A decentralized ecosystem for peer-to-peer weather data exchange.

WeatherBlock™

Version 1.3
1.11.2018

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Contents

1 Abstract

The world has been grudgingly augmented with the meteoric rise of cryptocurrencies, awareness of which has driven accelerated advancement efforts in decentralization of services. Although still incunabulum, the prospect synthesis of decentralization with Internet-of-Things (IoT) and Artificial Intelligence (AI) will bear modern shared economic models that repositions how value is dispersed using autonomous community services. These services will facilitate commerce between entities, individuals, and devices that trade on a trusted decentralized community chain.

WeatherBlock proffers to develop a weather ecosystem combining advanced weather station IoT devices with a decentralized, blockchain based service protocol using unified community delegated consensus methods leveraging WXB as initial utility and future protocol token for economic trade.

The new market will be Delivering Shared Economic Market using interconnected IoT weather devices to generate block production rewards and consumption incentives using publicly verifiable weather data storage and retrieval services. It will comprise of various novel cryptographic schemes that prove integrity of weather data.

2 Introduction

Since the dawn of time people have struggled with weather changes. Today, we have smart and connected sensors to help us be more informed. In this white paper we present a decentralized model for a weather data exchange network that uses blockchain technology to safely market, transact and reward participation. It facilitates formal verification using mathematical technique to validate the code administrating transactions, and elevates the security of the most sensitive or financially weighted trades.

We are introducing an ecosystem with digital currency (WXB) that powers authenticated trades in an reimagined marketplace style platform for weather data and services called WeatherBlock. It is a democratic platform that connects data owners and data consumers with tokenized transactions aligned with economic incentives for data mining, contribution and facilitation outlined in the business model section of this white paper.

BloomSky, as community and hardware supplier, will be the first large scale adopters and champion. BloomSky smart weather cameras and its existing community are contributing a rapidly growing amount of hyperlocal and "spot" weather information, creating a data-based economy in which users produce an exponential amount of weather data through crowdsourcing. There is an opportunity for individuals, or groups, to contribute hyperlocal weather data to create a value chain from underutilized assets, benefiting both personal and business endeavors. There is also a clear need for a transparent and fair data exchange based upon the expressive consent of the existing BloomSky users producing the data. However, the data marketplace industry is virtually nonexistent or deeply dysfunctional for both data owners and data consumers. This dysfunction can be understood in terms of the silo and source problem. The silo problem is that the data is scattered across a field of personal backyards with most of the potential value only available if the data could be intelligently collated. This contributes to the source problem, resorting to publicly broadcasted data. The problem is that we don't know where the data is coming from. The publicly available data is often the result of probabilistic matching models, misrepresentations, or generally incongruent with true condition.

The shortcomings of the current data exchange system and the necessity for a new approach to higher resolution data will only become more clear given the current technological and social trends as data production is going to dramatically increase on granular levels. This explosion of data is further contributed to the increasing adoption of Internet-of-Things (IoT) and connected weather devices such as BloomSky. The advent of blockchain technology poses a remedy to the

current dysfunctional data exchange system. It enables transparent systems that can simultaneously give data creators back control over their data while providing data-informed businesses the highest quality, ethically sourced data. This white paper specifies such a system built upon an user-controlled marketplace and a blockchain-based smart contract system to allow transparent and mutually beneficial exchange of hyperlocal data between consenting parties. We detail the requirements of such a system, its necessary structure, and the dynamic interactions of its components and stakeholders through a simple exchange of data using the WXB utility token.

WeatherBlock is adjoining the proven concept of crowdsource with the new consensus protocol of the Blockchain to build shared economy and value. The Member-based community will be self-sustaining with mathematical governance of Proof of Integrity that will create friction in shared processing and validation.

2.1 Weather Data Supply Chain

To predict the weather, we need to measure the weather. If you want to know what the weather is tomorrow, it's imperative to know what the weather was today and yesterday. Knowing the average weather on a particular day of the year is also useful. Collecting data every day can project patterns and trends, and help uncover an array of atmospheric works. Weather data includes any facts, numbers or images about the state of the atmosphere, including temperature, wind speed, precipitation, humidity, pressure and cloud coverage to name a few. These days, we have some amazing ways to collect various weather metrics. We have high-tech equipment that can measure everything with amazing accuracy ranging from industrial to personal applications. And, we can measure it from all sorts of locations: the ground, the air, and even space. It is extremely helpful to have environmental sensors deployed in different places of the atmosphere. The more data we have the better, but that is precisely the challenge on the ground. As a mission to address this scarcity, BloomSky was launched in 2014 to crowdsource weather data from individual data collectors on the ground at hyperlocal resolution. The devices are produced and sold by BloomSky, providing the advantage of sensor uniformity and credential for data quality management. It's immensely propitious for data observers, processors and consumers to profile equipment and setup. The volume and coverage of the location-based data created from undisclosed weather stations have always been a challenge for weather sensitive consumers and businesses. Platforms such as Weather Underground acts as the middle ground where weather data collectors and users can gather in one place to consume crowdsourced weather information. BloomSky is a comparable option but more filtered as its network is an unity of sensors not affected by variable margins caused by different hardware manufacturers and its configurations.

2.2 About BloomSky

In 2015, BloomSky was launched on Kickstarter as a solution to a common problem; lack of accurate local weather information. As a startup project, BloomSky raised USD $80,000 to invest in the hardware production of the first generation smart weather camera station for the IoT ecosystem. The first production device was delivered to end users in late 2015. After one year of real life use cases, testing and fine tuning, BloomSky improved the device and added a separate wireless wind and rain sensor. The new launch of the second generation on Kickstarter and Indiegogo raised over USD $750,000 combined, making it the most popular weather project in crowdfunding communities. BloomSky is now in over 100 countries and is the fastest growing weather network, projecting to have 50,000 personal units and 30,000 enterprise units (not sold to general public) distributed by 2019. BloomSky community shares its observational data in real-time to a map-based application.

