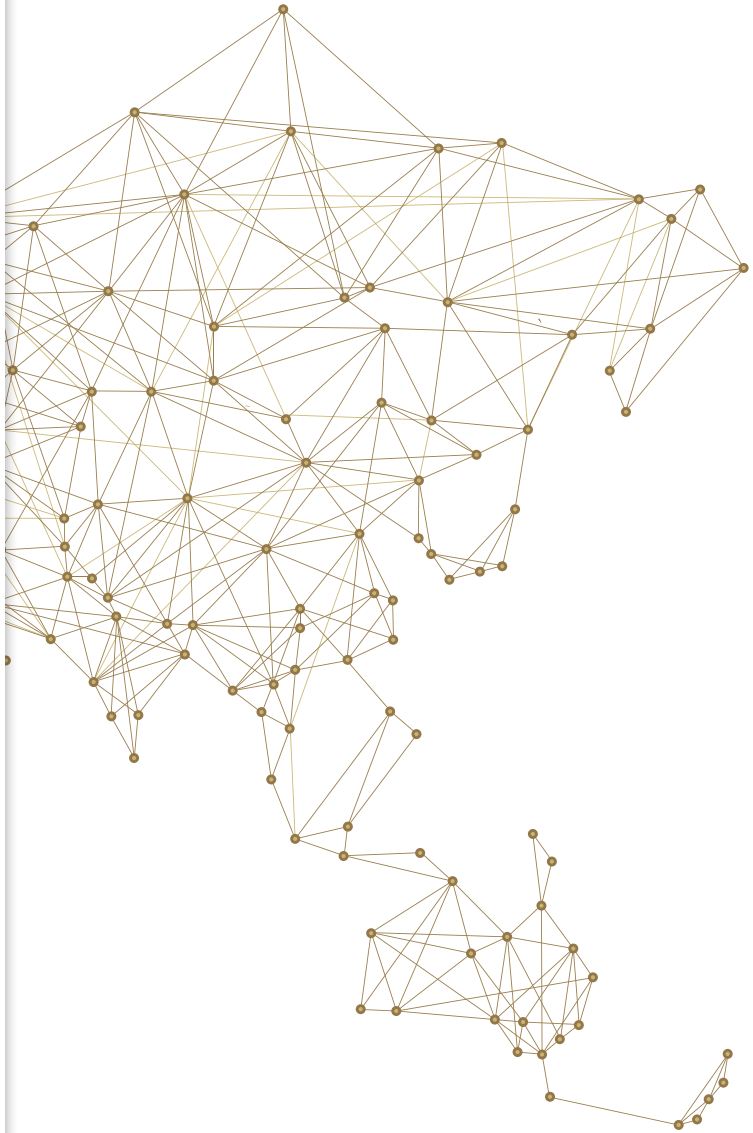


XUMA

Decentralized Database
for Developers

White Paper v 1.02

April 13, 2018

Content

Introduction

The three pillars of the Information Age are communication, computing, and storage. Communication and computing process and deliver information based on stored data. Since the introduction of the Internet in 1995, we've witnessed significant technological enhancements in throughput (communication), processing (computing), and capacity (storage).

As we progress in the Information Age, we are met with a new and progressive type of network – the blockchain. In simplest terms, a blockchain is a distributed ledger where data can be written but not erased. Blockchain can only be updated by consensus between participants in the system. The blockchain contains a true and verifiable record of each and every transaction ever made in the system.

While the Internet era produced extraordinary achievements especially in communication and computing, the blockchain will deliver even more transformative change in storage.

Since storage systems hold our data, they are faced with many challenges beyond traditional speeds and feeds. Storage systems need to manage the delicate balance between data ownership, consent, access, regional and international governance, all of which need to be maintained and optimized while at the same time, not hinder the pace of innovation.

Problem

Blockchain is the building block for the next generation of the Internet. Bitcoin and many innovative solutions to decentralize existing products and services available on the Internet today were built with blockchain. However, **a decentralized database solution does not exist.** As a result, distributed application (dApp) developers today still use centralized databases for their application code and data.

Solution

Xuma is a decentralized NoSQL database integrated with key blockchain technologies. The four major components of Xuma's solution are: 1) storage; 2) network; 3) business logic; and 4) interoperability.

Decentralized NoSQL database (storage)

Xuma's foundational building block is a global storage network featuring a built-in incentivized economy for consumers and resource contributors. Consumers rent database capacity to store their application code and data and receive the benefits of full database functionality and utilization of a zero downtime database system that is censorship free, DDoS-resistant, and fault-tolerant. Resource contributors can monetize their unused storage and bandwidth capacity.

Masternode (network)

Xuma leverages masternodes, a computer/server that stores a complete blockchain. These masternodes connect to form a complete network of nodes. From a technical perspective, masternodes are used to secure transactions, provide instant transactions, participate in governance voting, and enable budgeting in crypto. Xuma will continue to innovate with Masternodes and deliver database related functionally in upcoming releases. Masternodes are accessible to anyone and require 10,000 XMX as collateral.

Smart Contracts (business logic)

Xuma utilizes Smart Contracts business logic to facilitate exchange values in a transparent, conflict-free manner that eliminates the services of a middle-man. Having a fully automated system that processes read/write/share/access commands reduces errors. Smart Contracts can determine whether an asset should be allocated to one person/system or returned to the other person/system from whom the asset originated. Smart Contracts are stored on the blockchain where they are secure and immutable.

Multi-chain (interoperability)

Multi-chain capabilities ensure the Xuma solution is interoperable with the blockchain solutions ecosystem. By working with partners, Xuma is able to quickly distribute our solution to the vast developer community.

