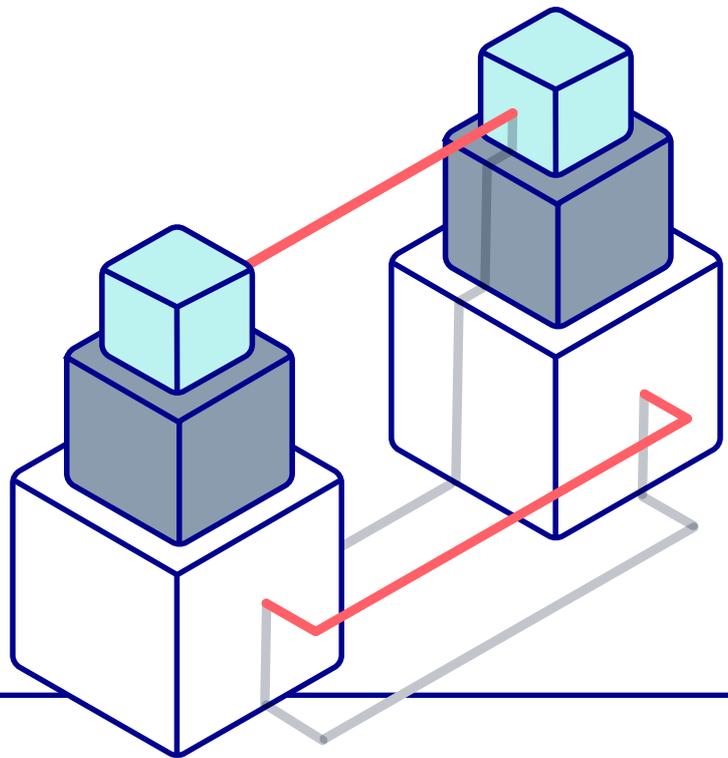




TTC Protocol

A Decentralized and Incentivized Social
Networking Protocol



V1.0

The information set forth below contains up to date materials from TTC Foundation in regards to the TTC Protocol and related matters. In an effort to ensure materials in this white paper are accurate and reflective of the most current state of the TTC Protocol, TTC Foundation may revise this white paper from time to time without any advance notice. The information presented in this White Paper is indicative only and is not legally binding on TTC Foundation, its affiliate(s), and/or any other party. This document is for informational purposes only and does not constitute and is not intended to be an offer to sell, a solicitation of an offer to buy, or a recommendation of (i) TTC tokens, or (ii) and investment in TTC-related platform(s) or any project(s) or property(ies) of TTC Foundation., or (iii) shares or other securities in TTC Foundation or any of its affiliate(s) or associated company(ies) in any jurisdiction. Please read the important legal disclaimer at the end of this White Paper.

Abstract

The vast majority of current social networks operate on centralized architecture in which a service is provided to end users in exchange for viewing advertisements on the platform. This exchange forms the foundation of the so-called “attention economy”.

The TTC Protocol is a decentralized and token-incentivized social networking protocol for the next generation of social platforms. The TTC Protocol provides a brand new social experience with completely decentralized platforms. This gives participating individuals a highly rewarding and dynamic user experience.

The TTC Protocol will offer incentives via a blockchain-based cryptocurrency also named TTC. Network users on social platforms are rewarded for (i) generating, distributing, and interacting with content, and (ii) interacting with other users. The TTC Protocol returns the commercial value in the attention economy to those same users who generated that value. As the number of end users grows, the TTC Protocol becomes more valuable, and the commercial value of TTC increases.

The TTC Protocol is committed to breaking the conventional bottleneck of social networks, decentralizing content distribution, and returning value to individual users through a blockchain-driven tokenized incentive mechanism. TTC Foundation is committed to building and improving the

ecosystem of the TTC Protocol, in which all social platforms, including, but not limited to, personal life sharing platforms, photo and video sharing platforms, live streaming platforms, social forums, and so forth, are welcome to join.

As a decentralized protocol, the TTC Protocol utilizes a multi-level BFT-DPoS consensus model. Representatives, whose responsibilities are to record and synchronize every transaction on behalf of all users, are elected by anyone holding TTC. Voters who contribute to the governance of consensus will be rewarded with TTC. Representatives can initiate and vote on proposals to optimize the consensus mechanism on behalf of their constituents, which promotes the development of the TTC Protocol in a simple, effective, and decentralized way.

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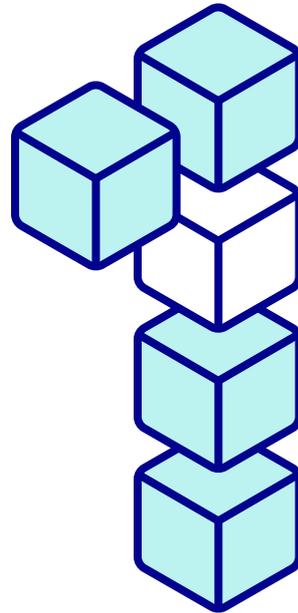
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White Paper Disclaimer

01

Background



Decentralized Social Networks

Individuals have adapted to the rapid spread of mobile communication technology and developed new ways to share their lives, interact with one another, and form communities. Social networks are no longer simply technological phenomena. Major platforms such as Facebook, Instagram, and Weibo have fundamentally changed the way people express their identities, communicate ideas, and develop relationships.

As social network services grow increasingly sophisticated, users run up against limitations caused by their centralized architecture. Currently, the platforms themselves determine how user-generated content is distributed. The resulting dynamic favors paid content, while authentic user-generated content is condemned to low engagement and low visibility. Additionally, advertising revenue generated by users' likes, shares, and other forms of engagement flows to the platform provider rather than to its contributing users.

This dynamic has not gone unnoticed. Users' patience is wearing thin, and community members now expect a new type of transparent, open-minded, decentralized social network that incentivizes participants rather than platforms. This is the next generation of social networking.

It is clear that in a centralized system, the service provider wields control over content distribution. It is the platform

that benefits from advertising. In a decentralized system, the communal interest decides which content is worth seeing, and the benefits go directly to the users.

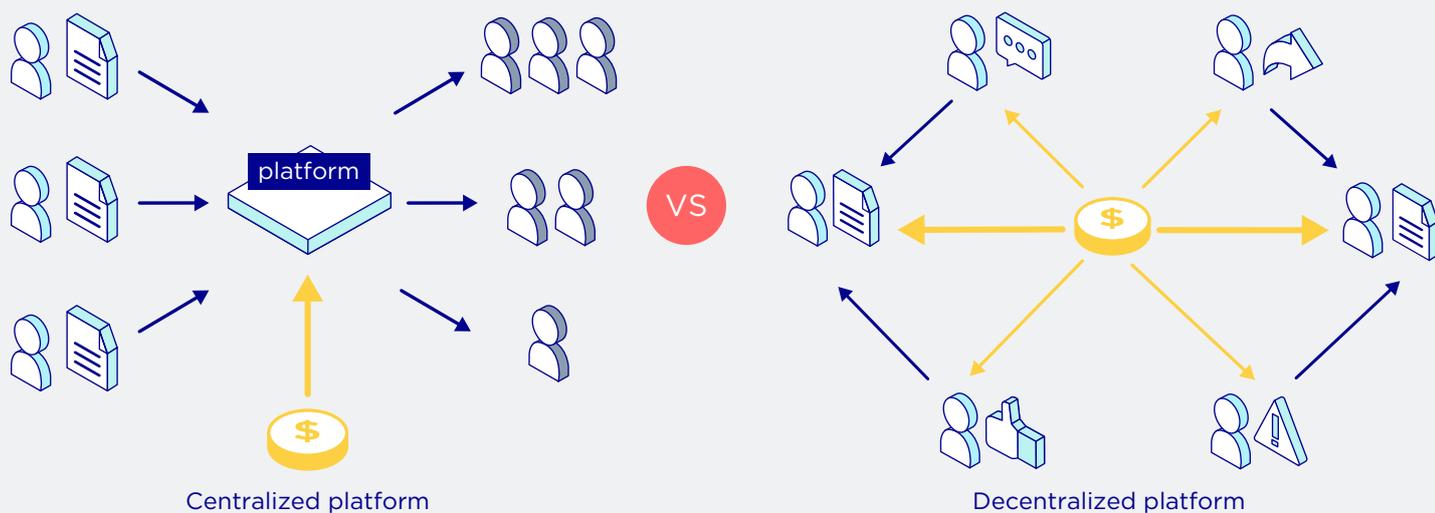


Fig 1. Centralized platform vs Decentralized platform

Blockchain Technology

Simply put, a blockchain is a digital ledger that is used to record transactions across multiple parties. It is decentralized, distributed, and public. Notably, because the record cannot be altered retroactively without the alteration of all subsequent information in collusion with the entire network, blockchain technology is secure by design. This makes blockchains suitable for keeping track of events, medical information, financial transactions, and other types of record keeping.

In technical terms, a blockchain is a distributed computing system that has achieved “decentralized consensus.” This means that there is no central authority that determines how and what information gets added to the ledger. The protocol around a blockchain is what allows participants on the network to reach a consensus about how to add new information, even when members cannot trust one another.

The advantage of blockchain technology is that all transaction information is transparent, anonymous, secure, and, because the ledger is append-only, immutable. Blockchain enables predetermined, decentralized mechanisms to run automatically, all while maintaining transparency to all.

Recently, blockchain technology has led to the rapid development of identity management, transaction processing, documenting provenance, and supply chain management. Blockchains are starting to become a part of our everyday lives.

Blockchain-Based Social Networks

In social networks, each user on the platform functions as a node. As the frequency and the probability at which user interactions increases, the density of nodes increases. This type of social model is highly compatible with the blockchain.

As a cutting-edge technology, the blockchain has been quickly adopted by the fields of finance and insurance, among others. However, it can hardly be said that ordinary users are well acquainted with it. A social networking service is the most familiar adoption for ordinary users, as the majority of users are unconcerned about whether or not they are interacting with the blockchain. Social networking is one of the most seamless paths for the blockchain to become widely accepted by the public.

Imagine a situation like this: you wake up in the morning to find your two cats are playing with each other. You take out your cell phone, take a video of your cats, upload the footage to a personal life sharing platform, and synchronize it to a video sharing platform that you only recently registered for. Suddenly, your video is welcomed by the platform users. They upvote your post, comment on it, even sharing it to other platforms. All of these interactions increase the value of your post. Then your post becomes one of the most popular posts of the day. For your high-quality contribution to the platform, you are rewarded with

tokens. You are surprised but pleased, and you use some of the tokens to buy virtual gifts for a streamer you like that is part of a live streaming platform that shares the same value system. You are satisfied with the experience and decide to keep making great videos for the platforms.

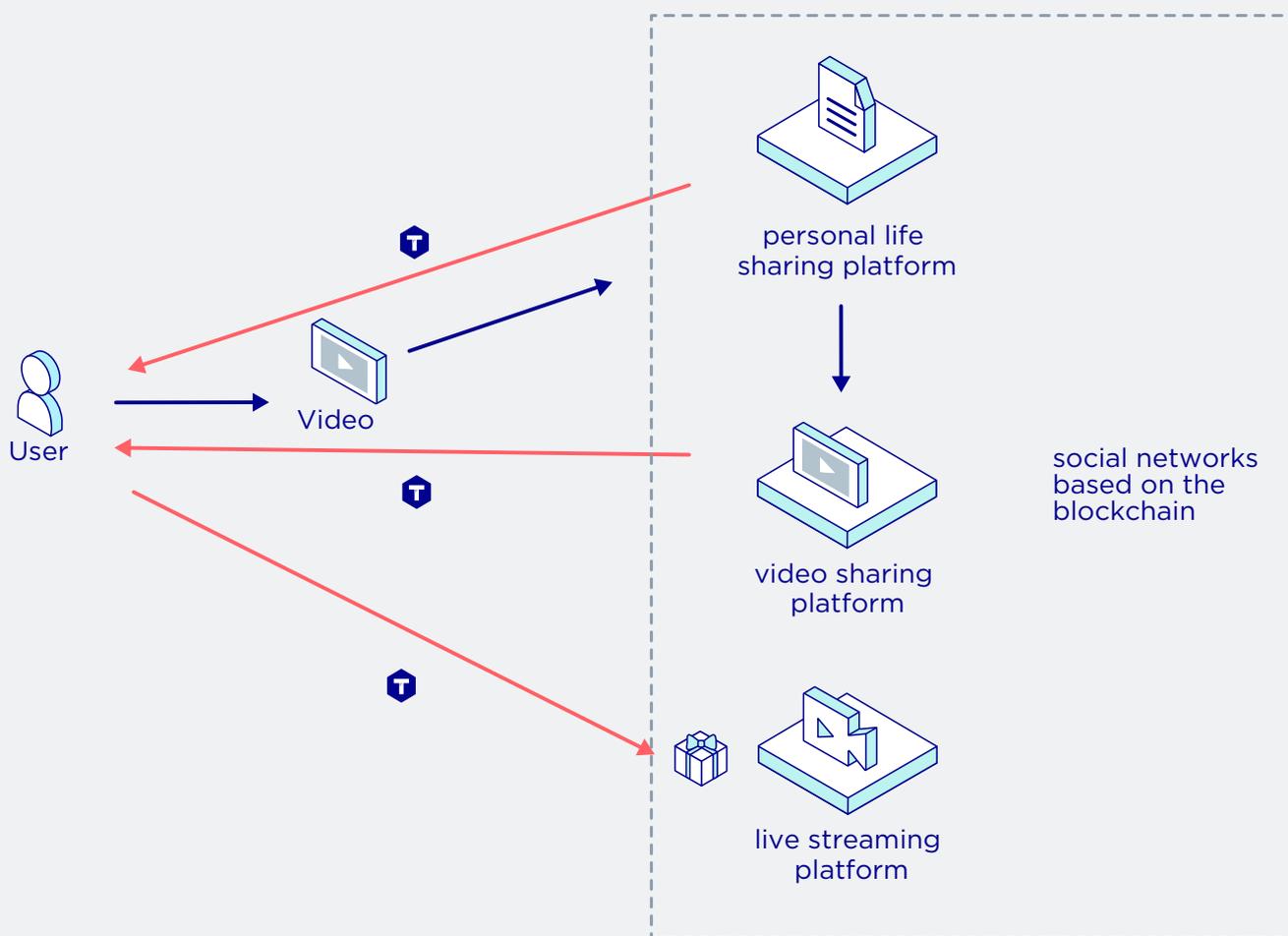


Fig 2. A demonstration of the value chain for blockchain-based social networks

This is the future of social networks built on blockchain technology. Those who have published high-quality content stand to be rewarded. Users can choose to watch ads or participate in activities requested by ad companies, and advertising revenue will be directly distributed to users. Blockchain technology provides the opportunity to build a Product Matrix for associated products to unify the cryptocurrency system, creating social value and exponential growth for communities. Blockchain-based social networking is changing your lifestyle, as well as the lives of billions of social users all over the world.

