Super Sky-net

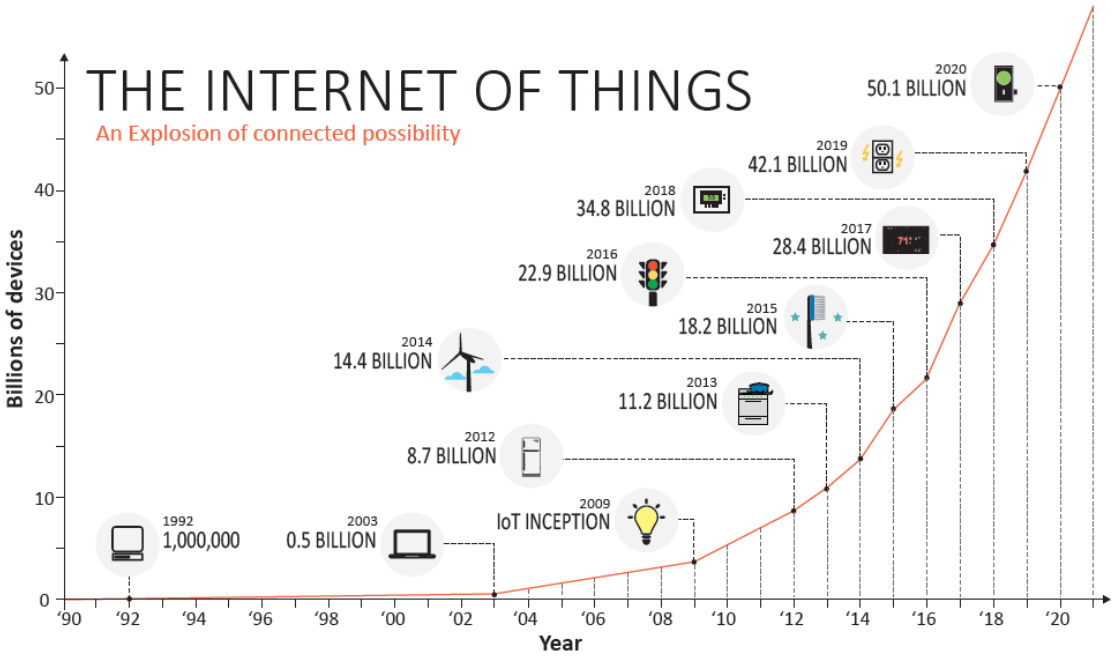
An artificial intelligence collaboration system centered on the blockchain and AI technology, based on the Internet of Things

[Abstract]: In this white paper, we propose an intelligent collaboration system based on Internet of Things, Fog Computing, blockchain technology and AI technology. The Internet has been part of our lives, and as an extension of it, Internet of Things is also rising rapidly. Now, we have been around more and more online devices, such as computers, mobile phones, routers, cameras and so on which are online in 24 hours. But these online devices are still not fully interconnected and not working together, the global online resources are greatly wasted. So we propose an intelligent collaboration system based on Internet of Things, Fog Computing, blockchain technology and AI technology ——Super Sky-net System.

Key: Super Sky-net, IoT, Fog Computing, blockchain, AI

1. Trends and bottlenecks of Internet of Things

Internet of Things is a widely applied technology, which is accelerating penetration into the production, consumption and social management and other fields, and with the explosive increase of online devices, the interconnection of all things era is to come.



The main purpose of the Internet of Things is to connect the online devices and share the variety of information (generated or collected by the devices) which reflects all aspects of social life, not only covering the "material" manufacturing, transportation, consumption and other details, also covering the "human" interests, entertainment and other details of life.

Because of the M2M role and characteristics of the Internet of Things, in order to make this huge network understand the world better from the data level, the number of the devices access to IoT (including a variety of sensors, unmanned monitoring devices automation equipment and so on) will grow exponentially. Compared to the current traditional Internet access devices, these devices have three main features:

(1) Network marginalization: A large part of these devices will be distributed in the edge of the network environment, the traditional hierarchical OC model will be difficult to make the high quality coverage.

(2) Data explosion: Unlike those devices that access traditional Internet for a small amount of simple information, these sensors will generate and send data for 24 hours a day, in the case of so large

number of devices, if we use the traditional cloud computing model, the core backbone network will be sustained continuous and huge impact.

