

Decentralized, Trustless and Fair Social Interactions Ecosystem



ichigo network

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<https://ichigo.network>

Everyday people and businesses rely on social media to connect with friends, family, colleagues, or clients, making internet social interactions a cornerstone of modern civilization. We envision a new ecosystem, fully decentralized, without gatekeepers or intermediaries, in which its community thrives in a fair and unconstrained environment, making our digital world a better place

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Introduction

Internet social media are controlled by unavoidable middlemen centralizing all its essential services and capturing financial incentives. The social ecosystem has been developing around those few players and is now restrained by their policies and bends to their agendas. Inevitably everyone must entrust to them their social interactions, their privacy and security and face inequitable practices.

This created an unprecedented monopoly on internet communication, which greatly harms individual freedoms and fair competition.

In this paper we present a decentralized approach to social interactions in which the middlemen are completely removed from the ecosystem. We describe how it can be replaced by a network of trustless nodes working together to provide all the necessary technologies, while ensuring network neutrality.

In doing so, our purpose is to:

- ✓ Propose a new approach to social media technologies to create a fair competition environment and balanced revenue distribution for all the ecosystem actors.
- ✓ Free social internet interactions from privacy invasion, abuse of dominant position, or any risks of a monopolized market.
- ✓ Restore the Internet to its control-less, user-driven form and revive it as a fair tool for innovation and creativity.



De facto standards

The current situation results in over two decades of development motivated mainly by private interests.

Actor	Contribution	Incentive
General Human User	HIGH Share and interact with contents. Human users' engagement is the essence of the ecosystem and its core value	NONE No incentive for their contribution
Content Creator	HIGH Dedicated to creating contents for a wide audience with entertaining or informative value	LOW mostly marketing value, channeled by centralized authorities and intermediaries
Storage Provider	LOW Handle all contents in the ecosystem. While mandatory, storage offerings have multiplied, and costs have greatly decreased over the years	HIGH Capture important shares of revenue by centralizing all authority on storage access
Application Layer	MEDIUM Applications provide and regularly create new interfaces for users to interact with the contents	HIGH Capture share of revenue by centralizing all authority on user interface access
Advertiser	MEDIUM Advertisers are the main source of financing for the ecosystem and allow large scaling without incurring cost for the general human user	MEDIUM Digital marketing has proven highly efficient, and advertisers get a fair amount of users' attention with it. However, their ROI is far from optimized because of a market complex and monopolized by middlemen.

Storage & application providers have authority over the functioning of the ecosystem. This creates an unfair market controlled by a few players. Creativity is suffocating as new ideas have enormous walls to overcome to be able to enter the ecosystem.

On the other hand, Human users invest hours of their attention in the ecosystem which makes its core value of it, however they are not considered as players within the ecosystem but rather as products of it. Overall, the incentive distribution is unfair and captured by the ecosystem central authority.



A New Approach

Ichigo network aims to keep the existing social ecosystem dynamics while removing the necessity to rely on a central authority and redistributing the control of the network and the incentives to every actor.

The 4 core concepts which each provide the essential services for the ecosystem:

- *Decentralize actor's profile and identification*
- *Provide distributed on-demand storage*
- *Create a trustless advertising market and promote fair distribution*
- *Dissociate application layer*

blockchain	network security <i>stacking, collaterals, reputation</i>
ichigo nodes	layer-2 <i>user profiles, identification</i>
flash storage	peer-to-peer network <i>decentralized on-demand storage</i>
application layer	human-network interface <i>encryption, data-format, presentation</i>
human user	end-user <i>content creation, engagement</i>

Fig 1. ichigo architecture stack

In this paper we will explain how we can rely on cryptography, peer-to-peer and blockchain technologies to achieve such decentralization.



Profile and Identification

Every actor in the ichigo ecosystem should have a unique profile. By relying on cryptographic identity, we remove the need to have a centralized authority to secure those profiles. Instead, every profile is represented by the profile key-pair and accessible by its cryptographic address. The ichigo nodes will store and distribute user profiles in a “user profiles ledger” stored in their own peer-to-peer network (i.e. off-chain) while relying on blockchain for its security (similar to a layer-2 solution).

