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WHITE PAPER **BLOCKMESH**

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AN INTRODUCTION



Chris Fabian

Co-lead of UNICEF's Innovation Lab.

"Technology has the potential to lift people out of poverty. All signs point to the developing world skipping past the eras of landlines and desktop computers and going straight to mobile. That potential for two-way communication is changing the face of international development. For the first time ever, we're able to have a clear line to people who are in the middle of nowhere to give them a sense of a future, information, opportunity and choice." ¹

¹ Consumer Technology Association <https://www.cta.tech/News/Blog/Articles/2015/July/How-Mobile-Phones-Are-Changing-the-Developing-World.aspx> ²

OUR PHILOSOPHY

Connect people via a self-sustaining network that has the ability to reward participation. Our methodology is to enable this change by running an efficient commercial business model.

Mobile telephony providers have implemented a very aggressive diffusion strategy for mobile networks, especially throughout Africa. The aggressive mobile telephony strategy has increased its market share, adoption of smart technology and infrastructure. Our technology relies on the adoption and market share characteristics, not infrastructure.

The global population is estimated at 7.8 Billion people², it is also estimated that 60% have no access to internet across the globe³.

ABOUT 4 BILLION NON-USERS

Affordability

13%

of people live below the international poverty line.²

29%

Number of countries where broadband is affordable for 100% of the population once household incomes are taken into account.³

Infrastructure

31%

of people live outside of 3G coverage.¹

Local adoption & use

80%

of online content is only available in 1 of 10 languages, which only about three people speak as their first.⁴

95%

of survey participants in 12 developed and developing countries have used online government services.⁵

Most recently available figures used : ² World Bank, 2015, ³ UNESCO Adult and Youth Literacy, 2015,

¹ 2 ITU, 2015 estimate,

⁴ World Bank, 2014, ⁵ BCG, 2014

² United Nations Population Division <https://esa.un.org/unpd/wpp/>

³ World Economic Forum <https://www.weforum.org/agenda/2016/02/4-reasons-4-billion-people-are-still-offline/>

WHO PAYS THE MOST NOW?

Whilst there is a large disparity between individuals who own smartphones and those that have data enabled mobile technology, the trend seems to be moving towards accessible economical technology that is affordable to lower income earners.

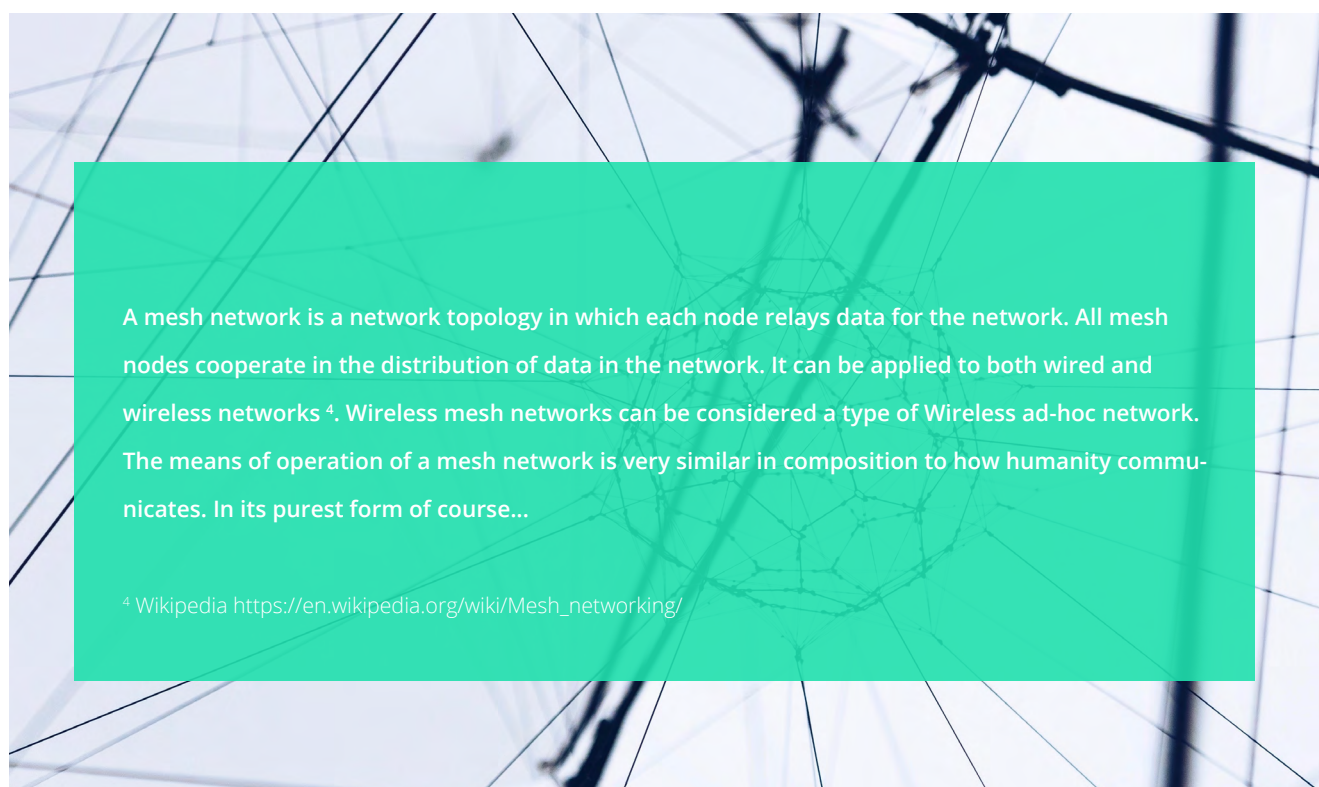
Targeting the largest customer base is a sound business model, however it is not assisting in development especially when the fees charged are not proportionate to the user's ability to earn, work and pay for those costs.

