



## A DECENTRALIZED DATABASE SERVICE FOR DAPPS

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Bluzelle fills a void in the decentralized  
internet ecosystem

## WHITEPAPER V 1.2

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# 1. INTRODUCTION

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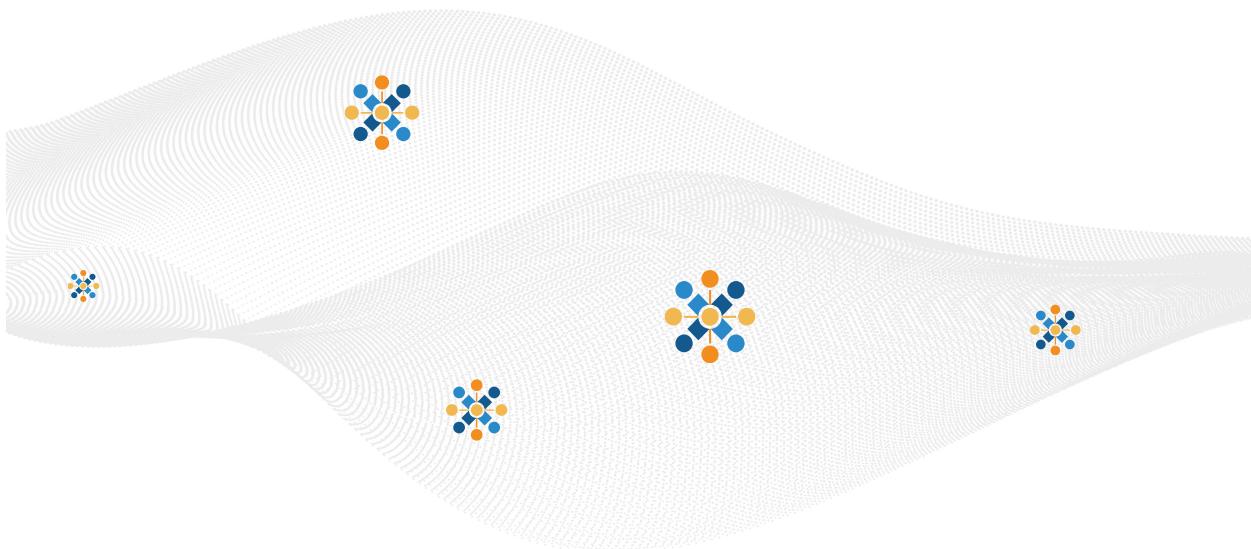
Our vision is to make the internet a safer and more secure place for the data of people and businesses.

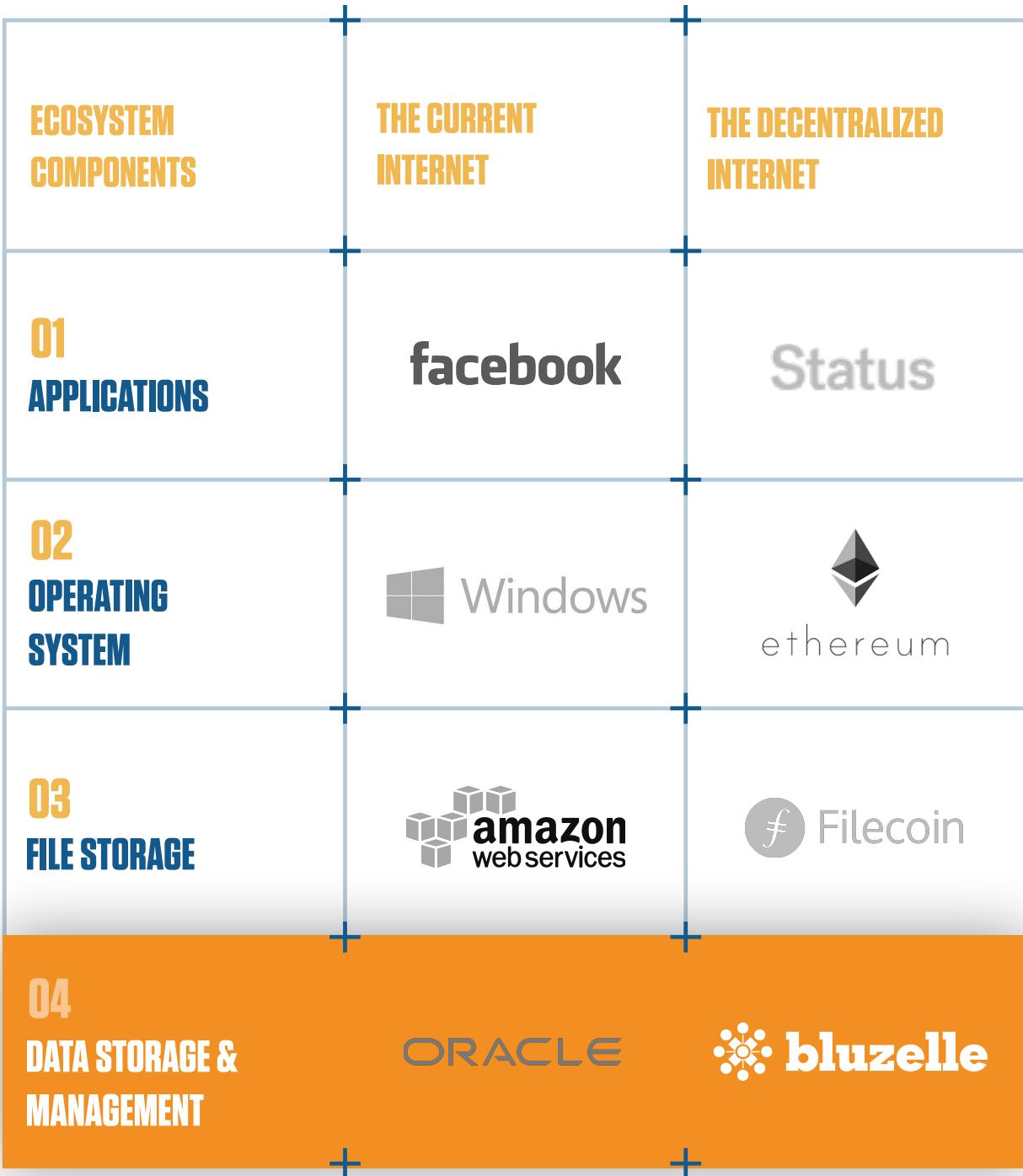
## 1.1. The Problem

Blockchain technologies are propelling the next generation of the Internet. Protocols like Ethereum are a platform for launching decentralized applications (dApps) that will change the way products and services are consumed. These dApps will exchange massive amounts of data that need to be stored and managed. **The problem is blockchains like Ethereum are not designed for data storage and management;** doing so would take up too much space and take too much time.

