# MeshBox

MeshBox will create a new distributed routing/ storage device standard.

## White Paper

January 17th, 2018

V 3.0.0

**meshbox.network**

# Table of Contents

# Market Background

## Global Gap in Network Coverage

In developed cities, people have 24/7 phone and internet service, it is a staple of modern life. But across the globe there are another 3.9 billion people who are unable to access the Internet, accounting for some 56% of the world's population. It is expected that in 2050, the population of the world will exceed 10 billion. The prospect of achieving a cost-efficient system with the ability to give network coverage to a population of 10 billion is a huge challenge for the future of Internet development.

## Imperfect Financial System

Financial services are the fundamental instruments that allow for the operation of market economies as well as for the development of Internet e-commerce. More and more people buy things on Amazon, Alibaba and other e-commerce platforms with every year that passes.

The expansive development of mobile Internet in the past 10 years has brought about a sea-change in the way payments are made in daily life. In China, ordinary citizens have grown accustomed making mobile payments through WeChat and Alipay wallets by scanning QR codes. Cash is quickly becoming a thing of the past, and even beggars use the codes to beg for money so people can make donations to them using phones.

But on the other hand, there are 2 billion people in the world who don't have bank cards and can't enjoy modern financial services. This prevents them from participating in the global labor market, and also precludes them from climbing out of poverty and benefiting from any of the dividends of globalization.

## Network Congestion and Failure in Developed Areas

Even in areas with developed networks, users experience significant amounts of downtime and latency. This is especially true during visits to tourist attractions, sports events, and concerts, as well as on the subway, in underground shopping malls, in corridors, and in elevators. When disasters occur, whether expected or unforeseen, the results can be even worse.

In August of 2017, Hurricane Harvey knocked out cell phone services in numerous counties, especially near Rockport, Texas where the hurricane made landfall taking out 95% of coverage with it.  Users couldn't send or receive calls, data or messages.
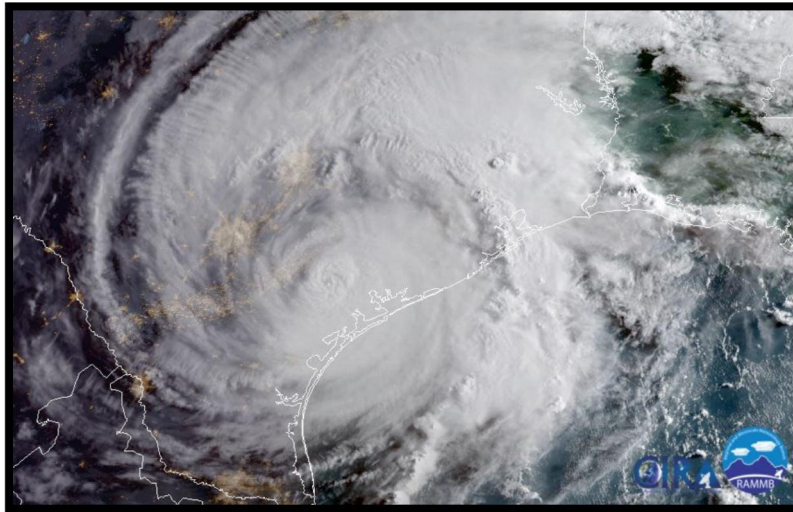


Music concerts and festivals often result in poor or no cellphone service because the spectrum gets overloaded in dense crowds.



**Information Privacy and Security**

As Big Data, BI and Analytics technologies become prevalent, the personal privacy of internet users becomes a growing concern.  Major companies like LinkedIn, Yahoo and more recently Equifax, have all experienced major hacks with passwords and sensitive information being stolen and passed around the internet.  The repercussions are wide-ranging and no one can ever be sure who is watching their communications

now or in the future. By operating in closed offline mesh networks, organizations, groups and individuals can take a major step towards security and privacy in communications, interactions and transactions by cutting off any channel between themselves and potential threats.

**Global Network Under Pressure**

On December 14, 2017, the United States Federal Communications Commission again abolished the Obama era "network neutrality" rule by a 3-2 vote. The reason network operators are under pressure lies behind this "net neutrality" principle. If it is truly abandoned, then we may pay more in the future when watching videos on YouTube or Netflix and the videos we watch at ease today may no longer be at our disposal.