2.2.1 Generation

There are over 10,000 BloomSky personal stations operating and transmitting globally any given minute. BloomSky's business model is geared to scale the community to 50,000 globally by 2019. Each complete station system generates 60 megabytes worth of daily data such as measurements of temperature, humidity, barometric pressure, rainfall, wind speed, wind direction, ultraviolet, cloud image and other derivatives from the key metrics.

2.2.2 Transmission

The BloomSky devices transmits data on average every five minutes for the main unit and thirty seconds for the wind and rain gauge. The main device uses WiFi to send the data to the BloomSky cloud. The wind and rain gauge uses radio frequency to relay the data wirelessly to an indoor dongle hardwired to the Internet router via LAN cable. Although the wind and rain gauge is physically independent to the main device, it needs to be hosted by a main device to operate. The communication technology and module market is very dynamic, and continues to improve, which means BloomSky future devices can take advantage of the advancements to innovate its products to better serve the evolution of IoT.

2.2.3 Distribution

BloomSky consumer units are sold primarily online direct to customer or through strategic partners in several international regions. Since 2015, BloomSky has shipped over 10,000 units. With United States being the most concentrated region, many microclimate territories are rapidly adopting BloomSky into their backyards not only as a weather monitor, but also home automation as an integral piece to the smart home environment. Many users have utilized the device to integrate with smart home gadgets in thermostat, lighting, irrigation and more. Currently, there is no offline or big box retailer channels selling BloomSky aside from pockets of boutique vendors in the United States. The BloomSky lineup of products are widely accessible directly available at https://shop.bloomsky.com or select international distributors listed on their website.

2.3 Industry

The most common and accessible provider of weather data is the government. In theory, government agencies with adequate funding are most capable to finance the operation of collecting and modeling weather data. This is mainly because running supercomputers and deployment of physical equipment is expensive and difficult. Because government agencies are funded with public money, for most part, the data is free. However, the free data is typically cleaned or enriched for the general public. There are several enrichment organizations using free public data to package consumer grade data for sale. The challenge with such effort is that they are limited in coverage and the derivatives they produce are less accurate because of the lack of source in many areas. Weather Underground is one of the pioneers in crowdsourcing hyperlocal weather data through personal weather stations. Station owners of all weather sensor communities gather on one platform and provide local conditions. However, hardware identification can be inaccurate as it is voluntary information and honor system integrity. This makes it difficult to measure and certify reliability. Although much of the simple weather data is free, the current acquisition cost and pricing models used by data brokers include the following basic categories:

- Free data is macro level data accessible without a fee through some publicly funded, government agencies such as NOAA in the United States.
- Freemium data is metric considered part freely accessible information and part advanced information derived from free data.
- Paid data is either data or service available for a fee, either by subscription, pay per use or a combination of models.

2.3.1 Market Potential

Weather Forecasting & Solutions Market worth **$3.80 Billion** USD by 2022*

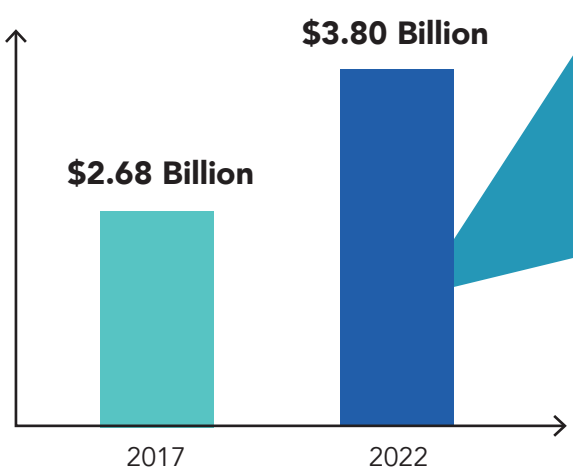


Figure 1

At a CAGR of 7.21% from 2017 to 2022. The growth of the Weather Forecasting Systems and Solutions Market can be attributed to the increasing demand for highly accurate weather forecasting systems from various end-use industries and growing investments.

* According to the new market research report "Weather Forecasting Systems & Solutions Market by Type (Solutions, Systems), End User (Commercial, Military, Meteorology, Weather Service Providers), Component (Hardware, Software), System (Satellite, Ground, Air), Range, Region - Global Forecast to 2022".

