



# TGnetwork WhitePaper

## v1.0.0

Statement:

This whitepaper is organized by TGnetwork community enthusiasts based on the official website of TGnetwork. For details, visit the official website [tg.network](http://tg.network).



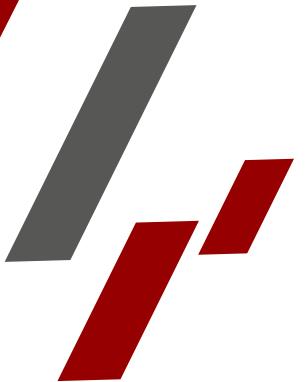


## 1、Background

Every country in the world is deploying 5G commercial network  
Artificial intelligence technology has experienced initial development and gradually penetrated into all walks of life  
IoT is expected to have 25 billion nodes accessing the network by 2020  
Blockchain and encryption technology has experienced 10 years of participation in users  
Traditional centralized CDN faces innovation in terms of cost and efficiency  
Worldwide borderless interoperability needs  
User Data Encryption and Privacy Protocol

## 2、Keywords

Blockchain node encryption  
5G infrastructure  
Network basic protocol  
CDN network and mining  
artificial intelligence  
Internet of Things  
Cryptographic economics  
Generalized economy  
Underlying network protocol  
Software-defined 5G network  
Intrusion Detection System IDS  
TorVPN  
Global node network  
data encryption  
Privacy agreement



### 3、Name

In the TGnetwork network protocol website, documentation and various articles: The project name TGnetwork is used to refer to the TGnetwork network protocol and the entire project.

The TG abbreviation is used to refer to the Token in the TGnetwork network protocol (TGnetwork – the only pass in the ecosystem).

The TGnetwork project team owns the copyrights of names such as TG and TGnetwork.

### 4、Summary

TGnetwork is reconfiguring an Internet network protocol based on 5G/Blockchain/Artificial Intelligence/IoT. TGnetwork is rebuilding a new Internet ecosystem. All users will become co-constructors of the underlying facilities of this network protocol and participate together. At the same time, the data of the users participating in it are encrypted and no longer monopolized by giants and many companies.

TGnetwork will create a decentralized Internet infrastructure, a new network protocol based on 5G technology, artificial intelligence technology, IoT technology and blockchain technology. On top of this new network protocol, TGnetwork will provide a range of distributed services, such as distributed node smart home, efficient low-cost enterprise-class CDN distributed storage, home traffic services, DNS and TorVPN based on 5G technology, and intrusion detection. Test system IDS, encryption and certificate economy. TGnetwork Eco has already reached cooperation with many well-known domestic and foreign companies, and its underlying network protocol will provide services for global Internet users based on 5G technology facilities.

In the TGnetwork ecosystem, the TG with stable value scale is used as an ecological “currency” incentive. It is a network of nodes composed of 5G users around the world to participate in the construction of a new networking ecosystem. Under the TGnetwork distributed network protocol, the Internet will be more open, stable, efficient, secure and free. Users will enjoy a more equal service in this ecosystem.



## 5、Long-term goal

We hope that the future world can become a distributed intelligent and distributed feedback world. This world is free, equal and open, and every participating user is the new world protagonist. Participate in co-construction and gain the benefits and feedback that the world should have.

In the existing Internet Protocol, the spirit of the Internet—freedom, openness, equality, and sharing—was not well implemented. The current Internet world is monopolized by giants, and users participate in it like a white rabbit. Although the centralized world brings some efficiency improvements to users, it will cause a lot of problems. At the same time, because of the existence of firewalls, connectivity cannot be achieved globally.

With the development and maturity of 5G technology, we hope that TGnetwork will play an important role in the next wave of technology. In this decentralized network protocol, everyone is completely fair. Not only can you enjoy the convenience of the latest technology to bring life, but also have the autonomy.

Our team members hope to bring new hope to the world. TGnetwork uses 5G technology as its lowest-level facility, while selecting technologies that will serve humanity in the coming decades—blockchain, artificial intelligence, and the Internet of Things. As the underlying network of this new world, we hope that 3.6 billion Internet users worldwide will be able to use the Internet through our network protocols, and everyone in the new world will have the same status without a central server.

TGnetwork is a global network protocol under construction. We invite every user who wants to be fair in the Internet world to participate in the joint construction. Together, we will build a healthy and fair foundation.

## 6、Philosophy and Principles

### 1、Core Networking Originally

Relying on the strong technical strength of the team, we decided to make the core networking part of the project strive for originality, because we want to build a new ecology, so we will do all the original and independent research and development of the underlying network protocol. And open all the underlying layers to the SDK, which is easy for developers and users around the world.

### 2、Drawing on Mature Design

Bitcoin and Ethereum have done a very good example in distributed nodes and encryption technologies. We can learn from reference and study. They have done a good job in mining and a variety of application scenarios.

### 3、General Standard Based on 5G/AI /IoT Technology

At present, we do some underlying adaptation according to the standards of 5G technology. The universal application standard for 5G uses VoNR, eMBB, mMTC and URLLC. When large-scale application of 5G technology comes in the future, TGnetwork will be able to enjoy the convenience and feedback of the ecology from the network layer. The underlying technology of artificial intelligence, Neural Networks, Machine Learning, and Deep Learning, was chosen. The mainstream protocols NB-IoT, LoRa and SigFox of the Internet of Things were selected, and the TG-IoT protocol was independently developed in combination with the three characteristics, enabling large-scale rapid verification.

### 4、Blockchain: A New Generation of Tens of Millions of Consensus Mechanisms R-DPOS

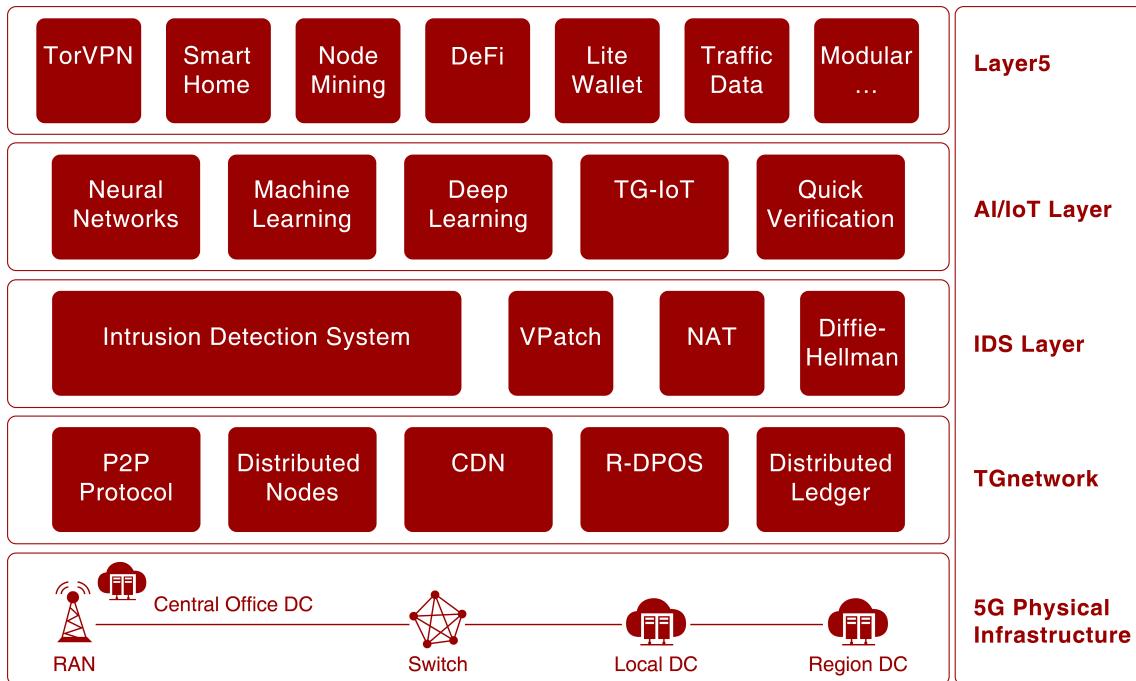
The combination of POS and DPOS of blockchain technology is adopted, and the R-DPOS consensus algorithm mechanism is introduced, which can effectively accommodate the network ecology of tens of millions of nodes.