Rewarding users with cryptocurrencies creates economic incentives. These incentives effectively facilitate the establishment and growth of social networks in a few ways.

Proactive users

Every user in the network is a stakeholder who supports the shared belief that contributions matter. Users will participate proactively as their contributions are clearly and fairly recognized and rewarded.

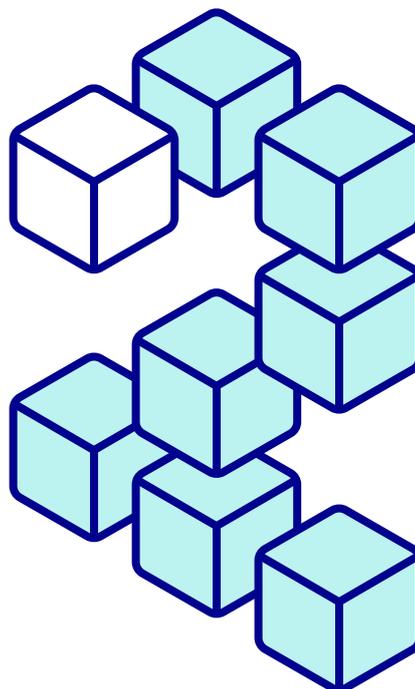
Healthy atmosphere

Content aligned with the core values of the network is highly rewarded. This creates a self-sustaining cycle where users are encouraged to create content that enriches the network.

Exponential growth

As the network grows, it increases in value, which in turn increases the value of the incentives. Not only does this make incentives more attractive to users, it also builds network visibility to the public.

02 The TTC Protocol



The TTC Protocol

The TTC Protocol is a blockchain-based social networking protocol that aims to provide a brand new social experience for users all over the world. The TTC Protocol connects every participant in the ecosystem by establishing common guidelines for different DAPPs. TTC is the circulating currency, incentivizing all participants in the ecosystem of the TTC Protocol.

There are several levels to the TTC Protocol. The consensus mechanism determines how information is recorded and synchronized. Above that, DAPPs provide social services to participating users. Users receive TTC from the TTC Reward Engine (TReE), which issues tokens on a daily basis to reward activity and contributions on DAPPs. Users can transfer TTC through different DAPPs with the TTC Connect via cross-chain technology. Each level mentioned above helps form the value chain of the TTC Protocol.

Consensus and Voting

Transaction speed is a top priority for the TTC Protocol, as a social networking protocol based on the blockchain. Throughout the TTC Protocol, transactions are not only limited to asset transactions, but operation transactions are also recorded on the blockchain. There could be millions of transactions per second for social platforms, hence the throughput is of vital importance to the TTC Protocol.

Consensus is the key factor to transaction speed. Blockchains based on PoW (Proof of Work) such as Bitcoin suffer from low transaction speeds and wasted computing power. For the TTC Protocol, multi-level BFT-DPoS serves as the consensus model.

In each round of the mining process, there are 21 representatives recording and synchronizing transactions on behalf of all users. The representatives are elected by users who hold TTC. A user's votes can only be designated to a single representative, where one vote is equal to one TTC. After ten rounds of mining, the representatives will be re-selected according to the latest voting results. Also, if a representative misses a certain amount of blocks, it will suffer reduced probability of producing blocks for a specific amount of time as punishment. Producing rate is a crucial factor for representatives.

In order to provide more opportunities to all participating representative candidates, there are multiple levels for

which representative candidates can be selected, with different probabilities according to the votes they have received. The details are illustrated in Fig 3.

Level	Rank	Probability
1	Top 10	100%
2	11 - 20	60%
3	21 - 30	40%
4	After 31	1 selected in each round

Fig 3. Representatives selection probability based on level and ranking

As voting for representatives is vital for the DPoS consensus, voting is defined as a method of mining for the TTC Protocol. Specifically, 61.8% of the TTC reward in a block will go to the representative, and 38.2% will be distributed among users who have voted for the representative. The more you vote, the more you can share in the voting rewards. A vote will become invalid after a week, so users will need to update their vote choice frequently. It is highly recommended that users review the performance of the representatives they have voted for, such as producing rate, blocks produced, and vote rankings. The voting rewards can effectively incentivize ordinary users to participate in the selection of block producers.

A decentralized consensus needs to be able to evolve in order to meet different scenarios in the future. In the TTC Protocol, representatives can initiate a proposal to optimize consensus mechanism aspects of reward distribution proportion and so forth. Proposals will be publicly voted on. During a voting period, representatives can share their positions on the proposal. All TTC holders can participate by voting for representatives according to their positions in TTC Connect. After the end of a voting period, all representatives will cast their votes on the proposal. Each representative's voting power is different; the number of votes a representative received from constituents determines the number of votes that representative uses when voting for the proposal. In this way, ordinary users can participate in the governance of consensus mechanism by voting for representatives they trust.

The TTC Protocol provides the means to achieve democratic consensus in a simple and effective way. The electoral voting mechanism increases participation, efficiency, and validity of voting compared to direct voting mechanisms. This system ensures the ultimate power to decide significant consensus reform lies with TTC holders.

DAPP Chains

A variety of social platforms are welcome to operate as DAPPs in the ecosystem of the TTC Protocol. DAPPs within the ecosystem include mainstream social networking services such as personal life sharing platforms, photo sharing communities, video sharing communities, and live streaming platforms.

There is one TTC Protocol core chain and several DAPP chains, with one DAPP chain for each ecosystem DAPP. The TTC core chain primarily deals with asset transactions, while the DAPP chain records the operation transactions for DAPPs. This separation of asset transactions and operation transactions will increase the performance and security of the TTC Protocol significantly, as well as decentralize and allow for independent management of different DAPPs in the long term. All transaction records on the TTC Protocol can be viewed through the Block Explorer tool.

The TTC Protocol uses cross-chain smart contracts to achieve the flexible transfer of assets between multiple chains. Initially, we mainly focus on cross-chain operation among isomorphic chains. At a later stage, we will gradually expand the compatibility of cross-chain operation to support non-isomorphic chains.

For more details on cross-chains, please refer to *Technical Considerations*.

The TTC Connect

Users manage their TTC assets in the TTC Connect. With a Single Sign-On (SSO) function, users can bind different DAPPs, and crossover from one DAPP to another to interact with communities across the entire ecosystem of the TTC Protocol. The main functions of the TTC Connect are as follows.

- Synchronizing TTC rewards among multiple DAPPs.
- Transferring TTC assets with other users or exchanges.
- Taking part in the governance of consensus by voting for representatives.

The TTC Connect is the most convenient way for users to make connections with the TTC Protocol. It forms a bridge between ordinary users and the full ecosystem of the TTC Protocol.

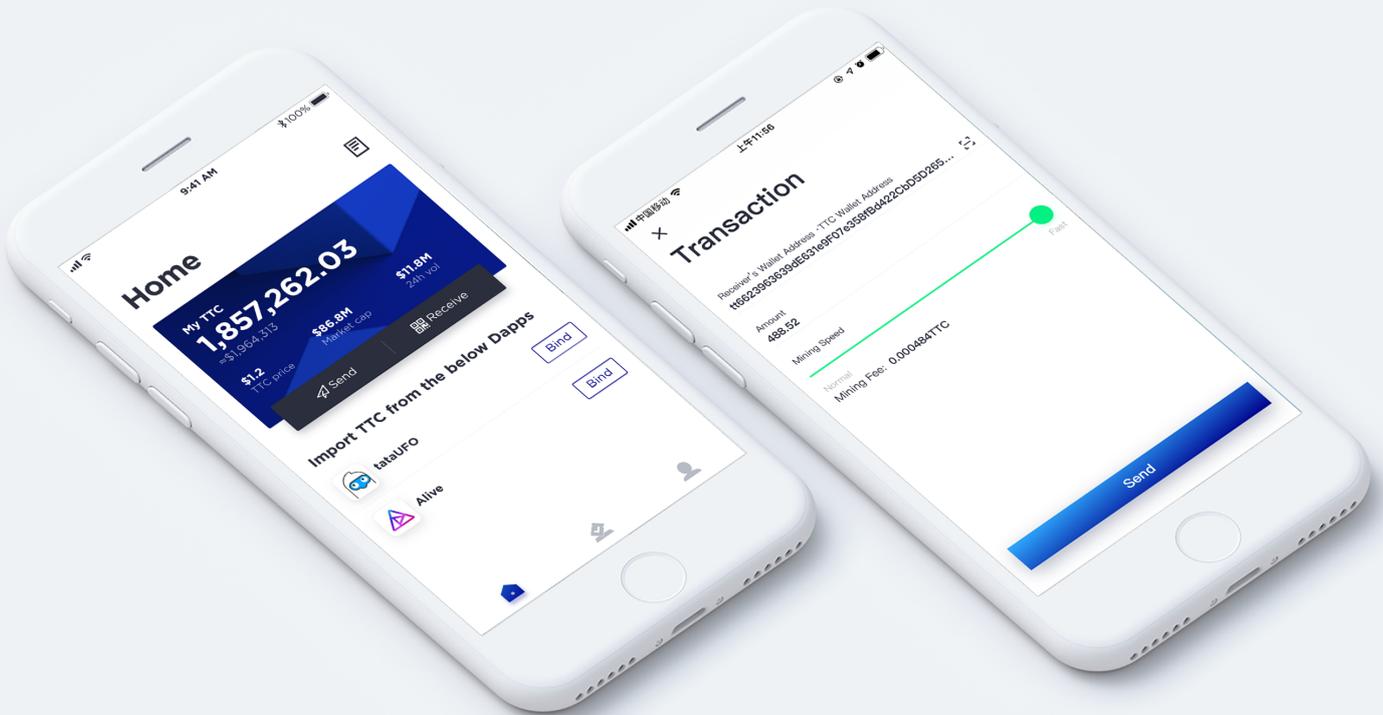
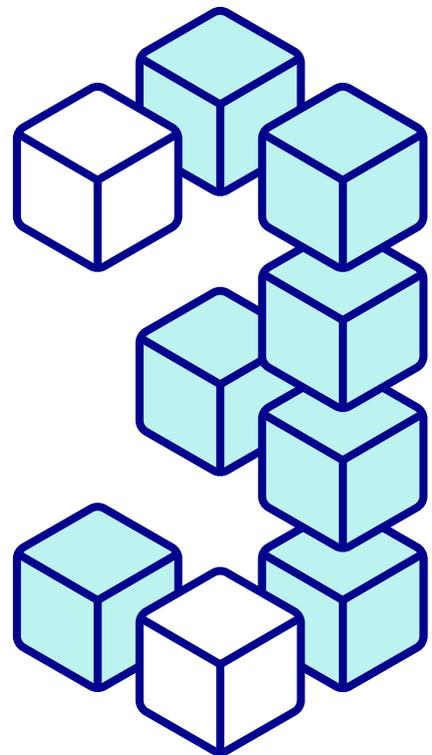


Fig 4. A demonstration of the TTC Connect

03

TTC Token



TTC Token

The TTC token (TTC) is a universal token based on the TTC Protocol, distributed to incentivize different participants in the ecosystem of the TTC Protocol. Currently, the TTC token is issued under the ERC-20 token standard. Eventually the TTC Protocol will transition to become its own universal coin.

A total supply of 1,000,000,000 (One billion) TTC tokens are issued for token sale, TReE, ecosystem building, TTC Foundation, team members, legacy users, and bounty programs.

- 25% of the total number of TTC tokens are distributed through the token sale.
- 25% of the total number of TTC tokens are allotted for daily TReE issued tokens that will go to DPoS representatives and voters, as well as DAPP developers and users.
- 20% of the total number of TTC tokens are preserved for ecosystem building, which will be used for investing on DAPPs and airdrop activities.
- 20% of the total number of TTC tokens are for TTC Foundation, to support the development of a healthy and accessible environment for every participant.

- 8% of the total number of TTC tokens are for core members and advisors.
- 2% of the total number of TTC tokens are for legacy users and bounty programs.