2.3.2 Key Market Segmentation

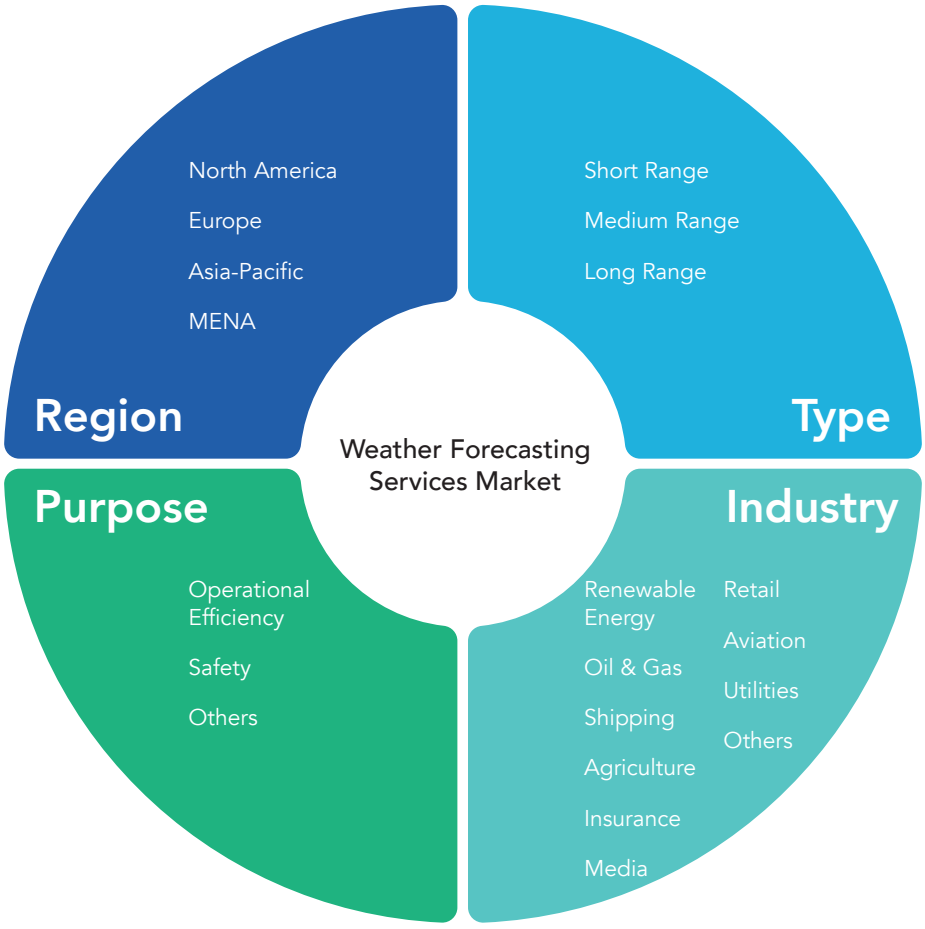


Figure 2

2.4 Industry Challenges

An incongruent and inefficient weather data industry.

The biggest challenge in today's weather data industry is the source and precision of data. Although there are platforms here and there organizing device owners, the citing quality and equipment condition is highly unknown. Even with all margin of unknown considered, there isn't a real marketplace where buyers and sellers can convene in a trustworthy environment to interact and transact based on needs from both sides.

Level of Data Accuracy:

"Macro data is not precise."

General weather indicators or incongruent granular data is the main reason why people don't trust their local weather man.

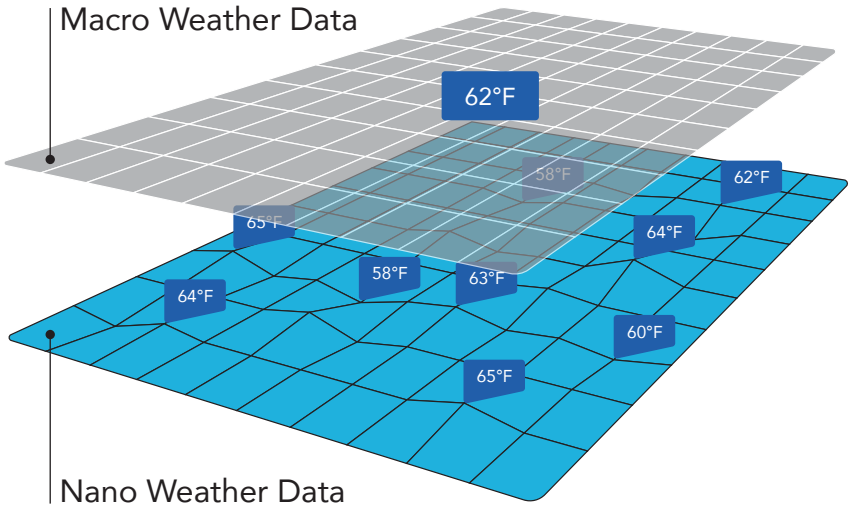
"Micro data is in infancy."

Platforms such as Weather Underground crowdsource weather data from the community but the system for integrity of data is questionable.

"Nano data is optimal."

With higher resolution, we can feed better information to alert systems and better train prediction models.

Public (Macro) Data versus Hyperlocal (Nano) Data



In addition to public data based primarily on macro atmospheric circulation, local weather conditions varies by latitude, longitude, elevation, water system, vegetation, architecture and human activities. Therefore, granular level data and location-based forecasting is extremely valuable for individuals and industries.

Figure 3*

*METREX™ model is developed by BloomSky for enterprise solutions and is a trademark of BloomSky, Inc., registered in the US and other countries.

2.5 Solution

A blockchain protocol for the weather economy.

BloomSky network is believed to become one of the largest private sector databases of high integrity weather nano data with images. BloomSky is gradually becoming a single point of contact for the provision of weather data to individuals and industries such as energy, agriculture, commodity, insurance and weather risk markets. BloomSky weather data comes from crowdsourced BloomSky stations via direct data supply to the BloomSky Cloud from device owners, rather than publicly available free data offered by middleman suppliers. In the WeatherBlock solution, we define the goals and requirements of a data exchange marketplace built upon expressive consent of direct method approach centered around three primary stakeholders, namely the device owner who is the Provider, data buyer who is the Requester but not necessarily the end user, and Facilitator such as BloomSky lookalike entities acquiring raw data to train models. In this section, we begin by describing the different

level stakeholders and its requirements for Providers, Requesters and Facilitators in the exchange process.

The stakeholders in the WeatherBlock marketplace solution have a lot to gain:

- BloomSky owners can monetize their data and turn a sunk cost into a potential money maker, or at least have the opportunity to realize return on investments in IoT sensors.

- Data buyers have unprecedented access to data and options to monetize their acquired data for, which large to small businesses can benefit from.

- Data enrichers have an ecosystem to train, market and sell optimized products and services to the right consumers.

2.5.1 Stakeholders

The principal value proposition of both primary stakeholders in the exchange is to transact in a monetized, transparent and secure commerce of weather data. Data providers need have an authenticated device using built in encryption keys to collect data, create provider profile and manage available contracts. Data requesters need to create requester profile and create offer request for data products from the provider. The exchange is secure, transparent, fair and highly encrypted.

2.5.2 Data Provider

For phase one, Providers are weather sensor owners who have purchased a BloomSky device and offer the data emitted from their sensors for sale on the WeatherBlock platform. This could be an existing community from the 10,000 devices installed prior to the WeatherBlock or a future owner of a BloomSky device. The key role of the Provider in WeatherBlock is to sell the data from their sensors on the platform. Providers are consensually open to sell their data collected from their BloomSky device on the property they own or have authorized access. They can also become Data Requesters in a scenario where they wish to purchase an available service or enhanced data offered in the marketplace such as location-based forecasting.

