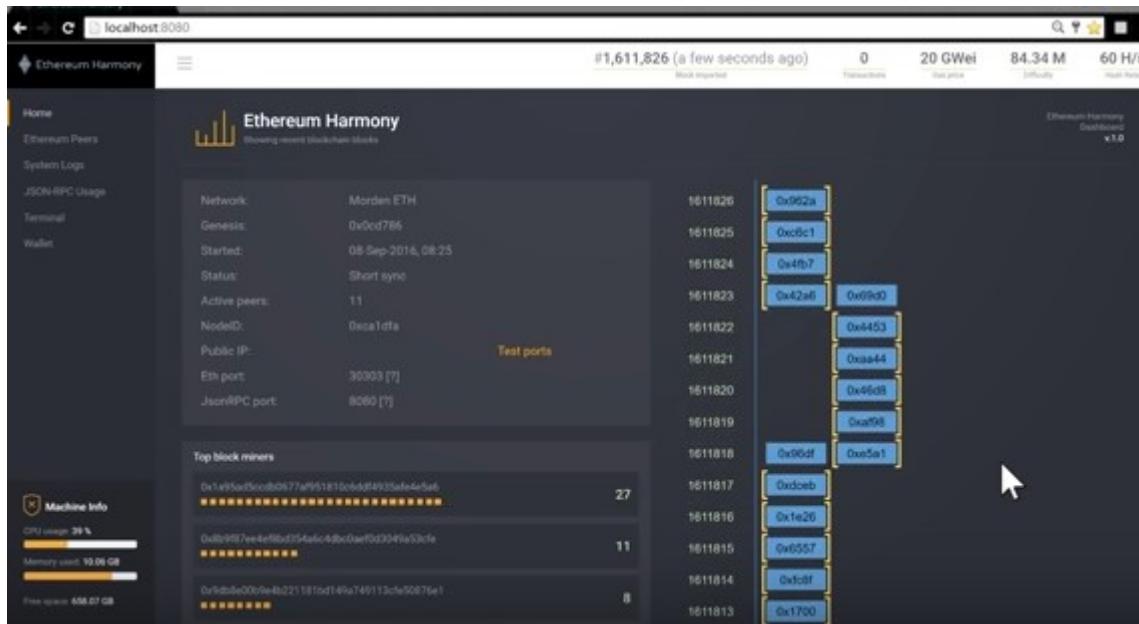
Version	Code name	Release date
0	Olympic	May, 2015
1	Frontier	30 July 2015
2	Homestead	14 March 2016
3	Metropolis (vByzantium)	16 October 2017
3.5	Metropolis (vConstantinople)	TBA ^[26]
4	Serenity	TBA

 Old version  Latest version  Future release

Ethereum Harmony ether-camp

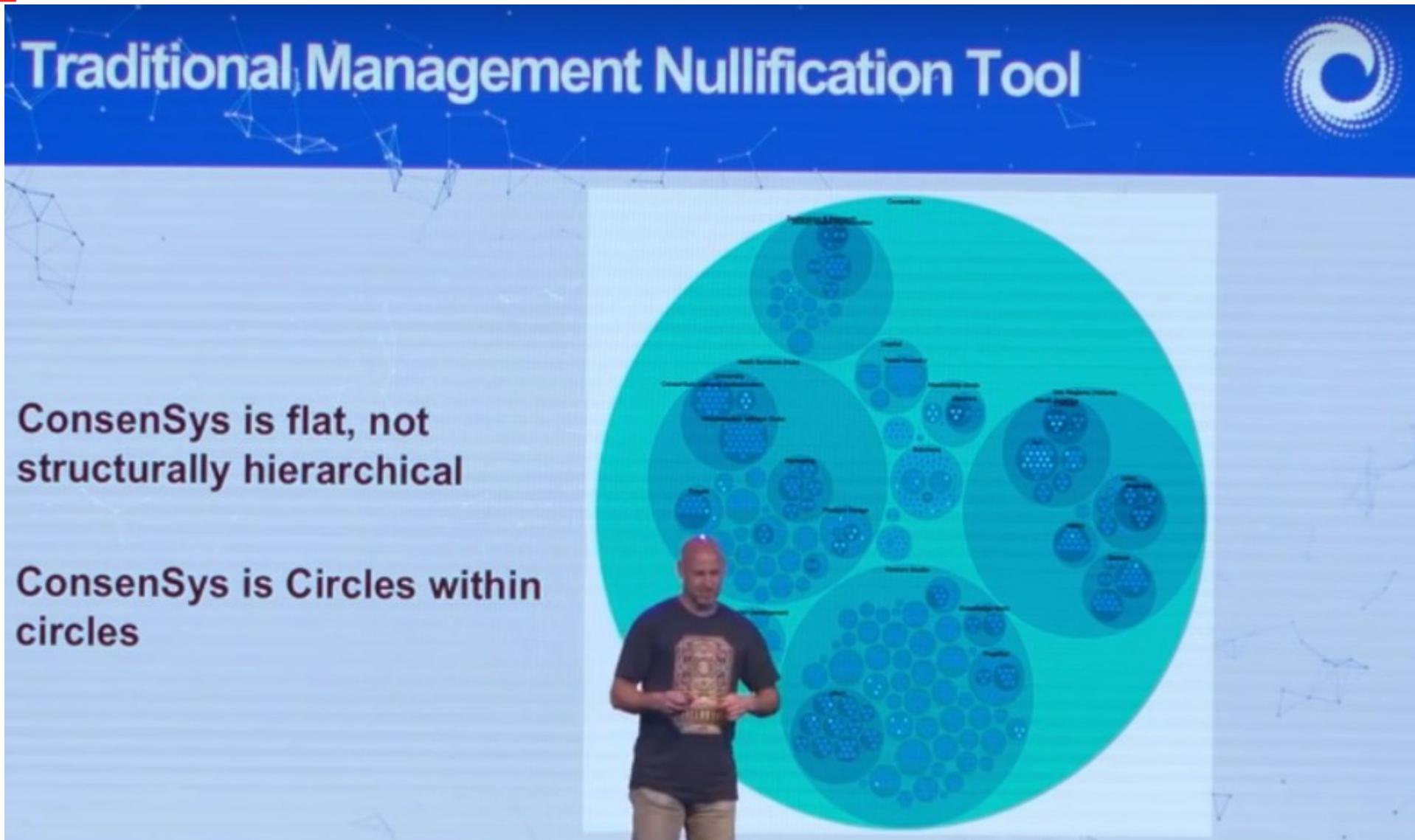
<https://github.com/ether-camp/ethereum-harmony>