**Network Giants Struggle: Skynet Progress Falters**

Internet giants have set their sights on infiltrating the boundaries of the world's regions that have no internet access. In order to approach the challenge of achieving global network coverage, Google has launched two projects, Project Loon and Sky Bender, to build wireless networks in the sky with hot air balloons and solar powered drones, but progress has been slow. At present, Sky Bender has been terminated. Facebook launched the Aquila UAV project only to see it go up in smoke with the failed launch of the Space-X Amos-6 satellite in a September 2017 explosion. In addition to these attempts, Network operator AT&T started testing the Flying Cow UAVs project in February 2017, but the overall progress of these Internet giants' attempts to extend their reach via the sky is sluggish.

**The Crux of the Matter**

One quandary that dogs current network coverage is that traditional network construction is dependent on only very a handful of network operators in any given nation. Investment costs are substantial, and they post little or no return sparsely populated or underdeveloped areas. In economically developed areas, the centralization of network design cannot distribute the burden of network strain, causing congestion. The UAV telecom broadcasting projects pushed out by the internet giants are not yet mature. What's more, only a single institution is investing in each one. They don't allow ordinary users to participate in the network construction process. Full play isn't given to the strength of the masses to build and share these networks, and they fail to connect with the power of the populace.

# Mesh: Real Network Solutions

How can we make full use of the power of ordinary Internet users to solve the problem of network coverage and congestion? The integration of Mesh networks and blockchain technologies will be the trend of the future.

With the help of blockchain to manage the distribution of tokens, users are encouraged to share their devices as nodes supporting mesh networks and can earn tokens in proportion to how much bandwidth they supply. Users need only make micropayments to leverage these nodes, and so there is mutual motivation allowing user-based mesh networks to self-propagate.

More importantly, such Mesh networks are decentralized. Every participant double as an operator and provide network services to others. It is truly the realization of an "All for One, One for All" shared network.

Advantage: This network comes at a low cost, runs with high efficiency, and is quite agile and scalable. None of these qualities are prevalent in centralized operator networks.

**SmartMesh Introduction**

**SmartMesh's First Blockchain Based Mesh Network**

SmartMesh is an underlying blockchain based networking protocol. It can enable smartphones, vehicle devices, and other equipment to attain network connections that otherwise would not have the ability to do so. SmartMesh has built-in blockchain Light Nodes, and expands the Lightning Network protocol to enable offline and off-chain crypto micropayments.

Based on blockchain token incentives, SmartMesh nodes can self-organize and form elastic, decentralized, and self-repairing Mesh Networks, providing higher near field speed and bandwidth than the Internet, and they are usually established free of cost. Mesh networks are likely to become established networks running parallel to the existing Internet.

**It's No Coincidence Mesh Networks Are Catching the Eyes of Blockchain Geeks**

In December of 2017 Vitalik Buterin, founder of Ethereum, stated an opinion on the issue of American network neutrality on Twitter. It boiled down to one point. That the issue of network load-bearing could not be resolved through VPNs and instead required Mesh network adoption on a grand scale. Twitter is also investigating the various technologies that will drive future blockchain development. The upshot is that Mesh networking ranks first among the most anticipated trends that blockchain technology geeks have their eye on to push the boundaries the decentralized realm. The Mesh-Blockchain combination has now become the very frontier that the entire blockchain and internet are heading into. The next step will be pushing the development of the Internet and the blockchain.
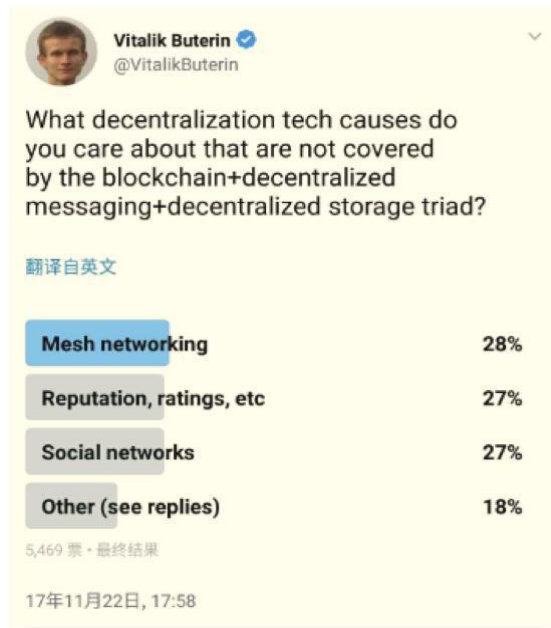
## SmartMesh is the Next Generation of Token Based Internet Protocols

If compared with the existing Internet protocols, SmartMesh is a next generation TCP/IP type protocol that works based on tokens. SmartMesh combines the Mesh with the blockchain.

## SmartMesh Mission

Connect the Unconnected, Bank the Unbanked. The mission of Smartmesh is to achieve the final realization of the interconnection between all human beings, the interconnection of the Internet of Things, and the eventual realization of the interconnection of all things.