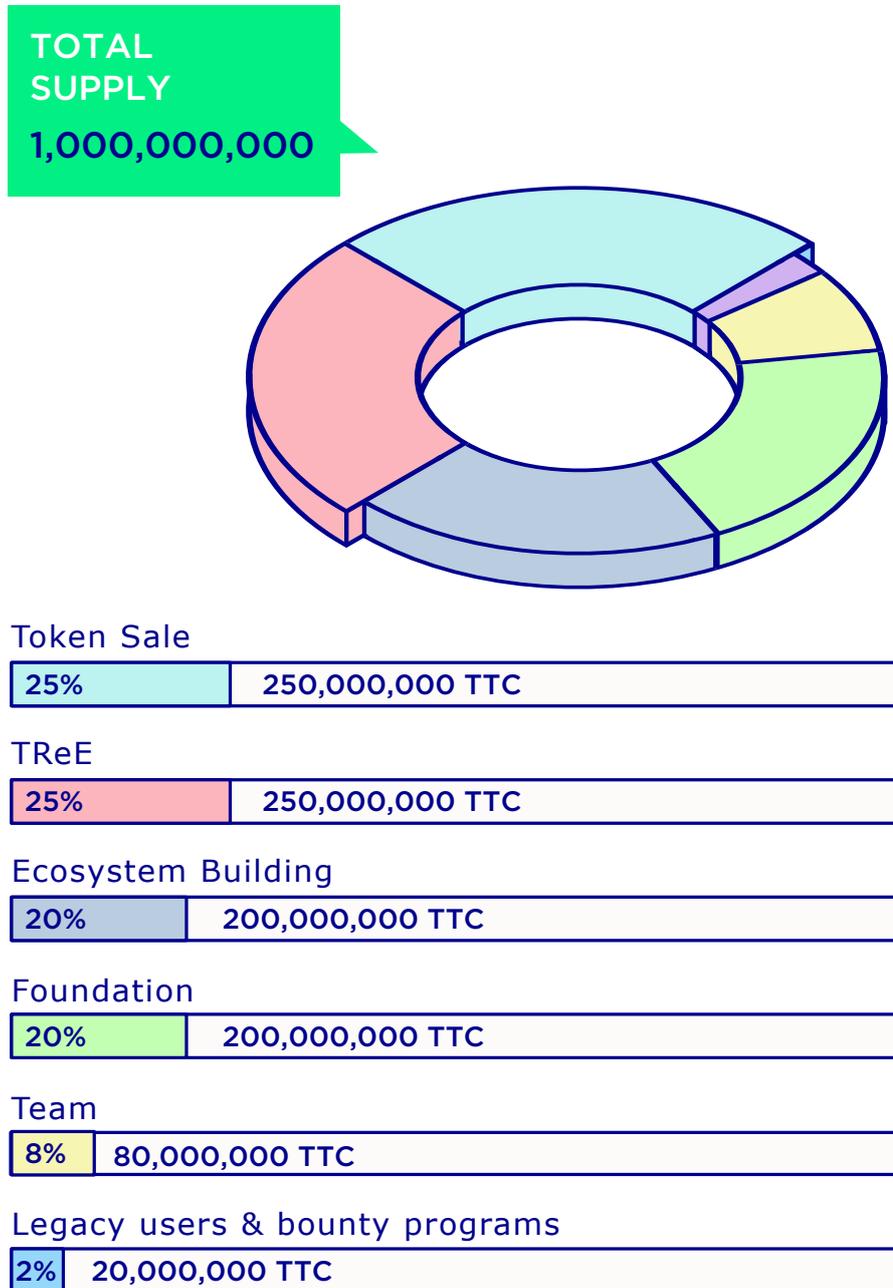
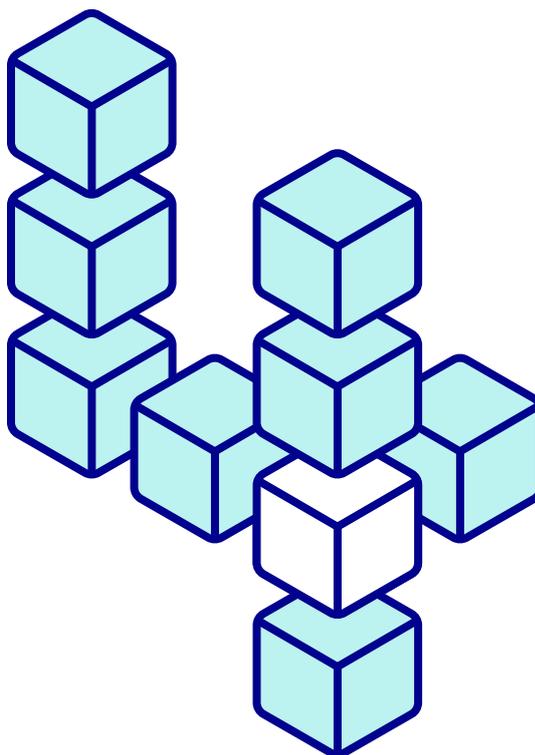


Fig 5. The allocation of TTC tokens

04

TReE



TReE

TReE, short for TTC Reward Engine, will incentivize all parties that make contributions to TTC Protocol's ecosystem by issuing TTC on a daily basis. There are two types of mining in the TTC ecosystem: consensus mining and social mining. As a blockchain protocol for social networks, the TTC Protocol distributes most rewards to DAPP users with social contributions. Compared with the traditional mining system, computing power is no longer necessary for mining. Instead, those who truly contribute to the platform are recognized and rewarded. The participants of TReE are depicted in Fig 6.

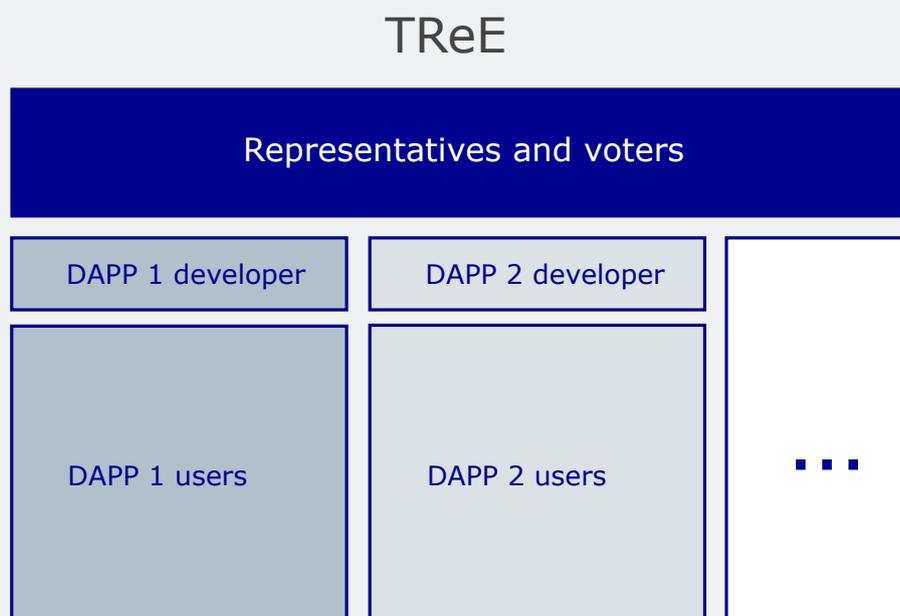


Fig 6. Participants that receive TTC rewards from TReE

Representatives and Voters

In a multi-level BFT-DPoS consensus, the transactions are recorded and synchronized by representatives that are elected by users who hold TTC. The proportion of TTC for representatives and voters is set at 10% of the TTC reward pool. By default, 61.8% of the DPoS mining rewards will go to the representative, while voters for the representative will share 38.2%, disbursed according to the amount of TTC they contributed in voting for the representative. For the ***Voting Is Mining*** mechanism, your voting reward is decided by the contribution of the representative you have voted for, as well as the number of votes that the representative has received. Therefore, it is highly recommended that TTC holders review the representatives they have voted for regularly.

For more details on the DPoS consensus model, please refer to *Technical Considerations*.

DAPP Developers

The ecosystem of the TTC Protocol welcomes social platforms from all around the world. All DAPPs will get a share of TReE, according to their performance parameters, including user attributes, daily usage time, user activity and retention, monthly active users, revenue, and so forth. The performance parameters will be updated on a monthly basis.

DAPP developers in the TTC Protocol's ecosystem make contributions by providing services to users. As such, they are apportioned a certain reward percentage from the TTC reward pool for maintenance costs, based on an assessment from TTC Foundation. Typically, the proportion granted to DAPP developers is no more than 30%. DAPP developers are also able to give all the rewards to their users should they choose to do so.

For more details on DAPPs, please refer to *The Ecosystem of the TTC Protocol*.

DAPP Users

The specific logic of TReE can be configured by the DAPP developer, based on the feature of the DAPP. In general, users who create high-quality content, interact with high-quality content, and maintain the environment of their DAPP community will be incentivized. A standard reward engine of DAPP users may contain the following elements.

Reputation

Reputation is a quantified value of the long-term contributions made by a user in terms of their loyalty, the quality of the content they create, the number of their followers, as well as their participation in auditing reported content.

Reputation = Retention Value + Value of Content created + Follower Value + Auditing & Reporting Value

Typically, a user's reputation progresses quickly at the beginning of their usage, as an incentive, but it becomes increasingly more difficult to gain reputation as their usage rises. It is better to set an upper limit for reputation,

otherwise users may lose track of the exact reputation ranking of other users.

A user's reputation can reflect how much contribution a user has made to the platform, and it is an effective way to fight against abuse.

Proportion of reputation elements	
Proportion of retention value	20%
Proportion of value of content created	30%
Proportion of follower value	30%
Proportion of auditing & reporting value	20%

Fig 7. A demonstration of proportion of reputation elements

Content value

One of the ultimate goals of a social platform is to produce high-quality content. The TTC Protocol defines the quality of content by the users who interact with it, in terms of the number of curators interacting with the content and the reputation of those curators.

A user's reputation value will be added to the content value of the content they interact with. Since there might be more than one way of interacting, such as liking, commenting, sharing, presenting gifts, and so forth.

Different weights can be set by DAPP developers for different interactions.

Weight of interactions	
Weight of liking	1
Weight of commenting	1.5
Weight of sharing	1.2
Weight of customized behavior 1 *	0

Fig 8. A demonstration of interaction weight values

$$\text{Content value} = \gamma_{\text{like}} * \sum f(\text{reputation of liker}) + \gamma_{\text{comment}} * \sum f(\text{reputation of commenter}) + \gamma_{\text{share}} * \sum f(\text{reputation of sharer}) + \dots$$

Another typical way to calculate content value is to calculate the proportion compared with all content on the platform. For some parameters, it is hard to quantify into a specific number (e.g. viewing time). These parameters can be measured precisely by proportion.

Content value = $\gamma_{\text{viewing-time}}$ * proportion of viewing time + γ_{comment} * proportion of comment + γ_{gift} * proportion of gift value + ...

DAPP developers can decide the calculation method according to the feature of the platform.

Reputation reward

The reward is distributed to users who have made contributions on a daily basis at 24:00 GMT. Typically, there are two types of rewards in the TTC Protocol: reputation reward and content reward.

Reputation reward is the incentive to users who keep making contributions to the platform. Users with high reputation value earn more reputation reward. Note that reputation increases slowly as it gets higher. There should be a mechanism to ensure distinction for high-reputation users.

DAPP developers can decide the proportion of the two kinds of rewards according to the needs of their platforms. Typically, reputation reward comprises less than 50% of the reward pool. If long time contribution is not what the DAPP developer intends to incentivize, they can adjust the proportion, distributing less reputation reward and more content reward.

Content reward

Content reward is for high-quality content, incentivizing both creators and curators. Reward for each content is determined by its content value. Since TReE is issued on a daily basis, calculation period needs to be taken into consideration.

DAPP developers can adjust the proportion parameters between content creator and curators. Typically, the content creator would get more of a share since they are the creator of the a high-quality content. However, if a DAPP developer cares more about interactions between curators, the proportion for curators could be higher. A good example of this type of DAPP might be a PGC (Professionally Generated Content) platform.

Curator rewards encompass different ways of interacting, such as liking, commenting, presenting gifts, and so forth. DAPP developers can modify contribution proportions, or directly input custom interactions they would like to incentivize.

Distribution between content creator and curators	
Proportion of content creator	61.8%
Proportion of content curators	38.2%
Proportion of liking	10%
Proportion of commenting	18.2%
Proportion of sharing	10%
Proportion of customized behavior 1 *	0%

Fig 9. A demonstration of distribution between content creator and curators

For reward-specific interactions, the distribution pattern typically decreases in time sequence, since interaction with high-quality content is less significant when it has already been recognized by a critical mass of users. For example, in tataUFO users are only rewarded for one social operation. Multiple social operations do not count towards the reward. Although these actions are not directly incentivized, they still impact rewards. With a function such as liking a comment, comments with more likes earn a larger share of the comment reward, since they are more popular.

DAPP developers can configure the reward engine for their users. A demonstration of TTC Reward Engine configuration is depicted in Fig 10.

TTC Reward Engine Configuration

Rewarding pool distribution

Proportion of content reward	50%
Proportion of reputation reward	50%

Content reward distribution

Content value calculation	<input checked="" type="checkbox"/> Fixed number <input type="checkbox"/> Proportion in all contents
---------------------------	---

Weight of interactions

Weight of liking	1
Weight of commenting	1.5
Weight of sharing	1.2
Weight of customized behavior 1 *	0

Distribution between content creator and curators

Proportion of content creator	61.8%
Proportion of content curators	38.2%
Proportion of liking	10%
Proportion of commenting	18.2%
Proportion of sharing	10%
Proportion of customized behavior 1 *	0%

Curators' distribution pattern

decrease in sequence
equal division

Reputation reward distribution

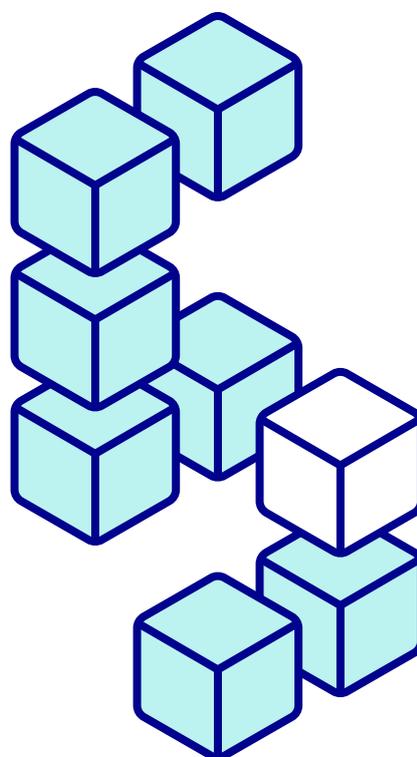
Proportion of reputation elements

Proportion of retention value	20%
Proportion of value of content created	30%
Proportion of follower value	30%
Proportion of auditing & reporting value	20%

Fig 10. A demonstration of TReE Configuration

05

The Ecosystem of the TTC Protocol



The Ecosystem of the TTC Protocol

There are different participants in the TTC ecosystem, representatives and voters, DAPP developers, DAPP users, third-party developers, advertisers and so forth. The participants and value chain of the TTC Protocol is depicted in Fig 11.