This profile can be used by human users to maintain profile information and point to a feed of contents present in flash storages. Users can maintain a list of profiles to stay in contact with other users of the network. As we will present hereafter, the application layer will also be able to make use of this profile to provide social interaction interfaces.

Other actors of the ichigo ecosystem will rely on this profile to make themselves known to the network and demonstrate their honest services (ichigo nodes, application layer providers and advertisers)

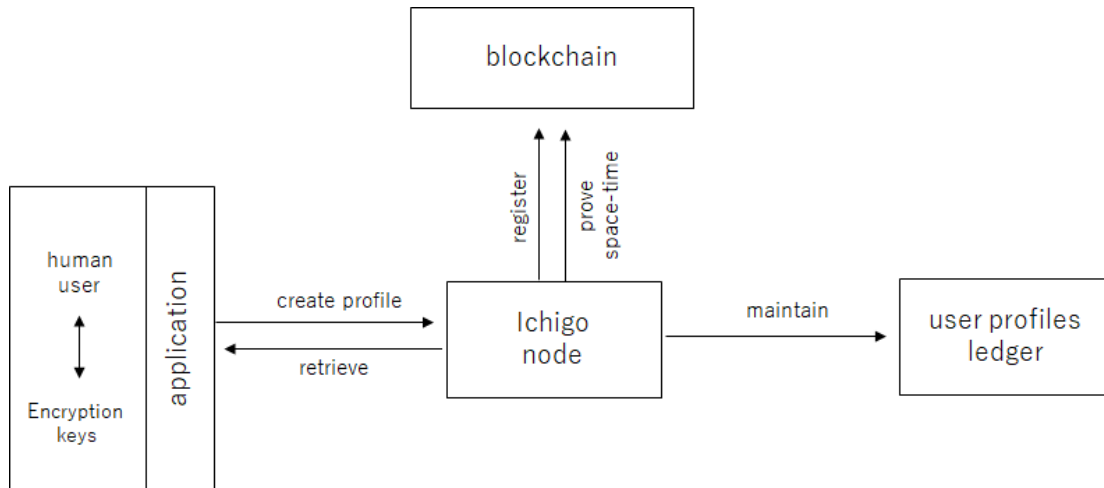


Fig 2. user profiles provision in layer 2



Decentralized on-demand storage

Our first step is to decentralize the storage provision. To do so we introduce flash storage and a peer-to-peer network of nodes. Flash storage are agreements to lease storage space from a node to a user focusing on content of relatively small size and limited period of storage time. This use-case is the most optimized for social interaction and allows greater speed and flexibility. *(Ichigo's Flash Storage will also allow large amount of data or extended period of storage, but other solutions might be better suited for that use-case)*

For every flash storage lease, the user and the node concur on data size, time frame and cost. The node will then be responsible to make the data available on the network for the specified time frame. Flash storage uses blockchain to ensure security of the network and peer-to-peer technology to make data available to any users. nodes will be incentivized to work honestly using collateral and stacking obligations and a reputation system.