Our ICO allows the deployment of a platform including application to solve this problem.

Mobile telephony technology, smart phones and its large adoption is the backbone to support 3G, Bluetooth, Wireless and tethering technology linked via mesh networks.

Our objective is to empower users with a smart device to be enabled to at their choosing, receive encrypted data from a recipient whom will collect the data then relay it along the mesh network until received by the designated recipient.

The mesh network route will then be rewarded for data passed on. This will mine our "Mesh Token" which then can also be used to pay peer to peer via our wallet. The token itself will be developed on the Ethereum network.



A mesh network is a network topology in which each node relays data for the network. All mesh nodes cooperate in the distribution of data in the network. It can be applied to both wired and wireless networks ⁴. Wireless mesh networks can be considered a type of Wireless ad-hoc network. The means of operation of a mesh network is very similar in composition to how humanity communicates. In its purest form of course...

⁴ Wikipedia https://en.wikipedia.org/wiki/Mesh_networking/

THE COMPANY

Introduction

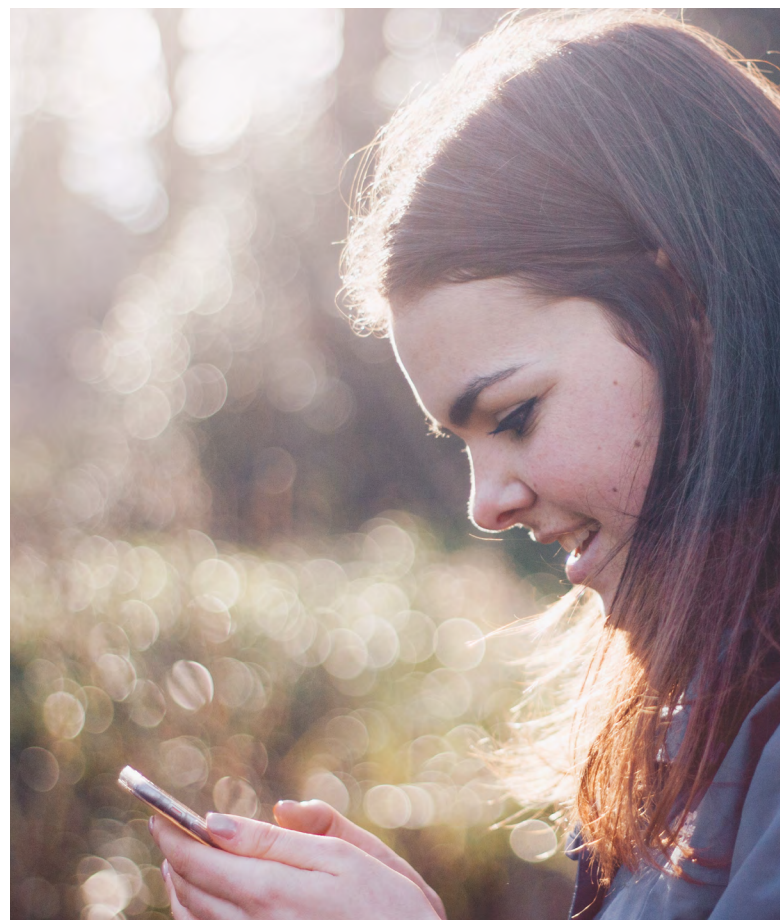
Blockchain technology has introduced the world to decentralisation whilst easing access to markets and trade. As worldwide adoption becomes a reality we are excited to be part of this positive change, through providing access to all these resources through established interfaces.