## 1.2. The Solution – Bluzelle

Just like decentralized services like Filecoin and Storj are needed for file storage & management; there is a need for data storage & management. **Bluzelle is a decentralized, on-demand, scalable database service for dApps.** Bluzelle fills a need and is complementary to the other components to make the decentralized Internet complete. Without these decentralized components, the decentralized Internet would not be able to run efficiently and scale to massive use.

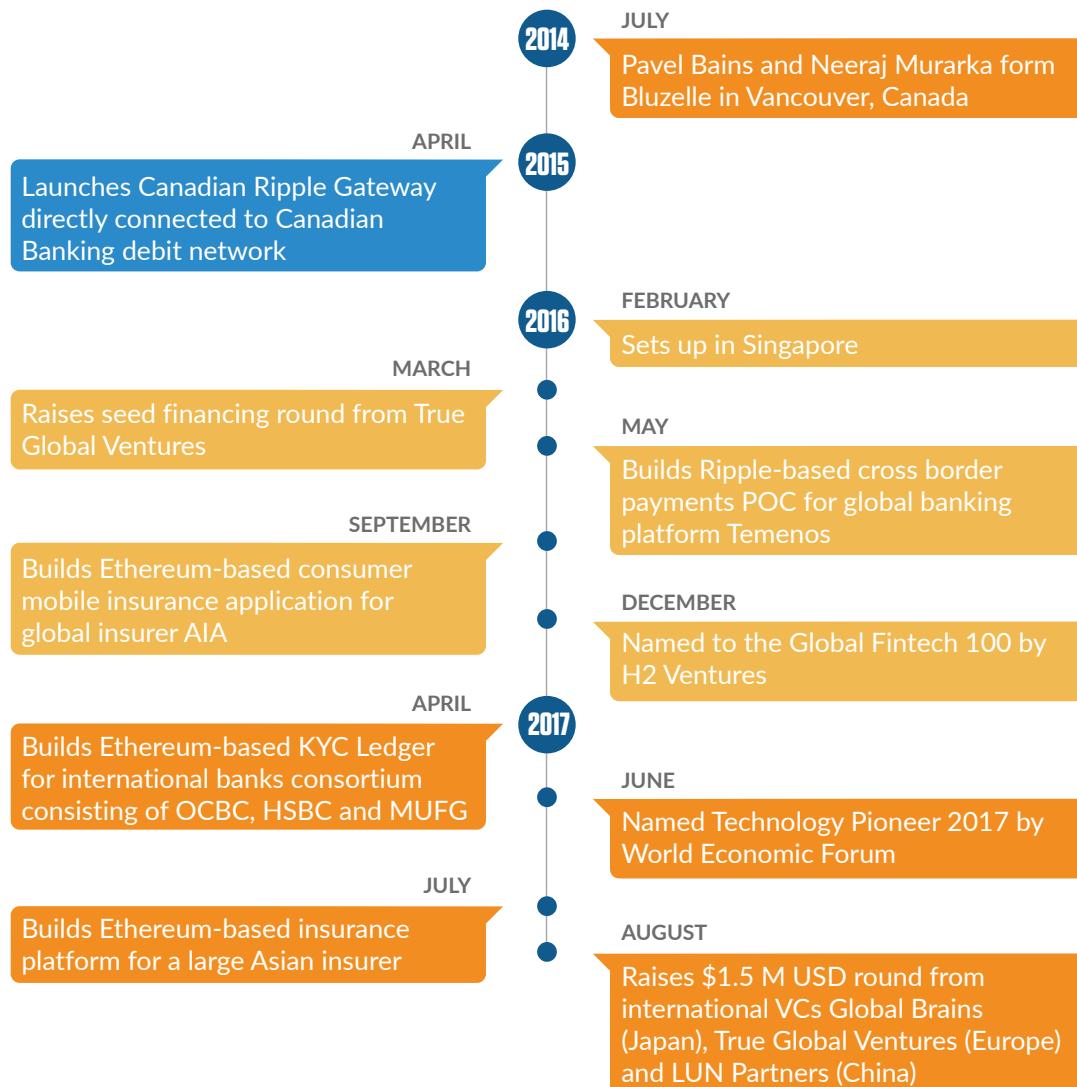




Bluzelle is the right fit because it provides enterprise-grade database services at a price for all Decentralized Application (dApps) developers.

## 2. HISTORY OF BLUZELLE

Seeing that blockchain can provide numerous benefits to the finance industry, Bluzelle was formed in July 2014. We created a technology stack that abstracts the complexities of managing blockchain applications.



Working with enterprise customers revealed one critical challenge for widespread adoption of blockchain applications: the management of large amounts of data. **This discovery led to the formation of the Bluzelle decentralized database service.**



### 3. THE CURRENT STATE OF DATABASE SERVICES

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It's estimated that in 5 years there will be over 20 Billion connected devices that require the generation, management, storage, and retrieval of enormous amounts of data.