### 5、TG Token

All value circulation in the TGnetwork ecosystem is defined by the currency “TG”, which will be benchmarked according to the amount of users and ecological ecology. TG has the practical significance of increasing value scale, global circulation payment and low cost.

## 7、TGnetwork Ecological Model

### TGnetwork Ecological Architecture Design



The TGnetwork protocol architecture is divided into five levels, namely 5G Physical Infrastructure, TGnetwork, IDS Layer, AI/IOT Layer and Layer5.

The TGnetwork network protocol is based on 5G standard technology, and 5G technology provides the underlying foundation that can guarantee the entire network to carry billions of users.

### TGnetwork Network Protocol Layer

The TGnetwork layer uses the latest encryption and ledger technology, and has designed a unique R-DPOS (Random Delegated Proof of Stake) mechanism to ensure that the number of nodes in the entire ecological network reaches tens of millions and billions, R-DPOS The mechanism will randomly select trusted nodes from all nodes to ensure continuity of the entire decentralized network. This is a very good innovation, we have a patent for this technology.

## IDS Layer

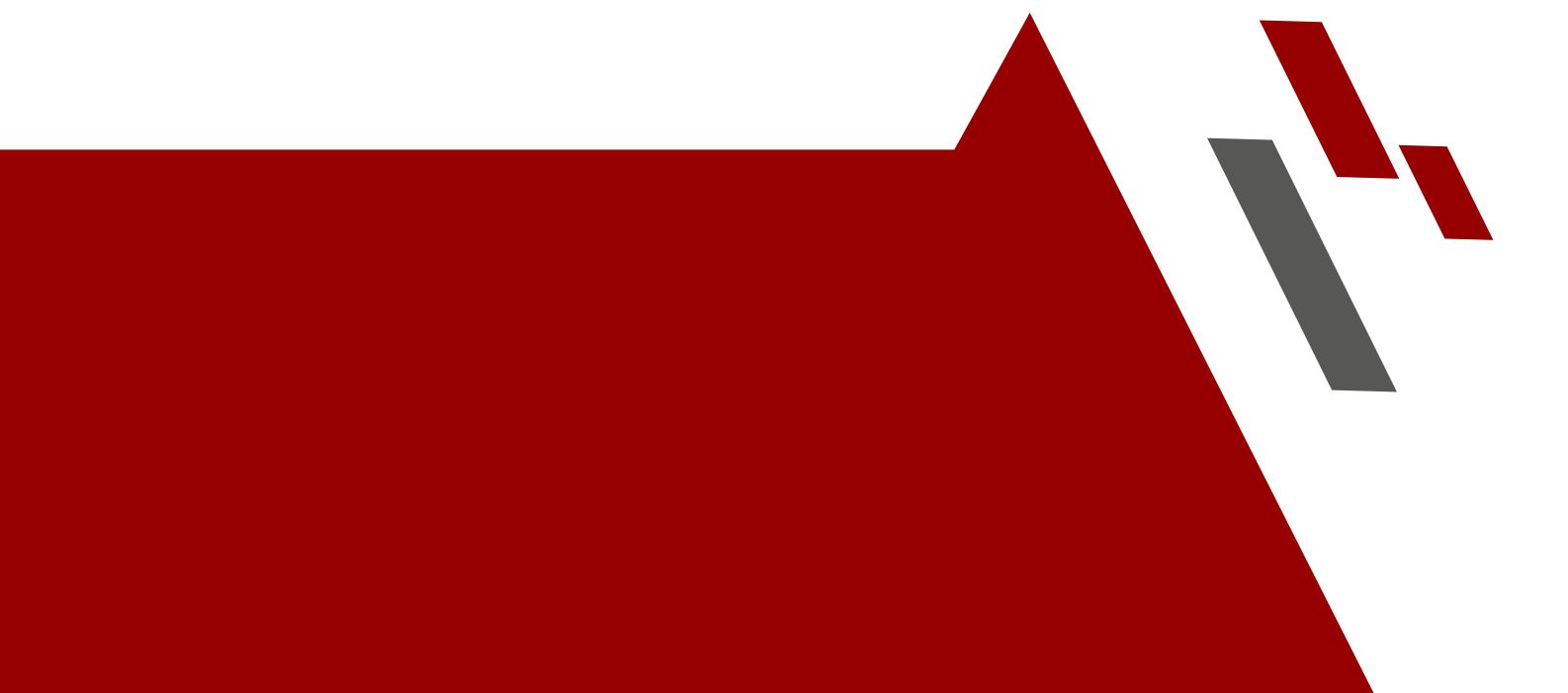
IDS Layer mainly provides maintenance of the network security layer, which is called Intrusion Detection System. Security maintenance includes two aspects, one is security at the network level, and the other is security at the node level. IDS guarantees the security of the TGnetwork network and uses the latest security technology.

## AI/IoT Layer

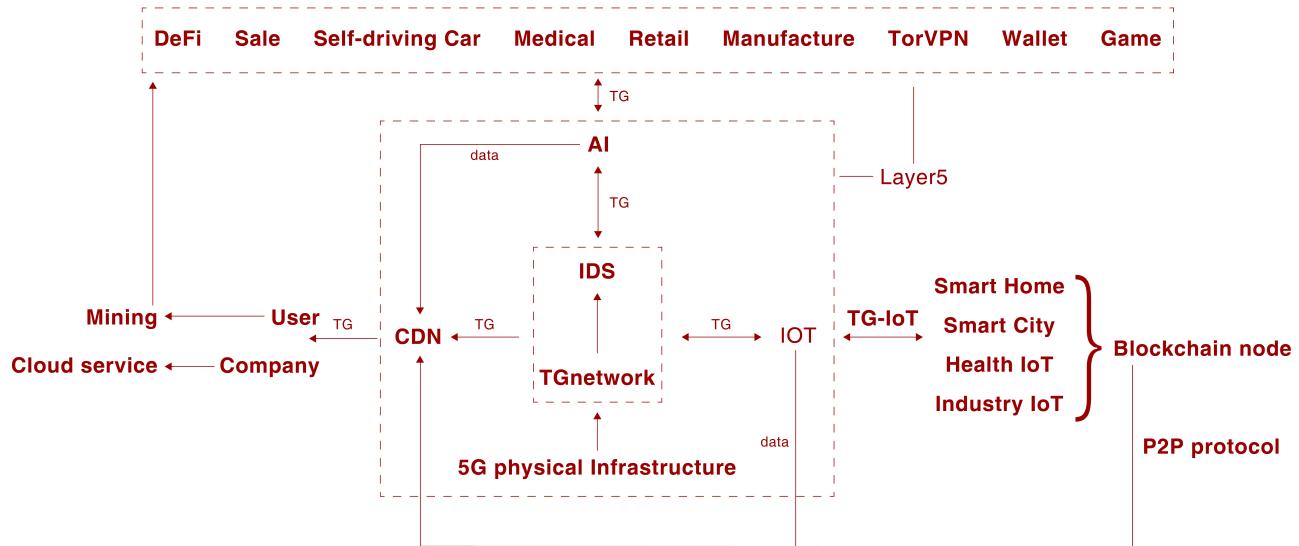
Artificial intelligence / Internet of Things layer. On top of the security layer, TGnetwork is the artificial intelligence and the Internet of Things layer. Based on the 5G technology, we have chosen the two most popular technologies in the world, artificial intelligence and the Internet of Things, as the underlying auxiliary technology of the TGnetwork ecosystem. Artificial intelligence technology can empower all industries to provide efficiency; the Internet of Things connects global nodes to form a large CDN storage network as a storage end of data.