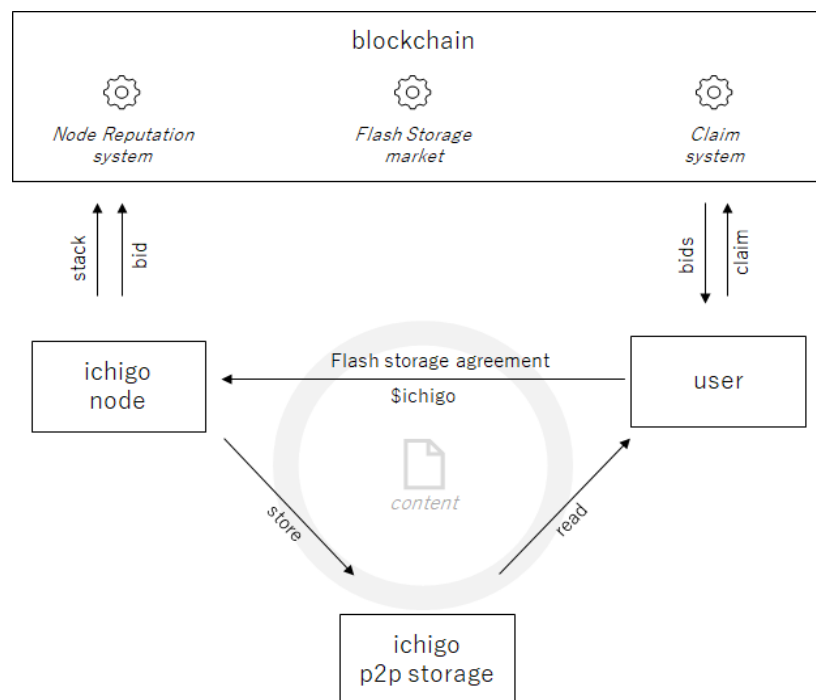


Fig3. Flash storage agreement for content availability in peer-to-peer network



Flash Storage Security

A - general concept

To be able to provide flash storage the node stakes tokens to the contract, which will be used to lock collaterals, as well as calculating node reputation.

The contract provides a market maker functionality. The node creates in the contract a bid for a flash storage agreement where it specifies its condition (minimum cost, maximum size or period, location, etc). The user can retrieve the list of bids to find the most suitable node for its content.

The agreement is specified directly between the node and the user. It is then uploaded by the node to be stored in the contract along with the payment. The contract will lock user payment and node collateral until the agreement is completed.

The node makes the data available on the peer-to-peer network until the end of the agreement. It will then be able to retrieve the full amount from the contract as compensation and may garbage collect the content if needed.

B - dispute resolution system

The purpose of the dispute resolution system is to discourage dishonest nodes financially and reputationally. When a node enters a flash storage agreement a significant amount of the node's tokens will be locked as collateral from its stack.

If the file becomes unavailable at some point within the agreement time frame any user can raise a 404 claim to the network. The network nodes will then be able to participate in a consensus vote to establish whether the file is available or not.

If the file is not available, the responsible node in breach of its agreement will lose all its collateral and its reputation score will be greatly decreased. The user in agreement and the user raising the claim will both be compensated by receiving tokens from the node collateral. Every node who correctly participated in the consensus will also receive a part of the collateral and their reputation score will be increased.

C - reputation system

The purpose of the reputation system is to keep track of honest and well performing nodes. The ichigo architecture includes a smart contract dedicated to keeping a reputation score for every registered node. The calculation is based on the EigenTrust algorithm taking the node contributions to the network as inputs.



Some example contributions that will affect the reputation positively are: staying registered on the network as a node over-time, successfully completing flash storage agreements, taking part in a 404 claim consensus and being right. On the contrary, being in breach of a flash storage agreement will greatly decrease the reputation score.

Stacking tokens will also increase the reputation score logarithmically. This can be used by a node with low reputation score to increase its chance to win flash storage bids (for example if the node is new to the network). As the node history builds up and the reputation score increases, they will be able to reduce the amount of token stacked while keeping a satisfactory reputation score.



Equitable Advertising marketplace

Advertisement represents the biggest part of the social ecosystem financing. We propose to maintain this source of financing but to rethink its organization. The ecosystem incentives should be fairly distributed between the human user for its attention and engagement, the content creator for the added-value it brings and the application-layer for the interface it provides.