Traditionally, the value proposition for a personal weather station varies in levels depending on practical application versus hobby. Users typically purchase a station to setup and personalize the benefit of data, whether it's uploading to a paid membership network or kept in silo for reference. Beyond the individualized adoption, there is burden of ownership, which incurs additional after-sale cost. Associated cost such as storage, connectivity and enrollment can be expensive over time. Moreover, the cost of ownership deters motivation of owning a station by non-enthusiasts indifferent to weather data contribution. With WeatherBlock and our blockchain protocol, the shared economy system alleviates and distributes cost of ownership. Once recouped and balanced, the device and data can generate additional revenue as participation stimulus. In other words, we're shifting the benefits to real contributors of the data.

2.5.3 Data Requester

Requesters are buyers of data or services on the WeatherBlock marketplace from the Provider or Facilitator using WXB utility token. The scope of this purchase could be to use

the data in its raw form, for their own purposes, or to enrich the raw data to be resold with added value on the WeatherBlock platform. The use of the data purchased by Requester can be quite straightforward. For instance, purchasing temperature and rainfall data provisioned by a neighboring office building to get accurate local readings, to the more complex, like purchasing data to train a weather forecasting model. Buyers are not necessarily end users of the data. They can be Facilitators with capabilities of providing an enriched data service such as forecasting. The integrity of data is the most valuable to any data buyer. With consensus and proofs, the source of data is verified, encrypted and securely transported to the data requester.

2.5.4 Data Facilitator

Facilitators are data buyers who purchase data to process with commercial motivation of enriching the data to either resell or complement their existing service or product for their clients or operations. Enrichment of data varies in schemes and credibility, and Facilitators can be endorsed based on level of expertise in the enriched service offered.

1) Individual or group who organizes the packing of data inventory into packs based on platform defined conditions such as location and variable requirements. Proceeds received from the Data Requester is distributed to the participating Data Provider in the pack based on the algorithm of Data Provider Inventory Valuation. The economic incentive for Facilitator is the token bonus for successful transaction additional to any other compensation for data.

2) Data Facilitator can also purchase data sets from Data Provider to enrich or manufactured services derived from raw data purchased using the WXB. These services are predefined in the marketplace. New services can be added through a democratic voting process in the blockchain protocol to request to comment or amend based on supply and demand.

2.5.5 Why Sell?

Economic incentive is the core motivator for selling data. BloomSky users generate millions of data sets daily that are stored in cloud. Much of the data is underutilized assets for the data owner. Many owners do not know the value of their data assets. The potential to monetize backyard weather data will incentivize anyone who has the space for setup to install a device as a low maintenance revenue stream. With return based on quality of data it will be convincing for individual owners, whether existing or new, to be sensitive to online status, citing conditions and other data quality assurance elements.

2.5.6 Why Buy?

The data is not available anywhere else. Location-based ground data and information is scarce. Most of the data is unavailable because deployment is limited. Individuals or entities typically use general public data as indicators to make crucial decisions and judgments. Hyperlocal network gives anyone who's sensitive to actionable weather information an advantage. The following are some basic scenarios to motivation of buying data.

Scenario 1: Farmer buys data to understand microclimate change and trends during harvest season.

Scenario 2: Insurance underwriter buys historical data to create dynamic rates or verify liability for a specific period of time over a defined hyper-location.

Scenario 3: Logistics and supply chain management buys data for real-time decisions on route optimization.

Scenario 4: Construction site buys data for labor management and material haul.

Scenario 5: There are also many organizations or academia that buys weather data for research and model training purposes.

Scenario 6: Enthusiasts and individuals have also purchased regional data to serve their local community as the neighborhood meteorologist.

All of the mention cases have one goal in mind and that is to make better decisions to improve bottom line.

2.5.7 Current & Future Network

The current network is comprised of individual BloomSky device owners contributing millions of data set daily to the cloud. The WeatherBlock ecosystem is designed with scalability in mind. In near future iterations, the network will integrate additional communities using the proven protocol.

2.5.8 Contributor Economic Incentive

The incentive structure is based on 'first-to-market' method combined with metrics of quality and proofs. A user in defined areas who is earliest to activation with longest history will have advantage in higher returns on data sales. In other words, if you set up first and a neighbor comes along later, you will earn priority. The priority is triggered by an algorithm written with variables in consideration such as location, time and quality.

2.6 Business Model

Monetize your weather.

A decentralized marketplace for buyers and sellers of weather data offering customers a foundation platform and point of access to satisfy their data needs using WXB as the only trusted currency for commerce.

2.6.1 Platform

WeatherBlock marketplace can define meta-formats and abstractions that support BloomSky device initially, and cross-device use cases in future iterations using the nexus™ node. The node is designed and developed for the WeathBlock blockchain by BloomSky. WXB will be smart contract compliant assuring each transaction is conducted in safe and fair manner. The smart contract process acts as a secure service-level agreement that can ensure marketplace integrity in delivering data of consistently high quality. WeatherBlock data marketplace makes it possible to share and monetize different types of weather information

to create incremental value. By combining elusive hyperlocal weather data values, analytical models and structures to generate incentives for data suppliers, more participants will provide data to the WeatherBlock marketplace platform. The community will also help define standard meta-formats for data pack descriptions and integrate mathematical processes to bring historical and real-time data into standardized packs. The packages will be grouped by metrics, location, historical, real-time and forecasts. Data streams are encrypted and come directly from the nexus™, so there is no vulnerable point in the process that is open to manipulation.

In the full platform iteration, a public feedback system is implemented which allows verified data buyers to provide rating on data quality to further enhance the controls on data quality. The community will nominate and score qualified virtual inspectors based on meteorological credentials to certify ratings. Device owners delivering data to the marketplace are incentivized through direct remuneration from data buyers using WXB. Data processors on the platform can monetize through the platform to include data enrichment and dynamic options as service Facilitators. The platform will have three iteration stages for data owners.