## Layer5

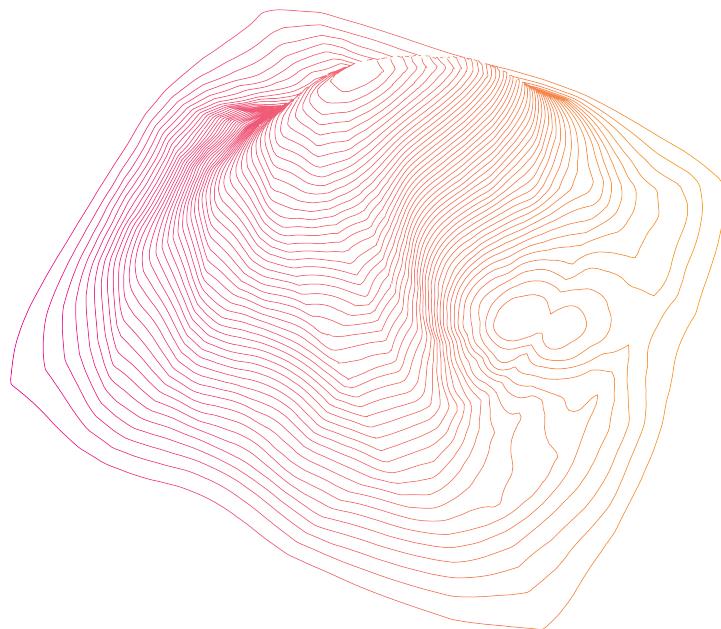
The fifth layer of the TGnetwork ecological model is the application layer. Large-scale commercial-grade applications can be run based on TGnetwork. For example, the global operation of the TorVPN network (based on the global 1000+ node has been tested successfully), intelligent central control based on the Internet of Things technology, smart home, financial industry application DeFi, 5G network-based traffic services (cooperation with partners) , TGnetwork-based network distribution (based on this to achieve global node mining gains), decentralized cloud storage services, decentralized entertainment solutions, decentralized supply chain finance. TGnetwork's network nodes will reach more than 25 billion, and can carry tens of thousands of decentralized applications to run simultaneously.



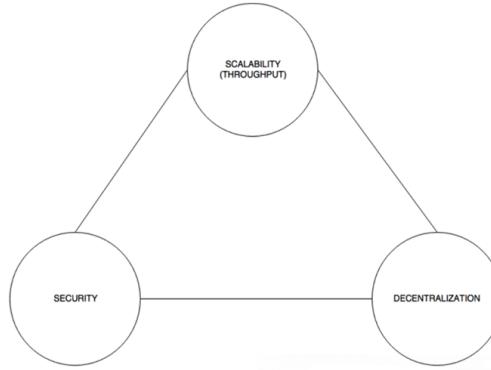
## 8、TGnetwork Technology



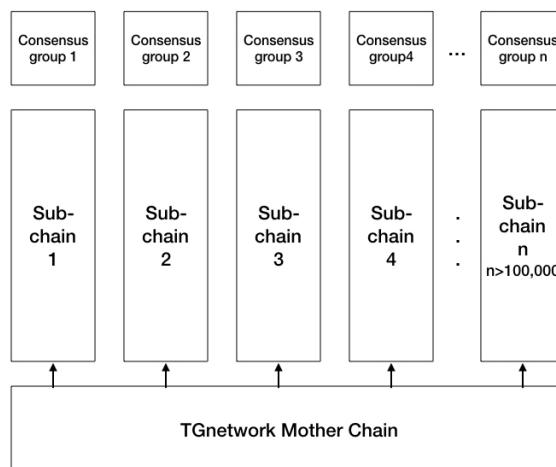
As a new ecological network protocol, TGnetwork has a very advanced architecture and design. Different from any blockchain project, TGnetwork selects artificial intelligence technology and IoT technology as the underlying layer of network protocol based on 5G technology, thus completely solving the impossible triangle of blockchain in technology, which can be achieved at the same time. Scalability, Decentralization, and Security.



## Solving impossible triangle theory



TGnetwork has a multi-chain system collaboration mechanism based on multiple technologies, each of which is called a “consensus group”. The consensus group consists of multiple homogeneous, functionally secure, well-balanced, logically isolated, independent consensus systems that work in parallel to share data throughput, technology, and storage pressure across the network., to share the maintenance of the entire network state. Since the consensus is completely parallel and asynchronous, even if there is congestion in a certain consensus group, the ticket sellers of different windows will play a synergistic role in the background to maximize the number of tickets sold per unit time. TGnetwork can reach millions of levels in the horizontal direction. A simple model of a multi-chain synergy mechanism is as follows:



The construction of the multi-chain coordination mechanism requires downloading the local node, creating an account, linking the TGnetwork network, deploying the sub-chain system, and accessing the entire node. The core code is as follows:

```

var Chain5 = require('chain5');
var chain5 = new Chain5(new Chain5.providers.HttpProvider('http://localhost:9000'));
chain5.personal.unlockAccount(chain5.mc.accounts[0], 'password',0);
var proto = "0x225Ebb0b9DF76E3D48eA0614943340611f63XXXX";
var vnodeProtocolBaseAddr = "0x0fB05e4a2b878855e27A7675135BecA0E257XXXX";
var min = 1 ;
var max = 10 ;
var thousandth = 1 ;
var flushRound = 20 ;
var subchainbaseContract = chain5.mc.contract([{"constant":true,.....,"type":"event"}]);
var subchainbase = subchainbaseContract.new(
    proto,
    vnodeProtocolBaseAddr,
    min,
    max,
    thousandth,
    flushRound,
    {
        from: chain5.mc.accounts[0],
        data: '0x6060604052600c601555670d...708e8ee3c23da8b02d0278ebXXXX',
        gas: '9000000'
    },
    function (e, contract){
        console.log(e, contract);
        if (typeof contract.address !== 'undefined') {
            console.log('Contract mined! address: ' + contract.address + ' transactionHash: ' + contract.transactionHash);
        }
    }
)
  
```

The meaning of each parameter is as follows:

1. The parameter proto: obtained through the official channel, or the address of the subchain protocolbase of the sub-chain mine pool deployed by itself, copied and pasted into this variable;
2. The parameter vnodeProtocolBaseAddr: obtained through the official channel, or the address of the agent smart contract vnodeprotocolbase deployed by itself, copy and paste to this variable;
3. Parameter min: the minimum number of SCS required after the sub-chain operation, the recommended number is 1;
4. Parameter max: the maximum number of SCS required after the sub-chain operation, the recommended number is 100;
5. The parameter thousandth: a few thousand, the default is 1;
6. The parameters flushRound: sub-chain refresh cycle (based on the number of parent chain block generation), less than 100, the contract will automatically be set to 100;
7. The gas value at the time of contract deployment must be 9000000;
8. Chain5.mc.contract: its content is the compilation result SubChainBase.abi;
9. Data: its content is the compilation result SubChainBase.bin, in front of the addition of "0x".