It is our belief that if we remove the barriers of access to networks and connectivity, it will empower the world, alleviate poverty and enlighten us as part of the global village.

Meet BlockMesh through Prometheus

We are first and foremost a business, secondly an organisation that exists to improve lives and break barriers to communicating. It is our belief we cannot affect great change without being a successful business model first. Our methodology is to implement best management and industry leading practices in the pursuit of creating value.

BlockMesh started as a mesh network solution provider in October 2015. This has enabled us to develop a solution in the market which could revolutionise the way the



current-centralised communication ecosystem operates. Our understanding and development utilising Blockchain has solved our challenge of compelling individuals to support the Mesh network, the reward function will utilise Blockchain technology via a cryptocurrency in order to reward supporting the network.



We are first and foremost a business, secondly an organisation that exists to improve lives and break barriers to communicating.



30+
Years Experience



100+
CSR Opportunities



Q1
ICO



+
Decentralised

UNDERSTANDING THE TECHNOLOGY

What is a Mesh network, not to be confused with the BlockMesh network?

A mesh network is a group of devices communicating and passing information from one device to another in sequence till the intended recipient is reached.

Function of BlockMesh technology

We have created an efficient Peer to Peer mesh, anonymous, decentralised, communications Platform. This information will be encrypted, end to end. Mesh networks relay data and messages using an ad-hoc system with partial mesh configuration. Data is propagated along a path by hopping from node to node until it reaches its destination. To ensure that all its paths are available, the network must allow for continuous connections and must reconfigure itself autonomously around broken paths, using self-healing algorithms such as Shortest Path Bridging. Self-healing allows a routing-based network to operate when a node breaks down or when a connection becomes unreliable. As a result, the network is self-reliable. The denser the population the more robust the mesh will be. Wi-Fi routers and boosters will further strengthen the network and increase range.

Challenges of Mesh technology?

Our team include some of the forefront research and development professionals on the planet. BlockMesh understands the complexities of the problem we are solving. We plan to solve these with our flexible platform.

BlockMesh and the INTERNET OF THINGS

The Internet of things (IoT) is the network of physical devices, vehicles, and other items embedded with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange⁵

According to research there will be nearly 20.4 billion devices on the Internet of things by 2020. ⁶ BlockMesh's aim is to create a global platform to mesh and channel the IOT expansion, so each device would not require internet access. Data can be channelled via the mesh to prevent latency issues and deterioration of bandwidth.

⁵ Wikipedia https://en.wikipedia.org/wiki/Internet_of_things#cite_note-Linux_Things-1

⁶ Gartner <https://www.gartner.com/newsroom/id/3598917>

This will also correct the issue of IOT devices needing to be within Wi-Fi ranges. Data can travel outside of the hotspot range via the mesh platform utilising wireless hardware embedded in other devices until an internet connection can be secured.

Each IOT device will receive a wallet address and earn Mesh Tokens for supporting the offline network and be able to pay other devices for internet access creating a profitable sustainable shared network.