## Smart Mesh Progress

Development Progress: Smartmesh App V1 was released on December 29, 2017. Community users: Over 100 thousand Smartmesh community users.

# MeshBox

Let us compare for a moment traditional centralized operator based network ecologies and Mesh distributed decentralized network ecologies which are blockchain based. In the midst of the traditional centralized operators emerged one Joseph Winton (Vint Cerf) and one Robert Elliot Kahn who invented the TCP/IP protocol. CISCO, HUAWEI and other device manufacturers developed router equipment based on this protocol. Then AT&T and Vodafone operators built up the existing Internet through continuous investment. In future Mesh networks based on blockchains, we can imagine that SmartMesh and its partners will undertake the development of the next generation of communication protocols. Following a similar trajectory to what is stated above regarding CISCO, HUAWEI and other hardware manufacturers, SmartMesh will develop high performance distributed routing hardware that users or any institution can purchase, deploy, and augment the established group of ordinary users to form huge Mesh networks. MeshBox will play precisely this role as distributed hardware merchandise.

Comparison of Centralized and Decentralized Networks



| Network | Protocol | Hardware | Operator |
|---------|----------|----------|----------|
| Centralized | | HUAWEI / CISCO | at&t / CHINA MOBILE 中国移动通信 |
| Decentralized | SmartMesh | MeshBox | Alice、Bob、张三 |

**MeshBox Overview**

Based upon the SmartMesh protocol, MeshBox is a hardware box that features a decentralized open-source hardware protocol allowing for multiple mining capabilities. It combines Mesh network routing with content storage and streaming functionality and can also integrate with any other applications and functionalities using the SmartMesh protocol. Each MeshBox can serve as a primary supporting node for a local Mesh network, eventually allowing for worldwide connectivity as Mesh networks that leverage the power of blockchain become distributed globally.

**The relationship between MeshBox and SmartMesh**

SmartMesh:
It is the basic protocol of the Mesh Network - equivalent to the TCP/IP protocol stack on the Internet, allowing all the Mesh network nodes to run.

MeshBox:
It is the data routing protocol of the Mesh Network -- the equivalent of IGP, BGP file exchange protocol running on Cisco only on Mesh-- and the equivalent of the HTTP standard on the Internet, running on Box hardware instead.
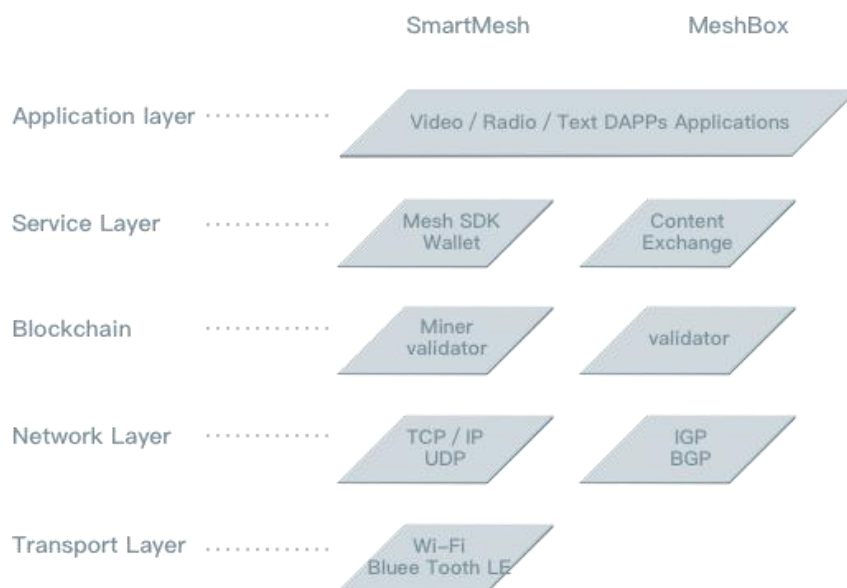
## MeshBox Mechanics