### Based on 5G Technology

It has fast speed, supports multi-link devices, and realizes the same-frequency full-duplex.

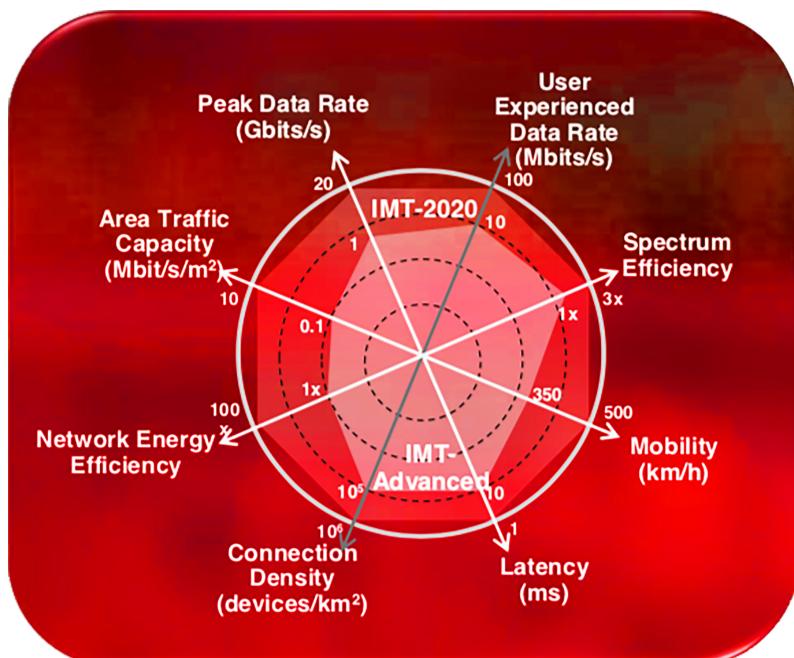
At present, all countries in the world are deploying the fifth generation mobile communication technology (5G) network.

With the determination of the 5G standard, the pace of commercialization will be faster and faster, and the end of 5G will penetrate into more vertical industries and promote the world.

Digital transformation. 5G is vital to any country, and it is a competitive force of the times.

According to statistics, 5G's contribution to global GDP will reach 2.1 trillion US dollars in the future.

Let's take a look at the key performance indicators of 5G network technology, including the following 8 items: Peak Data Rate(Gbits/s) , User Experienced Data Rate(Mbits/s) , Spectrum Efficiency , Mobility(km/h) , Latency(ms) , Connection Density(devices/km^2) , Network Energy Efficiency , Area Traffic capacity(Mbit/s/m^2) .



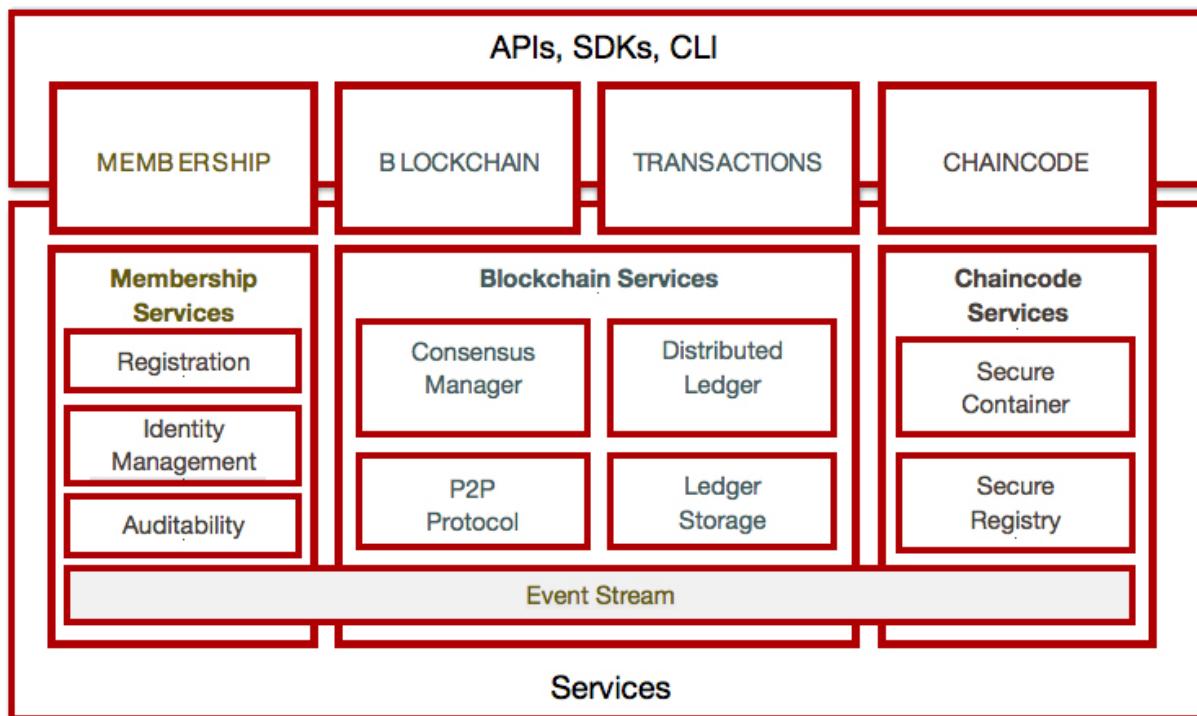
The development phase of the 5G NR standard is as follows. The first phase is the new air interface. The bottom layer of the technology is composed of Waveform/Coding, Numerology, Frame Structure, Massive MIMO. The second phase is the network architecture. The core technology is Non-standalone NR, Standalone NR and The CU/DU RAN split is composed; the third phase is mainly the application scenario, and the bottom layer of the technology is eMBB and URLLC.



TGnetwork's entire network rack protocol architecture is based on 5G technology. The network protocol is improved and designed according to the underlying standards of 5G technology, assisting 5G technology, and optimizing the software of the above eight key technologies, so that TGnetwork eco users can enjoy more. Safe, fast and fair service. At the same time, Tgnetwork Eco and Telecom have partnered to serve the entire ecosystem at the traffic portal, and users can choose to use TG to purchase global traffic services. When the next 5G is fully launched,  
1TG = 99GB international traffic service.  
Refer to the international carrier traffic price.

### TGnetwork Network Protocol – Blockchain Technology

The blockchain architecture of the TGnetwork network protocol contains many core sections. The core sections are as follows.