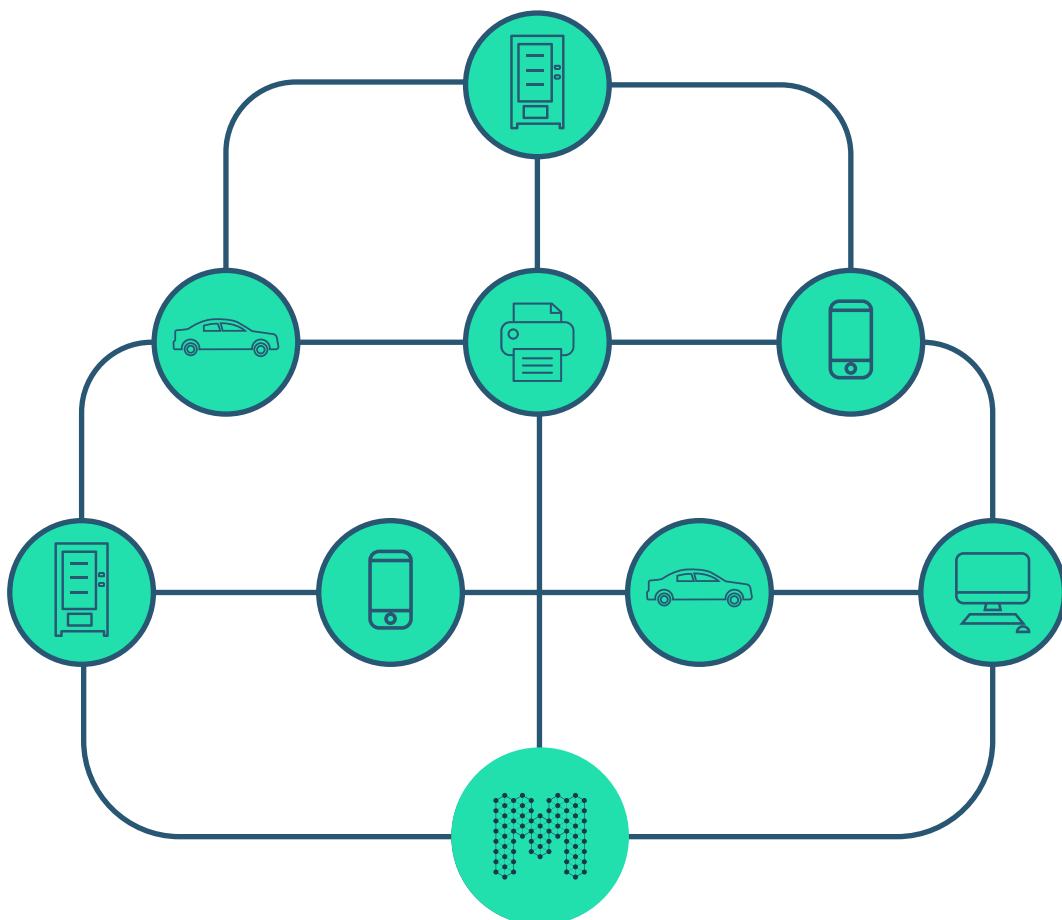
The BlockMesh network allows users to send data and messages through Bluetooth instead of Wi-Fi and cell towers, so, it's essentially cost-free. However, our users can also use the BlockMesh app with their normal cellular data

to send messages and data if there isn't a strong enough mesh network available nearby.

The app can be set to use the BlockMesh network as a primary setting and normal cellular data as a secondary option.

The user will also earn Mesh Tokens for every MB of data that passes through their mobile device while using the app.

The user can then use the earned Mesh Tokens to spend as a cryptocurrency or to buy mobile data in any Mesh hotspot at a fraction of the price of typical cellular data.



The BlockMesh Platform

The BlockMesh platform is a platform supporting mesh based devices focusing on communication and the IoT. Our platform will provide the user the ability to communicate and digitally transact in the peer to peer network, crushing data costs and banking fees. We aim to create a self-sustainable financial ecosystem for communication and IoT.

Users and IoT devices can earn "Mesh Token" for supporting the network and pay in "Mesh Token" for access to conventional internet at a fraction of the cost. Users with unlimited Wi-Fi can offer their community or clients internet access with no passwords needed. With "mesh" the internet connection can then be passed beyond the hardware range.