<https://www.youtube.com/watch?v=3qASGOy3qrw>



Ethereum ConsenSys

Traditional Management Nullification Tool



ConsenSys is flat, not structurally hierarchical

ConsenSys is Circles within circles

A man with a shaved head, wearing a black t-shirt and tan pants, stands on a stage holding a trophy. Behind him is a large, stylized graphic of concentric circles in shades of teal and blue. The circles contain various labels such as "Blockchain", "Smart Contracts", "Decentralization", "Consensus", "Blockchain", "Smart Contracts", "Decentralization", "Consensus", and "Blockchain". The background of the slide is blue with a network-like pattern of white lines and dots.

Ethereum ConsenSys



CONSENSYS

A venture production studio building decentralized applications and various developer and end-user tools for blockchain ecosystems, focusing primarily on Ethereum.

consensys.net

// PLATFORMS & APPLICATIONS

GNOXIS
Gnosis protocols are instant payment systems that allow anyone to create their own predictions, tracked via predictions on the Gnosis platform.
gnosis.pm

UJO
A digital rights management platform, enabling brands to manage their assets securely in music and creative events.
ujosystems.com

GITCHIN
Gitchin open source projects using decentralized technologies for the creation, validation and issuance process.
gitchin.org

VARIABLE
A decentralized derivatives trading platform on Ethereum that makes free trades in tokens and tokenized assets.

TRUSTOLOGY
An identity platform to support users and companies with customized smart contracts for diverse client needs.
trustology.io



VIANT
A platform for modeling and managing decentralized systems and business supply chains of the future.
viant.co



BALANCE3
A decentralized ledger system for shared social environments for people to interact and transact across financial asset networks.
balance3.com



KAURI
A decentralized technical support network to enable users to access all kinds of organizations.
kauri.co



LINNIA
A platform for consumers to share and express access to their longitudinal health data in order to live their best life.
linnia.com



CONSCIENCE
A scientific research group that creates a new platform that is transparent and auditable.



GRID+
Leveraging the power of consumers to give consumers easier access to wholesale energy markets.
gridplus.com



BENEFACTORY
A community platform for running and crowdfounding projects that contribute to their mission.
benefactory.io



OPEN LAW
A community-based protocol for the creation and execution of legal agreements in a trustless, transparent way.
openlaw.org



FRONTIER
An international platform for decentralized research and development.



AIRSWAP
A platform that makes it easier for users to buy and sell tokens on the Ethereum blockchain.
airswap.org



GOVERNX
A governance platform for creating and managing decentralized organizations.
govrnx.com



OMEGA ONE
A decentralized, automated trade ecosystem platform that facilitates lending, staking and safe storage.
omegafund.org



CIVIL
A platform for sustainable and responsible journalism using native cryptocurrencies and cryptomining.
civillive.com



CELLARIUS
A marketplace for buying and selling unique items from individuals, barterers, collectors and celebrities.
cellarius.com



TRUSET
A decentralized marketplace for checking and validating of corporate materials reference data.
truset.com



FATHOM
A decentralized peer-to-peer measurement platform for monitoring a company's decentralized systems.
fathom.com



BOUNTIES NETWORK
Provenance, basic authentication, paying out in any Ethereum compatible token or stablecoin.
bounties.net



PANGEA
An Ethereum platform for claimed property ownership for breeding in simple and sustainable ways.
pangea.com



CODE SPONSOR
Helps Ethereum developers build and maintain their projects through advertising targeting developers.
codesponsor.io

// SERVICES

DIGILOGIC
An Ethereum security firm that offers tailored private investigations, forensics, audits and threat intelligence services.
digilogic.com

CONSENSYS LABS
Our venture studio supports entrepreneurs and startups that have chosen to focus on the Ethereum ecosystem.
consensys-labs.com

BLOCKCHAIN FOR SOCIAL IMPACT
Facilitation, collaboration on R&D and implementation of local and global impact projects.
blockchainforsocialimpact.com



TOKEN FOUNDRY
A platform to help projects launch and market their tokens, raising capital and providing investors with a secure investment.



CONSENSYS ENERGY
Blockchain and robotics engineering solutions for the energy sector including mining, logistics and logistics.



CONSENSYS ADTECH
Marketing automation services securely created by leveraging decentralized human computation, technical details for adtechs.



SOLUTIONS
Global provider of enterprise and cybersecurity solutions for major multinational clients.



ETHERAL SUMMIT
A regular gathering to promote, facilitate and accelerate the growth of the Ethereum ecosystem.



THE BROOKLYN PROJECT
An industry-wide initiative for innovation, growth and investment protection.
brooklynproject.consentis.com



CONSENSYS MEDIA
Press, editorial, and branding services from writers to marketers to strategy and community outreach.
consensysmedia.com



CONSENSYS CAPITAL ASSET MANAGEMENT
Global institutional market infrastructure that brings together leading digital asset class.



CONSENSYS ACADEMY
Bringing the Ethereum ecosystem together globally for education about blockchain.



CONSENSYS VENTURES
Helps entrepreneurs in the decentralized technology space succeed through strategic capital and our global network.

// CORE COMPONENTS

UPORT
A self-sovereign identity management system with user-controlled decisions.
uport.io



METAMASK
A browser extension that allows users to interact with Ethereum nodes.



ALETHIO
A tool that enables prediction markets to interact with Ethereum.