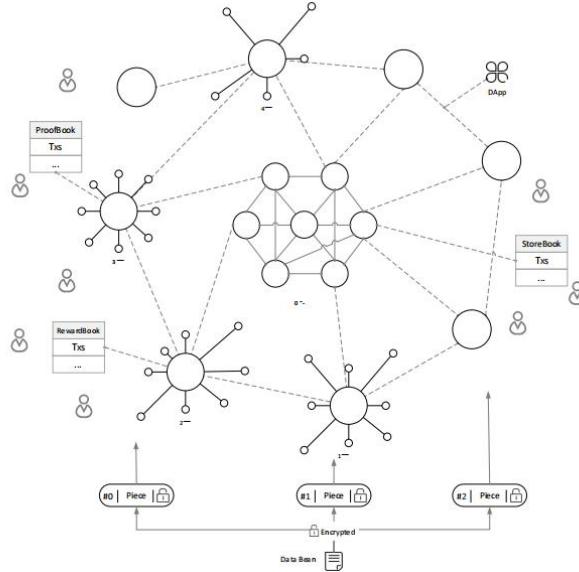
The three components are: Blockchain, Chaincode, and Membership. Among the three major components, there are many core technologies.

## Blockchain Service Module

The blockchain service module includes a consensus mechanism, a P2P protocol, a decentralized storage network, and a decentralized ledger.

### TGnetwork Consensus Mechanism

The TGnetwork consensus mechanism is R-DPOS (Random Delegated Proof of Stake). The premise of the consensus mechanism is that the network of nodes above 10 million levels far exceeds the nodes of Bitcoin and Ethereum (around 10,000). Based on the expansion of the TGnetwork IOT ecosystem, the number of nodes in the entire ecosystem will reach more than 20 billion in the future. Therefore, the team innovatively designed the R-DPOS mechanism and added random technology to the DOPS mechanism.



In the above figure, each type of node randomly selects a certain number of nodes as core nodes. The selection is based on time and will be re-selected every 24 hours according to a random algorithm. The random algorithm uses the Gaussian Randomness algorithm as follows:

```
using UnityEngine;
using System.Collections;
public class Gaussian : MonoBehaviour
```

```
{
    public int seed = 61829450;
    double sum = 0;
    long r = 0;
    void Start()
    {
    }
    void Update()
    {
        if (Time.frameCount % 7 == 0)
        {
            sum = 0;
            for (int i = 0; i < 3; i++)
            {
                long holdseed = seed;
                seed ^= seed << x;
                seed ^= seed >> y;
                seed ^= seed << z;
                r = holdseed + seed;
                sum += (double)r * (1.0 / 0x7FFFFFFFFFFFFFFF);
            }
            print(sum);
        }
    }
}
```

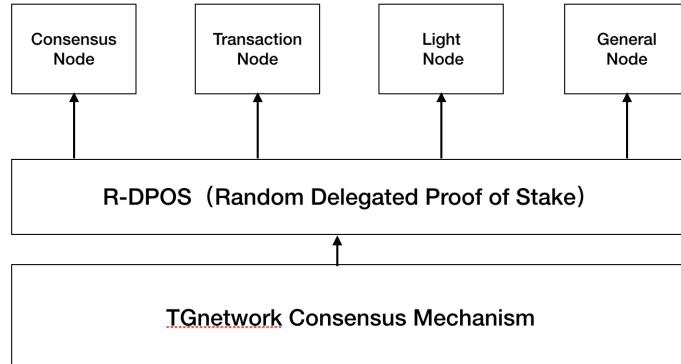
In the algorithm, the values of x, y, and z are determined according to the total number of nodes in the current.

The number of nodes in the DPOS mechanism is up to several hundred, and 21 (EOS) and 27 (TRON) are selected from several hundred nodes, which is technically a highly centralized network structure.

There are four types of nodes in the TGnetwork ecosystem: Consensus nodes, participate in network consensus and generate blocks;

The trading node is mainly responsible for token token transactions when participating in the consensus; Light node, does not synchronize all block data, but supports basic functions such as transmission and reception;

Ordinary nodes: Ordinary wallet users constitute a general node and support basic functions such as sending, querying, trading and asset exchange. All blocks are synchronized.

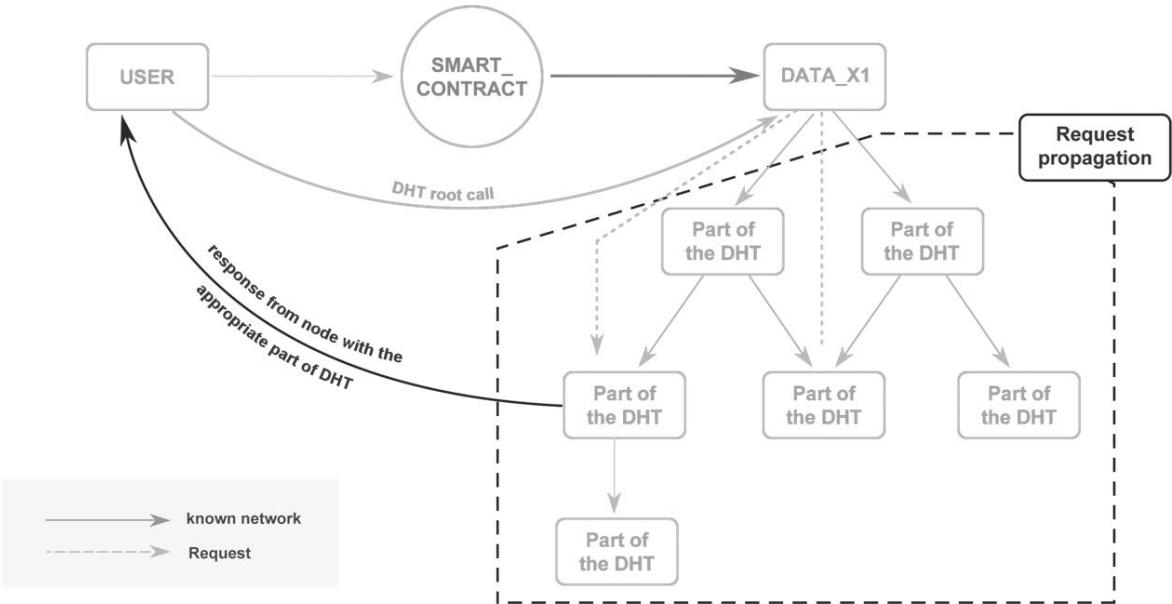


The TGnetwork has a block time of 1 block/s and has a multi-chain system coordination mechanism. The TPS can approach 100,000 in the test network. Later, as the number of nodes increases, TPS will continue to increase