(3) High latency requirement: Different from the traditional Internet access devices which require a lot of information filtering (that is a lot of computing) and a small amount of information transmission, the Internet of Things sensors require relatively simple processing of large amounts of data with low latency, and at the time the sensors produce data calculations, there is no intersection between the data for most of the time, thus forming a completely opposite model will be formed which requires a lot of information transmission and a small amount of information filtering (that is a lot of computing). In the case of so large number of devices, if we use the traditional cloud computing model, the central model of cloud computing is difficult to meet the requirements of low latency and large data centralized processing.

2. Fog Computing Model

Based on the above problems, compared with the traditional cloud computing, the fog computing model is more suitable for carrying the Internet of Things. Considering the whole network computing power of bitcoin is much higher than the sum of the computing power of all the supercomputers in the world, there are a lot of idle devices around us to provide computing. The fog computing can physically classify these devices into a giant topology network to form a para-virtualized service computing architecture that provides a range of services from network routing, data transfer to data processing for Internet of Things devices.

Based on the characteristics of fog computing, it will have the following advantages for the Internet of Things:

(1) Meet the low latency requirement: With the decentralized topology of the fog computing, the calculation can be executed at neighboring nodes, and a large amount of data can be processed and streamlined locally without going through the core backbone network, which will greatly reduce the delay.

(2) A huge potential computing power: Fog computing can effectively organize the huge potential computing power through modeling to make the computing efficiency and computing power far more than the traditional centralized cloud cluster, with a strong expansion capacity, scalability and low cost.

(3) Cache based on the geographical area: Through the experience of building and operating a nationwide and world-wide multi-level OC system, we have learned that reading and writing local data in each business scenario is 50% to 80% of local requests. With the decentralized characteristics of the fog computing, the system will automatically form a regional cache and block a large proportion of traffic for the core network, with greatly reducing network congestion.

So we can learn that fog computing technology can bring disruptive effects on the Internet of Things. But for the organization of idle computing power, what is the key to fog computing is that how can access more devices effectively and spontaneously to achieve its own expansion and expansion.

From this problem, considering the characteristics and application of the blockchain in the financial sector, we propose a supermodel service model based on the blockchain ——Super Sky-net.

3.Blockchain Supercomputing

We will establish a resource trading market in the Super Sky-net

System, the connected devices in the trading market can automatically trade all kinds of computing resources. In this way, the Super Sky-net which collects the global computing resources has a supercomputing power built on the Internet of Things. This supercomputing power is different from any previous supercomputer, it is composed of the small computing devices distributed around the world.

In the Super Sky-net, some nodes are selected as the master nodes to provide coordination and management services by the established rules. These master nodes need to be confirmed by the Super Sky-net and have sufficient computing resources, and the number of master nodes is determined by the number of smart devices connected to the Super Sky-net and its environment.

Throughout the system, the process of trading computing resources is considered the process of using the computing power. A variety of DAPPs built on the top of the system developed by third parties will be the actual consumers of computing power. In order to allow the computing power of DAPPs to be distributed in a certain granularity to make the parallel computing on the devices with computing power, we propose to construct a blockchain operation between the link layer and the application layer of the blockchain.

4.Blockchain Smart Operating System

we proposed this Super Sky-net System to coordinate and manage the online devices. The underlying support system is a blockchain operating system based on the Internet of Things. The blockchain operating system of IoT will provide great flexibility, and any electronic device can be connected to this system, so that the exchange of device information will be done in the blockchain operating system.

The blockchain smart operating system provides a series of API, so

that any language or virtual machine can be integrated into the system, greatly reducing the difficulty and workload of the development. In this way, all the charged devices can be quickly and easily joined to a unified standard of IoT system, to make the true realization of interconnection of all things.

Meanwhile, ordinary users can deploy decentralized application in the blockchain operating system quickly and easily, so that developers can only focus on business logic, rather than the encryption algorithms and other basic functions of system level.