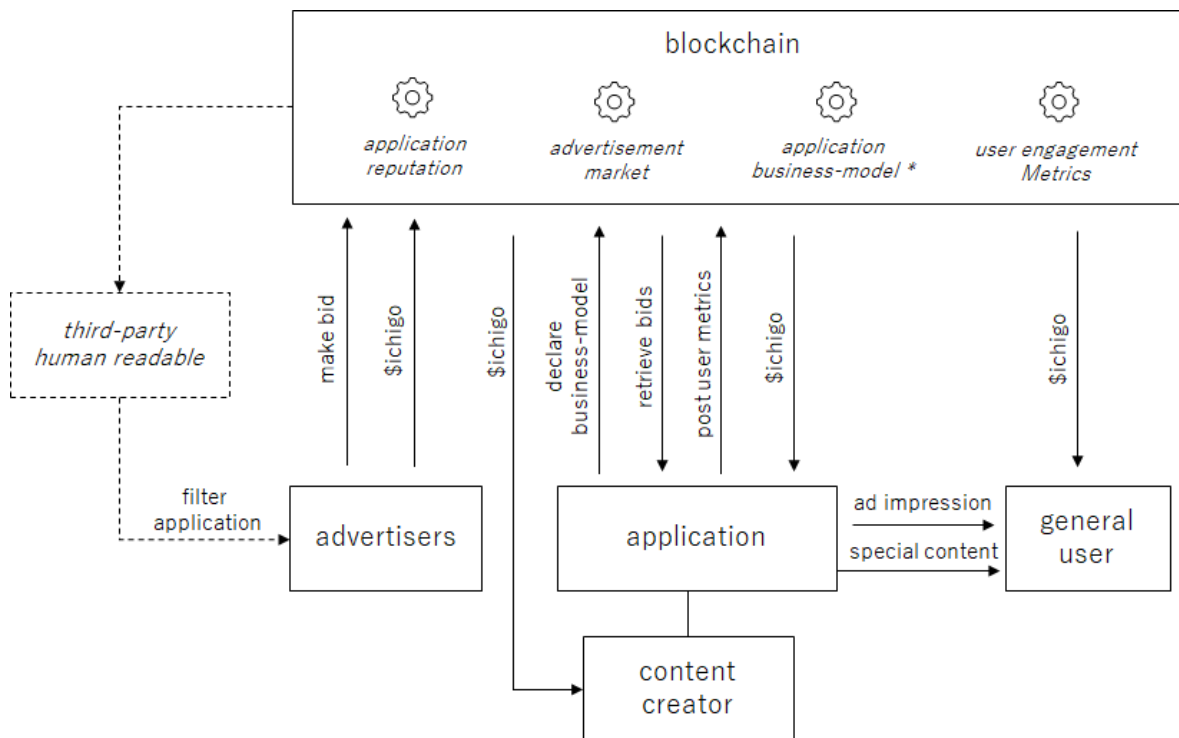


Fig 4. Decentralized and trustless advertising open market

Advertising Marketplace concept

A- Free advertising marketplace

Bids made by application layer providers to sell ad impressions are registered on the blockchain. Advertisers can select their preferred bids by their price, the reputation of the application or the business model it proposes. Then the advertiser sends its order along with the payment to an ichigo node for it to be written on the blockchain. There is no fee or commission whatsoever for the user of the marketplace.

B- Business model declaration

The business model defines the distribution of incentives between ecosystem actors from the advertiser payment. It specifies the amount of token to be subtracted from the locked payment and added to the human user, advertiser and/or content owner, based on user engagement metrics. In it, the application must declare its business model calculation. It is then written on the blockchain and cannot be changed for a given period of time.

C- Ad impression and user engagement metrics

The attention the user spends on an ad and how he interacts with it will determine the total cost for the impression. In doing so this creates a clear conversion of value between user attention and monetary cost. The application will compute its users' attention and save it on the blockchain in the user attention ledger.

The settlement will be automatically calculated from the application business model and the user attention metrics. Based on this calculation, every actor will receive the number of tokens they are entitled to.

Besides, a reputation score will be kept for every application based on their history performing ad impressions. A community trusted application will achieve a better score. Beside this statistical approach to reputation a part of the trust is also placed in the human world rather than the digital world. This means third party services can propose human-readable access to applications' business-model, their reputation and previous performance. Users and advertisers will be able to make informed choices on what application to trust. The ichigo foundation will maintain such a service at least for its first years of functioning.



Application Layer

Applications provide the human user facing layer to access the network and interact with it. The ichigo ecosystem sets conventions on how to implement 2 key-functionalities: the encryption / decryption routine and the content formatting.

With this approach, the application layer, the content and the storage for this content are all dissociated. Only the human user owns and manages his content. This also means the contents are not locked-in by a specific application, but any applications can commonly interact with it if the user allows it.