Our goal is to become the leaders in mesh technology reinvesting in the technology and creating a platform where any developer can take advantage of our network with our simple open source API.

MeshDEV

Mesh will deliver a platform where our open source code that will allow developers to create apps and custom solutions on the platform to take advantage of data free data transfers. There is a small fee dependant on data volume payable in Mesh Token.

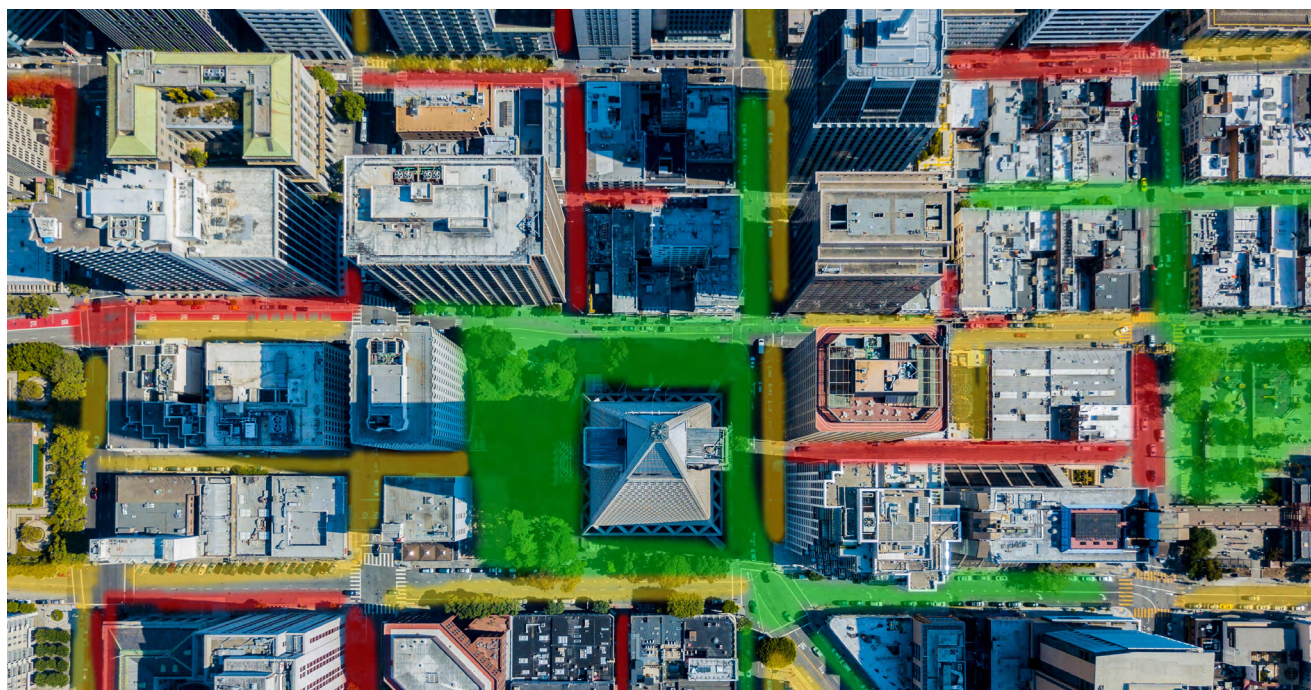
MeshEX

MeshEX is our custom Wi-Fi routers which will support and increase the network (BlockMesh mining). Users utilising the routers in homes or in their small business will be rewarded for each MB support on the DATA free mesh network via the hotspot created. Users can also offer internet connections to the mesh passing the connection far beyond the hardware hotspot limitations. Users wanting conventional internet with in MeshEX range will be charged in Mesh Token per megabyte. Converting an uncapped internet line from an expense to a value generation tool.

MeshAD advertising

MeshAD will be a revolutionary advertising platform where small and large businesses can purchase packages to advertise along the mesh. Most advertising packages online are gender and age driven within a set location. MeshAD is developed on clients' interests and hobbies with advanced "Location Trip advertising".