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"Business leaders demand next-generation applications and new insights to drive more intelligent engagement and better decisions. To get there, enterprise architects need to design an agile technical architecture that can scale automatically with capabilities, such as databases, that are always available to support new initiatives. It takes enormous time, effort, and coordination to provision new databases today because of a lack of resources to meet the administration challenges of rolling out complex clustered systems." **Forrester Research, 2017**

#### Market Overview Database As A Service

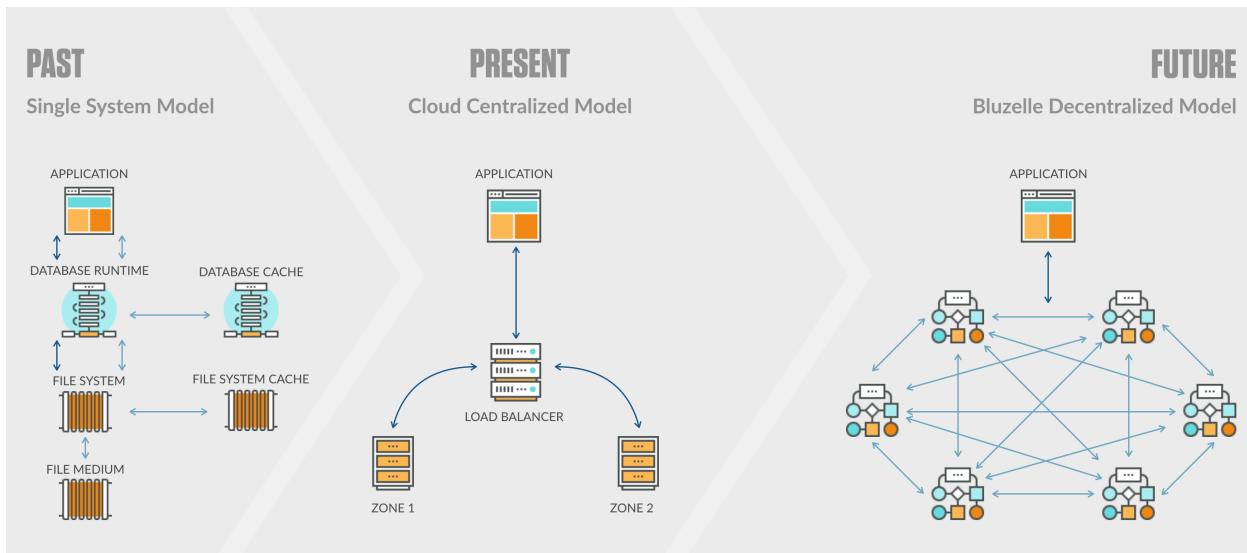
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To address this problem, emerged the Cloud Database and Database-as-a-Service (DBaaS) market. According to *Markets and Markets*, this industry is expected to grow at a CAGR of 67.30% to \$14.05 billion by 2019. There are four primary drivers of demand for DBaaS:

- **Consumer personalization apps** - financial, dating, social media products
- **Internet-of-things (IoT) applications** - everything is being connected
- **Mobile apps** - amount of data consumed is growing exponentially
- **Line-of-business (LoB) collaboration** - business units share more info

With all these applications producing more and more data, past and present database management services are under-equipped to meet the needs of businesses. There are problems centered around performance, reliability and scalability. These can lead to problems of data breaches resulting in massive amounts of data theft.

*The systems of the past and present will now evolve to the future: The Bluzelle decentralized, on-demand, database service.*



PAST: SINGLE SYSTEM DB	PRESENT: CLOUD DB	FUTURE: DECENTRALIZED DB
Multiple sources of failure	Single source of failure	No points of failure
Expensive to scale	Expensive to scale	Scales efficiently
No privacy	No Privacy	Highest privacy
No immutability	No immutability	Immutable
Performance limitations	Some performance limitations	No performance limitations

## **4. BLUZELLE FEATURES**

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Bluzelle is a decentralized database service for dApp developers. To ensure developers get the highest throughout in performance, reliability and scalability, Bluzelle implements swarming technologies. A swarm is a large group of nodes (computers) that work together to store and manage data. Nodes in these swarms can go down and new nodes can come up with minimal impact on the network. Overall Bluzelle is a meta-swarm comprised of multiple swarms.

### **4.1. Performance**

Bluzelle's unique and proprietary swarming techniques were designed for the highest performance. Bluzelle can reduce latency by retrieving data from the nearest nodes on the leaf swarm, and/or increase speed manyfold by retrieving data in parallel from the fastest nodes on the leaf swarm. This is like torrents and seeds. When data is requested, it is done in parallel where chunks (shards) are requested from all the different swarms that contain those shards, and these are all retrieved in parallel, resulting in desirable performance metrics.