NETHERUM
A .NET integration library for Ethereum that interacts with Ethereum clients like geth or parity using RPC.
nethereum.com

// DEVELOPER TOOLS

BTC RELAY
Ethereum interchain relay that connects Bitcoin, Ethereum and payments.
btcrelay.org



TRUFFLE
A development environment, compiler and optimizer for Ethereum-based smart contracts & dapps.
truffleframework.com

// INFRASTRUCTURE

INFURA
A reliable, standardised, flexible and cost-effective API endpoint for Ethereum, IPFS, and other infrastructures.
infura.io



PEGASYS
A product engineering team working towards Ethereum consensus for private chain use cases.



Interested in working with ConsenSys?
We're always looking for talented individuals to collaborate on exciting initiatives or get in touch with us at our website.



Ethereum Parity Technologies

<https://github.com/paritytech/parity>

<https://www.parity.io/>



<https://polkadot.network/>



Dr. Gavin Wood

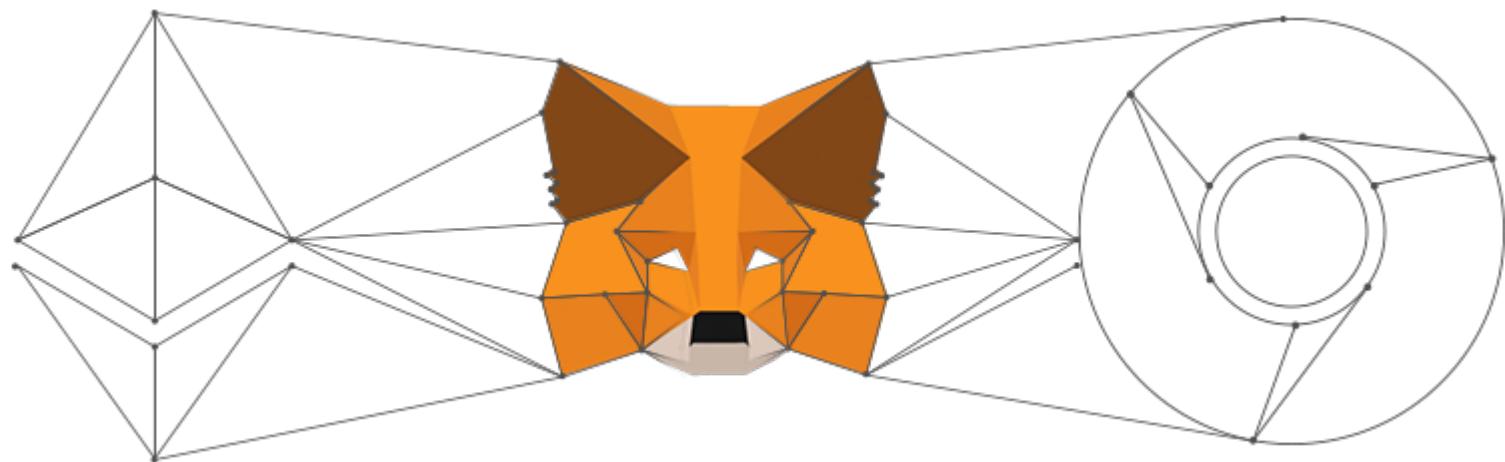
Ethereum Lev. Tools

Technologies we will use



Ethereum Network

Juxtaposition Web | DHT | DLT



ConsenSys MetaMask

Ethereum Dapps & Web3

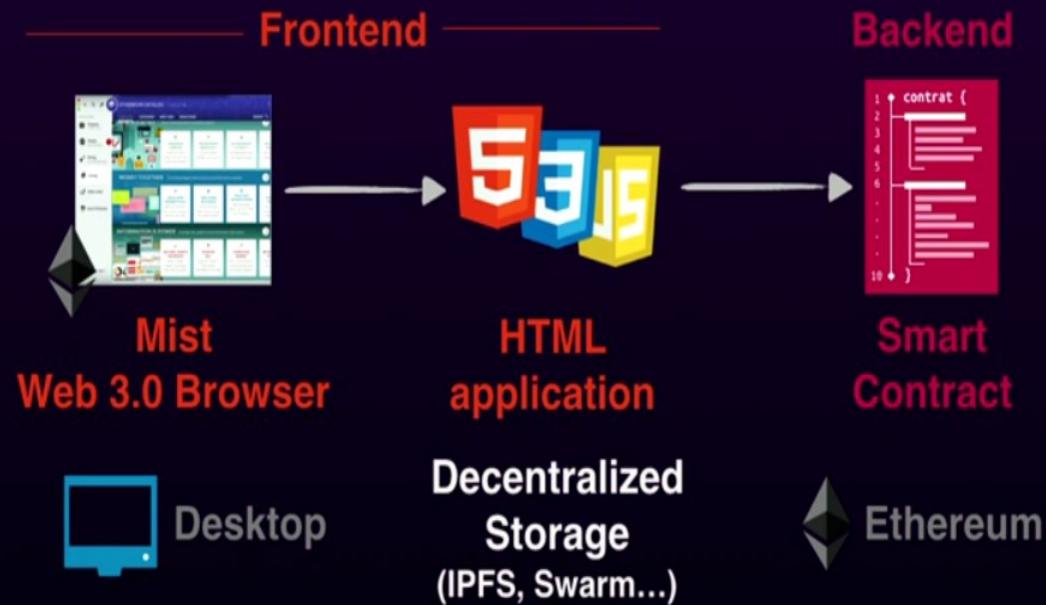
La Blockchain en détail (Benoît Lafontaine - Yann Rouillard)

5ème édition - 20 ou 22 avril 2016 - Paris



Les Dapps

Decentralized Applications (le futur)



Ethereum Dev. Tools : Truffle



TRUFFLE

[DOCS](#) [TUTORIALS](#) [BOXES](#) [BLOG](#) [SUPPORT](#)  GANACHE  DRIZZLE [TRUFFLECON 2018](#)

YOUR ETHEREUM SWISS ARMY KNIFE

Truffle is the most popular development framework for Ethereum with a mission to make your life a whole lot easier.