Phase 1

BloomSky will be the hardware supplier that will produce the nexus™ blockchain node and IoT gateway. It will be the WeatherBlock blockchain hardware protocol. The compact device will act as the router, verifier and administrator of data. These devices will be available for purchase through BloomSky only. The node is an IoT compatibility converter for the WeatherBlock platform in future iterations.

Phase 2

WeatherBlock will open the platform to one other or select weather station community using nexus™. This hardware will be a secure, compact and affordable gateway to convert third party stations into compatible smart stations for the WeatherBlock blockchain protocol.

Phase 3

WeatherBlock platform will be inclusive of all weather related IoT systems, including but not limited to, irrigation, thermostat, luminance, air quality and more. Different products, services and subscriptions can be traded on an one-stop platform, making the platform highly scalable. Mainstream users outside of the weather community can participate as super nodes if capable. They act as verifiers and authenticators in the ecosystem. This does not require nodes to own a weather station or compatible data yielding device.

2.6.2 Why Use Blockchain Protocol & Cryptocurrency?

It is a perfect marriage in respect to the prospect of a decentralized network for hyper-local, crowdsourced weather data. With multitude of participants and data sets, a consensus environment can entrust peer-to-peer (P2P) transactions. Blockchain is the optimal application for a marketplace, decentralized repository and ecosystem perspective.

From a weather data exchange and marketplace viewpoint, using the public chain protocol delivers commerce integrity. Our first iteration will be built

on an existing chain which enables the use of a seasoned financial ecosystem, with minimum fees.

Utility token ties them all together in an efficient and secure manner. Using an utility token over fiat currency also render the advantage of smaller fractions which will vest the possibility of micro-transactions, if necessary. Our technical roadmap will outline our plan to develop and build our native chain to accommodate growth and security. It is WeatherBlock's core intention to be fully independent chain when milestones are achieved.

2.6.3 Inventory, Services and Subscription

There are several categories and metrics from different aspects of data sets.

- **Sample of Inventory**

Standard Historical Weather Data Sets (Raw): All sets are available individually or packs. Pack of Standard Historical Weather Data Sets is a group of sets coordinated by an organizer that includes packed by region, by citing quality, by weather variable etc.

Nowcast Interval Feeds (Real-time): Provides data feeds of sub hourly, hourly and daily data for weather variables on the BloomSky station.

- **Sample of Services**

Hindcast Data Sets (Cleaned): Weather data is often incomplete and may contain erroneous values. The marketplace Hindcast Data Sets correct erroneous values. Facilitators such as BloomSky offers cleaned historical data sets of temperature and rainfall, amongst other variables as well as cleaned hourly data sets and feeds.

Location-based Short Term Forecast & Short Term Temperature Average Data Sets (Climate): Hourly data which used to calculate an average value for each hour for each day of the year, benefiting Requester the cost of buying and processing large volume hourly data sets. This can be provided for any variable for any online BloomSky device. Currently, historic hourly data is available from over 100+ countries and growing.

- **Sample of Subscriptions**

Real-time Monitor Subscription (API): Calling and receiving observational data periodically for different or all variables available from a specific data provider.

Data Provider Inventory Valuation and its order of priority to Data Valuation:

1) Location is calculated by region, its area saturation and climate trend.

2) Maturity is calculated by device activation date.

3) Data Quality is calculated by available sensor variables & citing condition.

4) Frequency is calculated by consistency of device transmission.

2.6.4 Transaction

Ultimately, the process of trading data through the marketplace will require payment in the protocol token. The network relies on the token to provide secure trading of data while respecting the terms set out by the marketplace.

2.7 Hardware Components

BloomSky Smart Weather Stations:

In the first iteration, we will use existing BloomSky weather sensors which is blockchain-ready. In mid-2018, BloomSky will launch their third generation weather stations with the main updates and additions being the following:

- Built-in security zone to store private key, encryption & digital signature functions.
- Built-in GPS module to send geo-location and time data for device integrity.
- Updated blockchain-ready firmware.

nexus™

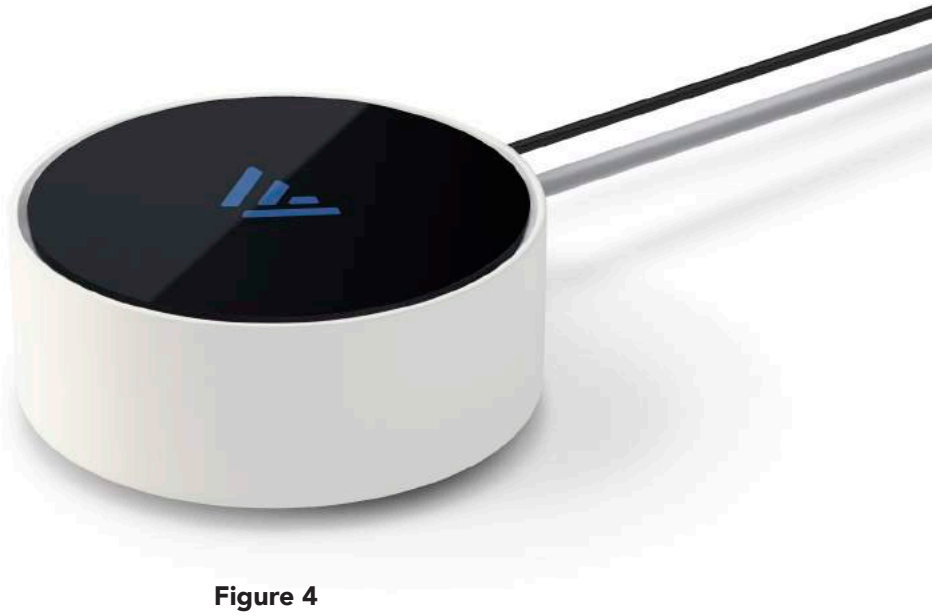


Figure 4

The nexus™ device is a blockchain node as well as a weather station gateway. It connects to weather sensors to receive weather data and connect various nodes together to become a peer-to-peer network as the underlayer of WeatherBlock blockchain. The top down technical stack of nexus™ is as follow:

- Web services
- Blockchain node
- IPFS
- Firmware
- Network & Storage

The nexus™ node is a Linux mini computer using ARM 4 core CPU. Since we are not using PoW to mine the block, it would be wasteful to equip it with more powerful CPU. The revolutionary consensus model permits us to run the node on low energy and low cost ARM CPU. Additionally, the node will off load the encryption and decryption work to dedicated AES RSA chip sets. Therefore, the ARM CPU will handle the general node calculation and smart contract, leaving heavy lifting work to specifically designed processors.