As seen above, the application layer can be incentivized for this service with advertisement impressions. It will also be possible to allow the apparition of other business models such as subscription, pay per access, etc.

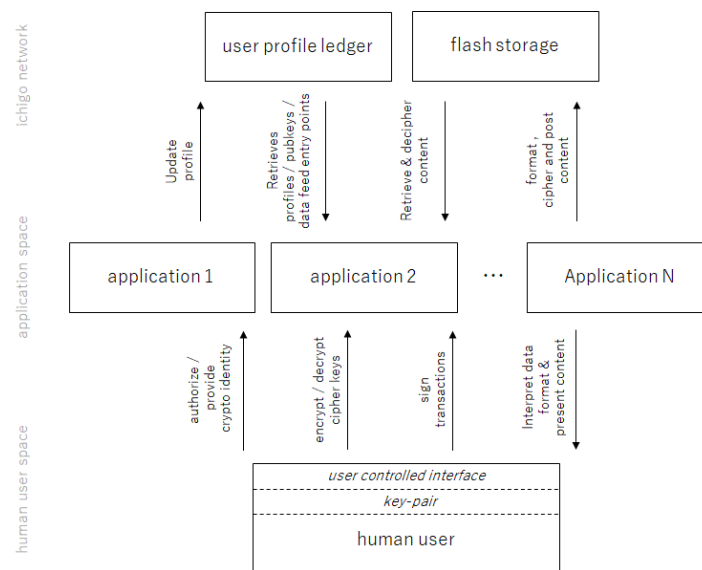


Fig 6. Content organization, privacy and presentation by the application layer

To understand better those functionalities here is an example of a common use-case:

A user generates a key and encrypts an image with it and also encrypts said key with his contacts' public key before uploading to flash storage. His contacts having his address in their list of contacts will retrieve this content from his data feed on the ichigo network with an image addressed to them. They will decrypt the encryption key with their private key and decrypt the image with it. If they wish to interact with the content (e.g. commenting on it) they will encrypt the comment in a similar way and make it available in their data feed in flash storage. The application, using the content formatting standard, can put back together the relation between different contents and present them in a user-friendly way.



Roadmap

Proof of Concept 2021 Q2 ~ 2022 Q1	Architecture Conception
	Implementation Solution Design
	Prototyping and Testing
	Release of Node v0 (used on testnet)
	Release of Wallet v0
	Deployment of testnet (based on Solana Devnet)
	Release of testnet sample application layer (Sandbox)
Pre-production 2022 Q2~Q3	Community building
	Launch of \$ICHIGO token
	Development Node v1 (production MVP)
	Production readiness for wallet and JS-SDK
Production 2022 Q4	Release of Node v1
	Initiation of Mainnet
	Release of Decentralized Advertisement Marketplace
	Release of real-world application layer sample
Expansion and Growth 2023 Q1~	Release of Mobile application / Mobile SDK
	Switch Community driven governance
	Implementation of many more functionalities by community direction (social metadata, sub-pub, video, live streaming,
	Support third-party initiatives such as application development, chain monitoring, etc.



Project Organization

The ichigo original team is made of early cryptocurrency enthusiasts with accumulated years of experience in infrastructure design, system security, peer-to-peer technology, and smart-contract coding. Ichigo's purpose is to extend to an open community where anyone can contribute, and the governance is fully decentralized.

The ichigo network has a vocation to be governed around its community. It will set the priorities, validate the roadmap, supervise development and releases.

To represent the community work and investments offline, a non-profit foundation is established in Switzerland with the sole purpose to oversee the administrative and legal obligations and the attribution of funding. The foundation will be managed by members of the original team for the first 24 months after the launch of the mainnet before migrating to community governance.



Ichigo Token

The ichigo token is a SOLANA token used to settle transactions and create monetary incentives.

- Storage providers will receive tokens from users for storing their data,
- Users will receive tokens from advertiser against their attention,
- Application will be able to implement different business model such as taking a part of advertiser tokens for showing their content or taking a small percentage on every user transaction,
- Content creators will receive tokens from users or applications for access to their content.