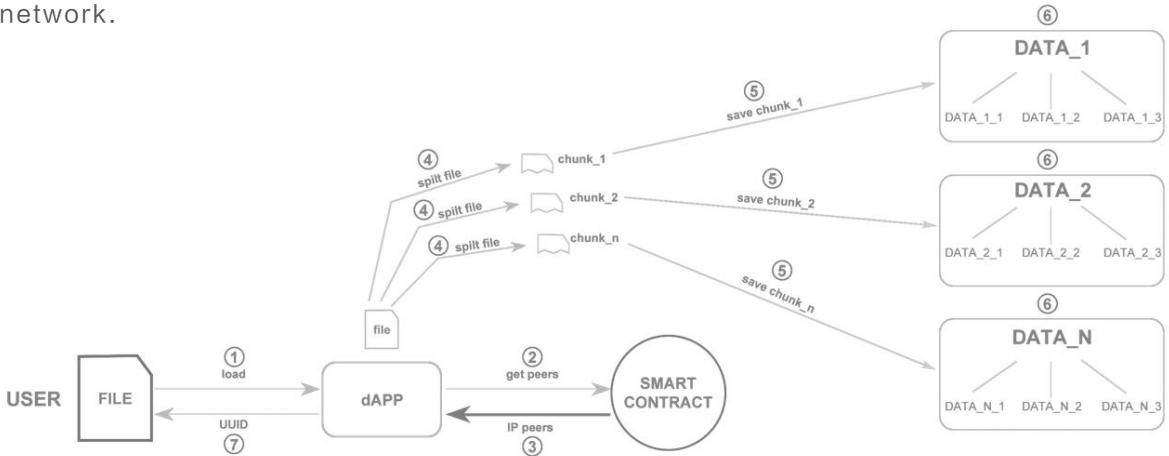
Transaction Times	Node	TPS
1000	1000	9600
1000	5000	24800
1000	10000	51200
1000	20000	80600
1000	50000	97600

## Decentralized Storage Network

In the TGnetwork network protocol, the basis of the decentralized storage network is the node network of the IOT device. The consensus node and the transaction node in the node network are the core of the decentralized storage network. The decentralized storage network in the TGnetwork network protocol has been redeveloped on the basis of IPFS to make it more secure and more powerful. The user's file storage will be broadcasted to the nearest node.



In the TGnetwork network protocol, each node should provide file storage space (disk capacity) and outgoing traffic (bandwidth traffic), because the number of file copies is controlled and restricted by smart contracts, so that agents can be controlled through smart contracts. The storage performance of the node and the disaster recovery backup. Smart contracts use commands to control the storage nodes that are backed up, propagated, and cached, with the most recent node with the lowest latency taking precedence. According to the reliability requirements, 4 copies of the same copy file will be stored in the node network.



Decentralized storage networks serve two purposes, one for personal storage and the other for enterprise services. Decentralized storage is far less expensive and more efficient than a centralized storage architecture. The service resource price of the traditional IDC room is priced at around \$8.5 per 100 GB of traffic. In the TGnetwork network protocol, individual users and corporate users can use TG to pay for storage. Each TG is anchored to a 99GB storage resource. The value of TG will be well reflected in the storage network.

AWS Amazon Cloud Service:

AWS Direct Connect pricing

[https://aws.amazon.com/directconnect/pricing/?nc1=h\\_ls](https://aws.amazon.com/directconnect/pricing/?nc1=h_ls)

AWS CloudFront Pricing

[https://aws.amazon.com/cloudfront/pricing/?nc1=h\\_ls](https://aws.amazon.com/cloudfront/pricing/?nc1=h_ls)

GCP Google Cloud Service

GPU Interconnect Pricing

<https://cloud.google.com/hybrid-connectivity/>

GCP CDN Pricing

<https://cloud.google.com/cdn/pricing>

## Chaincode Service Module

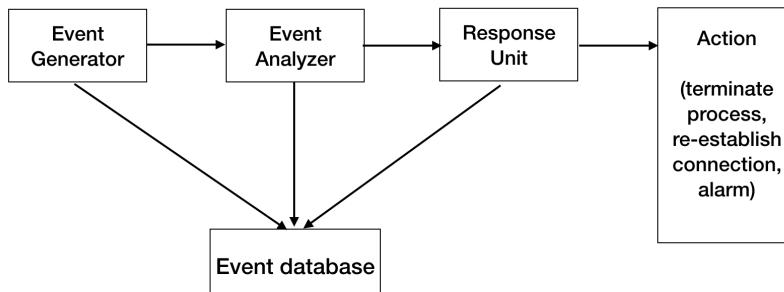
The chain code service module includes a secure container (mainly referred to as the IDS service) and secure registration. All products connected to the TGnetwork network protocol must be securely registered before they can operate normally. The security registration requires two aspects. One is a certain number of TGS. The certification fee; the second is the review of the core nodes in the ecological group.

The security requirements of the TGnetwork network protocol are first. When the nodes reach tens of thousands of applications, it is difficult to support without security guarantees.

The security container uses the Intrusion Detection System (IDS). An intrusion detection system is a network security device that monitors network traffic in real time, alerts you when an suspicious transmission is discovered, or takes an active response. It differs from other network security devices in that IDS is a proactive security protection technology. The IDS system architecture diagram is as follows. It consists of four parts: event generator, event analyzer, response unit and event database. According to the safety protection of the four parts, the system is absolutely safe.

An intrusion detection system is a network security device that monitors network traffic in real time, alerts you when an suspicious transmission is discovered, or takes an active response. It differs from other network security devices in that IDS is a proactive security protection technology. The IDS system architecture diagram is as follows. It consists of four parts: event generator, event analyzer, response unit and event database.

According to the safety protection of the four parts, the system is absolutely safe.



The core code of the security protection is as follows:

```

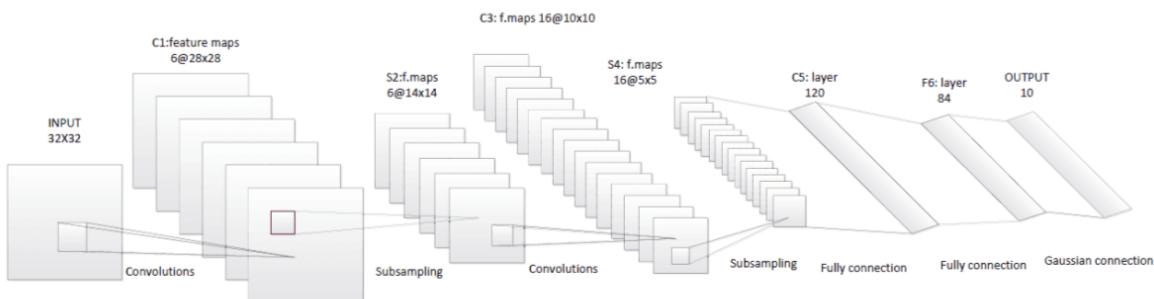
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;
public class RipClient implements Runnable{
    private static DatagramPacket packet;
    private static DatagramSocket socket;
    private static InetAddress address;
    private static RipTable ripTableClient;//全局用于比较路由信息
    public void run(){
        try {
            received(socket);
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
    public static void send(DatagramSocket socket,DatagramPacket packet)throws Exception{
        address = InetAddress.getByName("127.0.0.1");
        int port = 10010;
        RipTable tabletemp=Controller.initTable();
        ripTableClient = Controller.CopyRip(tabletemp);
        String strs=Controller.EncodeData(tabletemp);
        byte[] data = strs.getBytes();
        packet =new DatagramPacket(data,data.length,address,port);
        socket.send(packet);
    }
    public static void received(DatagramSocket socket)throws Exception{
        byte[] data2=new byte[1024];
        DatagramPacket packet2 = new DatagramPacket(data2, data2.length);
        socket.receive(packet2);
        String reply = new String(data2, 0, packet2.getLength());
        RipTable table1=Controller.mergeData(reply);
        System.out.println("Native routing table");
        Controller.showTable(ripTableClient);
        System.out.println("Received routing table");
        Controller.showTable(table1);
        RipTable tabletemp1=Controller.ModifyRip(table1);
        System.out.println("distance+1");
        Controller.showTable(tabletemp1);
        RipTable tabletemp2 = Controller.CompareRip(ripTableClient, table1);
        System.out.println("Last updated routing table");
        Controller.showTable(tabletemp2);
        socket.close();
    }
    public static void main(String[] args) throws Exception{
        socket = new DatagramSocket();
        send(socket,packet);
        new Thread(new RipClient()).start();
    }
}
  
```

## Member Management Permission Module

The member management authority mainly manages the core nodes of the entire network. In the future TGnetwork ecosystem, there will be more than 20 billion nodes, and the member management permission module will perform a global management of all nodes. The member management module will record the following member list, one is the ecological partner; the second is the node ecological user; the third is the ordinary user. The rights management of the three users will be performed.