### **4.2. Reliability**

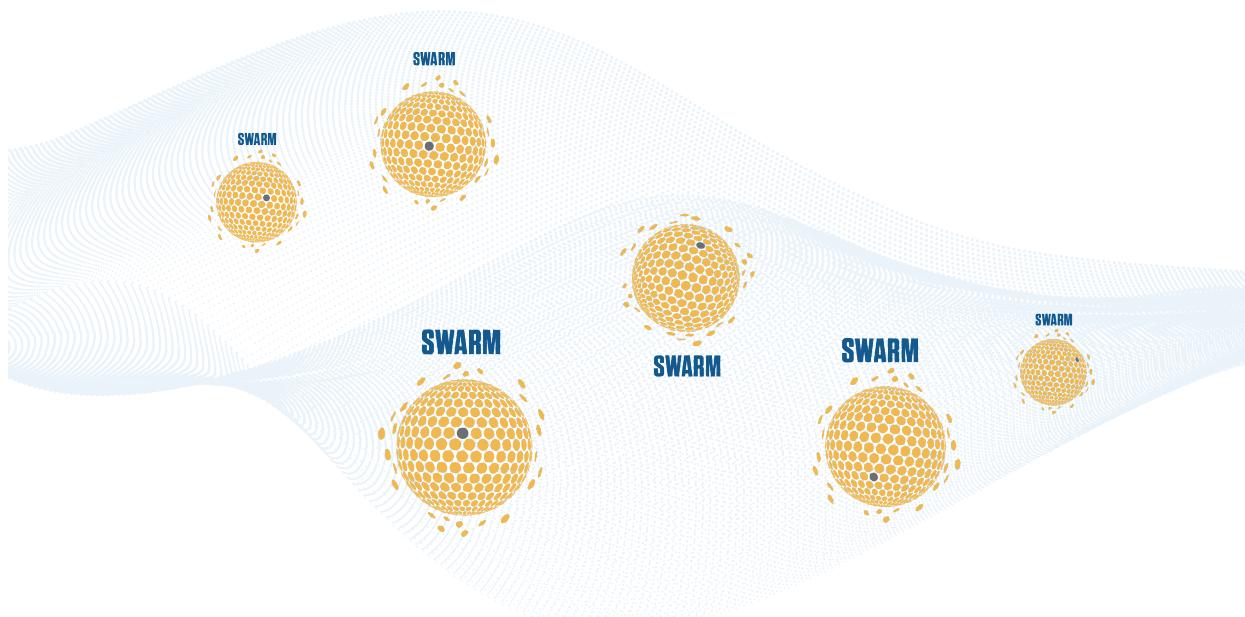
Using the concept of fog or swarm computing, Bluzelle follows a model where every unit of data is 100% replicated in a single leaf swarm amongst a swarm of swarms. So while the data is only in one swarm, that swarm's nodes are aplenty and are geographically dispersed, immune to localized outages caused by either natural or human-related events.

### **4.3. Scalability**

Scalability is possible both horizontally or vertically. Bluzelle manages the various strategies and considerations around the use case of having to increase scale. Horizontal scaling is a cornerstone of the Bluzelle architecture, where every swarm is another "unit" of horizontal scaling at the metaswarm level. Within every leaf swarm, every node acts as yet another agent of horizontal scaling, at the leaf swarm level.

The following table outlines additional features of Bluzelle.

FEATURE	DESCRIPTION
<b>Highest privacy</b>	Bluzelle employs cryptography and sharding techniques to provide a privacy guarantee.
<b>High reliability</b>	Bluzelle redundantly stores tiny pieces of data on nodes across the globe, eliminating any single point of failure.
<b>Enterprise scalability</b>	Bluzelle algorithms store data in a unique, distributed and intelligent manner that will provide enterprise-level scalability.
<b>Data immutability</b>	Bluzelle leverages blockchain technology so that once data is stored to such a network, it is impossible to change that data.
<b>High performance speeds</b>	Bluzelle dynamically adjusts the number and location of nodes sharding the consumer's data to meet performance metrics.
<b>No intruders</b>	Bluzelle's use of consensus is the only method by which updates to the network can be accepted as the "truth".
<b>Low cost</b>	Bluzelle operates few data centers and has little capital costs. Vast majority of computer resources are provided by participant producers.



## 5. HOW DOES BLUZELLE WORK?

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Bluzelle takes blockchain principles and sharding & partitioning concepts to create an AirBnB like marketplace for data storage and management. This is a crypto-economic network of powerful producers and consumers.

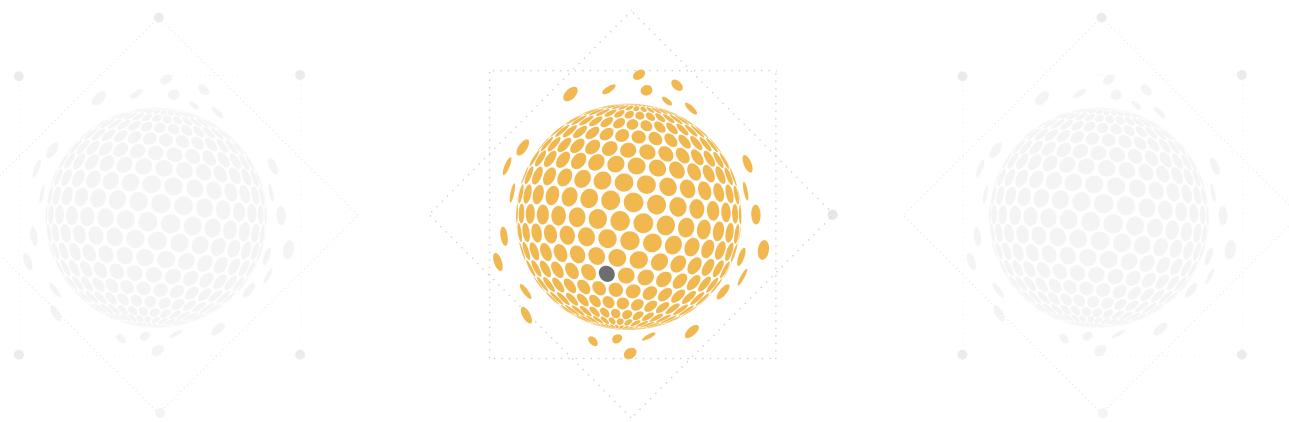
### 5.1. Consumer

The consumer is the one who “consumes” the Bluzelle database services. These are the developers we target. Consumers are spending Bluzelle tokens so they can store and retrieve data. Additionally a user could get a credit of tokens if a producer failed to meet certain service levels.

### 5.2. Producer

The producer is the one who provides resources to the network in return for earning Bluzelle tokens (BLZ). Bluzelle producers will be required to put up a proportional stake of Bluzelle tokens, in order to provide a guarantee on the service levels Bluzelle will provide. Bluzelle will encourage competition by producers to provide higher quality services, where those with higher service levels can charge more but also have to put up a higher stake.

Every participating consumer and producer of Bluzelle are initially required to independently create their own Ethereum account and take responsibility for securing and protecting their private key. The private key is used to secure access to their ETH and Bluzelle tokens and encrypt their data before it gets sent out over the Bluzelle network.