5.Super AI

Data, computing power and algorithms are the basis of artificial intelligence. The data generated by the Internet of Things is massive, and the distributed supercomputing system can be the guarantee of the computational power needed by the artificial intelligence application. So, we can develop a lot of AI applications based on DAPPs of the Sky-net system. For the personal data: for example, smart devices——a person's smart watch, air-conditioning and so on, can provide a lot of data on personal habits, living environment, health and other aspects of data. If the smart devices that generate these data are connected to the Sky-net system, the data owner can build the AI application for personal health data management through the data management services and computing power provided by the Sky-net system. On the other hand, the operation of the Sky-net will also produce a lot of data, these data are common, such as the nodes' operating position information, the network transmission speed in some areas, the trading frequency of the network data and computing power and so on. Through the processing of these public data, we can also build AI applications to make the entire network operation more efficient.

6.Attack Risk

- Physical layer attack

The Super Sky-net systems will face the physical isolation risks, such as the damage of the ntercontinental submarine cable. In this extreme case, physical network repairing will take a lot of time. In the complete isolation of the physical network, the Super Sky-net will continue to link and combine the online devices within the local area network in accordance with established rules to form a separate sub Sky-net system, which will ensure the smooth operation of local sub-network. After the completion of the cable repairing, the subnet system will be automatically re-integrated into the super Sky-net to continue to complete the corresponding work.

- **Protocol layer attack**

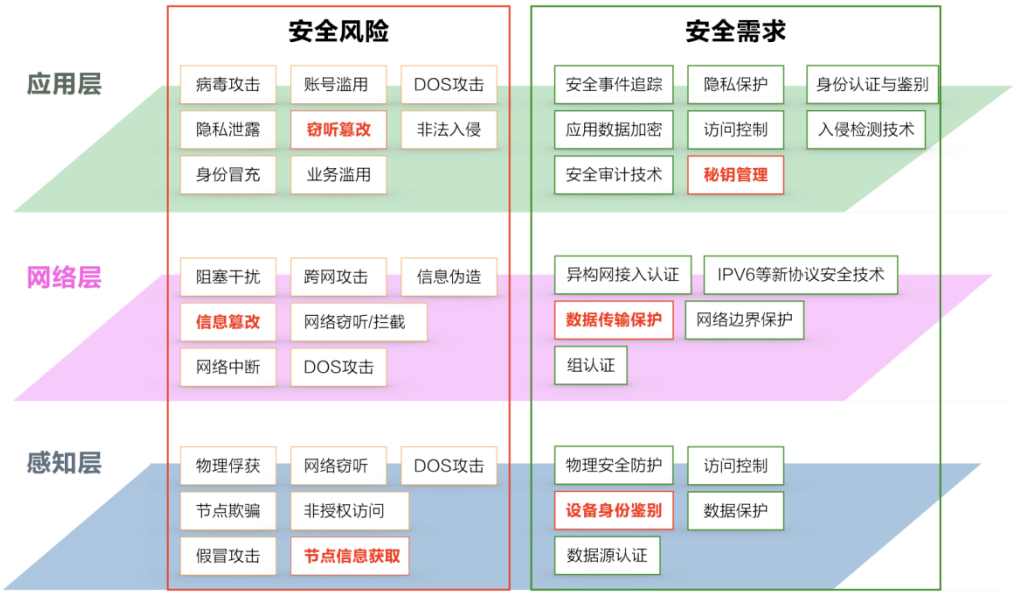
The application of blockchain technology can enhance the security of the Internet of Things, at present, it plays an important role in the following aspects.

(1) The Identification of the legitimacy identity of the nodes. Due to the limited computing capacity and storage capacity of the sensing devices, which makes it difficult to apply the security measures of the high complexity and high performance requirement of the nodes, because there is a high risk of counterfeiting. The verification and consensus mechanism of the blockchain will help identify legitimate Internet of Things nodes and avoid the accessing of the illegal or malicious networking nodes or devices.

(2) Privacy protection of data. The platform aggregates and processes the sensory data for the centralized solution of the Internet of Things. For industry users accessing to the Internet of Things, they face with the problem that the platform stores and forwards the privacy related data in

an unauthorized way. The blockchain will effectively solve this problem by the distributed, decentralized structure and the way in which all the transmitted data are encrypted.

(3) Improve the security of Internet of Things infrastructure: Whether the IoT applications over the Internet, or the special IoT network, the network infrastructure equipment that provide centralized services are the focus of security attacks. Such as using DDoS to attack Internet DNS server, base stations or core routers will cause the network paralysis. It can effectively prevent attacks on critical core network infrastructure to change the centralized services to distributed services by the use of blcokchain technology.