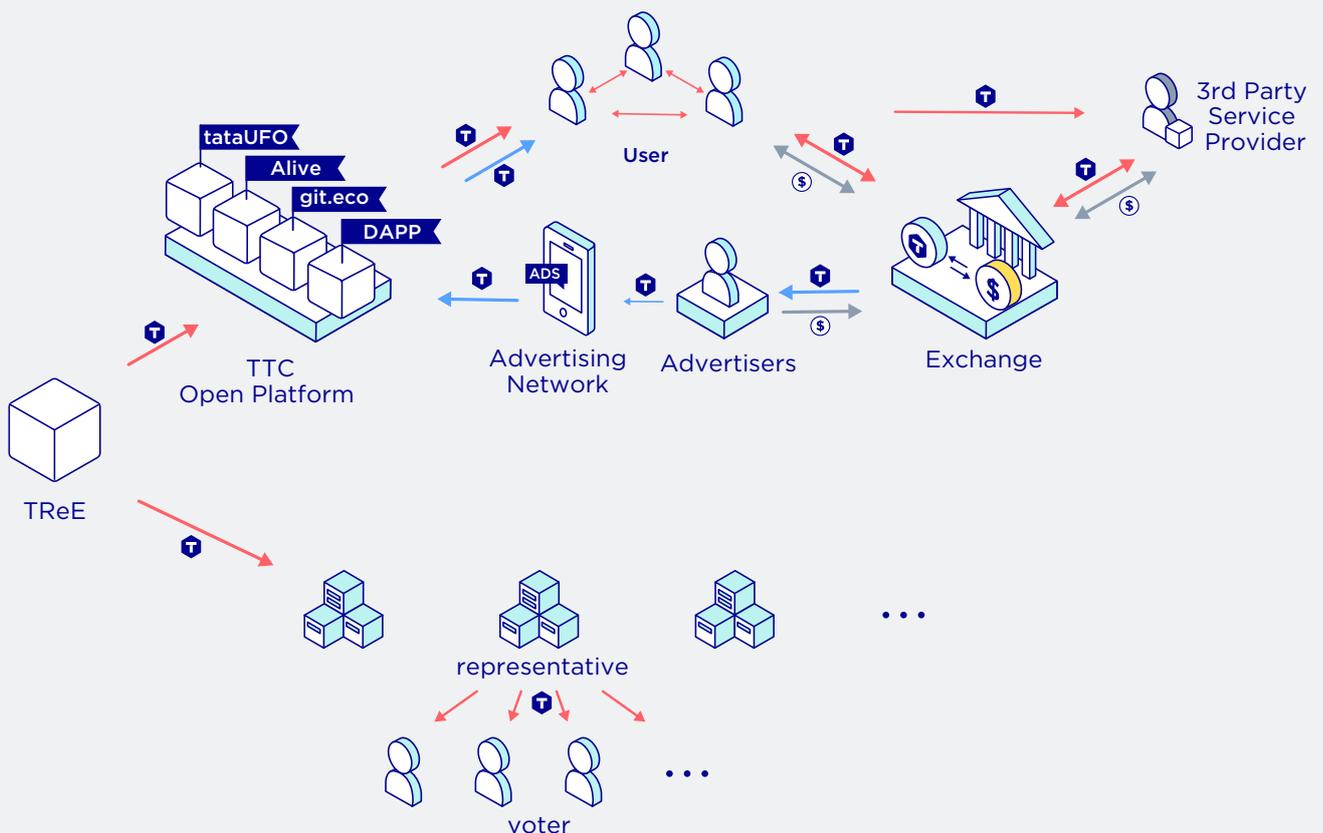


Fig 11. Participants and value chain of the TTC Protocol

TTC Open Platform

Developers of the open platform in the TTC Protocol will share the benefits of a decentralized and token-incentivized social network. Any developer can create his or her own blockchain DAPP and promote it on the ecosystem of the TTC Protocol.

To foster a unified and solid ecosystem, all DAPPs will be accessible with a Single Sign-On (SSO) function. In the TTC Connect, users can bind their account with different DAPPs, and cross from one DAPP to another to seamlessly interact with communities across the entire ecosystem of the TTC Protocol.

In addition, the TTC Protocol will also support a unified advertising platform with TTC as the universal currency. Advertisers can select multiple user groups from different DAPPs to increase their reach and increase the value of those advertisements.

Subsidy Strategy

TTC Foundation invests in a DAPP's development team or company on a case-by-case basis, offering TTC in exchange for equity. As a nonprofit entity, TTC Foundation uses equity to help build and maintain the TTC Ecosystem.

TTC Foundation will also employ additional subsidy strategies for DAPPs, depending on the current stage and needs of each DAPP.

DAPP developers are eligible for a percentage of TTC via one of the TTC Foundation's other subsidy programs such as an Airdrop Subsidy and Issued Reward Pool, as well as advertising revenue. The exact percentage of TTC will be distributed on a sliding scale determined during TTC Foundation's assessment. TTC subsidized to developers will be locked in for N months, with $1/N$ released each month.

DAPPs in the Ecosystem of the TTC Protocol

As a blockchain protocol for social networking services, the TTC Protocol aims to provide a new social experience for social users from around the world. DAPPs under the TTC Ecosystem cover mainstream social areas such as personal life sharing platforms, photo and video sharing platforms, live streaming platforms, social forums, and so forth.

tataUFO

tataUFO is a personal life sharing social network DAPP that is tailored to millennials and younger Generation Z. Users share their lives and interact with each other to build social relationships. tataUFO matches users that share similar interests by using big data and cloud computing to analyze the content each user generates and find potential matches. The result is not just more social connections, but more intimate connections.

Just five years after launching in 2013, the registered user base in tataUFO grew to more than 10 million, most of whom are college students in first- and second-tier cities in China. tataUFO's brand recognition and brand loyalty among the younger generation provide a solid foundation for the development in the future.

The open platform TTC Protocol will enable tataUFO to provide even more value to its users by establishing a decentralized and token-incentivized social network.

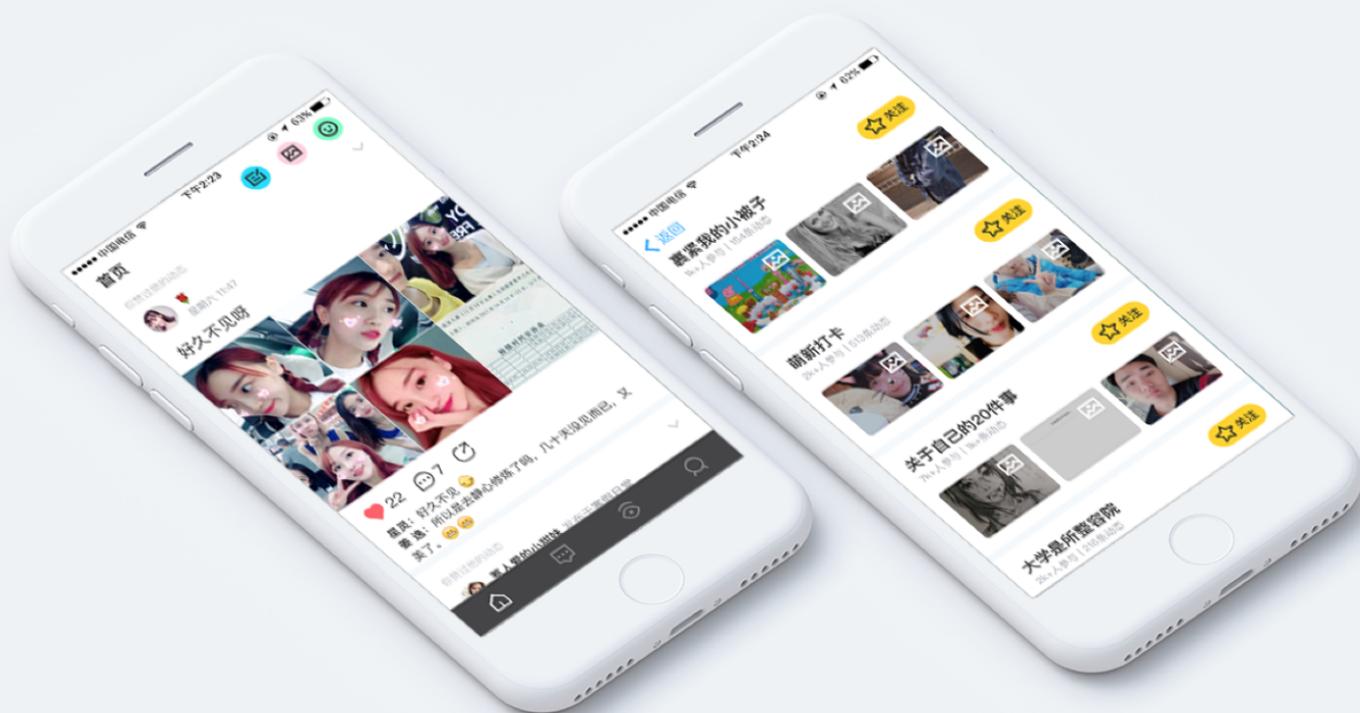


Fig 12. A demonstration of tataUFO

ALIVE

ALIVE is a video editing and sharing platform. ALIVE supports advanced beautifying functions for videos over 1GB and allows users to utilize a unique collection of various video editing tools. You can also share your video story across social platforms, and enjoy communicating with others' live moments.

Since its launching in 2014, ALIVE has acquired more than eight millions users in countries such as the USA, UK, China, Russia, Brazil, and Indonesia.

Currently, ALIVE is transforming from a video editing tool to a video sharing and interacting platform. TReE will help increase the interactions between video creators and their followers, leading to a healthy atmosphere on the platform.

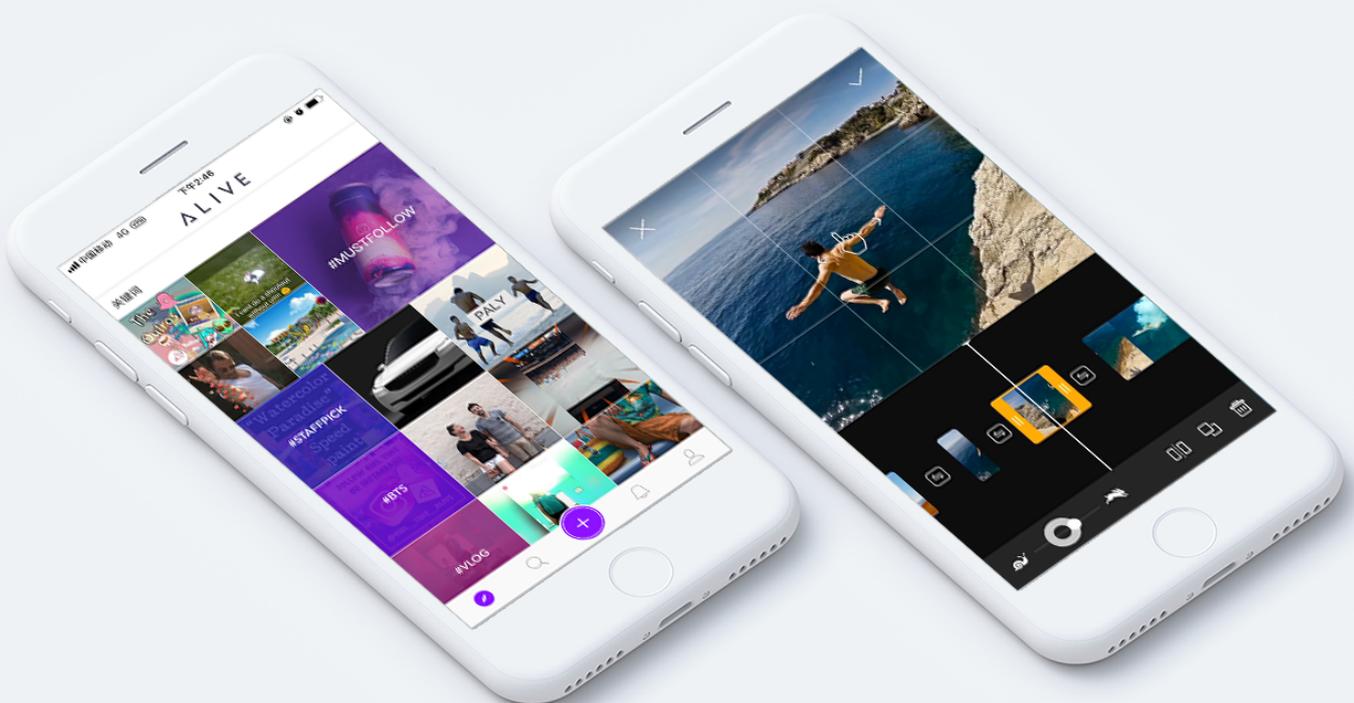


Fig 13. A screenshot of ALIVE

git.eco

git.eco is a token-incentivized collaboration community for developers based on the TTC Protocol. It offers token-incentivized open-source collaboration tools and community solutions including:

- Token escrow for projects
- Reward engine with smart contracts
- Source hosting (git/mercury)
- Bug/Issue tracking
- Contribution ranking (Leaderboard)
- Wiki/Documentation management
- Feature request
- And other contribution based incentives

git.eco cultivates the open-source collaboration by recognizing the contribution of developers, bug hunters, and maintainers with transparency, and rewards them rightfully. It decentralizes the way people work by empowering them with the right to choose how, when, and where to work. Their work will be measured and compensated by protocols or smart contracts, not by employers or companies.

git.eco itself is an open-source project and is carried out with developers and supporters to build this rebellious idea together. The TTC Protocol, as one of the initiators, will provide funding, reward engine technology, and other technical support for the project.

Third-Party Developers

As the universal cryptocurrency for all DAPPs, TTC plays an important role in providing a better user experience. Third-party developers get TTC for their service from platform users, rather than from TReE. They provide application scenarios for users, and the services they provide makes TTC flow in the ecosystem. Take tataUFO as an example. In tataUFO TTC can be used in the following ways:

Emoticons

Users can purchase emoticons developed by third party contributors with TTC.

Chat bots

Third party chat bots can offer various services such as on-demand weather reports, up-to-date exchange rates, and other premium services.

Private gifting

Once users follow one another, the chat feature is enabled. Users can send other users gifts of TTC via private chat.

Discount coupons

Users can use TTC to purchase discount coupons for online and offline stores.

Additional scenarios in other DAPPs might include bounty payments, interactive game earnings, and special item purchases. There are numerous possible ways to use TTC to provide a richer user experience.

Advertisers

Advertisers can promote their content and brands with TTC on member DAPPs in the ecosystem of the TTC Protocol. An advertiser acquires a certain number of TTC from the exchange and uses it to bid on the advertising network of the TTC Protocol. As a decentralized platform, TTC used for the advertisements are distributed directly to the users that view and interact with the advertisements. The DAPP developer and TTC Foundation will take a fractional transaction fee to cover the maintenance cost of implementing the advertising network.