## 6. DAPP USES CASES FOR BLUZELLE

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### 6.1. Predictions Markets

Decentralized predictions markets on Ethereum require the management and storage of massive amounts of data to work. These include: (1) the questions being asked, (2) the different possible outcomes, (3) the predictions being made, and (4) the sourced information for the actual events. A decentralized database can grow and scale as per the products needs. **Having fast and reliable access to data is important for the success of the predictions market to garner new customers and participation.** Historical data stored on Bluzelle will add a new category of predictions that can reduce human speculation by using past events to make better predictions.

### 6.2. Currency Exchange Protocols

A key part of a currency exchange protocol is the presence of relayers, who enable makers and takers to connect via off-chain order books. The underlying order-books must be fast, efficient, reliable, and easy to supply, by the relayers. A pain point is relayers are responsible to store these order-books each in their own way. **By using a decentralized database like Bluzelle, currency exchange protocols can provide relayers with a standard, consistent, ubiquitous, database that would be available with no effort.** This reduction in friction maximizes the service level and quality as the network would now still be powered by relayers.

### 6.3. Data Streaming Networks

Data streaming networks match up consumers of data points with producers of data points. For example a car uses real-time traffic data from the data streaming network. The car collects real-time data while it moves. It is both paying for data it "buys" and "earning" from data it "sells" to the network. The data points need to be both readable and writable with high performance, availability, scalability, and reliability. Bluzelle is ideal to provide the precise infrastructure needed so that a data streaming network can store its data to meet these requirements.

## 7. MARKETING STRATEGY

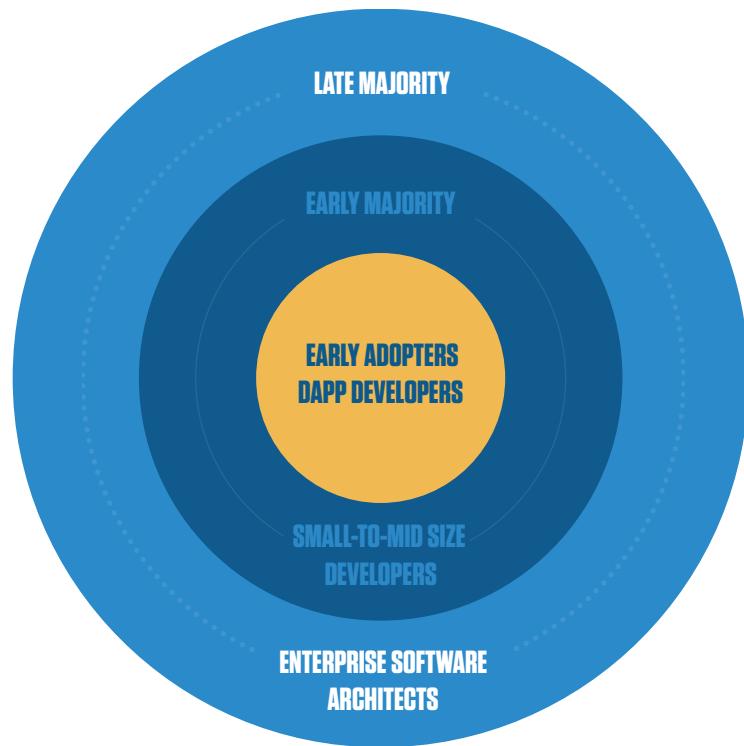
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### 7.1. Target Market

Bluzelle has three groups that it targets to become a mainstream product like Oracle Systems. Bluzelle will start the first with the first group and then expand outwards.

- **Early Adopters - dApp developers.**

One of the fastest growing segments in the software industry. It involves software developers writing blockchain based applications that take advantage of other decentralized technologies that are complementary to Bluzelle.



- **Early Majority - small-to-mid size developers.** Refers to developers that are not in dApps but building common web, mobile, hardware applications. These developers are writing games, productivity software, mobile applications, utility software, and many other software products.

- **Late Majority - enterprise software architects.** The large enterprises who see how dApps and other developers use Bluzelle and then have the validation to also move their data storage needs to us.

## 7.2. Regional Focus

With it's offices in both Singapore and Vancouver, Bluzelle is in a unique position to grow in two of the biggest regions for dApps and the blockchain: US/Canada and Asia Pacific.

From China to Korea to Japan to Southeast Asia, this region is home to a fast growing startup blockchain community. These startups require efficient and low-cost services. Many parts of Southeast Asia are rapidly developing as major cities and high-growth economies. They are leapfrogging legacy client-server architecture systems to innovative adaptive and scalable solutions built for the future.

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*"Asia Pacific is anticipated to aggressively adopt cloud database and DBaaS solutions in the near future. This is basically due to the increasing focus by small, medium, and large scale enterprises for the purpose of improving efficiency and productivity via investment in technology." - TMR Research Cloud Database and Database as a Service (DBaaS) Market, 2017-2025*

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Bluzelle has an R&D center in Vancouver, Canada. Being in Western Canada/US gives Bluzelle a strategic position to offer it's product to the growing blockchain and overall developer businesses in Seattle, Portland, San Francisco and Silicon Valley. Bluzelle's founders, advisors, investors have a history of working in Silicon Valley and have strong connections to build support in the worlds biggest technology center.

These regions are just to start. Bluzelle is a global product that meets the needs of developers everywhere.

## 7.3. The Bluzelle Developer Community

The first release of Bluzelle is planned for April 2018 and we have started building our developer community. Servicing software developers has less friction as they can be engaged online and are passionate about technologies that help them make better products quickly and easily. Early on, we will get feedback on the product and build the ecosystem enabling both the producers and consumers of Bluzelle.

We will have an online community site, go to hackathons, host meetup events, and much more. As a tech company, Bluzelle's employees have an organic network of peers, friends and acquaintances who are the target market. As mentioned in the prior section, Bluzelle will be doing various developer reach outs to many of the biggest cities in Asia and US/Canada.