7. Application scenario

7.1 Sharing the use of idle resources

The Super Sky-net can take full use of the idle resources through the blockchain smart operating system into the work of resource utilization, this way greatly improves the utilization of resources and the efficiency of

the work. When we store our personal data in the cloud storage service provider's system, will our privacy be hacked? will our information be tampered with? will the information we have stored for a long time be suddenly disappeared? These problems will not appear in the Super Sky-net. And you can share your excess storage space through the Super Skynet to the users who need the network storage space with a certain income.

7.2 Traffic dispatching, intelligent driving system

Traffic is the first important thing for the city development, only to build a perfect traffic system can be able to create a livable city. The Super Sky-net can quickly identify the congestion in the city through a large number of traffic data and the use of deep learning algorithm, then issue congestion details through the Super Assistant and make the automatic scheduling to solve the problem of long congestion within the city.

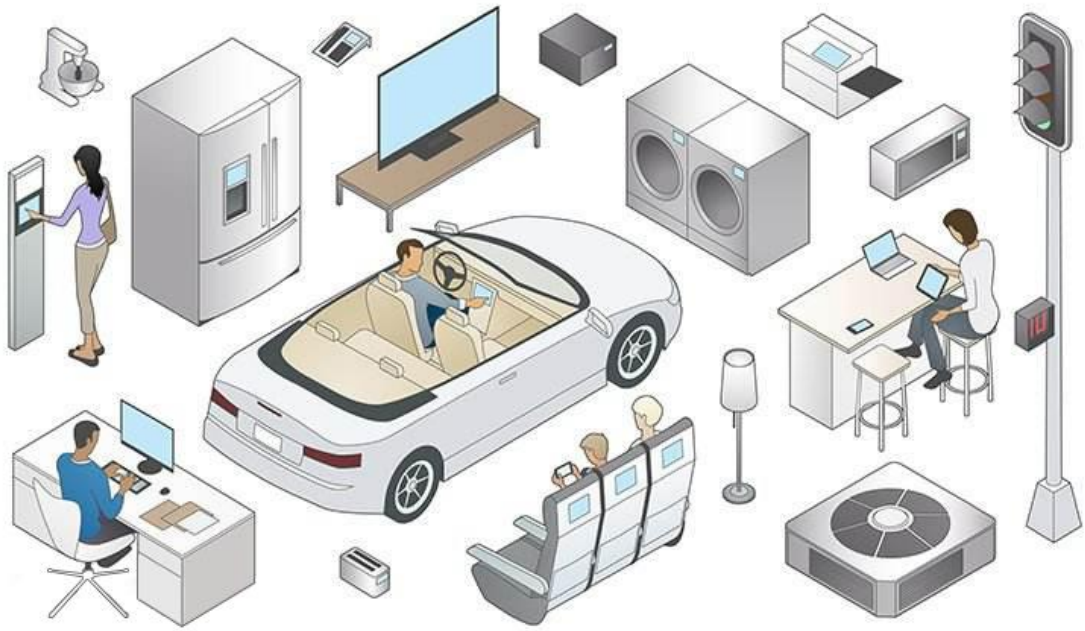
7.3 Large data analysis, weather, disaster prediction

As mentioned above, the Super Sky-net uses more than just personal computers and smartphones, but all the devices around us, these devices generate large amounts of data that can be analyzed and modeled by the supercomputing system in the Super Skynet using the fog computing technology to generate a variety of applications that facilitate people’s life. For example, meteorological monitoring equipment connected to the Super Sky-net can generate a lot of weather data, we can make the weather forecast, automatic analysis alarm according to these data.

8 Conclusion

In this white paper, we briefly describe the basic features of the Super Sky-net. By effectively combining advanced technologies such as blockchain, AI, Internet of Things and Fog Computing, we can create an unprecedented eco-network system. At present the blockchain, AI, Internet of Things and Fog Computing have been through years of development,

and these technologies are on the technical blasting eve. The Super Sky-net will make Interconnection of all things to become a real reality through the mutual benefit mechanism establishment of all the members of the system, and make the information interconnection from the link between people and people to muti-link (the link between people and people, things and things, people and things), and finally make the super-AI be possible for human services. We believe that the Super Sky-net system represents a new phase of human technology and creates a new economic model that is globally integrated and efficiently shared. We believe that this will make the world better.



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