Mesh Networks are composed of access nodes which collect and distribute information and data. Mobile phones, smart devices and various IoT devices are the terminal nodes of the Mesh network, and the information exchange depends on the Mesh network users and clients.
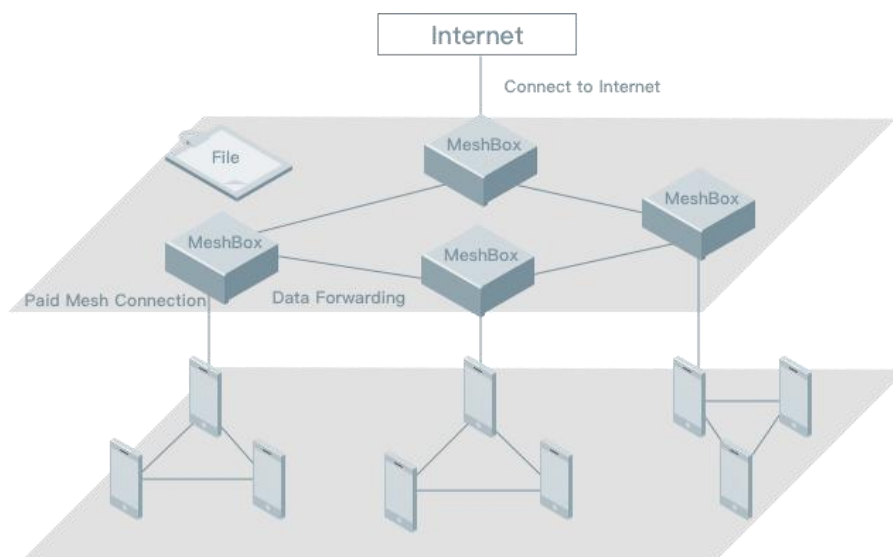


## MeshBox Routing

Where access to the internet is restricted or inhibited by various conditions, network connections enabling channels for the exchange of information and data can still be established with the worldwide distribution of MeshBox and its associated SmartMesh technologies to establish global connectivity.

Where unrestricted access to the Internet exists, deployed MeshBox devices can augment the existing network with additional range, functionality, performance and security. Networks formed employing MeshBox will empower users with more robust P2P communication, greater stability, and enhanced privacy and security.
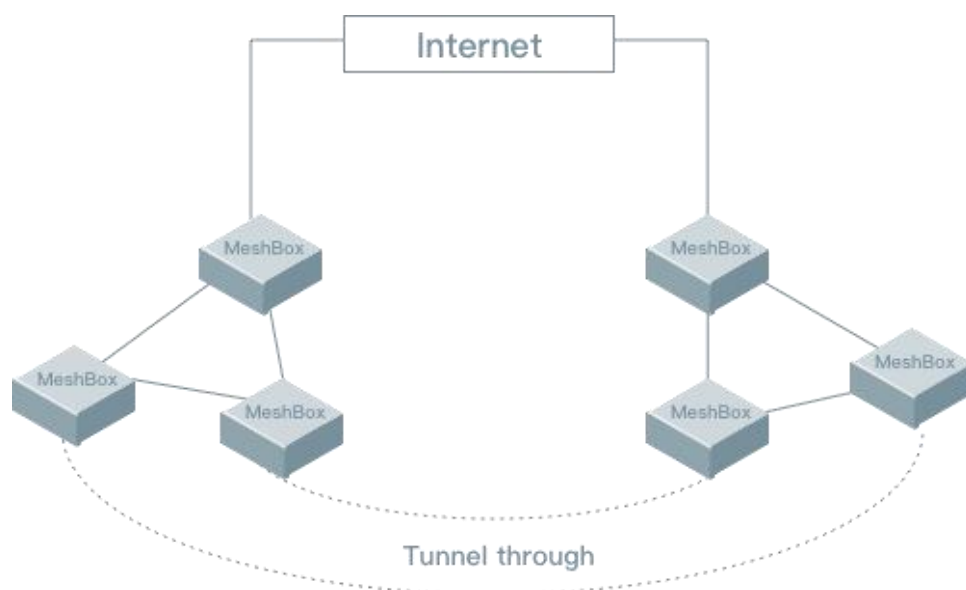
## MeshBox Content Storage and Distribution

Users store data in a MeshBox without needing to store it in any central server, which greatly reduces the possibility of data loss.

MeshBoxes' access strategy can be configured allowing for free or paid access to stored data. Social Media data and messaging data are only links to or mirrors of the data stored in MeshBox, which further protects the security and privacy of personal data.

## MeshBox and Smartmesh Spectrum Chain

MeshBox simultaneously handles all SmartMesh and Lightning Network nodes. In an environment where the Internet is connected, each MeshBox has the right to resolve blocks on the SmartMesh chain. According to how much bandwidth a Meshbox contributes to a network, the system will allocate a proportionate block resolution probability for each MeshBox, and this contribution variable is calculated dynamically with a global adjustment. In an environment without an Internet gateway, MeshBox provides network free payment services for connected devices based on the Lightning Network.

**MeshBox Node Access**

MeshBox provides access services for various IOT devices enabling cross network communication.