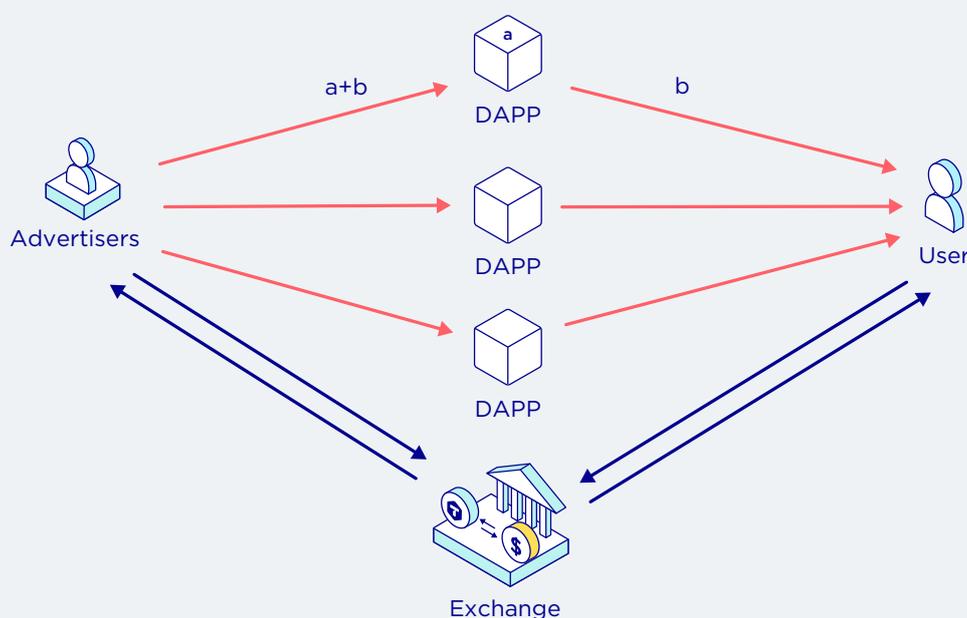
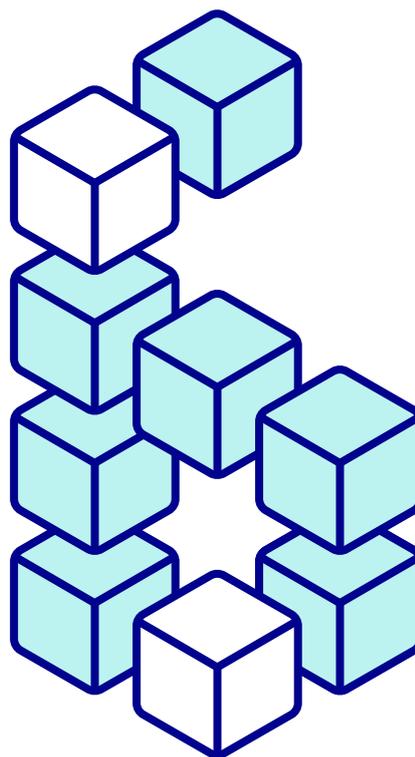


Fig 14. The TTC Protocol returns the commercial value to users

06

TTC

Foundation



TTC Foundation

TTC Foundation is an independent, democratic, and non-profit governance institution. Its mission is to ensure the TTC system operates reliably and transparently.

The main responsibilities of TTC Foundation include the following:

- To establish a global, social ecosystem covering various regions and user bases by adding DAPPs
- To establish a set of fair and transparent governance processes, and to supervise the operation of the TTC reward engine, rules of engagement, and legal disputes
- To establish the smart contract of a decentralized and incentivized social network, and to increase user value by creating a network effect
- To support the open platform TTC Protocol, fund new projects, and set up the distribution mechanism to DAPPs that ensures sustainable development

In order to accelerate the establishment of the global ecosystem that is the TTC Protocol, TTC Foundation will actively allocate its resources to develop and acquire more DAPPs on the open platform TTC Protocol. Resources will be used to encourage developers to join the TTC Protocol. This will accelerate growth in both the number of DAPPs and

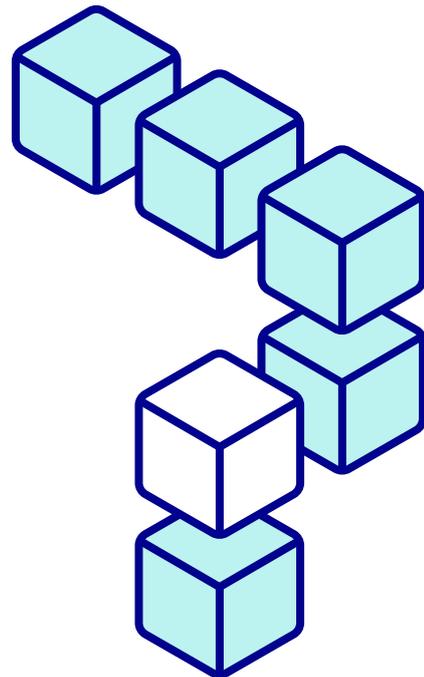
users. TTC Foundation will also invest in services with the potential to grow the TTC Protocol ecosystem. This will result in inorganic yet rapid growth of the platform.

As an independent organization, TTC Foundation secures its funds in the following ways:

1. 20% of the TTC are reserved for TTC Foundation as the original fund.
2. A pre-designed percentage of advertisement income will also go to TTC Foundation.

07

Decentralized Social Protocol



Decentralized Social Protocol

The management of the TTC Protocol's ecosystem depends on community participation.

On a consensus level, multi-level BFT-DPoS relies on representatives voted on by all TTC holders. It is difficult for ordinary users to become representatives due to the limitations of hardware performance. TTC holders delegate their power by voting for the representatives they trust. The voting rewards incentivize ordinary users to participate in the governance of consensus.

The ultimate power to decide significant consensus reforms lies with the TTC holders. A proposal on consensus introduced by representatives will take effect only when over half of the community members have reached the agreement to accept the proposal.

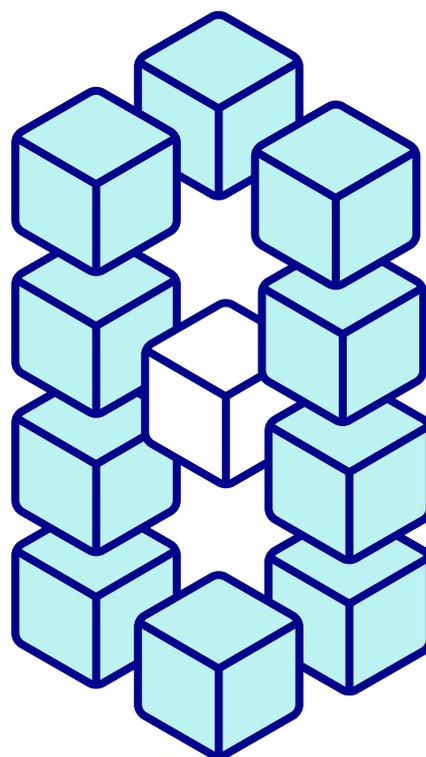
The TReE is hardwired into smart contracts that run automatically without any interactions. TTC distribution is based on the operation transactions on the TTC Protocol, where no one is capable of modifying any information.

The DAPP is governed by its users. Users can report inappropriate content, while other platform users audit that content. As a result, content aligned with the community standards and culture will be kept on the platform, while inappropriate content will be removed.

As an independent organization, TTC Foundation will be committed to establishing rules, funding new member DAPPs, and supporting technical development. TTC Foundation's main function is to support the development of a healthy and accessible environment for users and developers, while helping to build the guidelines for a sustainable ecosystem.

08

Technical Considerations



Technical Considerations

The TTC Protocol is a decentralized and token-incentivized protocol for social network services and online communities, seeking faster user growth. Every member in the ecosystem of the TTC Protocol works for one aligned goal of creating a more efficient, transparent, and meritocratic network.

We are building a blockchain protocol with improved performance, scalability, robustness, latency and mobile adaptation for large-scale social networking platforms.

Ethereum with its current PoW consensus algorithm is not suitable for mainstream services due to its limited transaction speed. The TTC Protocol utilizes Multi-level BFT-DPoS consensus algorithm to support DAPPs with a large user base.

The structure of the ecosystem of the TTC Protocol has three major layers: persistence layer, domain layer, and service layer. The persistence layer has the account system, Multi-level BFT-DPoS consensus mechanism, smart contracts, and more. The domain layer consists of the cross-chain protocol suite, oracle protocol suite, and data mapping and storage protocol suite based on smart contracts. Lastly, the service layer of the platform consists of a complete tripartite protocol, API and SDK, and dashboard and related components. Also, it provides access to developers, advertisers, and other related parties. The

entire ecosystem realizes the process of information generation, consumption, and transfer.

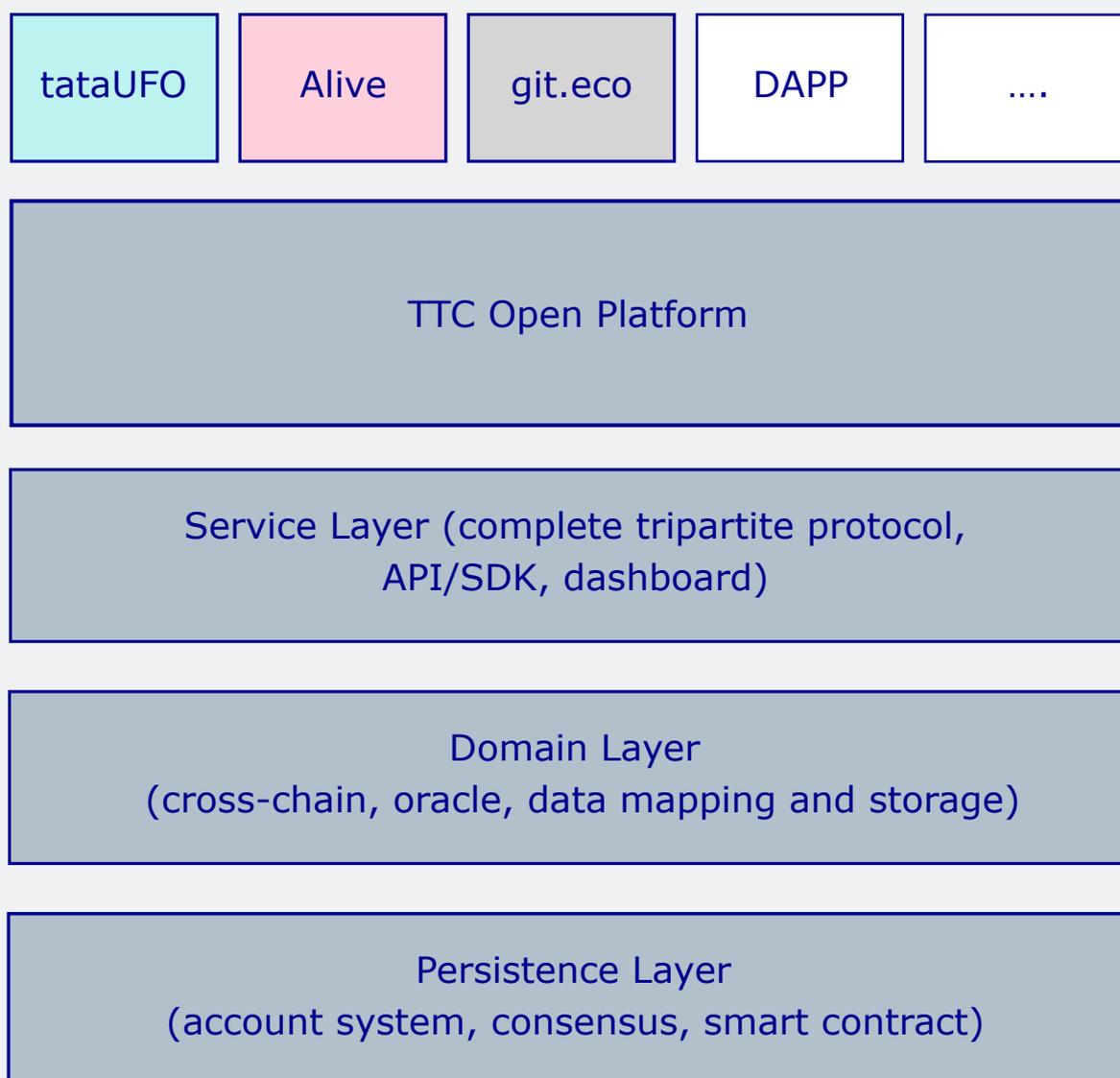


Fig 15. The technical architecture of the TTC Protocol

Account System

There are two types of mainstream account systems in blockchain society: asset-oriented (bitcoin UTXO) and user-oriented (Ethereum). The TTC Protocol applies the user-oriented account system, which distinguishes external owner accounts and smart contract accounts. While Ethereum matches one private key to one address, TTC Protocol allows one private key to correspond with multiple addresses, and also supports the authority transfer of the address owner.

DAPPs in the ecosystem of TTC Protocol create and assign one default account for data storage and reward distribution to each user. Each user can request the authority transfer of this account from the address owner (a DAPP) and bind to his or her universal account in the ecosystem of the TTC Protocol.

Consensus (Multi-level BFT-DPoS)

In a decade of development, the consensus algorithm - also known as the core of the blockchain technology - has evolved from a single PoW to multiple forms, such as PoS, DPoS and BFT. Each consensus algorithm has its pros and cons and a blockchain project must decide one consensus algorithm that is best suitable for its purpose and ideology.

We are building the TTC Protocol to close the gap between blockchain technology and existing social networking applications used by billions of people every day. Multi-level BFT-DPoS consensus is implemented in the TTC Protocol to enable large transaction processing capabilities and fast verification.

Multi-level BFT-DPoS is a consensus algorithm built based on the DPoS consensus, where multiple representative producers elected in real time can ensure the stability and efficiency of new blocks under fair premise. Its processing speed of a single chain can reach thousands of transactions per second without multi-chain parallelism or a sharding processing mechanism. It also uses the BFT mechanism to increase the speed of confirmation for each transaction. Ideally, the time of confirmation is the same as generation of a new block, which improves the execution efficiency of the entire blockchain. The Multi-level representative selection mechanism provides more representative candidates with the chance to produce blocks.

It is worth mentioning that we introduce the mechanism of gas in Ethereum for asset transactions to protect the system from external attackers by increasing the costs of abnormal transactions.

Smart Contract

The TTC Virtual Machine (TTVM) is the runtime environment for smart contracts with Turing completeness, high level of security, and high extensibility. TTVM has the following characteristics:

- Provides compilation tools with a comprehensive security check mechanism
- Supports multiple languages, such as Python, JavaScript, Solidity and Go, to embrace more developer communities
- Supports Ethereum virtual machine
- Improves the development efficiency by providing more standard libraries
- Provides developer-friendly IDE, online debugging and compilation environment

TTVM extends the functionality and use scenarios of smart contracts significantly by allowing smart contracts to access not only data on the blockchain, but also external services and data modules to implement the mechanism of the oracle.