Solutions Landscape

There are two major categories of storage solutions: Database (developer) and IPFS (consumer). Xuma provides key, and necessary features required for a truly decentralized database.

	ties.network / bluzelle / WOLK	XUMA	Sharder	STORJ / sia / Filecoin	amazon web services / Microsoft / ORACLE
APPLICATION	Database	**Database**	File storage	File storage	Database
NETWORK	Decentralized	**Decentralized**	Decentralized	Decentralized	Centralized
MASTERNODE	No	**Yes**	No	No	/
SMART CONTRACT	No	**Yes**	Yes	No	/
BLOCKCHAIN	Ethereum	**Multi-chain**	Cross-chain	/	/
NAS*	No	**No**	Yes*	No	No
UPTIME	Always-on	**Always-on**	Always-on	Always-on	Occasionally offline
SECURITY	High	**High**	High	High	Low
SUPPORT MODEL	ICO	**Community Governance**	ICO	ICO	Venture/IPO

** Network Attached Storage Hardware - Sold by Sharder and used to build database network*

The Xuma Benefits

- Fully integrated decentralized storage solution with business logic capability
- Enablement of new applications and use cases not possible with centralized database systems
- Development and growth of a storage sharing economy.

Market Opportunity

The demand for data continues to accelerate as more devices and people become connected.

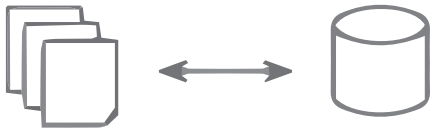
Gartner projects that 23 Billion connected devices will emerge by 2020.

According to *Markets and Markets*, the Database-as-a-Service (DBaaS) industry is expected to reach $14.05 billion by 2019 at a CAGR of 67.30%.

The four primary drivers of demand for Database-as-a-Service (DBaaS) are:

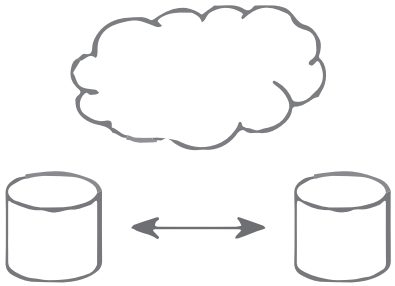
- Consumer Applications - social media, financial, dating products
- Internet-of-Things (IoT) Applications - smart homes, fitness trackers, electric meters
- AI/VR - amount of data generated and consumed increases
- Business Applications - Internet-of-Things, smart buildings (LED lighting, HVAC and physical security systems)

Database Evolution



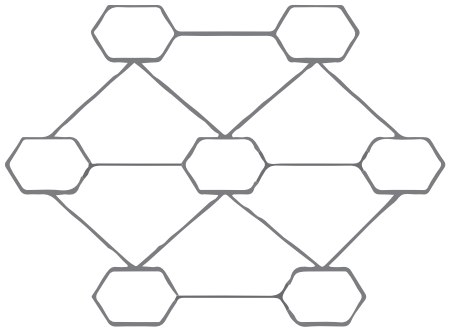
File system

The File System organizational structure closely resembles the file cabinet. Records were treated as discrete objects that could be stored in folders (i.e. directories). These systems were expensive to scale and were prone to failure. If the hard drive or operating system failed, all data would be lost.



Centralized - Cloud

The present batch of technologies that help increase performance and reliability are SQL, NoSQL, and cloud deployments. While performance and reliability have improved with each new technology, the systems are still prone to downtime and data loss. These issues remain because of today's database architecture still have single points of failure.



Decentralized

By applying blockchain technologies, Xuma is able to deliver a decentralized database that solves issues that have hindered databases since their inception. With a decentralized database architecture, the Xuma system will have zero downtime and be infinitely more secure through the use of blockchain technologies. The Xuma database is multi-chain, fault tolerant, censorship resistant, DDOS-resistant, and has zero-downtime.

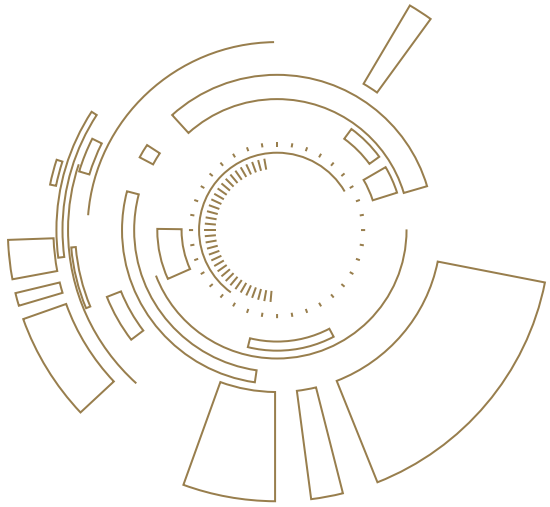
Xuma - A community effort

Our goal is to fully embrace the decentralized movement. Not only do we use the necessary blockchain technologies to ensure our system is secure and scalable, we're also enabling our community to build our software stack.

Our coin economy promotes widespread participation from blockchain enthusiasts to newcomers. We intentionally did not conduct an ICO nor offer a presale at launch. Instead, we chose to develop our product by leveraging the global network of developers and entrepreneurs around the world.

The Xuma project was conceived with fairness and transparency as the cornerstone of our mission statement.

We provided all participants, including the core team, the opportunity to mine Xuma coins at the same time. Our project is funded 100% by the community through our governance system. We are laser-focused on transforming the decentralized database evolution and excitedly welcome all participants into our project.



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