The first phase mainly supports two communication standards:

• Wi-Fi

• Bluetooth LE

The second phase mainly support these communication standards:

• Swarm and Whisper

• new expanded protocols for SmartMesh and MeshBox

Ultimately, MeshBox is interconnected with the world, and the freedom of the boundless transfer of information and value is attained.


**MeshBox Incentive Model**

Acting as a routing and forwarding node on Mesh networks, or an offline payment transaction node via Mobile Raiden that can periodically sync with the Spectrum public chain, a MeshBox can earn SmartMesh Spectrum SMT Token rewards. MeshBox also contributes hard disk space to the entire network system, caches data resources, and thereby earns a proportionate amount of MeshBox MESH Tokens. In the future, MeshBox will also integrate with numerous DAPPs and earn rewards from them as well.


**Data Plan Billing**

MeshBox can provide high-quality signal strength and routing functionality to any connected mobile phones and collect small fees in crypto-micropayments in return for the services. Users can also earn rewards themselves by contributing their idle broadband, extending Mesh networks, and transmitting data packets.
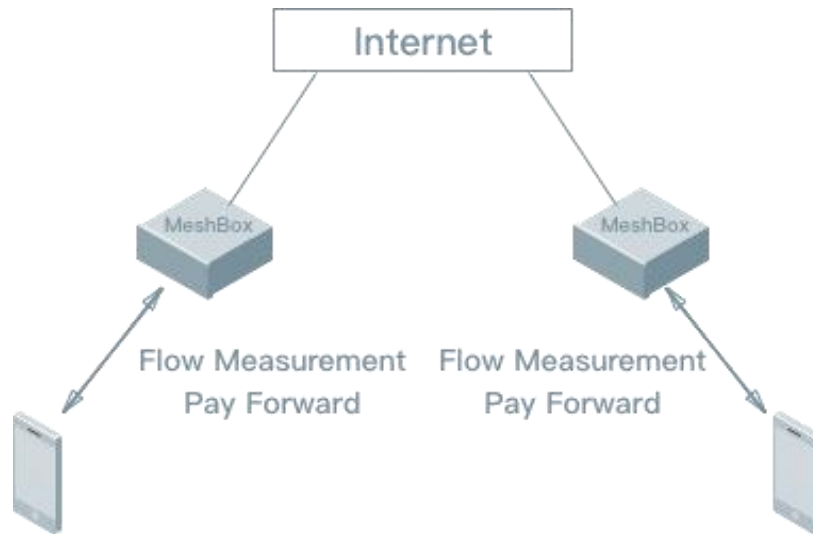
## Content Sharing

When users access MeshBox shared content via downloading or streaming, MeshBoxes earn rewards in MESH Tokens.
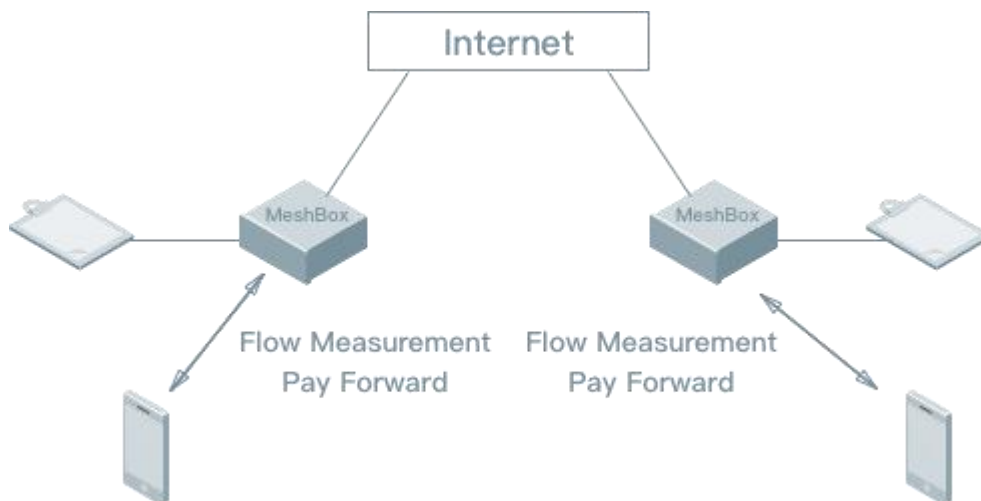


## Real Application Ecology Examples

### Concerts

Tens of thousands of concert-goers gather around an outdoor stage where their idols sing hit song after hit song.  The crowd eagerly sends a plethora of photos and videos

to their friends through Twitter, Facebook, WhatsApp and WeChat. However, the embarrassment is that the signal strength of the Internet is too overloaded, and the media messages can't be sent. With the help of MeshBox nodes, the load capacity of the base station network can be distributed, and everyone can share as much media as they wish.