[!\[\]\(b9f04b84184c56fb09e984e7e8217089_img.jpg\) Star 6,061](#) [!\[\]\(30eed98d0c17c3fca2dcfd26fad1df0f_img.jpg\) Fork 764](#) [gitter](#) [join chat](#)Truffle IRL![INSTALL VIA NPM](#)

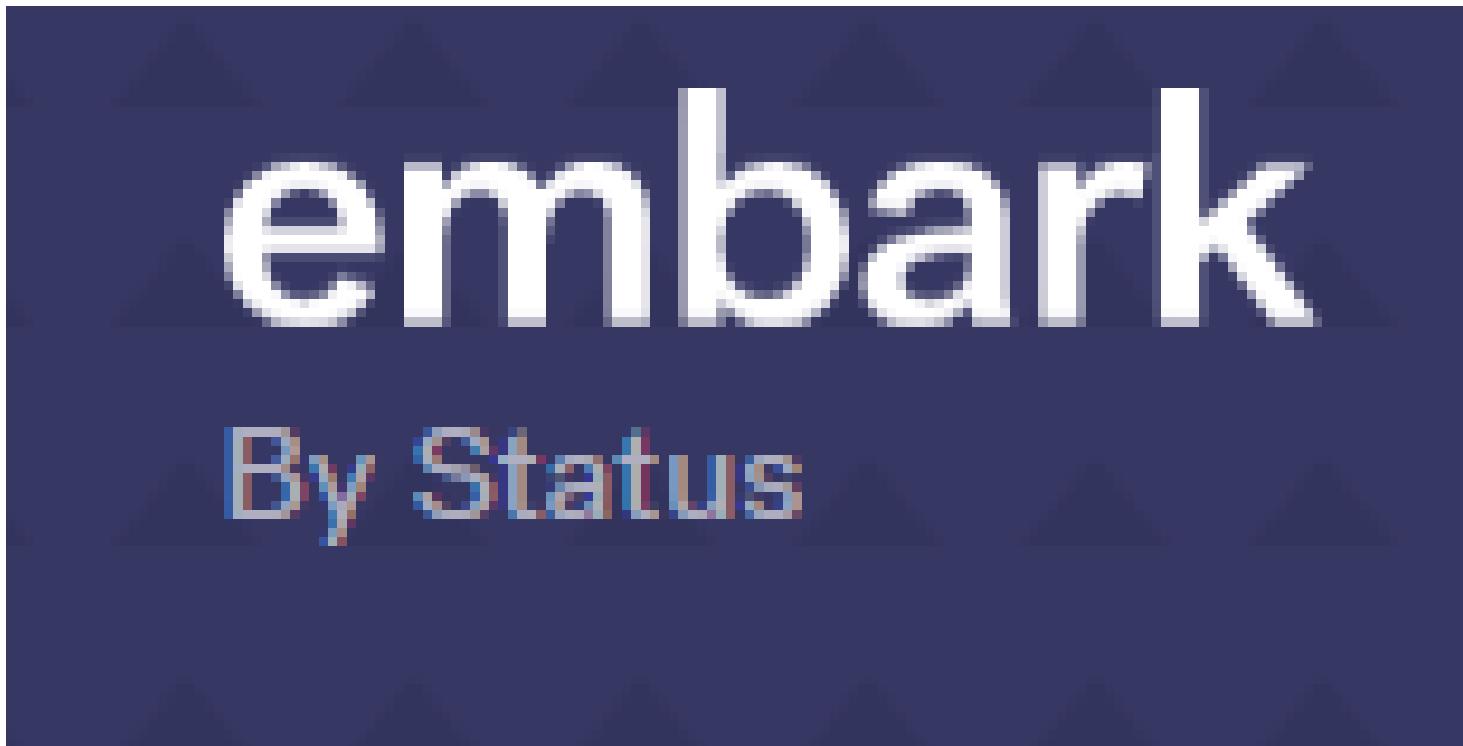
```
$ npm install -g truffle
```

Requires NodeJS 5.0+. Works on Linux, macOS, or Windows.

[DOCUMENTATION](#)[TUTORIALS](#)

Don't know where to start? Get yourself a [Truffle Box!](#)

Ethereum Dev. Tools : embark



Embark by Status : <https://embark.status.im/>

Ethereum Dev. Tools : dapp.tools

dapp.tools

Dapp Seth Hevm  Dappsys

Tools for dapps

Command-line-friendly tools for blockchain development

<https://dapp.tools/>

Ethereum KALEIDO / AWS

>Create a Consortium

1 MISSION 2 OWNERSHIP AND MEMBERS

Select an operator model

 Single Proxy Organization

Your organization will run all nodes as a proxy operator for the network

 Multi-Organization

Each member organization independently operates its own nodes within the network

Members

Define memberships within your consortium. Additional members may be added later

The proxy operator of this network is *LearningGeeks Network*

As the proxy operator you retain administrative control of all resources in the consortium

The following resources are scoped to each membership:

- Application Credentials
- Nodes

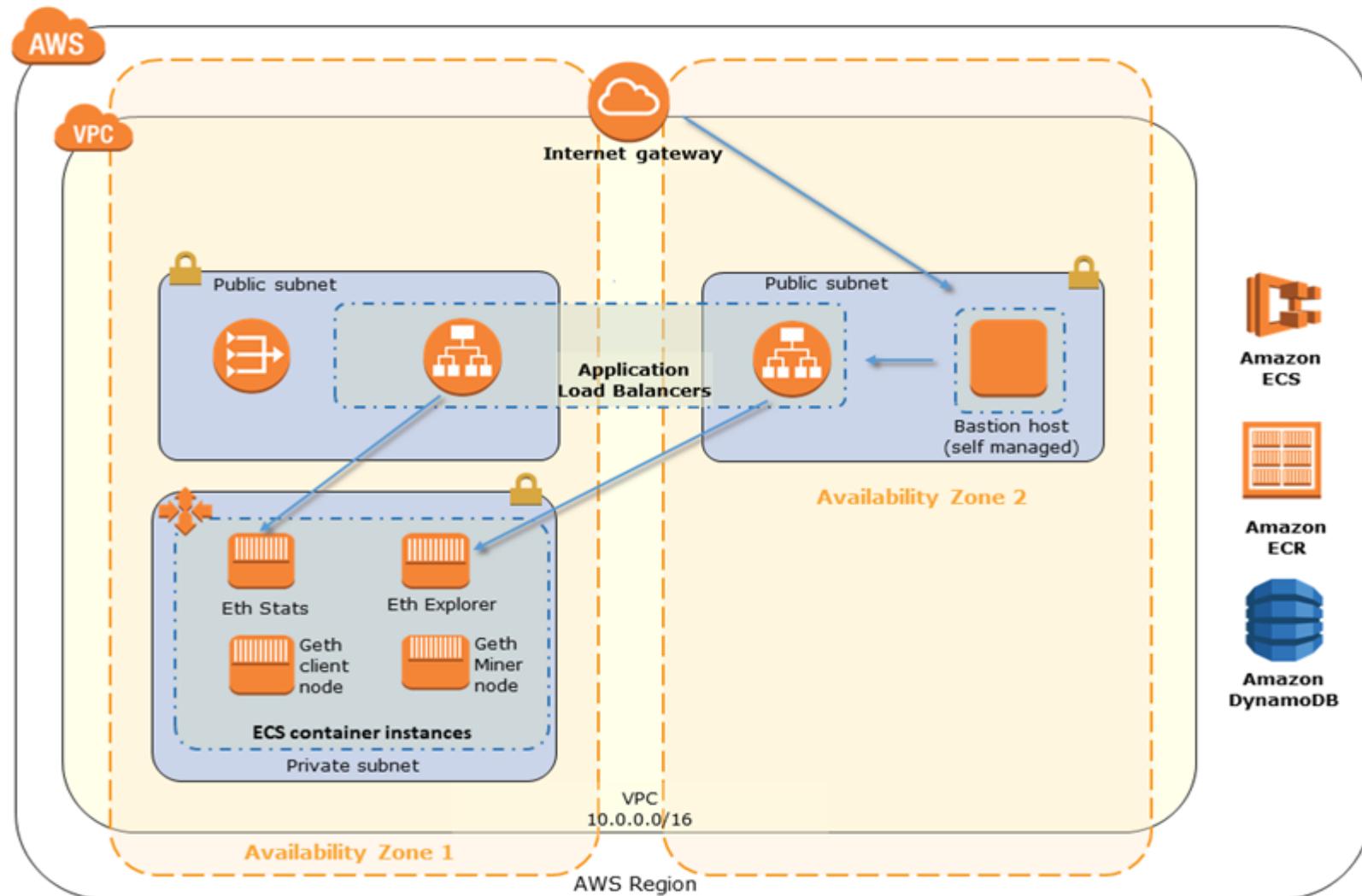
MEMBERSHIP ORG (0/4)

+ Add Another

<https://console.kaleido.io/>

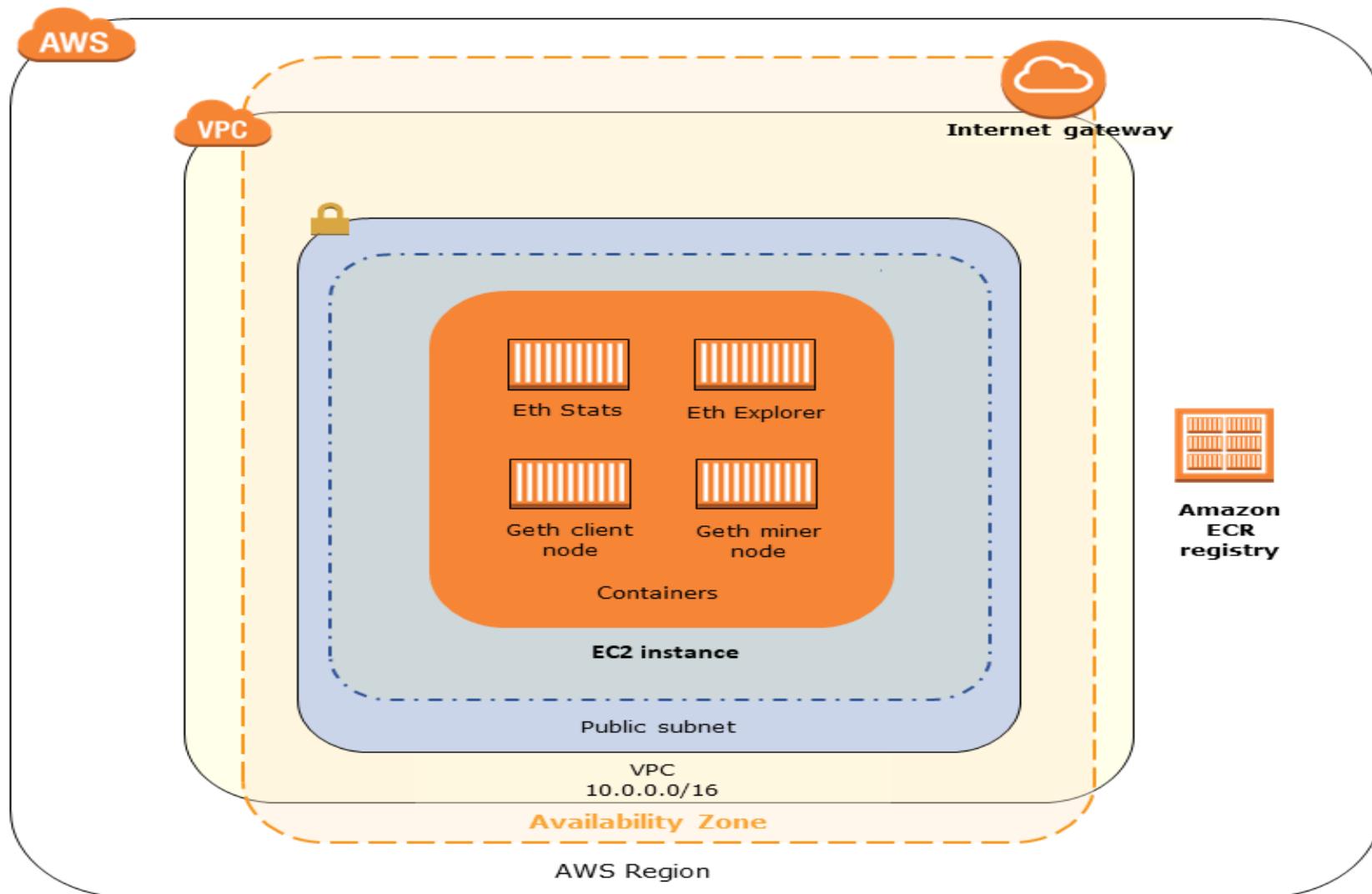
Ethereum / Amazon WS

<https://docs.aws.amazon.com/blockchain-templates/latest/developerguide/blockchain-templates-ethereum.html>