Cross-Chain

Cross-chain is one of the hot topics among current blockchain developer communities, as it maximizes the expandability and connectivity of blockchain. There are four major cross-chain protocols being widely used today: notary schemes, side chains/relays, hash-locking, and distributed private key control. Each protocol is different in terms of interoperability, trust model, and implementation difficulty.

The TTC Protocol uses cross-chain to achieve the flexible transfer of digital assets between multiple chains. More specifically, we chose a distributed private key control protocol, since it supports cross chain asset transfer and mortgage, Oracle, multi-token smart contracts, and it will not suffer from "51% attacks."

Initially, we mainly focused on development of the cross-chain operation among isomorphic chains. In the later stage, we will gradually expand the compatibility of cross-chain operation for non-isomorphic chains.

In the ecosystem of the TTC Protocol, we extended the concept of cross-chain so that it exists not only to run on the blockchain, but also to implement specific requirements such as data exchange and sharing at the service layer. It is implemented based on the SSO solution and the distributed data exchange protocols.

Multi-Dimensional Data Storage

To embrace DAPPs with different data requirements, the TTC Protocol provides a range of data storage methods, multi-dimensional data storage framework and services.

For digital assets, privacy, copyright, and other related data, the TTC Protocol provides data storage and numerous encryption methods using cryptographic modules. For behavior data, different storage methods, such as a distributed storage structure TTFS, can be selected according to the needs and scenarios. A relationship mapping of the corresponding data on the TTC Protocol will be created at the point of data storage.

Data in the ecosystem of the TTC Protocol is tagged with a clear ownership. Data can be shared and transferred according to specific business scenarios. For example, an advertiser can build a smart contract, requesting access to users' information for better advertising strategies. When a user agrees, related information stored in the blockchain will be decrypted first, then encrypted with the advertiser's public key before it is shared to the advertiser.

Oracle

The TTC Protocol supports blockchain oracle, so that DAPPs and smart contracts can interact with external trusted interfaces and data. An oracle is a trusted entity that uses the signature to feed information about the state of the uncertain external world to smart contracts. Smart contracts can access the local data verified by the oracle signature without pulling data from a third-party interface, which ensures both the access efficiency and the price consistency.

The ecosystem of the TTC Protocol supports multi-node oracle solution to ensure reliability, stability and decentralization. A transaction that carries external data will be initiated to the blockchain only when over half of the node data is consistent. The actual confirmation time of a transaction in an oracle is usually equal to a block that is produced, because of the Multi-level BFT-DPoS consensus mechanism.

Ecosystem Toolkit

TTC Ecosystem provides numerous features and toolkits for members of different roles.

1. For DAPP developers:

A complete set of TTC test chain and corresponding cloud storage resource as well as detailed documents, use cases, multi-platform cross-language SDKs and APIs can be obtained from the developer community. There is no need for developers to deploy servers to use the test chain for developing and debugging. After completing QA process, DAPP can be connected to the main chain just by replacing the relevant address and application key.

2. For DAPP operators:

Statistic data of users can be accessed through visualized charts in real time, as well as the amount of tokens acquired by users of the DAPP.

3. For advertisers:

Not only can they acquire advertising value in real time, they can also optimize the delivery strategy based on detailed user behavior data authorized by users.

4. For users:

A Single Sign-on Account (SSO) can be used to access all DAPPs in the ecosystem of the TTC Protocol. A universal wallet controls all assets, enabling the cross-linked digital asset transfer. Also, users can authorize the transfer, sharing, and other operations of the information among DAPPs with the same account. It is easy for users to earn token rewards from various DAPPs and to withdraw those tokens seamlessly.

Blockchain Built for the Mobile Services

While most of the popular services/platforms are mobile-centric, current blockchain technology is not yet ready for mobile applications due to issues with manipulation, stability and connectivity. As a result, blockchain-based services are not yet accessible to the majority of the internet population.

The TTC Protocol utilizes a dual side authorization solution to ensure that the mobile services run on blockchain technology without issues. TTC SDK integration for DAPPs ensures the security and transparency of data transfer.

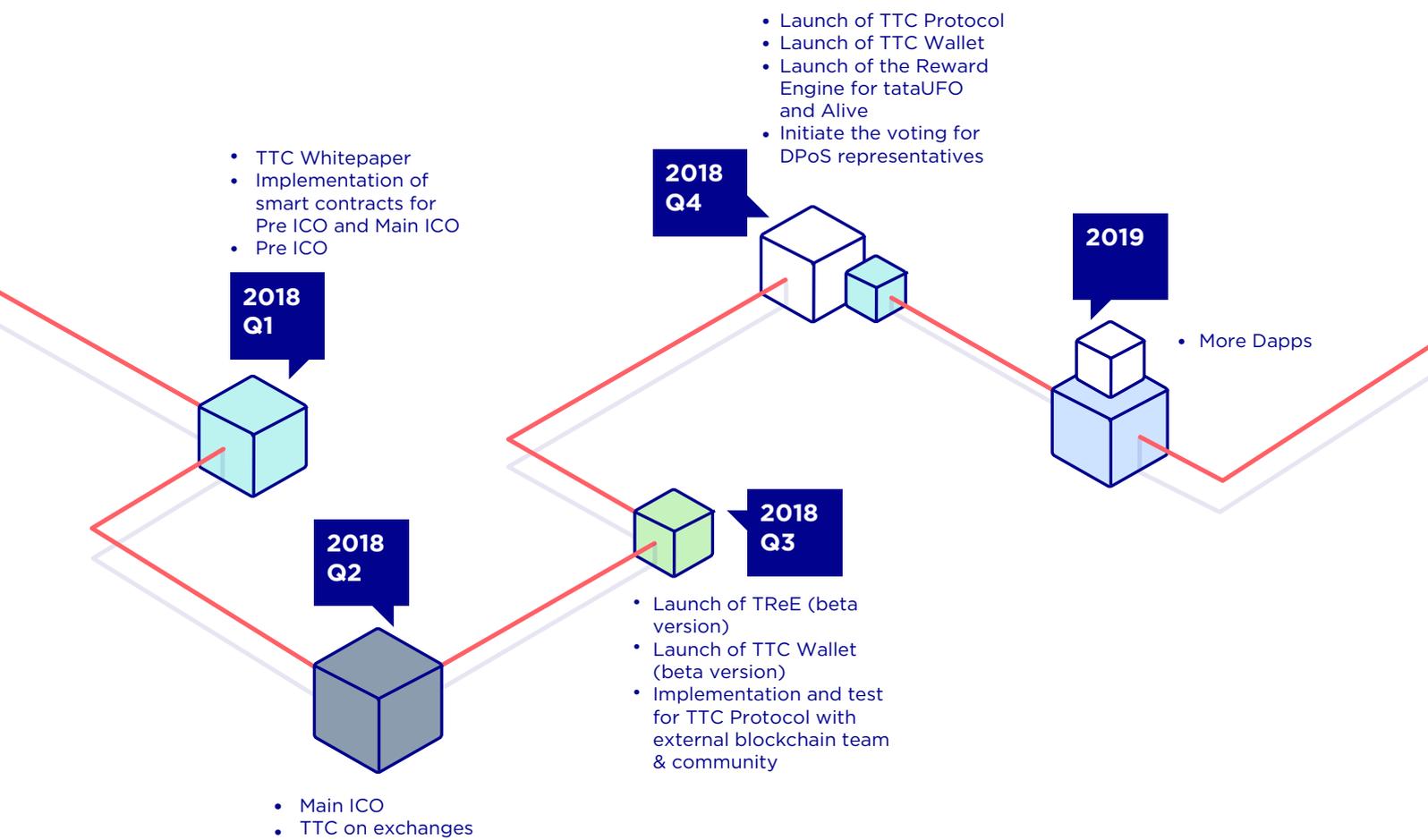
Anti-Spam Strategy

In order to create a fair environment for all DAPPs in the ecosystem of the TTC Protocol, a multi-dimensional anti-spam strategy is implemented.

Multi-point detection verifies the authenticity of interest-related behavior in DAPPs. When a user behavior is triggered, SDK is invoked by the mobile client, to record on the smart contract. As the server is notified of such operation, a corresponding smart contract is called to do relevant verification through the API interface.

The authenticity of the transaction is determined with machine learning algorithms based on user behaviors. It will affect the service such as value distribution through the blockchain oracle mechanism.

Roadmap



White paper disclaimer

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- (a) you are not an Excluded Person (as defined herein), or a citizen or resident of a country the laws of which prohibit or conflict with the Token Sale or your participation in the Token Sale (as referred hereto in the White Paper);
- (b) you agree to be bound by the limitations and restrictions described herein; and

- (c) you acknowledge that this White Paper has been prepared for delivery to you so as to assist you in making a decision as to whether to purchase Tokens.

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The Tokens subject of the Pre-Initial Token Sale and Initial Token Sale are proprietary cryptographic tokens issued and sold by an affiliate (“Issuer”) TTC Foundation. The Token will function as the native universal utility token used in the TTC Protocol as the means of value exchange and to power the TTC Protocol.

The Tokens are not be intended to constitute securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product in any jurisdiction. This White Paper does not constitute a prospectus or offer document of any sort and is not intend- ed to constitute an offer of securities of any form, units in a business trust, units in a collective investment scheme or any other form of regulated investment or investment product, or a solicitation for any form of regulated investment or investment product in any jurisdiction.

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- (A) A CITIZEN, DOMICILED IN, OR RESIDENT OF THE UNITED STATES OF AMERICA OR THE PRC;
- (B) LOCATED IN THE UNITED STATES OF AMERICA OR THE PRC AT THE TIME OF YOUR WHITELISTING FOR AND INTENDED PURCHASE OR PURCHASE OF TOKENS IN THE TOKEN SALE;
- (C) LOCATED IN A JURISDICTION WHERE THE TOKEN SALE IS PROHIBITED, RESTRICTED OR UNAUTHORISED IN ANY FORM OR MANNER WHETHER IN FULL OR IN PART UNDER THE LAWS, REGULATORY REQUIREMENTS OR RULES IN SUCH JURISDICTION; OR
- (D) A PERSON WHO IS OTHERWISE PROHIBITED OR INELIGIBLE IN ANY WAY, WHETHER IN FULL OR IN PART, FROM PARTICIPATING IN ANY PART OF THE TRANSACTIONS CONTEMPLATED IN THE TOKEN SALE TERMS (AS DEFINED BELOW),

(COLLECTIVELY, "EXCLUDED PERSONS").

For the purpose of this White Paper, to be "Whitelisted" means to be identified to be eligible to participate in the Token Sale by the Issuer subject to satisfactory know your client and anti-money laundering and counter financing of terrorism checks conducted in connection therewith, or such other criteria as may be imposed by the Issuer in connection therewith at its sole and absolute discretion.

No Token should be construed, interpreted, classified or treated as enabling, or according any opportunity to, purchasers to participate in or receive profits, income, or other payments or returns arising from or in connection with the TTC Protocol or the Tokens or the proceeds of the Token Sale, or to

receive sums paid out of such profits, income, or other payments or returns.

No person is bound to enter into any contract or binding legal commitment in relation to the sale and purchase of the Tokens, and no cryptocurrency or other form of payment is to be accepted on the basis of this White Paper.

Any agreement as between Issuer and you as a purchaser, and in relation to any sale and purchase, of Tokens is to be governed by only a separate document setting out the terms and conditions (the "Token Sale Terms") of such agreement. In the event of any inconsistencies between the Token Sale Terms and this White Paper, the former shall prevail.

There are risks and uncertainties associated with TTC Foundation, the Issuer and their business and operations, the Tokens, the TTC Protocol, and the Token Sale. Please refer to the section entitled "Risks and Disclosures" set out at the end of this White Paper.

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- (b) you are not an Excluded Person, or a citizen or resident of a country the laws of which prohibit or conflict with the Token Sale or your participation in the Token Sale;
- (c) you are not located in a jurisdiction where the Token Sale is prohibited, restricted or unauthorised in any form or manner whether in full or in part under the laws, regulatory requirements or rules in such jurisdiction;
- (d) you are not a person who is otherwise prohibited or ineligible in any way, whether in full or in part, from participating in any part of the transactions contemplated in the Token Sale Terms;
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- (f) you acknowledge and understand that no Token should be construed, interpreted, classified or treated as enabling, or according any opportunity to, Token holders to participate in or receive profits, income, or other payments or returns arising from or in connection with the Tokens or the proceeds of the Token Sale, or to receive sums paid out of such profits, income, or other payments or returns;
- (g) you agree and acknowledge that no regulatory authority has examined or approved of the information set out in this White Paper, no action has been or will be taken by TTC Foundation to obtain such approval under the laws, regulatory requirements or rules of any jurisdiction and the publication, distribution or dissemination of this White Paper to you does not imply that the applicable laws, regulatory requirements or rules have been complied with;
- (h) you agree and acknowledge that this White Paper, the undertaking and/or the completion of the Token Sale, or future trading of Tokens on any cryptocurrency exchange, shall not be construed, interpreted or deemed by you as an indication of the merits of TTC Foundation, the Tokens, the Token Sale, and the TTC Protocol;
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- (j) you agree and acknowledge that in the case where you wish to purchase any Tokens, Tokens are not to be construed, interpreted, classified or treated as:
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 - (ii) debentures, stocks or shares issued by any person or entity;
 - (iii) rights, options or derivatives in respect of such debentures, stocks or shares;
 - (iv) rights under a contract for differences or under any other contract the purpose or pretended purpose of which is to secure a profit or avoid a loss;
 - (v) securities;
 - (vi) units or derivatives of units in a business trust;
 - (vii) units in a collective investment scheme; or
 - (viii) any form of regulated investment or investment product;
- (k) you are fully aware of and understand that you are not eligible and you are not to purchase any Tokens if you are an Excluded Person;
- (l) you are legally permitted to participate in the Token Sale and all actions contemplated or associated with such purchase, including the holding and use of Tokens;
- (m) the amounts that you use to purchase Tokens were not and are not directly or indirectly derived from any activities that contravene the laws and regulations of any jurisdiction, including anti-money laundering laws and regulations;
- (n) if you are a natural person, you are of sufficient age and capacity under the applicable laws of the jurisdiction in which you reside and the jurisdiction of which you are a citizen to participate in the Token Sale;
- (o) you are not obtaining or using Tokens for any illegal purpose;

(p) none of:

(i) you;

(ii) any person controlling or controlled by you;

(iii) if you are a privately-held entity, any person having a beneficial interest in you; or

(iv) any person for whom you are acting as agent or nominee in connection with this Token Sale,

is a senior foreign political figure, or any immediate family member or close associate of a senior foreign political figure.