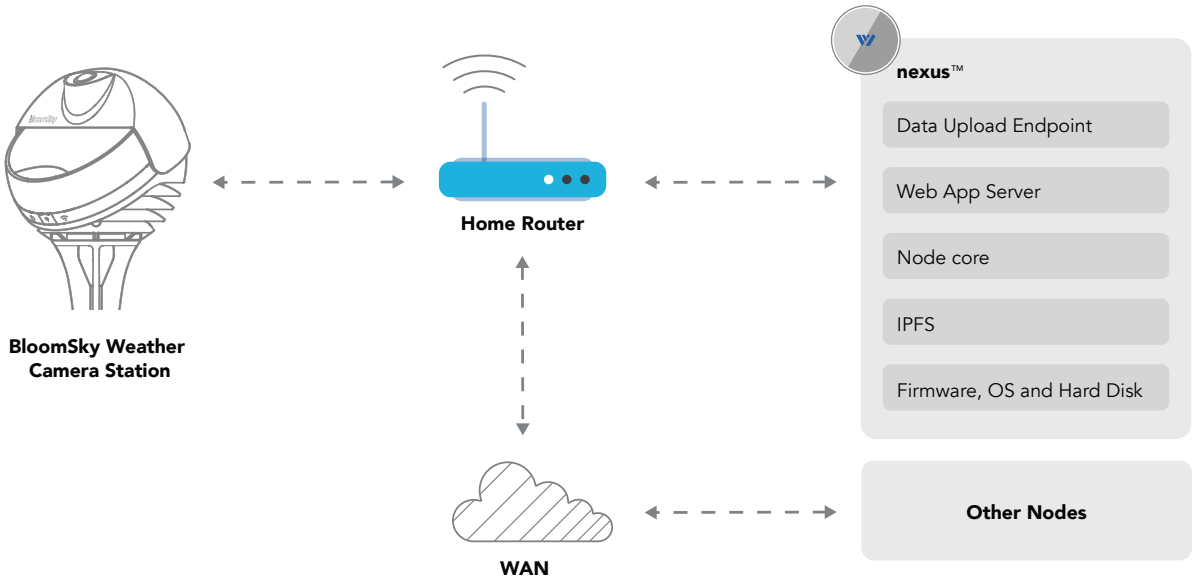


Figure 5

Super Nodes

Although our consensus model does not require nexus™ to do intensive computing for mining, however, there are some needs for decrypt and encrypt functions in large amount of data such as the transaction of historical data. In order to handle those large data processing, we introduce super nodes. Super nodes are not connected to weather station, rather they are just powerful computer nodes on our WeatherBlock blockchain. They are equipped with large storage (disk array etc.) to redundantly store the weather data for other users. Super node would be a physical machine or virtual machine on the cloud governed and managed by the community.

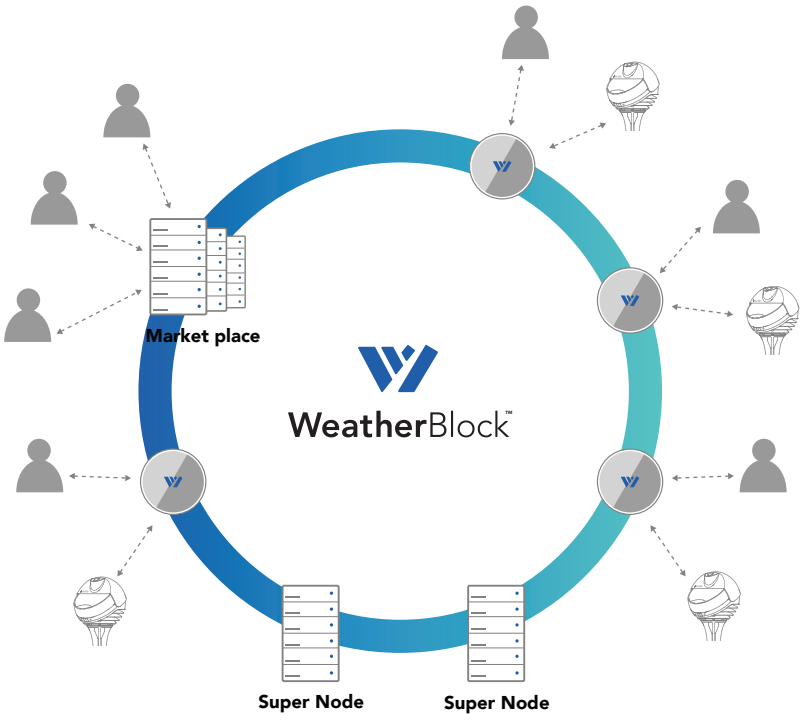


Figure 6

2.8 Protocol Overview

2.8.1 Storage

Traditional blockchain was not designed to handle big data. However, weather data as well as any kind of IoT data are far larger than what a traditional blockchain can handle. IPFS can turn large amount of data into tiny hash key by storing data to the decentralized P2P network. We use IPFS as our storage layer so that we only process the hash key instead of the original data.

Every nexus™ node and super node will run an IPFS node. The nexus™ node has a smaller internal SD card and an external USB port for external HD/SSD extension. Super nodes are equipped with larger storage units. All data are stored in a special designed format, so that key information are encrypted for security function.