**Office**                                                                                 **Filesharing Privacy**

How can organizations avoid their office work documents being spied on by a centralized communication tool in the process of delivery, disclosing critical business secrets?  Mesh networks built around Meshbox can realize the rapid transfer of P2P communications.  It is convenient, quick and secure.
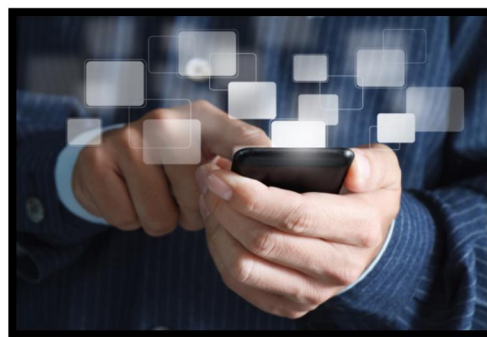


**Shared Community Network**

Within communities, Mesh networks can easily be deployed through several MeshBox boxes.  They can transmit videos and other media in a cheap and convenient manner, and can also share their redundant mobile operators' network packages to community users, making money while facilitating others.
When earthquakes and other disasters occur, and a base station collapses or is knocked out, then the MeshBox can sustain an emergency network.

## Pilot Program in Vanuatu

We will run a network pilot program in the Vanuatu Islands in the South Pacific, where there are no network lines, and the electricity supply is insufficient. With the help of several MeshBoxes with broadcasting radii of 2km, they can be deployed on the island, and harnessing solar power can consume minimal electricity, all the while covering every corner of the island with a signal. The residents access the island network through mobile phones and smart devices, sharing the digital content and storage resources on the MeshBox, and communicate with each other. A mini-network is born on the island, which is so simple and fast that everything is likely to be established in a single day.

In the future, we will introduce a credit system (TrustMesh) into the Vanuatu Mesh network. Users can use TrustMesh to settle payments, utilize credit based consumption, and engage in e-commerce activities in an environment without internet accessibility.

# MeshBox Development Roadmap

**2018 Q1**
MeshBox Hardware and Appearance Design

**2018 Q2**
OS Mounting:Routing/Ad Hoc Network/
Transmission Control Core

**2018 Q3**
Extension and Promotion of IPFS Clistribution in Mesh
Networks
Develop an offline Mobile Phone APP to Control
MeshBox Without Needing Internet or Data Service
MeshBox Indoor Version Prototype Release

**2018 Q4**
Pubish DAPP Market on MeshBox
Release MeshBox Outdoor Version Prototype
Release official Indoor Version of the MeshBox

**2019 Q1**
Distribute MeshBoxes to Global Partners Throughout the
World for non-deployment Pilots(Intended
Locations:India,Philippines,Nigeria,Vanuatu)
Rollout official Outdoor Version of the Meshbox

**2019 Q2**
Network Deployment of MeshBoxes in Various
Regions via Global Partners
Intended
Locations:China,USA,Bangladesh,Indonesia etc.
Develop Compatibility With Swarm,Whisper and
other Extended Protocois to Achieve
Interoperability of Global MeshBox Connections.