A “senior foreign political figure” is defined as a senior official in the executive, legislative, administrative, military or judicial branch of a government (whether elected or not), a senior official of a major political party, or a senior executive of a foreign government-owned corporation, and includes any corporation, business or other entity that has been formed by, or for the benefit of, a senior foreign political figure.

“Immediate family” of a senior foreign political figure typically includes such figure’s parents, siblings, spouse, children and in-laws.

A “close associate” of a senior foreign political figure is a person who is widely and publicly known to maintain an unusually close relationship with such senior foreign political figure, and includes a person who is in a position to conduct substantial domestic and international financial transactions on behalf of such senior foreign political figure;

(q) if you are affiliated with a non-U.S. banking institution (“Foreign Bank”), or if you receive deposits from, make payments on behalf of, or handle other financial transactions related to a Foreign Bank, you represent and warrant to TTC Foundation that:

(i) the Foreign Bank has a fixed address, and not solely an electronic address, in a country in which the Foreign Bank is authorised to conduct banking activities;

- (ii) the Foreign Bank maintains operating records related to its banking activities;
- (iii) the Foreign Bank is subject to inspection by the banking authority that licensed the Foreign Bank to conduct its banking activities; and
- (iv) the Foreign Bank does not provide banking services to any other Foreign Bank that does not have a physical presence in any country and that is not a regulated affiliate;
- (r) you have a basic degree of understanding of the operation, functionality, usage, storage, transmission mechanisms and other material characteristics of cryptocurrencies, blockchain-based software systems, cryptocurrency wallets or other related token storage mechanisms, blockchain technology and smart contract technology;
- (s) you are fully aware and understand that in the case where you wish to purchase any Tokens, there are risks associated with TTC Foundation and its businesses and operations, the Tokens, the TTC Protocol and the Token Sale;
- (t) you bear the sole responsibility to determine what tax implications purchasing Tokens may have for you and agree not to hold TTC Foundation or any other person involved in the Token Sale liable for any tax liability associated with or arising therefrom;
- (u) you agree and acknowledge that TTC Foundation and/or any person involved in the Token Sale and/or with the creation and distribution of Tokens or the TTC Protocol, is not liable for any direct, indirect, special, incidental, consequential or other losses of any kind, in tort, contract or otherwise (including but not limited to loss of revenue, income or profits, and loss of use or data), arising out of or in connection with any acceptance of or reliance on this White Paper or any part thereof by you;

- (v) you waive the right to participate in a class action lawsuit or a class wide arbitration against TTC Foundation and/or any person involved in the Token Sale and/or with the creation and distribution of Tokens or the TTC Protocol; and
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All statements contained in this White Paper, statements made in press releases or in any place accessible by the public and oral statements that may be made

by TTC Foundation or its directors, executive officers or employees acting on behalf of TTC Foundation (as the case may be), that are not statements of historical fact, constitute "forward-looking statements". Some of these statements can be identified by forward-looking terms such as "aim", "target", "anticipate", "believe", "could", "estimate", "expect", "if", "intend", "may", "plan", "possible", "probable", "project", "should", "would", "will" or other similar terms. However, these terms are not the exclusive means of identifying forward-looking statements. All statements regarding TTC Foundation's business strategies, plans and prospects and the future prospects of the industry which TTC Foundation is in are forward-looking statements. These forward-looking statements, including but not limited to statements as to TTC Foundation's prospects, future plans, other expected industry trends and other matters discussed in this White Paper regarding TTC Foundation are matters that are not historic facts, but only predictions.

These forward-looking statements involve known and unknown risks, uncertain- ties and other factors that may cause the actual future results, performance or achievements of TTC Foundation to be materially different from any future results, performance or achievements expected, expressed or implied

by such forward-looking statements. These factors include, amongst others:

- (a) changes in political, social, economic and stock or cryptocurrency market conditions, and the regulatory environment in the countries in which TTC Foundation conducts its business and operations;
- (b) the risk that TTC Foundation may be unable to execute or implement its business strategies and future plans;
- (c) changes in interest rates and exchange rates of fiat currencies and cryptocurrencies;
- (d) changes in the anticipated growth strategies and expected internal growth of TTC Foundation and the TTC Protocol;
- (e) changes in the availability and fees payable to TTC Foundation in connection with its businesses and operations or on the TTC Protocol;
- (f) changes in the availability and salaries of employees who are required by TTC Foundation to operate their respective businesses and operations;
- (g) changes in preferences of users of the TTC Protocol;
- (h) changes in competitive conditions under which TTC Foundation operates, and the ability of TTC Foundation to compete under such conditions;
- (i) changes in the future capital needs of TTC Foundation and the availability of financing and capital to fund such needs;
- (j) war or acts of international or domestic terrorism;
- (k) occurrences of catastrophic events, natural disasters and acts of God that affect the businesses and/or operations of TTC Foundation;
- (l) other factors beyond the control of TTC Foundation; and

- (m) any risk and uncertainties associated with TTC Foundation and its business and operations, the Tokens, the TTC Protocol and the Token Sale.

All forward-looking statements made by or attributable to TTC Foundation or persons acting on behalf of TTC Foundation are expressly qualified in their entirety by such factors. Given that risks and uncertainties that may cause the actual future results, performance or achievements of TTC Foundation to be materially different from that expected, expressed or implied by the forward-looking statements in this White Paper, undue reliance must not be placed on these statements. These forward-looking statements are applicable only as of the date of this White Paper.

Neither TTC Foundation nor any other person represents, warrants, and/or undertakes that the actual future results, performance or achievements of TTC Foundation will be as discussed in those forward-looking statements. The actual results, performance or achievements of TTC Foundation may differ materially from those anticipated in these forward-looking statements.

Nothing contained in this White Paper is or may be relied upon as a promise, representation or undertaking as to the future performance or policies of TTC Foundation.

Further, TTC Foundation disclaims any responsibility to update any of those forward-looking statements or publicly announce any revisions to those forward-looking statements to reflect future developments, events or circumstances, even if new information becomes available or other events occur in the future.

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This White Paper includes information obtained from various third party sources ("Third Party Information"). None of the publishers of the Third Party Information has consented to the inclusion of the Third Party Information in this White Paper and is therefore not liable for the Third Party Information. While TTC Foundation has taken reasonable action to ensure that the

Third Party Information have been included in their proper form and context, neither TTC Foundation, nor its directors, executive officers and employees acting on its behalf, has independently verified the accuracy, reliability, completeness of the contents, or ascertained any applicable underlying assumption, of the relevant Third Party Information. Consequently, neither TTC Foundation nor its directors, executive officers and employees acting on their behalf makes any representation or warranty as to the accuracy, reliability or completeness of such information and shall not be obliged to provide any updates on the same.

TERMS USED

To facilitate a better understanding of the Tokens being offered for purchase by TTC Foundation, and the businesses and operations of TTC Foundation, certain technical terms and abbreviations, as well as, in certain instances, their descriptions, have been used in this White Paper. These descriptions and assigned meanings should not be treated as being definitive of their meanings and may not correspond to standard industry meanings or usage.

Words importing the singular shall, where applicable, include the plural and vice versa and words importing the masculine gender shall, where applicable, include the feminine and neuter genders and vice versa. References to persons shall include corporations.

NO ADVICE

No information in this White Paper should be considered to be business, legal, financial or tax advice regarding TTC Foundation, the Tokens, the TTC Protocol, or the Token Sale. You should consult your own legal, financial, tax or other professional advisor regarding TTC Foundation and its business and operations, the Tokens, the TTC Protocol, and the Token Sale. You should be aware that you may be required to bear the financial risk of any exchange for of Tokens for an indefinite period of time.

None of the advisors engaged by us has made or purports to make any statement in this White Paper or any statement

upon which a statement in this White Paper is based and each of them makes no representation regarding any statement in this White Paper and to the maximum extent permitted by law, expressly disclaims and takes no responsibility for any liability to any person which is based on, or arises out of, any statement, information or opinions in, or omission from, this White Paper.

NO FURTHER INFORMATION OR UPDATE

No person has been or is authorised to give any information or representation not contained in this White Paper in connection with TTC Foundation and its business and operations, the Tokens, the TTC Protocol, or the Token Sale and, if given, such information or representation must not be relied upon as having been authorised by or on behalf of TTC Foundation. The Token Sale shall not, under any circumstances, constitute a continuing representation or create any suggestion or implication that there has been no change, or development reasonably likely to involve a material change in the affairs, conditions and prospects of TTC Foundation or in any statement of fact or information contained in this White Paper since the date hereof.

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Persons to whom a copy of this White Paper has been distributed or disseminated, provided access to or who otherwise have the White Paper in their possession shall not circulate it to any other persons, reproduce or otherwise distribute this White Paper or any information contained herein for any purpose whatsoever nor permit or cause the same to occur.

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This White Paper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities of any form, units in a business trust, units in a collective investment scheme or any other form of investment, or a solicitation for any form of investment in any jurisdiction. No person is bound to enter into any contract or binding legal commitment and no cryptocurrency or other form of payment is to be accepted on the basis of this White Paper.

THE TOKEN SALE (AS REFERRED TO HEREIN) IS INTENDED FOR, MADE TO OR DIRECTED AT ONLY PERSONS WHO ARE NOT EXCLUDED PERSONS

No regulatory authority has examined or approved of any of the information set out in this White Paper. No such action has been or will be taken under the laws, regulatory requirements or rules of any jurisdiction. The publication, distribution or dissemination of this White Paper does not imply that the applicable laws, regulatory requirements or rules have been complied with.

RISKS AND UNCERTAINTIES

Prospective purchasers of Tokens should carefully consider and evaluate all risks and uncertainties associated with the Issuer and TTC Foundation, and their business and operations, the Tokens, the TTC Protocol, and the Token Sale, and all information set out in this White Paper and the Token Sale Terms prior to any purchase of the Tokens. If any of such risks and uncertainties develops into actual events, the business, financial condition, results of operations and prospects of the Issuer could be materially and adversely affected. In such cases, you may lose all or part of the value of the Tokens.

Please read the following risks and warnings before deciding to purchase Tokens. It should be noted the following list of risks and warnings is not exhaustive. Accordingly, prospective purchasers should not place undue reliance on these statements.

1. RISKS RELATING TO PARTICIPATION IN THE TOKEN SALE

The Issuer may be forced to cease operations

It is possible that, due to any number of reasons, including, but not limited to, an unfavourable fluctuation in the value of cryptographic and fiat currencies, the inability of the Issuer to establish the Project or the Token's utility, the failure of commercial relationships, or intellectual property ownership challenges, the Issuer may no longer be viable to operate and the Issuer may dissolve or take actions that result in a dissolution of the Issuer.

There is no prior market for the Tokens and the Token Sale may not result in an active or liquid market for the Tokens

Prior to the Token Sale, there has been no public market for the Tokens. In the event that the Tokens are traded on a cryptocurrency exchange, there is no assurance that an active or liquid trading market for the Tokens will develop or if developed, be sustained after the Tokens have been made available for trading on such cryptocurrency exchange. There is also no assurance that the market price of the Tokens will not decline below the purchase price of the Tokens (the "Purchase Price"). The Purchase Price may not be indicative of the market price of the Tokens after they have been made available for trading on a cryptocurrency exchange.

A Token is not a currency issued by any central bank or national, supra-national or quasi-national organisation, nor is it backed by any hard assets or other credit. The Issuer is not responsible for nor does it pursue the circulation and trading of Tokens on the market. Trading of Tokens merely depends on the consensus on its value between the relevant market participants, and no one is obliged to purchase any Token from any holder of the Token, including the purchasers, nor does anyone guarantee the liquidity or market price of Tokens to any extent at any time. Accordingly, the Issuer cannot ensure that there will be any demand or market for Tokens, or that the Purchase Price is

indicative of the market price of Tokens after they have been made available for trading on a cryptocurrency exchange.

Future sales of the Tokens could materially and adversely affect the market price of Tokens

Any future sale of the Tokens (which were not available for sale in the Token Sale) would increase the supply of Tokens in the market and this may result in a downward price pressure on the Token. The sale or distribution of a significant number of Tokens outside of the Token Sale, or the perception that such further sales or issuance may occur, could adversely affect the trading price of the Tokens.

Negative publicity may materially and adversely affect the price of the Tokens

Negative publicity involving the Issuer, the TTC Protocol, the Tokens or any of the key personnel of the Issuer may materially and adversely affect the market perception or market price of the Tokens, whether or not such negative publicity is justified.

There is no assurance of any success of the TTC Protocol

The value of, and demand for, the Tokens hinges heavily on the performance of the TTC Protocol. There is no assurance that the TTC Protocol will gain traction after its launch and achieve any commercial success.

The TTC Protocol has not been fully developed, finalised and integrated and is subject to further changes, updates and adjustments prior to its launch. Such changes may result in unexpected and unforeseen effects on its projected appeal to users, and hence impact its success.

While the Issuer has made every effort to provide a realistic estimate, there is also no assurance that the cryptocurrencies raised in the Token Sale will be sufficient for the development and integration of the TTC Protocol. For the foregoing or any other reason, the development

and integration of the TTC Protocol may not be completed and there is no assurance that it will be launched at all. As such, distributed Tokens may hold little worth or value, and this would impact its trading price.

If and when the TTC Protocol is fully developed, there is no assurance it will be widely adopted or utilised by its target users.

The trading price of the Tokens may fluctuate following the Token Sale

The prices of cryptographic tokens in general tend to be relatively volatile, and can fluctuate significantly over short periods of time. The demand for, and correspondingly the market price of, the Tokens may fluctuate significantly and rapidly in response to, among others, the following factors, some of which are beyond the control of the Issuer:

- (a) new technical innovations;
- (b) analysts' speculations, recommendations, perceptions or estimates of the Token's market price or the Issuer's financial and business performance;
- (c) changes in market valuations and token prices of entities with operations similar to that of the Issuer that may be made available for sale and purchase on the same cryptocurrency exchanges as the Tokens;
- (d) announcements by the Issuer of significant events, for example partnerships, sponsorships, new product developments;
- (e) fluctuations in market prices and trading volume of cryptocurrencies on cryptocurrency exchanges;
- (f) additions or departures of key personnel of the Issuer;
- (g) success or failure of the Issuer's management in implementing business and growth strategies; and
- (h) changes in conditions affecting the blockchain or financial technology industry, the general economic

conditions or market sentiments, or other events or factors.