2.8.2 Consensus & Smart Contract

Traditional blockchain's consensus model (such as PoW or PoS) either require high energy consumption hardware or big data level processing capabilities. We designed a new generation consensus model to handle IoT related data on a blockchain. The new consensus model will be based on DAG and Pure Functional smart contract. The core feature includes;

- Low requirement on CPU power and low energy consumption.
- High scalability by converting a single chain to a parallel processing DAG.
- Smart contract is written in pure functional programming language so the logic could be more reliable and predictable.
- No free transaction, but each node can do Proof-of-Verification to deduct the transaction cost, or even make a profit.

3 Proofs

The value of blockchain technology on data-centric commerce is that the integrity of data is decentralized, governed and managed through proofs. The proof of data includes the following respects:

3.1 Proof of Existence

Each weather station and nexus™ has its own unique embedded public-private key-pair at time of hardware production. The private key are stored in a designated security zone within the device which cannot be accessible externally. Public key will be stored into a public blockchain so that it can be easily verified by any third party on the chain. All data sent from the hardware are signed by the private key. Other nodes can verify using the public key provided. As long as the device is connected to the chain, it will send data from the sensor on a time basis similar to a heartbeat. In this case, we can proof a specific device is the original device without alter, and is in working status.

3.2 Proof of Location & Time

Weather data is practically useless without the accurate location and time. For sensors with built-in GPS module, location data will be sent to the nexus™ and the chain as Proof of Location & Time. For older generation devices without GPS module built-in, the device owner will be required to proceed with a verification process. The verification process will utilize the mobile application to capture an image while the device is in operation. The image and the GPS reading from the mobile phone will be sent to the chain. The image can and will be verified by certified community members. As long as the device continue to signal a heartbeat to the chain and WiFi transfer time vary within a range, we can consider the location as the same. If the algorithm notified any WiFi transfer time change or heartbeat discrepancy, the community will request the owner to redo the verification. Failure to do so will result in devalued data in the marketplace. The image captured will also be used as part of Proof of Location when applicable.

3.3 Proof of Integrity

If the weather station is not installed correctly, it can largely impact the integrity of data and quality. Device install image mentioned in Proof of Location & Time section can also be used as the Proof of Integrity. The certified community member can verify the installation and sign the endorsement in the blockchain. Unverified devices will operate under devalued conditions until otherwise verified.

3.4 Proof of Ownership

Device owner, data owner and land owner may or may not be the same entity. In some cases, the owner of device can lease his device to other land owner, or rent the land from land owner to install device and own the data. The device can also be sold to other owners. To keep tracking the beneficial ownership, we will have a mapping in the chain. All related transaction will be signed by the corresponding person.

4 Token Usage

WXB is a traceable cryptocurrency for the decentralized peer-to-peer weather market ecosystem to exchange, verify and store location based weather data, information and services. The token can be used for secure transactions utilizing consensus protocol and smart contracts on the WeatherBlock blockchain. Participants, members and stakeholders can trade the token for multitude of functions of the weather industry, as well as other digital assets. The WXB will be initially exchangeable to/from select major crytocurrencies on public exchanges.

4.1 Marketplace

The members of the WeatherBlock ecosystem can spend, buy or mine tokens. The first iteration of the WXB is not minable but can be openly exchanged to future mineable protocol token or other digital assets. However, WXB is accepted as a standard utility token for the settlement of data sales between Provider and Requester.

4.2 Spending Token

- Data Requesters will use the WXB or future protocol token to settle transactions of weather data.

4.3 Earning Token

- Data Providers can earn tokens, or 'bonus', as revenue generated from their weather station for the work of providing, verifying and shared-economy storage of data through the nexus™ node powered by BloomSky.
- Data providers or participants in the comPoS consensus earn token bonuses for block production. Block production will be done by every device within the WeatherBlock ecosystem unless barred from consensus. Owner can stratify to

pay out both owner and lessor. This can be understood as the mining concept.

• A stable and consistent operator of the nexus™ node can expect a full return on the value of the hardware investment, including complete set of weather station cost, in less than two months taking in account of device location, contribution output and residual data sale.

4.4 Use of Funds

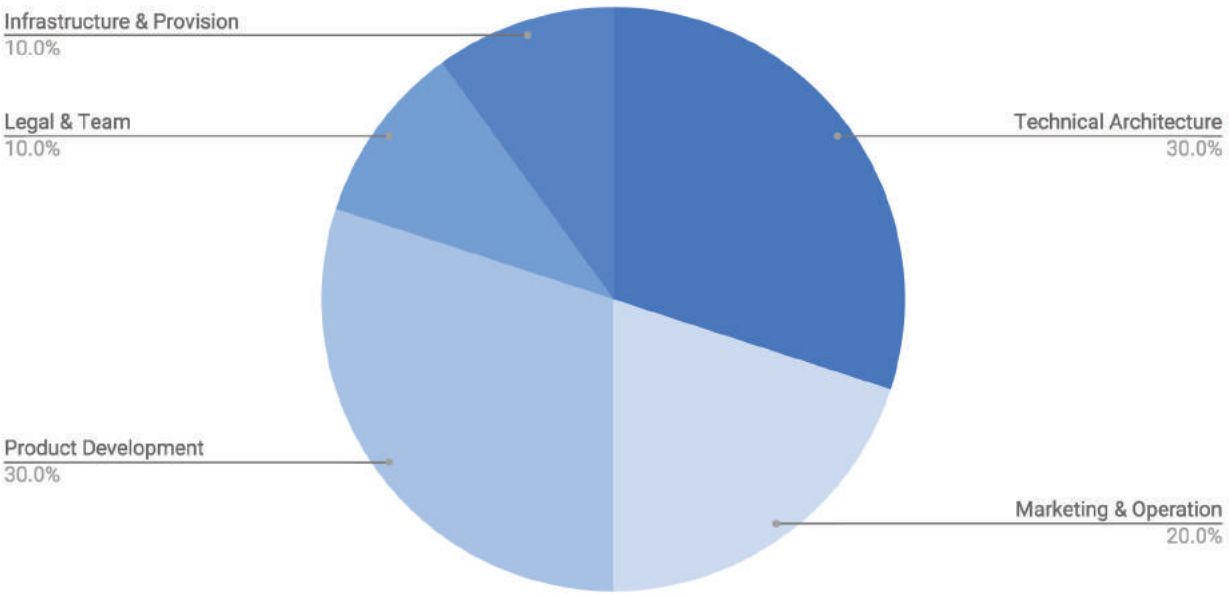


Figure 7

5 Token Sales

NAME
WeatherBlock

SYMBOL
WXB

TOTAL SUPPLY
1,000,000,000

Early Token Sale

Initial token offering will be through a preferred access sale. Available tokens for the preferred access round will be less than 25% of total supply. The public will have access to the early token sale.