**2019 Q3**
Construction of MeshBox Developers Network Ecosystem

**2019 Q4**
Construction of MeshBox Developers Network
Ecosystem

# Governance Structure and Team

## Organizational Structure and Functions of the Foundation

```
                    ┌──────────────────────┐
                    │      MeshBox         │
                    │  Decision Committee  │
                    └──────────┬───────────┘
                               │
                    ┌──────────┴───────────┐
                    │      MeshBox         │
                    │ Executive Committee  │
                    └──────────┬───────────┘
        ┌────────────┬─────────┼─────────┬─────────────┐
┌───────┴──────┐┌────┴─────┐┌──┴──────┐┌─┴───────────┐┌┴───────────┐
│   Network    ││ Developer││Technology││    Market   ││ Management │
│  deployment  ││Community ││R&D Center││ development ││  support   │
│    center    ││          ││          ││    center   ││   center   │
└──────────────┘└──────────┘└──────────┘└─────────────┘└────────────┘
```
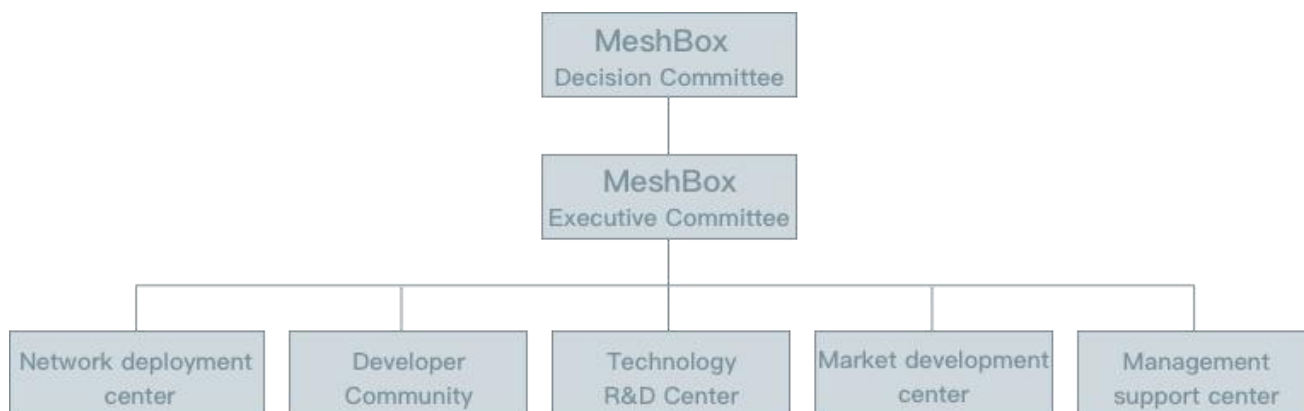
**MeshBox Decision-Making Committee**

Responsible for the management and decision of major events, including the formulation of strategic direction for MeshBox development, the appointment and dismissal of executive committee members, the executive director of the election Executive Committee, and the heads of the centers. The members of the committee are appointed for a term of three years and can be reappointed. The Committee has a chairperson, and the first board members will be voted in by the Mesh Box founding team and community representatives, and in an annual rotation thereafter.

**MeshBox Executive Committee**

Carries out the resolutions of the Decision-Making Committee and manages the compliance and work efficiency of each center.

**MeshBox Technology Research and Development Center**

The technology development center is responsible for the development of the underlying technology protocol, the design and development of hardware, and the testing, version innovation and advancement and the formulation of standards.

**MeshBox Developer Community**

The developer community procures software and hardware partners based on MeshBox protocols and hardware design specifications to provide technical support and services for hardware developers.

**MeshBox Network Deployment Center**

Provides network deployment technology support to foster the continuous optimization of MeshBox in different regions, environments, and application scenarios.

**MeshBox Market Development Center**

The market development center is responsible for the marketing of MeshBox products and the maintenance of community operations.

**MeshBox Management Support Center**

The daily management center includes the management of finance, legal affairs, personnel, administration and so on. This covers use and audit of financial funds; the drafting and examination of all kinds of documents, to guard against legal risks and ensure compliance; and includes administrative duties regarding all personnel, remuneration and organizational responsibilities.

**Core Members**

**Xiao Yongquan(Harry Xiao)**: The founder of MeshBox
Xiao Yongquan was one of the early internet pioneers when China Mobile's internet capabilities were in their infancy. He has more than 15 years of entrepreneurial experience, and created a leading mobile phone gaming platform before working with Samsung andZero2IPO Group. He has been an early investor in the blockchain projects of SmartMesh, 8btc, Aware and so on.

**Peter Yan**: MeshBox Chief Scientist

He was Chief Engineer of the HUAWEI American wireless interconnection laboratory, the Chief Scientist of the business routing business of Bo Tong, and the architect of the Freescale system.

**Cai Zhihong**: Chief Architect

Cai Zhihong is the former technical director of the CNNIC China Internet Information Center, was an HP blockchain senior consultant, has more than 15 years of experience in software development, was an early blockchain developer, and has an in-depth understanding of Ethereum, the IPFS block chain project, consensus mechanisms and code implementation.

**Daniel Finn**: Chief Marketing Officer

Founder of New Dynamik Ltd., and proficient in Mandarin Chinese and English, Dan has rich experience in digital marketing, media production and online training. In addition to working on branding and marketing campaigns for clients like Volkswagen and Skoda, he has also worked in the technology sector as a fintech product developer and trained dozens of companies including Lenovo, LG, ABB, China Mobile and many more.

**Advisory Team**

**Wang Qiheng (Henry Wang)**: Founder of SmartMesh

President of the International Blockchain Application Federation, Chairman of the AAMA Blockchain, and world leader in offline networking and social communications.

**David Cohen**: Founder of Dcntral.ai, Executive member of the IOTA Foundation and HashGraph Advisor.  David has deep insight into the development trends of the

Internet of Things, Blockchain and Artificial Intelligence.  He has extensive influence in the blockchain community.