## THE BLUZELLE



## DEVELOPER COMMUNITY

## **8. BLUZELLE'S ECOSYSTEM**

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The opportunity to get Bluzelle into the hands of consumers is tremendous. A key is to build a healthy ecosystem where Bluzelle is integrated to many technologies; making it easy for customers to find Bluzelle.

### **8.1. Developer Marketplaces**

Bluzelle aims to partner with leading software development ecosystems and establishing channel partnerships that share revenue. Notable examples would include Heroku, AWS Elastic Beanstalk, Redhat OpenShift, Google App Engine, and Microsoft Azure. With such integrations, developers can quickly use Bluzelle's decentralized database, just as effortlessly as they can use traditional cloud database offerings - simply point and click.

### **8.2. Developer Environments**

Development environments such as Android Studio, Apple XCode, Microsoft Xamarin and Visual Studio, Eclipse, IntelliJ, Unity3D, PhoneGap, and Ionic are targeted for plugins and integrations so that dApp developers of both desktop and mobile apps can easily integrate Bluzelle whenever they have database needs for their games, enterprise applications, etc.

### **8.3. Blockchains**

Blockchains play a large role in the Bluzelle ecosystem. Smart contract classes and instances are planned to be deployed directly not just to Ethereum but other open blockchain protocols like Hyperledger to enable dApp smart contracts to use Bluzelle for storage needs.

### **8.4. Operating Systems and Browser Tools**

Operating-system and browser tools further enhance the developer's ability to access data, whether it is from a GUI application running on their desktop or a browser plugin that enables them to quickly store and retrieve table data.

## 9. THE BLUZELLE TOKEN

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Bluzelle is powered by two tokens:

- **Ethereum ERC-20 external token: BLZ**

This externally-tradable token bridges the Bluzelle native token (BNT) with Ethereum's own native ETH token.

- **Bluzelle Network Token: BNT**

An internal token to Bluzelle alone that enables the Bluzelle crypto-economy, where consumers pay and producers earn.

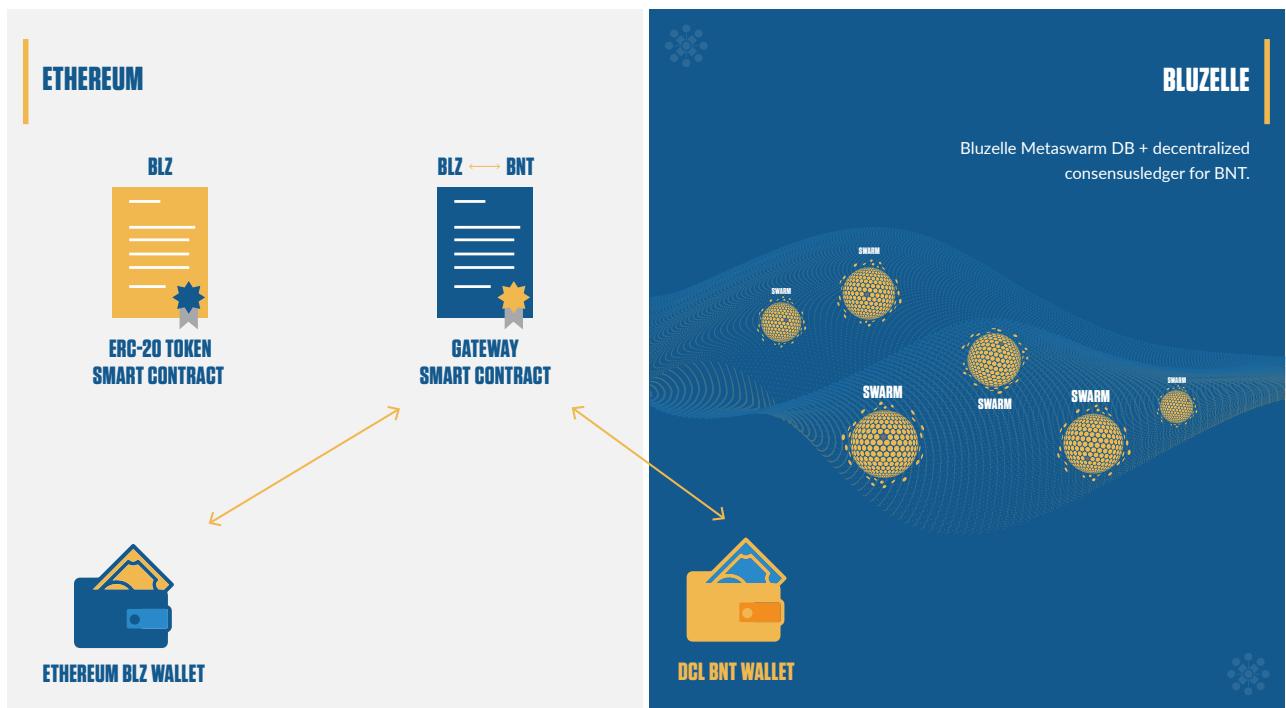
The need for an internal token is because ERC-20 tokens are too slow and expensive for real-time database accounting. The BLZ ERC-20 external token exists to represent on exchanges for customers to easily obtain to use the Bluzelle service. The BNT internal native token exists to enable high-speed, zero-cost, and real-time database accounting. The BLZ and BNT tokens can be interchanged via the Bluzelle token gateway. **For the public sale, people will be purchasing BLZ tokens.**

When a new participant to the network wishes to use its services as a consumer, they will need to acquire BNT tokens. The standard method of doing so is as follows:

1. Buy BLZ tokens on a crypto-exchange using ETH, BTC or other forms the exchange allows.
2. Send BLZ tokens to the Bluzelle Token Gateway's smart contract via Ethereum. The gateway will issue new BNT tokens to the user's Bluzelle network wallet.
3. The user now has BNT tokens, and is free to participate in the network as a consumer.