Example- A shoe store in a mall can purchase MeshAD packages with defined criteria (Female, 30-40 Years Old, Clothing) then apply the amount of "Links" in the mesh to be tripped. "Links" are the amount of devices the MeshAD with travel increasing range. This give the retailers the opportunity to directly advertise/issue coupon to clients within the vicinity. Increasing value for advertising and reaching clients on your doorstep. Clients are only charged for each received Advert.



Security

A large focus of ours is security. It is our view that the security of the data moving through the mesh requires industry leading encryption. This is a non-negotiable aspect of the technology and our business. Our understanding of efficient encryption technologies is developed, however we will incorporate specialists that can ensure we remain at the forefront of encryption technology.

Our relationship with leading anti-malware providers allows us to deliver anti malware and anti-virus leading technologies through our application. Our vision is to secure all facets of our code to ensure a robust platform to communicate, transact and store value.

The security framework developed uses the Elliptic Curve crypto system to provide authentication and digital signing, data encryption and decryption, and identity management for the Mesh network.

The main parts of the security framework are:

The per-device Keyring file contains encrypted secret keys for many identities, each identity unlocked with its own PIN (pass-phrase), and every identity deniable while not unlocked;

Mesh Datagram Protocol (MDP) uses elliptic curve public keys as its network address space, so once a subscriber is known, it is trivially easy to send encrypted traffic to him/her, and straightforward to perform key exchange for secure sessions;

Mesh Datagram Protocol (MDP) natively supports unsigned clear, signed clear, and signed encrypted payloads using the destination and origin BlockMesh Identity (SID)s as keys;

The routing protocol uses randomly generated BlockMesh Identity (SID)s, not MAC or IMSI device addresses, making it difficult for eavesdroppers to link a person to a handset;

Rhizome uses a strong hash (digest) algorithm to prevent tampering with the contents of files that it distributes;

Rhizome uses cryptographic signatures on all manifests to prevent tampering with file meta data and identity;

Rhizome can encrypt its payloads (independently of MDP encryption);

Rhizome allows anonymous and fully deniable authorship.