### AI Layer

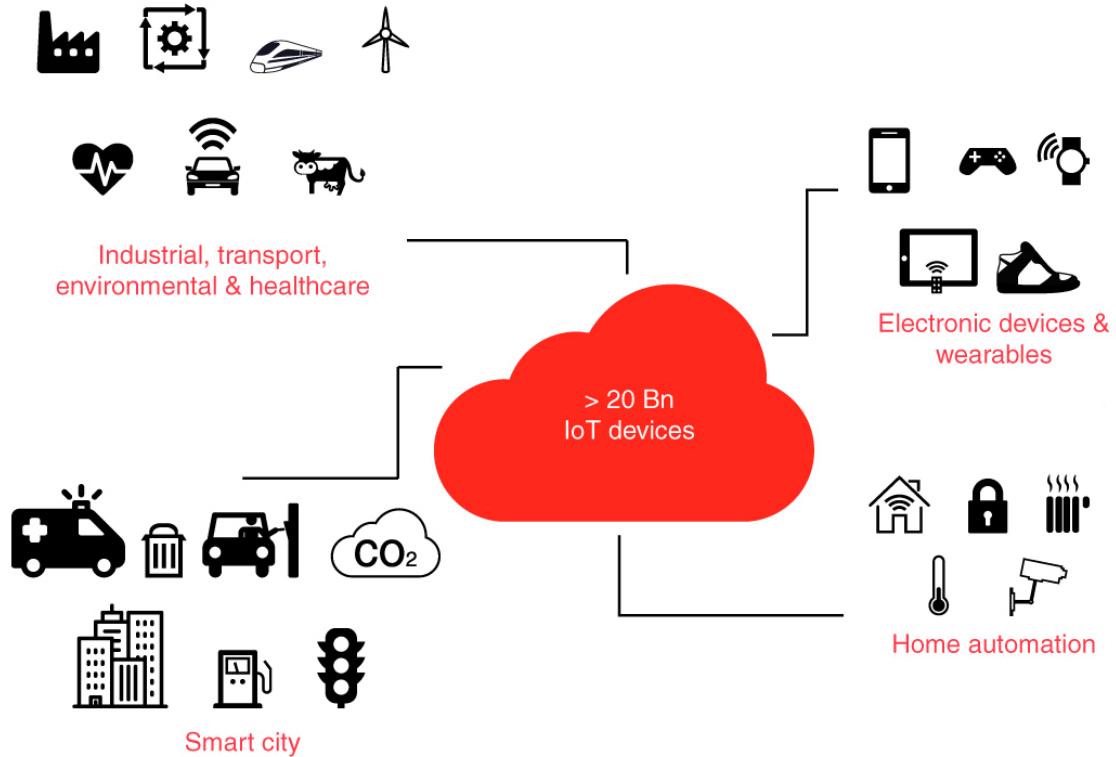
Artificial intelligence and IOT are on the same level of TGnetwork, and universal artificial intelligence can be used to provide services efficiently in any industry. We will embed natural language, machine learning, and deep learning directly into the TGnetwork ecosystem. Any ecological service will be processed by AI. TGnetwork puts the services provided by DAPP on the AI model chain and has independent operation capabilities. This distributed online incremental learning algorithm is a more general method. As the amount of data increases and the number of blockchain nodes increases, the model can be optimized and updated, and finally, each industry service can be empowered.



Developers can do many applications based on the artificial intelligence layer, such as DeFi, Sale, Edu, and so on. A general depth learning algorithm is as follows:

```
function str = makeValidFieldName(str)
    isoct=exist('OCTAVE_VERSION','builtin');
    pos=regexp(str,'^[^A-Za-z]','once');
    if(~isempty(pos))
        if(~isoct)
            str=regexp(str,'([A-Za-z])','x0x${sprintf("%X",unicode2native($1))}_','once');
        else
            str=sprintf('x0x%X_%s',char(str(1)),str(2:end));
        end
    end
    if(isempty(regexp(str,['^0-9A-Za-z_'],'once' ))) return; end
    if(~isoct)
        str=regexp(str,'([0-9A-Za-z_])','_0x${sprintf("%X",unicode2native($1))}_');
    else
        pos=regexp(str,'[^0-9A-Za-z_]');
        if(isempty(pos)) return; end
        str0=str;
        pos0=[0 pos(:)' length(str)];
        str='';
        for i=1:length(pos)
            str=[str str0(pos0(i)+1:pos(i)-1) sprintf('_0x%X_',str0(pos(i)))];
        end
        if(pos(end)~=length(str))
            str=[str str0(pos0(end-1)+1:pos0(end))];
        end
    end
end
```

The IoT IoT layer is the core of the TGnetwork network protocol ecophysical node. When a user accesses the TGnetwork ecosystem through an IoT device, it is called a node of the entire ecosystem. In the future, 20 billion IoT devices will be connected to the TGnetwork ecosystem. The project will join the global nodes into the TGnetwork eco-network protocol through external cooperation to ensure that there are more than 100 million node networks in the world. There will be many applications in smart cities, industry/transportation/environment/health, electronic devices/wearable devices, and smart homes.



The TGnetwork ecosystem will be connected to external devices through the open SDK/API. The access code is as follows:

## TG Privacy Agreement

The TGnetwork network protocol has data encryption and privacy features, which are very useful features for users. Now our data is monopolized by big companies, and we are faced with various problems such as passive data transactions. The privacy module of the TGnetwork network protocol is called the TG privacy protocol, which can solve the user's data encryption protection from the bottom layer, and the encrypted data is stored on the decentralized network, which can achieve secondary protection.

The TG Privacy Protocol is a blockchain format and protocol that relies on robust encryption primitives to provide very good scalability, privacy and substitutability. It addresses the gap between blockchains (and real-world needs) for almost all current implementations.

The main purposes and features of the TG privacy protocol are as follows:

The default feature of privacy protection. This makes it fully replaceable and retains the ability to selectively disclose information on demand.

The block size is adapted to the transaction volume. Historical transactions only retain about 100 bytes of transaction kernel, which saves a lot of space compared to other blockchains.

Powerful and proven cryptography. The TG protocol only uses elliptic curve ciphers, which have been tested and tested for decades.