When a producer wishes to “withdraw” their BNT tokens, they use the following steps:

1. Send the BNT tokens to the special Bluzelle gateway.
2. The gateway converts the BNT tokens at a 1:1 ratio to BLZ tokens, and sends these BLZ tokens to the producer’s registered Ethereum wallet.
3. The producer now has the BLZ tokens, and is free to transact with them on the Ethereum network.



## 10. REVENUE MODEL

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The BLZ <=> BNT gateway proposes a micro-transaction fee for every conversion going through the gateway in either direction. The fee is charged in BLZ tokens and is sent to a special Ethereum wallet owned by Bluzelle. The model is setup so the entire ecosystem remains completely decentralized while still providing a revenue for Bluzelle to improve and innovate the network and its associated services.

Following are two typical scenarios:

- A user needs BNT tokens to use the service.
  1. The user sends 100 BLZ to the BLZ smart contract.
  2. 0.1 BLZ is subtracted from the total of 100 BLZ and is sent to the Bluzelle Ethereum wallet as a non-refundable fee.
  3. The remaining 99.9 BLZ is converted to BNT and credited to the user's BNT Bluzelle native wallet.
- A user wishes to convert BNT to BLZ.
  1. The user sends BNT tokens to the BNT gateway.
  2. The BNT tokens are converted at a BLZ 1:1 rate, resulting in a conversion amount of 100 BLZ. 0.1 BLZ are subtracted from the total of 100 BLZ and is sent to the Bluzelle Ethereum wallet as a non-refundable fee.
  3. The remaining 99.9 BLZ is released out of custody by the Ethereum smart contract and sent to the correct participant's Ethereum wallet.

Absolute prices are calculated dynamically and are not 100% deterministic. Maximums are baked into Bluzelle, where the network adjusts the number of swarms and distribution of nodes as prices start to approach the maximums, getting increasingly aggressive with network adjustments as the maximums draw nearer, until expected average prices start to trend again.

# 11. TECHNOLOGY OVERVIEW

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This section provides an overview of Bluzelle's technology architecture. For a more in-depth reading with more details refer to the [Technology Paper](#).

## 11.1. Database 101 - CRUD API

CRUD stands for “create, read, update, and delete” for the four basic functions pertaining to databases and permanent storage. CRUD covers the functionality of relational databases, where each of create, read, update, and delete can be mapped to corresponding SQL and HTTP methods.

A password of the user's own choosing is also required, and it is up to the user to protect this password and keep it available for later. All the data stored in key value pairs are encrypted, with the password being used as the initialization vector in AES 256 symmetric key encryption. This password is only ever used locally and never travels on the network in any way, shape, or form.

## 11.2. Sharding

Shard stands for “System for Highly Available Replicated Data”. Large databases often are hard to work with due to the size and memory constraints they come with. By partitioning the database along logical lines, the database becomes much easier to work with.

A logical shard is the smallest unit in Bluzelle and contains individual units of data that all share the same partition key. A partition key is a unique identifier that allows the shard to be accessed for the retrieval of information. In Bluzelle, partition keys allow the dApp to store and retrieve data from the correctly identified leaf swarm efficiently. In Bluzelle, groups of logical shards are stored on leaf swarms, and it is the amalgamation of these leaf swarms that makes up the entirety of the Bluzelle database.

## 11.3. Jump Consistent Hashing

Jump consistent hashing (JCH) was first described in a white paper by John Lamping and Eric Veach at Google. It is an elegant algorithm that only takes about 5 lines of code in a language like C++. JCH does not have a state machine, and therefore requires no storage. It is an algorithm without lookups in memory and is therefore much faster.

Bluzelle uses JCH to map from the key (in key value pairs in a NoSQL table) to the id of the swarm that the key is replicated in. Once that id is found, Bluzelle uses Kademlia hashing to find the means to reach that swarm even if that specific swarm is not running.

## 11.4. Kademlia Hashing

Kademlia is an advanced form of a typical peer-to-peer distributed hash table which has been structured in a way to make particular use of the special symmetric and geometric properties of the bitwise XOR function. Bluzelle uses Kademlia hashing to efficiently enable nodes to know about every other swarm on the network. Using Kademlia's own form of "finger tables", each node in the network only needs to know information about how to reach  $O(\log(n))$  other leaf swarms, where  $n$  is the total number of leaf swarms on the network. This means that irrespective of how large the network ever becomes, every node can reach every other leaf swarm within  $O(\log(n))$  tries, by only storing  $O(\log(n))$  data. As a result, Bluzelle is able to handle exponential growth.

## 11.5. Partial Replication

Partial replication means that not every node in the network has a copy of the data -- only the nodes within the leaf swarm delegated to that data replicate it. This is one of the key differences between Bluzelle and a traditional "blockchain". Blockchains are inherently slow and do not scale well, as every set of transactions or blocks is 100% replicated everywhere, putting severe vertical scaling limitations on the network. Bluzelle by design only stores the data amongst a strategic subset of the nodes, statistically providing an guarantee that the data is always available and still achieving the benefits of boundless horizontal scaling. Partial replication exists because only ONE

swarm amongst all the swarms in the network replicates a given piece of data. An interesting incumbent technology that can be compared to this is the content delivery network (CDN).

## **11.6. Load Balancing**

A benefit of having a logical shard stored on multiple physical nodes is speed - by having the same data accessible through different hardware resources at various geographical locations, the system may load-balance queries to retrieve data from nearby nodes that are least taxed at any given moment in time. This permits Bluzelle to dynamically perform queries and retrieve data in the most efficient way possible, maximizing use of the shared resources spanning across multiple nodes.

## **11.7. Redundancy**

As replicated data is stored across different nodes with unique infrastructure, there is a severely reduced causation between single-node failure and loss of the shard. This method of mirroring serves to secure the availability of data in an efficient manner by ensuring any single point of failure is inconsequential.

## **11.8. Consensus**

Bluzelle deals with consensus differently from blockchains, doing away with any concept of a network-wide universal state. There is no need for a single state for the whole network, so Bluzelle applies the consensus model on a swarming level, ensuring that leaf swarms of nodes storing data shards are each reaching localized consensus, using our customized forms of consensus and proof algorithms .