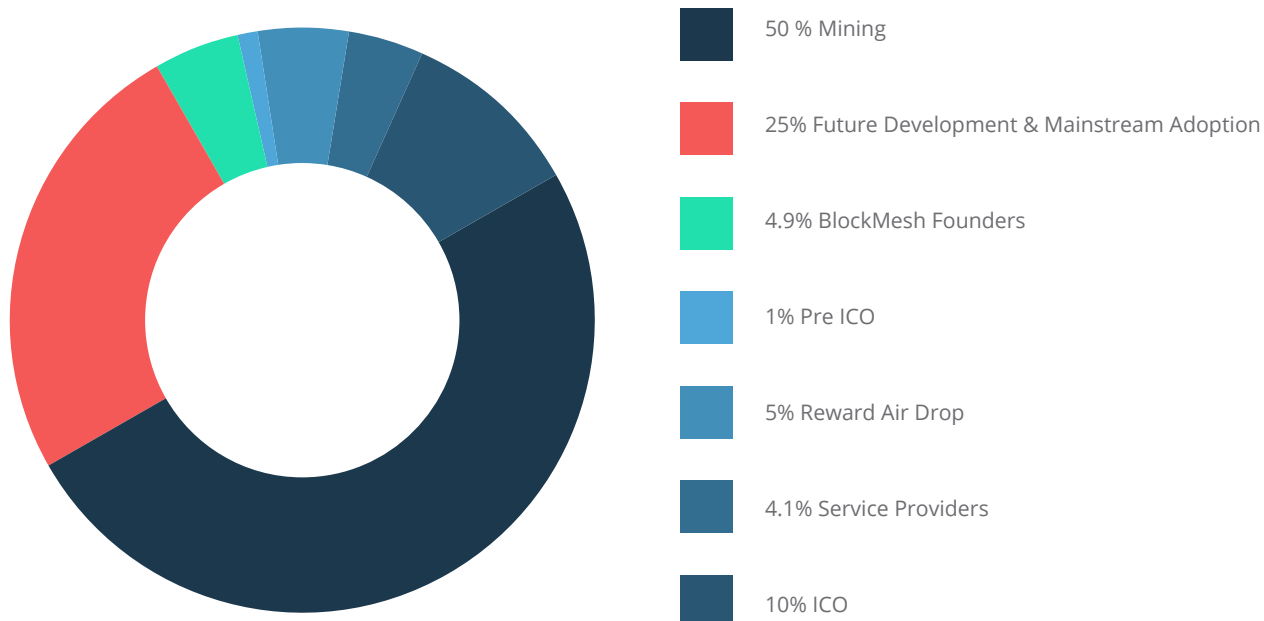
Liquidity on Bancor

Smart-tokens provide a simple and powerful building block for implementing new types of monetary models, applications and value networks such as local currencies, project tokens, decentralized index funds and much more.

Coin Breakdown

Total Market Cap = 2 Billion

Total ICO = 220 Million Tokens (\$0.05)



MINING THE BLOCKMESH

“Mining” BlockMesh through Proof of Network

Reward systems are an integral part of ensuring the BlockMesh network grows, it also ensures we create an environment where all involved benefit from supporting the network. Mining rewards will be distributed over 10 years and calculated per MB passed along the mesh.* Capped on personal usage at 1.8 GB's per month. This is to deter close looping.

Reward Airdrop

3 times a year for 1 year. This is to reward “hodling”.

MOBILE MESH USERS

Users with the app on their mobile device will be rewarded data sent via the app. The user will only need to use the app for free or paid communication services. Users using the app for communication via the mesh will be charged zero data fees and still earn mesh token just for having the app active on their phone supporting the network.

HOTSPOT USERS

Users with Wi-Fi routers or boosters can now convert an expense to a value producing asset. Earning mesh token by providing internet to the mesh and increasing the mesh range and stability. Custom Wi-Fi routers and software available on the website.

WHAT IS BLOCKMESH NOW?

It is a free and open-source app for Android 2.2 "Froyo" and later, under continuous development.

The official release of the BlockMesh app will be freely available from Google Play initially as we believe the target market we intend to saturate operates on the Android operating system.

BlockMesh allows people to make voice communication, send text messages and share files with other BlockMesh users, without requiring infrastructure like satellites, cell phone towers, Wi-Fi hot spots, or radio repeaters.

BlockMesh can use the Wi-Fi capabilities built into Android to connect with other devices within range. This requires a nearby Access Point, or turning on the portable HotSpot feature of one device. On some device's BlockMesh can use Ad Hoc mode to communicate directly with other devices within range, allowing communications to be easily relayed over multiple hops. To do so requires root permission on the Android device.

MESH DATAGRAM PROTOCOL (MDP)

MDP has been designed for use in a wireless mesh network, in which nodes may move and connections may be intermittent or of highly variable quality. MDP is unrelated to the Internet Protocol, although it copies some concepts such as port numbers. The main characteristics of MDP are:

- Every address, also known as a BlockMesh Identity (SID), is a 256-bit public key in the Elliptic Curve crypto system used by the BlockMesh application. The Security Framework describes this approach in more detail.
- Every node device may have one address (Device Identification (SID)) or many, which it creates itself using random key generation. The large size of the key space means that the probability of two devices having the same address remains negligible, even if the mesh grows to billions of devices.
- The payload of every MDP packet may be clear text, signed, or encrypted and signed. (Encrypted but not signed is not currently an option, but future advances in the NaCl crypto library may make this possible.) The encryption key is the public key (address) of the recipient, and the signing key is the private key of the sender.
- MDP is an OSI Level 3 (Network) layer, and may be carried over any wireless or wired data link, whether over a shared medium (eg, CSMA/CA used in Wi-Fi) or a dedicated medium (eg, AX.25 packet radio, serial cable).

- MDP does not guarantee packet delivery or preserve packet order. MDP may deliver duplicate copies of packets. It is up to the MDP client applications using higher level protocols layered over MDP to detect duplicate and deal with lost and out-of-order packets.