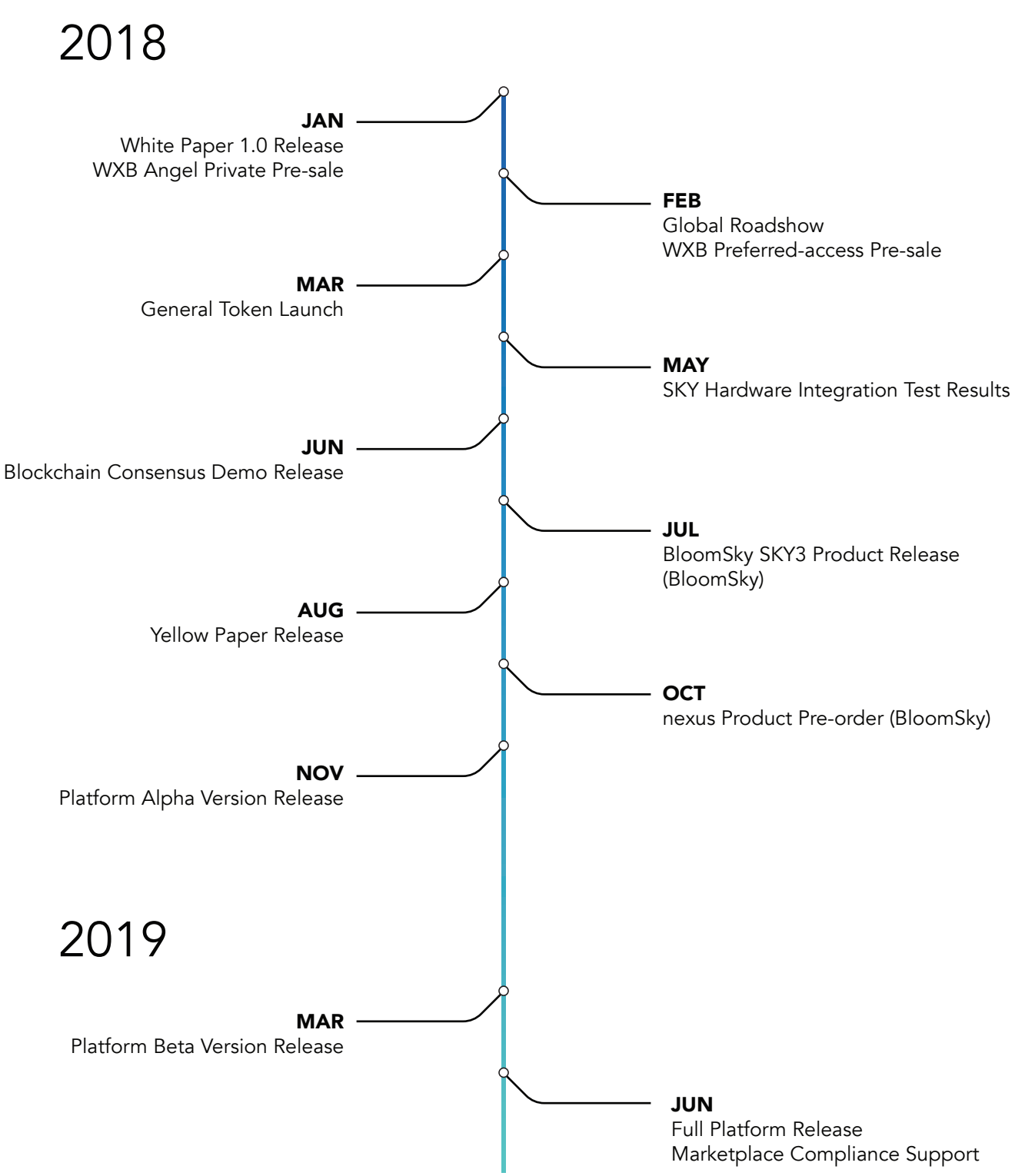
Main Token Sale

Main token sale will be in two stages, public pre-sale and public sale. Available tokens for public pre-sale round and for public sale round will be determined at time of offering for each stage.

Reserved Token

The total reserved supply will be 25%.

6 Timeline


2018
JAN
White Paper 1.0 Release
WXB Angel Private Pre-sale
FEB
Global Roadshow
WXB Preferred-access Pre-sale
MAR
General Token Launch
MAY
SKY Hardware Integration Test Results
JUN
Blockchain Consensus Demo Release
JUL
BloomSky SKY3 Product Release
(BloomSky)
AUG
Yellow Paper Release
OCT
nexus Product Pre-order (BloomSky)
NOV
Platform Alpha Version Release
2019
MAR
Platform Beta Version Release
JUN
Full Platform Release
Marketplace Compliance Support

7 Founding Team

Daniel Han
Co-founder
& Managing Director

Kevin Zhang
Co-founder
& Chief Technologist

JT Xiao
Principal Advisor

Strategic Advisors

Maria Zhang
CTO, Tinder
VP of Engineering, Yahoo
(Yahoo Weather, Yahoo Fantasy Sports)

Daniel Swain Phd
Atmospheric Scientist
& Researcher,
Stanford University

Charles Xue
Entrepreneur & Investor
Cryptocurrency Thought Leader

Evon Onusic
Co-founder, Algo
Co-founder, DeltaSift
Principal, GothamAlpha

Angelia Müller
Program Director, IBM
IoT Director, Techstars

Hanh Cho
Disruptive Technologist,
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Stanley He
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