A swarm with consensus appears to clients interacting with that swarm (or other swarms interacting with the swarm) as a single, atomic, indivisible unit that stores a set of data reliably. Any node in that leaf swarm can accurately service requests pertaining to that data.

## 11.9. Karma

Every producer on Bluzelle is entitled to run one or more nodes on the network as farming nodes. Each such producer will use their Ethereum address as the “key” that identifies them. This identifier is unique to that farmer and is tied 1:1 with their Ethereum address. The producer also has a “Karma Index”, which is a score that dictates how well-behaved the producer is. The karmic index can go up and down depending on the producer’s activities and decisions, intentional or not, autonomous or not, and spans all the nodes the producer operates. If one such node misbehaves, the karmic index typically drops and this applies to all the producer’s nodes. Furthermore, the farmer is required to put up a stake (in BNT tokens) that is proportional to the number of nodes and inversely proportional to the karmic index.

## 11.10. Sybil Attacks

Some blockchain networks, like Bitcoin, allow anyone to add their node to the network. That brings the concern that a malicious organization could potentially add so many nodes that they disproportionately control the network and leading to hijacking the network. This is referred to as a Sybil attack. Bitcoin and Ethereum obviate Sybil attacks by making them prohibitively expensive via proof of work. I

Bluzelle employs several methods to prevent Sybil attacks so that when a bad actor is caught, they can be blacklisted, and economically penalized leading to complete removal from the network. These anti-Sybil attack methods are:

- Producers are required to put up a BNT stake to participate in the network. This stake serves as a requirement for participation and as a strong economic deterrent from bad behaviour.
- The Kademlia distributed hash table is used as it relies on message redundancy and the XOR distance function. Neighbours are selected and messages are redundantly sent to multiple neighbors of the intended node for anti-Sybil verification purposes. Nodes that mislead the swarm location effort will be systematically tracked down and caught.
- A request to a swarm for CRUD functionality is done with redundancy, where multiple nodes in the same swarm all perform the request. Given the node->swarm membership rules for

Bluzelle, it is statistically unlikely that multiple such nodes chosen to perform a given transaction are colluding bad actors that deliver bad yet consistent data.

- Swarm membership is determined by the network and cannot be chosen by nodes. This means that a would-be Sybil attacker who attempts to join the network with  $n$  nodes or masquerading with the identity of  $n$  nodes will not be able to gain a critical mass of memberships into any single swarm.
- Nodes can be posed a challenge request to participate in a proof of storage test. This test is performed in cooperation with the consumer on either a random network-initiated basis or by the consumer directly and forces the targeted node to prove they have the correct data.

## 11.11. Byzantine General's Fault

One way to protect against Byzantine Faults is to have a default understanding of what to do if there is no information. In Bluzelle, if misleading or corrupted or inconsistent information is detected, the default is to do nothing. Thanks to the aforementioned redundancy in CRUD requests made to a swarm, inconsistency is caught, whether intentional or not. In any case, Bluzelle nodes are instructed to ignore the transaction and do nothing. Only authenticated transactions with proper credentials and checksums are accepted and transacted upon. By this way, Bluzelle is Byzantine Fault Tolerant by design.

## 12. THE COMPANY – STRUCTURE, TEAM, INVESTORS, ADVISORS

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Bluzelle Platform Pte. Ltd is a Singapore company. Singapore is chosen for its ecosystem of fostering blockchain innovations and regulations that support the growth of well-managed businesses.

### 12.1. The Team

Bluzelle is a team of 10 and growing with mainly top engineers with backgrounds in computer science, AI, cognitive science, blockchain, security, networking and more. Some members are:



Pavel Bains  
CEO



Neeraj Murarka  
CTO



Nitin Cunha  
Sr Developer



Scott Burch  
Sr Developer



Mehdi Kolahchi  
Sr Developer



Yingyao Xie  
Product Assoc.

**Pavel Bains, CEO/Co-Founder** – Pavel has over 15 years experience in operational management, digital technology and finance. An NCAA honor roll student-athlete from UCLA, Pavel also was the co-founder of Storypanda, a digital book platform that published critically acclaimed titles by DreamWorks, Warner Bros, Peanuts and more. Pavel was in GM and CFO roles for video game studios, including looking after 7 Disney studios across four continents and 350 people and \$150M budgets.

**Neeraj Murarka, CTO/Co-Founder** – Neeraj is an engineer and computer systems architect with over 20 years experience. He has worked for Google, IBM, Hewlett Packard, Lufthansa, Thales Avionics. Projects include: locking down of modified Android OS for retail markets; multicast UDP satellite-based systems, design and development of secure and FFA-approved systems for Airbus and Boeing. Neeraj was the fourth employee of acquired blockchain startup, Zero Block.



## 12.2. Early Investors

Bluzelle raised a round of financing from venture capital firms to kick-start development of the database service, accelerate staffing and provide capital needed for the token sale.



## 12.3. Advisors

Bluzelle has put together a specialized unit of advisors to guide the growth of the business. Each person is a technology heavyweight contributing to companies like Facebook, PayPal, LinkedIn, and more.



**Gil Penchina**  
Super-Angel  
Crypto-Advocate



**Brian Fox**  
Creator of BASH  
Open-Source Expert



**Prashant Malik**  
Creator of Cassandra  
Database Expert

## 12.4. Corporate Governance , Compliance, Legal

Bluzelle believes in maintaining high standards for operating a transparent business. We have created a group of top professional firms in legal & accounting to ensure these standards are met.

**OrionW** – legal counsel for Singapore

**Bryan Cave** – legal counsel for Hong Kong and USA

**PriceWaterHouseCooper** – corporate governance, corporate strategy, tax advisory

## 13. ROADMAP

We break down the development of Bluzelle into two distinct phases – the minimum viable product (MVP), and the post-MVP product releases (each named after a physicist).