Ethereum Amazon WS

<https://docs.aws.amazon.com/blockchain-templates/latest/developerguide/blockchain-templates-ethereum.html>



Ethereum DApps

State of the DApps — A List of 1,688 Projects Built on Ethereum

<https://www.stateofthedapps.com/>

<https://www.ethernodes.org/network/1>

<https://ethgasstation.info/>

Ethereum Improvement Proposals (EIPs)



Ethereum Improvement Proposals (EIPs) describe standards for the Ethereum platform, including core protocol specifications, client APIs, and contract standards. :
<https://eips.ethereum.org/>

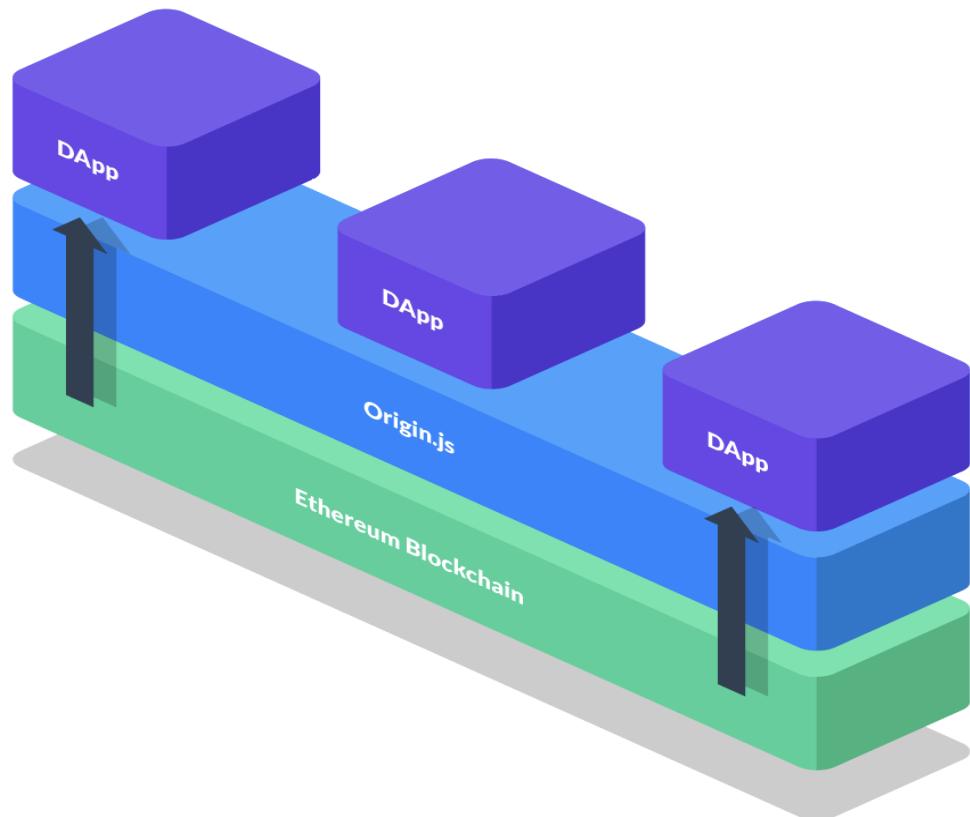
Ethereum Improvement Proposals (EIPs) : ERC : <https://eips.ethereum.org/erc>

EIP 20: ERC-20 Token Standard : <https://eips.ethereum.org/EIPS/eip-20>

EIP 721: ERC-721 Non-Fungible Token Standard :
<https://eips.ethereum.org/EIPS/eip-721>

ERC-721 Non-Fungible Token Standard :
--> What is CryptoKitties? <https://www.cryptokitties.co/>