Let's analyze it in detail below. Elliptic curves for cryptographic purposes are just a set of points we call C. These points can be added, subtracted, or multiplied by integers (also known as scalars). Given an integer k and using scalar multiplication, we can calculate  $k * H$ , which is also a point on curve C. Given another integer j, we can also compute  $(k + j) * H$ , which is equal to  $k * H + j * H$ . Addition and scalar multiplication on elliptic curves preserve the exchange rate and combination of addition and multiplication:  $(k+j)*H = k*H + j*H$

Based on the attributes of the ECC described above, the actual transaction value can be masked in the transaction data.

If v is the value of the transaction input or output and H is an elliptic curve, we can simply embed  $v * H$  instead of v in the transaction. This is because with the ECC operation, we can still verify that the sum of the output of the transaction is equal to the sum of the inputs:

$$V1 + v2 = v3 \Rightarrow v1*H + v2*H = v3*H$$

The input or output value at the time of the transaction can be expressed as:

$$r*G + v*H$$

among them:

r is a private key used as a blinding factor, G is an elliptic curve point, and their product  $r*G$  is the public key of r on G.

v is the input or output value and H is another elliptic curve point.

Neither v nor r can be derived, taking advantage of the basic properties of elliptic curve cryptography.

$r * G + v * H$  is called Pedersen Commitment.

As an example, let's assume we want to create a transaction with two inputs and one output.

Vi1 and vi2 as input values

Vo3 as the output value

Satisfy:

$$Vi1 + vi2 = vo3$$

Generate a private key for each input value as a blinding factor, replacing each of the above equations with their respective Pedersen Commitments, we get:

$$(ri1*G + vi1*H) + (ri2*G + vi2*H) = (ro3*G + vo3*H)$$

And ask:

$$Ri1 + ri2 = ro3$$

This is the first pillar of the TG protocol: the arithmetic operations that verify the transaction can be done without knowing any actual transaction values at all.

## 9、Team

The TGnetwork team was among the first to participate in the blockchain and communications industry. Some of them were involved in the development of Bitcoin core technology. Later, because of the conservative nature of the Bitcoin core developer team, Bitcoin could not be pushed to a wider range. Leave the public. Therefore, we want to combine the latest technology to provide a new network protocol ecosystem for users around the world, and enjoy a system that is more free, equal and capable of generating positive feedback.

In the initial team recruitment, TGnetwork chose the same way as Bitcoin to send emails to the top 100 blockchain, 5G, artificial intelligence and IoT industry elites in the world. The response can participate in the TGnetwork nuclear team. TGnetwork's team is based on technical geeks, including the underlying architect, the underlying protocol designer, and the communications industry for more than 20 years.

Most of the members are from Oracle, Qualcomm, Facebook, AT&T, etc.

We are engaged in more people to participate in the global ecological construction of TGnetwork, whether it is technology or market, we are welcome. If you are interested, you can send your resume to [tgnetworkfoundation@gmail.com](mailto:tgnetworkfoundation@gmail.com)

## 10、Road Map

- 2017年Q1 Core sponsor email invitation, team set up, project launching
- 2017年Q3 Business model and technical argument
- 2017年Q4 Underlying technology framework design
- 2018年Q1 Research and adaptation of the underlying technical standards of 5G communication
- 2018年Q2 The core structure of the TGnetwork network protocol layer is completed.
- 2018年Q3 AI&IoT module technology implementation, interoperability with 5G bottom layer and TGnetwork
- 2018年Q4 The core technical architecture has been completed, and the project v0.5 version is formed.
- 2019年Q1 Global node internal test, TPS reaches about 100,000Eco-Token TG internal value transfer test succeeded
- 2019年Q2 Global node and community recruitment Recruitment of global partners, partners who have already reached cooperation Vodafone Group plc Division and IBM IoT.
- 2019年Q3 TG public sale Distributed Storage CDN Network Test Phase
- 2019年Q4 Data storage and personal node mining test
- 2020年Q1 Enterprise cloud storage service beta, open the trillion dollar market
- 2020年Q2 5G technology operators can use TG to purchase global traffic cards, some countries support
- 2020年Q3 TGnetwork network protocol officially launched
- 2020年Q4 TGnetwork nodes reach a million levels, and the ecology gradually expands
- 2021年 TGnetwork ecological development, covering hundreds of millions of users around the world

## 11. About TGnetwork Ecology

The TGnetwork project is a new network protocol that combines the underlying technologies of the world. This network protocol corrects and improves some shortcomings of the current Internet, and emphasizes the user's ecological initiative. As long as the users involved can trust Free, equal enjoyment of this new ecological, while adding a privacy agreement, the user's data will not be monopolized by the giant, the user's data is encrypted while accessing the network, which is very friendly to the user.

The TGnetwork Ecology is a very inclusive and open ecosystem. As long as you are willing to participate, whether it is technology, market, operation or other aspects, there will be opportunities for participation. And as long as you participate, you can get the value of the benefits-TG. Through the ecological incentives, the whole ecology will be improved.

## 12. TG Distribution Plan

TG is the value of the entire ecological circulation, our philosophy is to use it, let TG play a real value. We are building a system of healthy and stable global participation. After the TGnetwork ecosystem is perfected, the true value of TG will be well expressed. In the future, the value of TG is as follows:

1TG = 99GB 5G Traffic

1TG = 99GB Storage Resource

1TG = 200GB TorVPN traffic

The future potential of TG will be very large.

The use of TG to purchase traffic, storage resources and TorVPN traffic will be a basic requirement.

In the future, there will be ecological partners accessing the TGnetwork network protocol, and there will be more applications to enhance the value of TG.

A total of 35 billion, most of the TG is distributed to community users

The team and early investors only hold 25.47% of the total and are locked. In the future, this part will be distributed to users, and the number will be determined in the future.

74.53% of the total amount of TG is given to the user.

## TG Distribution plan

### Team fund **12%**

- 100% freezed for 3.5 years.
- Till 2022.2.10 23:59:59 UTC.
- Release 10% per 3 months.

### Early Investors **13.47%**

- 3.5 billion TG are freezed for 2.5 years.
- Till 2021.2.10 23:59:59 UTC.

### Community **12%**

- 50% freezed for 3.5 years
- Till 2022.2.10 23:59:59 UTC
- Release 0.5% per TG public-sale season, for another 50%.

### Air Drops **2%**

For ETH holders and promotion before/during the TG public-sale

- TG airdrop
- Airdrop to ETH Holders

### Token Sale **22.54%**

For TG public-sale

### Miner **15%**

For service nodes' incentive

### Consumption pool **0.5%**

For special user contribution awards and sales promotions, the list of individual or organizational users will be charged to the consumer pool contract account until they are used up.

### DAPPs Support Plan**10%**

It is used to enrich TGnetwork ecology, foster and encourage developers to build more decentralized application services.

### Business**12.49%**

For exchange listing, business partners, etc

### 13. Conclusion

TGnetwork Ecology uses the network protocol consisting of 5G/Artificial Intelligence/IoT/Blockchain technology as the entry point. The protocol is free and equal, global users interoperate with the Internet, and all data privacy is encrypted. The value of the TGnetwork ecosystem carries TG, which will purchase traffic, storage resources and TorVPN traffic in the future, as well as the use of various ecological applications. TGnetwork will become the foundation of a new distributed network protocol in the future.

The value anchoring rules of TG have determined the value scale of TG in the future. TG will continue to progress according to current plans and will serve billions of users worldwide in the future.