- MDP uses per-hop retransmission to solve the cumulative end-to-end packet loss that can plague wireless networks. (To carry a packet over N hops, where each hop has a probability P of dropping a packet due to interference or collision, the end-to-end loss is $1-(1-P)^N$. For example, given a per-hop packet loss of 10%, a five hop route has a net packet loss of 41%, and a ten hop route 75 %.) The retransmission scheme does not attempt to be perfect – it does not guarantee zero packet loss and can produce duplicate packets – but it can restore a practically unusable route to highly usable, independently of the route length, at the expense of higher latency, some packet re-ordering, and some duplicate packets.

- Every packet has a source and destination MDP port number, which are completely unrelated to Internet port numbers. In encrypted packets, these port numbers are part of the encrypted payload, which makes it harder for an eavesdropper to guess the purpose of the packet.

BLOCKMESH MESHEX

The BlockMesh Mesh Extender is a hardware device that helps other devices to join and participate in a BlockMesh Mesh network.

Second-Generation Mesh Extenders:

- Powered by external USB, 12v/24v automotive and/or solar. (with MTTP tracking charge controller)
- Integrated LiFEPO4/Lilon/Sealed-Lead-Acid battery charger
- Custom-designed injection-moulded housing.
- Designed to meet IP66 environmental resistance.
- Integrated "Mesh of Things"/"Internet of Things" I/O port
- MicroSD card for bulk storage. (reduced power consumption versus USB)
- Wi-Fi access point (for devices to connect) and ad-hoc Wi-Fi. (between Mesh Extenders)
- RFD900/RFD868 UHF packet radio. (up to 4km range line-of-sight, ~200m indoors)
- Interface to Codan/Barrett HF Radios for very-long-range communications links. (support for other radios is also possible)
- provides a standard Wi-Fi Access Point for nearby devices (such as smart phones) that do not support Ad Hoc Wi-Fi mode.
- Offers the BlockMesh (app for Android) app for Android for download via HTTP so that people can join the Mesh network without having previously installed the app.
- Acts as a Rhizome node, storing and forwarding files and MeshMS messages
- Fully interoperable with first generation Mesh Extenders



PRIMARY GOALS FOR **BLOCKMESH**

**BlockMesh is a young company with large aspirations.
It is our ambition to deliver the below medium goals after ICO:**

01

Create a Cryptocurrency “Mesh Token” that will become the “Reward” token for users who support the network.

02

This token will be listed on exchanges for cross platform trading.

03

Large scale deployment of network hubs to initially support network.

04

Crisis and Disaster communication redundancy for locations they are supported.

FUTURE GOALS FOR **BLOCKMESH**

01

Hosting MOOC educational repositories that live on the mesh network allowing users to locally download and store educational material not reliant on data costs for access to content.

02

Subscription services for hosting stores and marketplaces.

03

Debit card linked to our token and wallet.

04

Trip mesh advertising.

TOKEN IMPLEMENTATION

- ✓ Tokens will be given as a reward for launching and supporting the BlockMesh network.

-
- ✓ Peer to peer payments.

-
- ✓ In app purchases.

-
- ✓ Traded on global Cryptocurrency exchanges.
-

THE TEAM

Bjorn Dingemans

Founder

Tyron Caithness

Head of Financial

Dr Paul Gardner Stephen

Head of Research

Matthew Schulz

Head of Digital Operations

Anjé Hoogervorst

Digital Analyst

Gareth Stuurman

Android Developer

Eureka Zandberg

Legal Counsel

Jaap Griessel

ICT Advisor (IBM, Computer Associates, Dimension Data)

Mike Weetman

Advisor (Former CFO of Yahoo and DreamWorks USA)

Jason Griessel

Head of Business Development

Wesley Billet

Head of Marketing

Kevin Dunbar

Head of Design

Christopher Underwood

Digital Analyst

OUR PARTNERS



BANCOR

Mesh is proud to have partnered with Bancor, it is our belief that without Bancor's technology implemented into future projects the Token ecosystem on DLT will not grow exponentially.

More to be announced.

OUR ROADMAP

ROAD MAP

01	1st Quarter 2018 ICO Listing	On time
02	2nd Quarter 2018 token distribution via web wallet and exchange listing	
03	4th Quarter 2018 Mobile app android and iPhone- Mesh hotspot reward roll out	
04	1st Quarter 2019 in app Marketplace	

Currency Structure

Ethereum ERC20 token

Purchase methods accepted: BTC and ETH