Ethereum MarketPlaces



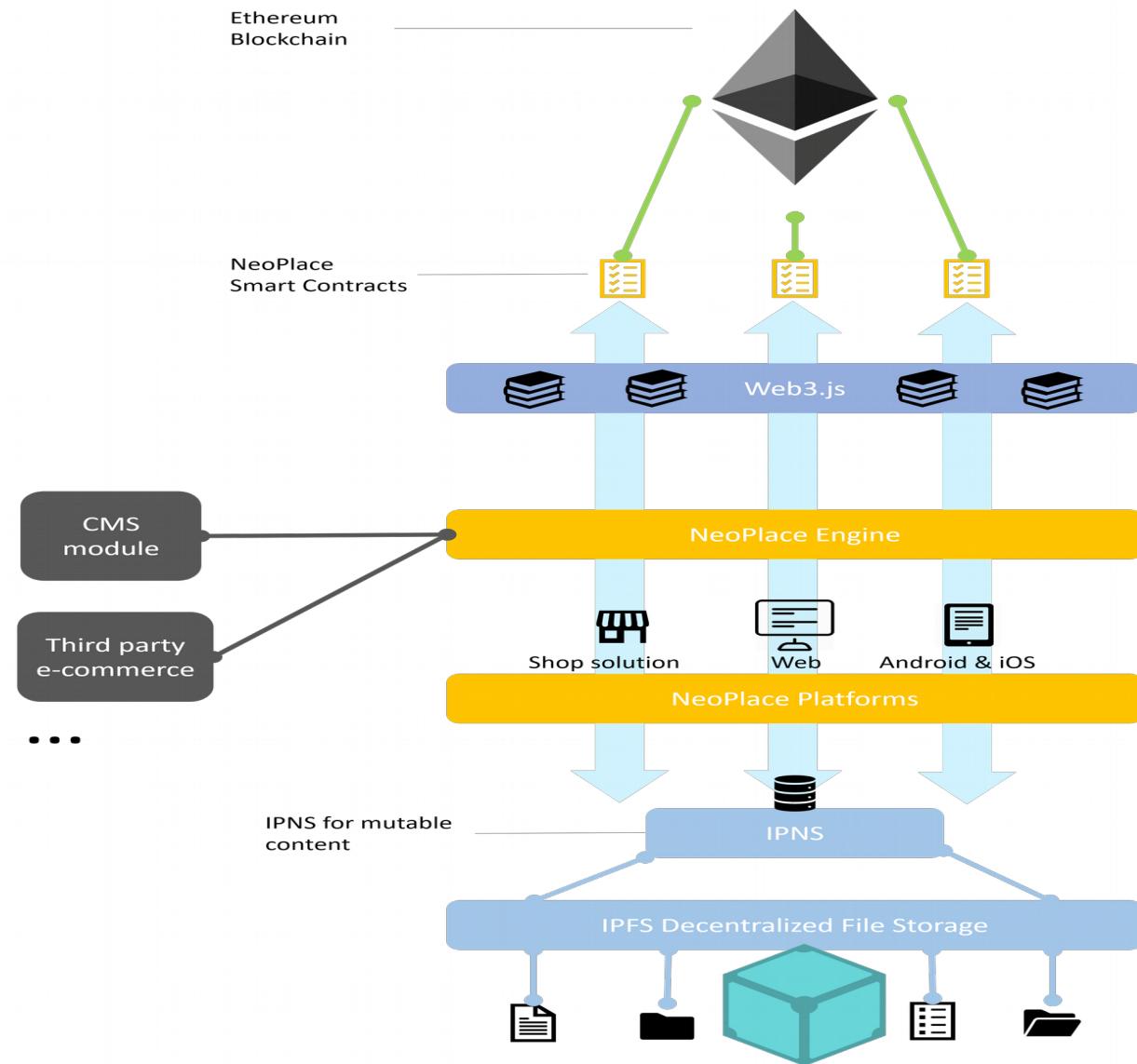
<https://www.originprotocol.com/>

Ethereum MarketPlaces



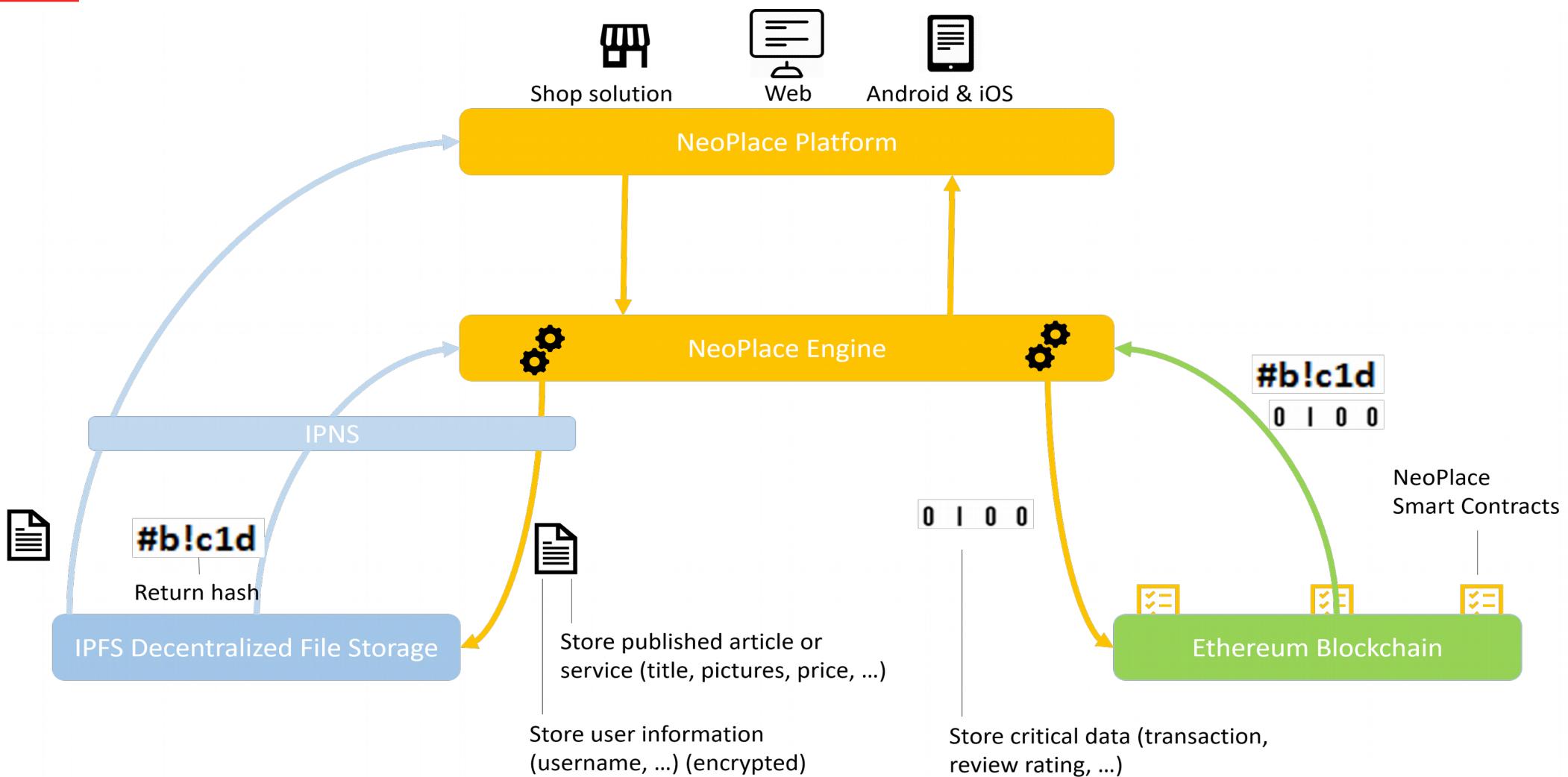
<https://neoplace.io/>

MarketPlace Neoplace.io



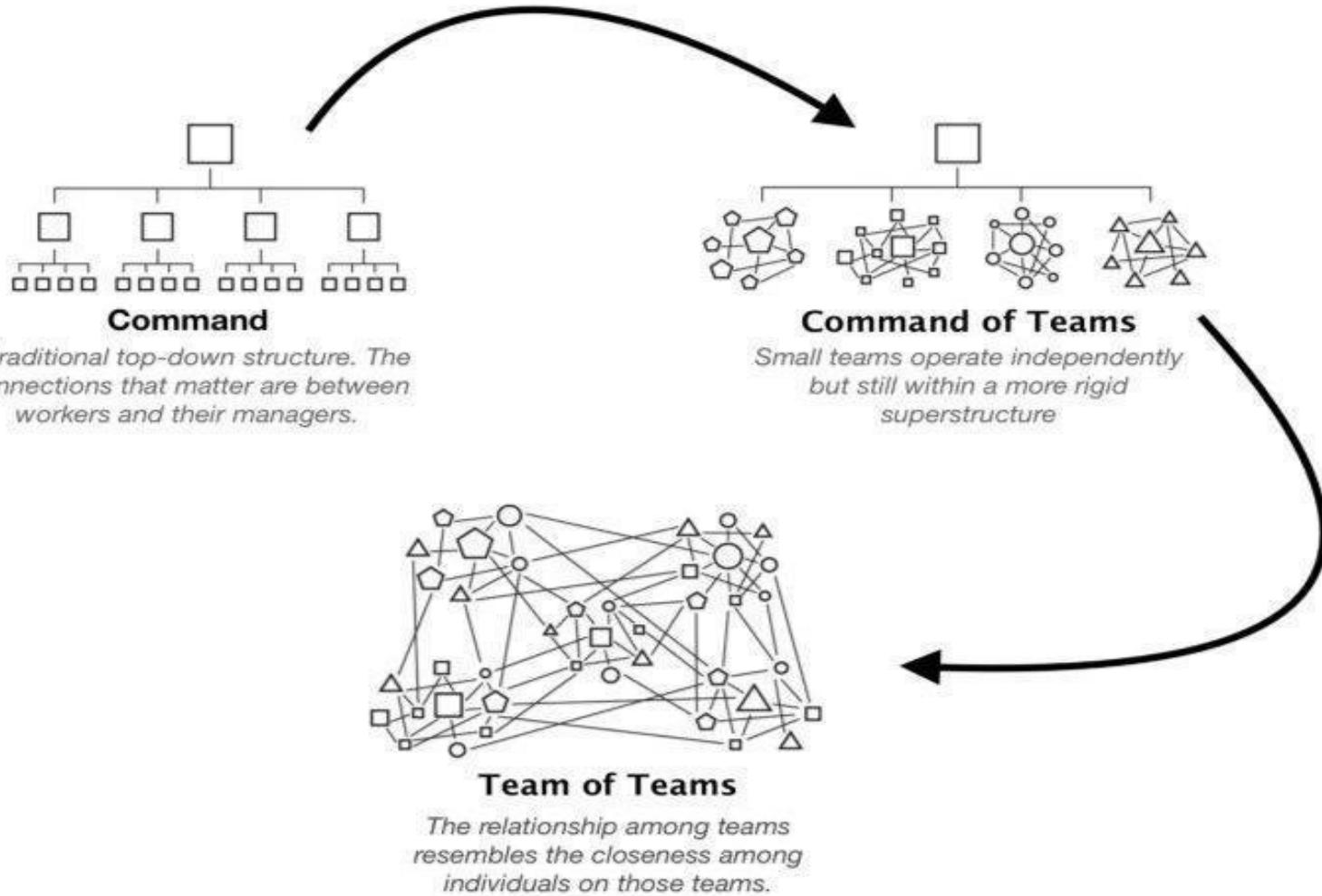
<https://neoplace.io/>

MarketPlace Neoplace.io



<https://neoplace.io/>

New Model of Governance



DAOStack

DAOstack - An operating system for collective intelligence

<https://daostack.io/>



Aragon One DAO



ARAGON

<https://aragon.one/>

Colony.io DAO



<https://colony.io/>

District0x DAO + MarketPlace

A network of decentralized markets and communities.

<https://district0x.io/>



Ethereum Tutorial

How to write a Smart-Contract ?

<http://etherscripter.com/0-5-1/>

<https://github.com/ethereum/remix-ide>

<http://remix.ethereum.org/>



Ethereum



Solidity



Truffle

Conclusion

- 1- A Blockchain is a network that manages a replicated distributed Ledger on each of the Super Nodes (Full Nodes).
- 2- The web network is an overlay network (over Internet TCP/IP protocols) as well as the blockchain network and the two web network and Blockchain network are juxtaposed next to each other. The tool Web3.js allows you to bridge between the two distinct overlay networks.
- 3- ConsenSys and Parity Technologies Ltd : These two companies are the most important in the Ethereum ecosystem because founded by the co-founders of Ethereum.
- 4- The steps to create your own system are : Create custom Ethereum network
 - A- create your own network with 4 nodes on for example AWS.
 - B- Create a genesis.json file. Init our blockchain with the settings in the genesis file and define a folder for storing chain data. > geth init genesis.json --datadir test
 - C- Build a Smart-Contract and deploy it on your own Blockchain Network
 - D- code your web front end with Angular 6 or React. And use Web3.js to access the functions of Smart-Contract Solidity.
 - E- Create an application based eg ElectronJS to enlarge the size of your network (the number of nodes). Whenever someone uses your app with a Full Node.