**Wang Binsheng**: Blockchain Joint Development Organization Consultant, Blockchain Micro-finance 50 Member Forum Committee Executive, Distinguished Professor at the Chinese Academy of Social Sciences Graduate School.  Wang Binsheng is a Chinese blockchain community theorist with widespread influence.

**Peter Zhang** : Former HUAWEI Chief Lawyer, who led the patent litigation war between HUAWEI and Cisco in 2003. He is now a partner of Geffel Capital Private Equity Investment Co., Ltd., and was the founder and managing partner of Fangguang Capital, Chairman of the Strategic Investment Committee of China Video Industry Association (formerly Ministry of Information Industry) and before that Principal Counsel to the Video Association of the Ministry of Information Industry.

**Tahn Joo Chin**: Hina Group  Managing Director. **Tahn Joo Chin** served as an investment partner in Venture TDF, Singapore in 1996. She is also a partner in WIIG-TDF Partners in Silicon Valley, USA. Projects she has invested in include: Alibaba (Alibaba.com), Webex (WBEX), Sina.com (SINA), and Gric Communications (GRIC). She founded and served as Director of the Information Technology Research Institute (ITI) under the National Computer Bureau of Singapore (NCB). Ms. Chen has been the Chief Information Officer of the National Computer Bureau of Singapore (NCB) and the 9001 National Project Manager of Information Technology. She also established the Singapore Israeli Industrial Research and Development Fund (SIIRD).

# MeshBox Token Allocation

• Token Name: MESH

• Our total offering is 10 billion tokens.  The breakdown of those not available for consumption is as follows:

• 40% - Mining Rewards
• 20% - Tokens for Pre-Sale
• 15% - Foundation Holding
• 10% - Team Rewards
• 7%   -  Marketing
• 5%   -  Advisors
• 3%   -  International Standard Setting
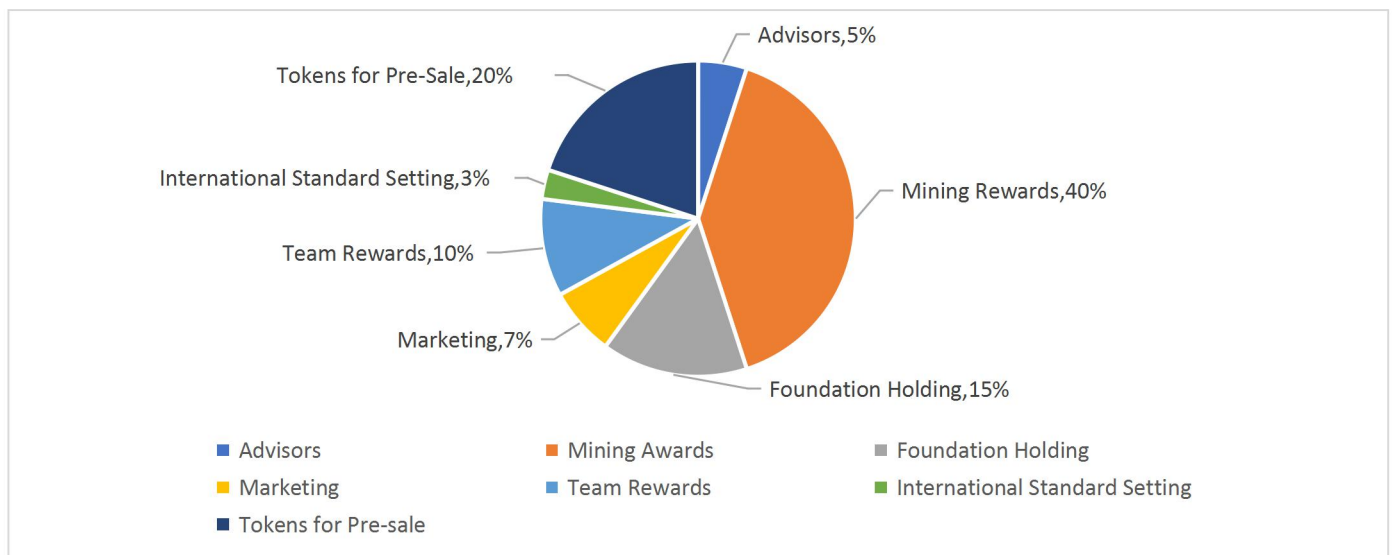


MESH tokens will be released in the SmartMesh network as ERC20 tokens.
SMT holders can get a 3% bonus.
**NOTE:**
SMT Community MESH Airdrop is included in the Marketing section of this breakdown.

Team Members' MESH Tokens will be frozen for the first two years.