The funds raised in the Token Sale are exposed to risks of theft

The Issuer will make every effort to ensure that the funds received from the Token Sale will be securely held at such address as directed by the Issuer ("Receiving Address"). Further, upon receipt of the funds, the Issuer will make every effort to ensure that the funds received will be securely held through the implementation of security measures. Notwithstanding such security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and "selfish-mining" attacks), sophisticated cyber-attacks, distributed denials of service or errors, vulnerabilities or defects on the Receiving Address, the TTC blockchain, or any other blockchain, or otherwise. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. In such event, even if the Token Sale is completed, the Issuer may not be able to receive the cryptocurrencies raised and the Issuer may not be able to utilise such funds for the development of the TTC Protocol, and the launch of the TTC Protocol might be temporarily or permanently curtailed. As such, the issued Tokens may hold little worth or value, and this would impact its trading price. The Tokens are uninsured, unless you specifically obtain private insurance to insure them. In the event of any loss or loss of value, you may have no recourse.

2. RISKS RELATING TO THE RECEIVING ADDRESS AND WALLETS

The Receiving Address may be compromised and the cryptocurrencies may not be able to be disbursed

The Receiving Address is designed to be secure. However, in the event that the Receiving Address is, for any reason compromised (including but not limited to scenarios of the

loss of keys to such Receiving Address), the funds held by the Receiving Address may not be able to be retrieved and disbursed, and may be permanently unrecoverable. In such event, even if the Token

Sale is successful, the Issuer will not be able to receive the funds raised and the Issuer will not be able to utilise such funds for the development of the TTC Protocol, and the implementation of the TTC Protocol might be temporarily or permanently curtailed. As such, distributed Tokens may hold little worth or value, and this would impact its trading price.

The loss or compromise of information relating to your wallet may affect your access and possession of the Tokens

Your access to the Tokens in a cryptocurrency wallet ("Wallet") depends on, among other things, the safeguards to the information to such Wallet, including but not limited to the user account information, address, private key, and password. In the event that any of the foregoing is lost or compromised, your access to the Wallet may be curtailed and thereby adversely affecting your access and possession to the Tokens, including such Tokens being unrecoverable and permanently lost.

The Wallet or Wallet service provider may not be technically compatible with the Tokens

The Wallet or Wallet service provider may not be technically compatible with the Tokens which may result in the delivery of Tokens being unsuccessful or affect your access to such Tokens.

3. RISKS RELATING TO TTC FOUNDATION

The TTC Protocol is intended to be operated and maintained by TTC Foundation. Any events or circumstances which adversely affect TTC Foundation may have a corresponding adverse effect on the TTC Protocol if such events or circumstances affect TTC Foundation's ability to maintain the TTC Protocol. This would

correspondingly have an impact on the trading price of the Tokens.

TTC Foundation may be materially and adversely affected if it fails to effectively manage its operations as its business develops and evolves, which would have a direct impact on its ability to maintain the TTC Protocol and consequently the trading price of the Tokens.

The financial technology and cryptocurrency industries and the markets in which TTC Foundation competes have grown rapidly and continue to grow rapidly and evolve in response to new technological advances, changing business models and other factors. As a result of this constantly changing environment, TTC Foundation may face operational difficulties in adjusting to the changes, and the sustainability of TTC Foundation will depend on its ability to manage its operations, adapt to technological advances and market trends and ensure that it hires qualified and competent employees, and provide proper training for its personnel.

As its business evolves, TTC Foundation must also expand and adapt its operational infrastructure. TTC Foundation's business relies on its block- chain-based software systems, cryptocurrency wallets or other related token storage mechanisms, blockchain technology and smart contract technology, and to manage technical support infrastructure for the TTC Protocol effectively, TTC Foundation will need to continue to upgrade and improve its data systems and other operational systems, procedures and controls. These upgrades and improvements will require a dedication of resources, are likely to be complex and increasingly rely on hosted computer services from third parties that TTC Foundation does not control. If TTC Foundation is unable to adapt its systems and organisation in a timely, efficient and cost-effective manner to accommodate changing circumstances, its business, financial condition and results of operations may be adversely affected. If the third parties whom TTC Foundation relies on are subject to a security breach or otherwise suffer disruptions that impact the services TTC Foundation utilises, the integrity and

availability of its internal information could be compromised, which may consequently cause the loss of confidential or proprietary information, and economic loss.

The loss of financial, labour or other resources, and any other adverse effect on TTC Foundation's business, financial condition and operations, would have a direct adverse effect on TTC Foundation's ability to maintain the TTC Protocol. As the TTC Protocol is the main product to which the Tokens relate, this may adversely impact the trading price of the Tokens.

There may be weaknesses, vulnerabilities or bugs in the TTC smart contract

TTC Foundation will make reasonable efforts to ensure that the smart contracts underlying the Tokens are audited, tested and approved by technical experts. However, as smart contract technology is still in its early stage of development and its application of experimental nature carries significant operation, technological, financial, regulatory and reputational risks, there are inherent risks that such smart contracts could contain weaknesses, vulnerabilities or bugs.

Purchasers of Tokens should understand and accept that there are no warranties that Tokens are fit for a particular purpose or do not contain any weaknesses, vulnerabilities or bugs which would cause loss in their worth or value. In the event that any of the aforementioned risks materialises, TTC Foundation's business strategies, results of operations and prospects may also be adversely affected.

TTC Foundation may experience system failures, unplanned interruptions in its network or services, hardware or software defects, security breaches or other causes that could adversely affect TTC Foundation's infrastructure network, and/or the TTC Protocol

TTC Foundation is unable to anticipate when there would be occurrences of hacks, cyber-attacks, mining attacks (including but not limited to double-spend attacks, majority

mining power attacks and “selfish-mining” attacks), distributed denials of service or errors, vulnerabilities or defects in the TTC Protocol, the Tokens, the Receiving Address, the Wallet or any technology (including but not limited to smart contract technology) on which TTC Foundation, the TTC Protocol, the Tokens, the Receiving Address, and the Wallet relies or on the TTC blockchain or any other blockchain. Such events may include, for example, flaws in programming or source code leading to exploitation or abuse thereof. TTC Foundation may not be able to detect such hacks, mining attacks (including but not limited to double-spend attacks, majority mining power attacks and “selfish-mining” attacks), cyber-attacks, distributed denials of service errors vulnerabilities or defects in a timely manner, and may not have sufficient resources to efficiently cope with multiple service incidents happening simultaneously or in rapid succession.

TTC Foundation’s network or services, which would include the TTC Protocol, could be disrupted by numerous events, including natural disasters, equipment breakdown, network connectivity downtime, power losses, or even intentional disruptions of its services, such as disruptions caused by software viruses or attacks by unauthorised users, some of which are beyond TTC Foundation’s control. Although TTC Foundation has taken steps against malicious attacks on its appliances or its infrastructure, which are critical for the maintenance of the TTC Protocol and its other services, there can be no assurance that cyber-attacks, such as distributed denials of service, will not be attempted in the future, and that any of TTC Foundation’s enhanced security measures will be effective. TTC Foundation may be prone to attacks on its infrastructure intended to steal information about its technology, financial data or user information or take other actions that would be damaging to TTC Foundation and users of the TTC Protocol. Any significant breach of TTC Foundation’s security measures or other disruptions resulting in a compromise of

the usability, stability and security of TTC Foundation’s network or services (including the TTC Protocol) may adversely affect the trading price of the Tokens.

We are dependent in part on the location and data centre facilities of third parties

TTC Foundation's infrastructure network is in part established through servers that which it owns and houses at the location facilities of third parties, and servers that it rents at data centre facilities of third parties. If TTC Foundation is unable to renew its data facility lease on commercially reasonable terms or at all, TTC Foundation may be required to transfer its servers to a new data centre facility, and may incur significant costs and possible service interruption in connection with the relocation. These facilities are also vulnerable to damage or interruption from, among others, natural disasters, arson, terrorist attacks, power losses, and telecommunication failures. Additionally, the third party providers of such facilities may suffer a breach of security as a result of third party action, employee error, malfeasance or otherwise, and a third party may obtain unauthorised access to the data in such servers. As techniques used to obtain unauthorised access to, or to sabotage systems change frequently and generally are not recognised until launched against a target, TTC Foundation and the providers of such facilities may be unable to anticipate these techniques or to implement adequate preventive measures. Any such security breaches or damages which occur which impact upon TTC Foundation's infrastructure network and/or the TTC Protocol may adversely impact the price of the Tokens.

General global market and economic conditions may have an adverse impact on TTC Foundation's operating performance, results of operations and cash flows

TTC Foundation has been and could continue to be affected by general global economic and market conditions. Challenging economic conditions worldwide have from time to time, contributed, and may continue to contribute, to slow-downs in the information technology industry at large. Weakness in the economy could have a negative effect on TTC Foundation's business, operations and financial condition, including decreases in revenue and operating cash flows. Additionally, in a down-cycle

economic environment, TTC Foundation may experience the negative effects of increased competitive pricing pressure and a slowdown in commerce and usage of the TTC Protocol. Suppliers on which TTC Foundation relies for servers, bandwidth, location and other services could also be negatively impacted by economic conditions that, in turn, could have a negative impact on TTC Foundation's operations or expenses. There can be no assurance, therefore, that current economic conditions or worsening economic conditions or a prolonged or recurring recession will not have a significant adverse impact on TTC Foundation's business, financial condition and results of operations and hence the TTC Protocol, which would correspondingly impact the trading price of the Tokens.

TTC Foundation or the Tokens may be affected by newly implemented regulations

Cryptocurrency trading is generally unregulated worldwide, but numerous regulatory authorities across jurisdictions have been outspoken about considering the implementation of regulatory regimes which govern cryptocurrency or cryptocurrency markets. TTC Foundation or the Tokens may be affected by newly implemented regulations relating to cryptocurrencies or cryptocurrency markets, including having to take measures to comply with such regulations, or having to deal with queries, notices, requests or enforcement actions by regulatory authorities, which may come at a substantial cost and may also require substantial modifications to the TTC Protocol. This may impact the appeal of the TTC Protocol for users and result in decreased usage of the TTC Protocol. Further, should the costs (financial or otherwise) of complying with such newly implemented regulations exceed a certain threshold, maintaining the TTC Protocol may no longer be commercially viable and TTC Foundation may opt to discontinue the TTC Protocol and/or the Tokens. Further, it is difficult to predict how or whether governments or regulatory authorities may implement any changes to laws and regulations affecting distributed ledger technology and its applications, including the TTC Protocol and the Tokens. TTC Foundation may also have to cease operations in a

jurisdiction that makes it illegal to operate in such jurisdiction, or make it commercially unviable or undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction. In scenarios such as the foregoing, the trading price of Tokens will be adversely affected or Tokens may cease to be traded.

The regulatory regime governing blockchain technologies, cryptocurrencies, tokens, and token offerings such as the Token Sale, the TTC Protocol, and the Tokens is uncertain, and regulations or policies may materially adversely affect the development of the TTC Protocol and the utility of the Tokens

Regulation of tokens (including the Tokens) and token offerings such as the Token Sale, cryptocurrencies, blockchain technologies, and cryptocurrency exchanges currently is undeveloped and likely to rapidly evolve, vary significantly among international, federal, state and local jurisdictions, and is subject to significant uncertainty. Various legislative and executive bodies in Singapore and other countries may in the future, adopt laws, regulations, guidance, or other actions, which may severely impact the development and growth of the TTC Protocol and the adoption and utility of the Tokens. Failure by TTC Foundation or users of the TTC Protocol to comply with any laws, rules and regulations, some of which may not exist yet or are subject to interpretation and may be subject to change, could result in a variety of adverse consequences, including civil penalties and fines.

Blockchain networks also face an uncertain regulatory landscape in many foreign jurisdictions such as the European Union, the PRC, South Korea, and Russia. Various foreign jurisdictions may, in the near future, adopt laws, regulations or directives that affect the TTC Protocol. Such laws, regulations or directives may directly and negatively impact TTC Foundation's business. The effect of any future regulatory change is impossible to predict, but such change could be substantial and materially adverse to the development and growth of the TTC Protocol and the adoption and utility of the Tokens.

New or changing laws and regulations or interpretations of existing laws and regulations may materially and adversely impact the value of the currency in which the Tokens may be sold, the value of the distributions that may be made by TTC Foundation, the liquidity of the Tokens, the ability to access marketplaces or exchanges on which to trade the Tokens, and the structure, rights and transferability of Tokens.

Tokens holders will have no control on TTC Foundation

The holders of Tokens are not and will not be entitled, to vote or receive dividends or be deemed the holder of capital stock of the issuer for any purpose, nor will anything be construed to confer on the purchaser any of the rights of a stockholder of TTC Foundation or any right to vote for the election of directors or upon any matter submitted to stockholders at any meeting thereof, or to give or withhold consent to any corporate action or to receive notice of meetings, or to receive subscription rights or otherwise.

The purchaser may lack information for monitoring their investment

The purchaser may not be able to obtain all information it would want regarding TTC Foundation, the Tokens, or the TTC Protocol, on a timely basis or at all. It is possible that the purchaser may not be aware on a timely basis of material adverse changes that have occurred. Information in relation to the development of Tokens may also be highly technical by nature. As a result of these difficulties, as well as other uncertainties, the purchaser may not have accurate or accessible information about the TTC Protocol.

There may be risks relating to acts of God, natural disasters, wars, terrorist attacks, riots, civil commotions widespread communicable diseases and other force majeure events beyond the control of TTC Foundation

The Token Sale and the performance of TTC Foundation's activities may be interrupted, suspended or delayed due to acts of God, natural disasters, wars, terrorist attacks, riots,

civil commotions, widespread communicable diseases and other force majeure events beyond the control of TTC Foundation. Such events could also lead to uncertainty in the economic outlook of global markets and there is no assurance that such markets will not be affected, or that recovery from the global financial crisis would continue. In such events, TTC Foundation's business strategies, results of operations and prospects may be materially and adversely affected. Further, if an outbreak of such infectious or communicable diseases occurs in any of the countries in which TTC Foundation, the developers, data providers or data consumers have operations in the future, market sentiment could be adversely affected and this may have a negative impact on the TTC Protocol and community.

There may be unanticipated risks arising from the Tokens

Cryptographic tokens such as the Tokens are a relatively new and dynamic technology. In addition to the risks included in this Annex, there are other risks associated with your purchase, holding and use of the Tokens, including those that TTC Foundation cannot anticipate. Such risks may further materialise as unanticipated variations or combinations of the risks discussed hereto.